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ABSTRACT

We develop a model of a firm whose production process requires it to start and nurture a relationship with its stakeholders. Because there are spillover benefits associated with being associated with a "winner," the perceptions of stakeholders and potential stakeholders can affect firm value. Our analysis indicates that while transparency (i.e., generating information about a firm's quality) may improve the allocation of resources, a firm may have a higher ex ante value if information about its quality is not prematurely generated. The costs associated with transparency arise because of asymmetric information regarding the extent to which stakeholders benefit from having a relationship with a high quality firm. These costs are higher when firms can initiate non-contractible innovative investments that enhance the value of their stakeholder relationships. Stakeholder effects of transparency are especially important for younger firms with less established track records (e.g., start-ups).

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1 Introduction

The entrepreneurship literature recognizes that a prior relationship with a leading firm provides individuals with valuable entrepreneurial opportunities. For example, the papers reviewed in Audia and Rider (2005) provide evidence that is consistent with the idea that firms operating at the technological frontier are more likely to provide their employees with greater access to valuable entrepreneurial opportunities. In particular, proxies for the technological success of firms, such as early entry in a new market (Brittain and Freeman 1986), superior technology (Franco and Filson 2000) or highly-cited patents (Gompers et al 2005), have a statistically significant positive effect on the likelihood that the firm's employees create new firms.[1]

This paper starts with the dual premise that a firm's stakeholders are essential for the firm's success and that they appreciate the benefits of being associated with a successful firm, i.e., a winner. Given this premise, a firm's success is closely tied to how it is perceived, both internally, by its employees, and externally, by its customers and suppliers. This is especially true for younger firms with less established track records, and perhaps a greater need to attract stakeholders.[2]

In order to manage how their firms are perceived, entrepreneurs make a number of choices that influence the extent to which information about the firm is generated and disseminated both internally and externally. These choices determine what we call the degree of transparency of the firm. For example, a firm's decision to go public is likely to increase its transparency due to the disclosure requirements associated with an IPO, the due diligence of the underwriters, and the scrutiny brought by market participants (e.g., analysts).

Although there are a number of reasons why transparency is likely to contribute positively to firm value, in this paper we stress the offsetting cost that it may have for a young firm,

[1] A paramount example of this process is provided by Fairchild Semiconductors, the firm producing the first integrated circuit in 1959. As reported by Saxenian (1994), at least 23 out of 67 entrants to the semiconductor industry between 1957 and 1976 had at least one founder who worked for Fairchild.

[2] For a excellent discussion of the importance of attracting stakeholders to entrepreneurial firms see Bhide and Stevenson (1999).

whose success depends on its capacity to attract and retain key stakeholders. In particular, these firms face the risk that their potential as industry winners is prematurely revealed, which may in turn jeopardize their appeal to potential employees, customers and suppliers. Of course, positive news will help the firm, but as we show, the costs associated with the early revelation of negative information can exceed the benefits associated with the early revelation of positive information, tilting entrepreneurs towards choices that reduce transparency.

To illustrate these value-reducing effects of transparency we develop a model in which the firm and its stakeholders can be of different classes. The firm may or may not be an innovator that sets future standards in its industry and the stakeholders can either realize substantial benefits or modest benefits from being exposed to the firm's innovations. The model assumes that initially everyone is uncertain about the firm's quality, but depending upon its transparency, the firm's quality is revealed either sooner or later to all. In contrast, stakeholders have private information about their own types, and this information is not revealed during the course of their relationship with the firm.[3] This last point implies that all stakeholders must be offered the same terms of trade with the firm, which in turn means that if the firm deals with both types of stakeholders, one or the other type will obtain a rent. In particular, when the firm is likely to be an innovator the stakeholders who benefit from their exposure to innovation earn rents and, when the firm is not likely to be an innovator stakeholders who do not benefit from being exposed to innovation receive rents. As we show, these expected rents are lower when less is known about the firm.

Transparency is especially costly when the firm can make non-contractible investments in innovative activities that increase the spillover gains to its stakeholders. For example, a software firm might enhance the design of its programs in ways that benefit sophisticated users or offer training to workers and customers about the internal architecture of its programs. By doing this, the firm becomes a more attractive partner and can thus attract stakeholders on more favorable terms. However, as we show, the stakeholders capture a greater portion

[3] We refer to stakeholders' "types" and potential firm "qualities" to emphasize that while stakeholders have private information about themselves the information about the firm, while imperfect, is symmetrically held by all.

of the innovation gains if the firm is more transparent, which reduces the firm's incentive to make these investments.

Our model contributes to the literature on the costs and benefits of transparency as well as to the growing literature on entrepreneurship and innovation. Regarding the former, most papers formalize the role of transparency in reducing asymmetric information in the market for the firm's securities, and study the optimal degree of transparency arising from trading off the corresponding reduction in the cost of capital with *direct* information costs.[4] For instance, Easterbrook (1984) considers the implications on the dividend decision, and Pagano and Roell (1998) examines the going-public decision. The literature on corporate governance has considered the transparency implications of shareholder activism (Burkart, Gromb and Panunzi 1997) and the connections between transparency and the effectiveness of boards (Hermalin and Weisbach 1998). Subrahmanyam and Titman (1999) point out that, if transparent firms are likely to be more efficiently priced, they are also likely to make better investment choices and thus be more valuable on average.

Our paper fits into the relatively small subset of papers in the former literature that analyze potential *indirect* costs of transparency. Teoh (1997) analyzes the problem of voluntary contributions to public goods and, like us, attributes the cost of transparency to its interaction to with an asymmetric information problem (about users' willingness to pay). Bhattacharya and Chiesa (1995) and Perotti and von Thadden (2000), among others, point to the costs of revealing potentially useful information to competitors. In their analysis of corporate governance, Hermalin and Weisbach (2007) attribute the cost of transparency to the additional uncertainty on executives' careers concerns and to the additional incentives to manipulate information.

Regarding the literature on entrepreneurship and innovation, our focus on stakeholder retention and on the idea that some stakeholders appropriate substantial spillover gains from the firm's innovative investments is consistent with a growing literature on the role

[4]See Verecchia (2001) for a survey of the literature on the design of firms' accounting and auditing systems and Diamond and Verrechia (1991) for an analysis of the effect of costly disclosure on the firm's cost of capital.

of the transition from employee to entrepreneur in the creation of new businesses (Pakes and Nitzan 1983, Gromb and Scharfstein 2001, Lewis and Yao 2003, Cassiman and Ueda 2006, Hellmann 2007a) and, more generally, the problem of the appropriability of innovative ideas (Anton and Yao 1994, 2002, Anand and Galetovic 2000, Gans and Stern 2003, Biais and Perotti 2004, Hellmann and Perotti 2006). We contribute to this literature by showing how transparency (i.e., the premature generation of information) affects the division of the returns from innovation between the firm and its stakeholders, and hence the firm's incentives to undertake innovative investments.

The rest of the paper is organized as follows. In the next section we describe the full model and in Section 3 we consider a simplified setup in which the firm's problem is reduced to *attracting* stakeholders who are already endowed with private information about their types.[5] As we discuss, the analysis of attraction of privately informed stakeholders is formally very similar to the analysis of the problem of *retaining* stakeholders that we consider in Section 4, where stakeholders start their relationship with the firm without any private information but acquire such information as the relationship progresses over time. In Section 5, we analyze the richest case in which the firm controls both its transparency and an investment that increases the value of the human capital that stakeholders acquire through their relationship with the firm. In Section 6 we discuss a number of illustrative stakeholder relationships to which the model could apply and consider some issues related to the robustness of our approach. Section 7 concludes the paper.

2 The model

We consider a firm that operates in a risk-neutral economy where the discount rate is normalized to zero. As shown in Figure 1, there are four relevant dates in the firm's life, $t = 0, 1, 2, 3$. At $t = 0$, the firm is born and chooses its level of transparency. This choice can be related to its funding (e.g., with angels' funds or with funds stemming from venture capitalists) and

[5] The problem of attracting stakeholders to startups has been addressed before in the literature on entrepreneurship. See Hellmann (2007b) for a recent contribution.

to other organizational aspects that affect the degree of involvement of external expertise in the analysis of the firm's business. The idea is that a higher degree of external involvement leads to a more intense scrutiny of the firm's activities and, as a result, to the generation of more information about the firm's prospects.

At $t = 1$, the firm initiates a long-term relationship with a continuum of *stakeholders*. By stakeholders we refer to a number of constituencies (employees, customers, suppliers, advisors or other agents) whose interests are intrinsically linked to the firm's prospects.[6] Such a relationship involves a *start-up* period in which the stakeholders acquire familiarity with the firm and, then, from $t = 2$, a *development* period in which large-scale production takes place. At the beginning of the development period, stakeholders can stop doing business with the firm. At $t = 3$ the firm generates revenue proportional to the fraction of the initially attracted stakeholders that remain with it.[7]

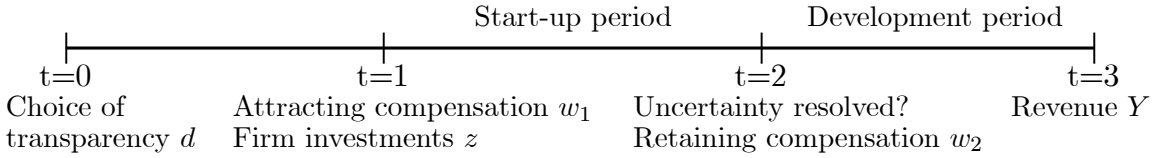

Figure 1: Sequence of Events.

A central aspect of our model is the interaction between stakeholders' unobservable heterogeneity and the timing of the resolution of uncertainty about the firm's quality. This interaction will interfere with the firm's problem of attracting and retaining its stakeholders, the transparency decision, and the incentives for the firm to undertake relationship-specific investments.

Stakeholder heterogeneity. Stakeholders are ex-ante identical and have an opportunity cost $\overline{U}$ of dealing with the firm during the start-up period. During this period, however, a

[6] In Subsection 6.1, we particularize the discussion to some specific constituencies.

[7] We rule out the possibility that the firm replaces its original stakeholders with new, unexperienced stakeholders at $t = 2$. This simplification captures the intuition that new stakeholders cannot perfectly substitute the original stakeholders attracted at $t = 1$.

proportion μ of them privately discover that they are *quick learners*, while the remaining proportion $1-\mu$ privately discover that they are *slow learners*. Being a quick or a slow learner affects the extent to which a stakeholder can profit from the experience acquired by dealing with the firm. This private discovery affects two aspects of the firm's stakeholder retention problem. First, by virtue of the experience acquired over the start-up period (and the surplus that they can obtain by dealing with another firm over the development period), a quick learner's opportunity cost of continuing with the firm at date $t=2$ is U_h, while the slow learner's is, instead, U_l, with $\Delta U \equiv U_h - U_l > 0$. Second, dealing with the firm during the development period may create for each of the stakeholder types different experience gains, which we will assume to be increasing in the firm's quality.[8] For simplicity, however, we assume that stakeholder types do not affect the gross revenue that the firm can generate at $t=3$.[9]

Firm quality. The firm can end up being of high quality (a *winner*) or of low quality (a *loser*). A winner firm is an innovator able to set the future technological and organizational standards of its industry and, hence, provides its stakeholders with especially valuable experience. To make things simple, we assume that the quick learners obtain an incremental experience gain z from their association with a winner up to date $t=3$ while the incremental gain equals zero in any other association (i.e., when a loser firm and/or a slow learner are present).[10]

We assume that all agents have *symmetric information* about the firm's quality at all dates, which allows us to examine the choice of transparency in the absence of information

[8] Notice that, to the extent that stakeholders are willing to credit the firm for the value of the experience that they can accumulate after date $t=2$, the difference between U_h and U_l does not necessarily imply that quick learners require a larger monetary reward for continuing dealing with the firm at $t=2$.

[9] Alternatively, one could assume different productivities across types in a model where the firm is a team and only the total team output is observable. We choose the current formulation for simplicity.

[10] The logic of our results also applies if slow learners could obtain some incremental experience gains, smaller than z, from dealing with a winner over the development period. As for the experience gains associated with working for a loser over such a period, one can interpret that they are already discounted from the opportunity costs U_h and U_l.

effects associated that may be associated with the firm's actions.[11] Specifically, we assume that all parties take γ as the initial likelihood that the firm is a winner. The uncertainty about the firm's quality is publicly resolved either after the start-up period ($t = 2$) or after the development period ($t = 3$). The timing of this discovery is affected by the firm's degree of transparency.

The transparency decision. The firm chooses its degree of transparency $d \in [0, 1]$ at $t = 0$. We assume that d equals the probability that the firm's quality is revealed at $t = 2$, and show that this probability can affect the value that the firm extracts from its relationship with the stakeholders. On top of these effects, we capture the standard costs and benefits of favoring an earlier resolution of uncertainty about the firm's quality by postulating that the transparency decision adds some *net* benefits $X(d)$ to the firm's gross revenue. We assume that $X(d)$ is a single-peaked function, with $X(0) = 0$, that reaches a maximum for some interior degree of transparency d^*, which would be chosen by the firm in the absence of the concerns identified in this paper. Technically, this can be guaranteed by assuming $X'(1) \leq 0 \leq X'(0)$ and $X'' < 0$.

Relationship-specific investments. In the most general case discussed below, we allow the firm to influence the size of the experience gain z that quick learners obtain when the firm turns out to be a winner. We interpret z as the result of innovative investments (e.g., R&D activities, unconventional human capital development activities, customer training programs) undertaken by the firm after starting its relationship with the stakeholders. Importantly, we assume that these investments are non-contractible and costly for the firm. The cost of providing z is described by the function $C(z)$, with $C' > 0$ and $C'' > 0$.

[11] Abstracting from signaling effects simplifies the analysis while neatly capturing the intuition that our notion of transparency refers to the generation of information about the firm rather than to the disclosure of information by the firm.

Attracting and retaining the stakeholders. We assume that the stakeholders attracted at $t = 1$ and the firm itself are free to unilaterally break up their relationships at $t = 2$.[12] For simplicity, we assume that the terms of trade are set by the firm through take-it-or-leave-it offers. Specifically, the firm offers its stakeholders compensation equal to w_1 to attract them at $t = 1$ and equal to w_2 to retain them at $t = 2$.[13] Stakeholders are assumed to be penniless and enjoy limited liability so that w_1 and w_2 must be non-negative.[14] We assume that the compensation w_1 at $t = 1$, must be the same for all stakeholders since they are ex-ante identical. We assume that this is also the case at $t = 2$, when stakeholder types are privately known, and show that this is optimal for the firm under a (mild) parametric assumption described below.[15]

Given that w_2 is the same for both types, the compensation required to retain both types will be the "reservation pay" (or opportunity cost net of expected incremental experience gains) of the stakeholder that finds it relatively more costly to maintain its relationship with the firm during the development period. Since reservation compensation differs across stakeholder types and firm qualities, it follows that, depending on the perception about the firm's quality, either the quick learners or the slow learners will appropriate some rents on top of their reservation compensation. The firm's transparency and investment decisions will then be partly driven by the firm's desire to reduce the expected value of those rents.

At $t = 3$, the firm generates a gross revenue αY, where α is the fraction of the initial stakeholders that the firm retains at $t = 2$ and Y is a productivity parameter that, for simplicity, we assume independent of stakeholder types and firm quality. Moreover, we assume that $Y > \max\{\frac{\Delta U+\mu U_l}{\mu}, \frac{U_l-\mu U_h+\mu z}{(1-\mu)}\}$, which is a sufficient condition for a firm, independently

[12] We discuss the robustness of our results to the introduction of termination fees or other types of long-term contracts in Section 6

[13] For workers or suppliers, w can be viewed as the wage or the cost of the input. For customers, w can be viewed as the discount that customers must be offered to attract them away from a more established competitor.

[14] We also discuss the robustness of our results for the case in which shareholders' wealth constraints are nonbinding.

[15] Under this assumption, the firm finds it profitable to retain both types of stakeholders rather than to offer a compensation that retains only some of them. In this setup, there is no pair of self-selecting payments that allows the firm to retain both stakeholder types while paying them different amounts.

of its quality, to find it optimal to offer a compensation that retains all stakeholders during the development period at $t = 2$. In essence, the previous sufficient condition requires that both stakeholder types are present in non-negligible proportions and that each stakeholder generates a larger revenue in the firm at $t = 3$ than his/her opportunity cost of abandoning the firm.[16]

3 Attracting stakeholders with asymmetric information

In order to highlight the fundamental mechanism that makes transparency costly in our model, we start the analysis by considering the simplified problem of a firm that must *attract* rather than *retain* privately informed stakeholders. Specifically, the firm must attract quick learners, who profit from an exogenous experience gain z when doing business with an eventual winner firm, and slow learners who do not. Formally, this simplified problem corresponds to a variation of the problem described in Figure 1 where (i) stakeholders are at $t = 2$ once they know their type, and (ii) the investment z is exogenous.

The analysis of the simplified problem will provide us with results that are valid for the analysis of the late stages of the full game (by backwards induction). In particular, it will show that greater transparency induces greater dispersion in stakeholders' unobservable valuation of their relationship with the firm, increasing the average information rents that stakeholders are able to appropriate.

3.1 The required compensation

The magnitude of the compensation w_2 required to attract the stakeholders at $t = 2$ depends on the stakeholders' perceptions of the firm. These perceptions differ in each of the three states, $s = \{u, g, b\}$, that can occur at $t = 2$: (i) in the *no-news* state ($s = u$), the firm's type

[16] As will be clear below, retaining all stakeholders rather than only the slow learners increases the retention cost of a loser firm to μU_h (to retain the quick learners) and gives a rent of $(1 - \mu)(U_h - U_l)$ to the slow learners. Similarly, for a winner, retaining all stakeholders rather than only the quick learners increases retention cost to $(1-\mu)U_l$ (to retain the slow learners), giving a rent of $\mu[U_l-(U_h-z)]$ to the quick learners.

remains unknown, (ii) in the *good-news* state ($s = g$), the firm is revealed to be a winner, and (iii) in the *bad-news* state ($s = b$), the firm is revealed to be a loser.

In the no-news state, the (minimum) compensation that attracts both stakeholder types is

$$w^u = \max\{U_l, U_h - \gamma z\}, \tag{1}$$

which reflects the fact that attracting a slow learner requires the firm to offer compensation equal to his opportunity cost of doing business with the firm, U_l, while attracting a quick learner requires paying the difference between his corresponding opportunity cost, U_h, and the expected value of the experience gain that he would get if the firm turns out to be a winner, γz.

In the good-news state, the required compensation is

$$w^g = \max\{U_l, U_h - z\} \tag{2}$$

since a slow learner requires U_l, and a quick learner, who is in this case certain to appropriate the experience gain z, would require $U_h - z$ instead.

Finally, in the bad-news state, the required compensation is

$$w^b = \max\{U_l, U_h\} = U_h, \tag{3}$$

since, there is no experience gain for a quick learner in a loser firm.

In line with intuition, the required compensation is lower under good news than under bad news ($w^g < w^b$), and also lower under no news that under bad news ($w^u < w^b$). Moreover, attracting stakeholders is weakly less expensive under good news than under no news, $w^g \leq w^u$; this inequality holds strictly if $\Delta U > \gamma z$.[17]

In this framework there are two reasons why the required compensation differs across states. First, different states imply different experience gains to quick learners and hence affect the required compensation when quick learners have a larger opportunity cost of

[17]Notice that if $\Delta U \leq \gamma z$, then $w^g = w^u = U_l$ since the minimum compensation is determined by the opportunity cost of the slow learner in both states. In contrast, when if $\gamma z < \Delta U$ then $w^g < w^u = U_h - \gamma z$, which implies that attracting a quick learner is always more difficult than attracting a slow learner.

dealing with the firm. Second, if the expected experience gains of the quick learners are high enough relative to the difference in reservation compensation across types, then the required compensation is determined by the more stringent demands of the slow learners. In this situation, the expected compensation across the states in which the firm's quality is known can differ from the compensation required in the no-news state, implying the possibility that transparency, as shown below, reduces firm value.

3.2 Expected costs of attracting stakeholders

Let $w_2(d)$ denote the firm's expected attraction cost as a function of the firm's transparency (i.e., the probability d that the firm's type is publicly observed at $t = 2$). Clearly,

$$w_2(d) = d[\gamma w^g + (1-\gamma)w^b] + (1-d)w^u.$$

From the expressions for w^g, w^b, and w^u given above, we obtain the following result:

Proposition 1 *In the stakeholder attraction problem, expected attraction costs are given by*

$$w_2(d) = \begin{cases} U_l + (1-\gamma)\Delta U d, & \text{if } \Delta U \leq \gamma z, \\ U_h - \gamma z + \gamma(z - \Delta U)d, & \text{if } \gamma z < \Delta U < z, \\ U_h - \gamma z, & \text{if } \Delta U \geq z. \end{cases} \tag{4}$$

Therefore, if $z > \Delta U$, the costs of attracting stakeholders are increasing in the firm's degree of transparency d; otherwise, they are independent of d.

In words, when quick learners' potential experience gains are large (i.e., $z > \Delta U$), slow learners are the costliest stakeholders to attract in the no-news and the good news state, whereas quick learners are the costliest stakeholders to attract in the bad news state. In this case, the required compensation in the no-news state, w^u, is strictly lower than the expected required compensation across the states in which the firm's type is revealed, $\gamma w^g + (1-\gamma)w^b$.[18] Since in each state s the compensation w^s is determined by the binding reservation utilities

[18] Notice that w^u reflects the requirement of slow learners if $\Delta U \leq \gamma z$ and quick learners if $\gamma z < \Delta U < z$. Instead, $\gamma w^g + (1-\gamma)w^b$ combines the requirements of both types since w^g is driven by the requirements of slow learners and w^b by the requirements of quick learners.

of different stakeholder types, the additional attraction costs that the firm must incur under bad news ($s = b$) are not fully offset by the reduction in case of good news ($s = g$). Thus, the expected attraction costs are *smaller* in the absence of news and, then, increasing in the firm's degree of transparency d. Transparency increases the information rents appropriated by the stakeholders.

In contrast, when the quick learners' potential gains are small (i.e., $z \leq \Delta U$), the required compensation is driven in all states by the requirements of the quick learners. Specifically, the expected attraction cost across the states in which the firm's type is revealed is $\gamma w^g + (1-\gamma)w^b = U_h - \gamma z$, which equals the compensation required in the state of no news, $w^u = U_h - \gamma z$. In this case, the firm's degree of transparency d does not affect stakeholders' information rents and, hence, the attraction costs are *independent* of d.

4 Long-term relationships and the retention problem

In this section, we consider the extended case in which stakeholders are attracted at $t = 1$ (when they are ex-ante identical) and must be retained at $t = 2$ (after they learn their types). As it turns out, the time structure of this extended model allows us to proceed with the analysis by backward induction, and to take the results obtained in Section 3 as a characterization of what happens after the start-up period.[19]

Specifically, the expected cost of retaining the stakeholders at $t = 2$ coincides with the $w_2(d)$ as defined by equation (4). As discussed in the previous section, the asymmetric information concerning stakeholders' types at $t = 2$ allows the stakeholders to appropriate rents, that is, to be paid a *retaining compensation* that exceed their net opportunity cost of doing business with the firm up to $t = 3$. However, unlike in the attraction problem discussed there, now the rents might be compensated at $t = 1$, if the stakeholders accept a lower *initial compensation* that implicitly credits the firm for those information rents. In the remainder of this section, we first look at the determination of the initial compensation

[19] We treat the experience gain z as exogenous, and postpone the analysis of the underlying investment decision to Section 5.

(and, as a result, the total stakeholder compensation) under a given degree of transparency d. Then we discuss how the firm decides on d at $t = 0$ taking into account the trade-off between the usual net benefits of transparency and its (sometimes negative) effect on total stakeholder compensation.

4.1 Total cost of stakeholder relationships

Let $w_1(d)$ denote the initial stakeholder compensation, i.e., the firm's payment to the stakeholders over the start-up period (at $t = 1$). Since stakeholders anticipate the retaining compensation at $t = 2$, $w_1(d)$ must satisfy:

$$w_1(d) + [w_2(d) + \mu\gamma z] - (U_l + \mu\Delta U) \geq \overline{U}, \tag{5}$$

where the term in brackets accounts for the expected monetary compensation and experience gains obtained from $t = 2$ onwards, and the term in parenthesis reflects a stakeholder's expected reservation utility at that date.[20] The difference between the term in brackets and the term in parentheses is positive and measures the informational rents that stakeholders appropriate from $t = 2$ onwards.

According to (4), depending on the size of ΔU relative to γz and z, three parametric regimes can emerge. To simplify the presentation, however, we will focus in the regime where $\Delta U \in (\gamma z, z)$, which features retention costs that are affected by the firm's transparency d and the experience gain z:[21]

$$w_2(d) = U_h - \gamma z + \gamma(z - \Delta U)d. \tag{6}$$

Under (6), the minimum $w_1(d)$ that satisfies (5) is given by

$$\widehat{w}_1(d) = \overline{U} - (1 - \mu)(\Delta U - \gamma z) - \gamma(z - \Delta U)d. \tag{7}$$

From (7) it follows that, due to the informational rents anticipated at $t = 2$, stakeholders would accept an initial compensation $\widehat{w}_1(d)$ which is lower than their opportunity cost of

[20] Recall that stakeholders are ex-ante identical and learn their type before $t = 2$.

[21] When $\Delta U \notin (\gamma z, z)$ either d or z have no effect on the expected retention costs which limits, but does not contradict, the results of the analysis presented here.

dealing with the firm during the start-up period, $\overline{U}$. Such an initial compensation is decreasing in d because transparency increases the expected compensation required to retain the stakeholders.

When $\widehat{w}_1(d) < 0$, the stakeholders' wealth constraints at $t = 1$ (that is, the requirement of $w_1 \geq 0$) are binding, so the minimum initial compensation is $w_1(d) = 0$ and the total stakeholder cost is $W(d) = w_2(d)$. In contrast, if $\widehat{w}_1(d) \geq 0$, then $w_1(d) = \widehat{w}_1(d)$ and the total stakeholder costs $W(d) = \widehat{w}_1(d) + w_2(d)$ become

$$W(d) = \overline{U} + (U_l + \mu\Delta U) - \mu\gamma z \equiv \overline{w}. \tag{8}$$

Thus, if stakeholders' wealth constraints are binding, the total stakeholder costs are increasing in the firm's transparency d; otherwise, these costs equal $\overline{w}$ (i.e., the stakeholders' intertemporal expected reservation utility net of expected experience gains) and do not depend on d. In general, since $\widehat{w}_1(d)$ is increasing in $\overline{U}$ and decreasing in d, we can establish the following result:

Proposition 2 *Total stakeholder costs are given by* $W(d) = \max\{\overline{w}, w_2(d)\}$, *which is increasing in the firm's degree of transparency* d *when the stakeholders' wealth constraints are binding (i.e., for small* $\overline{U}$ *and/or large* d*) and, otherwise, is independent of* d.

4.2 The transparency decision

At $t = 0$, firm value equals the present value of its gross revenue plus the net non-stakeholder-related benefits of transparency minus the total stakeholder costs:

$$V(d) \equiv Y + X(d) - W(d). \tag{9}$$

The firm makes its transparency decision in order to maximize $V(d)$. Thus, except at the point $d = \bar{d}$ defined by $w_2(\bar{d}) = \overline{w}$, if it exists, where $W(d)$ is non-differentiable, the firm's optimal transparency decision must solve the first order condition:

$$X'(d) = W'(d), \tag{10}$$

which states that the conventional marginal net benefits from transparency, $X'(d)$, must equal the marginal stakeholder-related cost of transparency, $W'(d)$. From (10) we obtain the following result which is proven in the Appendix:

Proposition 3 *When the stakeholders' wealth constraints are binding (i.e., for small $\overline{U}$ and/or large d^*), the stakeholder-related costs of transparency induce the firm to be less transparent than under the conventional trade-offs, $d < d^*$. Otherwise, its transparency is determined by the conventional trade-offs, $d = d^*$.*

Thus, when the stakeholders' opportunity cost of dealing for the firm over the start-up period, $\overline{U}$, is small relative to $d^* \equiv \arg\max X(d)$, i.e., the degree of transparency that would optimally resolve the conventional trade-offs, the firm will choose a relatively conservative transparency level $d < d^*$. Intuitively, this occurs when at d^* the stakeholders' wealth constraints are binding and, then, the higher cost of stakeholders' retention during the development period (increasing in the level of transparency) cannot be fully offset by reducing their compensation during the start-up period.

5 Endogenous relationship-specific investments

We now endogenize the experience gains z that quick learners obtain if the firm turns out to be a winner. We consider such gains as the result of some *innovative investments* undertaken by the firm during the start up period, after initiating its relationship with the stakeholders (at $t = 1$) but before the possible resolution of the uncertainty about firm quality (at $t = 2$). The investments that we have in mind include training programs that allow stakeholders (e.g., employees, customers or suppliers) to acquire the firm's know-how, R&D investments that widen the outside applicability of the firm's proprietary technologies, or the establishment of confidentiality procedures and licensing practices that limit the ability of those who do not keep a relationship with the firm to develop marketable skills. We assume that these investments, while observable for both the firm and its stakeholders, are unverifiable and

hence non-contractible.[22] We model them as a direct choice of z by the firm, at a cost described by the strictly increasing and strictly convex function $C(z)$ already described in Section 2.[23]

For brevity, we focus on the regime with $\Delta U \in (\gamma z, z)$, i.e., we assume that the choice of z is restricted to an interval $[\underline{z}, \overline{z}] \subset (\Delta U, \Delta U/\gamma)$.[24] In addition, in order to highlight the effects channelled through the investment level z, we assume that the stakeholders' opportunity cost of dealing with the firm during the start-up period $\overline{U}$ is large enough for the stakeholders' wealth constraints not to be binding at $t = 1$. Then, according to the analysis in Subsection 4.1, the total stakeholder compensation is, as in (8),

$$\overline{w} \equiv \overline{U} + (U_l + \gamma \Delta U) - \mu \gamma z, \tag{11}$$

which does not directly depend on the transparency decision d.[25]

It is also worth noting that in (11), stakeholders' expected gains from the innovative investments, $\mu\gamma z$, directly reduce $\overline{w}$, which implies that stakeholders are willing to receive such gains in lieu of their monetary compensation. Also, as we show, the firm's transparency choice d (made before the firm initiates the relationship with its stakeholders) acts as a commitment device to ensure the stakeholders a certain level of investment z.

5.1 Contractible investment scenario

As a benchmark, we start by examining the case where the innovative investments z are contractible and, hence, can be set at their first-best level. Since the stakeholders' experience gains $\mu\gamma z$ reduce their monetary compensation, ignoring additive constants, the value

[22] Maskin (1999) shows that the unverifiability problem could be solved with the use of a mechanism based on the parties' announcements. Nevertheless, we exclude the possibility of using this type of mechanism in our analysis. This is in line with approach taken by the incomplete contracts literature (e.g., Aghion and Bolton 1992 and Hart and Moore 2007), which argues that these mechanisms lack realism, are not robust to the possibility of renegotiation, and may not be robust to small amounts of private information (i.e., Aghion, Fudenberg, and Holden 2007).

[23] See Grossman and Hart (1986) and Hart (1995) for a theory of the firm that emphasizes the importance of relationship-specific investments.

[24] Technically, this could be guaranteed by assuming $\lim_{z^+ \to \Delta U} C'(z) = 0$ and $\lim_{z^- \to \frac{\Delta U}{\gamma}} C'(z) = +\infty$.

[25] At the end of the section we briefly discuss the case of a small $\overline{U}$ in which the total stakeholder compensation is directly affected by d, as in (6).

maximization program can be expressed as:

$$\max_{d\in[0,1],\ z\in[\underline{z},\overline{z}]} X(d) + [\mu\gamma z - C(z)], \tag{12}$$

whose first order conditions implicitly define the first-best solution (d^*, z^*)

$$X'(d^*) = 0, \tag{13}$$

$$\mu\gamma = C'(z^*). \tag{14}$$

Expressions (13) and (14) show that with contractible investments the transparency decision is separable from the investment decision. In particular, transparency d^* is determined by the conventional non-stakeholder-related trade-offs, exactly as in the case of exogenous z and nonbinding wealth constraints considered in the previous section.[26]

5.2 Non-contractible investment scenario

We now consider the case of interest where the innovative investments z are not contractible. As we show, the investment level z will be a decreasing function of the firm's transparency. Absent other transparency effects, the firm will make the transparency choice that commits it to choose the first-best z^*. In general, however, since there are other costs and benefits of transparency, z^* will not be implemented.

We proceed by backward induction: when z is chosen, the transparency d and the stakeholders' compensation $w_1(d)$ have already been determined. So z is set to maximize the firm's continuation value, which is affected by z through its effect on the required compensation to retain the stakeholders,

$$w_2(d, z) = U_h - \gamma z + \gamma(z - \Delta U)d, \tag{15}$$

and the investment cost, $C(z)$. Thus, ignoring additive constants, the firm solves

$$\max_{z\in[\underline{z},\overline{z}]} \quad \gamma(1-d)z - C(z),$$

[26] Notice that the marginal value of the z investment, $\mu\gamma$, is less than one because only quick learners in winner firms obtain experience gains. These results can be generalized to a situation where both types of stakeholders experience gains as long as the marginal valuations of the investments remained higher for the quick learners in winner firms.

which has the first order condition

$$(1-d)\gamma = C'(z). \tag{16}$$

For each possible value of d, (16) defines a unique solution $z = h(d)$, where, by the implicit function theorem, $h'(d) = -\gamma/C''(z) < 0$. This implies the following lemma.

Lemma 1 *When the firm's innovative investments z are not contractible, their level $h(d)$ is a* decreasing *function of the firm's transparency d.*

Equation (16) captures an important feature of the analysis. In contrast to the first-best case, the investment z and the transparency decisions d are not separable. Specifically, a less transparent firm tends to invest more in its stakeholder relationships because, with less information disclosure, the costs of stakeholder retention are more sensitive to changes in stakeholders' expected experience gains. In other words, the transparency decision d works as a mechanism that allows the firm to commit to any desired level of z. Such a commitment device, however, is costly for the firm because the transparency level that implements the first-best level of z is generally different from the first-best transparency level d^*.

Specifically, the *second-best* level of transparency, d^{**}, takes into account its effect on the investment z and, thus, solves

$$\max_{d\in[0,1]} X(d) + [\gamma\mu h(d) - C(h(d))], \tag{17}$$

where we have replaced $h(d)$ for z in the terms that account for the benefits and costs of the z investment. Under our assumptions, the objective function in the above maximization is quasi-concave so a necessary and sufficient condition for a maximum is:

$$X'(d^{**}) = -h'(d^{**})[\gamma\mu - C'(h(d^{**}))], \tag{18}$$

which uniquely determines d^{**} and, recursively, $z^{**} = h(d^{**})$.

It is clear from (13) and (14) that, if $h(d^*) = z^*$, then $d^{**} = d^*$ solves (18) and, thus, the second-best solution coincides with the first-best solution. In general, however, under- and

over-investment can occur. A parameter that determines which of the cases holds is μ, that is, the proportion of quick learners among the stakeholders. Specifically, by comparing (13) and (16), and noting that if $h(d^*) = z^*$ then $d^* = 1 - \mu$, we establish the following result:

Proposition 4 *When the proportion of quick learner stakeholders μ is above (below) the level $\mu^* \equiv 1 - d^*$, the firm makes a conservative (aggressive) transparency choice, $d^{**} < d^*$ ($> d^*$), and underinvests (overinvests) in relationship-specific innovation, $h(d^{**}) < z^*$ ($> z^*$). Furthermore, as the proportion of quick learners increases, the firm reduces its transparency and increases its relationship-specific innovation.*

The relation between transparency and the incentives to undertake relationship-specific investments stems from the time inconsistency problem that affects the firm's investment decision. Forward-looking stakeholders are willing to compensate the firm for their expected experience gains by improving their terms of trade (i.e., by accepting a lower monetary compensation). The firm level investment z, however, is set once the terms of trade for the start-up period (attracting compensation) are already fixed; hence, at that point, it only considers the effect of z on the terms of trade for the development period (retaining compensation). When, as a result of this, the firm anticipates a problem of underinvestment (overinvestment) in relationship-specific innovation, it can partially correct the problem by choosing lower (higher) transparency, since this makes the terms of trade of the development period more (less) sensitive to z and thus increases (reduces) the incentives to invest in z.[27]

The second part of the proposition states that when stakeholders are more likely to be quick learners (but do not know their types yet), they are willing to accept a larger reduction in their initial compensation in exchange for the potential experience gain z. Thus the optimal z investment is increasing in the stakeholders' ex ante probability of being quick learners, μ.

[27] To understand why it is possible to have incentives to overinvest as well as underinvest one should note that although the quick learners benefit from a higher z, a higher z reduces second period retention costs and, thus, reduces the rents appropriated by the slow learners. Notice that, as shown by (14), the ex ante optimal z increases with the proportion of quick learners, μ, while, as shown by (16), the ex-post choice of z does not directly depend on μ but on the transparency level d.

5.3 What if stakeholders' wealth constraints are binding?

We conclude this section with a brief discussion of the case in which the low value of stakeholders' opportunity cost of dealing with the firm during the start-up period, $\overline{U}$, makes their wealth constraints binding (so that $w_1 = 0$). In this case, the future rents that stakeholders appropriate under greater transparency cannot be transferred back to the firm. Hence, in addition to the effect channelled through the investment z, the transparency level d has a direct effect on the firm's stakeholder costs, as already discussed in Section 4. Since in this case the attracting compensation is set at the minimum level, the ex ante value and the continuation value of the firm (which are the relevant criteria for the choice of d and z, respectively) coincide and are equal to

$$X(d) - w_2(d, z) - C(z), \tag{19}$$

where $w_2(d, z)$ is given by (15). Maximizing expression (19) with respect to d and z leads to the following proposition:

Proposition 5 *When stakeholders' wealth constraints are binding (i.e., for small $\overline{U}$), the firm chooses a conservative transparency level $d < d^*$, which is independent of the proportion of quick learner stakeholders. Over- and under-investment in relationship-specific innovation are possible.*

This result leads us back to the logic of Proposition 3. When stakeholders' wealth constraints are binding, their compensation is paid after z is set so d plays no role as a commitment device. Similarly to the exogenous z case, when z is endogeneous more transparency leads to an increase in stakeholder retention costs and in total stakeholder costs as well.

6 Discussion of the results

In this section, we first discuss how the intuition developed in the preceding sections applies to specific firms and stakeholder relationships. Then, we explain how some of our partial

equilibrium assumptions can be justified within a market set up. Next, we examine the robustness of our findings to a contracting environment in which stakeholders and firms can stipulate penalties that discourage the breaking of their long-term relationships. Finally, we comment on the robustness of our results to other possible modifications of the model.

6.1 Some illustrative stakeholder relationships

While stakeholder relationships are important for all firms, they seem to be essential to the inception, development, and survival of new firms (see Bhide and Stevenson 1999). Indeed, several aspects of our analysis make it especially relevant for understanding the costs of transparency for these firms. In particular, we identify three key ingredients whose interplay create transparency costs: (i) ex-ante uncertainty about an aspect of the firm's prospects that affects stakeholders' future careers, (ii) asymmetric information about stakeholders' ability to benefit from their experience with the firm, and (iii) the presence of either stakeholders' wealth constraints or some non-contractible relationship-specific investments that affect the value of stakeholders' experience with the firm.

Arguably, the combination of these ingredients is more likely among *high-tech start-up firms* with businesses that require that relatively *sophisticated stakeholders* get involved in *specialized firm-specific activities*. In these situations, there is likely to be considerable uncertainty about a firm's potential and substantial room for asymmetries of information regarding stakeholders' abilities to take advantage of their relationship with the firm. For a sucessful relationship, stakeholders in these firms may need to develop novel firm-specific inputs, or to perform firm-specific tasks whose completion would affect the value of their experience. While the sharpest, most skillful or most ambitious employees, customers, suppliers or venture capitalists may clearly extract a great deal from their association with an industry leader, less able stakeholders may not extract much or find much of a difference between dealing with industry winners and losers.

Consider, for instance, the young, high-potential employees of a start-up attempting to develop and introduce some innovative product. Conditional on the success of the product,

the employees who absorb the "secrets" of the business can develop a profitable career in related firms or might start a firm of their own. Our analysis indicates that attracting and retaining the high-potential employees may be cheaper for the less transparent start-up because postponing the discovery of whether the product is a winner or a loser can reduce the overall employee costs and can be a credible device for the firm to commit to valuable human capital development investments (which allows it to attract employees with lower compensation).

As another example, consider the suppliers of customized inputs of a new technology. If such a technology becomes an industry standard, the more capable suppliers will benefit by supplying a much larger market. Our theory predicts that, in this case, suppliers would be willing to sell their inputs cheaper to the less transparent firm for reasons similar to those that lead employees to accept overall lower compensation in the previous example.

In the same vein, our theory can be applied to the relationship between, say, a software company and the early customers of a new software product. If the product succeeds and an updated version becomes dominant in the market, the more talented users who used the earlier versions may be more effective at developing profitable utilities and applications for the now dominant software. In this case, our analysis suggests that either in the form of higher (average) prices for the updated version of the application or as the result of the firm's commitment to a larger investment in the training of its customers, lower transparency can allow the firm to extract higher surplus from its customers.[28]

All in all, our theory predicts preference for less transparency than what one could infer from the analysis of the standard transparency trade-offs. We predict that the tilt toward less transparency should be more noticeable among high-tech startups with employees, suppliers,

[28] In the case of financial stakeholders, our theory would be hardly applicable to the anonimous holder of a publicly issued security or to a passive financier that does not interact with the firm's management. In contrast, our findings are relevant for venture capital and for active investors such as angels and hedge funds who are likely to develop valuable expertise by their association with innovators. Our theory suggests a complementary between the firms which are less transparent about their prospects and the less experienced financiers of the above classes. For obvious reasons, the transparency effect associated with wealth-constrained stakeholders does not apply to financial stakeholders. Yet the effects due to the non-contractibility of relationship specific investments may be very significant for the less experienced financiers.

and customers who care about the value of the experience gained by doing business with the firm but are ex ante uncertain about both their own ability to acquire such an experience and the actual value of the experience at stake.

6.2 Stakeholders in a market setting

We have analyzed the relationship between the firm and its stakeholders in a partial equilibrium setting where some key determinants of stakeholders' attraction and retention costs—their experience gains and opportunity costs of doing business with the firm—were exogenous. One may wonder whether there are reasonable market settings in which our assumptions regarding those variables could be justified in closer reference to first principles. In this subsection we argue that the answer is yes.

To start with, it is worth summarizing our assumptions regarding the determinants of stakeholders' reservation compensation: (i) at the start up period, the stakeholders' opportunity cost of doing business with the firm equals $\overline{U}$; (ii) at the development period, slow and quick learners' opportunity costs of doing business with the firm are private information and equal to U_l and U_h, respectively; (iii) experience gains z accrue solely to quick learners associated with winner firms during the development period.

These assumptions can be validated in the following market equilibrium setting. Consider a two-sector economy in which young firms (startups) deal with unexperienced stakeholders in one sector and mature firms operate with experienced (and possibly also unexperienced) stakeholders in the other. The firm in our model is a representative firm of the first sector. Stakeholders are experienced or unexperienced in regards to the specific business of a firm or group of firms. One can think of startups as innovative enterprises in their corresponding businesses so that they have no "experienced" stakeholders to whom first attract in the start-up period, and the only "partly-experienced" stakeholders who they have for the development period are their own. Our assumptions imply that, after dealing with a firm over the startup period, stakeholders realize how much they learned from the relationship for such period and can anticipate how much they will learn by keeping the relationship during the development

period. Assumptions (ii) and (iii) capture the idea that, relative to slow learners, quick learners extract more valuable experience in both periods and that the extra experience obtained during the development period is exclusive of those stakeholders dealing with a winner firm. Intuitively, there is a complementarity between the ability of a stakeholder to learn and the quality of a firm to produce valuable experience. Our results can be extended to more general specifications of this complementarity (e.g., experience also acquired in the startup period), but at the cost of additional analytical complexity.

Our assumptions are consistent with the idea that stakeholders can cash-in the value of the experience acquired in the startup sector if they move to the mature sector. For instance, this would occur if experienced stakeholders could be self-employed or run a business of their own in the mature sector. In this case, the opportunity costs U_l and U_h would represent their per-period net profits of moving to the mature sector immediately after the startup period. If instead stakeholders move after the development period, slow learners would still earn U_l per period and quick learners would make either $U_h + z$ per period (if they are associated to a winner) or U_h per period (otherwise). Notice that the fact that stakeholders are self-employed or run their own business in the mature sector is compatible with U_l and U_h being private information at the retention stage.[29]

Notice that these interpretations of U_l, U_h, and z imply $\Delta U > 0$ and $z > 0$, but do not impose any particular constraint to the relative sizes of the differential experience gains of the quick learners during the startup period, ΔU, and the value of the experience gains stemming from the association between a quick learner and a winner firm during the development period, z. Our results on the relevance of transparency only require that the former are less important than the latter, $\Delta U < z$ or, in other words, that the quick-learner winner-firm complementarity is important.

One can interpret U_l and U_h without the requirement that the experience acquired during the startup stage is valuable in the mature sector. To see this, suppose that z is the only

[29] Alternatively, one could consider a mature sector that yields type-dependent net profits U_l and U_h. This would occur if output were a function of a stakeholder's experience and some form of performance-based compensation were in place (e.g., piece rate compensation in the case of employees).

valuable experience, and that U_l, U_h reflect the stakeholders' expectations about what they could get by breaking their relationship with a loser firm and starting a new relationship with a new startup of unknown quality. Under this interpretation, $\Delta U > 0$ reflects the fact that slow learners can never obtain z, while quick learners find it possible to get z by associating with a winner. This interpretation also implies $\Delta U < z$ and, hence, corresponds to a case in which transparency has costs as those identified in our analysis.

As for the stakeholders' opportunity cost of doing business with the firm at the startup stage, $\overline{U}$, the model imposes no particular restriction. The interpretation of U_l and U_h as what each of the stakeholder types can earn somewhere else after accumulating experience during the startup period suggests that it is reasonable that $\overline{U} < U_l + \mu\Delta U$. This additional restriction, however, would not invalidate or qualify any of our results. Likewise, the results also hold if $\overline{U}$ measures what an unexperienced stakeholder gets in his sector of reference (e.g., in the startup sector or as an unexperienced-stakeholder in the mature sector).

6.3 Long-term contracts

In this subsection, we discuss whether a more general contracting environment would modify our key results. We do so by revisiting the scenarios in which, according to the analysis in previous sections, transparency is costly.

In the scenario in which stakeholders' wealth constraints are binding and experience gains are exogenous (Section 4), the question is whether a long-term contract can isolate the firm's total expected stakeholder costs from the effects of transparency, making the distortion of the firm's transparency decision unnecessary. The short answer is no, except in the trivial—and arguably implausible—case in which stakeholders can fully commit to do business with the firm for both periods. In such a case, stakeholders would accept a total intertemporal monetary compensation of $\overline{w}$ when starting their relationship with the firm and the firm's transparency decision would be determined by the conventional non-stakeholder-related trade-offs.

Notice that even if stakeholders cannot directly commit to deal with the firm for more

than one period, an equivalent commitment can be obtained by introducing a pecuniary penalty, L, imposed on stakeholders who rescind their relationship with the firm. However, the penalty L would reduce stakeholders' retaining compensation to $w_2 = w_2(d) - L$ only if their attracting compensation were (at least) $w_1 = L$, in which case, the total expected stakeholder costs would be $w_1 + w_2 = L + [w_2(d) - L] = w_2(d)$, as in the case without penalties analyzed in Section 4. If this is the case, our previous results remain valid.

In the scenario considered in Section 5, i.e., non-binding wealth constraints and endogenous z, long-term contracts can improve matters only if they contribute to a better alignment between the firm's ex post incentive to invest in z (that depends on the sensitivity of retaining compensation to z) and the objective of ex ante value maximization (that calls for minimizing the sum of stakeholder compensation and z costs). However, long-term contracts cannot address the fundamental non-contractibility of z. They can either preserve the original sensitivity of w_2 to z or fully eliminate it, in which case the firm has no incentive to invest in z.[30]

This polar no-investment solution is surely inferior to the solution without long-term contracts characterized in Section 5 if the proportion of stakeholders who are quick learners is above the critical level μ^* since, in such a case, the firm already underinvests in relationship-specific innovation (see Proposition 4); investing zero would simply aggravate the problem. In contrast, if the proportion of quick learners is below μ^* (so that the firm overinvests in relationship-specific innovation), it is possible that, by fully eliminating the sensitivity of the retaining compensation to z, firm value increases relative to the solution characterized in (18).[31]

[30] Indeed, the sensitivity of w_2 to z can be eliminated by either committing the firm to a very high retaining compensation, so that all stakeholders are willing to continue their business with the firm in all states, irrespective of the value of z, or by fixing a very high break-up penalty for the stakeholders, so that they are willing to keep their relationship with the firm even with a zero retaining compensation and regardless of the value of z. In either case, because w_2 does not depend on z, the firm loses its incentive to invest in z, irrespective of its transparency level.

[31] Actually, in this case, the optimal z investment lies somewhere between the amounts invested when all stakeholders receive either short-term or long-term contracts. As a result, the firm could implement the first-best investment level by offering long-term contracts to some of the stakeholders and short-term contracts to the rest. In addition, this argument suggests that the problem of overinvestment in z (and the remedy based

6.4 Other robustness issues

The model considered so far embeds a number of simplifying assumptions (on the number of stakeholder and firm types, the allocation of bargaining power, and the lack of variability of the firm's gross revenue with its type). These assumptions facilitate the algebra and the fixing of intuitions but are not essential to the results. In particular, we have checked that the mechanisms behind the transparency effects that we identify still work when: (i) there is a continuum of stakeholder types θ (i.e., stakeholders that differ in their opportunity costs of dealing with the firm in the development period, $U(\theta) = a + b\theta$ where $a, b > 0$ and $\theta \in [0, 1]$, as well as in the experience gains obtained by dealing with a winner, θz), (ii) there is a continuum of firm qualities (i.e., firms that differ in z), (iii) stakeholders have some bargaining power at the point of negotiating their retention compensation with the firm, and (iv) the gross revenue of the firm, Y, varies with its quality and stakeholders' compensation can be made contingent upon it.[32]

7 Concluding remarks

The perceptions of stakeholders play an important role in getting a firm started and continue to play an important role as the firm matures. As we emphasize in this paper, entrepreneurs make a number of choices that can affect the transparency of the firm and need to be cognizant of how these choices can influence stakeholder perceptions. For example, as we mentioned in the Introduction, transparency considerations can potentially influence how a firm is financed, e.g., the choice of private versus public equity financing, and the timing of their IPOs. There is a large literature on the costs and benefits of going public, some of which describe the information generated by the due diligence and book building process of the investment banker and the analysts. Our contribution to this literature is the observation that the increased scrutiny by public investors and analysts is not necessarily a good thing.

on an aggressive transparency decision) is less pervasive than the problem of underinvestment in z (and the remedy based on a conservative transparency decision).

[32] Details of the derivations regarding the robustness of the results are available from the authors upon request.

We provide a rationale for firms to (least temporarily) stay out of the lime light of the public markets, and remain, say, a less transparent private firm that gets "the benefit of the doubt".[33]

There are many other choices that firms make that can also affect the extent to which the firm is scrutinized. For example, an entrepreneur may choose to locate away from industry clusters, like Silicon Valley, to keep a lower profile while the firm is getting established. The firm may also want to avoid high profile investments , which are likely to attract the scrutiny of journalists and analysts, and similarly, they might want to discourage would be suitors, who might uncover unfavorable information in the course of their due diligence.

Similar concerns may apply in the context of mergers and acquisitions. Branderburger and Nalebuff (1996), discuss the case of Continental Insurance, a company whose board decided not to accept a lucrative takeover offer from CNA that was conditional on due diligence (p. 214). The board was concerned about the revealed information "including the potential adverse effects a possible decision by CNA (following such due diligence) not to make an offer could have on market and rating agencies' views of the company and on the willingness of insurance partners to proceed with transactions" (Continental Insurance's proxy statement, March 29, 1995).[34]

[33] Investment banks have a legal mandate to investigate firms (i.e., perform due diligence) before marketing their shares, and there exists evidence that suggests that institutional investors tend to be relatively informed when they acquire shares in a secondary offering (i.e., Gibson et al., 2004).

[34] Similarly, on July 12, 2007, Reuters reported that, in the context of the dealings between Iberia Airlines and TPG, a consortium interested in purchasing the airline, Iberia's board agreed to provide additional information but only in case it received a binding offer that the board considered interesting for the company. We interpret this as an attempt to immunize Iberia's shareholders from the effects of information revelation.

APPENDIX

Proof of Proposition 3 The analysis that led to Proposition 2 makes clear that:
(1) If $\overline{U} - (1-\mu)(\Delta U - \gamma z) \leq 0$, then $W(d) = w_2(d)$ ($\widehat{w}_1(d) \leq 0$) for all d.
(2) If $0 < \overline{U} - (1-\mu)(\Delta U - \gamma z) < \gamma(z - \Delta U)$, then there exists some

$$\bar{d} \equiv \frac{\overline{U} - (1-\mu)(\Delta U - \gamma z)}{\gamma(z - \Delta U)} \in (0,1) \tag{20}$$

such that $\widehat{w}_1(\bar{d}) \geq 0$, which implies $W(d) = \overline{w}$ for $d \leq \bar{d}$ and $W(d) = w_2(d)$ for $d > \bar{d}$.
(3) If $\overline{U} - (1-\mu)(\Delta U - \gamma z) \geq \gamma(z - \Delta U)$, then $W(d) = \overline{w}$ ($\widehat{w}_1(d) > 0$) for all d.
For convenience, let us extend the definition of d making it take value 0 if $\overline{U} \leq (1-\mu)(\Delta U - \gamma z)$ and value 1 if $\overline{U} \geq (1-\mu)(\Delta U - \gamma z) + \gamma(z - \Delta U)$. Then, when looking for candidate solutions to the first order condition (10), we can consider three exhaustive possibilities:
(a) $d < \bar{d}$. In this case, we have $W(d) = \overline{w}$ so (10) becomes $X'(d) = 0$, whose solution is $d = d^*$. Hence if $d^* < \bar{d}$, the firm's optimal transparency is d^*, which is then exclusively determined by the conventional non-stakeholder-related trade-offs captured by $X(d)$.
(b) $d > \bar{d}$. In this case, we have $W(d) = w_2(d)$ so, using (6), (10) becomes $X'(d) = \gamma(z - \Delta U)$, whose solution is $d = \widehat{d} < d^*$. Hence if $\widehat{d} > \bar{d}$, the firm's optimal transparency is $\widehat{d}$, which is smaller than d^* due to the stakeholder-related costs of transparency.
(c) $d = \bar{d}$. Given the form of $W(d)$, having a maximum at the non-differentiability point $\bar{d}$ requires $0 \leq X'(\bar{d}) \leq \gamma(z - \Delta U)$, that is, $\bar{d} \in [\widehat{d}, d^*]$.
Therefore, the solution is $d = \max\{\widehat{d}, \bar{d}\} < d^*$ when $\bar{d} < d^*$, and $d = d^*$ when $\bar{d} \geq d^*$. Finally, given that $\bar{d}$ is decreasing in $\overline{U}$, the result stated in Proposition 3 follows immediately.■

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