Managerial Replacement during Acquisitions

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Acquisitions are a means to access new markets and knowledge. Despite these and other benefits, the integration of a target can be quite challenging for acquiring firms (Buono & Bowditch, 2003), often leading to departure of strategic human capital (Krug & Hegarty, 2001) which threatens the success of the whole acquisition operation.

As an illustrative example, in mid-January 2010 Kraft Food (today Mondelez International) announced the hostile acquisition of Cadbury, one of the largest confectionery companies, for US$18.9 billion—US$2.7 billion more than their initial bid. Within a month after the acquisition announcement, the Chairman, the CEO and CFO resigned, followed by Cadbury’s marketing director by the end of April. By July of the same year, 120 out of 165 senior employees had left Cadbury, leaving the acquired firm with less than 30% of the senior staff that was present at the announcement of the acquisition. The company struggled to rebuild a leading management team.

In fact, managers are crucial for the success of acquisitions (Cannella & Hambrick, 1993; Graebner, 2004) as they navigate the target through the integration process. Consequentially, much of scholars’ attention has been on the departure and retention of managers after acquisitions (as pioneered by Walsh, 1988). While there is substantial work on the extent to which acquisitions affect managerial turnover, and who is affected the most, we know little about how managers are replaced once they have left the firm. Understanding the replacement of target’s managers is important because it directly affects the critical ‘coordination-autonomy dilemma’ that companies face during acquisitions (Puranam, Singh, & Zollo, 2006) and ultimately the firms’ ability to preserve knowledge in the acquisition target.

In this study, we investigate three mechanisms through which acquisition targets can replace managers who leave—transfer, promotion or hiring—and discuss the opportunities and challenges presented by each of them in relation to the ‘coordination-autonomy dilemma’ in acquisitions and the firm’s ability to preserve knowledge in the acquisition target.

On the one hand, managerial transfer from the acquiring firm to the target increases an acquirer’s control and aids knowledge exchange and transfer of organizational routines between acquirer and target. On the other hand, managerial transfer comes at the cost of reduced autonomy of the target. Promotion, as another replacement mechanism, leaves more autonomy to the target while preserving the firm specific knowledge and human capital within the target firm. Yet, promotion may also decrease ease and speed of integration due to lacking coordination and control of the acquirer. The third option is to replace managers via external hiring. Hired managers might take a more neutral position. However, they lack firm specific knowledge of both the target and the acquirer, and may therefore be less effective in navigating the integration process.

We argue that the replacement strategy adopted by the firm is conditional to (1) complexity of the acquisition, and (2) the quality of the acquisition target. Specifically, we hypothesize that target managers are more likely to be replaced by: i) transfer from the acquirer when the acquisition is complex ii) promotion within the target when the quality of the acquisition target is high.

To examine managerial replacement and to test our hypotheses, we construct a novel dataset based on linked employer-employee data provided by Statistics Denmark. The data provides information on firms, establishments (subsidiaries) owned by a firm, and all employees working in an establishment on a yearly basis from 1980 onwards. The granularity of the data allows us to construct an individual’s entire career history in Denmark, including information on salary and the type of position held in each firm. We use the information to
identify how managers are replaced. Our sample comprises 339 firms that got acquired over the period from 2009 to 2015, and all employees who have been promoted to a managerial position or joined the acquired firm as manager up to three years after the acquisition. The richness of the data, furthermore, allows us to create a meaningful comparison group to calibrate our findings. Our comparison group comprises 297 matched non-acquired multi-establishment firms with similar characteristics including all their incoming managers and employees promoted to managers.

Our study makes several contributions. First, we provide descriptive evidence showing that the phenomenon of managerial replacement is mainly observed during the year of acquisition itself as compared to following years post-acquisition. Thus, different to managerial turnover (Krug, Wright, & Kroll, 2014; Walsh, 1988), the replacement of managers is an immediate response to acquisitions that happens primarily in the short-term after an acquisition. Second, our results suggest that managerial replacement is a strategic decision taken to overcome the coordination-autonomy dilemma that firms face during acquisitions. The finding that internal replacement mechanisms (promotion and transfer) are used to a greater extent than external hiring, indicates that firm-specific knowledge (of both acquirer and target firms) embedded in strategic human capital is a crucial asset for the post-acquisition phase. These findings contribute to the literature on the coordination-autonomy challenges that are focal to the acquisition literature (Haspeslagh & Jemison, 1991; Puranam et al., 2006; Ranft & Lord, 2002). Third, the immediate and frequent replacement of managers observed in our data raises the question whether managerial replacement can overcome—or mitigate—the negative effects of managerial departure found in other studies which do not include incoming managers (Bergh, 2001; Cannella & Hambrick, 1993). Investigating retained and replaced managers jointly might therefore provide more insights on how to successfully manage acquisitions.

References

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Solutions Looking for Problems: Excess Resources and the Direction of Innovation

Detailed abstract

Innovation research has become increasingly concerned not only with the rate, but also with the direction of organizational innovation. Strategy scholars have argued that executive team actions (McGrath et al. 1992), strategic alliances (Hohberger et al. 2015), networks (Soh 2010), the market for ideas (Chatterji and Fabrizio 2016), capability development trajectories (Rockart and Dutt 2015), search breadth (Kaplan and Vakili 2015; Leiponen and Helfat 2010) and social context (Vakili and Zhang 2018) are among the important determinants of the direction of innovation, or how radical organizational innovation is (Bryan and Lemus 2017). The type of resources organizations have are important in directing their innovative efforts; however, we have a limited understanding of the heterogeneity of excess resources and their relationship with innovation. In this paper, I aim to answer the following question: how do different types of excess resources affect the direction of innovation?

Literature on excess resources and innovation has used a variety of notions to define “excess”. On the one hand, behavioral theory highlights that slack accumulates during abundant times and enables exploration with limited regard to immediate profitability (Bourgeois 1981; Cyert and March 1963; Levinthal and March 1981). On the other hand, Penrose (1959) argues that low demand conditions periodically create idle capacity, defined as resources that no longer enter a production function: these are the “idle man- or machine-hours at various points in the production process and in the managerial staff” (Penrose 2009, p. 63). This original distinction between the two types of excess resources has become less clear over time. Scholars have defined slack broadly as “excess inputs such as redundant employees, unused capacity, unnecessary capital expenditures” (Nohria and Gulati 1996), and argued that a certain level of slack enables experimentation (Nohria and Gulati 1996), R&D investments (Kim et al. 2008), as well as alliances and acquisitions (Iyer and Miller 2008; Kuussela et al. 2017; Lungeanu et al. 2016; Voss et al. 2008). However, this broad definition of excess resources overlooks both the variety of conditions that generate them as originally articulated by Cyert and March (1963) and Penrose (1959), and the directions of innovation that are engendered by these different types of resources. A distinction that merits further study is between abundance slack arising from positive industry shocks and idle capacity arising from negative shocks. Juxtaposing Cyert and Marchian slack and Penrosian idle capacity enables us to untangle the distinct organizational outcomes to which these resources lead. In this paper, I separate these two types of excess resources – abundance slack, which results from positive shocks, and idle capacity, which results from negative shocks - and study their differential impact on the direction of organizational innovation.

I argue that untangling different types of excess resources enables a more nuanced examination of organizational drivers of the direction of innovation. Positive shocks create abundance slack and enable intra-industry innovation as the organization looks to invest in projects that take advantage of the environmental conditions. The focal mechanism here is local slack search (Levinthal and March 1981; Levinthal 1997) that leads to innovation within the industry undergoing the abundance period. In contrast, negative shocks create idle capacity that engenders resource redeployment and recombination in new settings. The focal mechanism here is exaptation (Cattani 2005, 2006; Dew 2007). Exaptation – repurposing of artifacts and resources for unforeseen uses – has been shown to be a precursor of a high number of innovations (Andriani et al. 2017), and the present study provides evidence for one potential driver of exaptation: exogenous negative shocks that affect the opportunity costs of existing resources.

The empirical setting is the energy sector. I find that an increase in the price of oil affects new area (greenfield) exploration investment significantly more than known area (brownfield) investment in the oil and gas industry. The results hold when accounting for established measures of slack, such as current assets to liabilities ratio. An oil price increase by $10/barrel constitutes a 31% increase in expenditure for new projects at the firm level relative to brownfield projects. In addition, I find that windfarms run by firms with oil and gas experience following the oil price shock were significantly more productive and used more sophisticated technology (larger wind turbines) relative to windfarms run by other players in the industry. After the oil price shock in 2014, oil and gas firms built windfarms with turbines that were larger and on average 11% more productive relative to other firms in the industry. This effect is in particular driven by windfarms that were located near an oil and gas field, indicating that resources from existing oil and gas firms were redeployed in those areas. Consistent with the observation that offshore oil and gas industry segment was the most affected by the oil and gas price downturn, the effect is strongest for windfarms.
located close to offshore oil and gas reservoirs. Taken together, these findings support the arguments that abundance slack engenders innovation within the focal industry, while negative shocks engender exaptation of idle resources. The paper contributes to literatures on the direction of innovation, excess resources and industry renewal, and has implications for our understanding of the energy transition.
General or specialized? A “beginner’s guide” to search a new knowledge domain

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Most new products fail, but those that succeed have a positive impact on society and on the profitability of the innovating firms that have launched them. The success of these innovating products is firmly embedded in the value of the inventions behind them; thus, understanding the factors that lead to inventions of superior value is crucial for academics and for practitioners aiming at maximizing their return on R&D.

In a context where inventions are the result of new combinations of knowledge elements, a firm’s knowledge search, defined as the acquisition of external knowledge from a knowledge domain that is different from the one where the firm habitually operates, is a crucial and widespread mode to reconfigure the firm’s knowledge base and create new combinations of knowledge elements that lead to inventions.

Due to the parallel relevance of the value of inventions and of knowledge search as a mode to generate inventions, scholars have been genuinely interested in understanding the factors related to knowledge search that affect the value of these inventions. By focusing on where a firm searches and how much new knowledge it acquires, several impactful studies have identified the number of searched domains, the amount of knowledge extracted from each domain, and the distance between the searched domain and the firm’s knowledge base, as the main drivers of superior inventions.

Although insightful, these approaches rely on differences among the domains object of a firm’s search and propose a framework that inhibits the explanation of heterogeneous values of the inventive output when the search process is homogenous in terms of the searched domains. This limitation leaves some of the drivers of superior inventions still unidentified.

By focusing on the characteristics in terms of the generality of each knowledge elements extracted from a focal knowledge domain, this paper offers a perspective that bypasses the limitation of the current frameworks and, by answering the question: “how do different levels of generality of the elements imported from a new domain affect the value of inventions?”, it explains why generality is a relevant driver of the value of inventions.

Indeed, previous studies have shown that firms who search for knowledge in an external domain face ex-ante incentives to acquire knowledge elements that can be more general or specialized in nature. However, the implications of applying a general versus a specialized element remain unclear. Even more so when considering that searching firms extract different amounts of elements that entail different levels of generality from each domain.

By analyzing patent data from the mobile phone industry and focusing on RIM (Blackberry) as the innovating firm, we use patents cited by RIM as a proxy for the searched knowledge elements, and we adopt each cited patent’s class as a proxy for the searched knowledge domain. Relying on the established perspective that depicts knowledge elements in a domain as knowledge network in which past combinatorial relationships are recorded, we claim that the higher the number of past combinatorial relationship (backward citations) incident upon an element within a domain, the higher the generality of this element in the domain. In other words, a patent that occupies a more central position in the citation network within its patent class is more general in the knowledge domain represented by that class. Therefore, in a context where each patent cited by RIM represents a node, and the backward citations of this patent within its class represent a tie, we measure the generality of a searched element using its network centrality in its patent class.

Furthermore, combining this information with the dates of citation, we rank each element (cited patent) searched from each domain (cited patent’s class) in a “search sequence” that highlights the first, second, third, etc. patents extracted from a focal domain.

Our findings suggest that the level of generality of the first element searched in a new knowledge domain hampers the value of the innovation that adopts this element. The harming effect of generality persists but decreases with the rank occupied by the knowledge element in the search sequence. Furthermore, the level of generality of previous elements enhances the value of the innovation generated using subsequent elements from
the same domain, showing an indirect positive effect of the generality of the previous element on the outcome of the subsequent ones. This indirect effect increases with the generality of the following elements.

To support the causal effect of generality on the value of the innovation, we leverage on the Leahy-Smith act that, between 2011 and 2013 changed the patenting procedure in the US from a first to invent to a first to file, thus changing the incentive system for firms to use more specialized elements.
WHEN FIRMS ACQUIRE MORE (OR LESS)? THE ROLE OF INDUSTRY FRAGMENTATION OF TECHNOLOGY OWNERSHIP AS A DETERMINANT OF ACQUISITIONS

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Abstract
“Invention, and particularly modern invention...is a drama enacted on a crowded stage.”
(Polanyi, 1944, p. 71)

Firms innovate by combining technological knowledge generated through their R&D with inputs generated outside the firm (Helfat, 1994; Kneeland, Schilling, & Aharonson, 2020; Kogut & Zander, 1992). While seeking to use technology components in new ways, firms need to manage their innovation strategy to avoid infringing the intellectual property (IP) rights of other technology holders (Arora, Fosfuri, & Gambardella, 2001). Obtaining access to valuable IP rights is critical for firms to generate and appropriate value from their investments in innovation as technology owners can demand unreasonable royalties and upfront payments or engage in costly litigation. Thus, appropriability is a significant challenge for firms in fragmented markets for technology characterized by widely dispersed ownership of IP rights (Heller, 2008; Heller & Eisenberg, 1998). In extreme cases, the arduous task of assembling all relevant IP rights can prevent firms from innovating as they risk being “fenced in” by other technology holders (Huang & Murray, 2009). Simply put, a firm has its R&D activities fenced in when outside owners of IP rights can block or impose prohibitively high remuneration conditions for technologies relevant to the firms’ innovation activities.

Understanding how firms access and assemble valuable IP rights has increased in importance over the last few decades with the growing fragmentation of IP ownership (Ahuja, Lampert, & Tandon, 2008; Burk & Lemley, 2009). This phenomenon has driven firms to actively deploy strategies that allow them to access externally generated IP rights that can be subsequently incorporated into their ongoing R&D efforts (Cassiman & Valentini, 2016; Laursen & Salter, 2006). Among these strategies, one of the most commonly observed is the use of technology-related acquisitions (Capron, 1999; Valentini, 2012) in which the acquirer firm takes ownership of the target firm in order to access its IP rights (Ahuja & Katila, 2001; Schweizer, 2005).

Yet, our understanding of how the fragmentation of IP ownership in an industry relates to firms’ use of technology acquisitions is still limited. Our paper sheds light on this issue. We theorize that an industry’s structure of IP ownership is an essential determinant of the use of technology acquisitions as a value-appropriation mechanism. We argue that the level of fragmentation of IP rights in an industry is curvilinearly (inverted U-shape) related to firms’ rate of technology acquisitions. Furthermore, this curvilinear relationship becomes weaker (more linear) for firms at higher risk of being fenced in by owners of external IP rights. Moreover, the level of IP rights fragmentation in an industry also relates to the likelihood of firms becoming the targets of technology acquisitions. Specifically, we argue that firms that hold more valuable IP rights relative to their portfolio are more likely to be acquired as the fragmentation of IP rights in an industry increases. In the context of technology acquisitions in the global biopharmaceutical industry from 1986 to 2004, we test and find empirical support for our hypotheses.

Our study makes several contributions to the literature on the determinants of technology acquisitions (Ahuja & Katila, 2001; Schweizer, 2005; Valentini, 2012; Valentini & Di
Guardo, 2012). While this literature has focused primarily on learning and capability development benefits as determinants of technology acquisitions, to our knowledge, ours is the first paper to develop theory on how the fragmented ownership of IP rights at the industry level is related to firms’ use of technology acquisitions. In so doing, we provide a novel theoretical perspective on the antecedents of one of the most commonly observed strategies innovative firms use to access and assemble needed IP rights: technological acquisitions. We also contribute to the literature on value appropriation in markets for technology (Arora et al., 2001; Grimpe & Hussinger, 2014; Ziedonis, 2004) by examining the use of technology acquisitions as a means of strengthening appropriability in industries with fragmented IP rights. Overall, our paper advances understanding of technology acquisitions by introducing the fragmentation of IP rights within an industry as a critical determinant of technology acquisition decisions.

References
Analysis versus Implementation: The Effect of Perceived Uncertainty on Advice?

Amir Sariri

Seeking business advice from more experienced individuals is a long-standing tradition in business. In entrepreneurship, never before have we seen such mobilization of mentorship and advice due to entrepreneurship programs. Mentorship is a major, if not the primary, offering of public and private programs that have proliferated over the past decade (Cohen et al., 2019; Hochberg, 2016). Yet it is remarkable how little we know about the nature, sources, and implications of advice. This paper aims to contribute to the nascent literature on this topic by offering evidence on the nature of entrepreneurial advice.

In particular, I examine advice in a setting where it regulates the trade-off that entrepreneurs make between searching for information and executing costly and commitment-making ideas. This trade-off, central to entrepreneurial strategy (Gans et al., 2019), is the focus of this paper. Specifically, I examine the relationship between startup mentors’ perceived uncertainty and the activities they suggest founding teams should perform. For empirical analysis, I explore a database exceptionally suited for my research question. This data is from a mentorship program explicitly designed to help entrepreneurs prioritize use of their scarce resources for critical tasks.

At the beginning of each period, founding teams submit the three most important activities that they wish to perform at the “expense of everything else.” Subsequently, entrepreneurs participate in a series of discussions with mentors to revise and finalize those priorities. This process yields 5,850 individual activities corresponding to 642 early-stage technology startups. By comparing entrepreneurs’ intended activities with those revised by mentors, I document significant relative underinvestment by entrepreneurs in simple search and planning. In turn, they spend this share of effort on marketing, sales, and product development – implementation of ideas. I construct a proxy (Bachmann et al., 2013) for mentors’ perceived uncertainty by calculating the variation in the change of their interest in ventures from an earlier period to a later period, when additional signals about ventures are revealed. I show that mentors suggest substituting effort away from implementation and towards analysis particularly in periods that mentors perceive ventures as highly uncertain.

To establish causality, I construct two instrumental variables using random mentor presence at sessions and the order of venture presentations. The former is positively correlated with the probability of mentors voting for ventures – that is, expressing their interest, since absentee voting requires incurring additional communication cost. The second IV correlates with voting because polls are called in the order of venture presentations. Since each vote entails significant commitment of the mentor’s time to the venture, those presented earlier are more likely to receive a vote. Yet neither of these variables are related to the founding teams’ choice of activities.
References


Founding Team Human Capital: Rhetoric Skills and Resource Acquisition

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Detailed Abstract

The human capital of new venture founding team members is known to have significant impacts on both performance outcomes and the firm’s ability to acquire resources (e.g., funding from investors). Various streams of literature have noted that things such as previous founding experience, previous managerial experience, and education (especially in technical fields) are associated with improved firm performance. In addition, these traits serve as signals of the underlying quality of the firm. Since external parties like investors are not able to directly observe quality, they rely on the traits of founders to provide information that is otherwise unavailable.

Generally speaking, the literature on the human capital of firm founders has focused on either business related or technical human capital. However, a different set of skills has gone largely undiscussed in the human capital literature – the skill of communicating. A growing literature has suggested that the way that language is used by firms has an impact on both their performance and their resource acquisition outcomes. The use of various types of rhetorical tools has been shown to be important for the purposes of convincing external parties to provide resources to the firm. Despite the growing belief in the importance of new ventures engaging in rhetorical activities, little work has considered the underlying skills necessary to execute these activities effectively.

This study proposes that, just as a founding team’s human capital in the form of business and technical experience or education can impact a firm’s ability to acquire resources, so too does a founding team’s human capital related to rhetorical activities. Literature on human capital and founding teams has broadly ignored the implications of rhetoric-oriented human capital, either alone or alongside the traditional business and technical human capital constructs. To address this gap, this study explores the comparative (and complementary) impacts of rhetorical, business, and technical human capital of founding team members on firm funding.

In order to unpack the impacts of the rhetorical skills and knowledge of founding team members, I observe approximately 30 years of venture capital investments in U.S.-based entrepreneurial ventures, as well as the educational and professional backgrounds of the founders of the target firms. By categorizing founders’ human capital as oriented toward rhetoric, business, or technical aspects (or any combination of the three), I am able to observe associations between different founding team formulations and different types of funding outcomes for firms across multiple industries. I hypothesize, and find, that having a founding team with members who have rhetoric-oriented human capital is associated with receiving both a greater number of investments over time from venture capitalists, as well as investments from a greater number of unique investors, than teams with other human capital backgrounds, including those with technical or business-oriented human capital. In addition, when looking at team composition, a combination of rhetoric-oriented human capital with both business and technical-oriented human capital is associated with both a greater number of investments and a greater variety of investors in comparison to other combinations.
When Performance Isn’t Performance: The Impact of Earnings Smoothing on the Science and Practice of Strategic Management

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A core topic of study within strategic management is understanding the underlying determinants of firm performance, and a common measure of such performance is firms’ accounting profits (e.g., return on assets [ROA]; McGahan & Porter, 2002). However, accounting profit is to some extent a product of firm choices specifically made to achieve reported earnings targets, and not just an indicator of underlying value creation. A common use of earnings management is to “smooth” earnings by taking profits from overperforming periods and shifting them forward or backward to underperforming periods (Ronen and Yaari, 2008). Results from a survey conducted by Graham, Harvey, and Rajgopal (2005) indicated that 78 percent of the chief financial executives interviewed admitted to sacrificing long-term value to smooth earnings; this both speaks to the potential breadth of the phenomenon of earnings management as well as its potential impact on value creation. The phenomenon of earnings management has been studied in the accounting literature primarily from the focus of answering the questions of when, why, and how earnings management happens. My dissertation brings this topic under a strategic management lens to answer the question “So what?” by exploring 1) the impact of earnings management on how we as strategy scholars measure firm performance as well as 2) the impact of earnings smoothing specifically on subsequent propensity for strategic change.

Essay 1 (Gibbs, Simcoe, & Waguespack, 2020) provides quantitative estimates of the extent of earnings management among public firms and estimates of the non-classical measurement error present in publicly reported income numbers. By using an algorithmic bunching estimator pioneered by scholars in economics (Chetty, 2012; Kleven & Waseem, 2013; Diamond and Persson, 2017), discontinuities in the distribution of annual firm ROA can be compared against iterative counterfactual functional forms to estimate 1) the range of probable earnings management, and 2) how much mass has shifted from one part of the distribution to the other. The results suggest that approximately 15.5% of firm-years have been shifted due to earnings management (see Figure 1). Operational cash flows (OCF) are used as an alternative measure to serve as a counterfactual for the distribution of ROA. OCF captures the core value creation activities of most firms and has the added benefit of being less frequently and with less magnitude manipulated through earnings management. This lower level of manipulation occurs partially because it is not closely scrutinized by consumers of financial information as income-based measures such as ROA. Additionally, there are fewer opportunities to actively manage OCF as accruals by definition do not contribute to the measure. Using the Diamond-Persson method mentioned above, approximately 3.9% of OCF firm-years appear to have been shifted and the magnitude of the shift is far less than that for ROA. Using OCF as a counterfactual performance measure for ROA, an updated study in the decomposition of variance of profitability is conducted in the spirit of McGahan & Porter, 1997; 2002 and Mackey, 2008, to revisit how much variance in profit can be explained through various components. The results suggest that earnings management reduces the overall amount of variance explained by approximately 10 percentage points, as well as shifting our understanding of how much variance each individual component explains.

Essay 2 (Gibbs, 2020) examines the potential for a causal relationship between a firm’s earnings smoothing activity and subsequent propensity for strategic change. The study includes two instrumental variables to aid causal identification: 1) the influence of earnings smoothing by industry peers and 2)
variation in special items. Because these instruments have strong first stages as well as possible minor violations of the exclusion restriction, they provide an excellent opportunity to apply methods developed by Conley et al. (2012) and refined by Kippersluis & Rietveld (2018) to relax exclusion restriction assumptions empirically. Traditional panel regression models and 2SLS using the instruments above suggest that firm earnings smoothing leads to a lower propensity to change major resource allocations (R&D spending, SG&A spending, debt/equity ratio, etc.) in subsequent periods.


Figure 1: Histogram of Predicted vs. Actual Values of Return on Assets
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CCC | June 2020 | Extended Abstract: *Machine Learning and the Legal Industry*

There are widely cited concerns that advances in artificial intelligence will lead to massive job losses (e.g., Byrnjolfsson and McAfee 2014) and that automation of low-and medium-skill occupations contributes to wage inequality and employment polarization (e.g., Autor, Levy and Murnane 2003; Michaels, Natraj, and Van Reenen 2014). The intuition behind these concerns stems from the understanding that AI, or machine learning (ML) more specifically, increases prediction capabilities, effectively lowering the cost of prediction (Agrawal, Gans & Goldfarb, 2018). In turn, cheaper prediction, facilitated by ML adoption, decreases the demand for substitutes to prediction and increases the demand for complements. The expected result on labor markets from this cost reduction framework is that new automation technologies, which are, in theory, much more productive at prediction than the labor they replace, will result in productivity gains for the adopters that stem from reduced costs and incentives to expand output, which in turn increases demand for labor from non-automated tasks.1

In order to examine how ML is poised to impact the economy in various ways, such as through pricing, competition, and firm boundaries/resources, this paper examines the impact of ML adoption on the legal industry.2 Every organization is impacted by the law, from its incorporation through its demise, via merger, bankruptcy, or otherwise. Increasingly the distinction between the legal industry and business is becoming blurred as, for example, new regulatory schemes promote the dual ownership of law firms by non-lawyers.3 It is therefore imperative to understand how ML is likely to impact not only the practice and provision of law, but also aspects of legal practice such as contracts that govern a firm’s transactions. While I approach research from the legal industry perspective, legal automation is likely to impact multiple industries because most organizations rely on tasks, both those that are high-skilled and more routine, that fundamentally involve the law and legal issues (e.g., document production requests, contract review, regulatory compliance, etc.).

The legal industry is ripe for automation4 because it relies on prediction at its core. Indeed, the intuition behind “making a case”, or arguing one side of an issue, is that each side marshals facts, based on the law, to its advantage. Because there is some standard to which the arguments are compared, the side that can best predict how the judge (or other enforcement mechanism) will interpret the facts as applied to the law wins. The law is often backward-looking rather than progressive, which lends itself well to prediction machines that can leverage the power of data: previous cases and rulings. All aspects of the legal industry grow from this baseline intuition. For example, even corporate lawyers who primarily draft contracts are fundamentally concerned with risk mitigation, essentially drafting contracts that are most beneficial to their clients while remaining within the boundaries of the current (and future) law given the anticipated transactional setting.

This paper is part of a research program in which I evaluate the impact of automation (primarily ML) technologies on the practice and provision of law and on aspects of the law such as contracts.5

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1 However, these expected results hinge on the impact of the technology being much more productive than the labor it replaces, rather than just slightly better (e.g., Acemoglu & Restrepo, 2018). At the firm level, these productivity gains also depend on restructuring firm processes and strategies to complement ML’s capabilities.
2 The legal industry is defined here as law firms; corporate (in-house) legal departments; courts; compliance, policy, and regulatory functions; and alternative legal service providers.
4 Via machine learning, due to its prediction capabilities. In this paper, I focus on technology that uses the prediction aspects of automation (ML) to review (e.g., redline) contracts. I also work with legal tech companies whose products automate legal processes without ML.
5 For example, in one paper I examine how trust between exchange partners changes when one or both use ML-enabled contract drafting technology. In another paper I develop categories, using topic modeling on onboarding call transcripts, of firms that adopt ML based on their professed likelihood to use the product and match this with actual renewal data to confirm differences between firms to understand why some firms license then fail to use ML.
My goal in this paper is twofold. First, I examine which firms are more likely to adopt a ML-enabled contracting product as compared to those that do not adopt. Second, I examine the impact of adoption.

To do this, I use proprietary data from LawGeex. Because ML, especially in the legal context, is still relatively novel, data is scarce; LawGeex is a preeminent start-up in the ML/legal tech space with a contract review product and their willingness to collaborate represents a great opportunity to work towards my larger research program by gaining access to data on this topic. I have data on adopters (customers) and firms that came close to adopting but ultimately did not adopt LawGeex’s product. LawGeex’s customers are primarily not law firms, but businesses such as eBay, Johnson & Johnson, and Office Depot. I supplement this with data on lawsuits and lawyers from additional sources such as the Directory of Corporate Counsel and the Association of Corporate Counsel.

I am interested in the characteristics of firms that adopt LawGeex, as compared to those that do not adopt, for a number of reasons. First, because ML is likely to be a general purpose technology (GPT) (e.g., Cockburn, Henderson & Stern, 2018; Goldfarb, Taska & Teodoridis, 2020) the way that it diffuses throughout the economy will differ from that of a typical technology. GPTs require more complementary assets, so firms with internal resources or those that are located in wealthy geographical areas, with greater access to complementary resources, are more likely to adopt because they can access the resources necessary to realize productivity gains (e.g., Forman, Goldfarb & Greenstein, 2008). Second, new technologies typically appeal to early adopters, who tend not be mainstream, and thus who tend to differ from later adopters. Understanding the differences between early and late adopters is critical to developing firm strategy about scaling the technology and preventing it from falling into the chasm. And finally, firms that adopt are likely to be the firms that will benefit most from the productivity gains associated with this ML technology, based on their resources, capabilities, and risk exposure.

I examine differences between adopters and non-adopters across a number of firm-level variables before adoption and find that there are no differences between early adopters and firms that do not adopt (or firms that may adopt later). I find that adopters are more clustered in coastal urban areas in the United States, whereas non-adopters are more evenly spread throughout the country. In terms of firm size, I find no differences between adopters and non-adopters; in fact, it seems as though smaller firms are slightly more likely to adopt, which runs counter to existing work that finds firms with complementary resources are more likely to be early adopters (e.g., Bresnahan & Greenstein, 1996). I also find that adopters are more likely to come from securities and financial services industries6, where a firm’s risk exposure is potentially high and standardization of routine, high volume contracts can provide clear value. I also find that, in terms of risk exposure, there are no differences in terms of number of lawsuits and number of lawyers. Overall these findings suggest that this technology is likely to successfully ‘cross the chasm’ and become more widespread in the coming years. This finding aligns with the generally observed demand for automating prediction, especially in the legal industry. However, as more data becomes available from LawGeex and other legal technology firms with ML products, I will continue work on this question.

Next, I plan to investigate how adoption impacts productivity in terms of changes to the adopters’ in-house legal department activities and composition. I am still collecting data to address this question. Firms that adopt ML will likely adapt their activities to accommodate the productivity gains in contract review. For example, this may be a Penrosian story where ML adoption spurs the corporate lawyers to find other activities to perform, such as facilitating additional complex transactions or retaining more litigation in-house rather than outsourcing to law firms. In this case, adoption of ML and its associated productivity benefits may fundamentally change the capabilities and structure of corporate legal departments.

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6 NAICS 3 digit code 523.
As I continue to work on this research program, and, in particular, on this paper, I hope to add to the innovation literature by facilitating an understanding of how machine learning is reshaping the legal industry and, in turn, how this affects firm strategy.

References


Knowledge as a driver of evaluation effectiveness in organizations:  
A multifaceted approach  
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All decisions crucial for competitive advantage require firms to effectively evaluate proposals—be the proposals resources to acquire (e.g., Barney 1986), markets to enter (e.g., Porter 1980), or technologies to develop (e.g., Ahuja et al. 2013). Recently, the question of what makes evaluation effective has begun to draw attention from strategy and organizations scholars (e.g., Csaszar 2012, Keum and See 2017, Knudsen and Levinthal 2007, Reitzig and Sorenson 2013). One crucial factor highlighted by this literature is knowledge proximity—how “close” are the evaluators to the proposals they have to evaluate (Boudreau et al. 2016, Csaszar and Eggers 2013, Li 2017). However, conceptualizing knowledge only in terms of proximity runs the danger of under-theorizing the role of knowledge in proposal evaluation. 

More specifically, knowledge in organizations consists of various dimensions (Argote et al. 2003, Grant 1996, Kogut and Zander 1992). Research on innovation and organization design highlights that how knowledge influences performance often depends on (a) the knowledge breadth of each individual (e.g., Kaplan and Vakili 2015), (b) the knowledge overlap across individuals (e.g., Stasser and Titus 1985), and (c) the knowledge interdependence across different tasks (e.g., Khanna et al. 2018). While these knowledge dimensions have been shown to have nuanced impacts on the information processing and power dynamics inside the organizations, little is known about their specific roles in the context of proposal evaluation. Therefore, the goal of this paper is to further our understanding of how knowledge influences the effectiveness of proposal evaluation, by looking at the interplay among the three important aspects of knowledge: breadth, overlap, and interdependence. 

Empirically, this paper uses the context of GitHub, a large online platform for software development. The evaluation process studied involves core developers accepting or rejecting proposals from contributors. GitHub provides a unique setting because it allows for precisely measuring all relevant constructs. Knowledge is measured using the code editing history of the developers. Interdependence is measured using the function calls in the source code of the software. The quality of the project is captured using an established measure of architectural health from the software engineering literature (e.g., MacCormack et al. 2006, Nord et al. 2012). With this measure, decision effectiveness is calculated by comparing project quality under the actual decision and the counterfactual, opposite decision, which is simulated using the unique experimentation feature of GitHub. The final sample consists of 290 software projects, involving 3,686 decision makers evaluating 110,397 proposals. 

The results show that the role of knowledge breadth and overlap in proposal evaluation crucially depends on knowledge interdependence—more specifically, where the proposals locate in the knowledge interdependence structure inside the organizations. The more a proposal corresponds to a core, rather than peripheral, part of the interdependence structure, the more knowledge breadth and overlap increase evaluation effectiveness. This is because evaluating proposals located at the core of the organizations bring about greater informational and motivational challenges. Broader knowledge mitigates the informational challenge by preventing “tunnel vision” and allowing the evaluators to better see the global impact of a proposal. Higher knowledge overlap mitigates the motivational challenge by reducing the evaluators’ incentive to seek power. The results also show that knowledge breadth and overlap have a comparable or even larger impact on evaluation effectiveness than knowledge proximity, the major knowledge dimension studied in the existing proposal evaluation literature. Overall, these findings provide a more nuanced understanding of how knowledge influences proposal evaluation. They also provide practical implications on how organizations can be designed, in terms of knowledge distribution, to improve evaluation outcomes.
References


The Role of Third Parties in Value Creation and Capture: Why Receiving a Michelin Star may not be a Good Thing

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EXTENDED ABSTRACT
In this paper, I develop a theoretical framework that depicts how third parties, who are not contractually involved with a particular transaction, can affect the creation and capture of value in markets by influencing attention and bargaining. This framework emphasizes the independence of value creation from value capture, as well as highlights the equal importance of both upstream and downstream exchange relationships. Thus, this framework allows for a nuanced portrayal of the diverse social processes that affect the construction of value.

I examine the role of third parties affect markets using The Michelin Guide’s entry into New York City in 2005 as an empirical setting. Using a two-decade panel of New York City restaurants (2000—2019), I first analyze how being awarded a Michelin star impacted restaurant survival. The results from time variant Cox proportional hazards survival analyses suggest that receiving a Michelin star increases the likelihood that a restaurant goes out of business in subsequent years. A variety of additional statistical approaches, including matched sample designs, alternative model specifications, and robustness checks, corroborate these main results.

In order to unpack the mechanisms driving the negative effect of Michelin stars on restaurant survival, I leverage both quantitative and qualitative data—including interviews with Michelin starred restaurateurs—to depict how third parties can influence attention and bargaining at the restaurants’ upstream and downstream interfaces. The findings suggest that even if more attention is directed to restaurants after they receive a Michelin star, upstream exchange partners (e.g., food suppliers, landlords, and employees) and downstream consumers may be able to extract more value from the restaurant. There is evidence to suggest, however, that experience can help mitigate some of these negative consequences. These counterintuitive findings help emphasize that third parties play complex roles in markets and may produce notable unintended consequences. Ultimately, this work makes contributions to strategic management by incorporating third parties into explanations of value creation and capture.
Data-driven Start-ups in Fintech: Market Entry and Business Model Evolution in the UK

There has been an increasing activity in digital economy in the past years with a large number of new entrants that had a digital business model (i.e. Uber, Airbnb, Netflix, Amazon). These firms facilitated data exchanges and utilized digital channels to deliver their service, with which they disrupted various markets (Christensen, Raynor, and McDonald, 2015). Similarly to this trend at the industry level, these markets and businesses received a growing interest from the researchers as well. This then led to the emergence of digital business models as a stream of research under “digital entrepreneurship” (Kraus et al., 2019), since business model is at the core of firms’ competitive advantage (Casadesus-Masanell and Ricart, 2010). A business model can be defined as a roadmap for the firm to operationalize its broader strategy (Onetti et al., 2012). It defines how the offer delivered to the customer (Santos, Spector, and der Heyden, 2015), and its design and implementation is identified as a key factor for strategic entrepreneurial management (Zott and Amit, 2007). Accordingly, firms make changes in their business models as a response to various external factors as they go along (Saebi, 2014), which include economic, competitive and institutional/regulatory context of the industry (Birkinshaw and Ansari, 2015). De Reuver et al. (2009), on the other hand, found that regulation has a minor impact throughout the business model’s life cycle. However, there is still a need for theories that “incorporate characteristics innate to digital technologies” to understand how they facilitate innovation and entrepreneurship (Nambisan, Wright, and Feldman, 2019) as well as the impact of contextual characteristics of the market (Nambisan, 2017). Building on this theoretical basis, I ask: How do the business models of data-driven new ventures evolve upon entry into regulated data-sensitive industries?

This study followed an inductive, qualitative approach where the main data collection method was semi-structured interviews. I conducted over 50 interviews with founders/executives from 12 case firms as well as regulators and industry experts. The case selection was based on the criteria that they were data-driven fintechs (financial technology start-ups) in the UK and entered the market between 2010 – 2018. I supported this data with archival data and observations at industry events. I then grouped the cases based on their business models and their context-dependent evolution, which led to the emergence of three main categories: B2C entrant later pivoting to B2B, B2C entrant later adding B2B, and B2B entrant.

The core value proposition of the firms that entered with a B2C model was an app that connected customers’ bank accounts from different banks. They aggregated available financial data and then leveraged it to provide insights and nudges to the customer to help them manage their money better and save more (i.e. budgeting tools). However, their core proposition relied on data, and customer acquisition was a significant problem for these firms given the characteristics of the market. Customer acquisition issues consequently meant lack of data, which in turn constrained future growth and new product development prospects of these firms. Additionally, these players did not have a clear monetization model; thus, they either added or completely pivoted to a B2B model to solve both issues simultaneously. This process was accelerated by a regulatory change (Open Banking) that introduced a new technology (open APIs) for data access and aimed to promote entrepreneurship and innovation in UK banking. Banks wanted to adopt some of these innovations, which positively affected these new ventures’ opportunities to adopt a variety of B2B models. Interestingly, the firms that abandoned the B2C model and pivoted to B2B kept their B2C environment to test new products and train AI (i.e. before entering a new country to meet the customer needs in that market). There were two main types of business clients for these firms (clients with full licenses such as banks, and clients with limited/no licenses such as employers, pension providers, investment firms), where there were different pros and cons in terms of scope of data and opportunities for new product development.

The new technology the regulatory change introduced also had an impact on new ventures’ business model evolution. Previously, the main data access technology in the market was screen scraping, which had a number of disadvantages that created a bottleneck for customer acquisition. The regulator’s aim was to solve these problems with the new technology. However, it had its own set of challenges, which led to a transition period with high uncertainty. Thus, some firms had to keep using the old technology. During this period, a new type of organization emerged that translated the technology and alleviated these challenges for other players. These firms created an early mover advantage in terms of data access and monetization, which then enabled them to build valuable products for customers.

Overall, this study establishes “data” as a key resource (Kraus et al., 2019) and “data access” as a key business model component for start-ups in data-driven markets (Onetti et al., 2012). It documents the trade-offs between using old vs. new technology during a technological transition period and unravels how digital technologies and entrepreneurial strategies interact (Kraus et al., 2019; Nambisan et al., 2019). Furthermore, it analyzes the intricacies of B2C vs. B2B business models as well as the trade-offs between having different types of B2B clients in data-driven and regulated markets (De Reuver et al., 2009; Nambisan, 2017; Zott and Amit, 2007; Kraus et al., 2019; Nambisan et al., 2019).
References


Entrepreneurial persistence: Does motivation matter?

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Researchers have tried to understand the role of human capital in organizations by examining such dimensions of human capital as skills, abilities and experience. Lately, there has been a push to broaden the conceptualization of human capital to also include motivational factors. In my dissertation, I use the entrepreneurial setting to examine how entrepreneurs’ motivations affect organizational processes and outcomes such as organizational commitment and persistence.

In the first chapter of my thesis, I use French census data to examine how two categories of non-pecuniary motives—namely, independence and challenge—affect entrepreneurial persistence. These motivations are the two most often mentioned categories in the French entrepreneurial surveys, as well as in several other datasets (such as the sample of Dutch founders used by Carree et al 2011). While the exact notion of what challenge entails is domain-specific, broadly speaking it is an aspiration to escape from unchallenging jobs and better exploit own abilities (Vivarelli 1991). Entrepreneurial persistence is a complex decision that is a function of the individual, the business and the environment and I focus on the motivations of entrepreneurs while controlling for a range of other potential factors.

While most studies that look at motivation assume utility to be unobservable to the researcher, I use two measures of satisfaction (satisfaction from financial performance and satisfaction from creation) to more directly observe utility and thus link motivation and persistence. I hypothesize that entrepreneurs motivated by challenge behave very differently (have different commitment efforts and exit patterns) than those who are motivated by independence or pecuniary motivations. This could be explained by the fact that challenge-driven individuals derive utility from job characteristics that are quite different from characteristics that are valued by independence-driven individuals.

This project aims to make several contributions. First, by unpacking non-pecuniary motivations, I go beyond the finding that non-pecuniary benefits matter for entrepreneurship and try to uncover to some degree the nature of non-pecuniary benefits and how they drive persistence. By doing that, I paint a more complete picture of the individuals’ role in shaping organizational outcomes. Second, by linking motivation and persistence through satisfaction (a proxy for utility), I use a more direct way to assess non-pecuniary benefits than what is often done in the literature (wage differentials and latent functions). Third, when looking at persistence, I go beyond the typical proxy of survival. While survival by itself captures existence, it does not say anything about the level of engagement of the founder. By looking at both survival and “commitment” element of persistence (how committed to the business an entrepreneur is in terms of future goals and resource commitment), I capture better the level of entrepreneurs’ engagement in their enterprise.
The Effect of Internal Collaboration on Inventor Mobility: Quasi-experimental Evidence from Office Consolidation
Eunkwang Seo (UIUC)

Viewing innovation as a process of knowledge recombination, strategy scholars emphasize the pivotal roles of inventors’ collaboration for innovation within firms (Almeida and Kogut, 1999; Carnabuci and Operti, 2013; Corredoira and Rosenkopf, 2010; Fleming and Sorenson, 2004; Singh, Li, and Gopal, 2016). Although prior studies acknowledge and examine the effects of collaboration on value creation through firm innovation (e.g., generating valuable technologies), however, surprisingly little is known about how collaboration affects firms’ value capture from their knowledge resources. This study is aimed at filling this gap by examining how collaboration among inventors within firms affects their inter-firm mobility, a key factor known to affect firms’ value capture from knowledge assets (Coff, 1997; Peteraf, 1993; Teece, 1986).

The current literature suggests that collaboration may decrease employees’ mobility because it creates relational capital, which is valuable to inventors but is likely to be disrupted when the employees leave their current employer (Holtom et al., 2008; Palomeras and Melero, 2010). However, in this study, I argue that collaboration can facilitate rather than hinder inventors’ mobility through three distinctive mechanisms. First, inventors can enhance their general human capital by learning new skills and knowledge from collaborators. General human capital is valuable to other firms, so collaboration can potentially increase inventors’ mobility. Second, collaboration can give external employers signals about inventors’ unobservable (pro-social) characteristics such as helpfulness. With reduced information asymmetry in the labor market, therefore, collaborative inventors can gain better job market opportunities. Third, from collaborators, inventors can obtain valuable information that aids their job-search processes (e.g., searching, applying, and interviewing for jobs). Consistent with earlier research finding that interpersonal contacts often play key roles in employees’ mobility (Granovetter, 1995; Higgins, 2001; McDonald, 2011; Obukhova and Lan, 2013), increase collaboration may facilitate inventors’ mobility by expanding their interpersonal contacts that could potentially help their job searches.

I test the hypotheses using an inventor-year panel combining patents and LinkedIn data. To mitigate self-selection biases, a primary empirical challenge in prior studies, I utilize a novel quasi-experimental setting that leverages exogenous changes in collaboration opportunities created by an office consolidation. In 1995, Sun Microsystems established a mega-scale campus in Menlo Park, consolidating small offices distributed throughout Silicon Valley. Afterwards, Sun inventors were exogenously given more opportunities to collaborate with other inventors than those in competing firms (IBM and HP). Using this office consolidation event as an instrumental variable, I estimate the effects of collaboration on investor mobility. The results of my two-stage least square regression analyses on panel data on Sun, IBM, and HP inventors from 1990 to 2000 show that collaboration increases the probability of inventors’ mobility. This effect is partially explained by increased invention productivity and becomes greater for junior inventors after controlling for invention productivity. I also find that collaboration with mobile inventors increases mobility, in particular.

This study makes several important contributions to the strategy and innovation literature. First, this study contributes to research on collaborative innovation of firms by examining the role of collaboration in firms’ value capture. That is, this study suggests that firms’ efforts to create more value through collaboration can increase inventors’ mobility, ultimately reducing their ability to capture more value from their knowledge assets. Moreover, this study contributes to research on employee mobility by showing that collaboration can be a source of employees’ mobility, which contrasts with the conventional wisdom in the literature.
In this paper, we focus on the role of gender differences in persistence in driving the gender gap in innovation. Prior research indicates that women are less likely to both apply for and, conditional on applying, less likely to receive a patent than male inventors (Ding et al., 2006; Jensen et al., 2018). In 2010, only 18.8% of patents had at least one female inventor, and only 8% of all patents had a woman listed as primary inventor (Milli et al., 2016). We explore whether women are less likely to follow up on an application after receiving negative initial feedback and quantify the effect of this fall-out on the downstream reduction in patents granted to women. The patent review process is highly iterative and most applications receive at least one rejection, coupled with feedback from a patent examiner, to which inventors must respond in order to continue to pursue their patents. Consistent with evidence from other settings, we hypothesize that women will be more sensitive to rejection within the patent process.

We use data from the United States Patent and Trademark Office (USPTO). Our sample consists of all patent applications in the United States from 2002 through 2014. The final sample covers over one million applications from US-based teams, both those that received patents and those that did not. Importantly for our analysis, the USPTO data also include complete prosecution histories for each application.

We examine how men and women respond to rejections within the patenting process. We consider innovator tendency to follow up on an application and amend their claims as a measure of persistence. In order to identify the causal effect of persistence, holding constant other channels, we use quasi-exogenous variation in the likelihood of early-stage adverse decisions that arises from the random assignment of applications to patent examiners. Specifically, we use examiner harshness across all other applications as an instrument for initial patent rejection in order to study the heterogeneous responses across female- and male-led innovator teams.

We find that women-led teams are 3-7 percentage points (about 4%-7%) less likely to continue the patent process after an initial rejection compared to men. This differential effect by innovators’ gender is magnified when examining whether a patent is ultimately issued; we find that initial negative feedback differentially reduces the probability that a patent is granted by 5.5-10 percentage points (about 8%-14%) more for females compared to their male counterparts. When restricting our attention only to applications filed by individuals, our estimate suggests that an exogenous rejection reduces the percentage of women applicants by 4.3 percentage points (about 5%), compared to men. We examine whether teams working as part of a firm behave differently than individual inventors. We find that applications associated with a firm are considerably more likely to proceed beyond initial rejection and more likely to receive a patent, and this effect is relatively larger for female-majority teams. The same is true for applications prosecuted by a lawyer, and both firms and lawyers shrink the gap between majority male and majority female teams by 4-5.5 percentage points. Our results suggest that about 60% of the overall gender patent granting gap is explained by women’s differential deterrence when an examiner makes her initial determination.
I ideological firms as issue entrepreneurs: evidence from corporate giving to contentious issue areas

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In the corporate social responsibility (CSR) literature, there has been a growing acknowledgement that social actions of many firms are shaped by intrinsic and ideological preferences of their organizational members (Briscoe, Chin and Hambrick, 2014; Gupta, Briscoe, and Hambrick, 2017), which is particularly salient in advocacy issues of contentious nature (e.g., abortion rights, LGBTQ rights, gun control, global warming). Many anecdotal evidences show that firms with CEOs and other individual employees of strong ideological convictions often are the first to engage in hot-button issues that have little strategic relevance to their core business operations (Hogan, 2019). However, what remains to be explored is the broader, spillover effects that ideological firms may have on the rest of the firms in the population. While many ideological firms would want to encourage other mainstream firms’ participation in the issue areas that they care about, previous studies’ focus on the direct effect of a focal firm’s ideology on its own actions limits our knowledge on whether and when ideological firms may successfully encourage others’ participation, acting essentially as so-called “issue entrepreneurs” in their field that create and manipulate the saliency of social issues to their preferences (McCarthy and Zald 1977, p. 1215).

To answer this question, I draw on the institutional theory and social movement literature which suggests that it is feasible, but not without challenges. On the one hand, the traditional institutional theory scholarship and especially the line of work emphasizing the pattern of mimetic isomorphism in corporate social actions (DiMaggio and Powell, 1983; Marquis, Glynn, and Davis, 2007; Marquis and Tilsic, 2016) posit that ideological firms’ initial social actions may indeed trigger chain reaction by others in the field, as it would serve as an institutional cue based on which other firms would structure their own actions. On the other hand, another body of work in institutional theory and, relatedly, social movement literature suggest that the process of diffusion and institutionalization can be highly contested (Meyer and Staggenborg, 1996; Briscoe and Safford, 2018). One of the most salient sources of such challenges is, I posit, the countermobilization from their ideological rivals in the field, who would have very different notions about what is the right way to approach a given issue (McCright and Dunlap, 2000). Thus, firms with their own strong ideology wouldn’t let their competitors to set the agenda; they would rather strongly respond to their rivals’ actions by joining in the debate around the issue, but by fragmenting the structure of the debate or even forming an opposition (e.g., by funding nonprofits whose issue position is aligned with their own ideological preferences instead of their rivals’ preferences).

This paper examines these theoretical conjectures in the context of corporate philanthropic giving to advocacy issues, which corresponds to one of the few ways to systematically track such advocacy actions of firms in a large-scale. Specifically, I test my predictions based on a novel database on 441 firms’ giving of over $1 billion made to 4,021 501(c)(3) advocacy groups from 2003 to 2015, which tracks not only a variation in multiple firms’ advocacy engagement over time but also variation in their engagement across the entire issue universe. Controlling for firm, issue, and year fixed effects, the pattern of advocacy giving by ideological firms are indeed closely followed by the other firms, especially by non-ideological firms in the same industry that face the similar stakeholder environment. Such positive spillover effect from ideological firms’ giving contrasts to the insignificant effect of non-ideological firms’ giving on others, suggesting that ideological firms indeed play a unique and disproportionately influential role as issue entrepreneurs. However, I also find that ideological firms’ giving leads to a subsequent increase in spending to the issue by their ideological rivals, such that red firms selectively respond to blue firms’ giving, and blue firms respond to red firms’ giving. Consistent with my theory that this systematic pattern of interaction between firms on opposite ends of the ideological spectrum reflects within-issue competition to set the agenda, my data show that ideological firms respond to their rivals’ giving in so-called battleground states, where there is ongoing uncertainty in public stances about a given issue and thus room for competition.
ABSTRACT OF DISSERTATION RESEARCH

DESERT PLACES:
COOPERATIVES AS INFRASTRUCTURE PROVIDERS IN MARGINALIZED AREAS

Research background, Research question, & Theory
Infrastructure such as roads, bridges, and broadband are critical building blocks of the economy. Therefore, the question regarding who can provide and maintain high-quality infrastructure has been debated by policy makers, scholars, and general public. My study strives to answer this question in the context of broadband provision in the U.S. For-profit firms, the current dominant type of internet service provider in the U.S., are unwilling to provide high-speed internet services in disadvantaged regions. This is because for-profit firms do not capture the positive externalities from high-quality internet in a short term in a local community (e.g. better access to education, healthcare, and growth of local entrepreneurship), and marginalized areas with low-population and/or low-income are not profitable considering the high initial cost of building broadband networks. As a result, there are numerous regions where for-profit firms have underserved in providing high-quality internet service.

To address the ‘digital divide’ from a strategy perspective, my research extends strategy literature on comparative governance. Especially, my research aims to answer the questions: what are the optimal governance forms for the provision of broadband, and under what conditions are these different forms most likely to prevail (Ostrom, Schroeder, and Wynne, 1993)? Particularly, my research focuses on comparison between for-profit firms and cooperatives. Since cooperatives are owned by users within the community, cooperatives are able to internalize benefits from community-wide broadband access in a way that for-profit firms are not. That is, the cooperative’s members derive two benefits from the infrastructure project: the direct financial returns they receive as owners of the cooperative, and the indirect benefits they receive as members of a community that sees enhanced economic opportunity from the project. In contrast, the for-profit’s shareholders receive only the financial returns from the use of the infrastructure and do not share in the externalities it generates for the local community. Therefore, my paper hypothesizes that cooperatives are more likely to cover regions where for-profit firms provide only low-speed internet services and the effect will be stronger in marginalized areas such as rural and low-income level areas.

However, this is not to suggest that cooperatives will always have an advantage in undertaking infrastructure projects or are willing to serve marginalized areas. I expect the effectiveness of cooperative provision to be lower in communities with low social cohesion where the costs of cooperative governance are high. Prior literature has shown that racial and ethnic fragmentation has a negative effect on social participation within a community (Alesina and La Ferrara, 2000), reducing investments in essential public goods (Alesina, Baqir, and Easterly, 1999), and leaving communities vulnerable to outside exploitation (Alesina, Gennaioli, and Lovo, 2019). High racial or ethnic fragmentation will raise the cost of cooperative provision relative to for-profit provision. More ethnically fragmented communities may also see lower externalities from broadband provision, both because the indirect benefits from broadband access may not be shared equally across the community, and because cooperative members may only care about the gains to members of their own social group rather than the gains to the entire community. Therefore, my study predicts that the negative association between the speed of for-profit broadband provision and cooperative entry will be stronger in less ethnically fragmented communities than in more ethnically fragmented communities.
Data, & Main Findings
To test the aforementioned hypotheses, my study uses uniquely detailed data from the Federal Communications Commission (FCC) that allows track broadband provision at the census tract level from 2014 to 2017, including not only the identity of broadband providers, but also the technology used and the listed speed of provision.

The paper find that cooperatives are more likely to provide broadband in communities where the speed of for-profit provision is low, with this relationship being stronger in rural communities, as well as in communities with low ethnic fragmentation, consistent with the aforementioned predictions. These results are robust to the inclusion of census tract and year fixed effects, and to the use of a government policy (Connect America Fund) that incentivized for-profit broadband providers to invest in underserved areas as an instrument. Moreover, supplementary analyses show that, consistent with my arguments, these results are driven by the comparative technology investments of the for-profit and cooperative providers: cooperative providers are more likely to enter where for-profit provision uses relatively low-speed technologies (mostly Digital Subscriber Line (DSL)), and that when cooperatives enter such communities, they tend to do so with higher-speed technologies (fiber and fixed wireless).

Contributions
My research makes several contributions to prior literature. By applying a comparative governance lens to infrastructure provision, the study extends existing theory on public-private interaction (Cabral et al., 2019; Lazzarini, 2019), showing how the relative balance of public and private benefits from an activity influences how it is best organized.

In doing so, this paper also contributes to research on the role of cooperatives, providing empirical support for recent theoretical work that stresses their ability to deal with locally bounded externalities (Luo and Kaul, 2019), and offering additional insights into the conditions under which they are more likely to prove successful (Yue et al., 2013; Boone and Ozcan, 2014).

In addition, this study has important implications for public policy. The provision and maintenance of high quality infrastructure, especially in rural areas, is a central concern for policy makers in general, and the specific issue of digital inequality between prosperous and marginal communities in the United States and elsewhere has received a great deal of recent attention, both in academic circles (DiMaggio et al., 2001; DiMaggio et al., 2004; Warschauer, 2004; Van Dijk, 2005; Hsieh, Rai, and Keil, 2008; Greenstein and Prince, 2006; Greenstein, 2019) and in the popular media (Ali, 2019; Halpern, 2019). Our study offers theoretically driven, systematic evidence for the role of cooperatives in helping to bridge this divide, emphasizing the potential for self-organized community action as a path to economic development.

Future study
The subsequent study will investigate the effect of deployment of fast-internet connections. I am planning to use several economic development measures highlighting entrepreneurial activities. Especially, I expect that different speed levels of connectivity lead to different types of entrepreneurial activities. That is, if we see more high-tech/wall street type entrepreneurship in regions where gigabit or faster internet connection was introduced and more low-tech/main street type entrepreneurship in regions where low to mid-range internet connection was introduced.
FROM IDEAS TO CREATIVE PRODUCTS: HOW ROLE SEPARATION INCREASES CREATIVE CONVERSION ABILITY

Creative organizations' business rests on the continuous generation of new products, based on creative ideas – the main assets – generated by their employees. Competing in the market requires that, if these organizations create a novel product, it must be recognized as more creative than those produced by other creative organizations. This recognition, generally in the hands of experts in the field or critics, is essential for success. Therefore, creative organizations, as all those organizations that want to breakthrough in the market, need to produce something novel deemed to be creative by evaluative audiences.

We call creative conversion ability, the ability of an organization to convert novel ideas into final products deemed as creative. This ability ensures creative organizations' innovativeness essential for achieving their competitive advantage. Therefore, how can creative organizations enhance their creative conversion ability?

Drawing from creativity theories and the "blind-variation and selective-retention" model proposed by Campbell (1960), we argue that role separation between creative director and CEO is a viable strategy for creative organizations to increase their creative conversion ability. We theorize and test the mechanism: by delegating business activities to the CEO, creative directors can focus on creativity – i.e., the mediator –. Creative directors' focus on creativity increases the chance to generate ideas, to select those potentially more novel, and to transform them into successful creative products competing in the market, enhancing the creative conversion ability. However, role separation is challenging when the two executives do not collaborate. In this respect, we find that sharing years of experience in the company improve the productivity of their collaboration.

To test the model, we exploit a unique dataset of high-end fashion companies, which have to capture the individual creative input in order to generate creative products in order to be successful. Results confirm the importance of separating executives' roles between creative and business functions. Organizations, with a CEO apart from the creative director, show a significantly higher level of creative conversion ability. We also found strong evidence in favor of our mediation analysis of the creative director's focus on creativity that supports our mechanism.

We see our contributions in relation to the literature on creativity and creative organizations, by exploring not only idea generation and implementation but how organizations move from novel ideas to products competing in the market. Also, we add to the literature on the importance of configurations of roles at the top for creative conversion ability, by testing on a large scale if creative organizations benefit from role separation and how. Finally, we extended Baker and Faulkner (1991) findings in filmmaking short-term projects by assessing whether companies benefit from role separation in an industry (i.e., fashion) that imposes its structure for a more extended period, and thus, whether role separation or not can influence long-term results.
Reframing Conversations: Entrepreneurs’ Frame Divergence and Audience Support of Innovation

How should entrepreneurs communicate with audiences to promote their innovation amidst ambiguity? Existing literature has studied how entrepreneurs engage in one-way communication with the mass audience and assumed that the participation from audience members is limited. Entrepreneurs, however, also need to gain support from audience members who actively participate in the conversation around the innovation. In particular, a widespread use of social media and online community platforms has significantly lowered the barrier for audience members to participate in conversations. Therefore, the success of entrepreneurial innovation is increasingly dependent on how entrepreneurs effectively shape the evolving understanding of innovation by communicating with the participating audience members.

Entrepreneurs can take one of the two contrasting communication strategies when they are interacting with the audience members. On the one hand, entrepreneurs can communicate a convergent frame that focuses on the similar aspects of innovation that audience members have previously paid attention to. Entrepreneurs’ convergent frames around the innovation would provide a similar basis in understanding the innovation as the audience members and lead them to correctly interpret entrepreneurs’ propositions. On the other hand, entrepreneurs can introduce divergent frames around the innovation that communicate different understandings of the innovation from those shared among audience members. By doing so, entrepreneurs are able to reframe the discussion to a new way of understanding the innovation.

I propose that entrepreneurs’ introduction of divergent frames is more likely to increase audience support of the innovation given a high degree of ambiguity around the interpretation of entrepreneurial innovation. Entrepreneurs’ introduction of convergent frames may restrict the audiences’ scope of understanding to their preexisting frame around the innovation, which may not be sufficient to encompass the full extent of the innovation when there is a high degree of ambiguity. When entrepreneurs introduce divergent frames around the innovation, however, they enable exploration of new perspectives that enhance audience sensemaking of the otherwise ambiguous innovation.

To test this idea, I leverage rich conversation data from an online product discovery platform called Product Hunt. Product Hunt members such as early adopters of innovation and Silicon Valley influencers engage in discussions around the innovation and cast “upvotes” for the products they support. I leverage 500K comments on the Product Hunt to observe how entrepreneurs respond to audience conversations about entrepreneurial products in the discussion threads. I adopt a novel computational approach – neural-network word embedding model – to capture the relationship between languages used by entrepreneurs and audience members. This approach provides a nuanced way of translating the unstructured natural language to vector representations, which can be used to show the dimensions of innovation that entrepreneurs and audience members pay attention to during their conversations (Kozlowski, Taddy, & Evans, 2019). Such computational linguistic approach can then be used to assess the degree to which entrepreneurs diverge from the audience's understanding of the innovation when they respond to the audience in the discussion thread. Consistent with my proposition, I find that entrepreneurs’ skillful reframing of their innovation through the introduction of divergent frames increases the overall audience support of the innovation. I also find that the effectiveness of entrepreneurs’ divergent frames depends on the preexisting understanding of the innovation among audience members: the effect is stronger when entrepreneurs intervene earlier on and when audience members are already positively inclined towards the innovation.

My findings highlight the importance of considering the co-construction of understanding around the innovation among different stakeholders. Entrepreneurs do not engage in unilateral storytelling, but co-construct meanings around their innovation through their interactions with the audience members that actively engages in the construction of meaning around the innovation. Therefore, this study contributes to the recent scholarship on cultural entrepreneurship that started to emphasize the distributed and temporal process of entrepreneurial communication (Gehman & Soulière, 2017). This research also
contributes to the interactive view on frames by showing how frames influence one another and change over time. While previous work on managerial cognition and technological frames has focused on a static view of frames, I find that the development of interpretative frames around the innovation is a complex and dynamic process that depends on the interactions among different stakeholders (See Tripsas and Kaplan, 2008; Seidel, Hannigan, and Phillips, 2018, which call for the interactive perspectives on frames). Lastly, this study makes a methodological contribution by using the computational linguistic approach to measure people’s cognitive frames around the innovation. While previous studies on cognitive frames have mostly conducted qualitative studies or surveys to assess how people understand the innovation, I am able to use a novel machine learning methodology to capture the dimensions and cognitive mapping through which individuals understand the innovation.

References
Employee Mobility Patterns in Diversified Firms: Control, Coordination, and Redeployment

Strategy scholars have long been interested in how firms can reconfigure their resource base as it allows firms to grow and create value (Penrose, 1959; Wernerfelt, 1984). Firms can reconfigure their resource base by adding, divesting, recombining and redeploying their resources (see Karim & Capron, 2016). A relatively new stream of literature is devoted to exploring how firms can reconfigure their resource base by redeploying their existing resources (Folta, Helfat, & Karim, 2016; Levinthal & Wu, 2010; Sakhartov & Folta, 2014, 2015). Employees are a core target for firm-internal redeployment as firms shape their businesses portfolios (Capron, 1999; Folta et al., 2016). However, we are yet to fully understand how firms’ corporate scope choices, and their resulting diversification levels, are linked to internal employee redeployment patterns.

Existing literature on redeployment remains inconclusive about the link between diversification and employee redeployment. Research on resource redeployment postulates the notion that employees are non-scale free resources who are constrained in their use (Anand, Kim, & Lu, 2016; Bryce & Winter, 2009; Levinthal & Wu, 2010). Related diversification (Rumelt, 1982) offers firms opportunities to redeploy employees where they are most valuable, and to benefit from inter-temporal economies of scope (Helfat & Eisenhardt, 2004; Sakhartov & Folta, 2014). Yet, internal employee redeployment could also be useful to unrelatedly diversified firms. Organization design literature offers an additional perspective on employee redeployment. Coordination, the alignment of activities across elements of an organization, is key for organizational success (March & Simon, 1958). Looking at employees as repositories of knowledge (Kogut & Zander, 1992, 1996; Szulanski, 1996), employee redeployment can be a means to transfer and share knowledge to mitigate coordination failures and reap intra-temporal economies of scope. As firms diversify, formal control and coordination measures become increasingly expensive (Rawley, 2010; Zhou, 2011). Employee redeployment can be particularly beneficial to diversified firms by substituting for formal control and coordination measures.

In this research, I consolidate organization design and redeployment perspectives by taking into account the different directions of employee redeployment. In multiunit organizations, employees can move from parent firms to subsidiaries, across subsidiaries, and from subsidiaries to parent firms. I argue that each of these patterns plays a different role in mitigating coordination and control failures related to diversification. Employee redeployment from parent firms to subsidiaries can be an avenue to align actions by generating common norms and understanding between parent firms and subsidiaries (Karim & Williams, 2012). I therefore predict it will increase with diversification (H1). I hypothesize that firms will also increasingly rely on employee redeployment across subsidiaries as they diversify, to reduce coordination failures by creating a shared knowledge base (Puranam, Singh, & Chaudhuri, 2009; Puranam & Srikanth, 2007). Employee redeployment from subsidiaries to parent firms, however, does not resolve misalignment of diversification, because employees’ become more specialized and less applicable across the firm’s businesses (Penrose, 1959). Diversification will therefore be associated with lower levels of employee redeployment from subsidiaries towards parent firms (H3).

To test my predictions, I use data from the Finnish Business Register on corporate group structures and data on firms’ financial information; and employer-employee data on the entire Finnish working population from the Finnish census. The findings support the perspective that employee redeployment from parent firms towards subsidiaries and across subsidiaries can serve the purpose of control and coordination. I contribute to resource reconfiguration and diversification literatures by highlighting the role of organization design mechanisms on resource redeployment—specifically employee redeployment—and suggesting that employee redeployment may not only allow firms to reach inter-temporal economies of scope, but also to generate informal pathways to achieve control and coordination benefits.


Given its potential to dramatically disrupt how we work and organize, as well as our very humanity, artificial intelligence (AI) has been at the very center of today’s public and scholarly discourse (Kellogg, Valentine, and Christin 2019). At stake in AI’s development and use have been consequences of great societal magnitude, such as the automation of human labor and the resulting loss of human discretion in an increasingly rationalized world (Collins 2018). Social theorists, stretching as far back as Weber ([1930] 1992) and his writings on rationalization at the dawn of the twentieth century, have long feared this possible future. It is no wonder then that scholars have asked what kind of technologies today’s organizations have been building: how these organizations have guided their development (Bailey and Barley 2019), whether they might automate or augment human labor (Brynjolfsson and McAfee 2014; Faraj, Pachidi, and Sayegh 2018; Shestakofsky 2017), and what this all means for the future of work (Barley, Bechky, and Milliken 2017).

To better understand what has been going on within these organizations, I ethnographically embedded myself for a year in an AI startup, which I anonymize here as Reverb. It has been developing a technology that composes music. And as has been common across other organizations developing AI technologies, Reverb hired experts in the work that the AI was supposed to imitate, so that they could embed their expertise into the technology and allow it to do this work autonomously (e.g., Sachs 2019). Specifically, Reverb brought in those who were not only experts in music, but also intended users of the technology: music composers. As has been claimed in the literature on user innovators (e.g., Akrich 1992; Altman & Tushman 2017; Baldwin and Hippel 2011; Oudshoorn & Pinch 2003; Von Hippel 1986; 2005), the promise of these innovators is that they are able to speak for their broader user community, given their own identity and experience as users, and will thus build the technology in ways that serve both their own and their community’s interests and needs. And at Reverb, these user innovators defined placing the technology in composers’ hands and augmenting them through it as in their own and their community’s best interests. They meanwhile were bothered by the possibility that the alternative – namely, automating their work of music composition – might compromise themselves and their community.

However, these user innovators drifted over time and started working to automate themselves and their community, creating an inconsistency between what they initially defined as best for them and what they began to do. The company instead began to target video content producers as their end user, who would use their technology in place of human composers. In particular, Reverb’s AI began to automate stock music: the background music for media such as advertisements, trailers, and television. While there is much to explain about how this drift happened and was experienced, I focus in this presentation on one small but important part: how those at the company justified this gap between what they initially defined as valuable for themselves and their community and what they ended up doing. Surprisingly, the rhetorics that those at the company mobilized to justify this gap had long been used by members of the broader music community. Stock music, given how formulaic and repetitive it is, has generally been denigrated by the community as a lower form of music. And building on this belief, those at the company were able to reinterpret its automation as augmenting the community. For example, given that they were automating a lower form of music, they thought they could be challenging themselves and other composers to write more creative and expressive music instead. In other words, these user innovators’ very embeddedness in the broader music community – namely, the perspective on their community that it shaped – allowed them to denigrate some of the work that they and their community did, thus justifying its automation.
References


Entrepreneurship as a Way to Overcome Labor Market Discrimination: Evidence from Formerly Incarcerated Individuals

My paper focuses on entrepreneurship as a way to overcome discrimination in the labor market. Drawing from recent research that considers entrepreneurship as part of the career mobility and attainment process (Burton, Sørensen, and Beckman 2002, Sørensen and Sharkey 2014), I explore the question of whether entrepreneurship helps discriminated individuals find gainful work and more broadly, mitigates income inequality in the process. To address these questions, my paper focuses on a group of individuals who face pervasive labor market discrimination in the United States: formerly incarcerated individuals.

My paper introduces entrepreneurship as a possible way for formerly incarcerated individuals to overcome employment barriers and subsequently successfully reenter society. First, I investigate whether formerly incarcerated individuals are more likely to become entrepreneurs compared to those without criminal records. Specifically, I unearth the underlying mechanism of why formerly incarcerated individuals are pushed into entrepreneurship: they face discrimination from potential employers. To explore this mechanism empirically, I use the United States National Longitudinal Study of Youth 97 data and take advantage of the staggered implementation of a state and county level policy shock in the United States that bars employers from checking criminal backgrounds in the hiring process (“Ban-the-Box” policy). My results show that formerly incarcerated individuals are indeed more likely to seek entrepreneurship as a career choice particularly because of the lack of employment opportunities due to discrimination.

Second, I examine how entrepreneurship helps formerly incarcerated individuals overcome discrimination by examining their income, subsequent career attainment, and recidivism rates. I find that entrepreneurship mitigates the income inequality that formerly incarcerated individuals experience in wage-employment. Specifically, while employees with a criminal record earn $9,000 less than employees without a criminal record each year, entrepreneurs with a criminal record earn only $3,000 less each year than employees without a criminal record. Furthermore, I show that entrepreneurship not only helps formerly incarcerated individuals during entrepreneurship but also after they leave their entrepreneurial ventures. By examining career attainment after entrepreneurship, I show that entrepreneurship boosts the likelihood of formerly incarcerated individuals to secure work in wage-employment, compared to formerly incarcerated individuals without any entrepreneurial experience. Thus, entrepreneurship serves as a bridge to securing employment that would have been otherwise unattainable for formerly incarcerated individuals. Finally, I illuminate the social impact of entrepreneurship of formerly incarcerated individuals by examining recidivism rates, or the rate of going back to prison. I find that entrepreneurship decreases recidivism for formerly incarcerated individuals beyond wage-employment. This suggests that entrepreneurship might not only help discriminated individuals alleviate their economic well-being, but also improve their social integration.

My paper contributes to entrepreneurship research in the context of career choices and mobility, particularly for those who face discrimination in the labor market. While most entrepreneurship research has broadly focused on high-growth entrepreneurship by privileged groups, my research highlights the role of entrepreneurship as a way to overcome labor market discrimination for stigmatized groups. My paper further contributes to extending our understanding of individuals
and groups experiencing labor market discrimination. While my research offers unique implications as one of the first studies to examine entrepreneurship for the formerly incarcerated, I believe my results provide broader insights to other stigmatized groups. I hope my results inform scholarship and policy-making to consider and examine entrepreneurship as a career choice for groups experiencing discrimination in the labor market.
Sitting on the fence: integrating the two worlds of research and invention within the firm
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I study the organization of scientific discovery and invention within corporations (Argyres and Silverman, 2004; Arora et al., 2014). The literature presents two main views on the organization of scientific discovery. That of a specialized worker (Adam Smith, 1776), which supports a clear division of research and invention to increase productivity. And, that of an integrated worker, who “sits on the fence” and supports a continuous interaction between research and invention (Kline and Rosenberg, 1986; Rosenberg, 1990).

I explore how the organization of scientific discovery at the firm level—specialized or integrated with invention—affects the firm’s invention, discovery, and market value outcomes. Using data on inventors and authors related to U.S. publicly traded scientific firms for the period 1980-2015 (DISCERN dataset / Arora, Belenzon, Sheer, 2020), I distinguish between specialized scientists who only perform research (i.e., authors) and integrated-scientists who perform both research and invention (i.e., both authors and inventors) and possibly collaborate with specialized inventors. The data enables me to perform cross-industry within-firm analyses, which were limited in previous author-inventor co-authorship studies (Bonaccorsi & Thoma, 2007; Breschi & Catalini, 2009).

I find that integration is related to a tradeoff between short-term applied initiatives and long-term fundamental initiatives (Laverty, 1996). On the one hand, integration is beneficial for internal invention quality (Henderson and Cockburn, 1994; Gittelman and Kogut, 2003; Bonaccorsi and Thoma, 2007)-through guiding invention (Fleming and Sorenson, 2004), facilitating the transfer of research to invention (Cohen & Levinthal, 1990; Rosenberg, 1990; Cockburn & Henderson, 1998), and focusing on research related to the immediate invention needs of the firm. However, integration has adverse effects on discovery. In fact, integration decreases scientists’ specialization (Smith, 1776), increases coordination costs between scientists and inventors (Allen, 1984; Vincenti, 1990), and decreases future recruitment of scientists who have a “taste” for basic research (Stern, 2004). All of which can decrease the quantity and quality of discovery. In the long-term, the decrease in discovery quality will, in turn, harm future invention, which will require integrated firms to rely on external technology sourcing. Consistently, I find that the positive relationship between the market value of a firm and its stock of invention is stronger when the firm integrates its discovery and invention. Conversely, the relationship between the market value and scientific knowledge stock is weaker with integration.

Furthermore, the paper tries to get a better understanding of the factors that determine the optimal level of integration for each firm. I show that integration increases with the availability of scientific spillovers from rivals, with thick markets for invention, and with competition. I pursue an Instrumental Variable estimation strategy that is motivated by these potential determinants.

While specialized-scientists support the long-term fundamental initiatives of the firm, integrated-scientists guide the short-term applied initiatives internally (Fleming and Sorenson, 2004; Singh and Fleming, 2010) as well as externally (Allen, 1966; Tushman, 1977; Cohen and Levinthal 1990). Managers must understand how to organize their firm’s scientific discovery while balancing short-term and long-term initiatives.
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Product market choice of entrepreneurial ventures: the role of prior experience

The literature on technology commercialization has focused on the decision between licensing and integrating into the product market. Extant research in this line of work has treated product market synonymously with industry assuming that the conditions for successful commercialization on the product market are equal within the industry. This assumption ignores the reality that industries can be further partitioned into sub-markets based on a number of different criteria such as products and services offered, customers targeted, or the technologies used in each one.

In this paper, I distinguish between mainstream and niche sub-markets that technology-based ventures may choose to enact their entry strategy. Given the particular relevance of niche markets to the literature on disruption, I explore the antecedents of the decision to enter niche product markets for ventures commercializing potentially disruptive technologies, i.e. technologies with the potential to change the bases of competition in the industry. The literature on disruption makes a distinction between mainstream and niche markets based on competition. I complement this work by arguing that availability, consolidation, and co-specialization of complementary assets in different parts of the value chain in a market may be another distinguishing factor between niche and mainstream markets. The differences in the state of complementary assets in these markets present unique challenges for ventures entering each type of market. Mainstream markets present intense technological challenges to scale up for effective competition with incumbents while niche markets present intense commercialization challenges in the downstream part of the value chain, i.e. identification of user needs and the development of downstream complementary assets.

I use a cognitive lens to explain why ventures choose niches and argue that prior experience of the venture teams makes them familiar with either upstream or downstream challenges and primes them to enter product markets where they see familiar challenges. Using the context of the global solar photovoltaic industry, I study the market decisions of entrepreneurial ventures commercializing thin-film technologies and argue that ventures with prior technological experience shy away from niche markets and prefer to enter mainstream markets which offer familiar and well-defined technological challenges upstream in the value chain. On the contrary, ventures with prior marketing-related experience favor niches where the familiarity of challenges downstream in the value chain -- unclear product features, amorphous customer needs and unclear industry structure -- is more attractive. Similarly, teams with prior entrepreneurial experience are attracted to niches as they present features of the opportunity that experienced entrepreneurs favor -- unmet needs, manageable risk and opportunity for claiming the market. Finally, I explore the contingent role played by experience in the focal industry on these relationships.

This study contributes to the literature on disruption by unpacking the mechanisms that lead ventures towards or away from niche markets. I show that ventures commercializing potentially disruptive technologies do not always choose niche markets, thus, contributing an explanation for why disruption may not happen. The results also inform the literature on market entry by showing that the commercialization challenges faced by entrepreneurial ventures differ between mainstream and niche markets. The results also show that a group of ventures enters markets where complementary assets are consolidated, which I theorize to be mainstream markets, and make a choice that cannot be explained by market structure. Thus, I extend this literature by highlighting the role of cognitive factors on the choice of product markets.
Aspirational Category, Features, and Artifacts:  
The Evolution of the Category “Robot” (1921-2010)

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DETAILED ABSTRACT

Recently scholars have explored how categories evolve and the role categorization plays in market and industry dynamics (Cattani, Joseph, & Thomas, 2017; Hsu, 2006). Yet in investigating this question, category scholars have largely focused on how the categorization process is shaped by the social and physical objects that exist in the present (Kennedy, 2008; Navis & Glynn, 2010). The role of future-oriented categories, namely aspirational categories—a coherent set of desired, imagined features that are to be realized in the future—have been understudied. This is surprising given that sociologists have recently investigated the important role that ‘imagined futures’ (Beckert, 2016) or ‘socio-technical imaginary’ (Jasanoff and Kim, 2015) plays in market dynamics and technological development.

Aspirational categories are important because in many industries, the pre-industry dynamics of technological development is often driven by future aspirations. This was, for example, the case for flying machines (airplanes), automobiles, nanotechnology, and geo-engineering (Augustine, Soderstrom, Milner, & Weber, 2019). To understand pre-industry dynamics, it is thus important to understand how aspirational categories evolve and how they shape not only product development but also how diverse stakeholders—e.g. hobbyists, amateurs, engineers, university labs, incumbent firms, and government agencies—become involved and contribute to the industry (Grodal, 2018; Cattani, Ferriani, & Lanza, 2017).

In order to explore the role of the aspirational category in category evolution, I conducted an inductive study of the evolution of the category robot from the category’s inception in 1921 until 2010. I triangulated among multiple data sources including Popular Mechanics, New York Times, movies listed in the IMDb database, dissertations, technical notes, academic papers, and books. Thus far I have collected 1,086 articles from Popular Mechanics which contained the term “robot” or “robotic,” 313 articles from The New York Times, 238 movies that featured a robot, and 94 academic and technical papers written by early roboticists.

In this paper, I identify that the aspirational category shapes category evolution in three phases. The first phase “Aspirational Features” (1921-1960) began with the creation of the aspirational category “robot” in a science fiction play. The products that were referred to as “robot” in this phase were diverse in terms of forms and functions. Some had a human form, but others had different human features—such as replacing certain types of human work, speaking, calculating, or piloting. The second phase “Feature Selection” (1961-1985) started with the rise of category “computer” and the advent of computer-programmed machines. In this phase, calculating machines and immobile machines were no longer referred to as “robot,” and mobility became the core common feature between various products and prototypes which claimed to be
"robots", spurring the organizational field of “robotics.” The humanoid form was still popular and dominant. The third phase “Feature Shake-out” (1986-2010) began with the bust of the industrial boom that had surged in the early 1980s. Facing the realization of the gap between extant technology and aspiration, field participants began creating artifacts that did not contain many of the humanoid features. In so doing, they shook out the category’s aspirational yet unnecessary features and focused sharply on one essential feature—mobility.
Collaborative Problem-Solving in Open Innovation

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Extended Abstract

Open innovation has become increasingly prevalent. Literature has shown that open innovation provides unique solutions to the universal organizing problems of division of labor and integration of efforts. Taking a microanalytical approach from an individual participant (firm)'s perspective, I analyze task interdependence’ and actor interdependence’ effects on the coordination activities in open collaboration. Specifically, I study how the focal innovation’s knowledge dependency and the focal actor’s attributes impact whether a coordinated solution search will result in consensus.

Empirically I study Linux Kernel, the most commercially important open source project. Characterized by diverse commercial interests and high-level knowledge heterogeneity and complexity, Linux Kernel provides an ideal setting to understand open collaboration and coordination. I compiled over 3 million email exchanges of all development efforts from 130 Linux Kernel related mailing lists and utilized Secure Hash Algorithm 2 (SHA - 2) to map such development effort to the innovation outcome in the Linux mainline repository. Hence, I am able to directly measure technological dependency and fully track the lifecycle of a proposed innovation. The final dataset contains innovation (code submission) characteristics and outcome, developers’ (both individual and organization level) attributes, and interaction patterns between them.

Initial results show that both downstream dependency and outside module dependency reduce the probability that consensus is reached. The commercial ratio in the participation of a
module intensifies the negative effect of downstream dependency on the probability of consensus while author’s past experience mitigates the negative effect of outside module dependency.
Business model innovation in China: From new features to architectural innovation

The conventional wisdom is that Chinese companies, compared to their western counterparts, have been less successful at original product and service innovations over the last three decades, and much of the success Chinese companies achieved was the result of industrial imitation of established Western multinational corporations. However, the phenomenon itself and people’s perception towards it have become more diverse recently. With a global ambition—and driven by tremendous stimulus from large and varied domestic needs—China may be entering a new phase, moving aggressively from pure imitation to a global innovation path. For instance, China is considered a leader in the digital innovation arena, such as e-commerce and mobile payments.

If Chinese firms are—it is claimed—not good at radical product innovation, and instead, they achieve success in the market by using unique business models, it raises the question as to whether these business models exhibit any new-to-the-world features. This question has not been answered in the current literature, but it does have essential implications. Shedding light on the novelty of Chinese firms can not only help the world better understand Chinese innovation paths but also contribute to the overall field of innovation management.

This paper tracks business model innovations in China with new-to-the-world features and builds a theoretical framework to explain the changes from novel features to the architecture of a business model by investigating three questions: (1) What is the general innovation performance of business models that exhibit new-to-the-world features in China? (2) How do innovative features further prompt the success of BMI? (3) What can we learn from BMI in China?

Concerning the first question, we launched a crowdsourcing contest to collect a large number of innovative business models in China, with a uniform template of business model analysis that we designed for that. By analyzing suggested innovative business models from the crowd in a more in-depth fashion, we provide an overall picture of innovation performance of business models in China. Concerning the second question, we propose a theoretical model on how novel features may further help achieve business model innovation, with two cases “validating” the model. And, concerning the third question, we summarize the experiences and lessons learned from business model innovations in China based on the investigation of the first two questions.

This paper has research and managerial implications. The first one is a better understanding of patterns of innovation in China, especially of business model innovation, and proposing some plausible explanations for the new-to-the-world business successes emanating therefrom. It contributes to research on innovation management, while helping scholars better understand China’s current role in the innovation field. In terms of managerial implications, we identified four types of business models with new-to-the-world features: birth with Chinese characteristics, technology advance push, digitalization and information service trajectories, and novel value propositions for customers.
The Good Fight: Conflict and the Multipartner Alliance  
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Detailed Abstract

A multipartner alliance – a group of firms that comes together to fulfill a common goal – experiences heightened conflict: the increased number of partners, often with competing organizational goals, impedes communication and trust-building; and the strategic importance of the alliance’s projects often means the close and at times, contentious involvement of governments, local labor groups, and nonprofit stakeholders. It is well-accepted that conflict is harmful to alliance performance, yet there exists a gap in understanding what specifically drives conflict between alliance partners and between partners and other stakeholders; and more importantly, what can lessen the instances of conflict experienced by the alliance.

This study examines conflict experienced by the multipartner alliance through the lens of alliance diversity – a characteristic that is often necessary for alliances to build new capabilities or enter uncertain markets, but one that increases transaction costs and impedes communication. I posit that the conflict resulting from alliance diversity is mitigated in instances when the financial structure of the alliance is highly asymmetrical – that is, a few partners in the alliance control a majority of financial resources. I theorize that financial asymmetry helps mitigate the impact of alliance diversity on conflict by allowing the lead partner or partners of the alliance to make clear a set of norms and way of operating.

I test these hypotheses by creating a unique measure of the level of conflict experienced by the alliance through the coding of 345,000 pages of alliance documents across 2138 alliances operating in 135 countries that were brought together to execute on World Bank-funded projects from 1998-2017. My initial results provide empirical support for the theory that diversity does indeed drive conflict between partners in the alliance and between the alliance and other stakeholders; and my results support the hypothesis that financial asymmetry mitigates the detrimental impact of diversity on conflict. Using a sub-sample analysis, I also examine how high-conflict and low-conflict projects perform over time and show that those projects that experience high-conflict have lower performance over time than low-conflict projects, despite both sets of projects starting from the same level of performance. Lastly, I also show that participatory mechanisms, that is, the presence of voice, community participation and transparency, may impact how projects are able to recover when conflict does occur.
Competition, Firm Financial Condition, and Expansion Strategy: Evidence from the Micro-Mobility Industry

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Abstract

This paper examines the relationship between location traits, firm capabilities—including firm financial condition—and expansion strategy in a competitive environment. I first build a formal model of firm expansion and entry timing based on Cournot competition that is driven by heterogeneity in firm, location, and competitor traits. In the model, I allow for the possibility that firms face financial pressure and that firms may have to set-up markets in new locations; which are conditions consistent with contemporary new firm and industry types. Using Monte-Carlo simulation, I identify firm best responses and Nash Equilibrium which serve as predictions for empirical inquiry. I then consider how changes in firm traits and location traits lead to different expansion outcomes including whether firms expand at all, whether firms enter a market early or later, and whether firms co-enter or stagger their entry, where one firm enters early and another firm enters later. There are trade-offs to each expansion outcome. By expanding together, firms share the fixed start-up costs associated with setting-up a new market including institutional barriers and attracting consumers. While similar firms will have similar monopoly and duopoly rents, as firm relative capabilities differ so too do their ability to extract rents. Staggered entry becomes more appealing as firm relative capabilities and financial conditions change.

Expansion strategy becomes more nuanced when considering the interaction between firm, competitor, and location traits. For instance, I find that less capable firms prefer to expand after more capable firms, but financial pressure may push less capable firms to expand earlier than they would prefer. I discuss one set of propositions that can be explored given my empirical setting. While investigating just this set, the model generates many more propositions by explicating the full set of expansion behavior for all firm and location parameters, mapping out regions of best response based upon, firm, location and competition heterogeneity.

I test predictions from the model using a unique hand-collected dataset of firm expansion in the micro-mobility industry including all firms operating scooter, bike, and moped share businesses in the U.S. Increased financing from venture capital funding and the increased quality and availability of platform technologies have led to rapid expansionary behavior in industries with a large start-up presence. The empirical results from my preliminary data collection support some model predictions and illustrate the importance of different levels of data in explaining expansion strategy. The data also highlights several areas to extend the model.

Keywords: competition, entry timing, location strategy, formal model, simulation
Identifying Opportunities with Bold Experimentation

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Business experimentation continues to influence how firms design and implement strategy, helping them reduce decision-making uncertainty and embrace high-performing opportunities (Camuffo et al., 2020; Kerr et al., 2014; Koning et al., 2019). Despite experimentation’s potential to deliver high performance, many firms use business experiments to pursue incremental opportunities. For instance, Google famously incremented across 41 shades of blue to decide which to use in a navigation bar (Kohavi et al., 2020). On the other hand, some firms use experiments to test bolder, non-incremental opportunities. For instance, Booking.com tested a radically new landing page to decide whether or not to enter a new market (Thomke and Beyersdorfer, 2018). What might help explain this difference in approach to experimentation?

In this paper, I argue that the pursuit of incremental gains in experimentation reflects reduced cognition. In particular, the decreasing cost of experimentation alters the balance between cognition and action, or “thinking” versus “doing” (Ott et al., 2017), in the formation of strategy. Cognition helps managers consider how choices and activities combine and reinforce one another to deliver superior performance (Siggelkow, 2002). With reduced cognition, boundedly rational organizations take more incremental steps when acting (Gavetti and Levinthal, 2000), preventing their ability to identify high-performing opportunities (Levinthal, 1997).

To study the trade-offs between cognition and action in experimentation, I leverage a proprietary dataset of business experiments run on the widely-used A/B testing platform, Optimizely. This global dataset captures live business experiments by start-up firms and Fortune 100 companies alike, providing reliable estimates of business experimentation practice across industries. In addition, Optimizely’s detailed microdata on experiments enables us to generate continuous measures of high-cognition change in experimentation. Next, I pair Optimizely’s data on experiments with website traffic data from SimilarWeb to estimate how limits on customer feedback influence action and cognition in business experimentation.

In my first set of analyses, I demonstrate the value of cognition in experimentation—documenting how high-cognition changes in experimentation increase the chance of breakthrough performance while mitigating the chance of failure. Next, I illustrate how increased access to feedback resources in the form of customer traffic increases action but reduces cognition in experimentation. As organizations receive additional feedback resources, they run additional experimental trials while reducing the scope of high-cognition changes. Addressing potential mechanisms behind this result, I find that as feedback resources increase, organizations invest less in evaluating alternatives prior to testing. Finally, to address potential endogeneity concerns in my analysis, I isolate the effects of a natural experiment which reduces traffic for a subset of organizations in my sample. For these organizations that lost feedback resources, I find opposite effects—they reduce the number of experimental trials run while increasing high-cognition change in experimentation.

My findings contribute to the literatures on strategy, organization, and entrepreneurship along several fronts. First, I contribute to a burgeoning literature on experimentation in strategy by highlighting an often-neglected reality of practice—business experimentation is resource-constrained. Second, I demonstrate how a neglected construct in business experimentation—cognition—can help unlock long-tail performance opportunity. Finally, my findings illustrate how scarce resources for experimentation help shape the trade-off between cognition and action in experimentation, bearing important implications for the identification of high-performing opportunities.
References
Leveraging Institutional Intermediaries: Entrepreneurial Strategies to Contact Investors on a Fundraising Platform

Institutional intermediaries are “agents whose activities have the potential to create institutions” (Dutt et al., 2016) by connecting unconnected actors to enable activities that would not readily occur otherwise (Eberhart, Eesley, & Eisenhardt, 2017). Prior research on institutional intermediaries mainly discusses two types of benefits on entrepreneurship – building capabilities and providing credentials. First, institutional intermediaries enable certain capability-building activities that would not be possible in their absence (Armanios, Eesley, Li, & Eisenhardt, 2016; Dutt et al., 2016; Siegel, Westhead, & Wright, 2003). Second, institutional intermediaries can redefine market boundary and legitimize new actors in a new market (Mair, Marti, & Ventresca, 2012).

While prior papers have unpacked the effects of institutional intermediaries on entrepreneurs, the flip side of the story is missing – how do entrepreneurs leverage institutional intermediaries? The effects should depend on a fit between the type of institutional intermediaries and the type of entrepreneurial strategies, but we lack an understanding of the contingency effects. Also, prior research focuses mostly on offline institutional intermediaries, but online institutional intermediaries are less well understood. However, it’s important to examine online intermediaries, because the role of offline institutional intermediaries tends to be geographically restricted. Specifically, we ask: How do entrepreneurs leverage online institutional intermediaries to acquire resources?

We focus on the sequence of contacting investors and propose two types of strategies – stepping-stone strategy and status-picking strategy. A stepping-stone strategy means contacting low-rank investors to get initial replies, which could be used as stepping stones to contact higher-rank investors later on. On the contrary, a status-picking strategy starts with high-rank investors first. Using data from an online fundraising platform in China, we find that stepping-stone strategies are rewarded, whereas status-picking strategies are penalized online. Moreover, we find that stepping-stone strategies are more beneficial to entrepreneurs in less developed regions. In contrast, entrepreneurs in more developed regions are less penalized by taking the status-picking strategy.

This paper contributes to prior literature on institutional intermediaries, network tie formation, and platforms. First, while prior work focuses on how institutional intermediaries impact entrepreneurs (Armanios et al., 2016; Dutt et al., 2016; Eberhart et al., 2017), we explore how entrepreneurs leverage intermediaries. Second, network dynamics (Davis, 2016; Powell, White, Koput, & Owen-Smith, 2005), particularly the formation of networks (Hallen, 2008; Hallen & Eisenhardt, 2012; Zaheer & Soda, 2009), are not well understood in prior literature. We address this gap by investigating sequential attempts for initial tie formation and discussing initial tie formation online versus offline. Finally, while prior work on platforms focuses on the strategy of platform providers (Boudreau, 2010; Eisenmann, Parker, & Van Alstyne, 2006; Rochet & Tirole, 2003), this paper examines the strategy of platform users. Overall, this paper conceptualizes online fundraising platforms as a new type of institutional intermediaries, proposes two types of tie formation strategies through platforms, and examines how the effectiveness of these two strategies are moderated by offline institutional environment.
References:


The Strategic Role of Private Label Production by National Brand Firms

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Detailed Abstract:

Can national brand manufacturers gain strategic advantages by producing private label products along with their own brands? Private label products under retailers’ names experienced explosive growth both online and offline in recent years. Internationally, store private label sales increased to 51.8% in Spain, 46.2% in the UK, 45.5% in Germany, 31.7% in France, and 20.6% in Italy (PLMA, 2018). In the U.S., private label sales reached $128.6 billion, representing 18.5% by dollar, and 22.3% by unit of all consumer-packaged goods sales (Nielsen, 2019). AmazonBasics batteries are estimated to account for one in three batteries sold online, outpacing Duracell and Energizer. In 2018, Walmart, Target, and Kroger all introduced new private label products, with Albertsons launching 1,400 new products in one year (Terlep & Friedman, 2018).

Private label products were once a popular strategy used primarily by brand manufacturers. Brands used private labels to price discriminate (Federal Trade Commission, 1962), dispose of excess production (Cook & Schutte, 1967), expand into price-sensitive segments (Stern, 1966), and appeal to buyers who prefer cheaper and lower-quality goods during economic downturn (Hoch & Banerji, 1993). In recent decades, brand firms have seeded control of private label products to retailers (Insights CB, 2018), resulting in a dramatic rise in the number of categories that carry private label products, especially in categories that have low private label entry barriers (Chen, 2009). This rise has also attracted regulatory attention as Amazon is under federal scrutiny for its private label promotion practices and its use of competitor data (Mattioli, 2019; Mattioli, 2020).

With private label products’ increasing importance, many national brand manufacturers are faced with an important strategic decision of whether to produce private label products for retailers alongside their branded counterparts. On the one hand, co-manufacturing private label goods may cannibalize the original product and or reduce product equity. On the other hand, manufacturers can gain from a strengthened product position as private label products on store shelves effectively serve as in store advertisements. In this paper, I explore these tradeoffs by exploiting a natural experiment resulting from the merger of Post Holdings Inc., the third largest national brand ready-to-eat (RTE) breakfast cereal manufacturer, and Ralcorp Holdings, the largest private label RTE cereal manufacturer. This event altered product control and changed existing product competition. More importantly, it identified an instance of a national brand manufacturer producing both branded and private label products, information that is commonly regarded as industry secret.

Through this lens, I assess strategic choices such as private label introduction decisions and the resulting performance consequences. Among other results, I find that certain strategic use of private label products by brand manufacturers can help increase performance through business stealing from horizontal rivals.

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Citations


How to motivate the implementation of better management practices? Benchmarking – comparing relative performance and practices – is a widely advocated but under-studied strategy.

Theoretically, managers fail to leverage existing information and do not implement better management practices, mainly due to two reasons. For one, managers might suffer from information frictions and do not know the existence of better management practices. For the other, managers might pay limited attention to some practices and hold false beliefs over how those practices contribute to performance. Benchmarking works under both scenarios and motivates managers to implement better management practice by directly providing information as well as demonstrating the relationship between practices and performance. Following this line of reasoning, benchmarking is more likely to facilitate practice implementation for businesses with lower performance. Also, benchmarking has a stronger effect on practices to which business owners are more inattentive.

To investigate the causal impact of benchmarking, we carried out a randomized controlled experiment among small business owners operating cooked food stalls in Singapore. Every owner was informed of their own performance. Additionally, treatment owners were offered with their relative performance and practices of top performers. The experiment will conclude in late 2020 with visits to observe the treatment effect on practices and performance.