Economics of the Stakeholders' Firm

Finance Working Paper N°. 115/2006
January 2006

Vicente Salas Fumás
University of Zaragoza and ECGI

ECGI Working Paper Series in Finance

Economics of the Stakeholders' Firm

Working Paper N°. 115/2006

January 2006

Vicente Salas Fumás

Abstract

We model workers and shareholders contracting for joint production when investment in knowledge is non-verifiable and resulting transaction specific human capital, embedded in the workers, is non tradable. The model provides sufficient conditions for workers' becoming stakeholders of the firm and allows us to investigate the enlightened self-interest of shareholders to empower workers as a way to motivate investment. The model is extended to account for external product market competition that forces to share wealth with customers, and to consider the welfare loss from risk sharing with risk averse workers. Problems of implementation of bilateral and trilateral governance mechanisms for the "new" firm, that substitute the hierarchical shareholders oriented mechanism of the old one, are highlighted.

Keywords: Workers and shareholders contracting, knowledge investments, governance mechanisms

JEL Classifications: G31, G32

Vicente Salas Fumás
Dep. Economía de la Empresa, Universidad de Zaragoza
Dr. Cerrada 1
5005 Zaragoza,
Spain
Phone: +34 976 761803
e-mail: Vsalas@unizar.es

Introduction.

The "shareholders" oriented profit-maximizing enterprise, the dominant model in the study of efficient resource allocation in market economies during the past fifty years, is being challenged by the so-called "stakeholders" model of the firm. For some critics of the shareholder model the need for change is urgent after the scandals of large public corporations that went too far in their objective of share value maximization; the focus of the firm, critics argue, must shift towards more balanced objectives, social responsibility and ethical behavior. Others see a more fundamental economic reason, the shift from physical capital to knowledge as the critical resource for wealth creation, Rajan and Zingales (2000), Zingales (2000). The shareholder theory of the corporation was useful when the priority was to accumulate physical resources, but positive, normative and instrumental analysis of the modern business firm requires a theory adequate for the new reality[1].

Tirole (2001) describes the problem of governance in the shareholders oriented firm as how to make sure that managers that decide for the benefit of shareholders internalize the external effects of such decisions in the welfare of other interested parties. The socially responsible firm is that which substitutes total welfare maximization in place of profits maximization, when there are serious conflicts between the two. The implementation of the socially responsible firm depends on finding the appropriate incentive system for managers and decision markers so that they end up maximizing welfare. Little is known, however, on how the conflicts between private and social goals emerge in multiple constituencies contracting, as it is implicit in the stakeholder view of the modern firm. Formal models of exchange situations that explain how contracting parties build interests in the firm, beyond those of the shareholders as residual claimants, are lacking, and for this reason the debate around the stakeholders' theory is incomplete and imprecise[2].

The purpose of this paper is to contribute to the analysis of contracting problems that naturally explain the emergence of the stakeholders' firm. The analysis will help to

[1] There also people who believe that no major change is needed in the actual model of the capitalist firm and corporate governance, Holmstrom and Kaplan (2003).
[2] The exception would be the well documented analysis of the stakes at risk by debt holders under limited liability and risk shifting incentives of shareholders, Black and Scholes (1973).

understand the limitations of the shareholders' model but also will raise complications faced by the new model to overcome such limitations. The paper is build under a simple model of contracting between financial investors, generally called shareholders, and workers who accumulate transaction specific knowledge in the form of productive human capital. Knowledge accumulation requires investments that need to be financed. One of the questions raised is, who should finance the investment given that workers will always be the "owners" of the human capital. To own the human capital shareholders would have to own the workers and they can not legally do so. Another complication is that the investment in knowledge is non-verifiable information and can not be part of an explicit legally enforceable contract. In top of that, at the time the investment is made it is impossible to foresee all possible contingencies along the transaction and the contract has to be necessarily incomplete. Finally, the model is extended to allow competitive interactions among rival firms which naturally introduce customers as a third party of the transactions.

The model is in the spirit of economics human capital as formulated by Becker (1975) and formalized by Hashimoto (1981), who explicitly make the distinction between general and specific human capital and assume a perfectly competitive labor market in which firms make offers to workers to attract them. Therefore each firm is forced to pay the worker at least what it gets in the next best option. We depart from Becker making explicit the decision about who should finance the investment in specific human capital when the balance of power is not all concentrated in the shareholders, allowing for different degree of specificity and assuming that investment in human capital is not contractible and solutions such that workers and shareholders share the cost of the investment are not feasible. On the other hand, the model does not allow for repeated interactions and relational contracts that can build trust between workers and shareholders[3].

[3] Malcomson (1997) provides a revision of the literature on human capital investment under incomplete contracts and hold up. Other somehow related papers are Aoki (1990), Pagano and Volpin (2005) who model coalition formation between managers and workers to dispute shareholders rents but in a model of complete contracting and no distinction between general or specific human capital. Baker et al (2001) model the firms' boundary decisions applying relational contracts theory combined with asset specificity and incomplete contracts. Perotti and von Thadden (2003) explain the allocation of power in an economy with intermediated and non intermediated financial markets. Asher et al (2005) relate the stakeholder and the property rights theories of the firm but no formal analysis of the relation is provided.

Under fairly general conditions the model shows that the allocation of the finance and investment decision either to shareholders or to workers are both second best solutions in terms of total welfare creation. Workers' (shareholders') finance is preferred when workers' empowerment is higher (lower) and human capital is relatively general (specific). As investors, workers have "stakes" in the firm. Shareholders are willing to empower workers when the later finance the investment in human capital, but the empowerment chosen by shareholders is below the first best level. The shareholders instrumental value of the empowerment increases as the knowledge is more transaction specific. Since empowerment means workers sharing the uncertain rents of the collaboration, workers' risk aversion can limit their willingness to finance the investment.

The model is also extended to allow competition that determines the allocation of wealth between consumers and producers and between consumers, workers and shareholders. Here the key variable again is the outside options of the transacting parties and in the equilibrium of the competitive process a producer captures as much wealth as the difference between the wealth created of the firm is buying from and wealth created by the second best alternative. The analysis highlights the limitations of accounting profits as measure of economic wealth, and reviews opportunities for institutional development that could coordinate decentralized contracting into superior welfare solutions.

The rest of the paper is organized as follows. Section 2 presents an overview of the economic theories of organization that have shaped the thinking about the business firm in the past fifty years, mainly form agency theory to property rights theory. Section 3 presents the model of contracting under different scenarios together with the main theoretical results. Section 4 draws some implications for institutional development. The final section summarizes the main conclusions.

2.-Contracting problems and the theory of the firm.

Contracting between providers of labor services and providers of capital services is at the core of production of goods and services for the market. Often, capital services are provided by assets owned by a legal entity we call a firm, separated from investors who

in turn provide the money funds needed to finance the investment in these assets[4]. Contracts between legal entities take care of inputs needed in the production process at intermediate stage of elaboration. The legal entity of the firm becomes the "nexus of contracts", Jensen and Meckling (1976), that facilitates collaboration between financial investors and workers, directly or through the mediation of other firms.

The economic analysis of this form of organization has provided theoretical foundations for the need of having a common nexus for bilateral contracts as a way to overcome free riding problems in team production, and giving to the common nexus the status of residual claimant, Alchian and Demsetz (1972), Holmstrom (1982). In a world of uncertainty and risk aversion there are potential gains for assigning the position of residual claimant to financial investors because they are in a better position to diversify their personal wealth and share the risks of large investments among many small investors. The public corporation is a legal form of business firm that provides support to this form of organization and investors formalize their relation with the firm subscribing shares issued by the corporation. Shareholders hold decision and appropriation rights over the assets owned by the corporation that they contribute to finance, but only after all obligations of the corporation with other partners are satisfied according to the predetermined contract[5].

For a long time Agency theory, Jensen and Meckling (1976), has provided the theoretical support to understand and solve the collective decision making problem of contracting between shareholders and the "agent" that has effective control of the assets owned by the firm, the management team (the so called incentives problem from separation of ownership and control). Classical agency problems focus on the

[4] Why physical persons create a legal entity as the owner of the assets used in production and exchange is jet unsettled, Holmstrom (1999), although there some possible answers. To leverage bargaining power, to facilitate the buying and selling of the pool of assets, to facilitate managerial coordination and motivation of workers, Holmstrom (1999). To facilitate relational contracts (trust) as the time horizon of the legal entity is infinite, Kreps (1990). To commit (capital lock in) to ex post non-opportunistic behavior in incomplete contracts, Blair and Stout (1999), Blair (2004). As a mechanism to protect the value of knowledge and facilitate the accumulation of it, Kogut and Zander (1992). Hansmann (1996) offers a general view on the ownership theory of the firm, but does not explain its existence.

[5] Public offers for the purchase of shares is one of the mechanisms to voluntary or involuntary transfer of control of the assets of the public corporation among teams. The public offer can alleviated the collective supervision and control problem of the management team when shares' ownership is highly dispersed. However its limitations are also well known, Grossman and Hart (1980), and the debate around the causes of consequences of take over activity around the public corporation has dominated the recent literature on governance and control of public corporations.

relationship between external shareholders that provide finance and the internal control group and come out with second best optimal managerial incentive contracts. Implicitly, the contract is assumed to take place at the time when the firm goes public and is formulated as a complete contract. But in reality contracts between shareholders and managers are incomplete and often decision rights that agency models assign to shareholders are in fact exercised by the managers.[6]. The protection of the interests of the shareholders as residual claimants has to go beyond the protection provided by the initial public offer contract and the mechanisms for this purpose have been investigated under the topic of "corporate governance", Shleifer and Vishny (1997).

Agency theory and the broader research field of optimal incentive design have made substantial contributions to the management of personnel in complex organizations, that go far beyond contracting between external shareholders and the internal control team, Baron and Kreps (1999, chapters 10 to 12). However, the new challenges in managing people have to do with the allocation of residual decision rights in a world of incomplete contracts in order to assure the socially optimal investment in human capital over time, Malcomson (1997). The problem of governance goes beyond the protection of interests of external shareholders, corporate governance, to become a problem of "firm governance", Salas (2004)[7].

Agency and related theories operate in a world of complete contracts, meaning that once the contract is closed all decisions and pay off are perfectly predictable. The ex ante concern of the contract is to extract efficient effort in an environment of imperfect observation of the agent's effort by the principal. The human capital investment decision, on the other hand, is a decision made today to build an asset that will be deployed in future transactions. Due to imperfect information and bounded rationality

[6] Bebchuck and Freid (2003) for example argue that the problem of management compensation is not to find the contract that maximizes shares value given the information asymmetry conditions between shareholders and managers (agency theory). But to make sure that the board or the general assembly of shareholders is in a position to enforce this kind contract design problem (governance theory). They claim that most often managers have discretion to design the contract in their best interest contrary to those of the shareholders.

[7] For approaches to the governance problem in the context of shareholder-workers relations, from the labor relations and management fields see Armour et al (2003) and Parkinson (2003). Vives (2000) provides a view of corporate governance from diverse economic perspectives and institutional environments and Rodríguez Fernández (2003) reviews the literature on finance oriented versus stakeholder oriented models of the corporation.

the contract between the agent who invests in human capital and the agent who will purchase the services from this capital has to be necessarily incomplete, that is it has to leave out many of the potential contingencies that can arise along the duration of the transaction. How to make decisions when contingencies not contemplated in the contract arise is also part of the contract, and becomes the core of the study of governance mechanisms. Kreps (1997) identifies three possible governance mechanisms in incomplete contracting, hierarchical, bilateral and trilateral. In the first one residual decision rights are all allocated to one of the contracting parties, for example the entrepreneur in the traditional capitalist firm[8]. In bilateral governance the rights to decide on non pre contracted contingencies is shared among transacting parties (for example German co-determination) and in trilateral governance residual decision rights are allocated to a third party external to the transaction. The efficient choice among the three will take into account professional competence, information and trustworthiness.

If the investment is in an asset whose economic value is similar inside and outside the transaction that initially motivated it, then incomplete contracts are not a major economic problem since exit of the relation is sufficient protection ex post to guarantee investment ex ante. However if the asset is specific to the transaction and its economic value outside the transaction is much lower than inside it, then exit is no longer an effective protection of the value of the investment and to create incentives ex ante new solutions are needed. Transactions Cost (TC) theories recommend the joint ownership of all the assets that determine the uniqueness of the collaboration as the most efficient solution, Williamson (1979, 1985), Klein et al (1978). If the investment is made by a supplier to provide specialized services to a customer, then the TC recommendation would be that all the assets that determine the economic value of the specialized one be kept under a single ownership. This will avoid the ex post hold up situation that affects the supplier when exit is not an effective protection and when ownership of complementary (co-specialized) assets is separated. Vertical integration of supplier and customer, to concentrate the assets owned by the two legal entities into a single one, is a way to implement the joint ownership recommendation.

[8] Simon (1951) is the first to formalize the employment relation as an incomplete contract in which the employee sells the services to the employer who will observe the contingencies around the job as they appear and will decide the task assignment for the worker appropriate for each of them. The efficiency of the relation is determined by a trade off between the flexibility of adjustment to contingencies as they

The property rights approach raises the difficulty in implementing the joint ownership recommendation in transaction specific investments when the investment is in human capital embodied in physical persons. The ownership of embedded human capital is not transferable and the single ownership is not feasible when physical assets complement human capital and there are investments in specific human capital in both sides of the transaction (buyer and seller). In this situation the single ownership could only go as far as making one of the parties investing in human capital the single owner of her human capital and of all the other physical assets, the only tradable ones. But the human capital of the other party would still be left out of the single property. There will be situations where to concentrate the ownership of all the physical assets in a single owner can be less efficient than a more balanced distribution of the assets among transacting parties, Grossman and Hart (1986), Hart and Moore (1990), Hart (1995), Rajan and Zingales (1998). The property rights approach to the boundaries of the firm decisions has been extended to allow for relational contracts between upstream and downstream firms along the value chain, Baker et al (2002). But the analysis of efficient decisions in finance of the investment in specific human capital has not been done so far.

Risk sharing has been recognized as a serious impediment to single ownership of human and non-human capital even under well function financial markets. To have financial investors (shareholders) as residual claimants financing tangible and intangible tradable assets while risk averse workers receive a fixed salary, is viewed an efficient way to allocate economic risks, Wilson (1969), Hart and Holmstrom (1987). The alternative of creating a workers cooperative or make workers also the shareholders of the firm creates a new collective action problem and eliminates the benefits of risk sharing, so the potential advantages have to weighted against these costs.

In the current legal framework of the corporation shareholders are also the holders of residual decision rights, that is they hold the right to close the incomplete contracts under no agreement with the rest of the parties, mainly workers and managers. Before any recommendation about changing the status quo it is necessary to understand the contracting problems that shareholders face in the new world of knowledge and specific

---

come, and the disutility of the worker from the uncertainty at the start of the relation about the more or less attractive job to perform.

human capital put forward by defenders of the stakeholder theory. Do shareholders have in their interest to change the rules of the game inside the corporation to create the proper long-term incentives in human capital investment? In which direction is expected the change will go? How such investment should be financed, by workers or by shareholders? Will decentralized decisions led to socially optimal ones? How customers and suppliers and the market competition in general intervene in this process? What regulation if any? The model will help to provide answers to these questions.

3. - Contracting with specific human capital.

3.1.-Efficient financing and investment decisions under risk neutrality.-

We describe a production and exchange situation with three moments of time and the respective decisions being made in each of them, Figure 1. Production involves two assets, physical capital, K, and human capital, H, and two agents identified as workers and shareholders. Workers are embedded of the human capital and since workers can not be bought or sold ownership of invested human capital is non-tradable. Physical capital can be traded. Investments will last for several periods of time but at the time they are made it is not feasible to make contracts contingent to all future circumstances. Investment in human capital is not verifiable and therefore no explicit, legally enforceable, contracts are possible on this variable.

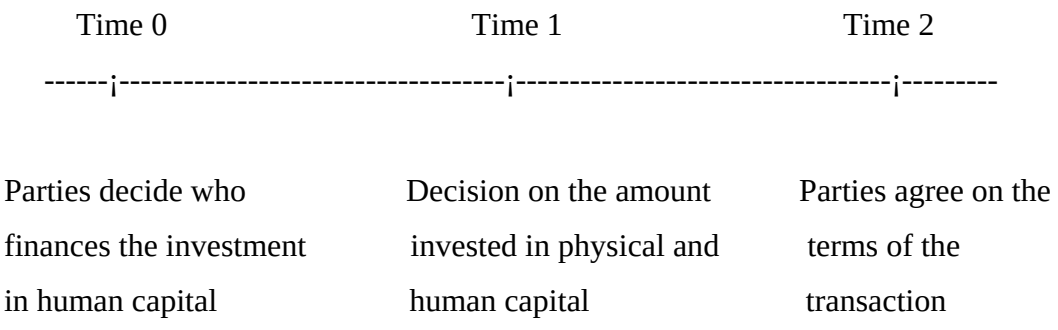

Figure 1.- Timing of contracting and investment decisions

At time 0 a decision is made on who will finance the investments, which implies to allocate the right to decide the amount of investment to be made. There are several meaningful alternatives, workers finance both assets, human and physical; shareholders finance all assets; workers finance human capital and shareholders finance physical capital. At time 1 actual decisions on the amount invested are made. At time 2 the parties bargain on the conditions of exchange. In the exposition of the model we assume that the terms of trade that are settled at time 2 are the compensation of workers and shareholders[9]. Bargaining will proceed assuming that in case of no agreement each party can leave the collaboration and collect the value of the respective assets in outside alternatives. This situation is equivalent to that where the resource markets are competitive and, for example, firms compete for workers so to retain the current employees inside the firm the compensation has to be at least that of the best outside offer. The Nash bargaining solution establishes a pay off for each party equal to the value of the assets in the case collaboration breakes down plus a share of the net gain of the collaboration that will reflect its relative bargaining power.

Bargaining power will be initially considered external to the model. Later on we will make explicit reference to ways that can be altered, that go from legal developments such as German co-determination that requires firms to seat workers' representatives in the supervisory board, to voluntary empowerment of workers by shareholders.

In the basic formulation of the model we assume that physical assets are of general use while human capital can have different degree of specificity. If an asset is general it means that the asset holder can always recover the amount invested at t=0 outside the current relation. That is, if amount invested is K then the outside value is also K. If an asset has specificity λ, between 0 and 1, it means that an investment of H in human capital it has an outside value of λH. When parameter $\lambda=0$, the outside value of the asset is also 0, while if $\lambda=1$, the asset is of general use.

Decisions at time 0 and 1 will take into account what will happen in the future, time 2, when parties determine the terms of trade. To do so they will evaluate the net benefits of

[9] Efficient and effective production requires that workers have the right human capital, capabilities for the job they are assigned, and also that they provide the effort required to apply these capabilities. We focus in the first problem of human capital accumulation and ignore the additional problem of motivating effort.

different alternatives. We define by $U=F(K,H)+\varepsilon$ the output of the transaction if physical and human capital are combined in the production process, where $F(\ )$ is an increasing and concave production function and ε is a random disturbance with $E(\varepsilon) = 0$ and $\sigma^2(\varepsilon) = \sigma^2$. U represents the monetary sum third parties are willing to pay for the output of the collaboration.

Under **single ownership of all the assets by risk neutral workers** who finance the investment in physical and human assets, if production takes place the owner will collect the pay off U and will pay the cost of the investment. Assuming an interest rate of zero, discount factor of one, the expected wealth in t=1 will be,

$$W = F(K,H) - K - H$$

The wealth maximizing values of K and H, K** and H**, will be determined by the first order conditions of equality between marginal value, F', equal to marginal cost, 1, for each of the productive inputs. We assume that the expected wealth maximizing solution W** is positive.

Single ownership of physical and human capital by workers that hold the human capital makes the problem and the solution trivial. This solution is also the first best solution for the allocation of human and physical capital and will be the benchmark for comparison with other non-trivial contracting problems.

Consider now the case where **shareholders finance both investments** and therefore decide how much to invest in each of them at time 1. After investment shareholders will own the physical assets and will decide how and where to use them, but they can not properly own the human capital because it is embedded in the workers and workers can leave the collaboration at their will. In making the decision at time 1 shareholders will take into account the implication of this fact at time 2 when the terms of the collaboration will be decided. Recall that contract at time 1 between workers and shareholder is incomplete and this means that the terms of the exchange are under dispute since they are not part of the contract.

At time 2 shareholders and workers bargain for the terms of collaboration with results determined by the Nash solution. In this solution each party receives pay off equal to the pay off in the outside option plus a fraction α, between 0 and 1, of the total net gain if the collaboration takes place. The parameter α is determined by the "bargaining power" of the party so if α is the bargaining power of the workers, then $1-\alpha$ will be the bargaining power of the shareholders. If collaboration breaks down workers will get away with human capital of value λH, independently of whether they finance the investment or not because shareholders can not claim property rights over the workers. Once the investment is made λH is also the opportunity cost of the human capital in the current collaboration. Shareholders however can claim ownership of physical assets and the outside value of the investment is K by assumption about being a general investment.

Shareholders expected gross return of at time 2 for the physical and human capital investments is then,

$$G(K, H) = K + (1-\alpha)\,(F(K,H) - K - \lambda H)$$

While workers receive an expected pay off,

$$S(K,H) = \lambda H + \alpha\,(F(K,H) - K - \lambda H)$$

At time 1 when the investment decisions are made shareholders determine the expected net pay off or profit to be maximized,

$$B(K,H) = G(K,H) - K - H = (1-\alpha)\,(F(K,H) - K - \lambda H) - H$$

The first order conditions of this problem imply,

$$F'_K = 1 \qquad (1)$$

$$F'_H = (1+(1-\alpha)\lambda)/(1-\alpha) \qquad (2)$$

Proposition 1.- When shareholder finance both physical and human capital the amount of physical capital is determined by the condition of marginal productivity equal to marginal cost. But shareholders under invest in human capital, compared with the first best solution, except for the particular case of $\alpha = \lambda = 0$.

The result of under investment comes from the fact that for general values of the bargaining power and specificity parameters the effective marginal cost of human capital for the shareholder is higher than 1, $\lambda+(1/(1-\alpha)) > 1$. From this result, the condition for effective marginal cost equal 1, that is a condition for a first best investment decision in human capital, is $\alpha = \lambda = 0$.

Shareholders can only protect the full value of the investment in human capital at time 2 when workers have no bargaining power and human capital have null value outside the collaboration with current shareholders (full specificity of human capital). Zero bargaining power of workers is not sufficient to protect the value of the investment because shareholders can not claim property of the human capital and prevent workers from leaving the firm and collect the outside value themselves. On the other hand workers' bargaining power does not affect the investment decision in physical capital, as long as expected total profit is positive, since the outside value of the physical capital is equal to the amount invested and shareholders assure the competitive return for this input.

Since in general shareholders' investment of the two assets does not give first best results, we can consider the alternative where **workers finance the investment in human capital and shareholders invest in physical capital**. It is straightforward to see that the decision on physical investment is not modified under this new situation so we shall focus on the human capital decision.

The workers' pay at time 2 is the same as when shareholders finance the investment, $S(K,H) = \lambda H + \alpha (F(K,H) – K – \lambda H)$. The net pay off at time 1 when the investment decision is made is given by,

$$SN(K,H) = \lambda H + \alpha (F(K,H) – K – \lambda H) – H$$

The first order condition with respect to H is given by,

$$F'_H = (1- (1-\alpha)\lambda)/\alpha \qquad (3)$$

Proposition 2 .- Workers' finance and investment decision on human capital implies under investment with respect to the first best value, except for values of the parameters, $\alpha = 1$ or $\lambda = 1$.

The under investment result comes from effective marginal cost greater than 1 for values of α and λ lower than 1. It is immediate to see that effective marginal cost equal 1 when either $\alpha = 1$ or $\lambda = 1$.

When workers finance the human capital and decide how much to invest in it the first best requires only one of the two conditions to be satisfied. Either, workers have all the bargaining power and collect all the extraordinary profits from the transaction, or human capital is fully general and its outside value assures at least a competitive return for the investment. Again, in the late case general human capital implies that at time 2 the resource allocation decisions are made under similar conditions as in time 1, since opportunity cost of human capital is H before and after the investment is made.

The final step in the solution to the contracting problem is the decision at time 0 about who finance the investment. One criterion to consider is social welfare that is, human capital is financed by the party whose decision implies higher total wealth created.

Proposition 3.- Wealth created is maximized if workers finance human capital invested when $\alpha > (1-\lambda)/(2-\lambda)$ and shareholders finance the investment otherwise. When the values are equal the decision is indifferent.

To prove this result notice that from concavity of F( ) on H total wealth increases with higher values of H as long as $H < H^{**}$. Effective marginal productivity of human capital is the same under workers finance than under shareholders finance, and equal to first best marginal productivity, equation (2) and (3). To maximize wealth created is equivalent to minimize effective marginal cost as long as this cost is grater than 1, the

minimum marginal cost under the first best solution. Therefore, from (2) and (3) workers' effective marginal cost of human capital is lower than shareholders' marginal cost if

$$(1- (1-\alpha)\lambda)/\alpha \ < (1+(1-\alpha)\lambda)/(1-\alpha) \qquad (4)$$

Arranging the terms of the inequality we find that (4) is equivalent to $\alpha > (1-\lambda)/(2-\lambda)$. The rest of the proposition follows immediately.

For a given value of the parameter λ, higher values of the bargaining power parameter α recommend workers finance the human capital. For a given bargaining power, workers should finance human capital as this human capital becomes more general, higher value of λ. Figure 2 shows the combinations of the two parameters that determine the optimal financing decision.

Since the minimum value of λ is 0, human capital fully specific, the maximum value of the bargaining parameter α for which it is desirable that shareholders finance human capital is ½. In other words, for values of bargaining power of workers higher than ½ wealth maximization will always recommend that workers finance the human capital investment. Finally, notice that when condition (4) is satisfied the workers net gain from financing the investment is higher than the net profits of shareholders if they would finance the investment. Therefore maximum welfare would follow from a decentralized rule where the party who finances is that which obtains higher net return from the decision[10].

[10] The implementation of this solution may require side payments at time 0 since there are relatively low values of α for which shareholders earn higher rents when they finance the investment even though the total wealth is higher if finance and the workers decide investment.

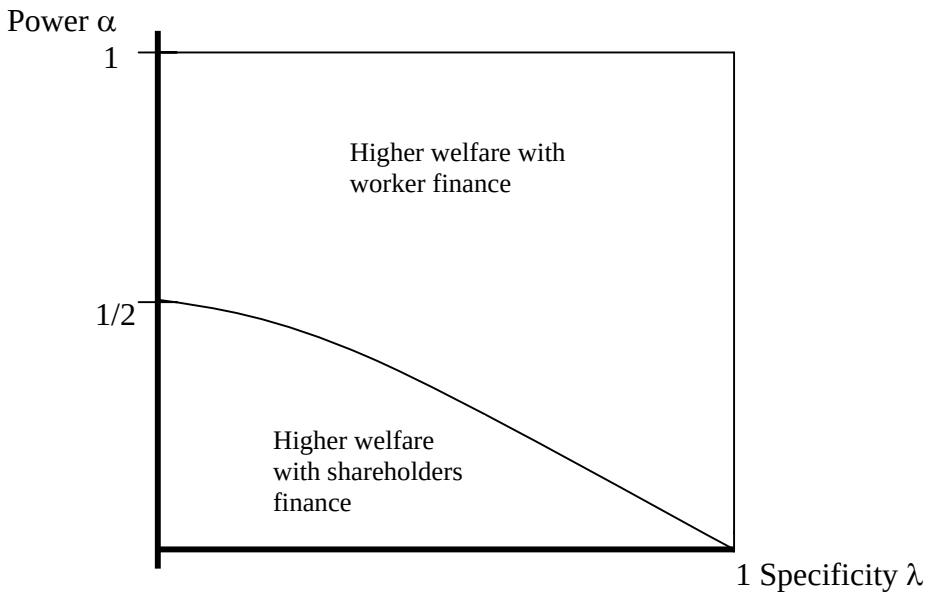

Figure 2.- Combinations of parameter that determine the second best optimal Investment decisions on human capital from the condition $\alpha \geq (1 - \lambda)/(2-\lambda)$

3.2.-The shareholders incentives to share power with workers

The parameter α can be determined by institutional factors, for example the presence of trade unions and labor organizations, or by regulation, as co-determination where the law forces firms to include workers in their governance bodies. These factors are beyond shareholders will, but the question is if it is in the interest of shareholders to empower workers beyond legal or other institutional reasons. After all workers' empowerment is one of the recommendations often made from stakeholders' theories. We want to explore empowerment under the enlightened self-interest of shareholders that want to maximize profits.

From equation (2) that determines the profit maximizing decision on human capital when shareholders pay for it, we can see that shareholders will never want to increase workers' bargaining power, increase α, because this will increase effective marginal cost and will lower profits. But when workers finance the investment the decision can

change because increasing bargaining power implies a trade off. On the one hand higher value of α increases workers' incentives to invest in human capital, but on the other it implies to give away part of the surplus.

More formally, shareholders will determine the profit maximizing value of α taking into account that the value of H is chosen by the workers and making sure that there is an incentive to make a positive investment. In this respect from SN(K,H) it is clear that shareholders will not choose $\alpha=0$ because in this case $SN(K,H)= (\lambda-1)H<0$ for $\lambda<1$, and the worker is better off with H=0. The choice of α by the shareholders can be formulated as

$$\underset{\alpha}{\text{Max}}\ B(K,H) = G(K,H) - K = (1-\alpha)\,(F(K,H) - K - \lambda H)$$

$$\text{Subject to } \underset{H}{\text{Max}}\ SN(K,H) = \lambda H + \alpha\,(F(K,H) - K - \lambda H) - H$$

$$SN(K,H) \geq 0$$

Let $H^*(\alpha,\lambda)$ be the value of H that solves the workers' rent maximization problem, from equation (3). Substituting in the net profit function, the first order conditions with respect to α are as follows,

$$(1-\alpha)(F'_H - \lambda)\, H'_\alpha = F(H^*) - \lambda H^*$$

From (3) we obtain $F'_H - \lambda = (1-\lambda)/\alpha$ and $H'_\alpha = -(F'_H - \lambda)/\alpha F''_H$. Substituting in the previous equation, the workers' empowerment preferred by the shareholders satisfies the condition,

$$(1-\alpha)/\alpha((1-\lambda)/\alpha)^2 = -F''_H(F(H^*) - \lambda H^*) \qquad (5)$$

The right hand side is positive (recall that F() is concave) for positive values of H* so the left hand side has to be positive too. A necessary condition for H* positive when $\lambda<1$ (equation (3)) is $\alpha>0$; therefore shareholders will choose a positive value of the

empowerment parameter, but lower than 1 because for $\alpha=1$ the left-hand side would be zero. For $\lambda=1$, the left-hand side is zero and the corner solution in this case is $\alpha=0$. If human resources are fully general it is in the interest of the shareholder to minimize the empowerment of workers. The next proposition summarizes these results.

Proposition 4.- When shareholder finance the investment in human capital the profit maximizing value of the empowerment parameter is zero, that is they want to transfer the lowest possible share of power to the workers. When workers finance and human capital is partly or fully specific the profit maximizing empowerment parameter is positive but lower than 1, the empowerment that would assure the first best result. If human capital is general the shareholders also prefer nil empowerment of workers.

3.3.-Shareholders' interest in workers employability

Shareholders have also preferences for the values of λ, the parameter that determines the specificity of human capital. Since higher values of the parameter imply higher outside value of the initial investment in human capital we relate higher λ values with higher employability of workers.

The analysis follows the same approach as before. First, if shareholders finance the investment in human capital it is immediate from (2) that their interest from profit maximization is to minimize employability and choose a value of the parameter equal to zero.

However if human capital is financed by the workers then as long as shareholders have some positive bargaining power, shareholders have interest in increasing workers employability up to a certain point because they increase the incentives of workers to invest in human capital and this means higher profits. Solving the same problem as above but with λ as the decision variable in place of α, the optimal choice of the employability parameter from the shareholders interests is given by,

$$(1-\lambda)(1-\alpha) = -\alpha^2 H F''_H \qquad (6)$$

Since the right hand side is positive the left hand side has to be positive too and therefore the shareholders will never choose $\lambda=1$, full employability. On the other hand, the value of $\lambda=0$ will occur only under particular cases.

Proposition 5.- If shareholders finance the investment in human capital they prefer minimum worker employability. If workers finance the investment shareholders prefer positive but less than full employability.

Shareholders preferences for parameters α and λ will depend on the values of the other parameter. Comparative static analysis in (5) and (6) show that shareholders choose higher values of the empowerment parameter as the human capital is more specific and choose lower employability as the power of workers increases[11].

3.4.-Risk aversion

So far we have assumed that shareholders and workers are both risk neutral and preferences can be represented by expected profits and expected rents. Shareholders diversify their private wealth and collectively, as a syndicate of investors, they behave as risk neutral. But workers can not diversify the investment in human capital and it is more realistic to consider them as risk averse.

If workers finance specific human capital then a positive bargaining power is needed to stimulate the investment and since output is uncertain workers share part of the uncertain rent. If $\gamma/2$ represents the risk aversion parameter of the worker the certainty equivalent, CE, of workers' rent is given by

$$CE = \lambda H + \alpha (F(K,H) - K - \lambda H) - H - \gamma/2\ \alpha^2\sigma^2$$

If risk aversion, γ, or the amounts of risk, σ^2, are sufficiently high positive values of α could give negative values of CE for the workers and they would refuse to participate in

[11] For example from equation (6) the derivative $\lambda'_\alpha = (-2\alpha HF_H'' + (1-\lambda))/(-(1-\alpha)+\alpha^2 H_\alpha'\lambda F_H'' + \alpha^2 HF_H'''H_\alpha'\lambda$. We assume that the third derivative of F with respect to H is non negative as a sufficient condition.

the exchange. To avoid workers sharing risks their empowerment would have to be zero and have shareholders finance the investment in specific human capital[12]. From equation (2) the effective marginal cost of the asset for shareholders will be $1+\lambda$ when $\alpha=0$. This marginal cost will determine the level of efficiency achieved in the transaction.

3.6.-Competitive advantage and customers relations

Firms produce to sell in the market. Often potential buyers have several opportunities to choose from and the revenues a particular firm can obtain form selling the products have to be determined taking into account the opportunities to choose of the consumer.

In the example above suppose that F(K,H) is the amount consumers are willing to pay for the product of the firm we identify by "a", that is the value attributed by them to the product for given values of K and H. Consumers have an alternative to satisfy their need for which consumers' willingness to pay is U_b . The opportunity cost of the alternative for the firm producing it is C_b , while the opportunity cost of the product of our reference firm "a" once the investments are made is $C_a = K+\lambda H$. It is assumed that wealth created, value minus opportunity cost is higher for "a" than for the alternative "b",

$$F(K,H) - C_a > U_b - C_b$$

Price is the firms' decision variable in a Bertrand type competition model. Let P_a be the price charged by firm a and P_b that of firm b. Consumer will choose "a" if net surplus, willingness to pay minus price, is higher than that of choosing "b". To attract customers firm b will lower price as much as possible. The equilibrium solution of he competitive process satisfies the condition that consumers do not want to change their choice and producers do not want to change their price. This condition implies,

[12] Workers could be empowered but not participate in sharing the residual rent. Workers payment could be set at time 1 for time 3 as a fixed side payment w. Since H is not contractible by hypothesis the payment can not be conditioned to a certain level of investment in human capital. Workers can always assure a compensation equal to the outside value of the human capital λH, but in our illustration the cost

$$F(K,H) - P_a^* = U_b - P_b^* = U_b - C_b$$

That is, firm "b" sets a price equal to opportunity cost and firm "a" sets a price that makes consumers indifferent between the two alternatives.

From this equation we obtain the revenue collected by firm "a",

$$P_a^* = F(K,H) - (U_b - C_b) = F(K,H) - W_b$$

Where $W_b = U_b - C_b$ is the wealth created by firm "b". Therefore the economic rent of firm a is $R_a = P_a^* - C_a = F(K,H) - C_a - W_b = W_a - W_b$, while consumers obtain a surplus of $CS = F(K,H) - P_a^* = W_b$. The total wealth created is $R_a + CS = W_a$.

Proposition 6.- The Bertrand competition model determines an equilibrium solution where firm "a", which creates more wealth than firm "b", obtains a rent equal to the difference between wealth created by "a" and wealth created by the competing firm "b", $R_a = W_a - W_b$. At the same equilibrium solution consumers get a surplus equal to the wealth created by the alternative choice, firm "b", $CS=W_b$.

The implication of this result is that the competitive process, buyers' opportunities to choose, rewards firms that create higher wealth with higher economic rents. Wealth created W is in fact an ex ante measure of *competitive strength* that turns out into an ex ante *competitive advantage* if it is higher than the wealth created by rival firms. The reward, economic rent, is just equal to the competitive advantage, $W_a - W_b$. Therefore ex post economic rent, R_a, becomes a measure of ex ante competitive advantage (opportunities to choose are difficult to observe by external observers).

A second implication is that buyers are able to capture a fraction of wealth created as long as they have alternatives to choose from that create positive wealth. Higher competitive strength of rival firms implies higher benefits for the consumers, since the consumer surplus in the equilibrium solution is just the wealth created by the best alternative to choose from. Customers are interested in maintaining these alternatives

---

of investment is H and when human capital is specific the total net rent of the workers, $w+\lambda H - H$ is maximized at H=0.

available and with that purpose they may be willing to share W_b with the "second source" supplier.

Lower competitive advantage, lower value of $W_a - W_b$, benefits consumers for a given value of W_a . On the other hand, producers struggle to get a higher competitive advantage than rival firms since the higher the advantage the higher the profits. In a dynamic setting the struggle will increase W_a and both consumers and producers can gain from the process.

Of course, the Bertrand model of price competition assumes no frictions and unlimited possibilities of switching for buyers and sellers. The presentation could be extended to account for such frictions for example in the form of buyers' switching costs[13]. Now the model has to introduce an additional time period when producers compete for consumers aware of the fact that consumers will face a cost to change supplier once have bought from one of them. In the model, if switching cost was higher than W_b , after the initial time period consumer will stay with firm a even if it charges a price equal to F(H,K). As expected, limitations to choose worsen consumers and benefit producers.

4. - Institutional development

4.1.- Accounting for wealth creation and distribution.

Market discipline lowers the income under dispute by shareholders and workers by the amount W_b , that is the income is not F(K,H) as we assumed in section 3, but F(K,H) – W_b . The revenues under dispute by shareholders and workers are equal to the value buyers give to the product minus the part of the value buyers can keep for themselves given the opportunities to choose (wealth created by the second best offer)[14]. Since W_b is taken as a constant the new situation does not change any of the marginal conditions,

[13] Such switching costs can be the result of transaction specific investments by the customer. The hold up problem and the incentives to under invest could be studied under the framework of transaction cost – property rights theory but as long as the investment is in tradable assets vertical integration is a well known solution to these problems.

[14] In standard product demand model models consumers end up with positive surplus even if the supplier is a monopolist because the supplier can not observe the willingness to pay of each individual buyer and is forced to sell at the same, profit maximizing price, to each of them.

and main results, derived above. However it changes the absolute pay off of each of the transaction parties. For the case of risk averse workers that finance human capital and the amount invested is H*, the pay off of consumers, workers and shareholders is given by,

Consumers' surplus = W_b

Workers' rents (CE) = $\lambda H^* + \alpha (F(K^*,H^*) - W_b - K^* - \lambda H^*) - H^* - \gamma/2\alpha^2\sigma^2$

Shareholders' rents = $(1- \alpha) (F(K^*,H^*) - W_b - K^* - \lambda H^*)$

The total wealth created = $F(K^*,H^*) - K^* - H^* - \gamma/2\alpha^2\sigma^2$

Implicit in the analysis is that total wealth created is positive and that each party, including the risk averse workers, obtains a non negative net pay off from the collaboration. Otherwise the "participation condition" would be violated and it would refuse to collaborate in production and exchange[15].

Under standard accounting practices the reported profits of the firm will not coincide with any of the rents listed above since even though accounting are intended to calculate the shareholders rents they ignore opportunity cost of capital K*. The closest to Shareholders' rents would be the EVA, Economic Value Added. Neither accounting profits nor EVA are measures of wealth created since ignore workers' rents and consumers' surplus, and externalities to indirect stakeholders when they exist.

Within the social responsibility framework, the sustainability tradition has developed the triple balance measurement framework, economic, social and environmental as an approximation to the total wealth created by the firm. But the framework does not properly attempts to measure economic wealth since it ignores the calculations of the opportunity costs of each stakeholder, which is a key variable to obtain total wealth created and the part shared by each interested party. The calculation of the opportunity

[15]Another important implicit assumption is that the production and sales activity does not produce external effects to indirect stakeholders such as impact in the economic development of the local community, pollution of the environment, degradation of natural resources or innovation spillovers

costs, except in perfectly competitive markets where are equal to market prices, is a complex task and difficult to protect from interested subjectivity, as it is well known with the calculation of the opportunity cost of equity, also ignored by conventional accounting.

4.2.- Shareholders commitment by choice of the legal form of the firm

Assets are more or less specific depending on the production technology and on the development of markets that determine the alternative opportunities to use them. The law and economics analysis of the stakeholders' firm maintains that shareholders have a discretional way of showing their commitment to the firm by the choice of the legal form. Blair and Stout (1999, 2005) explicitly claim that in a context of "team production" it is in the interest of the shareholders to blockade the exit of the (tradable) assets invested in the firm in order to stimulate the (specific) investment of the other interested parties (lock in capital). Blair (2004) argues that in the Anglo Saxon legal environment to choose the public corporation as a legal form of the firm indicates that shareholders voluntarily commit to restrict the discretional disposable of the assets of the firm in their private benefit. Those shareholders that do not want to make the commitment and prefer having more discretion in disposing of the assets that legally belong to the firm, will choose other legal form different from the public corporation.

In the model above the shareholders' commitment by choice of the legal form of the firm or using statutory provisions can be interpreted as using the choice to influence the outside value of the physical assets they contribute to finance. For example if the legal form limits shareholders' disposal of the assets legally owned by the firm in case of break up of the collaboration, from the shareholders point of view the outside value of the assets they finance will be lower. To explore the choice of commitment of physical assets by shareholders consider the situation where shareholders finance physical assets and workers finance human capital. Let μ between 0 and 1 represent the specificity parameter of the physical assets resulting from legal constraints in their disposal decided by the shareholders. If $\mu = 1$ this will imply that shareholders can dispose of all the assets of the firm if collaboration breaks down. When $\mu = 0$ if collaboration breaks

down all the assets would be left in the firm. It can be assumed that in this case the assets remaining will be shared among the rest of interested parties.

The effective cost for the shareholders of one unit of assets they finance, in time 1, changes from $(1-\alpha)$ in the initial model to $(2-\mu-\alpha)$ in the new situation, so the case we initially solved is a special case with $\mu=1$. Therefore, it results an increase in cost for the shareholders of $(1-\mu)$. Higher commitment of the shareholders in the way described increases the cost of capital. Simple algebra shows that the final effect of such decision, to choose a value of $\mu < 1$, implies lower profit maximizing investment in capital by shareholders and lower investment in human capital by the workers (if the two assets are complements as in team production) than that obtained with no commitment. The total wealth created also decreases, compared with that obtained under no commitment.

Any private or social explanation of shareholders' commitment in the way described will have to be based in other considerations. For example commitment is a way shareholders have to make side payments to workers and compensate them for the loss of utility due to risk sharing. Assume, for example, that there is an externally determined probability p that the collaboration will continue in time 2 and 1-p of termination, which lowers the workers expected rent from the human capital investment to $SN^1(K,H) = \lambda H + p\alpha (F(K,H) - K - \lambda H) - H$, when $\mu=1$. It could happen that under this source of uncertainty the expected value of compensation $SN^1(K,H)$ is either negative or it implies a negative certainty equivalent so the workers would refuse to collaborate. If shareholders renounce to μK of the investment in the benefit of the workers if the collaboration terminates, then workers' expected rent will be[16] $SN^1(K,H) + (1-\mu) K$ when $\mu <1$.

4.3.- Governance of the firm

[16] If external risk of termination can be separated from termination forced by the workers in the bargaining process, then expected workers compensation under commitment would be $SN^1(K,H) + p(1-\mu) K$, assuming that shareholders give μK to workers only if termination occurs due to external effects. Shareholders would receive $B^1 = (1-p(1-\mu))K + p(1-\alpha) (F(K,H) - K - \lambda H) - K$. The increment in effective cost of investment for shareholders will be $(1-p)(1-\mu)$, investment will increase and so will do welfare and profits.

Total wealth created by the decentralized solution presented above is less than the first best because effective marginal cost that determine H* and K* is higher than 1, the marginal opportunity cost of the resources. The results opens the way for institutional developments that can increase total wealth created.

One of these developments is the proposal of Blair (1996, 2004), Blair and Stout (1999, 2005), to legally consider the members of the board of directors as the trustees of the assets owned by the corporation and endow the board with the residual decision rights, which would be taken away from the shareholders. The board of directors would become the third party in the implementation of a trilateral governance mechanism. In fact Blair (2004) argues that in the US legal tradition the public corporation is already contemplated as a legal form of the firm that limits the rights of the shareholders to dispose of the assets of the firm. The board would receive the mandate to determine the revenues and amount of resources that maximize total wealth, that is to select H** and K**, and will "induce" the parties, customers, shareholders and workers to supply them. The inducement would involve the offer of compensations at least as high as those each party would obtain under the alternative collaborative arrangements. For example each party's expected compensation could be determined such that the sum of expected compensations is equal to the maximum wealth. Next, customers', shareholders' and workers' compensations will be respectively set to provide grater or equal consumer surplus, and shareholders' rents and workers' rents to that each party obtains under multilateral contracting.

The solution resembles that proposed from stakeholder / social responsibility theory of the firm and the solution to the corporate governance problem as formulated by Tirole (2001), since total wealth maximization is a way to recognize the external effects of the decisions. But Tirole also discusses in detail the implementation problem behind this solution since it is unclear how trustees or managers will have the proper incentives to behave this way. Second, the question of who will choose the members of the board remains open. One possibility is that the shareholders that make the IPO nominate the first board and the board it self makes future nominations. It is unclear whether the shareholders that go public will choose the board with criteria of maximum wealth or with the criteria to maximize the share price of the initial offer. The (regulated?) figure of the independent board director could have a place here, but the mission of the

independent would not be to take care of the interests of minority shareholders, as it is now, but to protect the interests of all stakeholders.

External governance mechanisms such as product market competition and the incentives from the labor market for trustees and managerial services are imperfect solutions since they are insufficient to prevent managers and directors from private appropriation of the assets of the firm. The market for corporate control would be blockaded by this institutional arrangement unless shareholders hold the right to elect the board members.

A second alternative is to regulate the presence in the board of representatives of all stakeholder groups and make sure that the power of interested parties is well balanced; bilateral governance. But to identify who has stakes in he firm is not easy. Firms will have different interest groups or at least the importance of the stakes of each of the groups will differ across firms, which will complicate across the board regulations. In principle a stakeholder is anyone whose private wealth is affected by the ex post wealth created by the firm. In the shareholder-oriented theory of the firm workers, suppliers, customers, lenders, contract ex ante for counterparts for the collaboration. The value of the assets of the firm guarantee that the contracted terms of the exchange will be honored, and only in extraordinary circumstances, such as bankruptcy, the contract will brake down. The only interested party with no pre-contracted terms of the collaboration are the shareholders, or the entrepreneur in other legal forms, who holds residual claims. The counterpart of this distribution of ex post claims is the opposite distribution of ex ante decision rights. The indirect stakeholders, external effects, are protected by legally enforced regulations that put constrains in environmental damages, human rights of the workers, minimum wages, maximum time of work, conditions for plant closing, etc.

The illustration above shows how a worker can become a stakeholder, that is her wealth depends on the ex post value of the assets of the firm, which include the knowledge embedded in the portable human capital. To nominate workers as stakeholders when they finance the human capital appears obvious since their claim in these assets is after having paid for them. The interest of shareholders to empower workers so that they end up having partial claims in all assets of the firm, as a way to stimulate the investment, just reinforces the stakeholder situation. Empowerment in this case can go beyond increasing the ex post bargaining power of workers to dispute the rents, for example

facilitating the collective organization of workers, and also include ex ante participation in decision making. Workers decide how much to invest with current expectations about the future value of the employability parameter, outside value of the investment. Once the investment is made it is in the interest of shareholders to create conditions that increase the specificity of the human capital, if they can. Workers' participation in decisions that can affect ex post the economic value of the assets they invest in is a governance solution that protects their stakes in the firm since they will prevent from taking actions that lower the economic value of workers' stakes in the benefit of shareholders[17].

But workers have ownership rights, as the right to move the human capital embedded in them to outside the firm, even if the shareholders finance the investment in human capital. This situation gives the worker stakes in the assets of the firm even if the bargaining power is zero. When shareholders finance the investment, governance can make progresses towards greater wealth created by limiting the rights of workers to dispose of the embedded human capital. Such limitations can have as a final consequence to reduce the value of this capital in outside alternatives (make human capital more specific) as it is the case with the prohibition to work for other firms that can dispute the wealth created by the initial one. To protect the interests of shareholders is necessary to increase the stakes of the workers in the corporation limiting exit possibilities.

Once again the question is how to regulate private exchange and negotiation in these circumstances when there are infinite possible combinations of parameter values and finance decisions. On top of negotiation and private contracting arrangements, especially when external effects are taken account by public regulations, the full picture has to consider also the use of implicit contracts. At time 0 or 1 workers and shareholders can agree on some conditions under which to conduct future transactions, although they are not legally protected by an explicit contract. For example workers agree that shareholders finance all investments and in exchange not to exercise the bargaining power and the stakes that ownership of embedded human capital gives to

[17] The empowerment we describe here means to go from hierarchical, shareholders hold all residual decision rights, to bilateral mechanism where consensus between workers and shareholders is needed to exercise residual decision rights. The boards as trustees would fall into the trilateral governance model.

them. Shareholders in turn promise to limit unnecessary risk taking and keep high level of solvency in the firm in order to reduce the probability of bankruptcy and protect the economic value of the investment. Implicit contracts create conditions for sharing rents and protect ex ante investments but also create incentives for wealth transfer from breach of trust that have to be accounted for. For example new shareholders that joint the firm through a public offer to purchase the shares or through a merger may not feel obligated by the implicit contracts of previous shareholders, Shleifer and Summers (1988). Trust between workers and shareholders as a feasible institutional alternative may require additional restrictions such as blocking exit by current shareholders[18].

In situations where the investment is observable, but not verifiable, there is room for implicit contracts to determine the amount of investment shared by workers and shareholders, in line with Becker (1975) solutions. The implicit contract at time 0 or 1 can be complemented with transparency obligations assumed by workers and shareholders in order to keep track of how mutual obligations are satisfied and limit opportunistic behavior.

4.4.- Market conditions

Rajan and Zingales (2000) describe production in the "old firm" with high physical investments, as shareholders financing and sharing the risk of the investment in these assets while keeping indirect control over the workers through high vertical integration and monopoly in the product market. Workers' outside opportunities to obtain rents from industry specific technical or commercial knowledge were minimal, λ close to 0, and presumably shareholders had the right incentives to finance the needed human capital investment.

Changes in production, transportation and communication technologies enlarged the markets and created conditions for vertical separation (specialization) along the value chain of the industry. New firms entered the market at each stage of the value chain and workers of established firms had outside opportunities to deploy the industry specific

[18] Shareholders commitment in the way described above could also be determined taking into account its contribution to build trust and facilitate implicit contracts through the side payment workers receive in case of breach of the implicit contract.

knowledge. Workers that remained in their original firms and workers that joined the new entrants increased their compensation at the same time that more competitors increased the customers' opportunities to choose. Customers capture a higher share of the wealth created at the expense of shareholders, lower profits, and later at the expense of workers too, specially those of the developed countries when more production is outsourced to developing countries where workers have less bargaining power in front of shareholders.

Workers and shareholders can have coinciding interests to develop a "new firm" if global competition is so intense that both see their rents seriously reduced. The new firm will have to offer highly differentiated products or services with consumer value high enough to create more wealth than rival firms do even though their costs are also higher (to have a competitive advantage). This can only be possible increasing knowledge through innovation activities and converting this knowledge in a specific asset for the firm, not for the industry. The value of λ has to be low again, but not because the industry is a vertically integrated monopoly but because human capital of each firm is specific to it. The stakeholder firm that emerges in this situation, especially if workers increase their participation in financing the investment because it is difficult to set λ low enough given the number of competitors in the market, is well represented by the model of section 3 together with the complicated contracting relations that are part of it.

The explicit consideration of competitors in the behavior of the stakeholder firm shows that market conditions are important to determine the rents for the owners of the resources of the firm for two reasons. First because market structure determines the wealth captured by consumers through the competitive process, and second because the outside opportunities to relocate human capital determine the rents of the workers who finance this capital and therefore the ex ante incentives to more or less investment. The model raises a potential contradictory effect of competition in the incentives to invest. On the one hand more general human capital, higher λ, raises the incentives to invest when the worker finances the investment but it also increases the opportunities to imitation that reduce competitive advantage of a particular firm with higher stakes for the customers and lower rents for workers. W_b can be an increasing function of λ too.

Conclusions.

The recent interest for an stakeholder theory of the firm has emerged in parallel with the crisis of governance in public corporations after recent scandals and with the recognition of new sources of competitive advantages of firms, mainly firm specific knowledge and human capital in general. This explains the double discourse around it, one asking for ethical standards in business behavior and the other asking for a theory of the "new firm". Although the reference to implicit contracts builds a bridge between the two discourses, since ethical behavior is a way to build trust, for the moment it is better to approach them separately. This paper builds upon incomplete contracting theory to discuss the origin and governance problem of the new firm with a model that explicitly recognizes the question of who finances the investment in specific knowledge, workers or shareholders, as one of the key issues of the stakeholder theory ignored so far in the debate.

Our analysis points out that contracting under the conditions around the new firm characterizes a world of second best where different combinations of two key parameters, workers empowerment and degree of human capital specificity, give similar results in terms of wealth creation. In particular shareholders finance of the investment with balanced empowerment ($\alpha=1/2$) and highly specific capital ($\lambda=0$), gives a, second best, similar investment that workers finance with low empowerment (($\alpha=1/4$) and relatively low human capital specificity ($\lambda=2/3$)). However, in a world of risk neutral workers we find that parameter combinations for which workers financing human capital give higher wealth than shareholders finance are three to one (Figure 2).

Some combinations of parameters of human capital specificity and bargaining power of workers describe reasonably well the dominant models of economic organizations, the German – Japanese model and the Anglo-Saxon model, respectively. The analysis presented helps to understand the relative success of the two models and the importance of coherence in the attributes of the model, complements, for high levels of performance. It also helps to identify the challenges faced by each of them under

external shocks such as the increase in customers' opportunities to choose and their capture of higher fraction of the wealth created. The relative dominance of opportunities for welfare improving with workers finance of the investment in human capital raises the issue of how to create wealth diversification and risk sharing mechanisms to increase the willingness of workers to do the investment.

The new firm will need new governance models and there are limitations to decentralized adoption of models that lead to first best results. For example shareholders have incentives to empower workers when the later finance the investment but only till the point of balanced power, while the first best is full empowerment. In top of that it is possible to end up in third best results since, under low bargaining power of workers, shareholders obtain higher profits if they finance the investment even though it would be socially better if workers finance the investment. We have also explored the choice of the legal form as a way of shareholders commitment with the firm by voluntarily choosing a legal form that limits their discretional disposal of the assets of the firm they contribute to finance. The results show that in the context of the model commitment implies higher ex ante cost of capital for the assets invested by the shareholders, lower investment and less wealth created. To limit the outside options when these options determine the minimum pay off if collaboration continues, is not in general a wealth increasing solution. The exception can be to consider the side payment of the commitment a way to compensate workers for their sharing of risks.

The limitations of decentralized contracting to reach first best results raises the question of public regulation, but here again we are far from a clear understanding of the costs of this regulation in an heterogeneous world as the one resulting from the knowledge based economy that is emerging, including the imprecision around the figure of the stakeholder. Meanwhile the paper identifies some of the possible directions of improvement in decentralized contracting. Among them: a) better protection of the knowledge embedded in human capital when shareholders finance it, and new mechanisms for risk sharing and diversification for workers when they finance the investment. b) Extending the governance models with more proliferation of bilateral (stakeholders representatives in boards) and trilateral (boards as trustees) solutions in place of hierarchical ones (shareholders' oriented boards). c) Broadening the list of legal

options in the choice of the ownership form of the firm to allow for different levels of shareholders' commitment.

References.-

Alchian, A., H. Demsetz, (1972), "Production Information Costs and Economic Organization", *American Economic Review*, 62, 777-795.

Aoki, M., (1990), "Towards an Economic Theory of the Japanese Firm", *Journal of Economic Literature*, 28, 1-27.

Armour, J., S. Deakin, S. Konzelman, (2003), "Shareholder Primacy and the Trajectory of UK Corporate Governance", *British Journal of Industrial Relations*, 41, 531-555.

Baker, G., R. Gibbons, K. Murphy, (2002), "Relational Contracts and the Theory of the Firm", *Quarterly Journal of Economics*, 117, 39-83.

Baron, J. and D. Kreps (1999), Strategic Human Resources, Wiley.

Bebchuck, L., J. Fried, (2003), "Executive Compensation as an Agency Problem", *Journal of Economic Perspectives*, 17, 71-92.

Becker, G. (1975), Human Capital. A Theoretical and Empirical Analysis with Special Reference to Education, Columbia Uni. Press.

Black, F., M. Scholes, (1973) "The Pricing of Options under Corporate Liability", *Journal of Political Economy*, 81, 637-654.

Blair, M., L. Stout, (1999), "A Team Production Theory of Corporate Law", *Virginia Law Review*, 65, 247-328.

Blair, M., (2003), "Reforming Corporate Governance: What History can Teach Us", Georgetown Law Center, WP nº 485663.

Coase, R., (!937), "The Nature of the Firm", *Economica*, 4, 357-376.

Coase, R. (1960), " The Problem of Social Cost", *Journal of Law and Economics*, 3, 1-44.

Grossman S., O. Hart, (1980), "Takeover Bids, The Free Rider Problem and the Theory of the Corporation", *Bell Journal of Economics*, 11, 42-64.

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

Hansmann, H., (1996), The Ownership of Enterprise , Belknap Press, Cambridge.

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

Hart, O. (1995b), Firms, Contracts and Financial Structure , Clarendon Press, Oxford.

Hart, O., B. Holmstrom, (1987), "The Theory of Contracts", in T. Bewley, Advanced in economic Theory: Fifth World Congress. Cambridge University Press, 71-155.

Hashimoto, M. (1981), "Firm-specific Capital as a Shared Investment", American Economic Review, 475-482.

.

Holmstrom, B. (1982), "Moral Hazard in Teams", *Rand Journal of Economics*, 13, 324-340.

Holmstrom, B. (1999), "The Firm as a Subeconomy", *Journal of Law Economics and Organization*, 74-102.

Holmstrom, B., S. Kaplan, (2003), "The State of U.S. Corporate Governance: What's Wright and What's Wrong?", NBER WP 9613, April.

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

Klein, B., R. Crawford, A. Alchian, (1978, "Vertical Integration, Appropriable Rents and the Competitive Contracting Process", *Journal of Law and Economics*, 21, 297-326.

Kogut, B., U. Zander (1992), " Knowledge of the Firm, Combinative Capabilities and the Replication of Technology", *Organization Science*, 3, 383-379.

Kreps, D., (1990), "Corporate Culture", en J. Alt, K. Shepsle edrs. Perspectives on Positive Political Economy, Cambridge Uni. Press, NY.

Kreps, D., (1996), "Markets and Hierarchies and (Mathematical) economic Theory", *Industrial and Corporate Change*, 4,

Malcomson, J.M., (1997), "Contracts, Hold-up and Labor Markets", *Journal of Economic Literature*, 35, 1916-1957.

Pagano, M. y P. Volpin, (2005), " Mergers, Workers and Corporate Control", *Journal of Finance*, 60, 841-868.

Parkinson, J. (2003), "Models of the Company and the Employment Relationship", *British Journal of Industrial Relations*, 41, 481-509.

Perotti, E., E. von Thadden, (2003), "The Political Economy of Bank-Market Dominance", Mimeo.

Rajan, R., L. Zingales (1998), "Power in the Theory of the Firm", *Quarterly Journal of Economics*, 113, 387-432.

Rajan, R., L. Zingales, (2000), "The Governance of the New Enterprise", en X. Vives, edr., Corporate Governance: Theoretical and Empirical Perspectives, Cambridge Uni. Press, Cambridge.

Rodríguez Fernández, J. M., (2003), El Gobierno de la Empresa: Un Enfoque Alternativo, Akal, Madrid.

Salas, V. (2004), "La Regulación del Gobierno Empresarial", *Moneda y Crédito*, 218, 205-263.

Shleifer, A., L. Summers, (1988), "Breach of Trust in Hostile Takeovers" en A. Auerbach, edr. Corporate Takeovers, Causes and Consequences University of Chicago Press, Chicago.

Shleifer, A., R. Vishny, (1997), "A Survey of Corporate Governance", *Journal of Finance*, 52, 734-784.

Simon, H. (1951), "A Formal Theory of Employment Relationship", *Econometrica*, 19, 293-305.

Tirole, J., (2001), "Corporate Governance", *Econometrica*, 69, 1-35.

Vives, X., (2000), Corporate Governance. Theoretical and Empirical Perspectives, Cambridge University Press, Cambridge.

Williamson, O., (!985), The Economic Institutions of Capitalism, Free Press, NY.

Williamson, O., (1979), "Transaction Cost Economics: The Governance of Contractual Relations", *Journal of Law Economics and Organization,*233-271.

Wilson, R., (1968), "The Theory of Syndicates", *Econometrica,* 36, 119-132.

Zingales, L., (2000), "In Search of New Foundations", *Journal of Finance*, 55, 1623-1653.

about ECGI

The European Corporate Governance Institute has been established to improve *corporate governance through fostering independent scientific research and related activities.*

The ECGI will produce and disseminate high quality research while remaining close to the concerns and interests of corporate, financial and public policy makers. It will draw on the expertise of scholars from numerous countries and bring together a critical mass of expertise and interest to bear on this important subject.

The views expressed in this working paper are those of the authors, not those of the ECGI or its members.

ECGI Working Paper Series in Finance

Electronic Access to the Working Paper Series

The full set of ECGI working papers can be accessed through the Institute's Web-site (www.ecgi.org/wp) or SSRN:

Finance Paper Series	http://www.ssrn.com/link/ECGI-Fin.html
Law Paper Series	http://www.ssrn.com/link/ECGI-Law.html