

Investor Protection and Business Creation*

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Abstract

We study the effects of investor protection on the cost of external finance, entrepreneurship, and creation of new firms in an equilibrium search model of private capital markets. Besides search frictions, we emphasize moral hazard problems that stem from entrepreneurs' possibilities to expropriate financiers. Investor protection reduces the scope for moral hazard. However, it also constrains the freedom of entrepreneurs to choose projects and to run their own firms. Strengthening investor protection does not therefore always enhance business creation: The results indicate that only when investor protection has a sufficiently large impact on financiers' monitoring cost relative to entrepreneurial freedom does strengthening investor protection enhance start-up creation. We also find a general equilibrium effect, since search frictions amplify the adverse effect of investor protection on business creation.

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1 Introduction

Becoming an entrepreneur and creating a new firm typically calls for external finance. Especially wealth-constrained entrepreneurs require external finance, because they rarely can afford to cover the costs of entry and other miscellaneous outlays, such as initial working capital, needed to establish a new firm. However, tapping the market for external finance is not easy: both academics and policy-makers regard the high cost and unavailability of external capital as crucial impediments to entrepreneurship and small business growth.¹

The findings of the influential law and finance literature, initiated by La Porta et al. (1997, 1998), suggests a means to lower the cost of capital and enhance its availability: improving the legal protection of outside financiers should make them less vulnerable to the opportunistic behavior by corporate insiders and hence increase the willingness to pour resources into the smallest companies. This has led to the notion (see, e.g. Rajan and Zingales, 2003, Beck et al., 2006) that stronger investor protection stimulates business creation through improved access to external finance.² What has not been recognized as clearly is that strong investor protection also constrains the freedom of entrepreneurs to run their own firms.

¹ For academic accounts, see, e.g. Evans and Jovanovic (1989), Holtz-Eakin, Joulfaian and Rosen (1994), Berger and Udell (1998), Blanchflower and Oswald (1998), Johansson (2000), and Cabral and Mata (2003). Blanchflower et al. (2001, p. 690) go so far as to claim that the “lack of capital holds back millions of potentially entrepreneurial people in the industrial countries.” For policy concerns and initiatives, see, e.g. European Commission (1999, 2001) and Storey (1998).

² Empirical work on the effects of investor protection in the law and finance literature is vast but mainly based on data from publicly traded companies. The issue of business creation is therefore beyond the scope of most of these studies; see however Perotti and Volpin (2006) for a recent exception.

Such reduced entrepreneurial freedom can severely discourage entrepreneurship because of its important non-pecuniary benefits, such as opportunities to “be one’s own boss” (Hamilton 2000 and Moskowitz and Vissing-Jørgensen 2002). This potential trade-off raises the central question of our study: How does investor protection affect entrepreneurship and business creation?

Traditional analyses of public policy on entrepreneurship have not addressed this question, as they focus on the effects of taxation, subsidies, and governmental services such as entrepreneurial training and provision of social insurance, on risk taking and occupational choice (e.g. Poterba 1989, Boadway et al. 1991 and Black and de Meza 1997). Some studies, such as Keuschnigg and Nielsen (2003), Inderst and Müller (2004) and Michelacci and Suarez (2004), seek to clarify the effects of public policy measures on venture capital finance and entrepreneurship, but notably do not address investor protection.

Investor protection and decisions of entrepreneurs to go public is considered by Shleifer and Wolfenzon (2002). Following them, we construct an equilibrium model of corporate finance and investor protection but, instead of frictionless equity markets and firms going public, we focus on the *private* equity and debt markets. These markets are typically fragmented and characterized by imperfections (Berger and Udell 1998), making the search for capital costly and time-consuming. The more significant these *search frictions*, the more difficult it is to raise external financing for a start-up.³

³ We emphasize that while venture capital finance has stolen the headlines, more traditional and passive types of small business finance – such as equity finance from individuals or other firms, loans from commercial banks and finance companies and trade credit – maintain their quantitative importance (see, e.g., Berger and Udell 1998).

Search frictions of capital markets are also emphasized in Inderst and Müller (2004) and Michelacci and Suarez (2004). Much as in labor market search models (Mortensen and Pissarides 1999, and Pissarides 2000), the central problem of capital market search is the creation of cooperating coalitions of entrepreneurs without financial resources and financiers with idle capital. A basic property of the search models is that, when an entrepreneur and a financier meet, they will find a way to exploit gains from trade, if the match surplus is fully transferable and positive. The crux of our model is that besides search frictions, there are *contract frictions* that constrain the transferable match surplus. They, together with search frictions, hinder business creation.

The contract frictions arise, because closely held firms - which start-ups are almost by definition - tend to be controlled by their few founders who remain the principal owners and managers. After outside financiers have invested in the firm, they, even upon receiving a minority stake in exchange for the finance, are exposed to opportunistic behavior by those in control, i.e., the founder-manager-owners. The ways to transfer value from the firm to them are multitude. Well-known examples include looting (Akerlof and Romer 1993), tunneling (Johnson et al. 2000) and self-dealing via selling assets to the firm or buying assets from it at non-market prices (Djankov et al. 2005). More straightforward means to expropriate the financiers of small businesses are excessive salaries, unjust payments of bonuses, and outright withdrawals of cash that can be accumulated by settling transactions frequently in cash without a receipt. The fear of such expropriation renders financiers reluctant to fund new business ideas even if they could be certain of their commercial viability.

The various possibilities of investor expropriation can for our purpose be grouped into the problems of interim and ex post moral hazard. Interim moral

hazard refers to the entrepreneurs' opportunities to use funding raised from financiers for some other purpose than the productive investment the funding was granted for. This opportunity to translate corporate assets into private benefits of control instead of investing them productively limits the “pledgeable” income of entrepreneurs (Holmström and Tirole 1997). Ex post moral hazard is about diverting corporate profits from a productive investment *after* it has been made (Townsend 1979, and Gale and Hellwig 1985). As the scope for ex post moral hazard grows, curbing such misbehavior by monitoring and auditing becomes more costly. In our model, interim moral hazard reduces the transferability of match surplus between entrepreneurs and financiers, whereas ex post moral hazard reduces the gross match surplus.

A major function of corporate (and bankruptcy) laws is to constrain the value-reducing forms of opportunism by corporate insiders (Kraakman et al. 2004). Although we do not specify legal details, the laws governing investor protection empower creditors and equity investors to monitor and influence entrepreneurial decision making both before and after a suspected act of expropriation. The laws thus have two generic effects on the match surplus in our model: the stronger the investor protection, the smaller the entrepreneurs' private benefits and the lower the monitoring costs. These two effects lead to the trade-off between investor protection and entrepreneurship suggested in recent empirical literature. The reduction in monitoring costs expands the gross match surplus, which encourages entrepreneurship. However, the reduction in the entrepreneur's private benefits improves transferability of utility by increasing the pledgeable income of entrepreneurs. This diminishes advantages of becoming an entrepreneur, because the threat to expropriate financiers endows entrepreneurs with bargaining power

in situations where it would otherwise be weak. This trade-off emerges despite that we consider an economy with a fixed amount of private capital.

The trade-off would also emerge from a model without search but search frictions, besides adding a touch of reality, generate a general equilibrium effect by exacerbating the adverse consequences of strengthened investor protection on entrepreneurship. The effect arises, because the frictions endow financiers with some bargaining power that is further enhanced by stronger investor protection. This reallocation of bargaining power links the private benefits of control and, accordingly, investor protection to the incentives to become an entrepreneur.

Because entrepreneurship is latent in search equilibrium, the effect of investor protection on business creation is not clear a priori and, in particular, the effects of investor protection on (latent) entrepreneurship and business creation are not necessarily equivalent. The creation of a firm requires that a would-be entrepreneur seeks and finds external project finance. When the number of latent entrepreneurs grows without corresponding increase in the supply of capital, the equilibrium stock of *idle* capital per an entrant diminishes. On the one hand, this congestion makes raising external finance harder and may reduce the rate at which new firms are created. On the other hand, the tighter the market for entrepreneurial finance, the faster the scarce capital is recycled. We show that the latter effect dominates so that latent entrepreneurship is directly related to business creation. Thus, what increases latent entrepreneurship also increases the rate of business creation.

Despite our focus on the generic effects of investor protection, we can offer some concrete policy recommendations: If we think that various transparency rules such as accounting, auditing, and disclosure affect ex post moral hazard (monitoring costs) more than interim moral hazard (project choices), our analysis

suggests that strengthening such transparency rules might stimulate entrepreneurship and business creation.⁴ In contrast, a cautious approach is called for with regulations controlling the freedom of entrepreneurs to “be their own bosses” and to choose their projects. Many laws governing minority-shareholder protection such as low thresholds for calling extraordinary shareholders’ meetings, or qualified majority requirements for charter changes and sales of major assets, typically reduce entrepreneurial freedom.⁵ These rules clearly limit entrepreneurial freedom if applied to small companies. Our analysis suggests that such laws should not be applied to small companies as harshly as to large corporations. These findings are topical, for on-going reforms of corporate laws in several countries nominally seek to rebalance the trade-off between the cost of capital and the freedom of entrepreneurial decision-making in firms.⁶ Our analysis shows that such a trade-off actually exists and provides a framework that enables one consider where the balance should shift.

In the next section, we describe the basic model. In section 3, we consider equilibrium search market activity. In sections 4 and 5, we present our main results concerning the effects of investor protection on equilibrium interest rates, entrepreneurship, and business creation. In section 6, we consider the design of optimal policy, showing first how investor protection can be designed to maximize business creation. Since a policy that maximizes business creation does not

⁴ To be sure, mandated disclosure also helps to constrain project choices (interim moral hazard), since it increases possibilities to seize expropriating acts (e.g. via internal corporate governance). Furthermore, the better the transparency, the more difficult it is to enjoy the private benefits of the pet project.

⁵ Permissible covenant rules and how they can be enforced in the court of law are other concrete examples of creditor protection that reduce corporate insiders' possibilities to pursue pet projects.

⁶ Reform of corporation laws are under planning or have been recently implemented at least in Australia, Canada, Finland, France, Denmark, Ireland, Italy, the Netherlands, and the UK.

necessarily maximize social welfare, we also consider the socially optimal level of investor protection. We give concluding remarks in section 7.

2 The Model

The economy consists of entrepreneurs and financiers who are infinitely lived and seek to maximize the expected present value of their net income stream. Maximizing expected discounted income is equivalent to maximizing expected utility if the agents are risk neutral or if consumption markets are complete.⁷ The entrepreneurs lack funds, but are endowed with projects requiring a fixed start-up investment I . The money can be raised from financiers with capital, but without projects. The allocation of funds to entrepreneurs, i.e. the creation of new firms, is constrained by search and contract frictions.

⁷ It is not clear whether entrepreneurs and their financiers are risk-averse or risk-loving. While we typically feel that most people are risk averse, we do not necessarily want to apply this presumption to entrepreneurs and their financiers. For example, those who tolerate risk more are more likely to become entrepreneurs (and their financiers). Moreover, assuming limited liability introduces a source of convexity in the agents' objective function and thus increases their incentives to take risk. Since it is hard to say whether entrepreneurs and their financiers are risk-averse or risk-loving, a bias to neither direction seems to be a proper benchmark. Modeling explicitly incomplete consumption markets with non-risk neutral individuals is not easy either, as incompleteness can take a variety of forms. Nonetheless, studying the effects of investor protection on business creation when entrepreneurs and financiers are not risk neutral and face incomplete consumption markets provides a promising avenue for further research.

2.1 Frictions

In modeling the effects of search frictions on the trade in a private capital market, we follow the received labor market literature on search and matching (e.g. Mortensen and Pissarides 1999, and Pissarides 2000). As we are interested in the creation of new firms, we work with measures of entrepreneurs seeking finance and financiers with idle capital rather than the entire community of entrepreneurs and financiers. We denote the measures e and f , respectively. The matching of entrepreneurs and financiers takes place according to a continuous time search governed by an aggregate matching function. We assume that the matching function exhibits constant returns to scale. This implies that the arrival rates of financing offers both from the perspective of an entrepreneur and from a financier can be conveniently written as a functions of the ratio $\theta=e/f$. Just like in the labor market literature, where the ratio of open vacancy to unemployment measures labor market tightness, θ signals the tightness of the market for entrepreneurial finance or, more shortly, *capital market tightness*. In other words, θ can be interpreted as capital scarcity: the larger is the ratio of unfunded entrepreneurs to idle capital, the slower a would-be entrepreneur should find a financier. Hence, we write that from the perspective of an entrepreneur, the arrival rate of financing offers is given by a decreasing and continuously differentiable function $q(\theta)$. Since the mass of financing deals per unit of time is $eq(\theta)$, the corresponding arrival rate of financing deals from the perspective of a financier is $\theta q(\theta)$, which is

increasing in θ . The arrival rates satisfy the usual limiting properties:

$$\lim_{\theta \rightarrow 0} q(\theta) = \lim_{\theta \rightarrow \infty} \theta q(\theta) = \infty \text{ and } \lim_{\theta \rightarrow \infty} q(\theta) = \lim_{\theta \rightarrow 0} \theta q(\theta) = 0.^8$$

Contract frictions stemming from the possibility entrepreneurs will expropriate financiers also hinder the creation of start-ups. The two common ways entrepreneurs can expropriate financiers may be described as “interim” and “ex post” moral hazard problems. The interim (i.e. the project choice) moral hazard emerges when, after receiving funds from a financier, the entrepreneur is able to choose between investing in a productive project or diverting the funds to a private “pet” project. The success of the private project is certain and, without investor protection, yields an infinite *non-transferable* stream of private benefits b per unit of time to the entrepreneur. In contrast, the productive project succeeds according to a Poisson process with intensity γ and yields a *transferable* income stream of π per unit of time.

Entrepreneurs can also divert and hide returns from successful productive projects. Reminiscent of the Townsend-Gale-Hellwig paradigm of costly state verification (Townsend 1979, Gale and Hellwig 1985), we assume financiers can prevent such ex post moral hazard by incurring monitoring cost flow, which has size v in the absence of investor protection. When there is no monitoring, entre-

⁸ In other words, we use the canonical assumptions of the Mortensen-Pissarides model. In particular, the underlying matching function is homogenous of degree one. In the labor market literature the constant returns to scale has been adopted, besides for convenience, due to its empirical relevance (see Petrongolo and Pissarides, 2001, for a survey of the estimates of the labor market matching function). In corporate finance, however, existing empirical research provides little guidance for the choice of matching function. We assume constant returns not only for convenience but also to make our model comparable both with the labor market literature and with the other corporate finance applications of the Mortensen-Pissarides model (e.g. Inderst and Müller, 2004, and Michelacci and Suarez, 2004).

preneurs divert returns and financiers receive nothing, irrespective of initial financial contracts.

2.2 Investor Protection

As we explained in the Introduction, we are primarily interested in the generic effects of investor protection. One can think that the rules of accounting, auditing, and disclosure regulate ex post moral hazard and thus govern monitoring costs almost by definition. To some extent they also affect to interim moral hazard, since the better the transparency, the more difficult it is to enjoy the private benefits of the pet project. For our modeling purposes, the relevant investor protection also consists of the legislation allowing creditors and equity investors to bind the hands of entrepreneurs or to monitor the project returns. Permissible covenant rules are an example of creditor protection that reduces the possibilities to pursue pet projects. In the case of equity financing, we can take that investor protection reflects company law and other legislation governing minority shareholder protection. For example, the antidirector rights index of minority shareholder protection developed by La Porta et al. (1997, 1998) and extensions by Pistor (2000) and Glaeser et al. (2001) include rules for limiting entrepreneurial freedom – for example, the possibility of outside investors to call an extraordinary shareholders’ meeting, or qualified majority requirements for charter changes and sales of major assets.⁹

To incorporate the generic effect of investor protection into our model, we assume that investor protection mitigates both moral hazard problems that are

⁹ See Kraakman et al. (2004) for an extensive survey of specific legal strategies that can be employed to curb investor expropriation by corporate insiders.

present in the model. We formalize the two effects of investor protection in a transparent way by specifying that investor protection reduces the stream of private benefits by αb and the monitoring cost flow by αv , where $\alpha \in [0,1]$ reflects the degree of investor protection in the economy. Thus, the net stream of private benefits from the private project and the total monitoring cost flow of the productive project are $(1-\alpha)b$ and $(1-\alpha)v$ per unit of time. The idea underlying this formulation is that the more stringent the general level of protection, the less of a problem the contracting frictions should be.

We could also explicitly assume that compliance with investor protection is costly. For example, a productive project could yield a non-transferable stream of private benefits that is reduced by investor protection. As long as the stream per unit of time is strictly less than b , we can normalize it to zero without loss of generality. Similarly, the reduction in the monitoring cost flow caused by investor protection may also be partly offset by an increase in the disclosure costs that entrepreneurs must incur. As long as obtaining relevant information for ex post monitoring is less expensive to the entrepreneur than the outside financier, one would expect no change in the basic results. This property of the model means that our analysis is consistent with an intuitive trade-off between a stifling effect of regulation stemming from compliance costs and the benefits of the regulation to investors.

2.3 Financial Contracting

To focus on the generic effects of investor protection, we follow Holmström and Tirole (1997) and deliberately stay away from modeling the exact form of the financing contract. Because of the monitoring cost flow, v , debt might in our model dominate equity. However, in our model debt does not necessarily economize the monitoring costs which, in contrast to the Townsend-Gale-Hellwig paradigm, are paid *until* the project succeeds. The repayment in our model might thus as well reflect an equity-like contract.

We further assume that, even in the absence of investor protection, entrepreneurs can directly raise funds for the fixed start-up investment from outside financiers. As in Holmström and Tirole (1997), this requires that the entrepreneur's "pledgeable" income is larger than the financier's investment costs. Denoting the common discount rate by $\rho > 0$ allows us to formalize the Assumption as

Assumption.
$$\frac{\gamma\pi}{(\gamma + \rho)\rho} - \frac{b}{\rho} - \frac{v}{\gamma + \rho} - I \geq 0.$$

The two first terms in the Assumption reflect the entrepreneur's pledgeable income, i.e. the maximum amount an entrepreneur can credibly promise to pay back to a financier. The two last terms capture the investment costs. From the financier's point of view, both fixed start-up cost I and monitoring cost v are needed get a productive project going. Thus, if there is no interim moral hazard ($b=0$), the Assumption simply says that the net present value of the productive project should be positive. In the presence of the interim moral hazard, however, a positive net present value is insufficient to guarantee that the entrepreneur will prefer the productive project.

If the Assumption failed to hold, there would be no private capital markets in the economy. The studies of Holmström and Tirole (1997) and Michelacci and Suarez (2004) suggest that, in such circumstances, an agent is needed to mitigate the moral hazard problems. In principle, the government in our model could be such an agent and raise the economy out of autarky by imposing a minimum level of investor protection. For simplicity, we normalize the minimum level of investor protection to zero and state that the Assumption holds even if $\alpha=0$.

Although we assume pledgeable income exceeds investment costs, this does not render financial contracting trivial. In fact, as we see in the next section, moral hazard problems modify the standard conditions for formation of a match. When an entrepreneur seeking finance and a financier with idle capital meet, bargaining over the terms of finance takes place. Provided that the shares received by each partner exceeds the forgone option of continued search, they write a financial contract stipulating the entrepreneur's repayment obligation, ω , which is the amount per unit of time a successful entrepreneur pays back to the financier. The standard conditions for formation of a match are modified, since the moral hazard problems in our model reduce both the gross match surplus and the possibilities to transfer utility using ω .

The bargaining takes a simple strategic form, whereby the entrepreneur makes a take-or-leave-it offer with probability β . With complementary probability $1-\beta$, the financier makes a similar take-or-leave-it offer on the repayment obligation. In the event of rejection, the parties resume their searches for other partners.¹⁰

¹⁰ It is well known that this simple strategic bargaining produces the same outcome as the generalized Nash bargaining under complete information and full transferability of match surplus (see,

Table 1 summarizes the notation we have defined so far and introduces the notation we use subsequent sections.

Table 1. Vignettes of variables

	Explanation / description
e	Measure of entrepreneurs seeking finance
f	Measure of financiers with idle capital
θ	$e/f =$ capital market tightness
$q(\theta)$	Arrival rate of financing offers
b	Non-transferable stream of private benefits (flow)
γ	Success rate of a productive project
v	Monitoring cost (flow)
α	Degree of investor protection
ρ	Discount rate
ω	Repayment obligation
β	Probability at which entrepreneur can make a take-or-leave-it offer
I	Start-up investment
c	Cost of seeking capital (flow)
U_E	Value of an unfunded project to an entrepreneur
U_F	Value of idle capital to a financier
G_E	Value of a financed productive project to an entrepreneur
G_F	Value of a financed productive project to a financier
B_E	Value of a private project to an entrepreneur
S	Total match surplus
n	Rate of business creation
$h_b(\alpha)$	Generalized effect of investor protection on private benefits
$h_v(\alpha)$	Generalized effect of investor protection on monitoring costs
λ	Shadow price of idle capital
$\eta(\theta)$	Elasticity of the arrival rate of financing offers

3 Equilibrium

We look for solutions in the class of dynamic stochastic equilibria where time and uncertainty are explicit, expectations rational, private gains from trade exploited subject to search and contracting frictions, and agents' actions mutually consistent.

e.g. Mortensen and Pissarides 1999). In the appendix we show that the equivalence also holds in our case where the match surplus is not fully transferable.

Let U_E and U_F denote the value of an unfunded project for an entrepreneur and the value of idle capital to a financier. Following Michalecci and Suarez (2004), we focus on an economy with limited available private capital but rich in opportunities for entrepreneurs.¹¹ Specifically, we normalize the total mass of financiers to unity and assume free entry of entrepreneurs. This implies that the equilibrium measure of entrepreneurs seeking finance, e , solves the no-profit condition

$$U_E=0. \tag{1}$$

The value of idle capital to a financier must be non-negative, $U_F \geq 0$, because participation is voluntary. To characterize the equilibria, we determine the equilibrium values of θ , ω , and U_F .

For an arbitrary repayment obligation, ω , the value of the project with transferable return to an entrepreneur, G_E , solves the asset pricing equation

$$\rho G_E = \gamma \left(\frac{\pi - \omega}{\rho} - G_E \right). \tag{2}$$

Analogously, the value of the private project to the entrepreneur, B_E , is given by

$$B_E = \frac{(1-\alpha)b}{\rho}. \tag{3}$$

The entrepreneur does not divert the funds to the private project if $G_E \geq B_E$ which, using (2) and (3), can be re-expressed as

¹¹ This is in line both with a large empirical literature on the existence of financing constraints (cf. footnote 1) and the standard assumption in labor market literature, which maintains unlimited entry for entrepreneurs, but a fixed labor supply (see Mortensen and Pissarides 1999 and Pissarides 2000).

$$\omega \leq \bar{\omega} \equiv \pi - \frac{(\rho + \gamma)}{\gamma}(1 - \alpha)b. \quad (4)$$

Inequality (4) is the entrepreneur's incentive compatibility constraint. The discounted value of $\bar{\omega}$, $\gamma\bar{\omega}/(\rho + \gamma)\rho \equiv \gamma\pi/(\rho + \gamma)\rho - (1 - \alpha)b/\rho$, equals the entrepreneur's pledgeable income for a given level of investor protection.

If the entrepreneur diverts the funds, either at the outset or after the project has successfully been completed, the value of the project to the financier is zero. Provided that the entrepreneur's incentive compatibility constraint (4) is satisfied, the value of a productive project to the financier, G_F , solves the asset pricing equation

$$\rho G_F = \gamma \left(\frac{\omega}{\rho} + U_F - G_F \right) - v(1 - \alpha). \quad (5)$$

In (5), value U_F shows that the financier returns to search in the event of success. This follows from our assumption that financial capital can be recycled, while entrepreneurial talent is specific to each project.

Once an entrepreneur and a financier meet, they begin negotiating to form a coalition. With fully transferable match surplus, a necessary and sufficient condition for the formation of a coalition is that the gross match surplus, $G_E + G_F - I$, exceeds the sum of the forgone options of continued search, $U_E + U_F$. In our model, however, moral hazard problems reduce both the gross match surplus and the transferability of utility. To make this clear, let us first consider an entrepreneur who gets to propose a repayment obligation with probability β . The entrepreneur demands the entire match surplus $S = G_E + G_F - I - U_E - U_F$ by offering repayment

$$\underline{\omega} = \frac{\rho}{\gamma} [\rho U_F + I(\rho + \gamma) + v(1 - \alpha)], \quad (6)$$

which solves $G_F = U_F + I$.

With probability $1-\beta$, the financier gets to propose a repayment obligation, but cannot similarly demand the entire match surplus S . As G_E decreases in ω and $B_E > U_E = 0$ by (1) and (3), the entrepreneur's incentive compatibility constraint $G_E - B_E \geq 0$ binds sooner than the entrepreneur's participation constraint $G_E - U_E \geq 0$. The financier therefore demands the maximum repayment, $\bar{\omega}$, that satisfies the entrepreneur's incentive compatibility constraint (4). In other words, the ability to credibly threaten to expropriate financiers allows entrepreneurs extract a share of the match surplus in the case where their bargaining position would otherwise be weak. We proceed under the assumption that the repayment determined by the financier's participation constraint satisfies the entrepreneur's incentive compatibility constraint, so that $\underline{\omega} < \bar{\omega}$.¹²

The two conditions determining repayments (4) and (6) illustrate how moral hazard problems decrease the transferable match surplus. On one hand, the utility is less transferable because the entrepreneur's private benefits reduce pledgeable income. On the other hand, the gross match surplus shrinks as monitoring increases the financier's investment costs. Because improvements in investor protection lower both the entrepreneur's private benefits and the monitoring costs, they enlarge the transferable match surplus irrespective of the agents' bargaining power.

The solution to the bargaining problem implies that the financier's share of the match surplus is

$$G_F - U_F - I = (1 - \beta)(S - B_E), \quad (7)$$

where B_E equals B_G evaluated at $\omega = \bar{\omega}$. The entrepreneur's share of the match surplus is

$$G_E - U_E = \beta S + (1 - \beta)B_E. \quad (8)$$

Equations (7) and (8) show that both the financier's and entrepreneur's shares are increasing in the total match surplus $S = G_E + G_F - I - U_E - U_F$. Because G_F is decreasing in v by (5), the ex post moral hazard problem decreases both parties' shares of the match surplus. The interim moral hazard, captured by B_E , however, increases the entrepreneur's share and decreases the financier's share. Reminiscent of Ayres and Madison (2000), it may thus pay to "handicap oneself", e.g. by choosing a bad form of corporation, to make a credible threat of performing inefficiently. In our model the ability of threatening to expropriate is valuable to entrepreneurs in circumstances where their bargaining position would otherwise be weak, i.e. when financiers get to propose the repayment obligation. Were there no interim moral hazard, B_E would be zero and equations (7) and (8) would collapse to the familiar expressions of the match surpluses.

We complete the characterization of the equilibrium by determining the conditions for equilibrium free-entry and repayments. The value of an un-funded project for an entrepreneur satisfies

$$\rho U_E = -c + q(\theta)(G_E - U_E), \quad (9)$$

where c represents the flow cost of finding capital or, more generally, the flow start-up cost of a new firm (as in Fonseca, Lopez-Garcia, and Pissarides 2001).

Similarly, the value of idle capital for a financier solves

¹² The assumption is fulfilled in equilibrium, but rather tedious to prove (calculations available upon request). The intuition, on the other hand, is clear. If it were not so, no matches would be formed and capital markets would collapse.

$$\rho U_F = \theta q(\theta)(G_F - U_F - I). \quad (10)$$

By substituting (1) and (2) for (9), we can then write the equilibrium free-entry condition for entrepreneurs, i.e. *the latent entrepreneurship condition*, as

$$\frac{c}{q(\theta)} = \frac{\gamma(\pi - \omega)}{\rho(\rho + \gamma)}. \quad (11)$$

Entrepreneurship can be regarded as latent, because not all those willing to become entrepreneurs automatically create firms. The creation of a start-up requires securing external finance to initiate the project. The latent entrepreneurship condition determines the dynamic demand for financial capital. Since the expected duration of finding capital for an un-funded project is $1/q(\theta)$, the left-hand side of (11) captures the expected cost of finding capital. The right-hand side captures the entrepreneur's expected payoff from the productive project. Thus, the latent entrepreneurship condition balances the expected costs and benefits of entrepreneurship.

To determine the condition for equilibrium repayments, we first need to solve the equilibrium value of idle capital (U_F). Inserting $S = G_E + G_F - I - U_E - U_F$ into (8) and rearranging the terms, we obtain

$$G_E - U_E = B_E + \frac{\beta}{1 - \beta}(G_F - I - U_F). \quad (12)$$

Substitution of (1) and (9) for the left-hand side of (12) yields

$$\frac{c}{q(\theta)} = B_E + \frac{\beta}{1 - \beta}(G_F - I - U_F). \quad (13)$$

After using (10) to substitute $\frac{\rho U_F}{\theta q(\theta)}$ for $G_F - U_F - I$ we can solve (13) for U_F ,

i.e.

$$U_F = \frac{(1-\beta)\theta}{\rho\beta} [c - q(\theta)B_E]. \quad (14)$$

A necessary condition for the existence of equilibrium is that the value of idle capital is non-negative, that is, $U_F \geq 0$.

To obtain the condition for equilibrium repayments we next solve (5) for G_F and insert it into (13). This yields

$$\frac{c}{q(\theta)} = B_E + \frac{\beta}{1-\beta} \left[\frac{1}{\gamma + \rho} \left(\frac{\gamma\omega}{\rho} - v(1-\alpha) - \rho U_F \right) - I \right]. \quad (15)$$

Finally, after substituting (14) for (15) and some manipulation, we find the condition for equilibrium repayments, i.e. *interest rate equation*:

$$\frac{\omega}{\rho} = (1-\beta) \left[\frac{\pi}{\rho} + \frac{\theta c - B_E(\rho + \gamma + \theta q(\theta))}{\gamma} \right] + \beta \left[\frac{(\rho + \gamma)I + v(1-\alpha)}{\gamma} \right]. \quad (16)$$

The search equilibrium is fully described by the capital market tightness and repayment pair (θ, ω) that satisfy (11) and (16). The two equilibrium conditions have useful descriptive properties as shown in Figure 1. By totally differentiating (11) and (16), we see that the latent entrepreneurship condition (LE) is a downward-sloping curve in (θ, ω) space and the interest rate equation (IR) slopes upward:

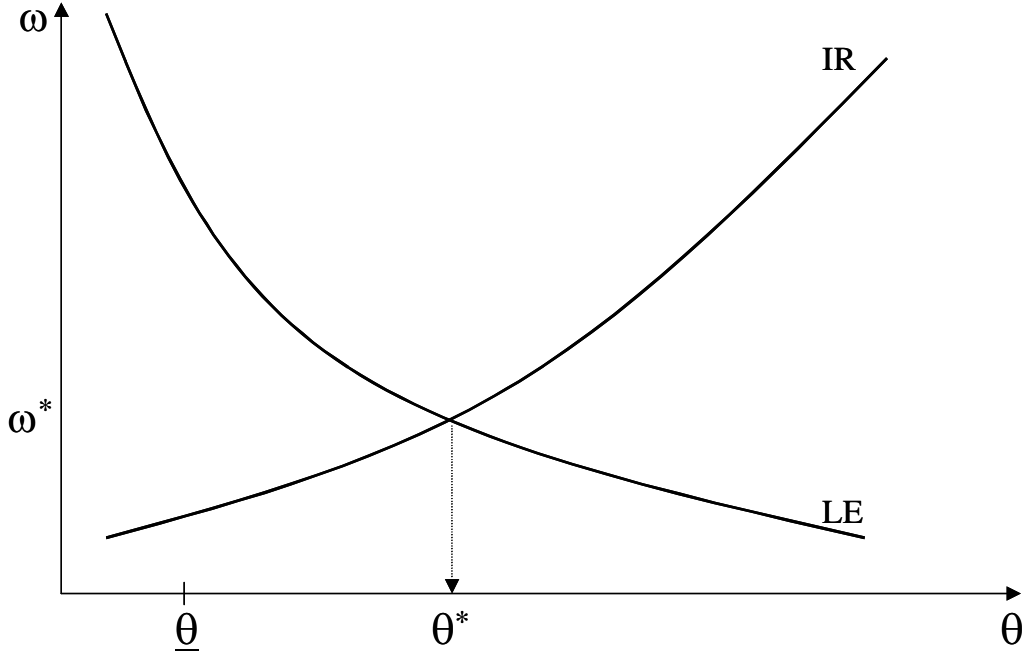
$$\left. \frac{d\omega}{d\theta} \right|_{LE} = \frac{c\rho(\rho + \gamma)}{q(\theta)^2 \gamma} q'(\theta) < 0 \quad (17a)$$

and

$$\left. \frac{d\omega}{d\theta} \right|_{IR} = \frac{(1-\beta)\rho}{\gamma} [c - B_E(q(\theta) + \theta q'(\theta))] > 0. \quad (17b)$$

It follows from the requirement that $U_F \geq 0$ (see equation (14)) that the term in the brackets in (17b) is positive.

Figure 1. Equilibrium of θ and ω .



As drawn in Figure 1, the equilibrium is unique.¹³

Proposition 1. There exists a unique equilibrium.

Proof: Equations (17a) and (17b) establish that if an equilibrium exists, it is unique. Recall that a necessary condition for the existence is that $U_F \geq 0$. From (14) we observe that $U_F \geq 0$ is equivalent to $\theta \geq \underline{\theta} \equiv q^{-1}(c/B_E)$. To guarantee the existence of equilibrium, we first show that the LE curve is above the IR curve

when θ approaches to $\underline{\theta}$. When $\theta \rightarrow \underline{\theta}$, (11) and (16) become $\frac{\omega}{\rho} = \frac{\pi}{\rho} - \frac{c(\rho+\gamma)}{q(\underline{\theta})\gamma}$

and $\frac{\omega}{\rho} = (1-\beta) \left[\frac{\pi}{\rho} - \frac{B_E(\rho+\gamma)}{\gamma} \right] + \beta \left[\frac{(\rho+\gamma)I + v(1-\alpha)}{\gamma} \right]$. Because $\frac{c}{q(\underline{\theta})} = B_E$ by

¹³ We obtain uniqueness largely thanks to the assumption of constant returns to scale matching. Were there increasing returns to matching, there could be multiple equilibria.

definition of $\underline{\theta}$, we need to establish that $\frac{\pi - B_E(\rho + \gamma)}{\rho - \frac{B_E(\rho + \gamma)}{\gamma}} >$

$(1 - \beta) \left[\frac{\pi - B_E(\rho + \gamma)}{\rho} \right] + \beta \left[\frac{(\rho + \gamma)I + v(1 - \alpha)}{\gamma} \right]$ or, equivalently, that

$$\frac{\gamma\pi}{(\gamma + \rho)\rho} - \frac{v(1 - \alpha)}{\gamma + \rho} - I - B_E > 0. \quad (18)$$

Under our Assumption, (18) holds.

To complete the proof we show that the LE curve is below the IR curve when θ approaches to ∞ . Let us rewrite (11) as $\omega = \pi - \frac{c(\rho + \gamma)\rho}{q(\theta)\gamma}$. By the properties of the matching function, $\lim_{\theta \rightarrow \infty} q(\theta) = 0$ and, hence, $\omega \rightarrow -\infty$. Since the IR curve is positive and upward sloping for $\theta \geq \underline{\theta}$, it must be above the LE curve for sufficiently large θ . QED.

As (11) and (16) show, another property of the equilibrium is that the interest rate equation directly depends on b and v , whereas the latent entrepreneurship equation does not. Using this property yields

Proposition 2. Interest rates are directly and latent entrepreneurship inversely related to the ratio v/b .

Proof: Totally differentiating (16) with respect to ω , b , and v shows that

$$\left. \frac{d\omega}{db} \right|_{IR} = -\frac{(1 - \beta)\rho[\rho + \gamma + \theta q(\theta)](1 - \alpha)}{\gamma} < 0 \quad \text{and} \quad \left. \frac{d\omega}{dv} \right|_{IR} = \frac{\beta\rho(1 - \alpha)}{\gamma} > 0, \quad \text{which}$$

means that the IR curve shifts up if either b decreases or v increases. Because the LE curve remains intact when b or v changes, ω increases and θ decreases if the ratio v/b increases. QED.

Proposition 2 suggests that interim and ex post moral hazards have counterbalancing effects on each other. The repayment obligation increases and, accordingly, the incentive to become an entrepreneur reduces, if monitoring costs increase or private benefits decrease. An increase in monitoring costs increases the financier's reservation value, which in turn increases the repayment obligation ω when the entrepreneur proposes it. A decrease in the private benefit increases pledgeable income, which increases the repayment obligation ω when the financier proposes it.

4 Entrepreneurship and Interest Rates

We next investigate whether investor protection increases or decreases latent entrepreneurship. As the model determines the dynamic demand for capital and the repayment obligation, it is meaningful to determine the effect of investor protection on equilibrium interest rates. Because the latent entrepreneurship condition (11) is independent of α , the effect of investor protection on latent entrepreneurship depends on whether the interest rate equation shifts up or down in (θ, ω) space (Figure 2). To address the questions, consider (16) as a function of α .

Proposition 3. Only if the ratio v/b is sufficiently high, strengthening investor protection lowers interest rates and increases latent entrepreneurship. Otherwise, the reverse obtains.

Proof: Totally differentiating (16) with respect to θ and α shows that

$$\left. \frac{d\theta}{d\alpha} \right|_{IR} = \frac{\beta\rho v - (1-\beta)b[\rho + \gamma + \theta q(\theta)]}{(1-\beta)\rho[c - B_E(q(\theta) + \theta q'(\theta))]} \quad (19)$$

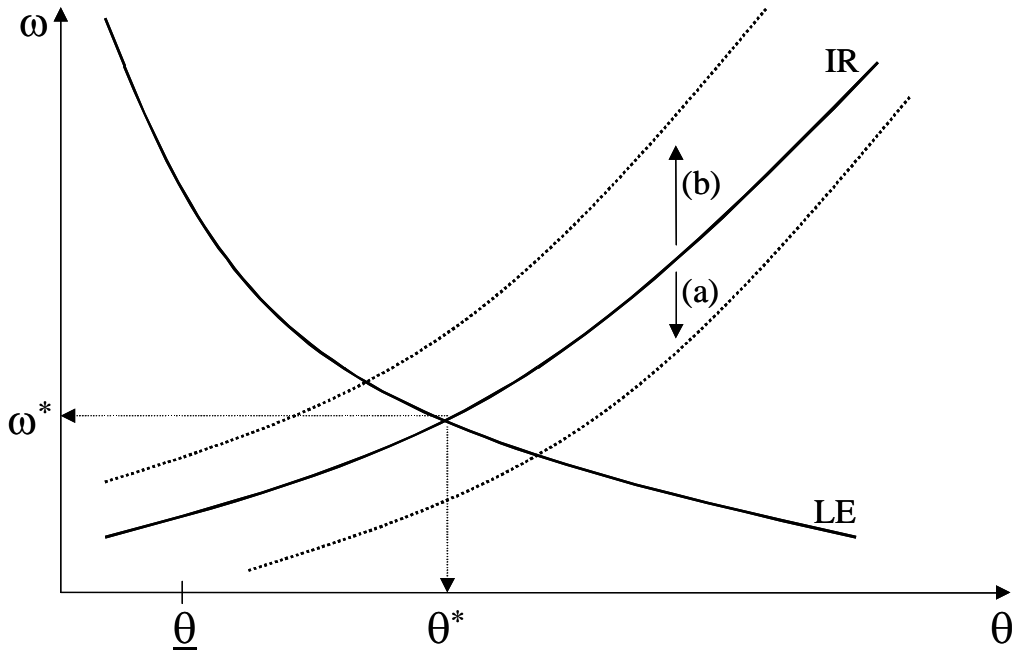
Because the nominator of (19) is positive, the sign of the denominator determines the sign of $d\theta/d\alpha$. We rewrite the denominator so that the sign of $d\theta/d\alpha$ is given by the sign of

$$\frac{v}{b} \frac{(1-\beta)[\rho+\gamma+\theta q(\theta)]}{\beta\rho}. \quad (20)$$

As θ is inversely related to the ratio v/b by Proposition 2 and as $\theta q(\theta)$ is an increasing function of θ , (20) is an increasing function of the ratio v/b . Consequently, there exists a unique positive threshold level of v/b such that $d\theta/d\alpha=0$. If the ratio v/b is larger (smaller) than the threshold, $d\theta/d\alpha > (<) 0$. QED.

In Figure 2 we illustrate the two possible outcomes of enhanced investor protection suggested by Proposition 3. If the ratio v/b is sufficiently high (outcome (a) in Figure 2), an increase in investor protection shifts the interest rate equation (16) down. Otherwise the interest rate equation shifts up (outcome (b)). The two potential outcomes have drastically different properties. If the interest rate equation shifts down, the new equilibrium will be characterized by low interest rates and therefore strong incentives to become an entrepreneur. As many entrepreneurs seek finance, capital markets are correspondingly congested. When the interest rate equation shifts up, interest rates are high. Entrepreneurship is unattractive and capital markets are slack.

Figure 2. Effect of investor protection.



An increase in investor protection may have wildly different consequences, we explain Proposition 3 carefully. We rewrite the denominator of (19) again to get the following formula that determines the sign of $d\theta/d\alpha$:

$$\frac{\beta v}{\rho + \gamma} - \frac{(1 - \beta)b}{\rho} \left[1 + \frac{\theta q(\theta)}{\rho + \gamma} \right]. \quad (21)$$

Equation (21) captures the effect of investor protection on the entrepreneur's share of the match surplus that, under the assumption of free-entry, determines latent entrepreneurship and capital market tightness. Enhancing investor protection decreases monitoring costs, which in turn increases the gross match surplus $G_E + G_F - I$. As the first term in (21) shows, the entrepreneur benefits from the increase whenever she gets to propose the repayment obligation.

Since an increase in investor protection makes the entrepreneur's threat of expropriating the financier less valuable, there is also a reduction in the entrepreneur's share of the match surplus whenever the financier gets to propose the repayment obligation, as shown by the second term in (21). In a static environment,

the negative effect on the entrepreneur's share of the match surplus would simply be $(1-\beta)b/\rho$, but search frictions create the multiplier in the brackets. The reason for the multiplier is that better investor protection increases the financier's reservation value, U_F , because searching for a new match becomes more rewarding.

5 Business Creation

In the previous section, we proved that if the ratio of the monitoring costs to the private benefits is sufficiently high, improving investor protection increases entrepreneurship. It is tempting to infer that the greater the number of entrepreneurs, the more firms that will be created. Our model indicates this is not necessarily the case. Entrepreneurship is latent and search frictions discourage entrepreneurs from starting up new firms. How investor protection affects business creation is not clear a priori.

To address the question of whether investor protection increases or decreases business creation, we calculate the steady-state flow of new firms. Because the stock of idle capital is f and a free financier matches an entrepreneur seeking funds at the rate $\theta q(\theta)$, the flow of new start-ups at any point in time is

$$n = \theta q(\theta) f . \tag{22}$$

The stock of idle-capital evolves according to

$$\dot{f} = \gamma(1-f) - n , \tag{23}$$

where $\gamma(1-f)$ captures the recycling of financial capital from successful projects. In a steady state, $\dot{f} = 0$, which, by (22) and (23), means that the steady-state rate of business creation is

$$n = \frac{\theta q(\theta)\gamma}{\theta q(\theta) + \gamma}. \quad (24)$$

Equation (24) shows how capital market tightness has two opposite effects on business creation. The tighter the market, the faster idle capital finds a project, $\theta q(\theta)$, but the smaller the steady-state stock of idle capital $f = \gamma/(\gamma + \theta q(\theta))$. As can be verified from (24), the former effect dominates.

Proposition 4. Business creation is directly related to latent entrepreneurship.

Proof: From (24), we see n is an increasing function of $\theta q(\theta)$, which in turn is an increasing function of θ . QED.

Since the steady-state rate of business creation is directly related to latent entrepreneurship and thus capital market tightness, we can combine Proposition 3 and 4 to obtain the main finding of our study.

Proposition 5. Only if the ratio v/b is sufficiently high, strengthening investor protection promotes business creation. Otherwise, the reverse obtains.

Proposition 5 provides a characterization of the trade-off that the on-going reforms of corporate laws aim at rebalancing: Better investor protection reduces the cost of capital, but limits the freedom of entrepreneurial decision-making. Our result shows that the trade-off can be a critical concern in economies with serious interim moral hazard problems. There is less need to pay attention to the trade-off in economies where the ex post moral hazard is severe and thus monitoring costs high, because there improvements in investor protection lower interest rates and stimulate business creation.

6 Designing an Optimal Policy

6.1 Maximizing Business Creation

The foregoing analysis suggests that, depending on emphasis, a legal reform aimed at improving the position of investors may have wide ranging consequences for business creation. How then should the protection of investors be reformed if policy is appraised, as in fact often happens, solely in terms of the number of start-ups created? We address this question before characterizing the socially optimal level of investor protection.

To obtain practical policy advice, we assume that investor protection reduces the stream of private benefits by $h_b(\alpha)b$ and the monitoring cost flow by $h_v(\alpha)v$, where $h_b(\alpha)$ and $h_v(\alpha)$ are increasing and continuously differentiable functions of α with images $[0, 1]$. It is straightforward to show that the effect of investor protection on business creation boils down to the sign of

$$\frac{h_v'(\alpha)v}{h_b'(\alpha)b} - \frac{(1-\beta)[\rho + \gamma + \theta q(\theta)]}{\beta\rho}, \quad (25)$$

which corresponds to equation (20) in our basic model. Combining equation (25) with Propositions 3 and 5 gives

Proposition 6. Only when the ratio $h_v'(\alpha)/h_b'(\alpha)$ is sufficiently high does strengthening investor protection lower interest rates and increase latent entrepreneurship and business creation. Otherwise, the reverse obtains.

Proposition 6 suggests that if a reform mainly reduces monitoring costs (i.e. $h_v'(\alpha)$ is high), it lowers interest rates and promotes entrepreneurship and business creation. A concrete example might be a tightening of auditing regulation or of the accounting rules that govern how cash flows are recognized in the bookkeeping. If, however, the reform principally constrains the freedom of entrepreneurs to choose projects (i.e. $h_b'(\alpha)$ is high), it has the reverse effect of raising interest rates and discouraging entrepreneurship and business creation. An example of such a reform is, in the context of debt finance, a creditor-friendly covenant regulation or, in case we think equity finance, a minority-friendly rule for how the members of the board of directors are selected.

6.2 Maximizing Social Welfare

The previous sections discussed the objective of maximizing the creation of start-ups. Such an objective is not necessarily socially optimal due to the limited supply of private capital and search costs. Entry of a new entrepreneur causes a positive externality on the other side of the market by increasing the probability that financiers find a match (thin-market externality). Decreasing the probability that other entrepreneurs match it simultaneously causes a negative externality on the same side of the market (congestion externality). In this subsection, we compare the market equilibrium to the constrained social optimum and characterize the conditions under which investor protection can be used to obtain efficiency.

Since (24) suggests that, for a given γ , the creation of start-ups in market equilibrium is fully characterized by capital market tightness, θ , we derive the condition that explicitly determines θ . This can be found by combining the two equilibrium conditions (11) and (16), whereby

$$\beta \left[\frac{\gamma\pi}{\rho} - \nu(1-\alpha) - (\rho + \gamma)I \right] - (1-\beta)[c\theta - B_E(\rho + \gamma + \theta q(\theta))] = \frac{c(\rho + \gamma)}{q(\theta)}. \quad (26)$$

Against this benchmark, we evaluate policymakers' actions, assuming policymakers are subject to the same search and contract frictions as market participants. Thus, the evolution of idle capital given by (23) also constrains policymakers. The social value of a new firm is $\gamma\pi/\rho - \nu(1-\alpha)$ and the flow and fixed start-up costs are c and I , so the social welfare function for an infinitely lived economy is

$$SW = \int_0^\infty e^{-\rho t} \left\{ (1-f) \left[\frac{\gamma\pi}{\rho} - \nu(1-\alpha) \right] - f\theta [c + q(\theta)I] \right\} dt. \quad (27)$$

A utilitarian social planner's problem is to choose capital market tightness θ to maximize SW subject to (23). The current-value Hamiltonian associated with this dynamic optimization problem can be written as

$$H(\theta, f, \lambda) = (1-f) \left[\frac{\gamma\pi}{\rho} - \nu(1-\alpha) \right] - f\theta [c + q(\theta)I] + \lambda [\gamma(1-f) - \theta q(\theta)f], \quad (28)$$

where λ is a co-state variable (shadow price of idle capital). Maximizing (28) with respect to θ and f yields the following first-order conditions:

$$-fc - f[q(\theta) + q'(\theta)](I + \lambda) = 0 \quad (29a)$$

and

$$\nu(1-\alpha) - \frac{\gamma\pi}{\rho} - \theta [c + q(\theta)I] - \lambda [\gamma + \theta q(\theta)] = \lambda\rho - \dot{\lambda}. \quad (29b)$$

Evaluating (29b) in the steady state and substituting λ from (29a) for (29b) gives the condition that determines socially optimal θ and thereby the socially optimal number of start-ups as

$$[1 - \eta(\theta)] \left[\frac{\gamma\pi}{\rho} - \nu(1-\alpha) - (\rho + \gamma)I \right] - c\theta\eta(\theta) = \frac{c(\rho + \gamma)}{q(\theta)}, \quad (30)$$

where $\eta(\theta) \in [0,1]$ denotes the elasticity of the arrival rate of financing offers $q(\theta)$.

Comparing the social optimum (30) with the market equilibrium (26), we see that they coincide if, and only if,

$$\eta(\theta) = (1 - \beta)(1 - \xi), \quad (31a)$$

where

$$\xi \equiv \frac{(1 - \alpha)b(\rho + \gamma + \theta q(\theta))}{\gamma\pi - \rho[v(1 - \alpha) + (\rho + \gamma)I + c\theta]} \geq 0. \quad (31b)$$

Equation (31b) shows that, in the absence of interim moral hazard, $\xi=0$, and equation (31a) reduces to $\eta(\theta)=1-\beta$. This is the Hosios condition (Hosios 1990), which states that the bargaining power of market participants should reflect their contribution to the creation of net surplus.

Similar to Michelacci (2003), who extends Hosios' (1990) results to incorporate technological externalities, we use equations (31a) and (31b) to extend Hosios' (1990) results to a capital market environment where the contract frictions reduce the transferability of utility between market participants.

Proposition 7. In the presence of interim moral hazard, market allocation can generate the socially optimal allocation only if the financiers' bargaining power $1-\beta$ is larger than $\eta(\theta)$.

Proof: If $b>0$, $\xi>0$, and equation (31a) only holds if $1-\beta>\eta(\theta)$. QED.

To understand this, recall from section 3 that the entrepreneurs' ability of threatening to expropriate is valuable only when their bargaining position would otherwise be weak. When proposing the repayment obligation, the financiers need to allow entrepreneurs a sufficiently high share of the output to avoid expropriation. This link between the interim moral hazard problem and the financiers' bargain-

ing power is reflected in (31a) and (31b). Compared to the standard Hosios condition, the opportunity of expropriating financiers makes entrepreneurship overly attractive from the standpoint of social welfare. It makes the negative congestion externality created by the entry of an entrepreneur on the same side of the market overly strong with respect to the positive thin-market externality on the other side of the market. Thus, the market allocation can be efficient only if the effect of the interim moral hazard on the entrepreneurs' entry decisions is offset by an increase in the financier's bargaining power.

Can the protection of investors be reformed to obtain efficiency? To address this question, we write $\xi(\alpha)$ given by (31b) as a function of α . Note that although the direct effect of α on $\xi(\alpha)$ is negative, the indirect effect through θ determined by (26) is quite complicated. This makes it hard to obtain decisive conclusion without imposing further restrictions on parameters. Nonetheless, we can prove that

Proposition 8. If $\frac{\eta(\theta)}{1-\beta} \in [1-\xi(0), 1]$, there exists $\alpha^* \in [0, 1]$ such that market

allocation and social optimum coincide.

Proof: Because $\xi(\alpha)$ is a continuous function of α and (31b) shows that $\xi(0) > \xi(1) = 0$, there exists at least one $\alpha \in [0, 1]$ such that (31a) holds if

$$\frac{\eta(\theta)}{1-\beta} \in [1-\xi(0), 1]. \text{ QED.}$$

It immediately follows from Propositions 7 and 8 that if the financiers' bargaining power $1-\beta$ is smaller than $\eta(\theta)$, policymakers can *never* use investor protection to implement efficiency. If $1-\beta < \eta(\theta)$, the congestion externality is relatively strong compared with the thin-market externality. It would thus be desirable to mitigate

the congestion externality by discouraging entrepreneurship. However, even imposing the maximal level of investor protection does not sufficiently reduce the entry by entrepreneurs to balance the two externalities. Nevertheless, if the standard Hosios condition holds, the maximal level of investor protection, $\alpha = 1$, yields the social optimum. At $\eta(\theta) = (1-\beta)$, the congestion and thin-market externalities without contract frictions counterbalance each other exactly. As contract frictions only tend to enhance the congestion externality, they should be eliminated completely.

7 Conclusions

We built an equilibrium model of private capital markets characterized by search and contracting frictions arising from interim and ex post moral hazard. The search frictions delay the funding of start-ups, while the contracting frictions reduce the transferable match surplus. We examine how investor protection affects the cost of capital, entrepreneurship and business creation in this economy.

Our analysis confirms the existence of the trade-off between investor protection and business creation suggested in recent empirical literature. It can, however, only emerge in economies where interim moral hazard problems are serious and financiers have some bargaining power. In our model the financiers' bargaining power naturally stems from search frictions and, in equilibrium, better investor protection enhances the financiers' bargaining position. This adverse general equilibrium effect of investor protection arises from the financiers' option to forego the current opportunity and search for a new match. There is no trade-off in economies where the ex post moral hazard is severe and thus monitoring costs

relatively high, because there improvements in investor protection lower interest rates and stimulate business creation.

In a desire to make a first cut on the role of investor protection in a private capital market with search frictions, we have only considered its generic effects. We show that, depending on the policy emphasis, improving the position of investors can have widely disparate consequences. A reform that mainly reduces monitoring costs lowers interest rates and promotes entrepreneurship and business creation. A reform that principally constrains the freedom of entrepreneurs to choose projects has the reverse effect of raising interest rates and discouraging entrepreneurship and business creation. It also turns out that the search frictions dilute the beneficial effect of investor protection on business creation.

To obtain these insights, we abstract from modeling features that would enable us identify the form of small business finance and, consequently, the exact form of investor protection. We neither specify whether the financial contracts involve debt or equity nor our financier who could be a bank, an equity investor, a friend, another firm, or any other passive financier that does not provide business advice. To be able to carefully evaluate the effects of a specific legal reform, additional ingredients should be brought into the model.

Nonetheless, we boldly offer several rather concrete policy recommendations. If we think that various transparency rules such as accounting, auditing, and disclosure govern monitoring costs more extensively than project choices, our analysis suggests that strengthening such transparency rules might stimulate entrepreneurship and business creation. In contrast, a cautious approach is called for with regulations controlling the freedom of entrepreneurs to choose projects. Many laws governing minority-shareholder protection such as low thresholds for calling extraordinary shareholders' meetings, or qualified majority requirements

for charter changes and sales of major assets, typically reduce entrepreneurial freedom. In particular, the antidirector rights index of minority shareholder protection developed by La Porta et al. (1997, 1998) and its extensions by Pistor (2000) and Glaeser et al. (2001) include several rules that limit entrepreneurial freedom if applied to small companies. The implication here is that such laws should not be applied to small companies as harshly as to large corporations. In these respects, our findings are quite in line with the on-going company law reform in the UK:

“Our law should provide the maximum possible freedom combined with the transparency necessary to ensure the responsible and accountable use of that freedom.”
(The Final Report of the Company Law Review, Department of Trade and Industry, UK 2001, p. xi).

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Appendix: The Generalized Nash Bargaining

In the main text we use a simple strategic bargaining game where the entrepreneur is allowed to propose repayment obligation ω with probability β and the financier with complementary probability $(1-\beta)$. It is well known that this simple game produces the same outcome as the generalized Nash bargaining under complete information and full transferability of match surplus (see, e.g. Mortensen and Pissarides 1999). We here confirm that the equivalence also holds when the match surplus is not fully transferable.

Under the generalized Nash bargaining, the repayment obligation is determined by

$$\omega \in \arg \max [G_E(\omega) - U_E - B_E]^\beta [G_F(\omega) - U_F - I]^{1-\beta}, \quad (\text{A1})$$

where $\beta \in (0,1)$ is the entrepreneur's bargaining power and $G_E(\omega)$ and $G_F(\omega)$ are functions of ω via (2) and (5). Note that in (A1) the entrepreneur's threat point includes the possibility of choosing the bad project (B_E). As in the main text, the entrepreneur's incentive compatibility and the financier's participation constraint are satisfied in equilibrium, meaning that $G_E(\omega) - U_E - B_E \geq 0$ and $G_F(\omega) - U_F - I \geq 0$.

From (2) and (5) we get $\frac{\partial G_F}{\partial \omega} = -\frac{\partial G_E}{\partial \omega} = \frac{\gamma}{(\gamma + \rho)\rho}$. As a result, the solution

to the maximization problem (A1) satisfies

$$\beta(G_F - U_F - I) = (1 - \beta)(G_E - U_E - B_E). \quad (\text{A2})$$

Rearranging (A2) gives

$$G_E - U_E = \beta S + (1 - \beta)B_E, \quad (\text{A3})$$

where $S = G_E + G_F - I - U_E - U_F$ is the match surplus as before. Equation (A3) is equation (8) of the main text. To obtain equation (7), we first rewrite (A2) as

$$G_F - U_F - I = \frac{(1-\beta)}{\beta}(G_E - U_E - B_E). \quad (\text{A4})$$

Using (A3) to substitute $\beta S + (1-\beta)B_E$ for $G_E - U_E$ in (A4) yields

$$G_F - U_F - I = (1-\beta)(S - B_E), \quad (\text{A4})$$

which is (7) of the main text.