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Hands-Tying Contracts: Book Publishing, Venture Capital Financing, and Secured Debt

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1. Introduction

It is common practice in the publishing industry for a publisher to agree to print a well-established author's next book long before it is written—often, indeed, before the author has more to show than a one- or two-page prospectus. What is more, these agreements commonly award the author a large advance against prospective royalties and occasionally commit the publisher as well to a large promotion budget or first printing. Such contracts raise an obvious question: Why do publishers not wait until they have read and evaluated the completed manuscript before committing themselves to invest heavily in its publication? Nor is the publishing industry the only arena in which investors leap before they look. Venture capitalists often leave voting control over a start-up firm with an entrepreneur who invests relatively little money of his own. Similarly, limited partners in a venture capital fund often commit themselves in advance to invest in all the fund's future projects rather than reserve the right to evaluate those projects after the fund's managers have proposed them.

In this article we develop a simple intuition to explain this phenomenon. When two parties invest at different times during the development of a common project, the first investor is vulnerable to the risk that the second will opportunistically withhold her investment. In particular, if the parties expect to share the payout from the project and if, after the first party has invested, the second party learns that the project will be less successful than originally anticipated, the second party has an incentive to withhold investment whenever the cost of investing would exceed her revised estimate of her share of the project's returns. Such a unilateral decision to withhold investment will be inefficient if the project's total expected payout remains sufficient to justify the second party's investment. The problem is that the party who invests second may not consider the project's total payout. Rather, she has an incentive to weigh the cost of her investment only against her own expected return and to neglect the return to the first party, whose investment is already sunk. If the risk of such an opportunistic decision to withhold investment is large enough, both parties have an incentive to write a contract ex ante to compel the second party's investment regardless of what she may subsequently learn about the project's prospects. We term such contracts "hands-tying contracts."

It is by now a familiar observation (e.g., Jensen and Meckling) that the equity shareholders in a firm financed partly with debt have an incentive to engage in inefficiently speculative projects since they receive a disproportionate share of any upside gains while the bondholders bear a disproportionate share of downside losses. Bond covenants constraining the firm's ability to increase the riskiness of its investments are frequently drafted with this problem in mind (Smith and Warner). The situation examined here is in a sense the reverse case: Where the persons in control will participate disproportionately in downside losses, they have an excessive incentive to avoid risky but valuable projects; consequently, constraints on their discretion to *reject* investments are called for.

In Sections 2 and 3, we present a simple model to explore the hands-tying intuition, using a stylized account of book publishing as an illustration. In Section 4, we examine further details of publishing contracts from the perspective of the hands-tying model. In Section 5, we explore hands-tying in other contractual contexts, including venture capital financing, oil and gas exploration, and secured debt.

2. A Model

Imagine a situation in which one individual (whom we shall term, for ease of reference, the "entrepreneur") contracts with another (the "investor") to undertake a project. The entrepreneur has unique skills in project development that the investor lacks. However, the entrepreneur has no funds of his own to invest; the capital required by the project must be supplied by the investor.[1] (In Section 3, we relax the assumption that there is only one potential investor.)

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1. The model would lead to similar results if, in place of this wealth constraint, we were to assume that the entrepreneur is more risk averse than the investor.

The project must proceed in two stages. In the first stage, the entrepreneur expends effort to develop the project preparatory to production. In the second stage, the investor invests capital in production. In our prototypical example, the entrepreneur is an author, the investor a publisher, and the project is the writing and publication of a novel. In the first stage, the author writes the book; in the second stage, the publisher invests in printing and promoting the book.

The project can have either of two outcomes: good or bad. A good outcome has a dollar value $v = v_g > I$, where I is the (fixed) amount the investor must invest in production. A bad outcome has a value $v = v_b < I$. The entrepreneur has a choice between two different levels of effort: Either he can expend no effort, in which case the outcome will always be bad, or he can expend a fixed positive amount of effort on which he places a dollar value of e, in which case there will be a probability of q, $1 > q > 0$, that the outcome will be good and a probability of $1 - q$ that it will be bad.

The investor is unable to observe whether the entrepreneur has expended effort. However, after the entrepreneur (allegedly) expends effort, and before the investor invests, the investor receives a costless but noisy signal s indicating the likelihood that the outcome of the project will be good. This signal can take either of two values: s_g or s_b. If the outcome of the project will be good, the signal will take value s_g with probability r and value s_b with probability $1 - r$; similarly, if the outcome of the project will be bad, the signal will take value s_b with probability r and value s_g with probability $1 - r$. That is, $p(s = s_g|v = v_g) = p(s = s_b|v = v_b) = r$, where $.5 \le r \le 1$. When $r = .5$ the signal contains no information, while if $r = 1$ the signal gives a perfect forecast of the outcome of the project. We shall refer to r as the reliability of the investor's signal.[2] After receiving her signal, the investor has the opportunity to decide whether or not to invest in the project. If she decides to reject the project, it will have value $v = 0$.

Finally, the investor and entrepreneur each seek only to maximize their expected returns (an assumption we make both to simplify exposition and to emphasize that our analysis does not depend on risk aversion).

All of the preceding is common knowledge to the investor and entrepreneur, except that in any given case the investor cannot observe whether the entrepreneur has actually expended effort and the entrepreneur cannot observe the investor's signal.

These assumptions track the basic characteristics of book publishing. A publisher generally cannot observe the amount of effort that an author puts into writing a book. Once the book is written, however, the publisher can read the completed manuscript. This reading permits the publisher to make a more refined estimate of the book's prospects, which corresponds to the signal in our model. Yet this signal will seldom yield a completely reliable forecast of the book's future success. Moreover, because the forecast is subjective, it is not observable by the author.

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2. We assume $p(s = s_g|v = v_g) = p(s = s_b|v = v_b)$ only for simplicity.

2.1 Efficient Outcomes

As a starting point, consider the first-best outcome that maximizes the joint return to the investor and entrepreneur combined.

There are three potentially efficient sets of actions that the parties can take. First, the entrepreneur expends no effort and the investor does not invest. The expected joint return is then 0. Second, the entrepreneur expends effort and the investor invests regardless of the value taken by her signal. The expected joint return is then

$$qv_g + (1 - q)v_b - I - e. \tag{1}$$

Third, the entrepreneur expends effort and the investor invests only if $s = s_g$. The expected joint return is then

$$qr(v_g - I) + (1 - q)(1 - r)(v_b - I) - e. \tag{2}$$

(Details of these and other calculations are presented in the Appendix.)

It will be efficient for the entrepreneur to expend effort if and only if either expression (1) > 0 or expression (2) > 0. We shall assume throughout that one or both of these conditions is met—that is, that it is always efficient for the entrepreneur to expend effort. Given this, it will be efficient to condition the investor's investment on the receipt of a good signal ($s = s_g$) if and only if expression (2) $>$ expression (1), which is equivalent to

$$-(1 - q)r(v_b - I) > q(1 - r)(v_g - I). \tag{3}$$

Intuitively, condition (3) states that, for the signal to be worth acting on, the expected value of the bad outcomes avoided by acting on the signal must be greater than the expected value of the good outcomes that are mistakenly rejected.

As we shall demonstrate, this first-best outcome can be achieved through a properly designed contract between the investor and the entrepreneur. But the form that this contract must take will depend on r. For some values of r the parties will wish to leave the investor free to act on her signal—that is, they will contract without hands-tying—or, alternatively, they will wish to postpone contracting until after the entrepreneur has performed and the investor receives her signal. For the values of r in which we are particularly interested, however, the contract must have just the opposite characteristics to achieve a first-best outcome. First, it must be entered into before the entrepreneur expends effort. Second, it must commit the investor to invest regardless of the value taken by her signal—that is, it must tie the investor's hands. In terms of our book-publishing example, this means that the author and the publisher must enter into a contract before the author writes the book and that the contract must commit the publisher to publish the book regardless of the assessment she makes of the book's likely profitability when she reads the completed manuscript.

We establish these two characteristics of an efficient hands-tying contract in reverse order. First, in the remainder of Section 2, we simply assume that the investor and entrepreneur enter into a contract prior to the entrepreneur's expenditure of effort and show when it will be efficient to put a hands-tying term in that contract. Then, in Section 3, we show when and why it is efficient to contract in advance of the entrepreneur's expenditure of effort.

We assume that the investor and entrepreneur cannot write an enforceable contract that is conditioned on outcomes that they cannot both observe. Thus, they cannot condition their contracts on the amount of effort expended by the entrepreneur or on the value taken by the investor's signal. They can, however, condition their contractual commitments on any outcome that is mutually observable. We shall generally not be concerned here with the particular methods by which the terms of contracts are enforced—whether by court-ordered damages and injunctions, by reputation, or by other sanctions. In a simple situation such as that modeled here, a hands-tying provision should be easily enforceable because it will be obvious if the investor violates the provision by refusing to invest. In more complicated settings—as where there are multiple signals of varying reliability that are difficult to distinguish—it may not be feasible to put an enforceable hands-tying provision in a contract. In that case, the parties must either enter into a contract without hands-tying or else forgo contracting entirely. Which of these they should choose depends on whether expression (2) is greater than zero. For the remainder of our analysis, however, we simply assume that hands-tying agreements are always enforceable.

2.2 Contracting with Hands-Tying

We begin by considering the contracts that the parties can make in which the investor ties her hands—that is, commits herself to invest regardless of the value taken by her signal.

The entrepreneur's compensation cannot be directly tied to his (unobservable) effort level. Rather, it can be conditioned only on the observed project outcome, which can be either good or bad. It follows that the only way to motivate the entrepreneur is to give him a share in the returns from good outcomes that is large enough to increase his expected compensation by at least e if he expends effort. (We assume that the entrepreneur's concern for his future reputation is in itself insufficient to induce the efficient level of effort. More precisely, we assume that e reflects the portion of the entrepreneur's effort that cannot be motivated by reputational concerns.)

Let the return paid the entrepreneur be w_g if the realized outcome is good and w_b if it is bad. Because the entrepreneur has no wealth of his own, it is necessary that $w_g, w_b \geq 0$. It follows that the minimum amounts that the investor can pay the entrepreneur and still retain an incentive for the entrepreneur to expend effort are (as demonstrated in the Appendix)

$$w_b = 0, \qquad w_g = e/q. \tag{4}$$

(For simplicity, we assume throughout that the entrepreneur can be induced to contract by offering him terms, such as these, whose expected value just equals his opportunity cost of effort e. Thus, all surplus goes to the investor.[3]) The investor's expected return is then

$$qv_g + (1 - q)v_b - I - e. \tag{5}$$

This is the same as the net social return (1), reflecting the assumption that the investor captures all surplus.

2.3 Contracting without Hands-Tying

Now consider the contracts that can be formed if the investor wishes to retain and exercise the right to reject a project if her signal is bad—that is, if $s = s_b$. In this case, there are three observable results on which the entrepreneur's wage can be conditioned: (a) the investor invests and the outcome is good; (b) the investor invests and the outcome is bad; (c) the investor refuses to invest. Denote the compensation given the entrepreneur in these eventualities, respectively, as $\hat{w}_g$, $\hat{w}_b$, and $\hat{w}_n$, where $\hat{w}_g, \hat{w}_b, \hat{w}_n \geq 0$.

In this case, the minimum terms that can be offered the entrepreneur, subject to the constraint of inducing effort, are

$$\hat{w}_n = \hat{w}_b = 0, \qquad \hat{w}_g = e/qr. \tag{6}$$

(See the Appendix.) Comparison of (6) with (4) indicates that the investor must increase the entrepreneur's return from a successful project by a factor of $1/r$ if she does not tie her hands. This is necessary to offset the expected loss that the entrepreneur would otherwise incur because, by acting on her imperfectly reliable signal, the investor will reject some projects that would have turned out to be good, and the entrepreneur will thus lose his share of the expected returns from those projects. (Since the investor bears all the losses if the project turns out to be bad, the entrepreneur gains nothing from the fact that, by acting on her signal, the investor can reject some projects that would in fact be bad. Thus, for any given wages, the entrepreneur will always be worse off if the investor acts on her signal.)

Given the entrepreneur's terms in (6), the investor's expected return without hands-tying is

$$qr(v_g - I) + (1 - q)(1 - r)(v_b - I) - e, \tag{7}$$

which is equal to the social return (2).

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3. To be sure, in author–publisher contracting, where the most likely source of rents is the author's peculiar genius, most rents may well accrue to the author.

2.4 When Does Hands-Tying Pay?

The investor will be willing to tie her hands if (5) > (7), which is equivalent to

$$-q(1 - r)(v_g - I) < (1 - q)r(v_b - I). \tag{8}$$

This is the same as condition (3), and has the same interpretation. As an aid to analysis, we can rewrite (8) as a condition on the value of r:

$$r < \frac{q(v_g - I)}{q(v_g - I) - (1 - q)(v_b - I)} \equiv r_{max}. \tag{9}$$

That is, given values for q, v_g, and v_b, hands-tying can benefit the investor only when the reliability of her signal is less than the expression on the right-hand side of (9), which we shall term r_{max}.

Condition (9) is, however, only a necessary and not a sufficient condition for hands-tying. A hands-tying provision is important only if, in its absence, the investor would choose to act on her signal. As shown in the Appendix, the investor will ignore her signal in any case unless it has at least the minimum level of reliability given by

$$r > \frac{q(v_g - I) - e}{q(v_g - I) - (1 - q)(v_b - I) - e} \equiv r_{min}. \tag{10}$$

That is, an investor who has not tied her hands will reject a project only when $r > r_{min}$. If $r < r_{min}$, the investor will invest even after observing $s = s_b$ because her signal is too unreliable to prompt her to act on it *despite* her excessive incentive to reject projects.

Written in terms of the reliability of the investor's signal, the necessary and sufficient conditions for a contract to have a strictly larger expected joint surplus when it has a hands-tying term than when it does not are therefore $r_{max} > r > r_{min}$. If r is in this range, then it will be jointly profitable for the investor and entrepreneur if the investor invests in all projects regardless of the value of her signal. Nevertheless, the investor will have an incentive to reject projects for which she receives a bad signal since, in deciding whether to invest, she will have an incentive to ignore the entrepreneur's share of the returns from good projects.

So long as $q,e > 0$, $v_g > I$, and $v_b < I$, it will always be the case that $r_{max} > r_{min}$—that is, there will always be a range of values of r for which hands-tying is worthwhile. Moreover, increasing e, ceteris paribus, reduces r_{min} without changing r_{max} and thus expands the range of values for r for which hands-tying is advantageous. This is because a larger e requires that the entrepreneur be promised a larger share of the returns from a successful project to cover his cost of effort, and hence gives the investor a stronger incentive to reject a project with positive expected joint returns.[4]

4. In this simple model, the contract entered into by the parties will always assure a first-best outcome. That is, the parties will include or omit a hands-tying term in their contract if and only if

Table 1. A Numerical Example of Outcomes Based on Different Actions by Investor

r	(a) Joint Surplus from Ignoring Signal	(b) Joint Surplus from Using Signal	(c) Investor's Surplus from Using Signal After Agreeing Not To
.50	20	−5	10
.60	20	5	17
.64 (r_{min})	20	9	20
.70	20	15	24
.75 (r_{max})	20	20	28
.80	20	25	31
.90	20	35	38
1.00	20	45	45

These results can be illustrated with a simple numerical example. Assume that $e = 30$, $I = 50$, $v_b = 0$, $v_g = 200$, and $q = .5$. Then, from (9) and (10), $r_{max} = .75$ and $r_{min} = .64$. Table 1 shows the surplus potentially available to the parties as r takes different values between .5 and 1. Column (a) gives the joint surplus [expressions (1) and (5)] when the investor invests regardless of her signal. Column (b) gives the joint surplus [expressions (2) and (7)] when the investor invests only on a good signal. Column (c) gives the private surplus [expression (A9) in the Appendix] that the investor would receive if she were to cheat on a hands-tying contract—that is, if she were to reject projects with a bad signal after agreeing not to [so that the entrepreneur's terms of compensation are those given by expression (6)]. Comparing columns (a) and (b), we see that the joint surplus is maximized by ignoring the investor's signal when $r < r_{max}$. Comparing columns (a) and (c), we see that the investor has a private incentive to act on her signal whenever $r > r_{min}$. Thus, for r between r_{max} and r_{min}, a hands-tying contract is necessary.[5] When $r = .70$, the joint surplus increases from 15 to 20, or 33 percent, if a hands-tying contract is used; when $r = .64$, a hands-tying contract more than doubles the joint surplus.

2.5 Application to Publishing Contracts

In applying these results to publishing contracts, we must keep in mind that r should be interpreted not as the reliability of the publisher's overall estimate of a book's likely success, but rather as the reliability of the *refinement* of that ex ante estimate that can be obtained by reading the completed manuscript.

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the resulting contract will induce them to take the actions appropriate to achieve a joint profit maximum. As a consequence, the initial contract is renegotiation-proof: Both when it contains a hands-tying term and when it does not, the parties have no incentive to renegotiate its terms after the investor receives her signal.

5. For $r > r_{max}$, the efficient contract leaves the investor free to act on her signal while adjusting the entrepreneur's terms of compensation to those given by expression (6), so that the investor's private return from acting on her signal is not that given by column (c) but rather the same as the social return in column (b).

With a well-established writer, such as a successful author of popular fiction, a publisher can often make a good forecast of the sales prospects for the author's next book without reading the manuscript. The author's reputation, when combined with general knowledge about the state of the economy and about the types of books that are currently popular, will provide a strong basis for a forecast, both because the author's reputation reflects his skills and ambitions and because that reputation is itself an important reason why people will buy the book. The *additional* predictive accuracy afforded by the publisher's reading of the completed manuscript is likely to be relatively modest.[6] Put in terms of our model, r may be less than r_{max}. Consequently, the author's and publisher's joint profits will be maximized by deciding whether and how much to invest in printing and promoting the book without regard to the publisher's impressions from reading the manuscript. Yet, if the publisher's hands are not tied in this regard, her reading of the manuscript may well leave her with an incentive either to refuse to publish or, more likely, to invest less in printing and promotion than is required for maximum joint profitability.[7] (Where, as is common in publishing, the contract does not call for the publisher to invest a fixed amount I in printing and promotion, as is assumed in our model, but rather gives the publisher some discretion over the size of the investment, the model is best interpreted as applying to the publisher's decision whether to invest another dollar at the margin, and hence to the publisher's decision about *how much* to invest.)

With an unestablished author, on the other hand, the publisher's reading of the completed manuscript will generally permit an important refinement in her estimate of a book's likely success. Indeed, it may be her only source of information. In terms of the model, $r > r_{max}$. A hands-tying contract would therefore require that valuable information be discarded.

In short, as an author's reputation grows, the reliability of the incremental predictive information that a publisher obtains from reading the author's manuscripts declines. It is therefore not surprising that hands-tying provisions are generally found only in contracts with well-established authors and that, as discussed further in Section 4, these provisions grow stronger in proportion to the author's reputation.

Finally, to avoid confusion, it is important to note that the variable q in our model, which gives the probability of a good outcome v_g, *cannot* be interpreted as an index of how well established an author is. Rather, as seen in

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6. Contrary to popular wisdom, large advances offered to prominent authors are regarded by insiders as among the least risky publishing investments (e.g., Turbide:52; Nixon). As one commentator observes of authors such as James Clavell, Stephen King, Tom Clancy, and Danielle Steel: "In a business of no guarantees, they are guaranteed" (Nixon:16). "Mid-list" authors are regarded as riskier investments by publishers, despite their far lower advances, and first-time authors are seen as riskier still.

7. Moreover, this problem will be accentuated if the strong salience of a completed manuscript tempts publishers who have not tied their hands to give too much weight to their reading of the manuscript, and too little to the author's general reputation, in estimating the likely success of a published book.

conditions (3) and (8), q has meaning only in relation to the relative magnitude of the other variables I, e, v_g, and v_b, all of which will be quite different for established versus unestablished authors.

2.6 The Role of Moral Hazard

The model developed here assumes double moral hazard: The entrepreneur's effort is unobservable by the investor and the investor's signal is unobservable by the entrepreneur. Moral hazard on the part of the entrepreneur is not necessary to motivate hands-tying, however.

In our model, the assumption that the entrepreneur's effort is unobservable is important only because it provides a reason for compensating the entrepreneur with a share of gross receipts rather than with a fixed wage. It is this sharing of receipts—or, more particularly, the *asymmetric* sharing of receipts that results from the entrepreneur's wealth constraint and the sequential character of the entrepreneur's and the investor's investments—that creates the incentive for hands-tying. Consequently, any other consideration that necessitates such a division of realized receipts would serve the same function as the entrepreneur's moral hazard does in our model.

Moral hazard is, in fact, probably the most common reason why publishing contracts, and the other types of contracts discussed in Section 5, provide for sharing of receipts. There may, however, be other reasons as well. For example, in the oil and gas limited partnerships discussed in Section 5, tax considerations, rather than the need to motivate the entrepreneur, induce the asymmetric sharing of returns that motivates hands-tying. Risk aversion on the part of the investor could also provide a reason for sharing realized returns.

Moral hazard on the part of the *investor*, however, does play a critical role in motivating hands-tying. Indeed, it is precisely the role of a hands-tying provision to eliminate the investor's moral hazard by having her commit in advance not to act on her signal. If the investor's signal were observable by the entrepreneur, a hands-tying contract would be unnecessary. The parties could simply wait until after the entrepreneur had performed and the investor had received her signal before contracting. The entrepreneur could then insist on a larger share of receipts when the signal is good than when it is bad. Such an effort to contract after the entrepreneur expends effort will not provide an adequate solution when the investor's signal is unobservable, however, as the following section shows.[8]

3. Why Contract Before the Investor Receives Her Signal?

We have assumed so far that the entrepreneur and the investor contract *before* the investor receives her signal. If this were not the case, there would be no

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8. Where, for reasons such as those suggested at the beginning of Section 3, there are reasons for the investor and entrepreneur to contract in advance of the entrepreneur's effort that are unrelated to the unobservability of the investor's signal, it is sufficient to motivate hands-tying that the investor's signal simply be *unverifiable* to a third party and hence unavailable as a basis for an enforceable contract; the signal need not also be unobservable to the entrepreneur.

occasion for hands-tying. Thus we must ask: Why not wait? In the case of book publishing, for example, why not enter into a contract after the book has been written and the publisher has read the manuscript (as is, in fact, usually done with unestablished authors)?

There are incentives for contracting in advance of the entrepreneur's effort that are unrelated to the specific assumptions of our model. For example, a book publisher may wish to capture the returns from contributing editorial services during the writing of a book by committing the author in advance to a lower rate of royalties upon the book's publication. Or an author may wish to borrow funds to support himself while writing his book and, given that the loan must be secured by the publishing rights to the book, a publisher—who is in a better position than a bank to assess the prospects for the book and to levy on its receipts—may be the least-cost lender. Or an author may simply be risk averse and wish to have the publisher bear more of the risk that the author's efforts at writing will turn out poorly.

There is, however, another incentive for contracting in advance that is closely related to the considerations that motivate hands-tying. To understand that incentive, let us return to our model. However, rather than assuming, as we did earlier, that the contract is written before the entrepreneur expends effort, suppose now that the entrepreneur develops the project first, without a contract, and subsequently seeks to deal with the investor. The investor can therefore observe her signal before entering into a contract with the entrepreneur.

We focus on the case in which $r_{min} < r < r_{max}$. We have already shown that, in this case, *if* a contract is written in advance of the investor's signal, hands-tying is worthwhile. We now show that the investor and the entrepreneur also have an incentive to write the contract in advance of the signal. We first consider the situation in which, as before, there is only a single entrepreneur and a single investor; we then consider the situation in which there are many competing investors.

3.1 Single Investor and Entrepreneur

Given that $r_{min} < r < r_{max}$, it is jointly profitable for the entrepreneur to expend effort and for the investor to invest in all projects regardless of the value taken by her signal. If the investor and entrepreneur contract after the investor receives her signal, however, the only contract terms on which they will be able to agree will induce the investor to invest only in projects on which she receives a good signal. Consequently, contracting will be inefficient and the parties, recognizing this, will have an incentive to write their contract in advance of the investor's signal.

To see this, assume the contrary—that is, that there exist contract terms that will induce the entrepreneur to expend effort and that will induce the investor to invest in projects that produce bad as well as good signals. Since the investor can observe her signal before contracting, she has the opportunity to select different contract terms depending on the value of her signal. Denote by (w_g^g, w_b^g) the contract terms agreed to when the investor's signal is good (the good-signal contract), where w_g^g (w_b^g) is the payment that the entrepreneur receives when the outcome of the project is good (bad). Similarly, denote by

(w_g^b, w_b^b), the payment terms offered by the investor when her signal is bad (the bad-signal contract).

These terms must be chosen so that the entrepreneur's expected returns from developing a project are sufficient to cover his cost of effort, that is,

$$p^g[q^g w_g^g + (1 - q^g)w_b^g] + p^b[q^b w_g^b + (1 - q^b)w_b^b] = e, \tag{11}$$

where p^g (p^b) denotes the probability that the investor will get a good (bad) signal on a randomly selected project, and q^g (q^b) denotes the probability that a project will have a good outcome given that the investor gets a good (bad) signal. (As before, we assume for simplicity that all rents go to the investor.)

It is necessary that $w_b^g = w_b^b = 0$; otherwise, the entrepreneur would have a positive expected return from contracting even if he expended no effort. He would therefore have no incentive to expend effort, and the contracts would represent an expected loss for the investor. Thus (11) reduces to

$$p^g q^g w_g^g + p^b q^b w_g^b = e. \tag{12}$$

Both the bad-signal contract and the good-signal contract must have positive expected value for the investor. It is easy to show (see the Appendix) that this implies that $w_g^g > w_g^b$. It follows, in turn, that the bad-signal contract $(w_g^b, 0)$ has lower expected value for the entrepreneur—and less expected cost for the investor—than does the good-signal contract $(w_g^g, 0)$ whatever the likelihood of a good versus bad outcome. Since the entrepreneur cannot observe the investor's signal, the investor therefore has an incentive to behave opportunistically, telling the entrepreneur that the signal is bad, and offering the entrepreneur the lower-valued bad-signal contract, even when the signal is good. But this means that the entrepreneur's expected return from developing a project will be, instead of (12),

$$p^g q^g w_g^b + p^b q^b w_g^b < e. \tag{13}$$

Recognizing this in advance, the entrepreneur will have no incentive to develop a project and seek a contract, and thus no projects will be undertaken, contrary to our initial assumption.

Thus, if contracting takes place only after the entrepreneur expends effort, there is no set of contract terms that provide efficient incentives for both the investor and entrepreneur.

It *is* feasible for the investor and entrepreneur to enter into contracts after the entrepreneur expends effort. In particular, so long as $r > r_{min}$, the investor and entrepreneur will both have an incentive to agree on the terms $w_g^g = e/p^g q^g$ and $w_b^g = 0$ when the investor gets a good signal and no contract when she gets a bad signal. These terms will be sufficient to induce effort by the entrepreneur. And they will be efficient terms in general when $r \geq r_{max}$. But they will result in the inefficient failure to invest in projects that yield bad signals when $r_{min} < r < r_{max}$.

It follows that, if $r_{min} < r < r_{max}$, the investor and entrepreneur can

contract efficiently, and thus maximize their joint return, only by contracting in advance of the investor's signal—and by writing a contract that commits the investor to invest regardless of her signal. In theory, it would be possible to write this contract after the entrepreneur expends effort. But by writing the contract *before* the entrepreneur expends effort it is easier to be certain that the investor has not examined her signal before deciding whether to sign. In book publishing, for example, the best way to guarantee that a publisher has not evaluated the manuscript before contracting is to sign the contract before the manuscript exists.

In short, the reason for contracting in advance of the entrepreneur's effort is the same as the reason offered in Section 2 for putting a hands-tying provision in the contract. Given that the entrepreneur must be compensated with a share of profits, the investor has an incentive to use her signal to reject some projects that represent efficient investments. Both parties will therefore prefer to remove this incentive by committing the investor in advance to invest regardless of her signal.

3.2 Many Investors and Entrepreneurs

It might be objected that the preceding analysis depends on the assumption that the entrepreneur can deal with only a single investor. In a more realistic world of multiple investors, perhaps competition would eliminate the investors' opportunism. If the first investor approached by an entrepreneur were to report a bad signal and offer commensurately unremunerative contract terms, the entrepreneur could take the project to a second or third investor. If in fact the project had yielded a good signal to the first investor, other investors would be likely to receive a good signal too and would have an incentive to bid honestly for the project.

There is force to this argument. But the desired competitive result requires a substantial amount of valueless activity that can be eliminated simply by contracting in advance of the entrepreneur's effort. To see this, return to the model under the assumptions made in Section 3.1, but assume now that (a) there are large numbers of both investors and entrepreneurs, (b) it is costless for an entrepreneur to submit a developed project to as many investors as he wishes and (as before) it is costless for an investor to examine her signal for any given project submitted to her, (c) the signals received by different investors for a given project are independent draws from the same distribution, and (d) an investor cannot know how many other investors have examined a project that has been submitted to her.

With these assumptions, there *does* exist an efficient equilibrium in which investors and entrepreneurs contract after the entrepreneur expends effort. In that equilibrium, each investor (i) examines her signal on every project submitted to her, (ii) offers contract terms ($\hat{w}_g^g = e/q$, $\hat{w}_b^g = 0$) for any project on which she receives a good signal, and (iii) offers contract terms ($\hat{w}_g^b < e/q$, $\hat{w}_b^b = 0$) for any project on which she receives a bad signal. At the same time, each entrepreneur (i) expends effort on developing each project for which he seeks to get a contract, (ii) accepts only contracts with terms ($\hat{w}_g^g = e/q$, $\hat{w}_b^g = 0$), and (iii) continues to resubmit a given project to addition-

al investors until an investor receives a good signal and offers the terms ($\hat{w}_g^g = e/q$, $\hat{w}_b^g = 0$). With these strategies, all projects will be undertaken on the terms ($\hat{w}_g^g = e/q$, $\hat{w}_b^g = 0$) since, sooner or later, even a bad project will yield a good signal to some investor. All investors, moreover, will end up accepting a random draw of projects even though they are only undertaking those for which they get good signals.

The same pattern of contracts would result if all investors simply ignored their signals and offered the terms ($w_g = e/q$, $w_b = 0$) for all projects submitted to them. The latter behavior would not, however, constitute an equilibrium. Each investor would have an incentive to deviate by looking at her signal and declining (or offering less favorable terms for) those projects for which her signal is bad. In this way she could secure for herself a disproportionate share of good projects, increasing her expected profits at the expense of the other investors. The reverse logic shows why the behavior described in the preceding paragraph *is* an equilibrium. For if any individual investor were to deviate from that behavior by ignoring her signal and simply offering ($w_g = e/q$, $w_b = 0$) for all projects submitted to her, she would attract to herself a disproportionate share of bad projects and incur a loss.

In sum, when contracting takes place after the entrepreneur develops the project rather than before, competition can avoid the inefficiencies of contracting that result when, as in Section 3.1, there is only a single investor and entrepreneur. As a consequence, an efficient contracting equilibrium is feasible. In this equilibrium, entrepreneurs commonly submit their project to multiple investors before having it accepted and investors examine signals on more projects than they finance. Yet, in the end, all projects are undertaken on the same terms that would be agreed to if each entrepreneur were simply to enter into a hands-tying contract with an investor prior to developing his project. Thus, efficiency is obtained in this equilibrium only through redundant submissions by entrepreneurs and valueless examinations of signals by investors. Under our assumption of zero transaction costs, all this activity costs nothing. But the analysis nevertheless illustrates the critical point: If contracting takes place only *after* project development by the entrepreneur, then there are strong incentives for repeated readings of signals that have no information value.

If, more realistically, repeated submissions and readings of signals are costly, there is strong reason for contracting in advance of the entrepreneur's effort. Otherwise, avoidable transaction costs will be incurred and some worthwhile projects might not be produced.[9] Moreover, at least in this simple

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9. As the number of rejections received by an entrepreneur increases, the entrepreneur will reduce his estimate of the probability (which before the first submission equals q) that his project is good. If the costs of submission are positive, at some point the probability of having a good project, and thus the entrepreneur's expected returns from that project, may drop below the level that justifies incurring the costs of further submissions. Indeed, if transaction costs are high enough, it will not pay an entrepreneur to make even a first submission, and thus no projects at all will be undertaken. Yet, since we are assuming here that $r_{min} < r < r_{max}$, all projects are worth undertaking if transaction costs can be avoided—as they can if contracting takes place in advance.

model, contracting in advance yields a first-best outcome and thus brings no counterbalancing inefficiencies.[10]

4. More about Publishing Contracts

Thus far we have employed a stylized account of contracting between authors and publishers to illustrate circumstances in which the simple hands-tying contract of our model might arise. In this section we demonstrate that many terms of actual publishing contracts can be understood as responses to the incentives analyzed in our model.

4.1 Advances

Established authors generally contract with publishers to receive generous advances against royalties[11] on the basis of a brief outline or sketch of a prospective manuscript. Indeed, sometimes the subject matter of the book is left undetermined at the time of contracting,[12] while in other cases the contract is for multiple books, only the first of which has reached the proposal stage.[13]

Although large advances in such circumstances have been explained as a means of covering the author's expenses while he writes, or as a means of reducing the author's risk, these functions alone seem insufficient to account for either the magnitude or the structure of advances. Large advances generally go only to established authors, who are too prosperous to need immediate cash or to be highly risk averse. Moreover, advances generally are not paid in full when the contract is signed. Rather, it is common either to pay half then and the other half upon submission of the completed manuscript, or to pay one-third on signing, one-third on submission, and one-third upon publication. These are not payment schedules designed to sustain starving authors while they write.

A more convincing explanation for advances is that they serve to mitigate the publisher's incentive to underinvest. A publisher who has paid a substantial advance against the author's royalties receives 100 percent of the returns from publication, rather than sharing them with the author, up to the point at which enough copies have been sold to earn back the advance. Therefore, when deciding whether—or, more importantly, how much—to invest in

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10. Contracting in advance of completion therefore performs a role here roughly analogous to the devices for controlling oversearching, explored in Kenney and Klein.

11. Standard royalty rates for hardcover books are 10 percent for the first 5,000 sales, 12.5 percent for the next 5,000, and 15 percent thereafter (Beil:153). These rates apply to adjusted gross returns and involve a substantially larger share of net returns. In addition, authors receive a return in the form of reputational enhancement, which in general is also positively correlated with sales.

12. Thus thriller writer Ken Follett recently obtained a $12.3 million advance for two novels about subjects "still to be determined" (Nathan:9), while Marlon Brando received a $3.5 million advance for contracting to write an autobiography without offering a written proposal (Feldman, 1991:64).

13. The best-known example is Stephen King's recent contract to write four novels for Penguin USA for a reported $35 million advance (Turbide:52).

printing and promotion, the publisher will balance the costs of that investment, not just against her share of the returns from publication, but rather against that share *plus* the author's share up to the amount advanced. Indeed, literary agents often remark on the importance of a large advance in motivating publishers to invest heavily in promotion and a big first printing (e.g., Nixon:17; Reid:14).

In the extreme, the advance could be made equal to the author's full expected return. This would essentially be equivalent to having the publisher purchase the full rights to the book from the author for a fixed sum. This would entirely eliminate the publisher's incentive to underinvest. But it would also remove all of the author's incentive to expend (unobservable) effort in writing the book. Therefore advances must be calculated to balance two competing objectives: giving the publisher a stronger incentive to invest, while not cutting too deeply into the author's incentives to write a successful book. [14]

Presumably the reason why advances are paid in full only after delivery of the completed manuscript is to discourage the author from abandoning the book entirely or missing important deadlines (that is, from failing to expend *observable* effort). [15]

4.2 Commitments to Publish

While large advances tie the publisher's hands indirectly by reducing the incentive to underinvest, other provisions of the publishing contract tie the publisher's hands directly.

Standard publishing contracts differ in the extent to which they commit the publisher to publish the author's completed manuscript. Two clauses are relevant here: the "obligation to publish" clause and the "satisfactory manuscript" clause.

The obligation-to-publish clause sometimes clearly states that the author's only recourse if the publisher declines to publish is to retain his advance. In effect, such an agreement relies exclusively upon the advance to limit the publisher's incentive to abandon mutually valuable manuscripts (Lindey:1–57). More frequently, however, the obligation-to-publish clause does not limit the author's remedies to retention of the advance. In this case, although the clause is often ambiguous on its face as to whether it gives the author the right

14. Publishers must worry about the effort invested even by established authors. For example, publishers commonly offer prominent authors bonuses when books rise to the upper reaches of the best-seller lists (Turbide:52) and give lower advances, offset by higher royalty rates, when authors' past books have yielded disappointing results (Feldman, 1989:42).

15. Conversely, there are advantages to having at least *some* of the advance paid upon signing the contract. For one thing, it discourages publishers from breaching before or at the time of the author's completion of the manuscript by providing, in effect, minimal liquidated damages for the author (for whom a suit against the publisher for specific performance or even damages may be unavailable or impractical). For another, it puts publishers in a much stronger position, as a practical matter, to enjoin the author from contracting with another publisher for the same book rather than fulfilling his initial contract.

to insist upon publication,[16] it is conventionally understood to do so in the industry.[17] Such a clause, therefore, is effectively a hands-tying provision, regardless of whether it is enforced primarily by the threat of lawsuit or by reputational sanctions.[18]

Yet the commitment to publish is conditioned on the author's submission of an acceptable manuscript under a second provision, the satisfactory manuscript clause, which commonly requires a completed manuscript that is "satisfactory in form and content [to the publisher]." Like the obligation-to-publish clause, this clause is ambiguous. At one extreme, it can be interpreted to require simply that the completed manuscript meet an "objective" standard of professional competence (e.g., House; Fowler). At the other extreme, it has been interpreted to give the publisher legal authority to reject any manuscript at will (Reid). Under the latter reading, of course, the publisher's hands would not be tied as a legal matter, and a publisher who finds a manuscript "unsatisfactory" might even be able to recover advance payments already made to the author under some formulations of the satisfactory manuscript clause (Reid).

Publishers have strongly resisted efforts by the Authors Guild to eviscerate the satisfactory manuscript clause by deleting from it any reference to the "content" of the manuscript (Reid). Thus, even prominent authors apparently face some risk that publishers will reject their manuscripts. However, it also appears that reputable publishers invoke the satisfactory manuscript clause against established authors only in egregious cases.[19] Whatever its possible legal construction, this clause is understood by agents and publishers as protecting only against an obligation to publish wholly "unpublishable" work rather than as a broad license to reject manuscripts of marginal economic promise (Reid).

In practice, then, the satisfactory manuscript clause merely imposes an outer limit on the publisher's hands-tying commitment. This limit can be easily understood through an alternative interpretation of the investor's signal in our model. We assumed in Section 2 that the signal (here the publisher's reading of a manuscript) has a fixed reliability of r that is known ex ante. Alternatively, however, we could assume that the reliability of the investor's signal is variable and that when the investor receives her signal, she receives

16. The Random house form contract, for example, merely states that the publisher "shall publish" a delivered manuscript satisfying the conditions of the contract. (Lindey:1-17). An alternative provision (Lindey:1-56) allows the author to retain his advance in the event of a failure to publish "without prejudice to any other remedies he may have."

17. Interview with Kathy Saideman, agent with Sandra Dijkstra Literary Agency.

18. We are not concerned here with *how* the commitment to publish is enforced but with *whether* it is enforced. The fact that this clause is commonly accepted as binding is evidence that it is enforced. Although no court has ordered the publication of a manuscript based on such a clause, it has been held that authors can recover their expected royalties as measured by publishers' projections or the performance of comparable books (Lindey:1-19).

19. Thus, one prominent editor claims to have rejected a manuscript under this clause only once during his publishing career (Reid). Our conversations with representatives of a trade publisher and a literary agency confirmed that the clause is rarely invoked.

two pieces of information: The first is a prediction, $s = s_g$ or $s = s_b$, about the outcome of the project, and the second is an indication, r, of the reliability of the prediction. The investor would then have an incentive to reject projects whenever $r > r_{min}$, which would lead to inefficient outcomes whenever $r_{min} < r < r_{max}$. This means that the parties would have an incentive to write a hands-tying contract binding the investor to ignore her signal unless $r > r_{max}$. A natural interpretation of the satisfactory manuscript clause is that it establishes an r_{max} above which the publisher is free to act on her negative signal.

4.3 Further Hands-Tying Provisions

The obligation-to-publish clause merely commits the publisher to print the book in some fashion, leaving the publisher free to determine the magnitude of her investment. Consequently, established authors sometimes obtain further contractual commitments from the publisher fixing the publisher's minimal expenditure on promotion or even the size of the first printing (Lindey:1–19; Bunnin:36–7).[20] Similarly, authors seek assurances that their books will remain in print and will not be placed on remainder lists prematurely (Bunnin:45–7). Indeed, even in the absence of such provisions, courts are sensitive to publishers' incentives to "privish" books—that is, to "mount a wholly inadequate merchandising effort after concluding that a book does not meet prior expectations"[21]—and therefore impose a minimal good-faith obligation on publishers to allow books "a reasonable chance of achieving market success."[22]

4.4 Television Program Development

In the entertainment industry, network commitments for the development of television comedy or drama series also reflect the importance of established track records for hands-tying contracts. Typically, the "concept" for a new series is offered—or "pitched"—to a network by a team that includes a producer, a writer, and occasionally acting talent as well. The network must then decide whether, and how far, to finance the development of the series.[23] Most producers and writers receive at most limited funding for script develop-

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20. Informal inquiries suggest that promotional guarantees begin to appear when authors' advances are in the range of $50,000 to $100,000. Promotional plans and print runs are among the key features of the "packages" offered by competing publishers when top authors put up their prospective books for auction (Turbide:53).

We recognize that there may be other incentives, unrelated to those explored here, for an author to seek a promotional budget commitment. In particular, some of the benefits from promoting an author's current book may spill over onto other books that the author publishes in the future, and thus redound to the benefit of the author but not the publisher. Such promotional spillovers among books may be one reason why publishers and authors find it attractive to sign multi-book contracts.

21. *Zilg v. Prentice-Hall, Inc.*, 717 F.2d 671, 676 (2d Cir. 1983) (Winter, J.).

22. *Id.* at 680. The *Zilg* opinion explicitly notes the asymmetric stakes facing publishers and authors. *Id.* at 679.

23. Interview with Lorna J. Soroko, Vice President, Adam Productions, Inc.

ment in exchange for granting the network the right to license the prospective series. Such an arrangement is a contract without hands-tying, since it gives little assurance that a developed script will, after inspection, lead to actual filming, much less to a slot in the network's programming. In contrast, better-established producers and writers may obtain not only funding for script development but also an advance commitment for the filming of a pilot episode of the proposed series. Moreover, the best-established producers or superstar actors can sometimes obtain a multimillion dollar, multi-episode commitment from a network without first presenting either a script or a pilot episode (Rosenbloom:117).[24] Once a network has invested heavily in such a multi-episode commitment, its incentive to give the series the air time necessary to become profitable is greatly enhanced. Thus, the multi-episode commitment plays a hands-tying role similar to a guaranteed promotional budget or print run in the publishing industry.

5. Some Additional Applications

Publishing is just one of many settings in which hands-tying appears. We focus here briefly on several others.

5.1 Venture Capital Financing

One example is the standard financing arrangement between a venture capitalist and the founder or entrepreneur of a start-up firm. Here the firm itself is the project. The entrepreneur, like the author in the publishing example, contracts with the venture capitalist to expend effort in developing a novel product; and the venture capitalist, like the publisher, undertakes to finance the entrepreneur's efforts. The agreement between the parties typically provides for the entrepreneur to receive common stock that gives him a portion of the profits in case the firm succeeds, thus creating a strong incentive for effort. The venture capitalist, in turn, is commonly issued convertible preferred stock that, while also providing her with a share of the profits if the firm succeeds, gives a superior claim on remaining assets if the firm fails. Given that the venture capitalist provides all of the firm's financing, one might expect her to retain voting control so that she can limit her losses by liquidating the firm should subsequent information suggest an increased likelihood of its eventual failure. Yet retaining such control would be equivalent to a contract without hands-tying in the publishing example. Because the venture capitalist bears all the risk that remaining assets will be lost if the firm fails, but receives only a portion of the gains if the firm succeeds, she has an excessive incentive to abandon the firm and salvage any remaining assets upon receipt of unfavorable information—much like a disappointed publisher might wish to abandon a manuscript on the basis of an unfavorable reading.

This is presumably important in explaining why venture capitalists often do not receive voting control over start-up firms, even when they require some

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24. For example, Bill Cosby and his agent, the William Morris Agency, received a seven-episode predevelopment commitment from NBC for "The Bill Cosby Show" without any prior script development (Katzman and Soroko:7).

representation on the board. The financing agreement generally leaves the founder with a control block of common stock that carries the power to manage the firm (Larson:208; Hewitt and Ruhm:194–5). The preferred stock issued to the firm's investors typically carries voting rights but lacks sufficient votes to dismiss the founder or control decision-making. In short, the investors' hands are tied.[25]

A hands-tying motive in the allocation of control over start-up firms may also be found in other provisions of venture capital financings that limit investors' exposure to loss by adjusting the size of capital contributions. For example, entrepreneurs sometimes allow investors to choose between funding ·a firm's entire business plan at a low share price or funding only the initial stages of the plan at the low share price with the option to purchase additional shares somewhat later at a higher price (Clayton:37). In effect, this strategy offers a choice between contracting with or without a hands-tying commitment. If the investor funds the entire business plan by purchasing cheap shares at the outset, she cannot withhold investment from the plan's later stages on the basis of unfavorable information; her hands are tied. If instead the investor funds only the plan's initial stages, she retains the right to withhold funds from its later stages—and thus retains an informal veto over the project—but only upon agreeing to pay a higher total price for the same ownership interest in the firm if future information indicates that the project is likely to succeed. In this case she contracts without hands-tying, regardless of the formal allocation of voting control.[26]

5.2 Venture Capital Firms

An even more conspicuous form of hands-tying appears in the structure of the limited partnerships formed to *supply* venture capital financing. The general partners in these firms are individuals who, though supplying only around 1 percent of the firm's capital, have nearly complete operating control over the partnership, including choice of the start-up firms in which to invest the partnership's funds. The institutions and individuals who provide the bulk of the partnership's funds, in turn, are limited partners who commit themselves at the outset to maintain their investment for the life of the partnership, which is typically 10 years, and are subject to a substantial penalty for withdrawal, commonly including forfeiture of one-half of their capital account (Sahlman:490–1).

25. The venture capitalists' preferred stock commonly has the right to additional votes— enough to establish control over the firm—if and when the firm fails to meet certain specified performance objectives. This voting trigger, which limits the extent to which the venture capitalists' hands are tied, might be analogized to the satisfactory-manuscript clause in publishing contracts.

26. In many start-up firms it is anticipated that the venture capitalists will invest additional funds at several points during the firm's early development. The hands-tying motive may shed light on the timing or number of financing stages. Ideally, new capital will be required—and hence the venture capitalists will have an effective veto—only when available information has become sufficiently reliable to allow investors to make a jointly optimal decision about whether to proceed (i.e., when $r > r_{max}$).

These firms closely follow the structure reflected in our model. The general partners (corresponding to the entrepreneur in our model) identify and oversee the start-up firms to which the partnership contributes capital. As compensation, they receive, beyond a base salary, a share—generally between 15 percent and 30 percent—of the firm's profits (Sahlman:491). This compensation structure is presumably arranged to provide strong incentives for the general partners to expend effort in locating attractive investments and monitoring them well. Allowing the limited partners (the investor) discretion to withhold or withdraw at will the funds they have promised would invite them to neglect the general partners' share of prospective profits when deciding whether to continue. That is, the limited partners might withdraw their investment when the prospects of the partnership as a whole, or of specific individual investments, appeared insufficient to provide the limited partners with an adequate return, even though the returns remained attractive for the partnership as a whole.[27]

5.3 Oil and Gas Limited Partnerships

By contrast with venture capital firms, in limited partnerships formed for oil and gas exploration it is the general partners rather than the limited partners who must have their hands tied to prevent them from underinvesting.

For tax avoidance purposes, oil and gas partnerships are commonly structured so that the limited partners supply all of the capital for the initial drilling of a well while the general partners who control the firm provide all the capital for the final completion stage in which the well is brought into production. The gross returns from a completed well, however, are divided between both types of partners. As a result, the general partners have a considerably larger share in the costs than in the returns from completion of wells. Not surprisingly, there is evidence that these firms often fail to complete a well when it appears, after the initial drilling, that the well will be only marginally profitable overall and thus not profitable at all for the general partners themselves.

In an effort to attract investors as limited partners on favorable terms, general partners seek, through reputation and otherwise, to bond themselves to the limited partners not to be influenced by this incentive for undercompletion but rather to make the investments necessary to complete all wells that promise to be jointly profitable for the partners as a group (Wolfson). In short, they seek to tie their hands.

5.4 Secured Debt

Each of the preceding applications closely tracks the structure of our model. In particular, all involve two parties who invest sequentially rather than simultaneously. (In some cases, of course, the first party's investment is in the form of labor.) This sequencing of investments is not, however, necessary to create the incentive for rejecting efficient projects that hands-tying agreements seek

27. The restrictions on the ability of the limited partners to withdraw might also seem to be justified by the probable illiquidity of the partnership's investments. But, if this were their only function, there would be no need to bar the limited partners from withholding or withdrawing their investments in the partnership not just as individuals but also as a group.

to control. There is a much broader class of situations that give rise to the same basic problem—namely, how much control over a project to give to a party who participates disproportionately in losses as opposed to gains. An important example from this broader class is the choice between secured and unsecured debt.

A lender can obtain substantial control over the investment policies of a borrowing firm by requiring stringent loan covenants, by taking a security interest in the borrower's assets, or both. In particular, a security interest can effectively permit the lender to exercise a veto over any attempt by the borrower to liquidate existing assets in order to switch to new lines of activity. It will also limit the firm's ability to turn to other lenders to fund new investments, since the firm will be unable to offer its existing assets as security to the new lender. Moreover if, as is common, the security interest is accompanied by stringent loan covenants that allow the lender to declare the borrower in default more or less at will, a secured lender may obtain an effective veto over almost any aspect of the borrower's business (Scott:925–9).

This type of control has the often-noted advantage of preventing the borrower from opportunistically substituting riskier lines of business for safer ones at the lender's expense (Smith and Warner).[28] But, at the same time, it can induce the inverse problem. Since a lender participates less in the firm's upside gains than in its downside losses, she has an incentive to be excessively conservative in permitting the borrower to enter new, jointly profitable lines of business. Thus secured or covenanted debt comes at a potential cost (Scott:929). Presumably this helps explain why unsecured debt is often issued even by firms that have assets that could be pledged as security. In effect, secured or heavily covenanted debt functions as investment without handstying while long-term debt that is free of such restrictions ties the lender's hands by permitting the debtor to continue, expand, or alter its projects without the lender's consent. Thus, though the microstructure of this situation differs slightly from that in our model—here the two parties invest simultaneously and the signal involves the likely outcome of a new project rather than the original one—the basic issues remain the same.

The observed pattern of secured debt is, in fact, roughly what would be predicted from our analysis. Secured debt is typically extended to small firms, start-up businesses,[29] and distressed firms, while large and established busi-

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28. Security interests also have the unrelated benefit of creating clear priorities among a firm's various creditors, thus mitigating the common pool problem in which creditors have an incentive to race to foreclose prematurely on the firm's assets once it faces some possibility of insolvency (Schwartz; Picker).

29. We noted earlier that venture capitalists often tie their hands in start-up firms to the extent of taking preferred rather than common stock. This is not inconsistent with the fact that lenders in new firms commonly do not tie their hands. The amount of hands-tying in both cases must be considered in relation to the other forms of protection available to the investors. The venture capitalist, for example, ties her hands only for the period of time between financing stages, and may also protect herself with specific performance criteria that serve as contractual triggers for her intervention. Thus, even with her hands tied, the venture capitalist holding preferred stock may be protected against opportunism as well as is the holder of secured debt in an equivalent firm.

nesses commonly obtain unsecured debt without restrictive covenants (Scott:940–1). Put in terms of our model, for established businesses, as for established authors, the reliability of the lender's signal may be insufficient to justify giving her the discretion to act on it.[30]

6. Conclusion

It might at first seem implausible that an investor would find it in her interest to enter into a contract whereby she agrees to discard subsequent information about the prospects for a project she is financing. Nevertheless, contracts of this type are relatively common. We have examined here one circumstance under which such contracts can be efficient—namely, when the returns to the investor and the entrepreneur from their joint activity are, as they must often be, asymmetric.

Appendix

A.1 Efficient Outcomes

To compute expression (2), note that when the investor uses her signal—situation (c) in the text—there are four possible cases as shown in columns (a)–(e) of Table 2. In case (i), the outcome will be good and the investor's signal accurately takes the value s_g. The ex ante probability of this result, as of the time that the investor contracts with the entrepreneur, is $p(v = v_g) \cdot p(s = s_g | v = v_g) = qr$. The investor will invest (since $s = s_g$), and the return from the investment will be v_g. In case (ii), $v = v_g$ but the investor's signal inaccurately takes the value s_b. Cases (iii) and (iv) follow similarly. Adding across the four cases, we get expression (2).

A.2 Contracting with Hands-Tying

To prove Equation (4), note that if the entrepreneur expends no effort, the outcome will always be bad and his expected return will be w_b. If, alternatively, he expends effort, his expected return will be

$$qw_g + (1 - q)w_b - e. \tag{A1}$$

To motivate the entrepreneur, it is necessary that expression (A1) $\geq w_b$, that is,

$$q(w_g - w_b) \geq e. \tag{A2}$$

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30. The hands-tying model may also describe participation or loan commitment agreements offered by lenders to would-be borrowers to cover the period in which borrowers assemble loan documentation and attempt to meet pre-closing conditions. Presumably because lenders have an excessive incentive to renege on such commitments upon discovering unfavorable information, courts are sometimes skeptical of lenders who refuse to honor their commitments because borrowers failed to meet pre-closing conditions. See, for example, *Penthouse International Ltd. v. Dominion Federal Savings and Loan Ass'n,* 665 F. Supp. 301 (S.D.N.Y. 1987), rev'd 855 F.2d 963 (2nd Cir. 1988).

Table 2. Returns when Investor's Signal Is Employed

	(a)	(b)	(c)	(d)	(e)	(f)	(g)
						Entre-	
	Project	Signal	Ex Ante	Investor	Project	preneur's	Investor's
Case	Value	Value	Probability	Invests?	Return	Return	Return
(i)	v_g	s_g	qr	yes	$v_g - I$	$\hat{w}_g$	$v_g - I - \hat{w}_g$
(ii)	v_g	s_b	$q(1 - r)$	no	0	$\hat{w}_n$	$-\hat{w}_n$
(iii)	v_b	s_b	$(1 - q)r$	no	0	$\hat{w}_n$	$-\hat{w}_n$
(iv)	v_b	s_g	$(1 - q)(1 - r)$	yes	$v_b - I$	$\hat{w}_b$	$v_b - I - \hat{w}_b$

The investor wishes to minimize the expected payments to the entrepreneur,

$$qw_g + (1 - q)w_b, \tag{A3}$$

subject to (A2). To obtain the appropriate values for w_g and w_b, we can treat (A2) as an equality and use it to solve for w_g in terms of w_b. Substituting the resulting value for w_g into (A3), we can solve for the value of w_b that minimizes (A3) subject to $w_b \geq 0$, which is $w_b = 0$. We then use (A2), as an equality, to solve for w_g in terms of w_b, giving $w_g = e/q$.

Given that the entrepreneur expends effort, the investor's expected return is

$$q(v_g - w_g) - (1 - q)(v_b + w_b). \tag{A4}$$

Substituting from Equations (4), we get expression (5).

A.3 Contracting without Hands-Tying

To establish Equations (6), note first that the entrepreneur's expected return if he expends no effort is

$$r\hat{w}_n + (1 - r)\hat{w}_b. \tag{A5}$$

Alternatively, if the entrepreneur expends effort, there are the four possible cases that appear in Table 2. Columns (f) and (g) of that table show the returns to the entrepreneur and the investor, respectively, for the payment structure involved here. Adding across the four cases, the entrepreneur's expected return as of the time of contracting with the investor is

$$qr\hat{w}_g + q(1 - r)\hat{w}_n + (1 - q)r\hat{w}_n + (1 - q)(1 - r)\hat{w}_b - e. \tag{A6}$$

An entrepreneur will accept employment only if expression (A6) ≥ 0 and will expend effort only if expression (A6) $\geq$ expression (A5). The investor's objective is therefore to minimize (A6) subject to the conditions (A6) ≥ 0, (A6) $\geq$ (A5), and $\hat{w}_n, \hat{w}_b, \hat{w}_g \geq 0$.

Because $\hat{w}_n, \hat{w}_b, \hat{w}_g \geq 0$, it follows that (A5) ≥ 0. Thus (A6) ≥ 0 if (A6) $\geq$ (A5). We can therefore ignore (A6) ≥ 0 as a separate constraint.

Suppose $\hat{w}_b > 0$. Then (A5),(A6) > 0. By reducing $\hat{w}_b$, we reduce (A6). This is an improvement unless the result would be that (A6) $<$ (A5). But the latter could happen only if, at the initial value of $\hat{w}_b$, (A6) $=$ (A5) and $d(\text{A6})/d\hat{w}_b > d(\text{A5})/d\hat{w}_b$. Yet

$$\frac{d(\text{A6})}{d\hat{w}_b} = (1 - q)(1 - r) < (1 - r) = \frac{d(\text{A5})}{d\hat{w}_b}. \tag{A7}$$

Thus $\hat{w}_b > 0$ cannot be a solution. Since $\hat{w}_b \geq 0$, it must be that $\hat{w}_b = 0$. Similar logic establishes that $\hat{w}_n = 0$. Consequently, (A5) $= 0$ and (A6) $= qr\hat{w}_g - e$. Minimizing the latter with respect to $r\hat{w}_g$, subject to (A6) $\geq$ (A5) $= 0$, gives $\hat{w}_g = e/qr$.

To establish expression (7), we add, for the four cases in Table 2, the product of the investor's return from column (g) and the probability in column (c). This yields

$$
\begin{aligned}
&qr(v_g - I - \hat{w}_g) - (1 - q)r\hat{w}_n - q(1 - r)\hat{w}_n \\
&\quad + (1 - q)(1 - r)(v_b - I - \hat{w}_b).
\end{aligned}
\tag{A8}
$$

Substituting from (6), we then get (7).

A.4 When Does Hands-Tying Pay?

To see when a hands-tying provision is needed, suppose that an entrepreneur contracted on the assumption that the investor would *not* act on her signal, and thus agreed to the terms of compensation given by (4). And suppose that the contract did not tie the investor's hands, but left her free to reject projects without making any payment to the entrepreneur (or, equivalently, required only that the investor pay the entrepreneur $\hat{w}_n = 0$ upon rejecting a project, as under the contract without hands-tying). The investor's expected return, if she were to proceed to reject projects whenever $s = s_b$, would then be

$$
\begin{aligned}
&qr(v_g - I - w_g) + (1 - q)(1 - r)(v_b - I - w_b) \\
&\quad = qr(v_g - I) + (1 - q)(1 - r)(v_b - I) - re.
\end{aligned}
\tag{A9}
$$

This expression is equivalent to (A8) but with w_g [the payment from (4) that the entrepreneur would accept with hands-tying] substituted for $\hat{w}_g$, w_b substituted for $\hat{w}_b$, and $w_n = 0$ substituted for $\hat{w}_n$.

The investor would then reject projects on the basis of her signal if (A9) $>$ (A4), that is, if

$$-(1 - q)r(v_b - I) > q(1 - r)(v_g - I - w_g). \tag{A10}$$

The left-hand side of (A10) is the investor's gain from avoiding the losses of bad projects that her signal permits her to screen out. The right-hand side of (A10) is the investor's loss from mistakenly rejecting good projects. The latter

figure is less than the full social loss from rejecting good projects by the amount $q(1 - r)w_g$, which is the loss in expected value that the entrepreneur suffers from the investor's rejection of good projects. That is, in deciding whether to reject projects, the investor will ignore the loss that the entrepreneur may suffer as a result.

After substituting for w_g from (4), (A10) can be rewritten as a condition on r, giving (10).

A.5 Why Contract in Advance?

To prove that, as asserted in Section 3.1 of the text, $w_g^g > w_g^b$, we first need the values for p^g and p^b—the probabilities, respectively, that the investor will get a good (bad) signal on a randomly selected project:

$$p^g = qr + (1 - q)(1 - r), \tag{A11}$$

$$p^b = q(1 - r) + (1 - q)r. \tag{A12}$$

Likewise, for q^g and q^b—the probabilities, respectively, that a project will have a good outcome given that the investor gets a good (bad) signal—we have the values

$$q^g = qr/[qr + (1 - q)(1 - r)], \tag{A13}$$

$$q^b = q(1 - r)/[q(1 - r) + (1 - q)r]. \tag{A14}$$

Denote by R^g (R^b) the investor's expected net return from offering the good-(bad-) signal contract after receiving a good (bad) signal, that is,

$$R^g = q^g(v_g - w_g^g) + (1 - q^g)v_b - I, \tag{A15}$$

$$R^b = q^b(v_g - w_g^b) + (1 - q^b)v_b - I. \tag{A16}$$

If the investor is to offer either contract, it must have a nonnegative expected return for her. Thus, $R^g, R^b \geq 0$. For a randomly selected project, the investor's expected surplus is

$$S = p^g R^g + p^b R^b. \tag{A17}$$

Solving (A15) and (A16) for w_g^g and w_g^b and substituting from (A13) and (A14), we have

$$w_g^g = v_g - [I + R^g - (1 - qr)v_b]/qr, \tag{A18}$$

$$w_g^b = v_g - [I + R^b - (1 - q(1 - r))v_b]/q(1 - r). \tag{A19}$$

Subtracting (A19) from (A18) and rearranging yields

$$w_g^g - w_g^b = \frac{(I - v_b)(2r - 1)(1 - q) + rS - p^g R^g}{qr(1 - r)}. \tag{A20}$$

Since, from (A17), $p^gR^g \leq S$, by substituting S for p^gR^g in the right-hand side of (A20) we get the inequality.

$$w_g^g - w_g^b \geq \frac{(I - v_b)(2r - 1)(1 - q) - (1 - r)S}{qr(1 - r)}. \tag{A21}$$

The numerator of (A21) is positive whenever $r > r_{\min}$. Thus $w_g^g > w_g^b$.

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