Reputation Capital, Financial Capital, and Transition to Entrepreneurship

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We provide a theory for career choices of employees willing to become entrepreneurs and facing credit constraints. We show that they need a sufficient mix of reputation and financial capital. We consider their choice to work for transparent or opaque firms. Transparent firms disclose more information about their employees. It has two consequences. First, it eases the updating of the employees' reputation, which is positive for those with a bad initial reputation and negative otherwise. Second, it fosters incentives to exert effort, which increases the wage, and thus, the financial capital available for setting a business venture. Employees thus adopt strategies that depend on their initial reputation. We also show that employees whose alternative is to choose between transparent and opaque projects to work on once employed make transparency choices that differ from employees who choose firms to work for. The former are less likely to become entrepreneurs than the latter.

Key words: Entrepreneurship, Career Concerns, Reputation, Financial Capital, Transition

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1. Introduction

This paper provides a theory for how employees aspiring to become entrepreneurs choose a job to optimize their reputation capital and financial capital. Such an understanding is important for the employees themselves and their employers. Indeed, the objective of becoming entrepreneurs quite plausibly influences the employees' ex ante behavior in terms of firms they apply to, projects they desire to work on, as well as their subsequent involvement in their job. This issue is all the more important as a large fraction of the labor force aims at becoming entrepreneurs,[1] a vast majority of new entrepreneurs were previously employed by established firms,[2] and the opportunity to start a business venture offers incentives that differ from usual career concerns (i.e., wages variations).

Throughout this paper, we adopt a broad definition of entrepreneurship: An entrepreneur is a residual claimant of the cash-flows that his labor generates. Among others, scientists establishing firms in high-tech industries, self-employed doctors, lawyers, accountants and consultants fit this definition.[3] Our study starts from the premise, substantiated by ample empirical evidence, that credit constraints are an impediment to the transition to entrepreneurship.[4] It should especially be the case for the above industries where the financial capital required to start a firm is large.[5] In this context, it is straightforward that personal financial capital is helpful. When talent can be transferred from an employee activity to an entrepreneurial activity, reputation capital should also help alleviate these constraints. For instance, it is well-accepted that networks of venture capitalists, engineers, entrepreneurs, and academic scientists play a significant role in allocating labor and capital throughout Silicon Valley and Boston's Route 128.[6] Thus, aspiring entrepreneurs should carefully manage their financial and reputation capital. In particular, choosing a firm to work with or a project to work on matters. Indeed, organizations differ according to the information they release about their employees' performance. For example, partnerships disclose little information.[7] In general, public firms disclose more information than private firms, etc. Projects are also very different in that respect, offering more or less resolution of uncertainty about the employees' talent. These information patterns affect directly how the employees' reputation capital evolves. It also affects indirectly how their financial capital evolves since

[1] Self-employment is a goal for about 70% of Americans, 60% of Germans, 45% of British people and 42% of French people (Blanchflower et al 2001).

[2] See Burt (2000), Burton et al (2002), and Gompers et al (2005) for high-tech and the service industries.

[3] Professional industries (i.e., the medical, legal, accounting, and management consulting industries) alone account for about 20% of firm creations every year in the United States (see, e.g., Hurst and Lusardi 2004).

[4] Seminal papers are due to Evans and Jovanovic (1989), and Evans and Leighton (1989). Recent literature includes Quadrini (1999), and Gentry and Hubbard (2004).

[5] Start-ups in the information technology or biotechnology industries require millions of dollars of investment (Gompers and Lerner 2004). Medical or legal practices are sold several times the annual net profit generated.

[6] See Granovetter (1973), Castilla et al (2000), and Shane and Cable (2002).

[7] See Morrison and Wilhelm (2007).

the employees' incentives to be diligent, and in turn the wage they earn, depend on how their effort translates visibly into output. The interaction between reputational and financial capital is all but straightforward, so we need to develop some structure for the analysis.

Consider a risk-neutral, wealthless scientist, whose *exact* talent is unknown to credit and labor market participants, himself included. However, the scientist has developed a professional reputation, e.g., through his track record of scientific publications, patents, etc. In a first stage, the scientist looks for an employer. When employed, his output is the sum of his talent, his effort, and a noise term which depends on the type of firm the scientist chooses to work for. Firms can be "transparent" or "opaque". Working for a transparent firm generates accurate information about the scientist's talent in the sense that little noise is added to the observable output. In contrast, working for an opaque firm generates less accurate information about the scientist's talent, i.e., more noise is added to the observable output. The scientist receives a wage equal to his expected output. In a second stage, he faces the opportunity to start a business venture. A financial investment is required to determine whether the venture is viable. The venture is viable only if the scientist abstains from pursuing personal objectives, which creates scope for credit constraints. If viable, the venture's value depends on the scientist's talent.

Consider the second stage. The scientist has accumulated financial and reputation capital. Accumulated wealth reduces the need for external finance, and thus relaxes the credit constraints, making it more likely that the venture be funded, for a given reputation capital. Reputation capital also relaxes the credit constraints. Indeed, reputation capital increases with talent, and talent increases the venture's value, if viable. Thus, the better the scientist's reputation, the larger the venture's value if viable. In turn, the larger the difference in the entrepreneur's revenue between pursuing personal objectives and maximizing profits. It fosters incentives, and thus helps relax the credit constraints, for given a wealth. Hence, financial and reputation capital are substitute remedies to credit rationing.

Now consider the first stage. As an employee, the scientist seeks to accumulate financial capital (i.e., wages) and reputation capital to mitigate credit constraints in the second stage. However, these two goals can conflict. The intuition is as follows. Suppose that the scientist's initial reputation capital is sufficiently good to allow him to start the business venture if the status quo persists, i.e., the scientist keeps the same reputation. In that case, the scientist favors no further updating of his reputation by the credit and labor markets, which is achieved by working for an opaque firm. Indeed, the less accurate information about talent, the smaller the extent of the updating process. However, while opacity should help him maintain his good reputation, it reduces his wage, and thus the wealth he accumulates. The reason is that the scientist faces fewer incentives to increase output since the markets barely use output to update his reputation. As a result, the scientist opts for the opaque firm when the loss in financial capital is lower than the anticipated gains from maintaining a good reputation.

Suppose instead that the scientist's initial reputation capital is insufficient to allow him to start the business venture if the status quo persists. Working for a transparent firm has two benefits. It gives him the opportunity to let the markets update his reputation, and accumulate more financial capital.

We also examine the case of a scientist who can affect the transparency level of his activity, *once employed*. We model this by assuming that the scientist can choose to work on a transparent or an opaque project. We show that employees do not make the same choices in terms of transparency-opacity as when they choose an employer because they cannot commit to a level of transparency, once employed. The consequence is that they are less likely to become entrepreneurs since they either put their reputation capital at greater risk or accumulate less financial capital.

We derive empirical implications from these results. We delay their presentation after we present formally our theory. Also, we only sketch here the points of departure of our paper from existing work and delay their in-depth discussion. Firstly, we focus here on reputation capital, an issue that has received little attention by research on the determinants of the transition to entrepreneurial activity that started with Evans and Leighton (1989). Next, our contribution to the specific empirical literature that studies the impact of financial capital on transition (e.g., Hurst and Lusardi 2004) is to provide a dynamic model where financial capital is determined endogenously and interacts with reputation.

Finally, we extend in three directions the theoretical career concerns literature that started with Holmström (1999). First, transition to entrepreneurship is a career concern that is different from the wage variations usually studied since it implies a discontinuity in terms of revenues, and thus creates scope for differing behaviors. Second, we relate labor market issues to credit market issues. Third, we model the interaction between choices of effort and choices of firms or projects.

The paper proceeds as follows. Section 2 presents the model. Section 3 characterizes the conditions under which a scientist can establish a firm. Section 4 examines the scientist's choice of employer, and Section 5 the scientist's choice of project. Section 6 presents empirical implications and discusses the relation between the present paper and existing literature. Section 7 considers robustness issues. Section 8 concludes. Proofs are in the Appendix.

2. The Model

We consider a two-period model with a competitive labor market consisting of firms and employees, and a competitive credit market, consisting of entrepreneurs and lenders. All parties are risk-neutral. Without loss of generality, we normalize the discount rate to 0 as in Tirole (2005).

2.1. Choice of Firm

First Period

At the beginning of the first period, the scientist i has no financial capital. He looks for an employer (a firm). If employed by a transparent firm (a $\mathcal{T}$-firm or simply $\mathcal{T}$ in what follows), his output is

$$\pi(\theta^i, e^i, r_{\mathcal{T}}) = \theta^i + e^i + r_{\mathcal{T}}, \text{ where} \tag{1}$$

- θ^i, the scientist's precise talent, is unknown to (labor and credit) market participants, including the scientist himself, as in Holmström (1999), and Gromb and Scharfstein (2005). It is common knowledge that θ^i is drawn from the distribution $N(E(\theta^i); \sigma^2_{\theta^i})$, where $E(\theta^i) \geq 0$ is the scientist's *initial* reputation capital, denoted In^i.

- e^i is the unobservable effort exerted by the scientist, that costs him $\psi(e^i) = \frac{k}{2}\left(e^i\right)^2$, with $k > \underline{k}$ (specified in the Appendix).

- $r_{\mathcal{T}}$ is the realization of a random variable drawn from the distribution $N(0; \sigma^2_{\mathcal{T}})$.

If employed by an opaque firm (an $\mathcal{O}$-firm or simply $\mathcal{O}$ in what follows), the scientist's output is also given by (1) except that $r_{\mathcal{O}} \sim N(0; \sigma^2_{\mathcal{O}})$ replaces $r_{\mathcal{T}}$. $\mathcal{O}$-firms add more noise to the scientist's output than $\mathcal{T}$-firms: $\sigma^2_{\mathcal{O}} > \sigma^2_{\mathcal{T}}$ (with $\sigma^2_{\mathcal{T}} > \underline{\sigma^2_{\mathcal{T}}}$, where $\underline{\sigma^2_{\mathcal{T}}}$ is specified in the Appendix). However, the choice of firm has no *direct* impact on expected output, i.e., $E(r_{\mathcal{O}}) = E(r_{\mathcal{T}}) = 0$. For the sake of conciseness, $\pi(\theta^i, e^i, r_{\mathcal{O}})$ (respectively $\pi(\theta^i, e^i, r_{\mathcal{T}})$) is replaced by $\pi^i_{\mathcal{O}}$ (respectively $\pi^i_{\mathcal{T}}$) henceforth.

The output is observable by everyone. However, it is not used in an employer-employee formal compensation contract. It is not at odds with practice: The actual explicit incentives that confront executives in large firms are weak (Jensen and Murphy 1990), or absent (e.g., in some regulated industries, government agencies developing military innovation, and universities housing scientific laboratories). Theoretical reasons explain this pattern, including the difficulty of verifying the output of each employee, or some dimensions of this output. In the former case, writing any explicit contract is impossible, while in the latter case, it would distort incentives (Holmström and Milgrom 1991). As a consequence, the scientist is paid a fixed wage W^i at the end of the first period. This wage is equal to his expected output since the labor market is competitive, and fixed at the beginning of the period. The scientist saves the first-period wage.

During the first period, the scientist imagines a new technology which is potentially more profitable than existing ones.

Second Period

In the second period, the scientist can still work as an employee as in Holmström (1999). Then, his output is again given by (1). His fixed wage is equal to his second-period expected output.

Alternatively, the scientist can try to set up his own firm based on the new technology.[8] Starting a

[8] To take into account that in practice intellectual property rights are barely protected by the law (see e.g., Hyde 1998,

business venture requires a financial investment I to fund R&D expenditures in order to learn whether the new technology is viable. If so, the new technology yields a net present value (NPV) equal to $\delta \overset{d}{=} \Delta - I$. We take $\delta > \underline{\delta} > 0$, where $\underline{\delta}$ is specified in the Appendix. The cash-flows depend on the scientist's talent.[9] Specifically,

$$\begin{aligned} \Pi(\theta, \Delta) &= \theta + \Delta \text{ if the new technology is viable,} \\ &= 0 \text{ if otherwise.} \end{aligned} \tag{2}$$

The scientist influences the probability that the new technology is viable. If the scientist maximizes profits, the new technology is viable with probability p that we normalize to 1 without loss of generality. If the scientist pursues personal objectives (e.g., by not allocating time properly across different tasks, or by hiring family members with poor qualifications), the probability decreases to q (with $q < 1$) while the scientist receives a private benefit whose monetary equivalent, $B > \underline{B}$ (specified in the Appendix), is sufficient to make the problem interesting, as in Holmström and Tirole (1997). Talent aside, the starting of a business venture requires profit maximization in order to be profitable in the sense that

$$q\Delta - I + B < 0. \tag{3}$$

Finally, entrepreneurs are protected by limited liability.

2.2. Choice of Project

Alternatively, we consider the case where, in the first period, but *once employed*, the scientist has to choose privately between a transparent project (a $\mathcal{T}$-project or simply $\mathcal{T}$ in what follows) and an opaque project (an $\mathcal{O}$-project or simply $\mathcal{O}$ in what follows). This assumption best describes the situation of

and Gilson 1999), we analyze in Section 7 the case where the scientist can steal existing technology and establish his own firm. It turns out to always be a dominated solution.

[9] Talent is transferable from an employee activity to an entrepreneurial activity in our model. However, we do not mean to suggest that there are no intrinsic differences between employees and entrepreneurs. Entrepreneurs may have a comparative disadvantage in a single skill, but more balanced talents that span a variety of different skills (Lazear 2004). As evidenced above, it does not prevent many employees from becoming entrepreneurs.

a scientist responsible for some important decisions. Again, this choice determines the level of noise $r_c \in \{r_T; r_{\mathcal{O}}\}$ in the scientist's output, given by (1).

2.3. Benchmark

In the absence of moral hazard in the second period, the scientist-entrepreneur would always maximize profits. Since $\delta > 0$, he could start the business venture with no reputation or financial capital. In this context, the first-period choice of firm or project would be irrelevant.[10] In the next section, we determine the conditions under which a scientist can start a business venture when moral hazard causes credit-rationing.

3. Starting a Business Venture

3.1. The Need for Reputation and Financial Capital

A scientist i who receives a first-period salary W^i lower than the required investment I needs external finance. At the beginning of the second period, his initial reputation capital, In^i, has been updated. The updated reputation capital, denoted Up^i, is the assessment that the labor and credit markets make about the scientist's talent. The markets use the first-period output, the scientist's choice of transparency versus opacity, and the first-period anticipated equilibrium effort.[11] Provided that the scientist's updated reputation capital satisfies

$$q \, \left[Up^i + \Delta\right] \geq I \Leftrightarrow Up^i \geq \frac{I}{q} - \Delta, \tag{4}$$

the starting of a business venture can be, in expectation, profitable even if the scientist does not maximize profits. However, (3) implies that the scientist would then obtain a higher revenue as an employee. Thus, it is worth starting a business venture only when profits are maximized.

[10] In the absence of moral hazard in the first period, the scientist would exert the first-best effort: $e^{FB} = \psi'^{-1}(1)$.

[11] When the scientist chooses a firm, the markets take into account his *actual* choice of transparency versus opacity (c) since this choice is observable. When the scientist chooses a project, the markets take into account his *equilibrium* choice (c^*) since this choice is not observable. Thus, in the former case, $Up^i = E\left(\theta \mid \pi_c^i, e_c^{i*}, c\right)$, while in the latter case, $Up^i = E\left(\theta \mid \pi_{c^*}^i, e_{c^*}^{i*}, c^*\right)$. For the sake of brevity, we abandon the notation c^* in the following.

In expectation, competitive investors must receive $I - W^i$ in order to provide funds. Maximizing profits must yield higher gains to the scientist than pursuing personal objectives, which reduces to

$$Up^i + \Delta - \left(I - W^i\right) \geq q \ \left[Up^i + \Delta - \left(I - W^i\right)\right] + B. \tag{5}$$

Reorganizing (5) shows that a scientist whose wage is lower than the required investment can become an entrepreneur if and only if

$$Up^i \geq \underline{Up_c^i} \overset{d}{=} \frac{B}{1-q} - \delta - W_c^i, \tag{6}$$

where the reputation threshold and the wage are indexed by c to capture that they ultimately depend on the choice of firm or project (see below). Eq. (6) implies that reputation capital is essential to overcoming the credit rationing problem when $\underline{Up_c^i} > 0$, or $W_c^i < \frac{B}{1-q} - \delta$. The intuition is that the better the scientist's reputation, the larger the difference in the venture's value between pursuing personal objectives and maximizing profits, which fosters incentives. This result stands in contrast to the benchmark case, where professional reputation is useless. Eq. (6) leads to the following proposition.

Proposition 1 *Updated reputation capital and financial capital help overcome credit rationing.*

3.2. Effort and the Transparency Versus Opacity Decision

The scientist exerts effort in the first period so as to maximize his second-period expected gains minus his first-period cost of effort, $\psi\left(e^i\right)$. Recall that deciding to exert more effort during the first period does not increase the first-period wage, since the latter is already fixed at the start of the period. The second-period expected gains are

$$\Pr\left(Up^i \geq \underline{Up_c^i}\right) \times E_{\pi_c^i}\left[Up^i + \delta \mid Up^i \geq \underline{Up_c^i}\right] + \Pr\left(Up^i < \underline{Up_c^i}\right) \times E_{\pi_c^i}\left[Up^i \mid Up^i < \underline{Up_c^i}\right], \tag{7}$$

where $E_{\pi_c^i}$ reflects that the expectation is taken with respect to π_c^i. The first part of (7) is the product of the probability to start the business venture and the expected gains in such a case. The latter, derived from (2), are equal to the scientist's updated reputation capital conditional on the latter being sufficient to start the business venture, plus δ, the NPV of the new technology. The second part of (7) is the product of the probability to remain an employee and the expected wage in such a case. The expected wage reduces to the updated reputation capital- conditional on the latter being insufficient to start the business venture -since the scientist exerts no effort during the second, final period because career concerns are absent. Overall, increasing effort raises (i) the probability to become an entrepreneur and (ii) the expected wage if transition to entrepreneurship is impossible at the end of the first period.

Assuming an interior solution as in Dewatripont et al (1999), the first-order condition for an equilibrium satisfies

$$ke_c^{i*} = f_c(\mathcal{A}_c^i)\left(\delta + \sigma_\theta^2 \frac{f_c(\mathcal{A}_c^i)}{1 - F_c(\mathcal{A}_c^i)}\right) + \left(\frac{\sigma_\theta^2}{\sigma_\theta^2 + \sigma_c^2} F_c(\mathcal{A}_c^i) + \left(In^i - \underline{Up_c^i}\right)\ f_c(\mathcal{A}_c^i)\right), \tag{8}$$

where f_c and F_c respectively denote the density function and the cumulative distribution function of π_c^i, and $\mathcal{A}_c^i \overset{d}{=} E\left(\pi_c^i\right) - \frac{\sigma_\theta^2+\sigma_c^2}{\sigma_\theta^2}\left(In^i - \underline{Up_c^i}\right)$ denotes the lowest value of π_c^i allowing the scientist to start the business venture.

The effort exerted depends on the choice of firm or project. The bedrock of the analysis is that the updating process is impaired when σ_c^2 increases: Output becomes less informative about talent. Thus, exerting effort has a less positive impact on the revision of reputation, which has two consequences. First, the incentives to exert effort in order to increase the probability of becoming an entrepreneur are reduced. Second, keeping probabilities constant, the incentives to exert effort in order to increase the expected second-period wage if transition to entrepreneurship is impossible are also reduced. However, probabilities are not held constant across choices. For instance, suppose that $In^i < \underline{Up_c^i}$ so that the status quo would not allow the scientist to start a business venture. Then, keeping effort constant, an increase in σ_c^2 reduces the probability of transition to entrepreneurship, and accordingly raises the probability to remain an employee. Hence, a scientist with an insufficient reputation faces additional incentives to exert effort in order to obtain a better wage in the second period when σ_c^2 increases since the probability of such an outcome rises. This effect goes in the opposite direction to the general decrease in incentives described above. However, since the new technology is sufficiently attractive, i.e., $\delta > \underline{\delta}$, this effect is dominated. Hence, insufficient-reputation scientists exert less effort when σ_c^2 increases. When $In^i \geq \underline{Up_c^i}$, i.e., when the status quo would be favorable to the scientist, raising σ_c^2 increases the probability of transition to entrepreneurship, and accordingly decreases the probability to stay an employee and earn W_c^i. Thus, sufficient-reputation scientists unambiguously exert less effort when σ_c^2 increases. These results are summarized below and formally proved in the Appendix.

Lemma 1 *The equilibrium effort e_c^{i*} is increasing in the level of transparency $\frac{1}{\sigma_c^2}$.*

We can rephrase Lemma 1 in terms of choice of firm or project: The scientist exerts less effort when choosing $\mathcal{O}$ rather than $\mathcal{T}$. A consequence is that the scientist's expected output is lower when opting for $\mathcal{O}$. In turn, the scientist earns a lower wage, which diminishes the financial capital the scientist can contribute to the business venture in the next period, so that more reputation capital is needed (see Proposition 1). This result is formally stated in the next proposition.

Proposition 2 *A scientist needs a lower updated reputation capital in order to start a business venture when opting for $\mathcal{T}$ rather than for $\mathcal{O}$ in the first period: $\underline{Up_{\mathcal{T}}^i} < \underline{Up_{\mathcal{O}}^i}$.*

Separating scientists according to their initial reputation capital facilitates the exposition of their choice of firm or project. To this aim, we use Lemma 2 whose proof is in the Appendix.

Lemma 2 *For a given σ_θ^2, there is a unique scientist $\widehat{i_c}$ characterized by $In^{\widehat{i_c}} = \underline{Up_c^{\widehat{i_c}}}$. Let $\underline{Up_c}$ denote this threshold. Besides,*

(i) $In^i > \underline{Up_c}$ implies that $In^i > \underline{Up_c^i}$, and $In^i < \underline{Up_c}$ implies that $In^i < \underline{Up_c^i}$;

(ii) $\underline{Up_{\mathcal{O}}} > \underline{Up_{\mathcal{T}}}$;

(iii) $In^j > In^i > \underline{Up_c}$ or $In^j < In^i < \underline{Up_c}$ imply that $\left|In^j - \underline{Up_c^j}\right| > \left|In^i - \underline{Up_c^i}\right|$.

Lemma 2 allows us to distinguish between three categories of scientists. Scientists characterized by $In^i < \underline{Up_{\mathcal{T}}}$ will not become entrepreneurs if the status quo in terms of reputation persists. Scientists characterized by $In^i \geq \underline{Up_{\mathcal{O}}}$ will become entrepreneurs if the status quo persists. Finally, scientists characterized by $\underline{Up_{\mathcal{T}}} \leq In^i < \underline{Up_{\mathcal{O}}}$ will become entrepreneurs if the status quo persists when the relevant reputation threshold is $\underline{Up_{\mathcal{T}}}$, but will not if the status quo persists when this threshold is $\underline{Up_{\mathcal{O}}}$. The relevant threshold depends on the choice of firm actually made, or on the anticipated equilibrium choice of project. In the next section, we examine the choice of firm.

4. Choice of Firm

The scientist chooses to work for the firm that maximizes the sum of his first-period utility

$$W_c^i - \psi\left(e^i\right) \tag{9}$$

and his second-period expected utility, given by (7). Since the markets correctly anticipate $e_c^{i^*}$, the second-period expected utility can be rewritten as[12]

$$In^i + \Pr\left(Up^i \geq \underline{Up_c^i}\right) \times \delta. \tag{10}$$

Replacing W_c^i by $In^i + e_c^{i^*}$ in (9) and combining with (10) shows that the scientist prefers $\mathcal{O}$ to $\mathcal{T}$ if

$$\left[\left(e_{\mathcal{O}}^{i*} - \psi\left(e_{\mathcal{O}}^{i*}\right)\right) - \left(e_{\mathcal{T}}^{i*} - \psi\left(e_{\mathcal{T}}^{i*}\right)\right)\right] + \left[\Pr\left(Up^i \geq \underline{Up_{\mathcal{O}}^i}\right) - \Pr\left(Up^i \geq \underline{Up_{\mathcal{T}}^i}\right)\right] \times \delta \geq 0. \tag{11}$$

The first term in square brackets in the LHS of (11) is the difference between the first-period utility when opting for $\mathcal{O}$ and the first-period utility when opting for $\mathcal{T}$. This term is negative since efforts are lower than in the first-best because $k > \underline{k}$ and the deviation is higher when choosing $\mathcal{O}$.

The second term in square brackets in the LHS of (11) is the difference between the probability of starting the business venture when opting for $\mathcal{O}$ and this probability when opting for $\mathcal{T}$. Two effects are at work. First, according to Proposition 2, choosing $\mathcal{O}$ imposes on the aspiring entrepreneur to have

[12] Formally, $E\left[E(\theta^i \mid \pi_c^i, e_c^{i*}, c)\right] = E\left[E(\theta^i \mid \pi_c^i(\theta^i, e_c^{i*}, r_c), e_c^{i*}, c)\right] = E(\theta^i) = In^i$.

a higher updated reputation capital at the beginning of the second period. In that respect, choosing $\mathcal{O}$ decreases the probability to become an entrepreneur. It is a "wealth effect". Second, opting for $\mathcal{O}$ impairs the revision of reputation. This "revision effect" has a positive impact on the probability that the scientist starts a business venture when his initial reputation capital is such that the status quo would allow him to become an entrepreneur. In contrast, this "revision effect" has a negative impact on the probability that the scientist starts a business venture when his initial reputation capital is such that the status quo would not allow him to become an entrepreneur. The next proposition states the relation that exists between initial reputation capital, financial capital, and the choice of firm.

Proposition 3 *Trying to preserve one's reputation capital by working for an $\mathcal{O}$-firm is* not *compatible with accumulating as much financial capital as possible. In contrast, trying to increase one's reputation capital by working for a $\mathcal{T}$-firm is compatible with accumulating as much financial capital as possible.*

The scientist's choice of firm depends on his initial reputation capital. Consider (11). When $In^i < \underline{Up_{\mathcal{T}}}$, opting for $\mathcal{O}$ adversely impacts on the probability to start the business venture: The wealth and revision effects go in the same direction, reducing the second-period expected utility. Since choosing $\mathcal{O}$ also reduces the first-period utility, the scientist's dominant strategy is to opt for $\mathcal{T}$.

When $\underline{Up_{\mathcal{T}}} \leq In^i < \underline{Up_{\mathcal{O}}}$, the probability to become an entrepreneur is greater than $\frac{1}{2}$ if the scientist chooses $\mathcal{T}$ and lower than $\frac{1}{2}$ if the scientist chooses $\mathcal{O}$. Since choosing $\mathcal{O}$ also reduces the first-period utility, the scientist's dominant strategy is again to opt for $\mathcal{T}$.

When $In^i \geq \underline{Up_{\mathcal{O}}}$, the status quo in terms of reputation benefits the scientist and can make the choice of $\mathcal{O}$ attractive. However, if the distance to $\underline{Up_{\mathcal{O}}}$ is low, choosing $\mathcal{O}$ does not overall increase the probability of transition because the wealth effect dominates the revision effect. Thus, the scientist still chooses $\mathcal{T}$. If the distance to $\underline{Up_{\mathcal{O}}}$ is larger, choosing $\mathcal{O}$ overall increases the probability of transition- the revision effect dominates the wealth effect -but fails to compensate the loss in first-period utility. Again, the scientist chooses $\mathcal{T}$. This result holds until In^i reaches $\underline{In}$. If $In^i \geq \underline{In}$, the scientist chooses $\mathcal{O}$, until In^i reaches $\overline{In}$. When $In^i \geq \overline{In}$ choosing $\mathcal{O}$ or $\mathcal{T}$ does not significantly modify the probability to become an entrepreneur which is close to 1. Thus, only the first-period utility matters. Therefore, the scientist chooses $\mathcal{T}$. These results are summarized below and formally proved in the Appendix.

Proposition 4 *For a given σ_θ^2, there exists $\overline{In} > \underline{In} > \underline{Up_{\mathcal{O}}}$ such that scientists characterized by*

(i) $In^i < \underline{In}$ or $In^i \geq \overline{In}$ choose a $\mathcal{T}$-firm;

(ii) $\underline{In} \leq In^i < \overline{In}$ choose an $\mathcal{O}$-firm.

This result stands in contrast to the benchmark case where the choice of firm is irrelevant. It implies that scientists whose initial reputation capital verifies $\underline{In} \leq In^i < \overline{In}$ try to preserve their reputation capital rather than accumulate as much financial capital as possible, whereas those characterized by either $In^i \geq \overline{In}$ or $\underline{Up_{\mathcal{O}}} \leq In^i < \underline{In}$ make the opposite choice. Those characterized by $In^i < \underline{Up_{\mathcal{O}}}$ both try to build a reputation and accumulate as much financial capital as possible. The next section considers a choice of project rather than a choice of firm.

5. Choice of Project

In Section 4, we have shown that scientists willing to start a business venture pay attention to the type of firm they work with during their employment period. In this section, we determine how scientists choose between $\mathcal{T}$- and $\mathcal{O}$-projects.

The differences between the two cases are the following. First, by choosing a firm, scientists commit to a level of transparency. Thus, the wage they receive depends directly on their choice. Such a commitment is impossible when scientists select a project once employed. The wage they receive depends on their anticipated- and not on their actual -choice since the wage is already fixed when the project is chosen.[13] Thus, scientists exclude from the comparison between $\mathcal{T}$- and $\mathcal{O}$-projects any differences in wages. Second, since the project chosen is not observable by the markets, the magnitude of revision is "locked" when scientists decide to deviate or not from equilibrium. Thus, scientists must exert the anticipated effort. Hence, they ignore the first-period cost of effort when making their choice. These

[13] Of course, nobody is fooled at the equilibrium.

two differences imply that scientists only consider the impact of the projects in terms of information released to the markets. Choosing an $\mathcal{O}$-project is an equilibrium for i if and only if

$$\Pr\left(Up^i \geq \underline{Up^i_{\mathcal{O}}}\right) - \Pr\left(Up^i(\mathcal{O},\mathcal{T}) \geq \underline{Up^i_{\mathcal{O}}}\right) \geq 0, \tag{12}$$

where $Up^i(\mathcal{O},\mathcal{T})$ denotes the scientist's updated reputation capital when the scientist chooses $\mathcal{T}$ while markets anticipate $\mathcal{O}$, i.e., when the scientist deviates from equilibrium. Choosing $\mathcal{T}$ is an equilibrium if and only if

$$\Pr\left(Up^i \geq \underline{Up^i_{\mathcal{T}}}\right) - \Pr\left(Up^i(\mathcal{T},\mathcal{O}) \geq \underline{Up^i_{\mathcal{T}}}\right) \geq 0, \tag{13}$$

where $Up^i(\mathcal{T},\mathcal{O})$ denotes the scientist's updated reputation capital when the scientist chooses $\mathcal{O}$ while markets anticipate $\mathcal{T}$.

The scientist's choice of project depends on his initial reputation capital. First, let $In^i < \underline{Up_{\mathcal{T}}}$. Assume that the $\mathcal{T}$-choice is anticipated. Accordingly, (i) substantial weight is placed on the information obtained at the end of the first period to modify priors, and (ii) the scientist is paid $W^i_{\mathcal{T}}$, so that the relevant reputation threshold is $\underline{Up_{\mathcal{T}}}$. Hoping to improve his reputation capital, which is necessary to establish a firm, the scientist gambles, i.e., opts for $\mathcal{O}$. Now, assume that the $\mathcal{O}$-choice is anticipated, the scientist is paid $W^i_{\mathcal{O}}$, so that the relevant threshold is $\underline{Up_{\mathcal{O}}}$. Since $\underline{Up_{\mathcal{O}}} > \underline{Up_{\mathcal{T}}} > In^i$, the scientist gambles to improve his reputation, even though the markets place little weight on the information obtained at the end of the first period to modify priors. Thus, choosing $\mathcal{O}$ is a dominant strategy.

Second, let $\underline{Up_{\mathcal{T}}} \leq In^i \leq \underline{Up_{\mathcal{O}}}$. Assume that the $\mathcal{T}$-choice is anticipated. Playing a safe strategy (i.e., choosing $\mathcal{T}$) makes it more likely that $Up^i \geq \underline{Up_{\mathcal{T}}}$. Assume now that the $\mathcal{O}$-choice is anticipated. Gambling (i.e., choosing $\mathcal{O}$) makes it less likely that $Up^i \leq \underline{Up_{\mathcal{O}}}$. Thus, both equilibria are possible. However, the latter equilibrium is dominated by the former equilibrium since both the first-period utility and the probability to start the business venture are higher when $\mathcal{T}$ is opted for.

Finally, let $In^i > \underline{Up_{\mathcal{O}}}$. Whatever the magnitude of the revision of reputation, it is worth playing a safe strategy for the scientist since it makes it more likely that $Up^i > \underline{Up_{\mathcal{O}}}$. Thus, choosing $\mathcal{T}$ is a dominant strategy. These results are summarized below and formally proved in the Appendix.

Proposition 5 *For a given σ_θ^2, scientists characterized by*

(i) $In^i \leq \underline{Up_{\mathcal{T}}}$ choose an $\mathcal{O}$-project;

(ii) $In^i > \underline{Up_{\mathcal{T}}}$ choose a $\mathcal{T}$-project.

Again, this result stands in contrast to the benchmark case where the choice of project is irrelevant. Based on the above discussion, the next proposition states the relation between reputation capital, financial capital, and the choice of project.

Proposition 6 *Trying to preserve one's reputation capital by working on a $\mathcal{T}$-project is compatible with accumulating as much financial capital as possible. In contrast, trying to increase one's reputation by working on an $\mathcal{O}$-project is* not *compatible with accumulating as much financial capital as possible.*

6. Implications and Discussion

In this section, we present implications of the above results and discuss their relation with existing literature.

6.1. Determinants to the transition

Prediction 1 *After controlling for reputation capital, one should observe that the probability of transition to entrepreneurship increases with the aspiring entrepreneur's personal financial capital.*

This implication, derived from Proposition 1, would not hold in absence of credit rationing. There is ample empirical evidence that credit constraints are an impediment to the transition to entrepreneurship (e.g., Evans and Jovanovic 1989, Evans and Leighton 1989, Quadrini 1999, and Gentry and Hubbard 2004). However, some recent papers (Hurst and Lusardi 2004, and Francis and Demiralp 2006) challenge this view. Several remarks are in order here. First, these papers consider entrepreneurs ranging from the owner of a pizzeria to the founder of Intel. It has been widely documented that the capital required to start most businesses in the United States is relatively low (Meyer 1990, Bhidé 2000, Hurst and Lusardi 2004), with a large fraction of ventures being created with a couple of thousand dollars. For such ventures, credit rationing is less likely to be a barrier to entrepreneurship. In contrast, we focus on businesses that require large investments. Second, in such ventures at least, founders invest their personal wealth, a phenomenon that would not be observed in the absence of credit-rationing. Interestingly, Hurst and Lusardi (2004) obtain the standard positive relation between wealth and the probability of transition to entrepreneurship for professional industries, i.e., one of the cases we consider here.[14] Third, even if one were to acknowledge that credit markets are perfectly efficient in the United States where these two studies were realized, it is unlikely to be the case for most countries around the world, e.g., in Europe. Hurst and Lusardi (2004) and Francis and Demiralp (2006) lessen the role of financial capital on the grounds that factors like ability or alertness that lead people to become entrepreneurs are also factors that lead them to become rich in the first place. We provide a model that accounts for the endogeneity of wealth in a context of credit rationing.

Literature on the relation between reputation capital and the probability to become an entrepreneur is scarce. It is not surprising in the light of the mislead aversion of economists and sociologists, until recently, of viewing scientists, whose reputation is easiest to measure,[15] as pursuing personal motives such as commercializing innovations (Zucker and Darby 1998). Exceptions are Shane and Cable (2002), and Shane and Khurana (2003). Shane and Cable (2002) conclude that reputation helps create a firm. However, their measure of reputation includes the ability to run a firm, and thus differs from the technical ability we focus on. Shane and Khurana (2003) show that a prominent status of the founder (i.e., being a full professor) has a significant positive effect on firm founding in a sample of MIT inventions. Markets for reputation could also be investigated in the professional industries. To draw a parallel, empirical research on the formation of CEOs' and top management's reputation on the labor and financial markets was scarce until recently, but is currently developing (e.g., Chang et al 2007).

In contrast, other determinants to the transition to entrepreneurship have been extensively studied.

[14] Francis and Demiralp (2006) exclude professional industries from their study.
[15] E.g., Zucker et al (1998) estimate scientists' reputation by their volume of scientific publications or citations rates.

Hsu et al (2007) review the literature that examines personal determinants and classify these determinants in four categories: (1) Basic demographic factors such as age, ethnicity and gender; (2) training and experience (e.g., knowledge of the market, exposure to role models or innovations); (3) cognitive factors such as risk tolerance and independence; and (4) financial and opportunity-cost rationales.[16]

Also external factors such as the protection of intellectual property rights, the strategic policy of employers, and labor market conditions have received considerable attention in recent theoretical literature. Of particular interest is the impact of these determinants on the organization of innovation: Is the latter realized internally or externally (e.g., by start-ups or spin-offs)?[17] In the present paper, it is always worth creating a firm for employees endowed with a new idea because they become residual claimants of cash flows.[18] Other research has examined cases where employees would prefer to realize their project internally, but employers refuse (e.g., Cassiman and Ueda 2006, Hellmann 2007). Cassiman and Ueda (2006) consider a firm whose limited capacity for internal ventures makes it balance the returns from an employee innovation against the option value of waiting for better projects, and cannibalization. Hence, firms reject projects that seem to be profitable, but are not in a dynamic perspective. Hellmann (2007) shows how firms managing a portfolio of core and satellite activities affect the generation of new ideas by letting (or not) their employees work on non-assigned creative tasks. His model has the seducing feature that firms can commit ex ante not to realize projects that are profitable ex post in order to avoid expanding in unrelated activities. It justifies policies such as the one followed by Xerox that was largely decried for not capitalizing on innovations (e.g., the mouse), and instead profitably focused on photocopiers, its core business. De Bettignies and Chemla (2007) model the willingness of firms facing competition from outside financiers to attract star employees in order to realize the innovation internally (i.e., through corporate venturing) when potential spillovers affect the value of

[16] Empirical papers include Evans and Jovanovic (1989), Evans and Leighton (1989), Romanelli (1989), Meyer (1990), Gilson (1999), Burt (2000), Dunn and Holtz-Eakin (2000), Shane (2000), Burton et al (2002), Hurst and Lusardi (2004), Dobrev and Barnett (2005), Gompers et al (2005), and Sorensen (2006, 2007).

[17] We refer the reader to the literature surveyed by Hellmann (2007).

[18] Despite this feature, our model is silent about the start-up versus spin-off issue since both types of organizations should provide entrepreneurs with adequate incentives.

the innovation. Finally, Gromb and Scharfstein (2005) examine situations where the market for failed entrepreneurs is thin, the stigma of failure prevails, so that intrapreneurship is particularly valuable.[19]

6.2. Career choices

Literature has identified partnerships as being particularly opaque, especially because they face few regulatory information disclosure requirements. Interestingly, partnerships tend to down-play individual accomplishment. Endlich (1999, p. 21) discusses the case of the Goldman Sachs investment banking partnership, but this characteristic extends to partnerships in the venture capital industry (Gompers and Lerner 2004), as well as the law-firm industry (Gilson and Mnookin 1985, p. 365). Accordingly, partnerships emphasize team work. More generally, private firms are less transparent than public ones. Thus, Proposition 4 implies that:

Prediction 2 *Elite as well as low-reputation aspiring entrepreneurs should choose to work for public firms.*

For a given project, advancing the arrival of news regarding the success of the product by secretly increasing development expenditures rather than basic research activity has been identified as a choice of transparency (see Hirschleifer 1993 for a discussion). When working in teams, secretly avoiding to collaborate with colleagues whose contribution is difficult to evaluate in order not to dilute one's personal performance is also a choice of transparency. Proposition 5 implies that elite aspiring entrepreneurs should make these choices, contrary to low-reputation aspiring entrepreneurs. However, since these choices are not observable, we do not write them as a formal prediction.

Suppose that the aspiring entrepreneur faces a positive liquidity shock (e.g., the anticipation or actual receipt of new government subsidies or new tax exemptions to create a firm) before making decisions. In our framework, it reduces the level of reputation capital required to start the venture. For instance, an aspiring entrepreneur who initially falls between $\underline{Up_{\mathcal{T}}}$ and $\underline{Up_{\mathcal{O}}}$ can end up above $\underline{Up_{\mathcal{O}}}$ after the shock, which affects his selection of firm or project. Thus:

[19] Gromb and Scharfstein (2005) also show that there exists an equilibrium where the external labor market does not penalize failed entrepreneurs, making the internal labor market less attractive.

Prediction 3 *When government policies differ across countries, aspiring entrepreneurs endowed with the same reputation capital can make differing choices in terms of firms to work with depending on the country they wish to incorporate their firm in.*

Comparing Proposition 4 and Proposition 5 shows that employees do not always make the same choices in terms of transparency-opacity when facing a choice of firm and a choice of project. When, for a given reputation capital, the aspiring entrepreneur opts for a $\mathcal{T}$-project instead of an $\mathcal{O}$-firm, he allows the markets to learn more information regarding his talent. Thus, he places his reputation at higher risk, which makes him less likely to become an entrepreneur. When, for a given reputation capital, the aspiring entrepreneur opts for an $\mathcal{O}$-project instead of a $\mathcal{T}$-firm, he forgoes some financial capital, which again makes him less likely to become an entrepreneur. At a practical level, it implies that employees can maximize their chances to become entrepreneurs by quitting their current employer rather than by selecting a particular type of project. Thus, our model provides a new rationale for the turnover of employees (for other reasons, see for instance Burdett 1978, Jovanovic 1979, and Lazear 2004):

Prediction 4 *Employee turnover can be driven by a desire to optimize their reputation and financial capital.*

It is well documented that job mobility is high in labor markets around technology-based clusters, this feature being exacerbated in Silicon Valley and West Coast (Roberts 1991, Fallick et al 2006). Furthermore, the combination of Proposition 4 and Proposition 5 implies that:

Prediction 5 *Among employees quitting their firm, those with the best reputation and those with the lowest reputation should quit for public firms.*

However, frictions prevent optimal and instantaneous matching between employees and firms, thus reducing job mobility (see job search theory that started with Stigler 1962 and Burdett 1978, and empirical estimations by Ridder and Van den Berg 2003). So far, frictions on the labor market at the individual level have been shown to be correlated with a higher transition rate from employee activity to entrepreneurship, e.g., facing an unemployment spell is shown to be correlated with a higher transition rate (e.g., Evans and Leighton 1989). This result could well not hold at the macro level, i.e., if one considers unemployment in general. Indeed, because of frictions, it occurs that employees have to choose projects rather than firms, which creates an inefficiency. Thus our model suggests that:

Prediction 6 *The more prevalent the frictions on the labor market (e.g., unemployment), the lower the probability of transition to entrepreneurship.*

Ridder and Van den Berg (2003) estimate a friction index defined as the inverse of the number of job offers that a worker receives during a spell of employment. Such a measure would perfectly fit to test our prediction.

A decline in the time lag from graduation to first firm founding is documented (Hsu et al, 2007). This evidence suggests that entrepreneurship may have become a motive that leads students to carefully select their first employer. Thus, we can rephrase the implication derived from Proposition 4 as:

Prediction 7 *Elite as well as low-reputation students who have just graduated and contemplate becoming entrepreneurs on the long run should choose to work for public firms.*[20]

It provides the empirical literature on the employment choices of students (e.g., Stolle 1978) with an original hypothesis to be tested. Research on career choices of law- and medical-schools students is burgeoning (Sauer 1998, Neumayer 2002, Haas 2006). To the best of our knowledge, these papers do not examine the reputation issue. An exception is Turban and Cable (2003) but they consider firm reputation along dimensions that differ from the one studied here, i.e., transparency.

Finally, we have a threefold contribution to the theoretical career concerns literature (e.g., Holmström 1999, Narayanan 1985a,b, Holmström and Ricart I Costa 1986, Scharfstein and Stein 1990, Hermalin 1993, and DeMarzo and Duffie 1995). First, transition to entrepreneurship is different from the wage variations usually studied in that an additional unit of wage can make it possible to create a

[20] The implication derived from Proposition 5 cannot be reinterpreted along these lines since it is unlikely that newly hired students can make decisions within the first firm they work with.

firm, which implies a gap in terms of revenues for the employee. This discontinuity creates scope for differing behaviors. In terms of our model, (11) shows that absent δ, all scientists would opt for the $\mathcal{T}$-firm. Second, we relate labor market issues to credit market issues. Third, we model the interaction between choices of effort and choices of firms or projects. To the best of our knowledge, these choices have been so far treated separately (e.g., Holmström 1999).

In the next section, we discuss robustness issues.

7. Robustness

In this section we examine the robustness of our results with respect to alternative assumptions.

Pay-off from entrepreneurship. Recent papers suggest that entrepreneurship may not "pay" financially, and that non-pecuniary reasons could explain the desire to become an entrepreneur (Blanchflower and Oswald 1990, Hamilton 2000, Moskowitz and Vissing-Jorgensen 2002). For instance, being their own boss was the main reason for starting a firm stated by over 21% of survey respondents in the 1992 Economic Census Characteristics of Business Owners. Other non-pecuniary arguments are the ability to control the work schedule, and an enhanced social status. Two remarks are in order here. First, the above studies include firms spanning from beauty shops to manufacturing and retail (Moskowitz and Vissing-Jorgensen 2002), sometimes even excluding professionals (Hamilton 2000), whereas we focus on industries where the financial profits of being one's boss are potentially larger. Second, our results hold provided that transition to entrepreneurship creates a discontinuity in the employee's revenue function, irrespective of the reasons that motivate transition to entrepreneurship. Hence Δ can represent the monetary equivalent to the pleasure to run a firm.

Optimism. Recent literature on entrepreneurship (e.g., Landier and Thesmar 2007) considers that entrepreneurs are optimistic, i.e., they overestimate the probability of success of their project or their talent. Assuming that entrepreneurs are optimistic would not modify the conclusion that, when choosing between two alternatives of varying transparency, scientists take into account the impact of their choice on their reputation and financial capital.

Intellectual property rights or opportunity to exploit innovation as an employee. So far, we have not considered the case where the scientist started the business venture as an entrepreneur by stealing existing technology. If so, the scientist would exert the first-best effort in the second period since he would be residual claimant of the cash-flows. However, he would prefer starting the venture based on more profitable new technology when $\delta > e^{FB} - \psi(e^{FB})$. Besides, note that commercializing new technology as an employee makes the scientist worse off than starting the business venture as an entrepreneur since incentives to maximize profits are absent in the former case and (3) holds.

Observability of the project choice. Contrary to the assumption made in Section 5, consider that the labor and credit markets observe the scientists' choice of project. Projects whose outcomes are resolved soon rather than in the distant future are transparent because they are informative about talent. In contrast, transversal projects are opaque since success depends on the team's capabilities rather than on an individual's sole talent. So are projects whose outcome is outside the managers' control such as foreign investments subject to political risk. If they observe the choice of project, the markets adapt the updating process to this choice. It implies that when deciding whether to deviate or not from equilibrium, scientists consider the impact of the projects in terms of information released to the markets *and* cost of effort to be exerted. Scientists characterized by $In^i \geq \underline{Up_{\mathcal{O}}}$ unambiguously choose $\mathcal{O}$. Consider scientists characterized by $\underline{Up_{\mathcal{T}}} \leq In^i < \underline{Up_{\mathcal{O}}}$. Choosing $\mathcal{T}$ is no longer an equilibrium. Indeed, suppose that firms anticipate the choice of $\mathcal{T}$, and pay scientists $W^i_{\mathcal{T}}$ so that the relevant threshold is $\underline{Up_{\mathcal{T}}}$. Opting for $\mathcal{O}$ reduces the revision of reputation and the cost of effort to be exerted. Choosing $\mathcal{O}$ is the equilibrium. Finally, choosing $\mathcal{T}$ is an equilibrium for scientists characterized by $In^i < \underline{Up_{\mathcal{T}}}$ if In^i is not far from $\underline{Up^i_{\mathcal{T}}}$ since the benefits from facilitating the revision of reputation more than offset the costs of exerting more effort. If otherwise, scientists prefer $\mathcal{O}$. Overall, the same messages remain. Optimizing one's reputation capital is not always compatible with accumulating as much financial capital as possible. Moreover, scientists who choose projects to work on instead of firms to work with are less likely to become entrepreneurs.

8. Concluding Remarks

In this paper, we show that aspiring entrepreneurs need a sufficient mix of reputation and financial capital when credit is rationed. Thus, they must carefully select the firm they work for or the project they work on before starting their own venture. We show that trying to optimize one's reputation capital can conflict with optimizing one's financial capital. We then derive implications from our results.

Appendix

Proof of Lemma 1. First, we determine the scientist's objective function. Note that given (i) $In^i \overset{d}{=} E(\theta^i)$, (ii) $Up^i \overset{d}{=} E(\theta^i \mid \pi_c^i, e_c^{i^*}, c) = In^i + \frac{\sigma_\theta^2}{\sigma_\theta^2+\sigma_c^2}\left(\pi_c^i - E(\pi_c^i)\right)$, (iii) $\pi_c^i \backsim N\left(In^i + e^i; \sigma_\theta^2 + \sigma_c^2\right)$, (iv) $\underline{Up_c^i} = \frac{B}{1-q} - \delta - W_c^i$, and (v) $W_c^i = e_c^{i^*} + In^i$ since the labor market is competitive, we have $Up^i \geq \underline{Up_c^i} \Leftrightarrow \pi_c^i \geq \mathcal{A}_c^i \overset{d}{=} E(\pi_c^i) - \frac{\sigma_\theta^2+\sigma_c^2}{\sigma_\theta^2}\left(In^i - \underline{Up_c^i}\right)$. $\mathcal{A}_c^i$ is thus a function of $e_c^{i^*}$, σ_θ^2, σ_c^2, In^i, δ, and $\frac{B}{1-q}$. Substituting $\mathcal{A}_c^i$ in Eq. (7), we obtain that the scientist exerts an effort $e_c^{i^*}$ that maximizes

$$\left(1 - \Pr\left(\pi_c^i \leq \mathcal{A}_c^i\right)\right) \times E_{\pi_c^i}\left[Up^i + \delta \mid \pi_c^i \geq \mathcal{A}_c^i\right] + \Pr\left(\pi_c^i < \mathcal{A}_c^i\right) \times E_{\pi_c^i}\left[Up^i \mid \pi_c^i < \mathcal{A}_c^i\right] - \frac{k}{2}\left(e^i\right)^2. \quad (14)$$

Next, we determine $e_c^{i^*}$. Assuming an interior solution, the first-order condition is[21]

$$ke_c^{i*} = f_c\left(\mathcal{A}_c^i\right)\left(\delta + \sigma_\theta^2 \frac{f_c\left(\mathcal{A}_c^i\right)}{1 - F_c\left(\mathcal{A}_c^i\right)}\right) + \left(\frac{\sigma_\theta^2}{\sigma_\theta^2 + \sigma_c^2} F_c\left(\mathcal{A}_c^i\right) + \left(In^i - \underline{Up_c^i}\right) f_c\left(\mathcal{A}_c^i\right)\right). \quad (15)$$

For any finite value of δ the RHS of (15) takes finite values, implying that there exists k_1 such that $e_c^{i*} < 1$ when $k \geq k_1$.

[21] The computations of the first-order condition are available in the on-line supplement.

Finally, we show that e_c^{i*} decreases in σ_c^2. Differentiating (15) in $e_c^{i^*}$ and σ_c^2 gives

$$\frac{de_c^{i*}}{d\sigma_c^2}=\frac{-\left(\begin{array}{c}\frac{\sigma_\theta^2}{\left(\sigma_\theta^2+\sigma_c^2\right)^2}f_c\left(\mathcal{A}_c^i\right)+f_c\left(\mathcal{A}_c^i\right)\left(In^i-\underline{Up_c^i}\right)\left[\frac{1}{\sigma_\theta^2+\sigma_c^2}+\frac{\left(In^i-\underline{Up_c^i}\right)^2}{\sigma_\theta^4}+\frac{1}{2}\left(\frac{f_c\left(\mathcal{A}_c^i\right)}{1-F_c\left(\mathcal{A}_c^i\right)}\right)^2\right]\\+\frac{1}{2}f_c\left(\mathcal{A}_c^i\right)\left(\frac{1}{\sigma_\theta^2+\sigma_c^2}+\frac{\left(In^i-\underline{Up_c^i}\right)^2}{\sigma_\theta^4}\right)\left(\delta+2\sigma_\theta^2\frac{f_c\left(\mathcal{A}_c^i\right)}{1-F_c\left(\mathcal{A}_c^i\right)}\right)\end{array}\right)}{k+f_c\left(\mathcal{A}_c^i\right)\left[\frac{\sigma_\theta^2+\sigma_c^2}{\sigma_\theta^4}\left(\left(In^i-\underline{Up_c^i}\right)^2+\left(In^i-\underline{Up_c^i}\right)\left(\delta+2\sigma_\theta^2\frac{f_c\left(\mathcal{A}_c^i\right)}{1-F_c\left(\mathcal{A}_c^i\right)}\right)\right)+\left(\sigma_\theta^2+\sigma_c^2\right)\frac{f_c\left(\mathcal{A}_c^i\right)^2}{\left(1-F_c\left(\mathcal{A}_c^i\right)\right)^2}\right]}. \tag{16}$$

For any finite value of δ, the second term of the denominator in (16) is finite. Thus, there exists k_2 such that if $k \geq k_2$, the denominator in (16) is positive. When $In^i \geq \underline{Up_c^i}$, the numerator in (16) is negative, so that $\frac{de_c^*}{d\sigma_c^2} \leq 0$. When $In^i < \underline{Up_c^i}$, the numerator in (16) is negative if $\delta \geq \underline{\delta}$, where $\underline{\delta}$ is a finite number (see the on-line supplement). Thus, $\frac{de_c^*}{d\sigma_c^2} \leq 0$ if $\delta \geq \underline{\delta}$ and $k \geq k_2$. We restrict our attention to the case where $\delta > \underline{\delta}$ and $k > \widetilde{k} = max\left\{k_1, k_2\right\}$.

It establishes Lemma 1.

Note that there exists $\underline{\sigma_{\mathcal{T}}^2}$ such that $e_{\mathcal{T}}^* < e^{FB}$ if $\sigma_{\mathcal{T}}^2 > \underline{\sigma_{\mathcal{T}}^2}$.

Proof of Lemma 2. First note that combining (6) and $W_c^i = In^i + e_c^{i*}$ leads to

$$In^i = \underline{Up_c^i} \Leftrightarrow K_c(In^i) \stackrel{d}{=} 2In^i + e_c^{i*} = \frac{B}{1-q} - \delta. \tag{17}$$

Second, note that $\frac{dK_c(In^i)}{dIn^i} > 0$ if $k > \widetilde{k}$. Indeed, (17) implies that $\frac{dK_c(In^i)}{dIn^i} = 2 + \frac{de_c^{i*}}{dIn^i}$. Using (15) we obtain

$$\frac{de_c^{i*}}{dIn^i}=-\frac{2f_c\left(\mathcal{A}_c^i\right)\left[\frac{\sigma_\theta^2+\sigma_c^2}{\sigma_\theta^4}\left(\left(In^i-\underline{Up_c^i}\right)^2+\left(In^i-\underline{Up_c^i}\right)\left(\delta+2\sigma_\theta^2\frac{f_c\left(\mathcal{A}_c^i\right)}{1-F_c\left(\mathcal{A}_c^i\right)}\right)\right)+\left(\sigma_\theta^2+\sigma_c^2\right)\left(\frac{f_c\left(\mathcal{A}_c^i\right)}{1-F_c\left(\mathcal{A}_c^i\right)}\right)^2\right]}{k+f_c\left(\mathcal{A}_c^i\right)\left[\frac{\sigma_\theta^2+\sigma_c^2}{\sigma_\theta^4}\left(\left(In^i-\underline{Up_c^i}\right)^2+\left(In^i-\underline{Up_c^i}\right)\left(\delta+2\sigma_\theta^2\frac{f_c\left(\mathcal{A}_c^i\right)}{1-F_c\left(\mathcal{A}_c^i\right)}\right)\right)+\left(\sigma_\theta^2+\sigma_c^2\right)\left(\frac{f_c\left(\mathcal{A}_c^i\right)}{1-F_c\left(\mathcal{A}_c^i\right)}\right)^2\right]},$$

and thus,

$$\frac{dK_c(In^i)}{dIn^i} = \frac{2k}{k + f_c\left(\mathcal{A}_c^i\right)\left[\frac{\sigma_\theta^2+\sigma_c^2}{\sigma_\theta^4}\left(\left(In^i - \underline{Up_c^i}\right)^2 + \left(In^i - \underline{Up_c^i}\right)\left(\delta + 2\sigma_\theta^2 \frac{f_c(\mathcal{A}_c^i)}{1-F_c(\mathcal{A}_c^i)}\right)\right) + \left(\sigma_\theta^2 + \sigma_c^2\right)\frac{f_c(\mathcal{A}_c^i)^2}{(1-F_c(\mathcal{A}_c^i))^2}\right]}. \tag{18}$$

Since, the denominator in (18) corresponds to the denominator in (16), it is strictly positive for $k > \widetilde{k}$.

Third, use (15), compute e_c^{i*} for $In^i = 0$, and note that there always exists B such that

$$K_c(0) < \frac{1}{\sqrt{\sigma_\theta^2 + \sigma_c^2}\sqrt{2\pi}}\left(\delta + \sigma_\theta^2\right) + \frac{\sigma_\theta^2}{\sigma_\theta^2 + \sigma_c^2} < \frac{B}{1-q} - \delta. \tag{19}$$

Define $\underline{B}$ as the value of B that equalizes the second and third terms in (19). For $B > \underline{B}$, $K_c(0) < \frac{B}{1-q} - \delta$.

Fourthn since (i) $K_c(0) < \frac{B}{1-q} - \delta$, (ii) K_c strictly increases in In^i, and (iv), $\lim_{In^i \to +\infty} K_c(In^i) \to +\infty$, there exists a unique scientist $\widehat{i_c}$ characterized by $K_c\left(In^{\widehat{i_c}}\right) = \frac{B}{1-q} - \delta$, or $In^{\widehat{i_c}} = \underline{Up_c^i} \overset{d}{=} \underline{Up_c}$. Besides, $In^j > \underline{Up_c^j}$ if $In^j > In^{\widehat{i_c}}$ and $In^j < \underline{Up_c^j}$ if $In^j < In^{\widehat{i_c}}$.

Fifth, Proposition 1 implies that $K_{\mathcal{T}}(In^i) > K_{\mathcal{O}}(In^i)$ and thus $\underline{Up_{\mathcal{T}}} < \underline{Up_{\mathcal{O}}}$.

Finally, $In^i - \underline{Up_c^i} = 2In^i + e_c^{i*} + \delta - \frac{B}{1-q}$ implies that $\frac{d\left(In^i - \underline{Up_c^i}\right)}{dIn^i} = 2 + \frac{de_c^{i*}}{dIn^i} > 0$ for $k > \widetilde{k}$. Thus, $\left|In^j - \underline{Up_c^j}\right| > \left|In^i - \underline{Up_c^i}\right|$ if $In^j > In^i > \underline{Up_c}$, or if $In^j < In^i < \underline{Up_c}$, $\forall i, j$.

It establishes Lemma 2.

Proof of Proposition 4. First consider the case where $In^i < \underline{Up_{\mathcal{O}}^i}$. Choosing a $\mathcal{T}$-firm maximizes the probability of starting the business venture since

$$\Pr\left(Up^i \geq \underline{Up_{\mathcal{T}}^i}\right) \geq \frac{1}{2} > \Pr\left(Up^i \geq \underline{Up_{\mathcal{O}}^i}\right) \text{ when } \underline{Up_{\mathcal{T}}^i} \leq In^i < \underline{Up_{\mathcal{O}}^i} \tag{20}$$

$$\text{and } \frac{1}{2} > \Pr\left(Up^i \geq \underline{Up_{\mathcal{T}}^i}\right) > \Pr\left(Up^i \geq \underline{Up_{\mathcal{O}}^i}\right) \text{ when } In^i < \underline{Up_{\mathcal{T}}^i}. \tag{21}$$

It also minimizes the inefficiency in terms of effort. Thus, the scientist opts for $\mathcal{T}$.

Next, consider the case where $In^i \geq \underline{Up^i_{\mathcal{O}}}$. Differentiate the scientist's expected utility with respect to σ_c^2. Using that $\Pr\left(Up^i \geq \underline{Up^i_c}\right) = 1 - \phi\left(-\frac{\sqrt{\sigma_\theta^2+\sigma_c^2}}{\sigma_\theta^2}\left(In^i - \underline{Up^i_c}\right)\right)$, we obtain

$$\frac{d}{d\sigma_c^2}\left[\left[In^i + \left(e_c^{i*} - \psi\left(e_c^{i*}\right)\right)\right] + \left[In^i + \Pr\left(Up^i \geq \underline{Up^i_c}\right) \times \delta\right]\right]\Big|_{\sigma_c^2=\sigma_{\mathcal{O}}^2} = \tag{22}$$
$$\frac{1}{2}\frac{In^i - \underline{Up^i_{\mathcal{O}}}}{\sigma_\theta^2\sqrt{\sigma_\theta^2+\sigma_{\mathcal{O}}^2}}\varphi\left(-\frac{\sqrt{\sigma_\theta^2+\sigma_{\mathcal{O}}^2}}{\sigma_\theta^2}\left(In^i - \underline{Up^i_{\mathcal{O}}}\right)\right)\delta + \frac{de^{i*}_{\mathcal{O}}}{d\sigma^2_{\mathcal{O}}}\left[\frac{\sqrt{\sigma_\theta^2+\sigma_{\mathcal{O}}^2}}{\sigma_\theta^2}\varphi\left(-\frac{\sqrt{\sigma_\theta^2+\sigma_c^2}}{\sigma_\theta^2}\left(In^i - \underline{Up^i_{\mathcal{O}}}\right)\right)\delta + \left(1 - \frac{k}{2}e^{i*}_{\mathcal{O}}\right)\right].$$

When the sign of the derivative in (22) is negative (respectively positive), the scientist chooses $\mathcal{T}$ (respectively $\mathcal{O}$). According to (16), this sign is negative if

$$\frac{1}{2}\frac{k}{\sigma_\theta^2\sqrt{\sigma_\theta^2+\sigma_{\mathcal{O}}^2}} \leq H\left(In^i - \underline{Up^i_{\mathcal{O}}}\right). \tag{23}$$

$H\left(In^i - \underline{Up^i_{\mathcal{O}}}\right)$ is precisely defined in the on-line supplement where we also show that for $k \geq k_3$, (23) is verified if $\left|In^i - \underline{Up^i_{\mathcal{O}}}\right|$ is high, but not if $\left(In^i - \underline{Up^i_{\mathcal{O}}}\right)$ takes intermediate values.

Define $\underline{k}$ as $k = max\left(\widetilde{k}, k_3\right)$. When $k \geq \underline{k}$, there exists $\underline{In} > \underline{Up^i_{\mathcal{O}}}$ and $\overline{In} > \underline{In}$ such that the scientist opts for a $\mathcal{T}$-firm when either $\underline{Up^i_{\mathcal{O}}} < In^i < \underline{In}$ or $In^i > \overline{In}$. Conversely, the scientist opts for an $\mathcal{O}$-firm when $\underline{In} < In^i < \overline{In}$.

It establishes Proposition 4.

Proof of Proposition 5. Observe that

$$\Pr\left(Up^i(c,\mathcal{O}) \geq \underline{Up^i_c}\right) = 1 - \phi\left(-\frac{1}{\sqrt{\sigma_\theta^2+\sigma_c^2}}\frac{\sigma_\theta^2+\sigma_{\mathcal{O}}^2}{\sigma_\theta^2}\left(In^i - \underline{Up^i_c}\right)\right) \tag{24}$$

$$\text{and } \Pr\left(Up^i(c,\mathcal{T}) \geq \underline{Up^i_c}\right) = 1 - \phi\left(-\frac{1}{\sqrt{\sigma_\theta^2+\sigma_c^2}}\frac{\sigma_\theta^2+\sigma_{\mathcal{T}}^2}{\sigma_\theta^2}\left(In^i - \underline{Up^i_c}\right)\right). \tag{25}$$

When $In^i > \underline{Up^i_{\mathcal{O}}}$, $\Pr\left(Up^i(c,\mathcal{T}) \geq \underline{Up^i_c}\right) > \Pr\left(Up^i(c,\mathcal{O}) \geq \underline{Up^i_c}\right)$, so that choosing the $\mathcal{T}$-project is a dominant strategy. When $In^i < \underline{Up^i_{\mathcal{T}}}$, $\Pr\left(Up^i(c,\mathcal{O}) \geq \underline{Up^i_c}\right) > \Pr\left(Up^i(c,\mathcal{T}) \geq \underline{Up^i_c}\right)$ so that choosing the $\mathcal{O}$-project is a dominant strategy. When $\underline{Up^i_{\mathcal{T}}} \leq In^i \leq \underline{Up^i_{\mathcal{O}}}$, being paid $W^i_{\mathcal{O}}$ and choosing an $\mathcal{O}$-project or being paid $W_{\mathcal{T}}^{i}$ and choosing an $\mathcal{T}$-project are possible equilibria. However, since

$$E_{\pi_{\mathcal{T}}^{i}}\left[\Pr\left(Up^{i}(c,\mathcal{T})\geq\underline{Up_{\mathcal{T}}^{i}}\right)\right]=\Pr\left(In^{i}\geq\underline{Up_{\mathcal{T}}^{i}}\right)\geq\frac{1}{2}\geq\Pr\left(In^{i}\geq\underline{Up_{\mathcal{O}}^{i}}\right)=E_{\pi_{\mathcal{O}}^{i}}\left[\Pr\left(Up^{i}(c,\mathcal{O})\geq\underline{Up_{\mathcal{O}}^{i}}\right)\right],$$

the $\left(W_{\mathcal{T}}^{i};\mathcal{T}\text{-project}\right)$ equilibrium is more efficient than the $\left(W_{\mathcal{O}}^{i};\mathcal{O}\text{-project}\right)$ equilibrium.

Lemma 2 implies that scientists characterized by $In^{i}\leq\underline{Up_{\mathcal{T}}}$ realize an $\mathcal{O}$-project, whereas those characterized by $In^{i}>\underline{Up_{\mathcal{T}}}$ realize a $\mathcal{T}$-project.

It establishes Proposition 5.

References

de Bettignies, J. E., G. Chemla. 2007. Corporate venturing, allocation of talent, and competition for talent. *Management Sci.*, in press.

Blanchflower, D., G., A. J. Oswald, A. Stutzer. 2001. Latent entrepreneurship across nations. *Europ. Econ. Rev.* **45** 680-691.

Bhidé, A. 2000. *The origin and evolution of new businesses.* New York: Oxford University Press.

Burdett, K. 1978. A theory of employee job search and quit rates, *Amer. Econom. Rev.* **68** 212-20.

Burt, R. S. 2000. Creating careers: Women's path through entrepreneurship. Working paper University of Chicago.

Burton, M. D., J. B. Sorensen, C. Beckman. 2002. Coming from good stock: Career histories and new venture formation. *Research in the Sociology of Organizations* **19** 229-262.

Cassiman, B., M. Ueda. 2006. Optimal project rejection and new firm start-ups. *Management Sci.* **52** 262-275.

Castilla, E., H. Hwang, E. Granovetter, M. Granovetter. 2000. Social networks in Silicon Valley. Hanck, M., C. Lee, W. Miller, and H. Rowen eds. *The Silicon Valley Edge.* Stanford University Press.

Chang, Y. Y., S. Dasgupta, G. Hilary. 2007. Managerial reputation in financial and labor markets. Mimeo Honk Hong University of Science and Technology.

DeMarzo, P., D. Duffie. 1995. Corporate incentives for hedging and hedge Accounting. *Rev. Financial Stud.* **8** 743-71.

Dewatripont, M., I. Jewitt, J. Tirole. 1999. The economics of career concerns, Part I: Comparing information structures. *Rev. Econ. Stud.* **66** 183-98.

Dobrev, S. D., W. P. Barnett. 2005. Organizational roles and the transition to entrepreneurship. *Acad. Management J.* **48** 443-449.

Dunn, T., D. Holtz-Eakin. 2000. Financial capital, human capital, and the transition to self-employment: Evidence from intergenerational links. *J. Labor Econom.* **18** 282-305.

Endlich, L. J. 1999. *Goldman Sachs: the culture of success.* A. A. Knopf. New York, N.Y.

Evans, D. S., B. Jovanovic. 1989. An estimated model of entrepreneurial choice under liquidity constraint. *J. Political Econom.* **97** 808-27.

Evans, D. S., L. S. Leighton. 1989. Some empirical aspects of entrepreneurship. *Amer. Econom. Rev.* **79** 519-535.

Fallick, B., C. Fleischman, J. Rebitzes. 2006. Job hopping in the Silicon Valley: some evidence concerning the micro-foundations of a high technology cluster. *Rev. Econom. Statist.* **88** 472-481.

Francis, J. L., B. Demiralp. 2006. Wealth, entrepreneurship and occupational experience. Mimeo, John Hopkins University.

Gentry, W. M., R. G. Hubbard. 2004. Entrepreneurship and household saving. Advances in Economic Analysis & Policy, Berkeley Electronic Press **4** paper 8.

Gilson, R. 1999. The legal infrastructure of high technology industry districts: Silicon Valley, Route 128, and covenants not to compete, *New York University Law Review* **74** 575-629.

Gilson, R. J., R. H. Mnookin. 1985. Sharing among the human capitalists: an economic inquiry into the corporate law firm and how partners split profits. *Stanford Law Review* **37** 313-392.

Gompers, P., J. Lerner. 2004. *The venture capital cycle.* The MIT Press, Cambridge, Massachusetts.

Gompers, P., J. Lerner, D. S. Scharfstein. 2005. Entrepreneurial spawning: Public corporations and the genesis of new ventures, 1986 to 1999. *J. Finance* **60** 577-614.

Granovetter, M. 1973. The strength of weak ties. *Amer. J. Sociol.* **70** 1360-1380.

Gromb, D., D. S. Scharfstein. 2005. Entrepreneurship in equilibrium. Mimeo LBS.

Hamilton, B. H. 2000. Does entrepreneurship pay? An empirical analysis of the returns to self-employment. *J. Political Econom.* **108** 603-631.

Haas, A. S. 2006. The rationality of law students' career choices. Harvard Law School Student Scholarship Series, paper 8, Berkeley Electronic Press.

Hellmann, T. 2007. When do employees become entrepreneurs? *Management Sci.* **53** 919-933.

Hermalin, B. E. 1993. Managerial preferences concerning risky projects. *J. Law, Econom. Organ.* **9** 127-135.

Hirshleifer, D. 1993. Managerial reputation and corporate investment decisions. *Finan. Manage.* **22** 145-160.

Holmström, B. 1999. Managerial incentive problem: A dynamic perspective. *Rev. Econ. Stud.* **66** 169-182.

Holmström, B., J. Ricart I Costa. 1986. Managerial incentives and capital management. *Quart. J. Econ.* **101**. 835-860.

Holmström, B., P. Milgrom. 1991. Multitask principal-agent analyses: Incentive contracts, asset ownership, and job design. *J. Law, Econom. Organ.* **7,** Special Issue, 24-52.

Holmström, B., J. Tirole. 1997. Financial intermediation, loanable funds, and the real sector. *Quart. J. Econ.* **112** 663-691.

Hsu, D. H., E. B. Roberts, C. E. Eesley. 2007. Entrepreneurs from technology-based universities: Evidence from MIT. *Research Policy.*

Hurst, E., A. Lusardi. 2004. Liquidity constraints, household wealth, and entrepreneurship. *J. Political Econom.* **112** 319-347.

Hyde, A. 1998. Silicon Valley's high-velocity labor market. *Journal of Applied Corporate Finance*

11 23-37.

Jensen, M. C., K. J. Murphy. 1990. Performance pay and top-management incentives. *J. Political Econom.* **98**. 225-64.

Jovanovic, B. 1979. Job matching and the theory of turnover. *J. Political Econom.* **87** 972-990.

Landier, A., D. Thesmar. 2007. Financial contracting with optimistic entrepreneurs/ Theory and evidence. *Rev. Financial Stud.,* in press.

Lazear, E. P. 2004. Balanced skills and entrepreneurship. *Amer. Econom. Rev* **94** 208-211.

Meyer, B. D. 1990. Why are there so few black entrepreneurs. Working paper NBER 3537.

Morrison, A. D., W. J. Wilhelm. 2007. The demise of investment-banking partnerships: Theory and evidence. *J. Finance*, in press.

Moskowitz, T. J., A. Vissing-Jorgensen 2002. The returns to entrepreneurial investments: A private equity premium puzzle. *Amer. Econom. Rev.* **92** 745-778.

Narayanan, M. P. 1985. Observability and the pay back criterion. *J. Bus.* **58** 309-323.

Narayanan, M. P. 1985. Managerial incentives for short-term results. *J. Finance* **40** 1469-1484.

Neumayer L., S. Kaiser, K. Anderson , L. Barney, Curet M., D. Jacobs, T. Lynch, C. Gazak 2002. Perceptions of women medical students and their influence on career choice. *Am J. Surg.* **183** 146-50.

Quadrini, V. 1999. The importance of entrepreneurship for wealth concentration and mobility. *Rev. Income Wealth* **45** 1-19.

Ridder, G. G. J. van den Berg. 2003. Measuring labor market frictions. *Journal of the European Economic Association* **1** 224–244.

Roberts, E. B. 1991. *Entrepreneurs in high technology: lessons from MIT and beyond.* Oxford University Press, New York.

Romanelli, E. 1989. Organization birth and population variety: A community perspective on origins. *Research on Organizational Behavior* **11** 211-246.

Sauer, R. M. 1998. Job mobility and the market for lawyers. *J. Political Econom.* **106** 147–171.

Scharfstein, D., J. Stein. 1990. Herd behavior and investment. *Amer. Econom. Rev.* **80** 465-479.

Shane, S. 2000. Prior knowledge and the discovery of entrepreneurial opportunities. *Organ. Sci.* **11** 448-4689.

Shane, S., D. Cable. 2002. Network ties, reputation, and the financing of new ventures. *Management Sci.* **48** 154-171.

Shane, S., R. Khurana. 2003. Bringing individuals back in: the effects of career experience on new firm founding. *Industrial and Corporate Change* **12** 519-543.

Sorensen, J. B. 2006. Bureaucracy and entrepreneurship. Working Paper, Sloan School of Management, MIT.

Sorensen, J. B. 2007. Closure and exposure: Mechanisms in the intergenerational transmission of self-employment. *Research in the Sociology of Organizations* **25** 83-124.

Stigler, G. 1962. Information in the labor market. *J. Political Econom.* **70** 94–105.

Stole, C. D. 1978. Perceived differences among public accounting firms which affect job choices. *Acc. Rev.* **52** 474-488.

Tirole, J. 2005. *The theory of corporate finance.* Princeton University Press: New Jersey.

Turban, D. B, D. M. Cable. 2003. Firm reputation and applicant pool characteristics. *Journal of Organizational Behavior* **24** 733-751.

Zucker, L. G., M. R. Darby. 1998. NBER Reporter 7-11.

Zucker, L. G., M. R. Darby, M. B. Brewer. 1998. Intellectual human capital and the birth of U.S. biotechnology enterprises. *Amer. Econom. Rev.* **88** 290-306.

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