

Is Family Capitalism Harmful for Growth? The Macroeconomic Consequences of the Separation of Ownership and Control

Pietro Tommasino

Bocconi University

Abstract

We study a simple innovation-based growth model, in which entrepreneurs can choose whether to organize production through a hierarchy of professional managers or to self-manage their business. First of all we demonstrate that the organizational choice depends on deeper institutional parameters, such as the legal infrastructure of the economy. Second, we show that the decentralized equilibrium displays an inefficiently small fraction of managerial firms, and a suboptimal growth rate.

1 Introduction

Do organizational choices made by entrepreneurs influence a country's economic performance?

Major discontinuities in economic and technological development have been associated with path-breaking organizational innovations. One prominent example is the development of the factory system during the first industrial revolution. Another example, which constitutes the focus of this paper, is the appearance of the managerial enterprise during the second industrial revolution, in the late nineteenth century (Chandler 1962, 1977). While the former innovation was mainly aimed at reorganizing low-level production tasks, the latter was an attempt to introduce a higher degree of division of decision-making labour, and involved the *separation of ownership from control*. In managerial firms, in fact, owners delegate control and coordination of corporate activities to an external manager (more often, to a hierarchy of professionals). This is in sharp contrast with those enterprises in which control is concentrated in the hands of the owner (often the founder of the firm) or it is shared within a small group of close relatives. Throughout this paper, we define *family firms* those organizations in which ownership and control are concentrated in the hands of a single household (not necessarily the founder's). We refer instead to *managerial firms* as to those

businesses in which a significant amount of authority and decision making power is given to outside professionals.

As it is well known, Chandler's books on the history of the American enterprise argue that formally trained salaried managers are a key for success in many business areas. The idea is that, at least for those firms involved in the second industrial revolution, "the administrative load of executives increased to such an extent that they were unable to handle their entrepreneurial responsibilities efficiently. The situation arose when the operations of the enterprise became too complex and the problems of coordination appraisal and policy formulation too intricate for a small number of officers" (Chandler 1962).

Conversely, Chandler sees the failed separation between ownership and control as a major cause of corporate hardships. His influential explanation of the distress of British business in the Victorian Era is quite representative of his views: "the pioneers recruited smaller managerial teams, and the founders and their families continued to dominate the management of the enterprise" (Chandler 1990). His analysis of British business is also important for our purposes as he suggests that this entrepreneurial failure is also the root of British (relative) industrial decline.

Linking macroeconomic performance with intrafirm allocation of power, the Chandlerian conjecture pushes us back to the opening question: how does the prosperity of a country relate to the organizational choices of its capitalist class? In particular: does the predominance of the family form of enterprise cause disappointing growth records?

If this is so, then why entrepreneurs in different countries have reacted to the same challenges in different ways? Are there appropriate policy actions to escape such economy-wide organizational inefficiencies and, if the answer is yes, are these policies likely to be implemented?

In this paper, we offer answers to these, and related questions, from a general equilibrium viewpoint.

We use a very standard endogenous growth model, in which growth is driven by quality-improving innovations which give to innovators the possibility to enjoy temporary monopoly rents. Contrary to the standard model, we make the organizational form through which economic activities are performed an *endogenous* variable and relate a country's bias for personal management and small scale firms to deeper institutional characteristics of the environment, in particular those features of national laws and regulations that protect the rights of owners and investors from managerial opportunism. These institutions shape the basic trade-off faced by the owners: the efficiency gains granted by professionals, against the increased agency and governance costs induced by separation

of ownership from control.

First of all, we show that *the private returns in opting for a family firm (relative to a managerial one) are significantly different from the social ones*. The reason is that each entrepreneur's choice of corporate organization has an externality on all the others. Indeed, even if firm-level efficiency gains from going managerial are small compared with the induced increase in agency costs, in equilibrium these agency costs are themselves endogenously determined. In particular, we will see that when an outside professional is hired, the overall labour demand and wages go down (as a matter of fact, managers here are mainly aimed at reducing production-labour requirements). This will ultimately reduce the outside option of managers, given that they see a production job as the main alternative to a managerial position. This in turn increases the relative profitability of the managerial enterprise for all the other owners, rising the fraction of managerial firms in the economy. So further efficiency gains are generated, together with a further worsening in the bargaining position of the members of the managerial class¹.

Besides, we try to show that, given the existence of these external economies, *small inefficiencies at the firm level can translate into big differences in macroeconomic performances*, which in turn implies that small improvements in corporate governance institutions can have big effects on firm profitability, innovation, and growth.

In our model, cross country differences in corporate governance can be responsible of threshold effects and convergence dynamics similar to those highlighted by the recent empirical literature on the world distribution of income, which focuses on development traps and convergence clubs (Quah 1996, Howitt 2000, Aghion, Howitt and Mayer-Foulkes 2003): in particular we show that laws should grant *a minimum level of investor below which innovation-based growth is not viable*.

Moreover, we are able to reconcile with each other two strands of the empirical microeconomic literature. On one side, the link between corporate governance and economic growth is significant and well established (see for a survey Levine 2004), and the same is true with regard to the link between better governance and higher degrees of managerial capitalism (La Porta et al. (1999)). On the other side, not only family firms are still widespread in many highly developed countries, but their performance seems in general by no means inferior to that of corresponding managerial

¹ It might seem that, because owners' decisions interact through changes in wages - a pecuniary externality- there should be no welfare effects. This is not so because (1) the model assumes monopolistic competition, so that changes in wages have an impact on the (static) inefficiency associated to monopoly power (2) wages affect here the distribution and the size of monopolistic rents, both of which are linked to the incentive to innovate. Given the existence of R&D spillovers, changes in wages have also an impact on the (dynamic) inefficiency implied by these spillovers.

firms (Anderson and Raab 2003). Together, these pieces of evidence seem to point to something similar to the external effect that we have in mind. Moreover, Demirguc-Kunt and Maksimovic (1998) highlight that the impact of better laws on firm profitability is positive for new firms but negative for incumbents: our shumpeterian model fits naturally with this feature of the data, as macroeconomic growth comes in a "creative destruction" way, so that better corporate governance rises innovation by outsiders and perspective growth but also makes the rents of present producers more insecure. This tension between industry insiders and innovators can in turn lead to a political economy explanation for the persistence of weak corporate governance rules in many countries.

2 Literature Review

MICRO

Since the seminal book of Berle and Means (1936), economists are aware that separating ownership and control introduces a conflict of interest between managers and owners that reduces firm profitability (Jensen and Meckling 1976 provide one of the first formal treatments). On the other side, it became soon clear that owners could resort to a number of mechanisms to mitigate managerial misbehavior: the market for corporate control (Manne 1965), product market competition, competition among managers (Fama 1980), monitoring institutions such as the board of directors. Moreover it was highlighted that separation has benefits as well as costs: first of all, it is not true that the interests of the owner-manager are always aligned with the interests of the firm (Demsetz and Lehn 1985). More importantly, separating ownership from control can avoid the mismatch between talents/skills of the owner and talents/skills required to manage the firm, and it improves the economy-wide allocation of risk (Fama and Jensen (1985)). The bottom line of this early literature is then: (1) there is a trade-off between concentrating and delegating power inside the firm; (2) business organization (the intrafirm allocation of power) is endogenous and, as such, should be viewed as (privately) optimal; (3) in general we expect to observe intermediate arrangements between full concentration and full separation of ownership and control.

In the nineties, in a bunch of papers that took advantage of the theory of the firm developed by Grossman and Hart (1986) and Hart and Moore (1990), Shleifer et al. (1997, 1998) pointed out that, in a context in which contracts are incomplete and small shareholders are harmed by collective action problems, national institutions (especially laws and regulations protecting shareholders) can influence the intrafirm distribution of power between managers and owners. This in turn can have efficiency effects influencing in various ways the degree of financial development.

The first attempt to formally model the organizational choice of an entrepreneur between the managerial firm and the family one, provided by Burkart, Panunzi and Shleifer (2003). We borrow from this paper the main elements of the strategic interaction that opposes the owner to the manager in a context of imperfect shareholder protection. On the other side, their model remains a *static partial equilibrium model*, whereas we take here fully into account the general equilibrium effects of the organizational choices. In our model it is then possible that both forms of organizations are present at the same time -this is an obvious real life fact (see again La Porta et al.1999) that, to our knowledge, has never been explained before in a formal model-. Burkart, Panunzi and Shleifer, like Caselli and Gennaioli (2003), crucially assume some unmodeled financial market imperfection, which prevents talented people to buy the firm which they are fit to manage even if both the owner and the manager would in principle benefit from this deal. Finally, we go beyond their contribution, as we model the link between microeconomic arrangements and macroeconomic growth.

MACRO

The micro-macro link is also at the heart of a small but growing recent strand of theoretical literature. As a matter of fact, endogenous growth theories pioneered by Romer (1990), Aghion Howitt (1992), Grossman Helpman (1991) emphasize that the main engine of growth are innovation efforts driven by hopes of future profits, and the internal organization of firms is a crucial variable in determining both the amount and the distribution of these profits.

Martimort e Verdier (2000) also enrich a schumpeterian model of growth by introducing an agency problem inside the firm. There are two main differences between their approach and ours: (1) they *assume* the separation between ownership and control, instead of explaining it, and (2) they model the agency relationship between the owner and the top management using tools taken from the mechanism design literature, so allowing for complex, detailed contracts and sophisticated enforcement devices. Our contribution instead follows the incomplete contract literature.

Caselli and Gennaioli (2003) assess the macroeconomic consequences of imperfections in the market for corporate control. Contrary to Marimort and Verdier, they *assume* that there is no separation between ownership and control. All the firms in the economy are managed by their owners, but people differ in their managing talents and in their wealth. There is imperfect enforcement in the market for firms (even if I paid to buy a firm, I am not sure of really getting it). Then, poor talented people cannot become owner-managers of a firm, even if they would be better suited for this task than the actual owner-managers. Our modeling strategy differs from the one of Caselli and Gennaioli as (1) we distinguish between ownership and control (allowing for the two to

be separated); (2) following the chandlerian tradition, we disregard heterogeneity of talents but we emphasize managerial overload and low throughput as the main inefficiencies associated with personal capitalism; (3) we concentrate on the effects of contractual incompleteness inside the firm, not outside of it.

Finally, Acemoglu, Aghion and Zilibotti (2003a, 2003b) use a dynamic general equilibrium framework to study momentous organizational changes, and how these interact with the growth record of a country. However they don't address the issue of family firms. Most importantly, we model an economy at the knowledge frontier, which needs endogenously generated innovation to enjoy positive growth rates, whereas they concentrate on countries which are distant from the world technological edge.

3 The model

3.1 Overview

As in Romer(1987, 1990), Aghion-Howitt (1992), Grossman Helpman (1991), the production side of the economy is divided into three sectors:

- The Final Sector uses intermediate goods to produce the final consumption good. Firms in this sector are price takers on both their output and their input markets.
- The Intermediate Sector. Firms in this sector have a monopoly in the production of an intermediate good.
- An Innovating Sector, populated by would-be entrepreneurs who invest resources in *R&D*, trying to improve one of the intermediate products produced in the economy. There is free entry in this sector. *R&D* is modeled as a "patent race", where the prize is a blueprint/patent for a higher quality product. The winner can then start a new firm, displace the former producer, and enjoy a monopoly in the production of this good until the next innovator drives him out of the market.

Contrary to standard growth models, we study the internal organization of monopolistic producers of intermediate goods. In fact, the owners of a monopoly, whoever they are, must choose whether to hire an outside manager, or to manage the firm by themselves. In this second situation, the owner has also to choose the appropriate allocation of authority between him and the outsider.

As there are decreasing returns to managerial efforts, the second alternative reduces managerial overload and enhances productive efficiency. On the other side, managerial firms, in contrast with family firms, are harmed by an agency problem, the costs of which depend on the overall corporate governance institutions of the country (which the entrepreneurs take as given).

Of course, given the general equilibrium nature of the model, there is a two-way relationship that links the choice of internal organization and market conditions:

- If there are more managerial firms, wages will be lower. That's because the increase of managerial firms increases the efficiency of production and so reduces the demand for labour for each intermediate firm. This of course causes a decrease in wages. Given that a manager sees a position as a production worker as the alternative to a managerial task, a decrease in wages will make cheaper for an owner to hire an outside professional.
- If wages are high, managerial firms are more attractive. This effect is driven by two distinct forces. First of all, as managers increase labour productivity, they will be more valuable if labour becomes relatively costly. Second, and more subtle, in our model owners try to limit managerial expropriation through monitoring activities that are privately costly and involve deadweight losses. An increase in wages implies a higher managerial compensation, because it rises the manager's outside option. In equilibrium, a fraction of this higher compensation is given to managers in the form of reduced monitoring. This in turn also reduces deadweight losses linked to managerial compensation, making managers relatively more attractive. (interestingly, this second link works even if hiring a manager gives no efficiency advantage).

So, in a (static) equilibrium *the fraction of managerial firms, wages and the amount of managerial compensations are jointly determined* (Proposition 1). In particular, it turns out that, for certain parameter configurations, both kinds of organizations are present (Proposition 2a). Parameters capturing corporate governance have an impact on the characteristics of the equilibria in that shareholder-oriented laws rise the equilibrium number of managerial firms (Proposition 2b).

In a dynamic equilibrium, the rate of growth of the economy is linked to the rate at which new improved goods are introduced, which in turn depends on the amount of resources devoted to R&D. These are determined by the expected profitability of innovations, i.e. by the discounted stream of profits that the newborn monopoly is expected to earn. This is the link through which the internal organization of the firm affects growth. Again, we can disentangle two channels:

- If the (equilibrium) internal organization of the firm is more efficient, per-period operating profits will be higher, so making innovation more attractive.
- If the (equilibrium) internal organization of the firm is more efficient, there will be less need for labour services, lower wages, higher profits, and so more innovative effort.

As we remarked in the introduction, *only the first effect is (albeit partially) internalized by owners*, and this drives a wedge between privately optimal and socially optimal organization choices.

It turns out that positive growth can be sustained only if there is a minimum level of investor protection. This means that a country could stagnate and/or fail to converge to the world frontier even if the efficiency gains from the managerial organization at the firm level are negligible! More generally, an higher percentage of managerial firms is associated with higher rates of growth (Proposition 3).

3.2 Preferences and Endowments

Let there be a continuum L households with preferences over consumption and labour effort:

$$U_j = \int_0^{\infty} [\log c(\tau) - \frac{k}{2}l(\tau)^2]e^{-\rho\tau} d\tau \quad (1)$$

$j \in L$ (as usual we can interpret each household as composed by finitely lived generations linked by some degree of altruism, reflected in the intertemporal discount rate ρ).

3.3 Technology and the benefits of managers

The consumption good is produced through a continuum of intermediate goods of measure 1:

$$Y_t = \int_0^1 A_{it}^{1-\alpha} x_{it}^{\alpha} d\bar{i}. \quad (2)$$

Each intermediate good is in turn produced by a monopolistic firm through a linear technology: one unit of the intermediate requires λ units of labor.

We introduce now two key assumptions regarding distribution of labor inside these monopolistic firms.

(1) In the firm we have both production and managerial tasks, which are necessary to coordinate and enhance production efficiency;

(2) managerial performance depends on the division of managerial labor: in particular, if a manager is in charge of many tasks, his effectiveness in performing each of them is reduced.

Behind both assumptions there is a huge microeconomic literature which studies the role of managerial work in production activities. In particular, managers are needed to supervise workers' efforts in production (Williamson 1967, Calvo and Wellisz 1979, Qian 1994) and to enhance coordination and communication (Radner 1993, Bolton and Dewatripont 1994, Van Zandt 1998). Most of these papers find that managerial effectiveness is inversely related to the span of control (see also Keren and Levhari 1979, 1983). This in turn gives formal content to the concept of managerial overload which is at the core of Chandler's work as well as of many other contributions in business history and management.

To capture these microeconomic insights in a straightforward way, we assume that, in each intermediate firm run by a professional manager $\lambda_m < \lambda_f$. In what follows, we want to argue that even *small* productivity improvements brought by managerialization can be important in the aggregate. So we make the minimal assumption about λ_m and λ_f , namely that the measure of managers which are necessary in a managerial firm (we normalize it to 1) are less than the measure of production workers which are saved by using a managerial hierarchy to coordinate production

Assumption $\Delta\lambda = \lambda_f - \lambda_m \geq 1$.

Indeed, if $\Delta\lambda = 1$ actually there is no productivity improvement even at the firm level, as the amount of production workers that you save thanks to managerial supervision has measure 1, but you lose at the same time an amount of measure 1 of production workers (a manager cannot be employed in production activities²). Finally, to grant balanced growth, we assume that production-labour requirements in each firm decrease with x_{it} , the amount of production: allowing for such a learning-by-doing effect simplifies the algebra and goes in the direction to make family firms more attractive, so it actually makes our results stronger.

3.4 Production and Profits in the Family Firm

Given the final sector is competitive, the price of an intermediate good will be equal to its marginal productivity. This implies that each family firm perceives a downward sloping demand curve of the

²This of course is true as long as firm-level employment remains fixed throughout, as will in fact be the case below.

form:

$$x_{it} = A_{it} \left(\frac{\alpha}{p_{it}} \right)^{\frac{1}{1-\alpha}}. \quad (3)$$

We also assume that there in each sector there is a competitive fringe of firms which can produce the same good at a price of X , so that all the firms will charge the limit price $p=X$ (In turn, X can be seen as a policy parameter capturing the degree of intermediate product market competition in the economy, as in Acemoglu, Aghion and Zilibotti (2003a, 2003b)). If unconstrained by competition, firms would fix a price which is a mark-up on unit production costs: $\frac{\lambda_m}{\alpha} w_t$. Then limit pricing will be optimal iff: $X < \frac{\lambda_m}{\alpha} w_t$. As we will see, in equilibrium the wage rate will be $\lambda_m + 1 < w_t < \lambda_f$. So a sufficient condition for limit pricing is given by

Assumption $X < \frac{\lambda_m^2}{\alpha}$.

Profits are then given by

$$\pi_{it}^f = A_{it} \left(\frac{\alpha}{X} \right)^{\frac{1}{1-\alpha}} (X - \lambda_f w_t) \equiv A_{it} \tilde{\pi}^f(w_t).$$

Besides, in order to make the problem interesting, we want family firms to be potentially viable as an organization mode. In order not to exclude this possibility on a priori grounds, one wants that $X > \lambda_f w_t$. Again, given that in equilibrium will turn out that $\lambda_m + 1 < w_t < \lambda_f$, we are led to a second convenient parameter restriction:

Assumption $X > \lambda_f^2$

3.5 Corporate Governance and the cost of managers

As we have seen, the intrafirm allocation of control has efficiency effects through its impact on managerial overload. At the same time, the literature on contractual incompleteness and corporate governance reminds us that the allocation of control has sizable effects also on the *distribution* of the rents generated by the firm (Shleifer and Vishny 1997, Zingales 1998). Hiring a professional separates ownership from control. By this very fact the professional manager is in a position to divert some of the profits generated by the firm. In contexts in which contracts are incomplete (in particular, the expropriation decision of the manager is non contractible) the magnitude of the managerial agency costs incurred by the owner is mainly determined by the quality of legal institutions and/or by monitoring performed by the owner himself. In modeling this two forces, we follow Shleifer et al.(2003). In particular we model shareholder-protecting laws as a public good

which is available to the owner at no cost, while internal monitoring is a costly activity.

If owners do not make any effort to monitor managers, the manager can steal a fraction of revenues which is less or equal to ϕ : the amount of tunneled resources is proportional to the amount of delegation. On the top of this, owners are endowed with a monitoring technology such that, at a cost cm , they can recover a fraction m of operating profits. The parameter $c < 1$ captures the efficiency of the monitoring technology. Both the upper bound to expropriation $\phi < 1$ and the effectiveness of the monitoring technology c , capture (as in Shleifer et al. 2002), the effectiveness of a country's law and institutions in reducing managerial agency costs.

3.6 Production and Profits in the Managerial Firm

A managerial firm faces a demand curve identical to the that of a family firm: $x_{it} = A_{it}(\frac{\alpha}{p_{it}})^{\frac{1}{1-\alpha}}$. The owner of a managerial firm chooses m (the amount of monitoring) in order to maximize his payoff, given by:

$$(1 - \phi + (1 - c)m_{it})A_{it}(\frac{\alpha}{X})^{\frac{1}{1-\alpha}}X - A_{it}(\frac{\alpha}{X})^{\frac{1}{1-\alpha}}\lambda_m w_{it}$$

and subject to the participation constraint of the manager, otherwise the manager would rather offer his labor in the market for production workers. Assuming away for the moment monetary incentives, this participation constraint takes the following form³:

$$(\phi - m_{it})x_{it}X \geq w_{it}x_{it}$$

i.e.:

$$m \leq \max\{0, \phi - \frac{w}{X}\}.$$

At the optimum the constraint holds with equality, and this implies that:

$$\pi_{it}^m = A_{it}(\frac{\alpha}{X})^{\frac{1}{1-\alpha}} \max\{(1 - c\phi)X - (1 - c) - \lambda_m w_{it}; (1 - \phi)X - \lambda_m w_{it}\} \equiv A_{it}\tilde{\pi}^m(w_{it}; \phi, c)$$

³The Individual Rationality constraint for the manager must be satisfied in expected terms, i.e., we assume that the manager does not know x_{it} but only its average/expected level.

4 Innovation and Growth

As in Aghion Howitt (1992) in Grossmann Helpman (1991) we model innovation as a stochastic patent race among would be entrepreneurs. If successful, the innovator rises the quality parameter A of a factor $\gamma > 1$:

$$A_{it+1} = \gamma A_{it}$$

(This is the right place to notice that t denotes throughout the paper the number of quality improving innovations that have been already discovered, while we use the greek letter τ to denote (continuous) calendar time).

The $t+1$ innovation in the i -th sector arrives randomly with Poisson instantaneous probability ηn_{it} , with $\eta > 0$ and $n_{it} = \frac{N_{it}}{A_{it}}$. N_{it} is the amount of resources spent in R&D and targeted to the i -th sector, in order to achieve the $t+1$ innovation (these resources are in units of the final good). Notice that this specification captures the well-known "fishing pond effect", in that the probability of discovering the next innovation decreases with the number of innovations that are already discovered. So if V_{it+1} is the present discounted value of being a monopolist in the i -th intermediate sector, $\eta'(n_{it})V_{it+1}$ is the marginal benefit from R&D. In turn, one can easily show that:

$$V_{it+1} = \frac{\max[\pi_{it+1}^m, \pi_{it+1}^f]}{\tau + \eta n_{it+1}}$$

In words, the value of being the next monopolist is given by the stream of future profits discounted with the risk-adjusted discount rate $\tau + \eta n_{it+1}$. So the marginal benefits of R&D can be expressed as $\eta \frac{\max[\pi_{it+1}^m, \pi_{it+1}^f]}{\tau + \eta n_{it+1}}$, and in equilibrium we have:

$$\eta \gamma \frac{\max[\tilde{\pi}^m(w_t; \phi, c), \tilde{\pi}^f(w_t)]}{\tau + \eta n_{it+1}} \leq 1 \quad (4)$$

with equality if $n_{it} > 0$.

In the aggregate⁴, we can rewrite

$$Y_t = \int_0^1 A_{it}^{1-\alpha} x_{it}^\alpha di = \left(\frac{\alpha}{X}\right)^{\frac{\alpha}{1-\alpha}} \int_0^1 \gamma^{t_i} di = \left(\frac{\alpha}{X}\right)^{\frac{\alpha}{1-\alpha}} A_t,$$

⁴We fix $A_{i0} = 1$ for each i for simplicity

where $A_t = \int_0^1 A_{it} di = \int_0^1 \gamma^{it} di$, can be taken as an economy-wide index of technological progress. Anticipating the fact that in equilibrium the amount of innovation is the same in any sector, and limiting our analysis on steady state equilibria in which R&D effort is constant through time, the rate of growth of aggregate output is then equal to the rate of growth of A . As $A_{\tau+\varepsilon} = \eta n \varepsilon \gamma A_\tau + (1 - \eta n \varepsilon) A_\tau + o(\varepsilon)$, one has that

$$\frac{\dot{A}}{A} = (\gamma - 1)\eta n = \frac{\dot{Y}}{Y},$$

where⁵

$$n = \max\{0, \max[\tilde{\pi}^m(w; \phi, c), \tilde{\pi}^f(w)] - \frac{\rho}{\gamma\eta}\}.$$

This can be taken to be the bottom line of any endogenous growth model: the rate of growth of the economy depends on the amount of resources devoted to R&D, which in turn are endogenously determined, i.e. they are linked to deep structural and institutional characteristics of the economy through the arbitrage equation (4). In particular, all those institutional changes that rise R&D productivity η and/or rise the size of innovation γ also foster both innovative activities and growth. Another feature that our model shares with other endogenous growth models is that higher wages discourage R&D, as they imply lower perspective profits. What is new is the negative influence of ϕ and c on profits and so on R&D incentives both *directly and indirectly* (viz. through their impact on equilibrium wages)⁶. Besides, corporate governance institutions interact with other institutions influencing growth in a somewhat interesting way (see proposition 5 below).

4.1 The organization of economic activity in equilibrium

It is now time to properly define an equilibrium for the whole economy (for notational ease we will often omit time subscripts):

Definition 1 *An equilibrium is given by:*

(i) *An organizational form μ_i , and a production decision x_i for each intermediate firm, where $\mu_i=1$ if the firm is managerial, and 0 otherwise. Only if the firm is managerial ($\mu_i = 1$) a monitoring decision m_i ;*

⁵Remember that, the Euler condition for Ramsey Household delivers: $r = \rho + \frac{\dot{Y}}{Y}$

⁶One should also notice that, even if the arrival of an innovation at the industry level is random, the fraction of sectors experiencing a new innovation can be considered deterministic (an application of the law of large numbers).

- (ii) for each individual, the offer of managerial and production work;
- (iii) for each final sector firm, a demand of intermediates ;
- (iv) a fraction of managerial firms μ in the economy;
- (v) a wage level w ;
- (vi) a choice of R&D intensity on the part of innovators

such that:

(Optimal Choices I) Given μ and w , $(\mu_i, x_i)_{i \in [0,1]}$, $(m_i)_{i \in \mu}$, and the individual allocation of labor are optimally chosen;

(Optimal Choices II) Given μ and w , the demand of inputs by the final sector is such that each input is paid its marginal product;

(Optimal Choices III) Given μ , and w , the amount of R&D is optimally chosen;

(Compatible Choices) $\mu = \int_0^N \mu_i di$, and the labor market clears.

An entrepreneur will choose to relinquish control to a manager iff $\pi_m > \pi_f$. It can be easily shown that $\pi_m > \pi_f$ iff $\max\{-c\phi x_{it}X + \Delta \lambda x_{it}w_t - (1-c)x_{it}w_t; -\phi x_{it}X + \Delta \lambda x_{it}w_t\} > 0$.

This implies that $\pi_m - \pi_f$ is increasing in w , and that there exist only one w^* for which $\pi_m = \pi_f$:

$$w^* = \frac{c\phi X}{\Delta \lambda - (1-c)} > 0 \quad (5)$$

If we define $x_t^f = \int_{i \in 1-\mu} x_{it} di = \int_{i \in 1-\mu} A_{it} \left(\frac{\phi}{X}\right)^{\frac{1}{1-\alpha}} = A_t \left(\frac{\phi}{X}\right)^{\frac{1}{1-\alpha}}$ (accordingly, we can define $x_t^m = \int_{i \in \mu} x_{it} di = A_t \left(\frac{\phi}{X}\right)^{\frac{1}{1-\alpha}}$), the overall demand of labour is given by:

$$L^d = (1-\mu) \frac{\lambda_f x_t^f}{x_t^f} + \mu \left(\frac{\lambda_m x_t^m}{x_t^m} + 1 \right) = (1-\mu)\lambda_f + \mu(\lambda_m + 1)$$

(remember that we have assumed that production-labour requirements in each firm decrease with x_{it}). That is, L^d is made up of three components: (1) the amount of production labour requested by family firms, $\lambda_f x_t^f / x_t^f = \lambda_f$ (remember that family firms are a fraction $1-\mu$ of the total number of intermediate firms); (2) the amount of production labour requested by managerial firms: $\lambda_f x_t^m / x_t^m = \lambda_m$; (3) the demand for managers to serve in managerial firm, which is obviously equal to the fraction of managerial firms μ . Given the demand side, the labour offered by each household will be such that the marginal benefits of one unit of work (w_t) is equal to the marginal cost: kl .

Given that there are L households in the economy, we get that $L^s = Ll^*(w_t) = \frac{L}{k}w_t$. Given we are not interested in comparative statics exercises on k and L , we can as well set $k=L$, so that that $L^d = L^s$ gives:

$$w = (1 - \mu)\lambda_f x_t^f + \mu(\lambda_m x_t^m + x_t^m) = \lambda_f - (\Delta\lambda - 1)\mu. \quad (6)$$

We are now in a position to state the following result:

Proposition 2 (*Existence and Uniqueness*) *The model has one and only one equilibrium.*

The intuition of the result can be easily given. We have seen that there exist one level of w^* of w such that $\pi_m = \pi_f$. (given by equation 5) We can then build a perfectly elastic "demand of managers" in the space (w, μ) , which is 0 if $w > w^*$, 1 if $w < w^*$, and whatever $\mu \in [0, 1]$ if $w = w^*$. On the other hand, the equilibrium condition on the labour market gives (6), which is a downward-sloping curve in the same space.

The equilibrium values of w and μ are then obtained as the unique intersection of the demand and the offer of managers.

Proposition 3 (*Comparative statics*)

- *The equilibrium number of managerial firms weakly increases with the quality of corporate governance, i.e. it is inversely related to ϕ (and c). In particular, for intermediate values of ϕ (and c) both kinds of organizational forms are present in equilibrium (i.e. $\mu \in (0, 1)$):*

$$\text{Case 1 } \mu = 0, w = \lambda_f \text{ iff } \frac{c\phi X}{\Delta\lambda - (1 - c)} > \lambda_f$$

$$\text{Case 2 } \mu = 1, w = \lambda_m + 1 \text{ iff } \frac{c\phi X}{\Delta\lambda - (1 - c)} < \lambda_m + 1$$

$$\text{Case 3 } \mu = \frac{1}{\Delta\lambda - 1} \left[\lambda_f - \frac{c\phi X}{\Delta\lambda - (1 - c)} \right] \in (0, 1), w = \frac{c\phi X}{\Delta\lambda - (1 - c)}$$

$$\text{iff } \lambda_f > \frac{c\phi X}{\Delta\lambda - (1 - c)} > \lambda_m + 1$$

- The equilibrium amount of monitoring decreases with the quality of corporate governance, i.e. it is inversely related to ϕ (and c);
- The wage level decreases with the quality of corporate governance, i.e. it is inversely related to ϕ (and c).

The intuition for these results has been already highlighted in the introduction: better investor protection reduces the agency costs inside managerial firms, so making the managerial form of organization relatively more attractive. As more firms become managerial, overall production efficiency in the economy raises: intermediate firms can now produce the same amount of good with less production workers. This, in turn reduces the demand for labour and the wage level.

Proposition 4 \dot{Y}/Y decreases⁷ with ϕ .

This notwithstanding one could argue that, as $\lambda_f > w > \lambda_m + 1$ the importance that the external effect that corporate governance exerts on growth through wages decreases as $\Delta\lambda$ approaches 1. This is true only if investor protecting laws reach a minimum level, under which governance institutions are too weak to support innovation-driven growth:

Proposition 5 (The Chandler Effect) For each $\Delta\lambda > 1$, there is a minimum level of Corporate Governance (and a corresponding minimum fraction of managerial enterprises in the economy) below which no one innovates, and the rate of growth in the country is zero.

In fact, one immediately sees that growth is positive only if:

$$\left(\frac{\alpha}{X}\right)^{\frac{1}{1-\alpha}}(X - \lambda_m w) > \frac{\rho}{\gamma\eta}$$

but this implies that there is a threshold level of w below which innovation is not profitable and the country is deemed to stagnate. As we know that both w and μ depend negatively on the quality

⁷ Suppose we are in Case 3, which as we have seen seems the empirically relevant one. We have that

$$\dot{Y}/Y = \max\left\{0, (\gamma - 1)\eta\left(\frac{\alpha}{X}\right)^{\frac{1}{1-\alpha}}\left(1 - \frac{c\phi\lambda_f}{\Delta\lambda - 1 + c}\right) - \left(1 - \frac{1}{\gamma}\right)\rho\right\}$$

One should notice that, even if better Corporate Governance implies higher growth, the way in which the growth-enhancing effect of ϕ depends on $\Delta\lambda$ is quite subtle. Lowering λ_f holding λ_m fixed reduces $\left|\partial(\dot{Y}/Y)/\partial\phi\right|$ and the fraction of managerial firms μ , but a rise in λ_m holding λ_f fixed has opposite effects both on $\left|\partial(\dot{Y}/Y)/\partial\phi\right|$ and on μ . Of course, in both cases the [maybe I will fix $\lambda_m = 1$ in the next version]. Apart from that, it is clear that both a decline in λ_f and a rise in λ_m make the parameter configuration displayed in Case 3 less likely.

of corporate governance, one can conclude that if the regulatory and institutional infrastructure of a country falls below a certain level, the country itself is locked in a no-development trap. Again, this extreme result is a by-product of the positive externality that each new managerial firm exerts on all the other firms, as a higher fraction of managerial firms reduces wages and so rises profits of all firms, independently of their organizational form. Hardly a theoretical *curiosum*, the fact that only a few advanced countries perform R&D activities is well documented. For example, Howitt et al. (2002) calculate that the 80% of world patents are due to 5 countries, while 11 countries account for 95% of world patents. On the other side, it is obviously unrealistic to presume that the absence of leading-edge technological research causes a country to stagnate (but notice that in our highly stylized model we have left aside both capital accumulation and imitation activities).

From an historical point of view, this can explain why the outburst of innovation known as the second industrial revolution has taken place in those countries in which the managerial firm was first introduced, so vindicating what we have called the "Chandlerian Conjecture". Our hypothesis is that *both the economy-wide organizational change and the jump in the rate of technological progress are caused by (not necessarily big) improvements in corporate governance, so that the first countries to enter the new regime are those in which the laws and other investor-protecting institutions first reached the minimum level compatible with leading-edge R&D.*

Finally, it is interesting to note that, in our model with endogenous organizational form, the growth rate is also more sensitive to variations in the other parameters affecting the rate of innovation, such as an increase in the productivity of R&D represented by η or more drastic innovations (represented by the parameter γ).

Proposition 6 $(\frac{\partial g}{\partial \eta})/\partial \phi < 0$; $(\frac{\partial g}{\partial \gamma})/\partial \phi < 0$.

5 Cross-Country Technology Spillovers and Club Convergence

As we said in the introduction one robust empirical fact seems to be the tendency of the growth rates of a set of developed countries to converge in the long run, notwithstanding the persistence of sizable income and productivity differentials among them. Inspired by Howitt (2000) and Aghion and Howitt (2003) we assume here international productivity spillovers. In particular, we assume that, if the i -th sector is hit by an innovation at time τ , the quality level improves by a coefficient γ the most efficient technology available at τ , that we label $A_{\tau}^{\max} \equiv \max\{A_{i\tau-\varepsilon}^j : i \in [0, 1], j \in W, \varepsilon \rightarrow 0^+\}$, where $A_{i\tau}^j$ is the quality level of the i -th sector in the j -th country at time τ . In words, in the basic

model we assume that current innovators are "on the shoulders" of past national innovators, while here we assume that current innovators can build upon the effort of past innovators from all over the world. If we call $\eta^W \equiv \sum_{j \in World} \eta^j$ the total amount of research performed in the world, one can easily show that

$$\frac{\dot{A}_\tau^{\max}}{A_\tau^{\max}} = (\gamma - 1)\eta^W \quad (7)$$

and that

$$\frac{\dot{A}_\tau^j}{A_\tau^j} = \eta^j(\gamma d_\tau^j - 1) \quad (8)$$

where $d_\tau^j \equiv \frac{A_\tau^{\max}}{A_\tau^j}$ is a measure of the distance to the world technological frontier of country j at time τ (One should notice that equation (8) displays a sort of "Gerschenkron effect", analogous to the one in Aghion et al.(2003a,2003b): that is, *ceteris paribus*, more backward countries experience higher growth rates). Finally one should note that the evolution of d_τ^j has a stable steady state⁸ for each country:

$$d_\infty^j = \begin{cases} \frac{1}{\gamma} + \frac{\gamma-1}{\gamma} \frac{\eta^W}{\eta^j}, \text{ iff } \eta^j > 0 \\ \infty \text{ iff } \eta^j = 0 \end{cases}$$

Then the model implies that: (1) In the long run, the group of innovating economies converges to a common rate of growth given by (7); (2) Among them there are persistent TFP differences driven by differences in the amount of R&D and so grounded in the same institutional differences that we highlighted above; (3) As in the basic model, those countries which do not innovate progressively diverge from the rest of the world.

6 Bibliography

Acemoglu, D. Aghion, P. and Zilibotti, F. (2002), "Distance to Frontier, Selection and Economic Growth", NBER working paper 9066.

Aghion Howitt (1992), "A Model of Growth through Creative Destruction", *Econometrica*, 60, 623-651.

Aghion, P., Howitt, P. and Mayer-Foulkes, D. (2003), "The Effect of Financial Development on Convergence: Theory and Evidence", mimeo.

⁸ $\frac{d d_\tau^j}{d \tau} = \frac{\dot{A}_\tau^{\max}}{A_\tau^{\max}} - \frac{\dot{A}_\tau^j}{A_\tau^j} = (\gamma - 1)\eta^W - \eta^j(\gamma d_\tau^j - 1)$

Anderson, R. and Reeb, D. (2003), "Founding Family Ownership and Firm Performance: Evidence from the S&P500", *Journal of Finance*, forthcoming.

Berle, A. and Means, G. (1936), *The Modern Corporation and Private Property*, New York, Macmillan.

Bolton, P. and Dewatripont, M. (1994), "The Firm as a Communication Network", *Quarterly Journal of Economics*, 109, 809-839.

Burkart, M., Panunzi, F. and Shleifer, A. (2003), "Family Firms", *Journal of Finance*, forthcoming.

Calvo, G.A. and Wellitz, S. (1978), "Supervision, Loss of Control, and the Optimal Size of the Firm", *Journal of Political Economy*, 86, 943-952.

Caselli, F. and Gennaioli, G. (2003), "Dynastic Management", mimeo.

Chandler, A.D. (1962), *Strategy and Structure: Chapters in the History of the Industrial Enterprise*, Cambridge MA, MIT Press.

Chandler, A.D. (1977), *The Visible Hand: the Managerial Revolution in American Business*, Cambridge MA, Belknap Press.

Chandler, A.D. (1990), *Scale and Scope: The Dynamics of Industrial Capitalism*, Cambridge MA, Belknap Press.

Demirgiuc-Kunt, A. and Maksimovic, V. (1998), "Law, Finance, and Firm Growth", *Journal of Finance*, 53, 2107-2137.

Demsetz, H. and Lehn, K. (1985), "The Structure of Corporate Ownership: Causes and Consequences", *Journal of Political Economy*, 93, 1155-1177.

Fama, E.F. (1980), "Agency Problems and the Theory of the Firm", *Journal of Political Economy*, 88, 288-307.

Fama, E.F. and Jensen, M.C. (1985), "Organizational Forms and Investment Decisions", *Journal of Financial Economics*, 14, 110-119.

Grossman, S. and Hart, O. (1986), "The Costs and Benefits of Ownership: a Theory of Vertical and Lateral Integration", *Journal of Political Economy*, 94, 691-719.

Grossman, G.M. and Helpman, H. (1991), *Innovation and Growth in the Global Economy*, Cambridge MA, MIT Press.

Hart, O. and Moore, J. (1990), "Property Rights and the Nature of the Firm", *Journal of Political Economy*, 98, 1119-1158.

Howitt, P. (2000), "Endogenous Growth and Cross-Country Income Differences", *American*

Economic Review, 90, 829-846.

Jensen, M.C. and Meckling, W.H. (1976), "Theory of the Firm: Managerial Behavior, Agency Costs, and Ownership Structure", *Journal of Financial Economics*, 3, 305-360.

Keren, M. and Levhari, D. (1979), "The Optimal Span of Control in a Pure Hierarchy", *Management Science*, 11, 1162-1172.

Keren, M. and Levhari, D. (1983), "The Internal Organization of the Firm and the Structure of Average Costs", *Bell Journal of Economics*, 14, 474-486.

La Porta, R., Lopes de Silanes, F. and Shleifer, A. (1999), "Corporate Ownership Around the World", *Journal of Finance*, 54, 471-517.

LaPorta, R., Lopez de Silanes, F., Shleifer, A. and Vishny, R.W. (1997), "Legal Determinants of External Finance", *Journal of Finance*, 52, 1131-1350.

LaPorta, R., Lopez de Silanes, F., Shleifer, A. and Vishny, R.W. (1998), "Law and Finance", *Journal of Political Economy*, 106, 1113-1155.

Levine, R. (2004), "Finance and Growth: Theory and Evidence", mimeo.

Manne, H.G. (1965), "Managers and the Market for Corporate Control", *Journal of Political Economy*, 110-120..

Martimort, D. and Verdier, T. (2000), "The Internal Organization of the Firm, Transaction Costs, and Macroeconomic Growth", *Journal of Economic Growth*, 5, 315-340.

Quah, D. (1996), "Twin Peaks: Growth and Convergence in Models of Distribution Dynamics", *Economic Journal*, 106, 1045-1055.

Quian, Y. (1994), "Incentives and Loss of Control in an Optimal Hierarchy", *Review of Economic Studies*, 61, 527-544.

Radner, R. (1993), "The Organization of Decentralized Information Processing", *Econometrica*, 61, 1109-1146.

Romer, P.M. (1990), "Endogenous Technological Change", *Journal of Political Economy*, 98, S71-S102.

Shleifer, A. and Vishny, R.W. (1997), "A Survey of Corporate Governance", *Journal of Finance*, 52, 737-783.

Van Zandt, T. (1998), "Organizations with an Endogenous Number of Information Processing Agents", in Majumdar, M.(ed.), *Organizations with Incomplete Information. Essays in Economic Analysis*, Cambridge UK, Cambridge University Press.

Williamson, O.E. (1967), "Hierarchical Control and Optimum Firm Size", *Journal of Political*

Economy, 76, 123-138.

Investor Protection and North-South Productivity Differences

Pietro Tommasino

Bocconi University

Abstract

A higher degree of investor protection improves the terms at which entrepreneurs can borrow and increases their profits. As high profits attract innovation efforts, new technologies are developed with an eye to the needs of more financially developed countries (the north). As in these countries firms rely relatively more on intangible assets, R&D will be concentrated in intangible assets-intensive industries, which will therefore enjoy higher productivity levels. The mismatch between the needs of the countries with weak investor protection (the south) and the world supply of new technologies implies a permanent north-south productivity gap, even without barriers to technology transfers.

1 Introduction

A well functioning financial sector seems an obvious precondition for economic prosperity, and indeed cross-country differences in financial development seem to account for a sizable portion of differences in income levels (see Levine 2004 for a survey of empirical evidence). However, it is not clear through which channels the efficiency of the financial infrastructure has an impact on a country's long run economic performance. Even if it is by now quite uncontroversial that factor productivity is a major determinant of differences in income levels (Hall and Jones 1999, Klenow and Rodriguez-Clare 2000, Caselli 2004), past research has mainly focused on the role of the financial sector in increasing the saving rate and in improving the process of factor accumulation (examples are Greenwood and Jovanovic 1990, Acemoglu and Zilibotti 1997, Galor and Zeira 1993). However, other contributions (King and Levine 1993, De la Fuente and Marin 1996, Aghion et al. 2003, Morales 2003) have stressed that a developed financial sector contributes to ameliorate moral hazard and adverse selection problems which are inherent to the financing and monitoring of R&D, so rising the amount of resources devoted to innovative activities, with a positive impact on

productivity. One objection to this line of reasoning is that less developed countries do not need to innovate in order to grow: to a certain extent, they can prosper using innovations developed elsewhere (this point is forcefully advanced by Parente and Prescott 1994 and 1999, among others). Indeed, R&D activity is concentrated in a handful of developed countries (Howitt 2000 reports that 80% of world patents are due to 5 countries, while 11 countries account for 95% of world patents). The fact that, this notwithstanding, financial development seems more crucial for less developed countries, as documented by Aghion et al. (2003), adds weight to such an objection.

The aim of this paper is to highlight a new causal link between financial development and economic growth -one which goes through TFP-which is relevant even if every country has access to the world technology frontier instantaneously and without costs.

The main idea is quite simple and rests on three basic assumptions:(1) there are technological differences among industries, related to the fact that some sectors rely more heavily on more tangible production factors (real estate, plants, machinery) than others; (2) there are institutional differences among countries, which have an impact on (and are a proxy for) the degree of financial development. In particular, countries differ in the level and the enforcement of investors' rights; (3) those sectors which rely on more tangible assets suffer less from low financial development. Assumption 1 and 3 are corroborated by some recent empirical evidence (Claessens and Laeven 2003, Braun 2003), and are in line with much of the incomplete contracts literature, in which assets are seen as a way to distribute bargaining power inside the lender-borrower relationship (see for example Hart 1995). In particular, the transfer of control over assets when the borrower does not repay, is a way to empower the lender, which is all the more important if poor laws do not protect him enough. Tangible assets are more difficult to conceal, and more easily redeployed by an outside investor (Shleifer and Vishny 1992), so that in principle they seem relatively more useful in backward contexts.

Assumption 2 has been explored and to a large extent confirmed by the "law and finance" approach, pioneered by La Porta et al. 1997, 1998.

Our argument runs as follows: a higher degree of investor protection improves the terms at which entrepreneurs can borrow, so it lowers production costs, and increases sales and profits. As high profits attract innovation efforts, technologies are developed with an eye to the needs of more financially developed countries (the north). As in these countries firms rely relatively more on technologies which are intensive in intangible assets, R&D will be concentrated in intangible assets-intensive industries, which will therefore enjoy higher productivity levels.

Then, differences in TFP are likely to persist even if all countries have free access to the world portfolio of state-of-the-art technologies. The reason is that countries with bad investor protection (the south) suffer from a mismatch between their institutional characteristics and available technologies: their inefficient contractual environment would benefit if R&D were mainly directed to increase the productivity of tangible assets, but their needs are neglected by innovators, which are instead responsive to the composition of the demand for technology which prevails in the north.

Our contribution is related to that strand of the growth-and-development literature which explains lower TFP levels in developing countries with differences in factor endowments with respect to developed nations. In particular, Acemoglu and Zilibotti 2001 and Basu and Weil 1998 focus on differences in physical capital to human capital ratios. We emphasise instead differences in national institutional environments as a major cause of differences in output per capita.

2 The Model

In this chapter we present our model economy. The starting point is a standard innovation-based growth model in the vein of Aghion and Howitt (1992) and Grossman and Helpman (1991), even if it departs from them because capital is added (as in Aghion and Howitt 1998) and because innovation efforts can be channeled toward different sectors (as in Acemoglu 1998 and Acemoglu and Zilibotti 2001).

2.1 The Environment

Demographics and Preferences

Let there be a continuum of agents born in each period. Each of them lives for two periods. They are endowed with 1 unit of labour in their youth, and none when they are old. Let their preferences be linear in consumption: $U=c_1 + \beta c_2$, where c_t is a composite consumption index:

$$c_t = e^{\int_0^1 \ln c_{it} di}$$

The production of consumption goods is undertaken by perfectly competitive firms which take both product and factor prices as given. We normalize prices so that

$$\int \ln p_i di = 0, \tag{1}$$

where p_i is the price of consumption good i .

Technology

In the economy there are 2 different kinds of intermediate goods, and firms in sector i can choose between two different production technologies. The first technology uses labor and a continuum of intermediate goods k_j , with $j \in [0, 1]$, while the second technique uses labor and a continuum of intermediate goods h_j , with $j \in [0, 1]$ (the assumption of a continuum of varieties for each intermediate good is made in order to deliver a non-stochastic growth rate, and can be dispensed with, at the cost of complicating the algebra).

Intermediate goods differ because k -type goods are produced by a linear production technology which just involves capital of type K , while intermediate goods of type h are produced by a linear production technology which just involves capital of type H ¹:

$$k_{jt} = \frac{K_{jt}}{A_{jKt}}, h_{jt} = \frac{H_{jt}}{A_{jHt}}.$$

A_{jK} and A_{jH} are productivity indexes². We define $A_s = \int_0^1 A_{js} dj$ for $s=H,K$.

The difference between the two kinds of capital is not technological: indeed we assume that one unit of the consumption aggregate can be transformed one-to-one into both kinds of capital. On the other hands, we will see below that institutional features of the economy potentially drive a wedge between the rental rates of K -capital and H -capital goods. As in Acemoglu and Zilibotti (2001), let sectors with a lower index be relatively more productive with the H -intensive technology:

$$y_i = i l_{iK}^{1-a} \int_0^1 A_{jK} k_{ij}^a dj + (1-i) l_{iH}^{1-a} \int_0^1 A_{jH} h_{ij}^a dj \quad (2)$$

where l_{iK} (resp. l_{iH}) is the amount of capital used together with intermediate goods of type k (resp. h) in sector i , k_{ij} (resp. h_{ij}) is the amount of the j -th variety of intermediate good k (resp. h) used in the same sector.

In any period there is one young person for each variety of intermediate goods who is capable to produce an innovation. If such an innovation is discovered, the productivity of that variety will improve from A_{jst} to $A_{jst+1} = \gamma A_{jst}$, with $\gamma > 1$. The innovator will succeed with probability μ_{jst} .

¹Our results extend quite easily to a situation in which intermediate goods are produced with both capital and labour (see Howitt and Aghion 1998).

²Time subscripts will be omitted when they do not generate confusion.

Successful innovators will then be the only ones which are able to produce the improved variety in the second period of their life, so earning monopoly profits (for simplicity, we will assume that this advantage lasts for one period).

Institutions

Given linear preferences, the market interest rate is fixed at $r = \frac{1}{\beta} - 1$. Successful innovators have to borrow, in order to buy capital and produce the intermediate good which they have improved. However, contract enforcement in the loans market is imperfect, so that entrepreneurs can default from their liabilities, "taking away" the amount of money they should repay. This tunneling comes at a cost, however, as both state agencies and the lender monitor the borrower. We assume that the costs of running away with the money is equal to ϕm , where m is the amount of monitoring privately performed by the borrower, and ϕ is a measure of a country's level of investor protection. On the top of this, we will make the crucial assumption, that one kind of capital is more easily concealed by borrowers. In particular, when you try to run away with an amount of type- s capital, you will be able to take with you a fraction $\delta_s < 1$ of it, with $\delta_h < \delta_k$, while the remaining part remains in site, so that the lender can recover it: K is a less tangible form of capital. Of course, as long as the lender exerts monitoring, it does it in an amount just sufficient to deter the borrower from running away: $m_s = \frac{\delta_s}{\phi} D_s (1 + r_s)$, where D_s is the principal and r_s is the rental rate for s -type capital. So her gains from lending an amount D_s of capital to a s -user are $D_s (1 + r_s) - m_s = (1 - \frac{\delta_s}{\phi}) D_s (1 + r_s)^3$. As the market for loans is perfectly competitive, in equilibrium one has: $(1 - \frac{\delta_s}{\phi}) D_s (1 + r_s) = D_s (1 + r)$ or, rearranging:

$$R_s \equiv (1 + r_s) = \frac{(1 + r)}{1 - \frac{\delta_s}{\phi}} > 1 + r, \quad (3)$$

so that $r_k > r_h > r^A$.

To sum up, even if the overall quality of investor protection is a national characteristic, the importance of the agency problem is sector-specific. However, the technological and the institutional dimension interact: it is readily proved from equation (3) that an improvement in the contractual infrastructure (a rise in ϕ) benefits the intangible asset intensive-sector relatively more. Put

³we assume that $\delta_s < \phi$, so that the loans market is viable.

⁴For simplicity, we assume that it is always optimal for the lender to monitor. This happens as long $\phi > 1$.

differently, better laws reduce the interest rate spread: $\frac{R_K}{R_H} = \frac{\phi - \delta_H}{\phi - \delta_K}$, and

$$\frac{\partial(\frac{R_K}{R_H})}{\partial\phi} = -\frac{\delta_K - \delta_H}{(\phi - \delta_K)^2} < 0.$$

While this way of modeling the lender-borrower relation is admittedly rough, it brings home one of the main building blocks of the paper, i.e. the idea that tangible assets are a substitute for good laws. In turn, this implies that they are relatively more valuable in less developed financial markets.

2.2 Firm Behavior

Intermediate sector firms

As final good firms are perfectly competitive and take prices as given, they demand intermediate goods up to their marginal value. So the producer of the k -type intermediate good of the j -th variety⁵ faces a demand curve which is downward sloping in the price χ_{jK} , with constant elasticity:

$$k_j = \left(\frac{aA_{jK}}{\chi_{jK}}\right)^{\frac{1}{1-a}} \int_0^1 (ip_i)^{\frac{1}{1-a}} l_{iK} di,$$

and profit maximization implies a price which is a constant mark up on unit costs⁶:

$$\chi_{jK} = \frac{A_{jK} R_K}{a}, \chi_{jH} = \frac{A_{jH} R_H}{a}. \quad (4)$$

Profits can then be written as: $\pi_{jK} = a^{\frac{1+a}{1-a}} (1-a) A_{jK} R_K^{-\frac{a}{1-a}} \int_0^1 (ip_i)^{\frac{1}{1-a}} l_{iK} di$.

Final sector firms

⁵The argument for producers of H-type goods is symmetric.

⁶The maximand is given by:

$$\pi_{jK} = \left(\frac{aA_{jK}}{\chi_{jK}}\right)^{\frac{1}{1-a}} \left[\int_0^1 (ip_i)^{\frac{1}{1-a}} l_{iK} di \right] (\chi_{jK} - A_{jK} R_K).$$

Optimal pricing is not constrained by potential users of the old technology (so we are implicitly assuming that γ is big enough).

Equation 4 implies that each firm in the final sector will buy an equal amount of each variety, as the advantages of using more productive varieties are exactly offset by their higher costs. In particular, if they rely on the set of K-intensive goods, their cost function is given by:

$$C_{iK}(y_i, \chi_K, w) = \frac{y_i}{iA_K} w^{1-a} \chi_K^a a^{-a} (1-a)^{-(1-a)},$$

while if they opt for the H-intensive goods, it becomes:

$$C_{iHt}(y_{it}, \chi_{Ht}, w_t) = \frac{y_{it}}{(1-i)A_H} w^{1-a} \chi_H^a a^{-a} (1-a)^{-(1-a)},$$

where χ_s is the cost of acquiring one unit of each of the s-type varieties.

So sector i uses intermediate goods of type k if and only if i is greater than a threshold J, where:

$$J = \frac{1}{1 + \frac{A_K}{A_H} \left(\frac{\chi_H}{\chi_K}\right)^a} = \frac{1}{1 + \left(\frac{A_K}{A_H}\right)^{1-a} \left(\frac{R_K}{R_H}\right)^{-a}}. \quad (5)$$

The fraction of sectors which will use intangible-asset-intensive goods will be higher (i.e. J will be lower) if k-type goods are relatively more productive ($\frac{A_K}{A_H}$ is high) and if the rental cost of capital of type K is relatively lower. In particular, *for given technologies*, an improvement in investor protection (a rise in ϕ) will favour the adoption of the K-based technology.

Demand for variety j coming from sector i is equal to :

$$k_{ij} = \begin{cases} \left(\frac{a^2 p_i^i}{R_K}\right)^{\frac{1}{1-a}} l_i & \text{if } i > J \\ 0 & \text{otherwise} \end{cases}, \quad h_i = \begin{cases} \left(\frac{a^2 p_i(1-i)}{R_H}\right)^{\frac{1}{1-a}} l_i & \text{if } i < J \\ 0 & \text{otherwise} \end{cases} \quad (6)$$

Using equations 2 and 6 one gets: $y_i = i l_i A_K \left(\frac{a^2 p_i}{R_K}\right)^{\frac{a}{1-a}}$ for sectors $i > J$, and $y_i = (1-i) l_i A_H \left(\frac{a^2 (1-i) p_i}{R_H}\right)^{\frac{a}{1-a}}$ for sectors $i < J$. The value of the average product of labour is then $p_i i A_K \left(\frac{a^2 p_i}{R_K}\right)^{\frac{a}{1-a}}$ for sectors $i > J$, and $p_i (1-i) A_H \left(\frac{a^2 (1-i) p_i}{R_H}\right)^{\frac{a}{1-a}}$ for sectors $i < J$. As this magnitude has to be equal

inside both subsets of sectors, one has:

$$p_i = i^{-1}P_K \text{ if } i > J; p_i = (1-i)^{-1}P_H \text{ if } i < J, \quad (7)$$

with $P_H = p_0$ and $P_K = p_1$ as constants to be determined. In equilibrium the value of the average product of labour has to be equalized across subsets as well, which implies that

$$P \equiv \frac{P_K}{P_H} = \left(\frac{A_K}{A_H}\right)^{-(1-a)} \left(\frac{R_K}{R_H}\right)^a. \quad (8)$$

Indeed, the relative value of the average (and marginal) product of labour in sectors which use k-type intermediate goods decreases with $\frac{R_K}{R_H}$ (as workers in those sectors are matched with smaller amounts of intermediate goods), and this effect must be compensated with an higher relative productivity and/or higher prices.

Given our specification of preferences, $p_i y_i$ should be constant across goods, which implies that for each $i > J$, $l_i = \frac{L_K}{1-J}$, and that for each $i < J$, $l_i = \frac{L_H}{J}$. It also implies that:

$$\frac{\int_J^1 p_i y_i di}{\int_0^J p_i y_i di} = \frac{1-J}{J} = \frac{\int_J^1 p_i i A_K l_i \left[\frac{a^2 P_K}{R_K}\right]^{\frac{a}{1-a}} di}{\int_0^J p_i (1-i) A_H l_i \left[\frac{a^2 P_H}{R_H}\right]^{\frac{a}{1-a}} di},$$

or, rearranging⁷:

$$P^{2-a} \left(\frac{A_K}{A_L}\right)^{1-a} \left(\frac{R_K}{R_H}\right)^{-a} \left(\frac{L_K}{L_H}\right)^{1-a} = 1. \quad (9)$$

R&D Firms

To innovate with probability μ_{jst} young researchers have to spend an amount $A_{jst+1} n(\mu_{jst})$ of resources, with $n(\cdot)$ increasing and convex (innovative activity becomes more and more difficult as the number of innovations already discovered increases: this is the so-called "fishing out effect"

⁷Here we make use of the fact that in sector J both expressions for prices in equation (6) have to hold. This implies that $P = \frac{J}{1-J}$

which is standard in the literature on patent races). They choose μ_{jst} to maximize

$$\beta \mu_{jst} \pi_{st+1} - A_{jst+1} n(\mu_{jst}).$$

We assume an internal solution: $\mu_s^*(\pi_s) \in (0, 1)$, where we define $\pi_s = \frac{\pi_{js}}{A_{js}} = a \frac{1-a}{1-a} (1-a) A_{js} R_s^{-\frac{a}{1-a}} P_s^{\frac{1}{1-a}} L_s$, with $s=H,K$, which does not depend on j .

The dynamics of each productivity index is then given by:

$$A_{st+1} = [\mu_s^* \gamma + (1 - \mu_s^*)] A_{st}.$$

2.3 Solving the model

To sum up, at the beginning of each period old agents which were successful innovators in the previous period produce intermediate goods, that they sell to final sector firms, which use workers and intermediate goods to produce. Young workers work in the factories and young potential innovators run their labs. At the end of the period, those among them which proved to be successful borrow resources to buy sector-specific capital.

In a balanced growth path all the variables are constant or grow at a constant rate. So a BGP implies that $\mu_K^*(\pi_K) = \mu_H^*(\pi_H)$, i.e. $\pi_H = \pi_K$. Rearranging terms:

$$R_K^{-\frac{a}{1-a}} P_K^{\frac{1}{1-a}} L_K = R_H^{-\frac{a}{1-a}} P_H^{\frac{1}{1-a}} L_H. \quad (10)$$

Intuitively, as an higher spread on type K capital reduces relative expected unit profits for those who perform R&D directed to varieties of type k, these agents must be compensated with a larger perspective market, which in turn requires higher levels of P_K and/or L_K .

Equations (5), (8), (9) and (10), taken together, uniquely deliver $P, J, \frac{A_K}{A_H}$ and $\frac{L_K}{L_H}$ as a function of $\frac{R_K}{R_H}$, along a BGP:

$$\frac{P_K}{P_H} = \frac{A_H}{A_K} = \frac{L_H}{L_K} = \frac{R_K}{R_H}, \quad J = \frac{R_K}{R_K + R_H}. \quad (11)$$

Together with the labour market clearing condition ($\int_0^1 l_i di = L_K + L_H = L$, where L is the measure of workers active in production), equation 11 requires that $L_K = \frac{R_H}{R_K + R_H} L$, $L_H = \frac{R_K}{R_K + R_H} L$.

The partial equilibrium result outlined above is preserved: better investor protection, through a reduced spread between the rental rates on the two kinds of capital, rises the measure of sectors which adopt the K-based technology. Actually, the partial equilibrium effect is reinforced, when one accounts for endogenous technological change, because a higher ϕ rises also the relative productivity level of k-type goods (the fraction $\frac{A_K}{A_H}$).

Substituting equation (6) into equation 1 gives: $P_K = \frac{1}{e^{1-J}}$ and $P_H = \frac{1}{e^J}$. Given the expression in equation (10), one has: $P_K = \frac{1}{e} \frac{R_K + R_H}{R_H}$, $P_H = \frac{1}{e} \frac{R_K + R_H}{R_K}$, and

$$\pi_K = \pi_H = a^{\frac{1+a}{1-a}} (1-a) \left(\frac{1}{e}\right)^{\frac{1}{1-a}} \left(\frac{R_K + R_H}{R_H R_K}\right)^{\frac{a}{1-a}} L = \xi \left(2 - \frac{\delta_K + \delta_H}{\phi}\right)^{\frac{a}{1-a}}$$

with $\xi = a^{\frac{1+a}{1-a}} (1-a) \left(\frac{1}{e}\right)^{\frac{1}{1-a}} \beta^{\frac{a}{1-a}} L$. The growth rate of the economy is given by:

$$g = (\gamma - 1) \mu^* \left(\xi \left(2 - \frac{\delta_K + \delta_H}{\phi}\right)^{\frac{a}{1-a}}\right).$$

3 North-south productivity differences

No enforcement of IPR

As an useful benchmark, suppose now (as in Acemoglu and Zilibotti 2001) that R&D is performed only in one country (the north) and that intellectual property rights are not enforced internationally, so that elsewhere in the world (the south) innovations discovered in the north can be freely used without paying royalties. We assume that neither trade in final goods nor trade in intermediate goods is possible. While the first hypothesis concerning international trade can be dropped without changing the qualitative results, the second one is crucial. Indeed, producing intermediate goods in countries with good investor protection and then exporting them would make institutional differences irrelevant⁸. Given this assumptions, the location of R&D activity is not crucial (what is crucial is the legal environment of the country in which intermediate producers are based). To simplify notation we still maintain that potential innovators are concentrated in the north. Assume also that the two economies differ *only* in their level of investor protection, with $\phi > \phi^S$ (superscript S indicates the south). Equilibrium in the north is exactly equal to the one

⁸Free flow of capital across countries are instead irrelevant, as contractual arrangements remain country-specific.

described in the previous section. Weaker laws in the south imply that $\frac{R_K}{R_H} < \frac{R_H^S}{R_K^S}$ and, correspondingly, that $J < J^{S9}$: the fraction of final sectors which operates with a k-type technology is higher in the north than in the south.

Given the shape of the production function in equation (2), total factor productivity is given by:

$$TFP_i = iA_K \text{ for } i > J, \quad TFP_i = (1-i)A_H \text{ for } i < J,$$

and the corresponding measure of aggregate productivity is given by: $TFP^e = e^{\int_0^1 \ln TFP_i^e di}$ ¹⁰.

The definition of TFP implies that there are no productivity differences between the north and the south for all those sectors with an index higher than J^S and lower than J^N . However, $TFP_i^N > TFP_i^S$ for all those $i \in (J^N, J^S)$. As a consequence $TFP^N > TFP^S$.

To better grasp the intuition, notice that the value of the threshold which maximizes aggregate TFP is given by $J^* = \frac{1}{1 + \frac{A_K}{A_H}}$, and equation (11) tells us that $J^* = J^N$: the equilibrium composition of R&D activity in a BGP maximizes TFP in the north, but it is not appropriate for the south. Put differently, if the south could choose, it would favour research aimed at improving the productivity of h-type goods, because its weak investor protection induces southern firms to use h-type goods relatively more. However, given that intellectual property rights in the south are not protected, innovators channel their efforts toward the needs of northern firms, which rely relatively more on k-type goods. Also notice that the mismatch between the direction of technological change and the needs of southern economies increases with the difference in the levels of financial development.

Full enforcement of IPR

Acemoglu and Zilibotti 2001 focus on lack of adequate patent enforcement in the south as the main reason which induces innovators to neglect southern demand of better intermediate goods. Interestingly, we can demonstrate that cross country TFP differences do not rest on cross-country differences in the protection of intellectual property rights. Will full IPR protection, equilibrium is still given by equations (5), (8), (9) and their southern counterparts (contained in footnote

⁹Equations 5, 8, 9 have an exact counterpart for the southern economies, and they uniquely pin down equilibrium in the south. In particular:

$$J^S = \frac{1}{1 + (\frac{A_K}{A_H})^{1-\alpha} (\frac{R_K^S}{R_H^S})^{-\alpha}}, \quad P^S = (\frac{A_K}{A_H})^{\alpha-1} (\frac{R_K^S}{R_H^S})^{\alpha}, \quad \frac{L_K^S}{L_H^S} = \frac{1}{P^S}.$$

So it turns out that $P^S > P$ and $\frac{L_K^S}{L_H^S} < \frac{L_K}{L_H}$.

¹⁰The derivation can be found in Acemoglu and Zilibotti (2001).

9). However the no arbitrage condition for R&D (equation 10) changes, as now intermediate monopolists sell their goods also to final producers in the south, and becomes:

$$R_K^{-\frac{a}{1-a}} P_K^{\frac{1}{1-a}} L_K + R_K^S^{-\frac{a}{1-a}} P_K^{S\frac{1}{1-a}} L_K^S = R_H^{-\frac{a}{1-a}} P_H^{\frac{1}{1-a}} L_H + R_H^S^{-\frac{a}{1-a}} P_H^{S\frac{1}{1-a}} L_H^S \quad (12)$$

Substituting equations (5),(8),(9) and their three southern counterparts in equation (12), one obtains the equilibrium technological bias with full IPR protection:

$$\frac{A_K^{IPR}}{A_H^{IPR}} = \left(\frac{R_K^{-a} + R_K^{S-a}}{R_H^{-a} + R_H^{S-a}} \right)^{\frac{1}{a}}$$

So $\frac{A_K^{IPR}}{A_H^{IPR}} < \frac{A_K}{A_H} = \frac{R_H}{R_K}$: as with full IPR the needs of southern markets are at least partially taken into account by innovators, the world technology frontier is less biased toward k-type goods than without IPR. As a consequence, $J^{IPR} > J$, and $J^{S,IPR} < J^S$: the fraction of final sectors which use the k-based technology in the south (resp. in the north) increases (decreases), so productivity differences are reduced *but don't disappear*. The intuition is simple: even with full enforcement of property rights, so that the innovators can fully extract monopoly rents accruing from southern demand, the southern market remains less attractive: weak investor protection rises the costs of producing intermediate goods in the south, and reduces local demand for such goods. So R&D activities will still be relatively biased toward the needs of northern customers.

4 Bibliography

Acemoglu, D. (1998), "Why do New Technologies Complement Skills? Directed Technical Change and Wage Inequality", *Quarterly Journal of Economics*, 113, 1055-1089.

Acemoglu, D. and Zilibotti, F. (1997), "Was Prometheus Unbound by Chance? Risk, Diversification and Growth", *Journal of Political Economy*, 105, 709-751.

Acemoglu, D. and Zilibotti (2001), "Productivity Differences", *Quarterly Journal of Economics*, 116, 563-606.

Aghion, P. and Howitt, P. (1992), "A Model of Growth through Creative Destruction", *Econometrica*, 60, 323-351.

Aghion, P., Howitt, P. and Mayer-Foulkes, D. (2003), "The Effect of Financial Development

on Convergence: Theory and Evidence", mimeo.

Basu, S. and Weil, D.N. (1998), "Appropriate Technology and Growth", *Quarterly Journal of Economics*, 113, 1025-1054.

Braun, M. (2003), "Financial Contractibility and Asset Hardness", mimeo.

Claessens and Laeven (2003), "Financial Development, Property Rights, and Growth", *Journal of Finance*, 32, 2401-2436.

Caselli, F. (2004), "Accounting for Cross-Country Income Differences", mimeo.

De la Fuente, A. and Marin, J. (1996), "Innovation, Bank Monitoring, and Endogenous Financial Development", *Journal of Monetary Economics*, 38, 269-301.

Galor, O. and Zeira, J. (1993), "Income Distribution and Macroeconomics", *Review of Economic Studies*, 60, 35-52.

Greenwood, J. and Jovanovic, B. (1990), "Financial Development, Growth, and the Distribution of Income", *Journal of Political Economy*, 98, 1076-1107.

Grossman, G.M. and Helpman, E. (1991), *Innovation and Growth in the Global Economy*, Cambridge, MA, Mit Press.

Hall, R.E. and Jones, C.I. (1999), "Why do some Countries Produce so much more Output per Worker than others?", *Quarterly Journal of Economics*, 114, 83-116.

Hart (1995), *Firms, Contracts and Financial Structure*, Oxford, UK, Oxford University Press.

Howitt, P. (2000), "Endogenous Growth and Cross-Country Income Differences", *American Economic Review*, 90, 829-846.

Howitt, P. and Aghion, P. (1998), "Capital Accumulation and Innovation as Complementary Factors in Long-run Growth", *Journal of Economic Growth*, 3, 111-130.

King, R.G. and Levine, R. (1993), "Finance, Entrepreneurship and Growth: Theory and Evidence", *Journal of Monetary Economics*, 32, 513-542.

Klenow, P.J. and Rodriguez-Clare, A. (1997), "The Neoclassical Revival in Growth Economics: has it gone too Far?", *NBER Macroeconomics Annual*, 73-103.

LaPorta, R., Lopez de Silanes, F., Shleifer, A. and Vishny, R.W. (1997), "Legal Determinants of External Finance", *Journal of Finance*, 52, 1131-1350.

LaPorta, R., Lopez de Silanes, F., Shleifer, A. and Vishny, R.W. (1997), "Law and Finance", *Journal of Political Economy*, 106, 1113-1155.

Levine (2004), "Financial Development and Growth", mimeo.

Morales (2003), "Financial Intermediation in a Model of Growth Through Creative Destruction",

Macroeconomic Dynamics, 7, 363-393.

Parente, S.L. and Prescott, E.C. (1994), "Technology Adoption and Growth", *Journal of Political Economy*, 102, 298-331.

Parente, S.L. and Prescott, E.C. (1999), "Monopoly Rights: a Barrier to Riches", *American Economic Review*, 89, 1116-1133.

Shleifer, A. and Vishny, R.W. (1992), "Liquidation value and debt capacity: a market equilibrium approach", *Journal of Finance*, 47, 1343-1366.

The Political Economy of Investor Protection

Pietro Tommasino

Bocconi University

Abstract

If legal investor protection is so crucial why do some countries suffer from backward financial institutions and weak corporate governance rules? We show that, even if the economy would benefit from corporate governance reforms, not all the agents in the economy would stand to gain from the improvement. In particular, entrepreneurs and firms which are already well established would fear better rules that would allow the financing of new firms and stronger competition. As a consequence, those industrial incumbents will try to influence the political process to block the reforms. If national political institutions are weak, these efforts are likely to be successful.

1 Introduction

A large body of literature has shown that financial development generates higher growth.¹ But financial systems differ sharply across the world, as shown by La Porta et al. (1998), (2000). Some countries have highly inefficient financial systems compared to other countries. The obvious question to ask is what are the causes of prolonged financial backwardness in some nations. Recent empirical work has demonstrated that various dimensions of a country's financial development, such as the breadth and depth of its financial markets, the number of IPOs, firms' access to external finance, prevailing ownership patterns are positively correlated with the degree of legal investor protection prevailing in that country (La Porta et al. 1998)². But even if one is ready to accept this point of view, the question of why some countries have poor legal investor protection remains unanswered.³ Why laws are not changed to increase legal investor protection? Rajan and Zingales (2001) advance an explanation for this puzzle. Their key idea is that although society would overall benefit from better corporate governance rules, not all the agents in the economy would stand to gain. In particular, stronger investor protection allows the financing of new ideas and new firms who represent a threat to the profits and rents of incumbent firms. Improvements in the functioning of the financial system are less valuable for the incumbents than they are for the potential entrants. In fact, incumbents can rely on the cash flow produced by existing assets, they can use the existing assets as collateral, and, moreover have developed a reputation

¹See, e.g., Levine and King (1993), Jayaramna and Strahan (1998), Rajan and Zingales (1998)

²For the definition and measurement of investor protection, see La Porta et al. (1997).

³La Porta et al.(1997) argue that differences in legal protection are related to the legal origins.

But the legal origin explanation cannot account for variations of investor protection over time. Rajan and Zingales (2001) have found strong evidence of such variations of legal investor protection over time during the XXth Century (see section 2 below for further details).

over time. Therefore, the net effect of reforms aimed at improving the financial system can be negative for the incumbents: the advantage of an easier access to financing may be second order with respect to the increased threat of competition represented by new entrants in the market. As a consequence, the incumbents will try to influence the political process in the direction of not adopting the reforms needed to improve the efficiency of the financial systems. The attempts to block the reform process would be ineffective in the case where the only objective of the politicians was the maximization of social welfare. But the political economy literature has convincingly shown that politicians are vulnerable to the influence of lobbying and special interests. Politicians are self-interested. For instance, they care about being reelected and reelection depends, among other factors, on campaign contributions. Incumbents are in a better position to enter into mutually beneficial agreements with the political establishment since they are currently enjoying the rents that new entry would dissipate. As a consequence, politicians do not attempt to adopt the reforms aiming at increasing the efficiency of the financial system because they do not want to lose the contributions received by the incumbents.

In this paper we try to build a model that captures the links between legal investor protection and the economic and political features of the insider-outsider conflict. More precisely, our model has the following features. Entrepreneurs need to have access to the capital markets to finance their projects. The entrepreneurs have different financial needs. In particular, those who are already operating in the market can reinvest in new projects (part of) the cash flow produced by the existing assets and therefore have lower financial needs than potential entrants. There is moral hazard on the entrepreneur side. We model moral hazard by assuming that the entrepreneur can divert a fraction of the cash flow as private benefits of control. Investors are ready to finance the project only if they expect to break-even. Thus,

when the threat of expropriation by managers is very high they will not finance the project, even though this is socially optimal. The project will be financed only when the entrepreneur financing needs are low. Legal protection shapes the ability of entrepreneurs to appropriate corporate resources as private benefits of control. We model stronger legal protection as a lower fraction of resources that can be diverted by the entrepreneur. When legal protection is weak, only "rich" entrepreneurs (i.e. entrepreneurs who have a large private wealth and consequently have reduced financial need) will be able to finance their project. "Poor" entrepreneurs will remain outside the market. A stronger legal protection, by restraining the entrepreneur's ability to divert resources in his favor, gives access to funds even to "poor" entrepreneurs. New entry in the market can be socially desirable but it is certainly opposed to incumbent entrepreneurs who face new competition. To stop any attempt to improve legal protection "rich" entrepreneurs (incumbents) can try to influence the political process. In our model politicians have an objective function which is a mixture of social welfare and monetary transfer received from entrepreneurs. We show that when politicians are sufficiently self-interested, they will not pass policies aimed at implementing a stronger legal protection. In fact, incumbents have both larger incentives to lobby the politicians than the entrants⁴ and more funds to spend in the lobbying activities. This is the central results in the paper: the political process may preserve an inefficient level of legal investor protection. Our next step is to open up the black box of the political process. We present a model of political competition where politicians need campaign contributions to win the vote of uninformed voters who are influenced by ideology. We show that a high

⁴The argument is identical to the so called efficiency effect in R&D models. The price that a monopolist is ready to pay to acquire a patent for a new innovation is higher than the price a potential entrant would pay whenever competition destroys total profits in the market.

fraction of uninformed voters and strong ideologies increase the value of contributions for politicians and make them more vulnerable to lobbying pressure. Our model thus predicts that countries where voters' behavior is highly influenced by ideology and where the media are not credible (say, because they are owned by the different lobbies) are less likely to be captured by the incumbents' lobby. We also analyze the impact of different electoral rules: it is well known that electoral competition is stiffer in majoritarian systems than in proportional ones, because in majoritarian elections candidates pay most attention to those districts in which he voters are more mobile and the electoral outcomes are more uncertain, and t. In our model this implies that *ceteris paribus* majoritarian countries will enjoy a higher investor protection, as politicians would be punished more severely for pleasing the incumbent's lobby.

In section 2 we will study the equilibrium consequences of the degree of investor protection on the welfare of different classes of agents. This allows us to derive their political preferences. In section 3 and section 4 we will study how this policy preferences are translated into a policy outcome, under different assumptions about the mechanics of the political system. For each institutional setting we characterize the political-economic equilibrium.

In the last section we draw some conclusion and we point to several extensions and refinements of our results.

2 Literature Review

Of course this is not the first paper to ask what determines legal protection. In particular the previous literature has put forward two competing explanations: legal

origins and politics⁵.

La Porta et al.(1997) showed that differences in legal protection are related to the legal family to which a country belongs: namely, civil law systems seem to grant less protection if compared with common law systems.

The obvious question then is: what are the channels through which legal history can have an impact on investor protection?

La Porta et al.(1999) argue that common law countries are countries in which property rights were protected and recognized even in the early stages of economic development, and that this tradition translated naturally, later, into better investor rights.

Johnson et al. (2000) focus instead on differences in enforcement mechanisms: as common law systems are mainly case-based, common law judges are given more discretionary power, and they use this power to detect and punish more effectively investor expropriation.

While differences in legal origins seem to fit well with cross-country differences in investor protection, they cannot explain changes in a country's level of investor protection, like the ones documented by Rajan and Zingales (2001).

Two recent papers (Pagano and Volpin (2000), Rajan and Zingales (2001)) argue that investor protection is not the heritage of ancient institutional vicissitudes, but the outcome of ongoing political struggles⁶.

Of course in this light it becomes crucial to understand what are the relevant

⁵See La Porta et al. (2000), Beck et al. (2001) and Pagano and Volpin (2001) for useful surveys.

⁶Roe (1994) also looks at the political conflicts which shaped the U.S. system of corporate governance, but he concentrates on the pro-market, antimonopoly ideology which is distinctive of American politics. We instead focus on the incentives faced by self-interest and rational policy-makers.

Perotti and Von Thadden (2001) build a political economy model to explain another prominent difference among financial systems: the one between bank-centered and market-centered systems.

political conflicts and the actors involved, and what are the features of the political system which are more important in determining the outcome of these conflicts.

Pagano and Volpin (2000) focus on the firm-level conflict among outside investors, managers and workers. They argue that managers and workers can form a political coalition at the expense of investors, which translates in less investor protection but higher employment protection and higher benefits from control.

Rajan and Zingales (2001) and Hellwig(1999), instead, point to the industry-level conflict which opposes industrial and financial incumbents to outsiders.

While we think that both lines of research are promising and that they are to a large extent complementary, in this paper we try to build what is -to our knowledge- the first formal model which tries to spell out the links between legal investor protection and the economic and political features of the insider-outsider conflict. Our paper is also related to a recent strand of literature which tries to assess empirically the role of non legal institutions as an alternative source of investor protection .

Among others, Stulz and Williamson (2001) and Coffee(2001) find that factors like religion, ethnic composition, or moral norms go some way in explaining differences in financial development. Dyck and Zingales (2001) in turn show the explanatory role played by the diffusion of newspapers.

As pointed out by Myers and Strassman (2001), the growing awareness of the social and cultural embeddedness of finance is certainly good news, but one should also avoid the risk of theoretical indeterminacy: the temptation to conclude that, after all, "anything matters".

We think that one advantage of our approach is that it is able to reconcile these recent empirical findings with the law and finance paradigm. Indeed non legal

factors in our model do not matter per se but just as long as they shape the political competition and the relative strength of the competing interest groups. Politics is not only the main determinant of legal protection, but also the main channel through which non legal factors influence the effectiveness of national corporate governance mechanisms.

3 The economic model

Consider an economy populated by a set N of individuals with identical utility functions, but different endowments. Utility of individual $i \in N$ is quasi-linear in consumption q and money w :

$$U(q, w) = \frac{\varepsilon - 1}{\varepsilon} q^{\frac{\varepsilon}{\varepsilon - 1}} + w$$

where $\varepsilon > 1$. The assumption of isoelastic utility is not crucial, but it makes calculations much easier. At some points below we will use specific examples, as the logarithmic one (with $\varepsilon \rightarrow 1^+$).

The population in turn is divided into two subgroups: consumers and entrepreneurs.

In this section we investigate the impact of different degrees of investor protection on the welfare of the different categories, which in turn shapes their political preferences.

3.1 Consumers

If an agent belongs to the subset $N_c \subset N$ of consumers (from now on lower case letters will stand for the cardinality of the correspondent sets, e.g. $|N_c| \equiv n_c$), he has nominal wealth A_c , and chooses his consumption to maximize his utility, given

his budget constraint: $pq + w \leq A_c$.

The solution to the consumer's maximization problem turns out to be independent from income, yielding the following demand function:

$$q(p) = p^{-\varepsilon}. \quad (1)$$

3.2 *Entrepreneurs*

The optimal demand of consumption is the same for both consumers and entrepreneurs. However, an entrepreneur differs from a consumer because he is able to manage a firm.

A firm is a very simple technology which, at a fixed cost I and with constant marginal costs of 1, produces 1 unit of consumption good.

So if an entrepreneur's wealth is A_j he needs an amount $I - A_j$ of external finance to cover the entry costs.

We assume that there is a subgroup $N_e^r \subset N_e$ of "rich" entrepreneurs, each of them endowed with an amount A_r of resources, and a subgroup $N_e^p = N_e \setminus N_e^r$ of "poor" entrepreneurs each endowed with wealth $A_p < A_r$.

To make the problem interesting we make the following assumptions

Condition 1 $I - A_r < 0$,

Condition 2 $n_r A_r + n_p A_p + n_e A_c \equiv A \geq I n_e$

Those conditions imply that even "rich" entrepreneurs need external finance and that in the economy as a whole there are potentially enough resources to meet the financial needs of both kinds of entrepreneurs.

3.3 *Product Market Competition*

Those entrepreneurs which have enough funds to open a firm choose simultaneously and noncooperatively their quantities to maximize profits⁷. The equilibrium level of prices can be shown to be:

$$p(m) = \frac{\varepsilon}{\varepsilon - \frac{1}{m}} \quad (2)$$

where m is the number of firms in the industry.

It follows that individual gross profits and individual profits net of entry costs are given respectively by :

$$R(m) = \frac{n(m\varepsilon - 1)^{\varepsilon-1}}{m^{\varepsilon+1}\varepsilon^{\varepsilon}} ; \quad \Pi(m) = \frac{n(m\varepsilon - 1)^{\varepsilon-1}}{m^{\varepsilon+1}\varepsilon^{\varepsilon}} - I$$

We also impose:

Condition 3 $\Pi(n_e) > 0$.

This to make sure that "poor" entrepreneurs, if given the possibility, are willing to enter the market, as they would earn positive profits.

3.4 *Corporate Governance*

As remarked before, would-be entrepreneurs need to borrow the difference between I (the sunk entry costs) and their personal wealth, if they want to open a firm.

⁷As it will become apparent the assumption of Cournot competition in the product market is disposable. What is crucial to our point is that a firm's profits are decreasing with the number of competitors.

In this subsection we describe the financing game between potential borrowers and potential lenders, and find the equilibrium number of producers as a function of Φ .

We assume that the firm's returns are partially non verifiable, so the entrepreneur can appropriate a fraction of revenues up to $(1-\Phi)R$, where the parameter $\Phi \in [0, 1]$ is determined by the law and is taken to represent the degree of investor protection.

We also assume that the expropriation decision is not contractible, so the entrepreneur will ex post divert resources up to $(1-\Phi)R(m)$.

The extreme discontinuity of the "expropriation technology" available to the entrepreneur, and the assumption that Φ is completely determined by the legal environment, are both unrealistic.

However this framework (which is reminiscent of Holmstrom and Tirole (1997) and Tirole (2001)), captures the essence of the legal approach to corporate governance: the relationship between outside investors and firm's insiders is hindered by an agency problem that neither private contracting nor reputational mechanisms can fully solve. This implies that the agents must rely on the rights that the law assigns to investors if they want to limit expropriation by the insiders.

When he decides whether to invest his funds in a firm or not, each lender behaves atomistically, i.e. he takes as given the number m of firms which are financed. This implies that an entrepreneur j is financed iff:

$$I - A_j \leq \Phi R(m) \tag{3}$$

One can easily prove the following:

Lemma 4 *In the unique Nash Equilibrium of the financing game the equilibrium*

number of firm is given by:

$$m(\Phi) = \begin{cases} n_e & \text{if } \Phi \geq \bar{\Phi} \\ n_r & \text{if } \Phi < \bar{\Phi} \end{cases} \quad (4)$$

$$\text{where } \bar{\Phi} \equiv \frac{(I-A_n)\varepsilon^\varepsilon n_e^{\varepsilon+1}}{n(n_e\varepsilon-1)^{\varepsilon-1}}.$$

Lemma 1 is important because it embodies the main economic insight of the paper: an ineffective corporate governance acts as a barrier to entry. Simple as it is, we will see that this fact can lead to big economic and political consequences.

The intuition of the result is straightforward: when there are a lot of firms in the industry, individual returns are lower. Even if Condition 3 ensures that all firms still enjoy positive profits, entrepreneurs can credibly pledge to the borrowers only a fraction Φ of total returns. So poor entrepreneurs get funds only if Φ is high enough.

3.5 Policy Preferences

We have just demonstrated that Φ determines the number of active firms: in particular, an higher (lower) degree of investor protection makes product market competition harder (resp. softer). Suppose now that two different corporate governance regimes can be chosen, a good corporate governance regime in which expropriation is limited, characterized by a level of Φ equal to $\Phi^h > \bar{\Phi}$, and a bad corporate governance regime in which $\Phi = \Phi^l < \bar{\Phi}$.

As we have already derived the equilibrium price level as a function of m (equation 3), and the demand schedule of the generic individual (equation 2), we can calculate the indirect utilities of the different kinds of agents as a function of Φ ,

and finally use them to assess the effect of changes in the policy variable on their economic welfare, which we summarize in the following lemma. [[[formule in app.]]]:

Lemma 5 *(i) Both consumers and poor entrepreneurs are better off with a high level of investor protection, while the rich entrepreneurs are worst off;*

(ii) Total profits are reduced by an improved investor protection;

(iii) The overall effect on social welfare

$$U(\Phi) \equiv n_c U_c(\Phi) + n_p U_p(\Phi) + n_r U_r(\Phi)$$

of an increased investor protection is in principle ambiguous.

Point (i) and point (ii) of the lemma are quite intuitive: all the agents in the population benefit from better corporate governance because it enables more firm to enter the market, and the increased competition lowers prices. the poor entrepreneurs benefit even more from an high Φ because it makes their project financed. At the same time increased competition hurts the incumbents because it cuts their profits, and this negative effect more than offsets the positive effect on their consumption expenditures.

Taken together, points (i) and (ii) deliver the main result of this subsection: incumbents will oppose reforms aimed at improving the quality of the national corporate governance system, *whatever the effect of these reforms on the overall social welfare*, as poor investor protection is for them a shelter from competition..

The rest of this subsection will be devoted to Point (iii) which is perhaps less transparent. Indeed an high Φ has a positive impact on averall welfare because it allows the "poor" entrepreneurs to enter the market, so prices go down and overall production goes up. But at the same time each firm now produces a smaller amount:

of total output, and this implies (due to the presence of the fixed cost I) higher average costs.

So in our simple model the possibility of excess capacity at the firm level can be seen as a potential dark side of increased investor protection.

We think that this side effect of an high degree of investor protection is interesting per se and it would be useful to assess whether it is robust to different modeling assumptions. Besides it makes even more likely that in equilibrium a low level of Φ will be chosen. However, we prefer to put ourselves in the worst possible position, and to demonstrate that a poor corporate governance can arise even when it is unambiguously harmful for social welfare.

One can prove that:

Lemma 6 *When $\varepsilon \rightarrow 1^+$, $\Delta U \equiv U(\Phi^h) - U(\Phi^l) > 0$.*

So, in the following, we will restrict ourselves to the special case when $\varepsilon \rightarrow 1^+$.

In this case $U(q, w)$ becomes: $U(q, w) = \log(q) + w$.

Thanks to the logarithmic specification, we can appreciate more easily the economic forces portrayed in lemma 2. We have indeed that:

$$\Delta U = n \log\left(\frac{\alpha n_e - \alpha}{\alpha n_e - 1}\right) - \left(\frac{n_r}{n_r} - \frac{n_e}{n_e}\right) - n_p I \quad (5)$$

Where $\alpha \equiv \frac{n_r}{n_e}$ is the proportion of "rich" entrepreneurs in N_e .

The first component of ΔU in equation (8) represents the positive effect on consumers welfare induced by the reduced price; the second component represents instead the profit destruction effect of increased competition, and finally the right-most element captures the negative effect of increased competition on producers cost.

4 The political model

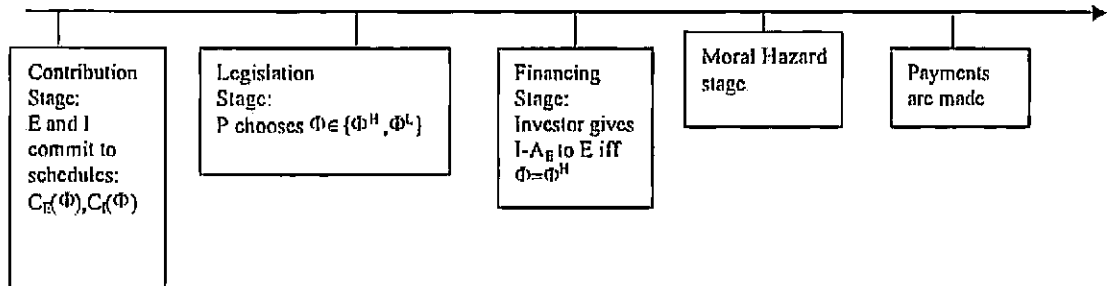


Figure 1:

The indirect utility functions of the agents, as derived in lemma 2, determine their policy preferences, which are clearly divergent: incumbent investors prefer lower investor protection (which acts for them as a shelter from competition), whereas consumers and entrant entrepreneurs prefer high investor protection. Which group will get its way? It obviously depends on the specific assumptions about how the political system aggregates individual preferences into a collective choice about Φ .

Given that good corporate governance is overall beneficial, a benevolent politician would of course implement it.

Unfortunately, the public choice and the political economy literature have argued convincingly (if needed) that textbook pigouvian policy makers are more the exception than the rule. So we assume that politicians are, at least to some extent, self interested.

The second crucial assumption that we make about politics is that people can influence political outcomes not only voting at the elections but also through the

initiatives and actions of organized interest groups.

Self interest politicians, when taking decisions, pay attention not only at social welfare, but also to the interests of organized groups and lobbies, so that in the end the preferences of some citizens (those which happen to belong to some powerful lobby) are more politically relevant than the preferences of the others.

Of course, good political institutions are just aimed to mitigate the agency problem between citizens and politicians and to minimize the power of organized special interests.

In this and in the following sections we will show how different political institutions determine the winners and the losers of the conflict which opposes industry insiders to the rest of the population with regard to corporate governance.

In this chapter we assume the existence of an incumbent policy maker which is free to choose the policy he prefers: elections and democratic check and balances are here left on the background. In the next chapter we will instead explicitly take elections and electoral incentives into account.

So Suppose that the political choice is about the level of $\Phi \in \{\Phi^H, \Phi^L\}$.

Of course one could ask from the start: why do we assume away other more direct forms of barriers to entry? Following Rajan and Zingales (2001), one first answer is that indirectly restricting entry through financial markets is by far less costly, from a political point of view, than imposing overt barriers to entry. As corporate governance seems not a crucial issue in the day-by-day political mayhem, or in pre-electoral debates, a politician can disguise more easily her political deal with the economic establishment. Besides, restricting entry through corporate governance can be really efficient (you do not need an ongoing policing activity to keep the borders of the market safe: investors will do the job for you) and effective (e.g. you don't have to be afraid that a slightly different product or production process may

void your red tapes barriers). On the other side, we really view financial barriers to entry as a possible complement, not substitute, for other forms of restrictions (like the ones surveyed in Dyankov et al. (2002).

4.1 *Lobbies*

We suppose also that both "rich" entrepreneurs and "poor" entrepreneurs are organized in a lobby (respectively lobby R and lobby P) whereas consumers are not.

What social groups are more easily organized in a pressure group, and how they manage to solve the free riding problem is still an open and debated question. Typically we observe hard lobbying when the special interest group is small and the stake in the political issue is big (Olson (1965)). Consumers are a big and dispersed group, so each of them has a strong temptation to free ride. Besides, each of them stands to gain relatively little by contributing to the common struggle, so it seems overall plausible (and in line with previous contributions)) not to see them as a powerful interest group.

We adopt a common agency framework of the kind first studied by Bernheim and Whinston (1986)(An early application of this model to economic policy making is Grossman Helpman (1994)) in which active lobbies try to influence politicians promising them valuable monetary resources⁸

Lobby R and lobby P submit two contribution schedules (here couples of non negative real numbers $(C_R(\Phi^H), C_R(\Phi^L)), (C_P(\Phi^H), C_P(\Phi^L))$) to the Politician in order to maximize the welfare of their reference groups, i.e. the objective of lobby j

⁸Of course straight monetary transfers are not the only way through which lobbies gain political power. A comprehensive exposition of the role and effects of organized interest groups is provided by Grossman and Helpman (2001).

is:

$$\max_{(C_j(\Phi^H), C_j(\Phi^L))} U_j(\Phi) - \frac{1}{n_j} C_j(\Phi) \quad j = R, P \quad (6)$$

(Where we are assuming that members of a lobby share equally the costs of lobbying).

4.2 *The policy maker*

A single individual (or a cohesive political establishment) P has the authority to set Φ . P's objective function is given by:

$$W(\Phi) = C^R(\Phi) + C^P(\Phi) + \eta \frac{1}{n} \bar{U}(\Phi) \quad (7)$$

Where $\eta \geq 0$ wants to capture the extent to which the policy maker internalizes the welfare of the polity. It can be seen as the degree of policymaker's benevolence as well as a summary parameter that depends on the ex post accountability -through elections or other democratic institutions- of incumbent politicians (as we will see better in the next section).

Given the contribution schedules, P decides the level of Φ .

After P's decision the financing decisions are made and finally the promised contributions are payed (the extensive form of the political game is also summarized in figure 1 above).

4.3 *Political Equilibrium*

We are looking for a subgame perfect Nash equilibrium $(\Phi^*, (C_i^*(\Phi^k))_{i=L,E,k=H,L})$ of the lobbying game. To rule out implausible equilibria we concentrate, following the relevant literature, on "truthful" subgame perfect Nash Equilibria, whose properties

are investigated by Bernheim and Whinston (1996). These are SPNE in which lobbies use "truthful" contribution schedules in the sense that the difference between the two offers is equal to the corresponding difference in the utility levels: $|\Delta U_i| = |\Delta C_i|$ for $i=R,P$. In other words, we have:

$$C^i(\Phi) = \max\{0, U(\Phi) - b^i\}$$

The competition among interest group then concentrates on the choice of the reservation utility b^i .

It turns out that there exist a unique truthful SPNE. In turn, the equilibrium outcome depends crucially on η :

Proposition 7 *There is a unique threshold $\bar{\eta} > 0$ such that if $\eta < \bar{\eta}$, $\Phi^* = \Phi^h$ and if $\eta > \bar{\eta}$, $\Phi^* = \Phi^l$.*

The moral of the story is quite crude: if the politician does not sufficiently internalize the welfare of the citizenship (if political institutions do not provide an adequate level of ex post accountability) the country will be left with a backward governance regime (and a suboptimal level of production). The economic and political establishment will strike a mutually beneficial deal at the expense of the rest of the population. The mechanics that lead to this result is also straightforward: as potential allies the entrants are less interesting for the politician. The higher competition that they would bring into the market would destroy profits, so they have less to offer in the political bargaining stage. Conversely the rich can pledge a greater amount of perspective resources, conditionally on being left undisturbed in the market. So in those countries in which politicians are not subject to effective popular oversight, incumbents will succeed in tilting policy in their favour.

5 Electoral competition

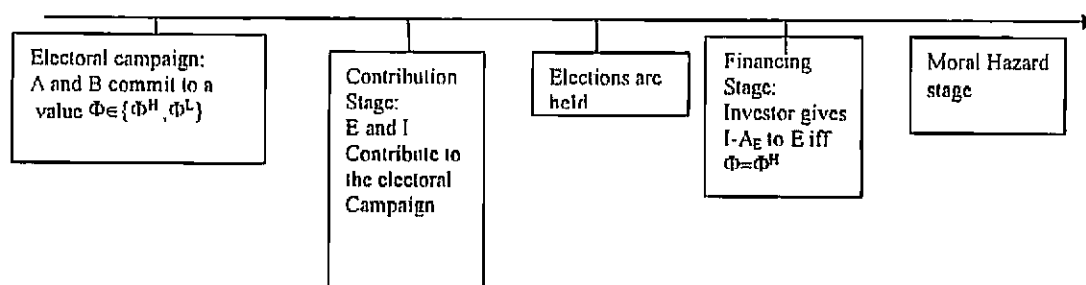


Figure 2:

To sum up: if one wants to find the causes of a country's financial underdevelopment, one should look at the workings of the national political system. To defeat the vested interests and enhance corporate governance a country needs institutions which guarantee a high congruence between policy outcomes and social preferences.

Of course the main instrument people have to keep politicians on their toes are elections, so in this section we put electoral competition at the centre stage to see how and when elections provide politicians with the right incentives to overlook the organized interest groups and enact welfare enhancing financial reforms.

We use a simplified version of the voting model developed by Baron (1994) and extended by Grossman and Helpman (1996)⁹ to argue that the effectiveness of elections in disciplining politicians cannot be taken for granted, and crucially depends on the broad social and political characteristics of a country.

⁹The main simplification we introduce with respect to Grossman Helpman(1996) is given by the different timing. In their model contributions are decided before, not after, political positions are set. This implies that lobbies can use their contributions to influence both the electoral outcomes and the electoral platforms.

The driving force here is the assumption that agents, when voting, are of two different kinds: informed and uninformed. Uninformed voters are not aware of the relevance of corporate governance for their own well-being. Besides, they can be influenced by campaign spending, in the form of political advertising or whatever, which has in turn to be funded by the contributions of lobbies.

This implies that, when choosing electoral platforms, candidates face a fundamental trade off: putting in their agenda an improvement of corporate governance, they can attract votes from the (majority of) the well-informed portion of the electorate. On the other side, sweeping financial reforms under the carpet they will be rewarded by the incumbent's lobby with valuable resources which can be used to influence the voting of the uninformed and impressionable voters.

In what follows we spell out the extensive form of the electoral game (summarized also in figure 2 above) and characterize the equilibrium level of Φ .

5.1 *Candidates*

There are two candidates (or cohesive political parties), say A and B. Each candidate has a fixed ideological position that cannot be credibly changed, but each of them can freely choose which value of Φ to implement if he will win the elections. (The ideological position of a candidate can summarize a set of exogenous characteristics of the politician (e.g. ability)). If a politician wins the elections, he is bound to implement the promised policy.

Candidates are office seekers: they maximize the probability of winning the elections.

Needless to say, we are abstracting away a lot of the complexity of real world electoral politics, where political issues come in bundles. For example Pagano and Volpin (2001) have convincingly argued that there is a strong political link between

Financial market and Labour market regulation, and it would be certainly interesting to investigate this link in our framework. Here, however, we ignore these interrelations assuming that corporate governance is (perceived as) orthogonal to the other salient political topics, and so can safely be considered in isolation.

5.2 *Lobbies*

Once the candidates have chosen their preferred Φ , Lobbies can influence the electoral outcome by giving electoral contributions to whatever party they want (or to both of them), in order to maximize:

$$\max_{C_j^A, C_j^B} P_A U_j(\Phi^A) + (1 - P_A) U_j(\Phi^B) - \frac{1}{n_j} (C_j^A + C_j^B) \quad j = R, P \quad (8)$$

where P_A is the probability that party A wins the elections. P_A is of course endogenous and we will see immediately how it depends on the candidate choices and on the contributions. Finally, one should note that (unlike in section 4), in order to be used in the political struggle, contributions must be handled before the elections, so that lobbies have to use for this aim the initial wealth of their members.

5.3 *Informed voters*

Informed voters represent a fraction μ of the electorate¹⁰. When casting their ballot, they evaluate both the ideological position and the policy platform of the candidates.

So a generic informed voter j votes for party A iff $U_j(\Phi^A) > U_j(\Phi^B) + b_j$, where b_j measures the net ideological preference of j for party B . We assume that ideological

¹⁰Actually we are assuming that the percentage of uninformed is the same across different economic groups. This shortcut simplifies calculations. It also strengthens our results to the extent that rich entrepreneurs are more likely than the rest of the population to be aware of the importance of the issue.

bias for B is distributed in the population as a uniform with mean b/f and density $1/f$. Here f is inversely related to the strength of ideological preferences in the population: a low level of f implies that a larger fraction of the electorate entertains extreme ideological views.

So the fraction of informed voters that votes for party A is given by¹¹

$$s_A^I = \frac{1}{2} - b + f \left[\frac{1}{n} U(\Phi^A) - \frac{1}{n} U(\Phi^B) \right]. \quad (9)$$

Following Grossman and Helpman (2002) and the literature on probabilistic voting we further assume that candidates are uncertain about the true value of b , and they perceive it as drawn by some known distribution with cumulative function $F_b(\cdot)$, where $F'_b > 0 > F''_b$ ¹².

5.4 *Uninformed voters*

The fraction $(1-\mu)$ of uninformed voters, when voting, does not take into account the promised level of investor protection. They just care about the ideological position of the candidates and, on the top of this, they are influenced by campaign spending.

Like Grossman and Helpman (1996), we assume the fraction of informed voters that votes for party A is given by:

$$s_A^I = \frac{1}{2} - b + c(C^A - C^B) \quad (10)$$

¹¹We assume that f is small enough that s falls between 0 and 1 for all feasible policy options

¹²As it will become apparent soon, one could have alternatively assumed that parties maximize their vote share, while knowing the exact value of b . Good informal reasons for such an objective can be found in Grossman and Helpman (1996).

Where $C^j = C_j^R + C_j^P$ for $j=A,B$, and e is a parameter that captures the efficiency of the technology which transforms campaign contributions into electoral consensus. What is implicit in this reduced form specification is that, without campaign contributions, the relative popularity of the parties is the same among the two kinds of voters.

5.5 Political Equilibrium

We are now in a position to say something about the subgame perfect Nash equilibrium of the electoral game: $(\Phi^{A*}, \Phi^{B*}, (C_j^q(\Phi^q))_{j=R,P}^{q=A,B})$. In particular the main result of this section is given by the following proposition:

Proposition 8 Define $\eta \equiv \frac{\mu f}{(1-\mu)e}$. There is a unique threshold $\bar{\eta}$ (which depends on F_b) such that if $\eta < \bar{\eta}$ $\Phi_A^* = \Phi_B^* = \Phi^L$, and if $\eta \geq \bar{\eta}$ $\Phi_A^* = \Phi_B^* = \Phi^H$. Furthermore in equilibrium $C_j^q = 0$ for each j and q .

What is the main intuition behind this result? First note that the percentage of votes earned by party A is given by the weighted sum of s_A^I and s_A^U (given by eq. 12 and eq. 13 above):

$$s_A = \mu s_A^I + (1 - \mu) s_A^U = \frac{1}{2} - b + \mu f \left[\frac{1}{n} U(\Phi^A) - \frac{1}{n} U(\Phi^B) \right] + (1 - \mu) e (C^A - C^B).$$

So the probability of winning of party A is given by:

$$P_A = \text{Prob}(s_A > \frac{1}{2}) = F_b(\mu f (U(\Phi_A) - U(\Phi_B)) + (1 - \mu) e (C^A - C^B)) \quad (11)$$

and candidates (for candidate B the problem is identical) maximize

$$W(\Phi) = \frac{\mu f}{(1-\mu)e} U(\Phi_j) + (C_j^R + C_j^P), \quad (12)$$

which is equal to the objective function that we assumed in the post-electoral model of section 4, save that we now know that $\eta = \frac{\mu f}{(1-\mu)e}$.

Equation 15 is important for many reasons, besides being the key to prove proposition 2. First, it shows clearly the trade off between welfare and contributions faced by both candidates. As we anticipated above, electoral competition is per se a force that pushes candidates towards welfare maximizing policies. On the other side, to the extent that campaign rhetoric has an appeal for a significant fraction of the voting population, tilting platforms towards the lobbies desiderata is tempting, because it provides candidates with resources to invest in campaign messages. We demonstrate in the appendix that the economic asymmetry between the two competing interest groups (which we have already discussed at length) leads to a political asymmetry so that the incumbent's lobby is always privileged.

Equation 15 also explains what factors influence the relative importance of the two forces:

- An high percentage of informed voters on the total population, should be associated to high investor protection. Not only this reinforces the intuition of Pagano and Volpin that a widespread "equity culture" is important for the development of the financial sector. This can be also seen to rationalize recent empirical findings (Zingales and Van Dijk (2002 a)) of a positive impact of well functioning media on a country's corporate governance.

While informal explanations of the corporate governance role of the media have focused on a direct effect of information on the incentives of the managers

(Zingales and Van Dijk (2002 b)) we highlight here an indirect effect, which works through the disciplining effect of the media on political actors.

- If the strength of ideologic preferences is high, investor protection will be low. This is a new and potentially testable implication of our analysis. It is also quite intuitive: voters in countries that are swept by harsh political and ideological conflicts obviously care less about the parties positions on such "technical" issues. Then Politicians have more room to engage in political bargaining with influent interest groups at a reduced political cost. Deep ideologic, ethnolinguistic, cultural divides were already been associated in the empirical literature to financial underdevelopment (Coffee (2001), Stulz and Williamson (2002)). Here we provide a new rationale for these findings, to the extent that social cleavages translate into political ones. We think that the cultural variables used so far could be seen as a proxy for more precise measures of what political scientists call the "political culture" of a country (references) and that more empirical investigation along these line could be fruitful.

6 Extension: Electoral rules

As we gave a first look into the black box of the political process, we have seen that several socio-political characteristics of a country can influence the equilibrium level of legal investor protection trough their impact on the electoral competition. From a normative point of view one could be disappointed to recognize the importance of "soft", or informal elements of the political system as so important, because they seem quite difficult and slow to change. It would be interesting to see whether different formal political institutions per se, other things being equal, can generate

differences in Φ .

One easy step to take in this direction is to look at the impact of different electoral rules.

Suppose that the country is divided into 3 different electoral districts, named 1,2,3. To concentrate on politics that they have the same economic composition and the same population. The only difference pertains to the direction and the strength of the ideological preferences. For instance, let district 1 be ideologically biased toward party A: the ideological preferences of the population of district 1 is distributed as a uniform of mean $-(b+l)/f_1$ and density f_1 where $l > 0$ and let district 2 be ideologically biased toward party B, with the ideologic preferences of the population distributed as a uniform of mean $(b+l)/f_3$ and density f_3 . Besides, suppose that l is so big that, whatever Φ_A, Φ_B are, the majority of votes of district 1 will go to party A and the majority of votes of district 3 will go to party B.

District 2 ideological preferences can instead by summarized by a uniform distribution of mean b/f_2 and density f_2 .

District 2 is taken to be not only the more "moderate" district, but also the more homogeneous one, from an ideological point of view: $f_1 < f_2, f_3 < f_2$.

Now suppose the electoral rule is proportional, i.e. to win a party needs a vote share greater than $1/2$ of the population. Following the same steps of section 4, candidate $j=A,B$ can be shown to maximize

$$\frac{\mu \bar{f}}{(1-\mu)e} U(\Phi_j) + (C_j^R(\Phi_j) + C_j^P(\Phi_j))$$

with $\bar{f} = (f_1 + f_2 + f_3)/3$.

But now suppose that the electoral rule is majoritarian, so that each candidate wins if he gets a majority of votes in *two districts out of three* (one can also interpret

the 3 districts as three electoral colleges in a presidential election). This implies that, when choosing their policy platforms, both candidates completely disregard the 2 extreme districts, so that the electoral competition takes place only in the "marginal" district. One can show that now candidate j maximizes:

$$\frac{\mu f_2}{(1-\mu)e} U(\Phi_j) + (C_j^R(\Phi_j) + C_j^P(\Phi_j)).$$

As $f_2 > \bar{f}$ this implies that, *coeteris paribus*, it is easier to observe a high degree of investor protection in a majoritarian than in a proportional country: to the extent that majoritarian voting systems tend to concentrate electoral competition in some marginal district, particularly sensitive to policy, the pressure toward policies that are optimal from an utilitarian point of view becomes stronger.

7 Conclusions

The Law and Finance approach has had a major impact on our understanding of corporate governance. While the earlier literature was putting the emphasis on the comparison between different financial systems, the work of La Porta et. al has asked the more fundamental question of why financial systems differ across the world. The more recent literature has underlined the importance of legal investor protection in defining the features of financial systems. However, the Law and Finance raises a new set of questions: What are the determinants of legal investor protection? Why are some countries stuck in a situation of poor investor protection?

To answer these questions one needs to understand the workings of the political process. In this paper we have applied the tools of the field of political economy to understand the evolution (or the lack thereof) of the corporate governance systems. Following Rajan and Zingales (2001), we have argued that improvements in legal

investor protection, while being socially desirable, harm incumbent entrepreneurs. In fact, better corporate governance law, by facilitating the access to financing to new entrepreneurs, induce new entry that dissipates the incumbents' rents. Incumbents can try to stop the evolution to better corporate governance rules by lobbying self-interested politicians. We have shown that the equilibrium outcome is shaped by factors such as the role of the press, the type of electoral competition, the ideological entrenchment of voters. Our paper is only a preliminary attempt to understand the political economy of corporate governance. Much remains to be done. First, while we have discussed general corporate rules, it is interesting to study specific rules and laws. For instance, in an interesting recent paper Biais and Récasens (2002) [Corrupt Judges, Upwardly Mobile Entrepreneurs and the Political Economy of Bankruptcy Laws mimeo, IDEI, Toulouse] study the political economy determinants of bankruptcy law. Second, the increasing integration of capital markets poses a threat to the incumbents' ability to bend in their favor the political process. In fact, firms can decide to migrate in more "investor friendly" legal regimes. For instance, Italian firms may decide to be listed in the NYSE or the LSE, thereby committing to the tougher corporate governance rules imposed by those Stock Exchanges. The possibility of a migration of national firms to more investor friendly regimes can undermine the ability of incumbents to preserve inefficient rules in their country. Some authors have come to the extreme conclusion that differences in corporate governance will soon disappear (Hansmann e Kraakman (2000), The End of History of Corporate Law, mimeo, Yale Law School). Although this conjecture seems probably extreme, it is nonetheless very interesting to understand how the reduction in mobility barriers impact on the political decisions process. These questions await further research.

8 Appendix

Lemma 1

$$U_c(\Phi) = A_c + \frac{1}{\varepsilon - 1} p(m(\Phi))^{-(\varepsilon-1)}$$

$$U_p(\Phi) = A_r + \frac{n(m(\Phi)\varepsilon - 1)^{\varepsilon-1}}{m(\Phi)^{\varepsilon+1}\varepsilon^\varepsilon} - I + \frac{1}{\varepsilon - 1} p(m(\Phi))^{-(\varepsilon-1)}$$

$$U_r(\Phi) = A_p + 1_{[\bar{\Phi}, 1]}(\Phi) \left[\frac{n(m(\Phi)\varepsilon - 1)^{\varepsilon-1}}{m(\Phi)^{\varepsilon+1}\varepsilon^\varepsilon} - I \right] + \frac{1}{\varepsilon - 1} p(m(\Phi))^{-(\varepsilon-1)}.$$

Lemma 2

$$U_c(\Phi) = A_c - \log(p(m(\Phi))) \tag{13}$$

$$U_p(\Phi) = A_p + \frac{n}{m(\Phi)^2} - I - \log(p(m(\Phi))) \tag{14}$$

$$U_r(\Phi) = A_r + 1_{[\bar{\Phi}, 1]}(\Phi) \left[\frac{n}{m(\Phi)^2} - I \right] - \log(p(m(\Phi))). \tag{15}$$

$$U(\Phi) = A - n \log(p(m(\Phi))) + \frac{n_r n}{m(\Phi)^2} - I + 1_{[\bar{\Phi}, 1]}(\Phi) \left[\frac{n n_p}{m(\Phi)^2} - n_p I \right].$$

Proof. (Proposition 1)

Define

$$\bar{\eta} \equiv \frac{n_r |\Delta U_r| - n_p \Delta U_p}{\Delta U/n}$$

First of all note that $\frac{n}{n_r} - \frac{n}{n_r} + n_p I - n_c \log\left(\frac{\alpha n_c - \alpha}{\alpha n_c - 1}\right) > 0$, so we are sure that $\bar{\eta} > 0$.

We consider first the case in which $\eta < \bar{\eta}$. The proof of the statement is in two parts. First we demonstrate that in any SPNE $\Phi^* = \Phi^L$, and then we show that an SPNE exists.

note that $\Phi^* = \Phi^h$ cannot be an equilibrium. In fact $\eta < \bar{\eta}$ implies $\eta \Delta U/n < n_r |\Delta U_r| - n_p \Delta U_p$ i.e that

$$n_r |\Delta U_r| > \eta \Delta U/n + n_p \Delta U_p > \eta \Delta U/n + n_p \Delta C_p$$

and $\Phi^* = \Phi^h$ implies

$$|\Delta C_R| \leq \Delta C_P + \eta \Delta U/n$$

But then lobby R could deviate offering the following menu of contributions: $C_R(\Phi^h) = 0, n_r |\Delta U_r| > C_r(\Phi^l) > n_p \Delta U_p + \eta \Delta U/n$ which would make their members better off.

Consider instead the set of strategy profiles : $C_R(\Phi^h) = 0, C_R(\Phi^l) = \Delta U_p + \eta \Delta U/n, \Delta C_P < \Delta U_p + \eta \Delta U/n$

$$\Phi^* = \Phi^L.$$

It is immediate that any of them is in fact an SPNE.

The case in which $\eta < \bar{\eta}$ can be treated symmetrically. ■

Proof. (Proposition 2) We look for a SPNE of the election game.

If both parties choose the same platform, contributions will be 0 and each party will have a probability of 1/2 to win the elections.

What if one party (say A) chooses Φ^L and the other (say B) Φ^H ?

If R contributes, he contributes only to party A. R contributes if and only if

$$\beta(1 - \mu)e\eta_r\Delta U_r > 1$$

and in this case he gives all he has: A_R .

If P contributes, he contributes only to party B. P contributes iff

$$\beta(1 - \mu)e\eta_p\Delta U_p > 1.$$

We have 3 possible situations:

- if $\beta(1 - \mu)e\eta_r\Delta U_r < 1$ the only equilibrium is one in which $\Phi_A^* = \Phi_B^* = \Phi^H$, no contributions are given, A and B are equally likely to win.
- if $\beta(1 - \mu)e\eta_p\Delta U_p < 1 < \beta(1 - \mu)e\eta_r\Delta U_r$ and $\eta < \frac{\Delta R}{\Delta U}$ the only eq. is one in which $\Phi_A^* = \Phi_B^* = \Phi^L$, whereas if $\eta > \frac{\Delta R}{\Delta U}$ the only eq. is one with $\Phi_A^* = \Phi_B^* = \Phi^H$.
- if $1 < \beta(1 - \mu)e\Delta U_p$ and $\eta < \frac{\Delta R - \Delta R}{\Delta U}$ the only eq. is one in which $\Phi_A^* = \Phi_B^* = \Phi^L$, whereas if $\eta > \frac{\Delta R - \Delta R}{\Delta U}$ the only equilibrium is one with $\Phi_A^* = \Phi_B^* = \Phi^L$.

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9 Bibliography

Baron, D. (1994), "Electoral Competition with Informed and Uninformed Voters", *American Political Science Review*, 88, 3-47.

Bernheim, B. and Whinston, M. (1986), "Menu Auctions, Resource Allocation, and Economic Influence", *Quarterly Journal of Economics*, 101, 1-31.

Biais, B. and Recasens, G. (2001), "Corrupt Judges, Upwardly Mobile Entrepreneurs, and the Social Costs of Liquidation: the Political Economy of Bankruptcy Costs", mimeo.

Coffee, J. (2001), "Do Norms matter? Cross-Country Examination of Private Benefits of Control", mimeo.

Dyankov, S., La Porta, R., Lopez-de-Silanes, F. and Shleifer, A. (2002), "The Regulation of Entry", *Quarterly Journal of Economics*, 117, 1-37.

Dyck, A. and Zingales, L. (2001), "Private Benefits of Control: an International Comparison", mimeo.

Dyck, A. and Zingales, L. (2002), "The Corporate Governance Role of the Media", mimeo.

Grossman, G. and Helpman, H. (1994), "Protection for Sale", *American Economic Review*, 84, 833-850.

Grossman, G. and Helpman, H. (1996), "Electoral competition and special interest politics", *Review of Economic Studies*, 63, 265-286.

Grossman, G. and Helpman, H. (2001), *Special Interest Politics*, Cambridge MA, MIT press.

Hellwig, M. (1999), "On the Economics and Politics of Corporate Governance and Control" in Vives, X. (ed) *Corporate Governance*, Oxford, Oxford University Press.

Hansman, H. and Kraakman, R. (2000), "The End of History in Corporate Law", mimeo.

Holmstrom, B. and Tirole, J. (1997), "Financial Intermediation, Loanable Funds, and the Real Sector", *Quarterly Journal of Economics*, 112, 663-691.

Jayaratna, J. and Strahan, P.E. (1996), "The Finance-Growth Nexus: Evidence from Bank Branch Deregulation", *Quarterly Journal of Economics*, 111, 639-670.

Johnson, S., La Porta, R., Lopez de Silanes, F., Shleifer, A. (2000), "Tunneling", *American Economic Review*, 90, 22-27.

La Porta, R. Lopez de Silanes, F., Shleifer, A. and Vishny, R. (1997), "Law and Finance", *Journal of Political Economy*, 106, 1113-1155.

La Porta, R. Lopez de Silanes, F., Shleifer, A. and Vishny, R. (1998), "Legal determinants of external finance", *Journal of Finance*, 52, 1131-1150.

La Porta, R. Lopez de Silanes, F., Shleifer, A. and Vishny, R. (1999) "The quality of government", *Journal of Law, Economics and Organization*, 15, 222-279.

La Porta, R. Lopez de Silanes, F., Shleifer, A. and Vishny, R. (2000) "Investor protection and corporate governance", *Journal of Financial Economics*, 58, 3-28.

Levine, R. and King, R.G. (1993), "Finance Entrepreneurship and Growth: Theory and Evidence", *Journal of Monetary Economics*, 32, 513-542.

Pagano, M. and Volpin, P. (2001). "The Political Economy of Finance", *Oxford Review of Economic Policy*, 17(4), 502-519.

Pagano, M. and Volpin, P. (2000). "The Political Economy of Corporate Governance", *Journal of Finance* (forthcoming).

Perotti, R. and Von Thadden, L. (2001), "The Political Economy of Bank vs Market dominance", mimeo.

Persson, T. and Tabellini, G. (2000) *Political Economics*, Cambridge MA, MIT Press.

Persson, T. and Tabellini, G. (1999), "The Size and Scope of Government: Comparative Politics with Rational Politicians. The Marshall Lecture 1998", *European Economic Review*, 43, 699-745.

Tirole, J. (2001). "Corporate Governance". *Econometrica*, 69, 1-37.

Rajan, R. and Zingales, L. (2001) "The Great Reversals: the politics of financial development in the XX century", mimeo.

Rajan, R. and Zingales, L. (1998), "Financial Dependence and Growth", *Amer-*

ican Economic Review, 88, 559-586.

Roe, M. (1994) *Strong managers. weak owners: the political roots of american Corporate Finance*, Princeton, Princeton University Press.

Stulz, R. and Williamson, R. (2001). "Culture, Openness and Finance". NBER working paper 8222.