



The 80/20 rule: Corporate support for innovation by employees[☆]

Silvana Krasteva^{a,*}, Priyanka Sharma^b, Liad Wagman^b

^a Department of Economics, Texas A&M University, College Station, TX 77840, USA

^b Stuart School of Business, Illinois Institute of Technology, Chicago, IL 60616, USA



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ABSTRACT

We model an employee's decision to pursue an innovative idea at his employing firm (internally) or as a start-up (externally). We characterize an idea by its market profitability and the degree of positive/negative externality that it imposes on the employing firm's profits. The innovation process consists of exploration and development. Exploring an idea internally grants the employee access to exploration support provided by the firm but reduces his appropriability of the idea. We demonstrate that ideas exhibiting weak externalities are explored and developed externally, whereas ideas with strong externalities are explored and handled internally. Moderate externalities are associated with internal exploration but subsequent external development. An increase in the firm's exploration support attracts internal exploration of a wider range of ideas but may increase the likelihood of subsequent external development. We further show that while the optimal level of exploration support rises with the firm's innovation appropriability, overall profits may decline.

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1. Introduction

Evidence indicates that innovations developed by start-ups are often conceived by former employees of established firms who undertake projects that had been overlooked by their employers (Sørensen and Fassiotta, 2011). These innovations are frequently related to the respective parent firms' lines of business (Agarwal et al., 2004; Bhide, 1994; Cassiman and Ueda, 2006; Franco and Filson, 2006; Klepper and Sleeper, 2005). For instance, FriendFeed, Aardvark, and Nextstop were founded by former Google employees, with each closely connected to their founders' work at Google.¹ Similarly, former Microsoft employees Rob Glaser, Gabe Newell, and Rich Barton famously went on to found RealNetworks, Valve, and Zillow, each directly connected to their past

responsibilities at Microsoft (Rich Barton also co-founded Expedia.com as part of his employment at Microsoft in 1994; it was later spun off).

While innovations may eventually be developed outside of their respective parent firms, the initial exploration often occurs within. In fact, many of the firms that bear a reputation for employees leaving to form start-ups, including Amazon, Google, and Microsoft, also have in place generous policies for supporting exploration of new ideas. Firms such as Chubb,² LinkedIn,³ and Apple⁴ followed Google in implementing generous company policies for allowing employees to explore new ideas “on the company's dime.” Google's renowned 80/20 “Innovation Time Off” (ITO) policy encourages employees to take 20 percent of their time to work on company-related projects of their choosing. The policy has led to some exceptionally successful commercial products, including Gmail, AdSense, and Google News, and in-house utility tools like Google Moderator.⁵

A firm's choice to support exploration of new ideas by its employees, in lieu of negotiating exploration-contingent contracts, can be understood in light of the nature of the innovation process. Innovative ideas are frequently the result of unpredictable and non-contractible initiatives, which go beyond employees' normally prescribed tasks (Aghion and Tirole, 1994; Hellmann and Thiele, 2011). Thus, incentive contracts based on measurable performance objectives studied in the literature

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* Corresponding author.

E-mail addresses: ssk8@tamu.edu (S. Krasteva), priyanka.sharma@stuart.iit.edu (P. Sharma), lwagman@stuart.iit.edu (L. Wagman).

¹ Numerous other start-ups that bear a relationship to Google's product line were founded by former Google employees, including Ooyala, Dasient, TellApart, Cui, Redbeacon, Mixer Labs, Howcast, MyLikes, Weatherbill, Doapp, reMail, Hawthorne Labs, and Appjet, among others.

² <http://sloanreview.mit.edu/article/redesigning-innovation-at-chubb/>.

³ <http://www.wired.com/2012/12/linkedin-20-percent-time/>.

⁴ <http://goo.gl/42rer7>.

⁵ <http://goo.gl/Cjq38>.

(e.g., Gibbons, 1998; Holmström, 1991; Holmström and Milgrom, 1991, 1994), are often hard to structure and evaluate in practice. Policies for corporate innovation, such as Google's ITO policy, have attracted considerable media and practitioners' attention in recent years,⁶ and their profitability has been questioned.⁷ This paper aims to gain a better understanding of the relationship between a firm's support for innovation and employees' choice of whether to innovate and where to pursue new ideas.

We present an integrated model that incorporates both the firm's problem of incentivizing innovation by its employees as well as an employee's choice of pursuing an innovation internally or externally. Similar to Pakes and Nitzan (1983), a new idea in our framework can be turned into a marketable innovation in two stages—exploration and development. Exploration turns a non-verifiable and non-contractible idea into a working prototype that can be evaluated by a third party, while the development stage turns the prototype into a marketable product.

From the employee's perspective, external exploration has the advantage of a higher appropriability of the innovation. The benefit of internal exploration is twofold. First, the employee can take advantage of the firm's exploration support, which may increase the likelihood of successful exploration. Second, internal exploration and handling of an idea may be more efficient if the idea is related to the firm's line of business (e.g., due to better output coordination and tailoring of new products to existing ones). Given the trade-offs that the employee faces upon coming up with an idea, he chooses whether to ignore the idea, explore the idea internally, or explore the idea externally. Our objective is to understand how the firm's level of support and the conceived idea's characteristics interact with the employee's exploration and retention incentives.

Our model gives rise to the prediction that at the early exploration stage, firms tend to bleed out ideas that impose weak (positive or negative) externalities on existing profits, and retain ideas with strong externalities. This is primarily because ideas exhibiting stronger externalities are associated with higher efficiency gains from joint development, which the firm and the employee share in the downstream. This prediction is consistent with some empirical evidence. In particular, in the semiconductor, laser and disk-drive industries, spinoffs are likely to enter new niche markets that do not significantly affect the profits of parent firms (Christensen, 1993; Klepper, 2010; Klepper and Sleeper, 2005).

Our model also incorporates heterogeneity of employees' entrepreneurship potential (e.g., due to varying managerial abilities and access to capital), where an employee's type is private information and affects his profitability from the external pursuit of an idea. This gives rise to an adverse selection problem for the firm in the downstream once an innovation has been internally explored; that is, once a prototype has been completed. In particular, in the development stage, the firm may fail to provide sufficient compensation to the high-type employee, resulting in the employee's departure to form his own start-up. Our model gives rise to the prediction that internal exploration and subsequent external development occurs for valuable ideas exhibiting moderate externalities. These ideas generate sufficient surplus inside the firm to encourage internal exploration by all entrepreneurship types, but not enough to induce a high compensation offer by the firm to the employee in the development stage. As a result, the high entrepreneurial type leaves the firm in favor of independent development.

In equilibrium, since low-type employees have less attractive outside options, and consequently weaker incentives to pursue ideas externally, their initial exploration decision may signal their types. Interestingly, as the firm increases its support for exploration, the firm's ability to infer the employee's type diminishes—as all employee types find internal exploration more attractive. Therefore, while increasing

exploration support attracts more ideas for internal exploration by existing employees, it may also have the undesirable consequence of increasing downstream disagreements as higher exploration support exacerbates the firm's adverse selection problem in the downstream. This suggests that increasing the level of support that the firm offers may play a significant role in changing the timing of the employee's departure but may fail to eliminate such departures.

When choosing its optimal exploration support, the firm will take into account both its impact on the success of internal exploration (productivity effect) and on the employee's exploration choice (retention effect). From a policy perspective, we consider how the firm's optimal choice of support and its expected profit interact with its ability to appropriate the returns from the employee's exploration. The firm's appropriability is affected by numerous policy variables such as the allocation and strength of property rights, enforcement of non-compete agreements, and the firm's control over vital production inputs. Higher idea appropriability by the firm increases the firm's profit from internal exploration at the expense of the employee's profit. We show that the optimal level of support rises with the firm's degree of appropriability. The reason for this is twofold. First, the increase in the firm's profit from internal exploration strengthens the productivity effect, making internal exploration more attractive for the firm. Second, the corresponding reduction in the employee's profit from internal exploration makes the employee's retention harder. This, in turn, causes the firm to further increase its level of support in order to encourage internal exploration and enables the firm to reap the benefits of its higher appropriability.

However, a higher degree of appropriability does not necessarily benefit the firm—and may in fact reduce its ex ante expected profit. This is because the cost of maintaining the flow of ideas brought internally can outweigh the gains from appropriating larger proceeds in the downstream. We show that as a result of a higher level of appropriability by the firm, the productivity effect increases firm's expected profit, but the retention effect decreases it. When the firm's appropriability increases past a threshold, its expected profitability may decrease. This suggests that innovative firms may favor balanced property rights that give employees sufficient control over innovation output inside the firm.

2. Related literature

There is a significant body of literature that addresses different aspects of innovation within firms. Questions related to employees' incentives to leave established companies to form start-ups (e.g., Amador and Landier, 2003; Anton and Yao, 1995; Cassiman and Ueda, 2006; Hellmann, 2007; Klepper and Sleeper, 2005; Pakes and Nitzan, 1983; Thompson and Chen, 2011) and inducing innovation within firms (e.g., Aghion and Tirole, 1994; Bernardo et al., 2009; Hellmann and Thiele, 2011; Holmström, 1989; Holmström and Milgrom, 1991; Inderst and Klein, 2007; Manso, 2011) have been at the forefront of the entrepreneurship literature. Interestingly, the analysis of these two important aspects of innovation within firms—inducing innovation and new venture formation—has been largely disconnected. We bridge this gap by studying the choices of (i) exploration support by the firm and (ii) start-up formation by employees, in an integrated model.

Some of the emerging explanations for employee departure include labor market frictions (Astebro et al., 2011); information asymmetries and overly optimistic employees (e.g., Amador and Landier, 2003; Thompson and Chen, 2011); lack of commitment by established firms to not expropriate innovative ideas (e.g., Pakes and Nitzan, 1983; Anton and Yao, 1994, 1995; Wiggins, 1995; Gans et al., 2002; Gans and Stern, 2003; firm's optimal pre-commitment to reject innovation by employees in order to incentivize effort on the firm's core business (Hellmann, 2007); know-how acquisition by employees that increases their potential for entrepreneurship (Franco and Filson, 2006); inability of the established firm to prevent the development of profit-eroding

⁶ <http://www.forbes.com/innovative-companies/>.

⁷ http://blogs.hbr.org/cs/2010/08/free_time_innovation.html.

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