

The network-firm as a governance structure: what challenge for contractual theories of the firm?

Virgile Chassagnon (contact author)

University of Lyon-LEFI

virgile.chassagnon@ish-lyon.cnrs.fr

Bernard Baudry

University of Lyon-LEFI

bernard.baudry@univ-lyon2.fr

Institut des Sciences de l'Homme (ISH)/LEFI

14 Avenue Berthelot

69363 Lyon cedex 07

Abstract. Departing from the seminal question raised by Coase in his 1937 work, this article aims to discuss and assess the theoretical analysis of the boundaries of the firm proposed by the contractual theories – notably the transaction cost theory and the modern theory of property rights – by investigating the case of the network-firm. More precisely, the objective of this paper is triple. First of all, an original synthesis of the contributions of the contractual approaches to the theory of the firm is proposed. These theories share the view that the firm is the more efficient governance structure to minimize hold up risks. Then, a theoretical characterization and an analysis of the functioning rules of the network-firm are carried out, shedding light on intra-network incentive provisions and coordination mechanisms. This casts doubt on the role played by hold-up considerations on the boundaries of the firm. Finally, the focus is on the theoretical implications of the emergence of the network-firm. The legal nature of the firm does not coincide with the economic definition of the network-firm, which tends to recognize it as a specific organizational form and to a certain extent to rehabilitate contractual theories of the firm.

Keywords: contractual theories of the firm, network-firm, nature and boundaries of the firm, authority, incentives, power.

JEL Classification: D23, L22, L24

1. Introduction

The market/hierarchy debate, revealed by the 1937 article of Coase and revived by Williamson in the seventies and eighties, has been regularly enriched by theories which have presented new analyses to determine the nature and the boundaries of the firm. However, despite the abundance of research papers in this field, our knowledge about these issues is vague (Gibbons, 2005). In this article, we have chosen to consider the transaction cost theory (Williamson, 1975, 1985, 1991) and the modern theory of property rights (Grossman and Hart, 1996; Hart and Moore, 1990; Hart, 1995; Hart and Moore, 2008¹). These two theories are suitable² because they raise explicitly – as Coase did – the two complementary questions that are at the heart of the theory of firm: (i) What is a firm in opposition to the market? (ii) What are the forces that have an influence on the choice between the market and the firm? Briefly let us recall the point of view of Coase on these two questions.

Concerning the first point, the author argues that the boundaries of the firm are based on the opposition between a market transaction – a buyer-seller relationship – coordinated by the price mechanism and an employment contract – an employer-employee relationship – coordinated by a controlling authority³. Concerning the second point, Coase explains that there is a cost of using the price mechanism and therefore insists on the difficulties to establish an agreement between a buyer and a seller – difficulties directly linked to the costs of negotiating and concluding an exchange contract. In other words, the marketing costs correspond closely to what economists call ‘coordination costs’. In a market system, the coordination issue arises, according to Milgrom and Roberts (1992, p. 29), from ‘the need to determine prices and other details of the transaction, to make the existence and location of potential buyers and sellers known to one another, and to bring the buyers and sellers together to transact’. But the firm generates symmetrically some costs that come from decreasing returns to the entrepreneur function and from an inefficient allocation of the factors of production. Coase apprehends these costs as ‘the costs of organizing’. These ones are close to the hierarchy-coordination costs which are due to imperfect information and communication.

The boundaries of the firm is a crucial issue for Coase because the respective proportion of marketing costs and organizing costs determines the distribution of transactions between the firm and the market in an economic system. But how is this double Coasian question to be answered today?

First of all, it is significant to note that the current researches devoted to the firm tend to eclipse the Coasian coordination costs in support of ‘motivation costs’. Motivation costs are associated with informational incompleteness, asymmetries and imperfect commitment of contractors (*ibid.*). Yet the commitment of contractors is central because it is extremely difficult to implement and enforce contracts that guard against contractors’ opportunism. Then, modern facts show both a trend towards vertical disintegration that blurs the boundaries of the firm and the development of new inter-firm relationships based on long-term contracts (Roberts, 2004) and relational commitments (Baker *et al.*, 2002). This double trend results from the emergence of a modern form of vertical economic organization: the network-firm. This latter links some legally autonomous firms into a single productive system through a hub-firm that has the power to control the whole without recourse to equity ownership. The existence of such organizations strengthens the suitability of the Coasian questions on the definition of the boundaries of the firm and the role of property rights on motivation and coordination costs. But economists have to revisit these questions.

In this article, we want to show that the network-firm constitutes an analytical focus for research on the boundaries of the firm. Indeed, how are incentive provisions and coordination

devices provided in a network-firm? How can this modern complex organization affect the theoretical shell of the firm? To answer to these two questions, the article is organized as follows.

In a first section, we want to clarify the theoretical arguments used by economists to treat the Coasian questions of the nature and the boundaries of the firm. Hence, we show that, if both the transaction cost theory (TCT) and the modern theory of property rights (MTPR) take roots in the Coase's seminal article, they diverge in their conclusions concerning the genesis and the boundaries of firms. In a second section, we propose a theoretical characterization of the network-firm and a clarification of its functioning logic. The network-firm is based on critical resources and specific assets, which sheds light on inter-firm incentive and coordination mechanisms. These mechanisms depend on complex contractual arrangements that impact on network-firm performance. In a last section, we aim to add some research perspectives necessary for economists to revisit the boundaries of the firm. Does the network-firm cast doubt on the conclusions both of TCT and MTPR concerning the role of property rights respectively on inter-firm coordination and on the incentives to invest in specific assets? How can the network-firm be approached comparatively with market and hierarchy? Does the network-firm contribute to alter the boundaries of the firm?

2. The questions of the nature and boundaries of the firm in contractual theories

The aim of this section is to propose an original synthesis of the contributions of the contractual approaches concerning these two seminal questions of the theory of the firm⁴. Firstly, the focus is on the nature of the firm. Even though there is a consensus on the fact that the firm conceals both an authoritative structure and incentive mechanisms, contractual theories diverge about their origin and role. Secondly, the focus is on the boundaries of the firm. Even though these theories come to the same conclusion that the firm is the more efficient governance structure to minimize hold up risks, they propose two distinct theoretical treatment of vertical integration.

2.1. The nature of the firm: authority and incentives

As we have mentioned in introduction, authority is for Coase the distinct ontological property of the firm. This authority results in obedience: employees take orders from the employer⁵. If the contractual theories reviewed here recognize the authority of the employer over the employees, they diverge in the supposed nature of this authority.

The transaction cost theory (TCT) is in part in line with Coasian thought. In part, because, if Williamson considers that authority results from employment contract, he adds that there is an implicit contractual right peculiar to the firm; this one is a private ordering (Williamson, 2002). The firm is its 'own court of ultimate appeal' (Williamson, 1991). This means that in each firm, there is a so-called forbearance right thanks to which the firm gets an intrinsic obedience power called 'fiat'. For Williamson, fiat is a coordinating mechanism that constitutes the salient trait of the internal organization. In this sense, he is in opposition with Alchian and Demsetz (1972) who consider that authority is just an illusion. Because the firm generates a specific authority, the firm differs, by essence, from the market. In other words, the TCT defines the firm as regards with control on human assets. In a firm, employees accept the authority of the employer whereas in a market, where economic transactions are coordinated by commercial bargaining, there is neither authority nor power⁶.

The nature of authority is clearly different in the modern theory of property rights (MTPR). Contrary to the TCT, the MTPR argues that a firm can also give orders to another firm. Hence, the interesting question is for this theory why an employee pays attention whereas an independent contractor does not. To answer to this question, Hart (1995, p.58) affirms that ‘in the former case, if the relationship breaks down, the employer walks away with all the nonhuman assets, whereas in the latter case each independent contractor walks away with some nonhuman assets. This difference gives the employer leverage. Individual *i* is more likely to do what individual *j* wants, if *j* can exclude *i* from assets that *i* needs to be productive’. This theory defines the firm as a collection of nonhuman assets⁷ so that ‘control over nonhuman assets leads to control over human assets’ (*ibid.*). Why does an employee obey to his employer? The answer is because the latter can deprive the former of production assets. Consequently, the origins of authority come from ownership; ownership is a source of power. Authority is not linked to the particular nature of the employment relationship and command power is not specific to the firm: the commanding role within firm is not different from the commanding role between firms. The conception of authority proposed by the MTPR is far from the conception of authority successively proposed by Coase (1937), Simon (1951) and Williamson (1985). Does this divergence in contractual theories exist concerning incentive issues?

As regards with incentive questions, the contractual theories analyzed here consider that the firm differs from the market. However, the invoked arguments are not the same. For the MTPR, the firm and the market constitute two investment incentive systems, where the level of investment is related to the allocation of property rights between co-contracting parties. For example, let’s take the case of a seller A possessing a physical asset X and a buyer B possessing a physical asset Y. The total surplus is the result of the investments made by A and B. But the investments cannot be verified. The market is regarded as an environment for negotiating how to allocate the property rights on nonhuman assets X and Y; the agents may conclude contracts providing one of the parties with the residual control rights over the use of these assets. After the negotiation process, three potential configurations are shown: (i) The absence of integration between A and B, (ii) the integration of A by B (B acquires X) and (iii) the integration of B by A (A acquires Y). Hence, ownership is crucial for two main reasons. On the one hand, the owners of assets have the residual rights of control of these assets, i.e. the rights to decide on all the ways of using assets, as long as they are not inconsistent with the contracts signed previously, custom or the law (Hart, 1995). On the other hand, the property-based control over nonhuman assets is a source of power because it has an *ex post* influence on the distribution of incomes resulting from cooperation between the two co-contracting parties. In return, these incomes affect the parties' incentive to make specific investments. Hence, there is a direct relation between the nature of the firm – i.e. the ownership of nonhuman assets – and the investments made by each economic agent.

Each institutional arrangement has its own properties. According to Williamson (2000, p. 606), ‘each generic mode of governance – spot market, incomplete long-term contract, firm, bureau, etc. – is defined by a syndrome of attributes to which distinctive strengths and weaknesses accrue. Specifically, the TCT holds that alternative modes differ in incentive intensity, administrative controls, access to the courts, and informal organization’. In other words, for Williamson, the firm and the market are alternative and discrete governance structures. Thus, it is impossible to replicate in the firm the strong market incentives via a ‘selective intervention’ (Williamson, 1985, p.135-136). This selective intervention is not feasible owing to three reasons. First of all, the owner-managed supplier who becomes the manager of a supply division has no longer incentives to use efficiently the productive assets since he does no longer own them. Besides, the manager can reduce the net revenues of the

manager of the supply division by using discretionary manipulations. Then, transfer prices can be also manipulated by the management. Finally, the management is tempted to step in the monitoring of the supply division, notably if some collective gains can be realized to the detriment of the division. Vertical integration implies – as in the MTPR – specific costs and distortions so that it is impossible to replicate in the firm the high powered market incentives.

2.2 The boundaries of the firm: hold-up risks and vertical integration

Since the firm and the market do not have the same characteristics in terms of authority and incentive mechanisms, each theory is able to propose an explanatory pattern of the organizational forms of economic activities. For the TCT as well as for the MTPR, the trade-off between the firm and the market is contingent on the benefits outweighing the costs linked to each institutional arrangement.

For the TCT, it is the combination of behavioral hypothesis and the characteristics of transactions that explains vertical integration. Power on nonhuman assets allows the firm to exert its double function: (i) the protection of specific assets by reducing hold-up risks and (ii) the *ex post* adjustment of the firm when contingencies – unanticipated *ex ante* events – occur. The internalization of transactions in a firm alters the sequence of transactions insofar as the hierarchy substitutes an employment relationship – providing a zone of acceptance – to a commercial relationship. The risk of supplier post-contractual opportunism is hence annihilated and the employer can use the authority relation *vis-à-vis* employees. Moreover, in certain circumstances, the hierarchy is more efficient than the market because the authority relation grants more flexibility rather than an inter-firm relationship. The ability of the hierarchy to give orders allows the employer both to settle quickly and costlessly disputes and conflicts and to implement orders without resistance in the zone of acceptance. However, as it is impossible to make a selective intervention, vertical integration refers to the Coasian trade-off. As regard with its nature, the firm is indeed not able to maintain the high powered market incentives. In other words, it is necessary to compare the benefits of vertical integration (resulting from the resolution of supplier hold-up problems and the gains of flexibility) with its costs (resulting from weak incentives and bureaucratic costs).

The MTPR argues that, when the market is privileged to the vertical integration, economic agents are susceptible to make poor specific investments compared to a situation where the signature of the contract gives the two contracting parties the property rights of these same assets, because of hold-up risks. That's why the boundaries of the firm matter for the MTPR. The vertical integration strategy generates simultaneously costs and benefits. It is hence interesting to see the economic implications of vertical integration by taking into account distortions in relationship-specific investments. Suppose a seller, an owner-manager, who has a vertical relationship with a buyer, a managerial firm. If this latter acquires the seller, the owner-manager is dispossessed from his assets; he has no longer control over nonhuman assets. This loss of control leads to strong incentives to invest in specific assets for the managerial firm since this one owns more assets, has more power and so can capture a larger part of the *ex post* rent. *A contrario*, this leads to weak incentives to make specific investments for the employee-manager since he does no longer get the whole *ex post* rent resulting from his investment⁸.

The MTPR proposes from a normative perspective a rigorous step to analyze the boundaries of the firm. Even though the first best equilibrium cannot be achieved⁹, it is essential to give ownership of assets to protagonists whose the realized investment generates the larger *ex post* net surplus. Consequently, vertical integration leads to an overinvestment from the owner of specific assets and to an underinvestment from the other contractor. Thus,

the net output of the owner of specific assets must be such that it compensates the underinvestment of the other contracting party. In the case where all the specific assets have the same importance, the absence of integration can be privileged; the levels of investment will be restrained for each party.

Finally, the conclusions of the TCT differ from the conclusions of the MTPR as regards with both the issue of the contractual incompleteness¹⁰ and the theoretical treatment of vertical integration (see figure 1). The integration of the buyer by the seller authority does not coincide with the integration of the seller by the buyer authority¹¹.

Figure 1: The contributions of the TCT and the MTPR to the boundaries of the firm issue

Issues	Sub-issues	TCT	MTPR
Authority	Specific to the firm?	<ul style="list-style-type: none"> • Yes • Fiat 	<ul style="list-style-type: none"> • No
	Main form Nature Function	<ul style="list-style-type: none"> • Employment contract and forbearance • Reduction of post-contractual opportunism and adjustment 	<ul style="list-style-type: none"> • Power of the employer • Residual control rights • Leverage on employees
Incentives	Market	<ul style="list-style-type: none"> • High-powered incentives 	<ul style="list-style-type: none"> • Incentives based on the structure of ownership of specific assets
	Firm	<ul style="list-style-type: none"> • Low-powered incentives 	
Boundaries of the firm	Make or buy Trade-off	<ul style="list-style-type: none"> • Transaction costs <i>versus</i> benefits of the firm 	<ul style="list-style-type: none"> • Costs and benefits of vertical integration

In a world of vertically integrated firms with recourse to equity ownership, property rights economists used their theory of the optimal assignment of assets to analyze the boundaries of the firm that were relatively stable and easily defined. But, owing to the movement towards vertical disintegration and the development of complex productive systems – roughly materialized by the modular architecture (see Langlois, 2002; Sturgeon, 2002) –, definitions of the firm and analyses of its boundaries based exclusively on asset property rights can no longer be the only relevant ones (Holmström and Roberts, 1998). Vertical interfirm cooperation processes have profoundly affected the relationships between legally independent economic entities and the network-firm is the best evidence of this tendency.

3. The network-firm: theoretical definition and functioning rules

Since the beginning of the 1980's, the international industrial landscape has been changed on the impulse of externalization and outsourcing generalization. This has led to the emergence of new organizational forms among which the network-firm. The aim of this section is both to bring some conceptual clarifications of the network-firm and to analyze the diversity of intra-network incentive and coordination mechanisms, which is essential to reveal the different elements of the 'organizational glue' that holds the network-firm cohesive.

3.1. A theoretical characterization of the network-firm

The network-firm refers to a productive entity that unifies a set of legally independent firms vertically integrated and coordinated by a main firm called the 'hub-firm' 'which is the firm that, in fact, sets up the network and takes a proactive attitude in the care of it' (Jarillo, 1988, p. 32). The network-firm as a 'core network' (Robertson and Langlois, 1995) is situated either upstream or downstream. But four elements characterize each network-firm.

(1) The network-firm is built on narrow links between different firms that are economically interdependent owing to the complementarity and the difficult orchestration of their specific resources. This is the main condition for the emergence of this complex organizational firm. Firms form a network-firm to access complementary and inimitable resources as well as to create an inimitable resource by itself only through its formation. From the resource-based view of the firm, the creation of value-generating resources is linked to the firm's network of relationships (Barney, 1991). The ability to incorporate knowledge emanating both from inside and outside the firm's boundaries 'emerges as a distinctive organizational capability' (Lorenzoni and Lipparini, 1999, p. 317). The network-firm can hence be treated as a dynamic network of capabilities (Dagnino, 2004). A single firm within the network is required to manage diverse and complementary capabilities. Such an assignment must belong to the hub-firm that controls critical resources around which revolve complementary activities that need to be qualitatively and quantitatively coordinated (Richardson, 1972). Indeed, the hub-firm has to implement the organization of production, which requires managing the capabilities that it needs but does not own on the basis of a durable project. Critical resources represent the core of the network and the hub-firm carries out the protection of intra-network economic relationships. Three critical resources play an essential role in the network-firm: (i) access to inter-firm network, (ii) brand reputation and (iii) logistic network.

Firstly, the selected firms obtain the ability to specialize their own resources to the relation even though this right can be revoked. The hub-firm that controls access to critical resources offers or denies others firms to capture rent. The different members of the network – notably the partners that belong to the inner circle – dedicate their specialized resources to the hub-firm and participate to the network knowledge-creating process. Network-firm-specific human investments are embodied in a valuable collective learning process that exists only given access to critical resources (Rajan and Zingales, 1998, 2001). According to Lorenzoni and Lipparini (1999, p. 334), 'the dissemination of knowledge among actors improves the absorptive abilities of the whole network as well as mutual adaptation of network participants'. Access enables the network-firm on the whole to develop its key resources. The control of access to critical resources gives the hub-firm the legitimate ability to draw the organizational design of the network so as to set up inter-firm incentive system (Holmström and Milgrom, 1994). This is a strong source of power. Håkansson and Johanson (1993) argue in this sense that the analysis of the network-firm must be realized from actors as well as from resources and activities. Power emerges from these three elements as it will be shown latter.

Secondly, the members of a network are linked to each other by brand reputation. As a result, they have to stay durably in this network insofar as there is a positive relation between brand reputation and future rent. Indeed, the brand reputation of the hub-firm that becomes the brand reputation of the whole network gives the network members access to a 'conquered market'. For the network partners, that situation of lock-in results in strong incentives to make specific investments and to avoid opportunist actions because of the threat of being dismissed from the network. Brand reputation, as a critical intangible resource, confers a power that generates strong incentives to invest in specific resources (Holmström and Roberts, 1998).

Thirdly, logistic integration consists in enforcing supply chain partners' commitments by controlling their circulating capital but not their capital stock. For instance, thanks to EDI (Electronic Data Interchange) network, automated warehouses, computerized keyboarding programs, bar codes...some of the larger international firms (Benetton, Marks and Spencer, Ikea) control the productive actions and behaviors of subcontracting partners. Logistic integration leads to 'electronic hierarchies' (Malone *et al.*, 1986) within which the hub-firm

has a power over subcontracting partners. Similarly to brand reputation, logistic integration contributes to reduce post-contractual opportunism.

(2) Most of the exchanged products in the network-firm do not pre-exist the market transaction. This means that intra-network exchanges are ‘non market exchanges’ (Hodgson, 2002). The product can be the result either of a common project between the hub-firm and its supplying partners or of a need expressed by the hub-firm, in which case the design of the product results of the collaboration between the hub-firm and its supplying partners. Network exchange relationships take the form of non-market relational exchanges (Goldberg, 1980; Dore, 1983). But network exchanges are not internal transfers since intra-network transactions are property rights exchanges between lawfully independent firms. Inter-firm contracts as an institutionalized base are important but trust, which is not contractual in essence, is a necessary condition to network maintenance. The network-firm binds a set of independent firms vertically related under the relational power of a hub-firm that takes care of the integrity of the whole network. The network-firm is a relational firm¹² (Orts, 1998; Baker *et al.*, 2002). The relational management of the network-firm strengthens the cohesion of the whole.

(3) The internal architecture of the network-firm is structured in a pyramidal form composed by two, three or more levels coordinated by the hub-firm, which implies a strong delegation of responsibilities. Thus, in the case of two levels, the hub-firm delegates to the first level firm the task of organizing transactions with the second level firms and so on. The network-firm is an efficient organizational form for the decoupling of strategy and the organization of production both in terms of operationality and property rights allocation. The network-firm is hence clearly the opposition of the fordist firm in which the decoupling of design and the execution were only in terms of operationality, i.e. under unified ownership.

(4) Empirical evidences show that the network-firm is built from numerous specific assets (Powell, 1998; Dyer and Nobeoka, 2000) – that can be human, physical, immaterial, temporal, dedicated or sited (Williamson, 1991) – through recurrent relations stamped of uncertainty. In other words, the network-firm is based on the three same Williamsonian conditions that justify recourse to vertical integration. Consequently, intra-network specific investments produce high sunk costs, which are supposed to be the heart of two linked problems: opportunism and hold-up risks. But, despite lock-in effects due to the multilateral dependence, transaction costs are not necessarily high (Dyer 1997). The network-firm succeeds in maintaining strong market incentives to invest with a low opportunism.

As we have seen, the network-firm is based on some types of control that exist independently both of the subscription of a marketing contract and of vertical ownership integration (Sacchetti and Sugden, 2003). The coordination of economic activities within the network-firm is realized through complex integrative methods implemented by the hub-firm. Interestingly, the main concern becomes about the coordinating mechanisms within it.

3.2. Coordination and incentives in the network-firm

The network-firm is based on incentive devices that grant the protection of it from the opportunism of subcontracting partners. The hub-firm ensures thus the durability of the whole network. More specifically, the hub-firm implements two distinct but complementary devices for managing supplier relationships (Baudry, 2004).

(1) The first mechanism is what we call the selection procedure: the hub-firm selects some firms and revokes access to other firms. The selected firms are then licensed – certified and approved – and are integrated in the production plan of the hub-firm. That’s why numerous firms wish to be selected and to compose the first-level panel. Competition among

these firms provides high powered incentives because they know that they will capture a part of the whole rent by accessing to the network on a long term basis. Besides, the selection and retention of firms by the hub-firm to compose the supplier network do not result from product or price basis.

(2) The second mechanism is what we call the allocation procedure. The function of this device is to allocate intra-network tasks between those firms selected by the selection procedure. But the incentive-based scheme of this second mechanism is based on a shorter term than the former mechanism. And competition among network members can be very high. Moreover, the hub-firm has the possibility structuring and regulating power relations by influencing the degree of dependence between it and its subcontracting partners. For example, the hub-firm can use a double sourcing strategy in order to bypass lock-in effects and to retain operational flexibility. In this case, the hub-firm avoids giving too much power to network members.

These two mechanisms can be enforced only if three conditions are met: (i) the exchanges between the hub-firm and its supplying partners must be repeated, (ii) the specific assets of network members must be protected and (iii) the incentive mechanisms must be credible in order to reduce hold-up risks. In this sense, the hub-firm's reputation is crucial. Generally, in a network where relational and intangible resources create competitive advantages reputation, relational commitments and trust are the key success factors. This point is largely developed in numerous research works (e.g. Powell, 1990; Zaheer and Venkatraman, 1995; Uzzi, 1997; Dyer and Singh, 1998; Gulati *et al.*, 2000; Tsai, 2002). These factors strengthen the durability, cohesion and integrity of the whole network (Chassagnon, 2008). According to Gulati and Gargiulo (1999, p. 1446), the relational interdependence of the whole network 'highlights the effects of cohesive ties between social actors on subsequent cooperation between those actors'.

In a network-firm, the hub-firm cannot deprive network members of their specific human capital but can strongly affect their productive activity by breaking off the relationship. The consequent problems of coordination may indeed be related to access to and to control of network resources. Access enables the network-firm on the whole to develop its key resources. The control of access to critical resources gives the hub-firm the legitimate ability to draw the organizational design of the network and so the configuration of powers (see Rajan and Zingales, 2000)¹³. The distribution of power due to resource dependence (Emerson, 1962) is a necessary condition for the emergence of the network-firm. The power of the hub-firm on its subcontractors is hence legitimated by its key strategic role in the coordination of the whole network. The degree of coordination of the network is strong because of the large number of relational contracts¹⁴. This 'coordinator role' confers a durable specific resource and so a power source to the hub-firm. Does this mean that there is a certain inter-firm authority in the network-firm as some authors have shown without really finding its source (e.g. Blois, 1972; Diamantopoulos, 1987)?

Bradach and Eccles (1989, p. 103) argue that 'authority mechanisms are written into contracts and also exist implicitly by virtue of industry practise'. Similarly, Sacchetti and Sugden (2003, p. 681) affirm that 'in networks of direction, relationships are based on the authority of the core firm over suppliers'. Generally, all those works show that within the network-firm authority mechanisms are similar to those emphasized by Coase and Williamson concerning the internal organization; there are fiat and control. The commanding role is saddled with numerous obligations that the subcontracting parties must respect, notably in terms of technical and commercial pressures (Stinchcombe, 1985). Anyway, control clauses – like quality control, fabrication rules or audits of production (Ménard, 2004) – are inserted in

inter-firm contracts. Ultimately, inter-firm authority allows the hub-firm to establish contractual clauses and to complete the contract when contingencies occur.

The network-firm is finally confronted to another problem; that of the production organization and the goods and services distribution. We have seen in the general introduction on Coase that market coordination costs explain the emergence of the firm. As an organizational form, the network-firm generates high coordination costs notably because the circulating products are dedicated to the hub-firm, the cooperation requires information sharing and dissemination and the just-in-time delivery do not allow any stock accumulation. As a result, it is more difficult for the network-firm to ensure a complete coordination between the different productive agents compared to the hierarchical firm. This one has crucial characteristics like the ability to design the production process and the redistribution, to centralize and diffuse information, to control easily any product or to make synchronization easier (Milgrom and Roberts, 1992). To reduce inter-firm coordination costs, the hub-firm uses two important devices, namely the institutional procedure of certification discriminating the choice of network members and reducing *ex ante* adverse selection risks and the logistic ICT integration of the system allowing greater *ex post* control.

To conclude on this section, we wish to underline the very interesting research perspectives let by the theory of critical resources introduced by Penrose (1959) then by Wernerfelt (1984) and revived recently in the incomplete contracts view by Rajan and Zingales (1998, 2000, 2001). First of all, this theory allows us to explain why the internalization of transactions in a firm is not an absolute necessity. Then, this approach allows us to shed light on the functioning rules and the efficiency conditions of the network-firm. These arguments cast doubt on the significant impacts of the boundaries of the firm on economic agents' incentives. Finally, the theory of critical resources allows us to propose a theorization of the network-firm that combines in certain senses the MTPR and the TCT. Indeed, the former focuses on the impact of the control of specific resources – and so of the power – to create incentives and argues that it is essential for the hub-firm to select the firms that have nonhuman assets susceptible to develop new sources of revenue (market incentives). The latter considers that authority is the best mechanism for directing and coordinating intra-network activities, even though the authority of the hub-firm goes beyond the legal perimeter used by Williamson to define the firm, i.e. beyond the range of employment protection laws (Collins, 1990).

This form of inter-firm authority fulfills the role of the hierarchical authority in the TCT, which consists in allowing the hub-firm to produce the 'rules of the game' and to complete inter-firm contracts when contingencies occur. In terms of organizational efficiency, the network-firm can be apprehended as a trade-off between the firm and the market. This complex organizational form benefits from *ex ante* incentives to make specific investments (MTPR) and is protected from *ex post* opportunist behaviors (TCT).

4. Network-firm and contractual approaches of the firm: what theoretical implications?

In this last section, we aim to study firstly the impact of the emergence of the network-firm on the conclusions expressed respectively by the MTPR and the TCT and so to answer to that following question: does the sustainability of the network-firm confirm the theoretical predictions of these two theories? Then, we argue that the economic boundaries of the network-firm do not coincide with the legal nature of the firm. If the functioning rules of the network-firm correspond closely to those of the firm *stricto sensu*, they have not the same nature, notably in legal terms. The network-firm is not a hybrid form but a distinct

organizational form (Teubner, 2002), which finally tends to rehabilitate the contractual theories of the firm.

4.1. A reappraisal of the relation between ownership, authority and incentives

We have shown before that, according to the MTPR, ownership of nonhuman assets is crucial insofar as it procures power over other economic agents. In a world of contractual incompleteness, the holder of property rights on nonhuman assets acquires residual control rights giving him strong incentives to make relationship-specific investments. As regards with the question of the boundaries of the firm, the analysis of the functioning rules of the network-firm sheds light on two distinct limits of the MTPR. On the one hand, there is an overvaluation both of hold-up risks that are not sufficient to explain the boundaries of the firm and of the role of ownership on economic agents' incentives. On the other hand, there is in the MTPR an undervaluation of the power of the hub-firm to impose certain rules of the game.

The MTPR focuses exclusively on the role of property rights on nonhuman assets and consequently neglects the crucial role played by other assets – resources – on agents' incentives. Indeed, certain resources are critical and play a role closely similar to that played by ownership of assets. Contractual problems resulting from hold-up situations cannot be entirely and always resolved by the integration of a buyer and seller in a firm. The trend towards externalization and outsourcing strategies – and so vertical disintegration – shows that firms can have recourse to contractual agreements that differ from hierarchy even though assets are strongly specific (Holmström and Roberts, 1998). Generally, the theories of the firm 'become too narrowly focused on the hold-up problem and the role of asset specificity' (*ibid.*, p. 91). Inter-firm contracts are susceptible to take the place of property rights on assets as soon as some conditions (repeated exchanges, balanced distribution of relational quasi-rent and protection of specific assets) are fulfilled.

Furthermore, the MTPR neglects the power of the hub-firm to create certain rules of the game regardless of ownership. For example, in his 1995 book, Hart reconsiders the well-known example of Fisher Body which for many years has supplied car bodies to General Motors (see Klein *et al.*, 1978). To underline the crucial role of ownership of nonhuman assets on contractual negotiation, he argues that when the demand for car bodies increased substantially – constituting thus a contingency that no contract could allow for – General Motors was not able to revise the formula for determining price. Therefore, General Motors chose to buy Fisher Body out in order to be next in a stronger bargaining position thanks to residual control rights over Fisher Body's assets. In theoretical terms, the argument of Hart seems to be valid. But the industrial reality shows that he underestimates the power of the hub-firm to create self-regulating rules allowing here to obtain an extra-contractual supply. This is the role played by the allocation procedure in the network-firm. Indeed, one of the more important rules of the allocation market is flexibility: the supplier accepts *ex ante* the hub-firm's rules to stay in place in the selection market. Owing to its power, the hub-firm is able to complete inter-firm contracts by creating the rules of the intra-network game. The MTPR cannot efficiently explain the emergence of the network-firm since it functions as a cohesive and sustained whole without recourse to property rights concentration. Does the TCT explain better the emergence of this complex organizational form?

In his 1991 article, Williamson proposes a reply to criticisms concerning the incapacity of the market-hierarchy dichotomy for apprehending inter-firm networks by distinguishing three institutional arrangements: the market, the hierarchy and the hybrid-form. He distinguishes them according to their contractual attributes, advantages and disadvantages. The hybrid-form corresponds to inter-firm relationships which incorporate highly specific assets. In this view,

the network-firm can be included to this intermediate category. Indeed, the comparative analysis of Williamson concludes that network-firms' attributes – instruments, performance and contract laws – are located between two polar opposites: the market and the hierarchy. If the hybrid firm is characterized by semi-strong incentives and an intermediate degree of administrative apparatus, it is tripped up when the degree of specificity increases, because the increasing of opportunism risks leads to the rising of the costs due to contract adjustment.

The introduction of the hybrid form between the firm and the market does not affect the general reasoning in terms of hold-up: only unified ownership of assets – vertical integration – is supposed to be able to resolve lock-in. Independently to the difficulty to valid empirically the theoretical results of the TCT (Hodgson and Carter, 2006) in spite of numerous attempts (see Shelanski and Klein, 1995; Saussier and Masten, 2002), two limits of this theory should be revealed as regards with the study of the network-firm. On the one hand, the TCT overestimates the positive effects of unified ownership. On the other hand, the TCT underestimates the positive effects of non hierarchical contracts. Whereas Williamson (1991) considers that the hierarchy is a more efficient institutional arrangement than the market or the hybrid form when specific assets are important in an economic transaction, he underlines at the same time the limits of the hierarchy. This makes his judgment on the respective performance of the different contractual arrangements and so on the role of ownership unclear¹⁵. If Williamson affirms that the firm reduces the hold-up risks of external suppliers, he concedes that the firm affects also negatively the incentive system; the hierarchy promoting weaker incentives than the market since a selective intervention is impossible¹⁶. Besides, Williamson develops – notably in his 1975 book – the thesis according to which vertical integration results in a new hold-up risk due to the importance of the employees' specific human capital in the employment relationships (see also Blair, 1999; Blair and Stout, 1999). Indeed, the argument of the specificity of human capital is similar to that of the specificity of nonhuman assets: the integrated employees have a consequent advantage on the potential new employees for a given level of qualification. Hence, the integrated employees are able to demand a large part of the quasi-rent due to their idiosyncratic experience.

The functioning rules of the market are largely omitted in the TCT so that the market is more treated as a 'black box' than as a real institutional arrangement (Holsmtröm and Roberts, 1998, p. 77). The market is close to a state of nature and, if the market costs seem to be interestingly analyzed, its benefits are clearly not taken into account. This weakness leads Williamson to overestimate the weight of specific assets in the explanation of the emergence of the network-firm. Yet, as we have seen, there are numerous specific assets in the network-firm but lock-in effects do not absolutely result in vertical integration. Besides, the coordination and incentive systems are implemented independently of ownership of assets. The hub-firm is able to exert an administrative power – initially exclusively devoted to the hierarchy – allowing to sustain the whole network. In conclusion, the TCT, like the MTPR, does not propose a substantial and satisfactory answer to the question of the relation between boundaries of the firm and incentives to make relationship-specific investments.

4.2. Legal nature of the firm and economic boundaries of the network-firm

The emergence of new complex organizational forms leads both economics and lawyers to clarify the distinction between the legal and economic boundaries of the firm (e.g. Hodgson, 2002; Iacobucci and Triantis, 2007). Indeed, as there are incentive, coordination and authority mechanisms both in the firm and the network-firm, is-it necessary to refine the traditional boundaries of the firm? This is the opinion shared by Rajan and Zingales (2001) who consider that, if we retain the Coasian definition of the firm as an authoritative structure, then the network-firm does not coincide with the legal definition of the firm. For these authors, the

economic organization – the firm including – is a set of critical resources linked to each other by a network of complementary human and nonhuman specific investments formed durably around a core critical resource. This definition of economic organizations is close to the definition of the firm proposed by the resource-based view (see Wernerfelt, 1984). But the market/firm dichotomy has no longer sense since those are the boundaries of the network that become the pertinent unit of analysis, making the analysis of organizational forms and so the respective role of the market and the firm very complex.

Rajan and Zingales (1998) underline that there is a crucial difference between the boundaries of the firm defined by its property rights and the economic definition of the organization. From a resource-based view perspective, the contractual definition of the firm needs to be extended to power that accrues to key social actors having made specific investments around a critical resource of the economic entity and ‘who cannot be readily replaced in that function’ (Pfeffer, 1981, p. 113). Intra-network power relationships – which are the result of the entanglement of dynamic network resources – are the materialization of the ‘interorganizational glue’ that keeps the network-firm together. In this view, Benson (1975) characterizes interorganizational network as a political economy. Similarly, Cowling and Sugden (1998) analyze power relationships between firms and conclude that there are no differences between intra-firm relationships and certain inter-firm relationships. Thus, they define the firm as ‘a nexus of strategic decision-making’ and argue that, as subcontracting firms are often dependent on a decision-making hub-firm, sub-contracting firms are integrated parts of the hub-firm. For Rajan and Zingales (2000), is considered as an integrated part of the inter-firm network the legal entity which has access to its critical resources, that is to say the legal entity which has a valuable power within this economic organization. Sacchetti and Sugden (2003, p. 681-682) add that ‘although we are focusing here on networks of actors that are not comprised within one vertically integrated hierarchy, we assume that the direction of the core firm designs relationships within a hierarchy that expands outside the legal boundaries of the firm’. The network-firm is here close to the firm as such.

The analysis of the network-firm is accurate to reject the broad use of the term contract in economic theories of the firm and to expand consideration of the true legal basis for the firm. Legally autonomous entities are integrated and coordinated by the controlling and ordering power of the hub-firm that does not originate in contract but in organization itself. The network-firm differs thus from the firm in a usual sense because its boundaries differ from the perimeter of the legal entity as a nexus of contracts. Such complex organizations have some fundamental implications both in economics and in law, notably in terms of employment contract. The specialized members of the network-firm constitute the critical human resources that give the whole growth opportunities. But there are not employment contract and protection between legally independent firms and the hub-firm. Employment contract constitutes yet an institutional device that lacks in the network-firm where some critical resources may extend beyond firm’s legal boundaries. The economic perimeter of the network-firm is circumscribed by the perimeter of the hub-firm’s reputational power. In other words, the exploitation of power draw a perimeter which can be treated as the one of the very network-firm. This last argument pleads for the singularity of the network-firm compared to the hierarchical firm, which finally tends to rehabilitate the conclusions of the contractual theories of the firm according to which the firm is bounded by its legal shell.

The distribution of power between actors is the main coordinating mechanism in a vertical network of production. The analysis of the relations of power in the network-firm reveals a salient fact: the absence of legal bases for professional subordination. There is no authority in the network-firm other than the contractual authority – regulating the enforcement of commercial commitments – coming from subcontracting relationship. Yet a focal firm cannot

legally aspire to a formal authority on the employees of its subcontractors. Consequently, the network-firm is directly based on powers but strictly devoid of authority. If incentive mechanisms and power relationships exist in a network-firm, these cannot be compared to intra-firm devices. The relations of power within these inter-firm relations cannot be said to be totally free of hierarchical principles. But the employment relationship assumes a legal particularity that differs from a commercial relation between firms.

Concerning authority, Masten (1988) has identified the aspects that distinguish the firm from the market by comparing employment law and commercial contract law. He seeks to establish whether any rights or authority of the employer can be replicated in commercial contracts, i.e. between legally autonomous firms. His main conclusion is that the law does not treat consistently commercial transactions and employment relationships. The real authority¹⁷ of the hub-firm is different from the formal authority of the employer in terms of obligations, sanctions or procedures. Inside the firm, individuals engaged in an employment relationship accept 'an implied duty to yield obedience to all reasonable rules, orders and instructions of the employer' (*ibid.*, p.196). Courts establish the nature of a particular economic relationship as regards with these criteria. For example, in the case of a commercial contract, control can only apply to the outcome. Whereas in the case of an employment contract, authority and control apply both to the outcome and to the manner in which the work is performed as Coase (1937) has shown. For this, Masten concludes that 'the traditional emphasis in economics on the authority of management to direct the efforts of employees is at least nominally supported by the law governing employment transactions' (*ibid.*, p. 186).

Masten (1988) is also interested in mechanisms allowing the employer to enforce his hierarchical authority. On the one hand, the employer's authority results in the threat of dismissal. But this does not make a difference between the firm and a market transaction. Indeed, the 'authority of management is no different from that of an independent transactor engaged in ordinary market exchange' (*ibid.*, p.188). The threat of breaking off commercial relations is a sanction that the independent contractor is able to impose. This argument leads to adhere to Alchian and Demsetz's position according to which there is no distinction between the employment relationship and the commercial relationship. But case law reveals that dismissal is not the only means of authority enforcement for the employer. An employee can be held responsible prejudice to his employer's business if he upholds his duties. The loyalty of the employee is institutionalized so that he has to act in his employer's interest. *A contrario*, the loyalty of contractors engaged in a commercial relationship rests on business considerations. This second argument is in contradiction with Alchian and Demsetz's judgment: the law makes that the employee who wishes to keep his job has stronger incentives to obey to his employer and so to accept the employer's authority than does an independent contractor *vis-à-vis* another one. But in the case of the network-firm, the question is about who is the employer. In automobile industry for instance, the majority of the production workers are employees, not of the hub-firm (auto constructor), but of subcontractors that provide components and modules along the vertical line of production.

The employment contract is a single employer-employee relationship. But the development of complex economic organizations, where there are multiple employers, has strong implications for both the legal and the socially constituted nature of the employment relationship (Rubery *et al.*, 2002). Collins (1990, p. 355) argues that 'this raises the question whether the exclusion from employment protection rights is in fact an important reason for vertical disintegration rather than an unfortunate side-effect of other economic forces'. The analysis of the network-firm shows a strong separation between the '*de jure* employer' (peripheral firm) and the '*de facto* employer' (hub-firm) that makes the employment relationship ambiguous. This argument leads some lawyers to reconsider the relation of

professional subordination in the network-firm with the intention to give subcontractors' employees rights and to establish a joint responsibility for the employment relationship (Morin, 2005). These legal arguments tend to confuse the issue of the nature and boundaries of the network-firm.

To consider authority, subordination and commanding power in inter-firm relationships is to strengthen the confusion about the nature of intra-firm authority. Hodgson (2002) underlines that if power and control are two important concepts in the firm analysis, they do not lead to omit the legal dimensions of intra and inter-firm relationships. In a legal perspective, the control inherent in the intra-firm authority relationship cannot be replicated in inter-firm contracts even though these contracts include control clauses. Thus, we echo back to the point of view of Hart and Moore (1990) according to which an essential difference between integration and non integration rests on the fact that in the former case the employer can selectively fire some of the employees of a firm – those who are unproductive –, whereas in the latter case he can stop dealing only the entire firm. In this sense, we echo back also to the point of view of Williamson in his response to Achian and Demsetz: the market is not able to replicate the firm in terms of authority. In a power perspective, there is a crucial difference between intra-firm power and inter-firm power taken into account by the MTPR. In the case of the employment relationship, the employee loses all rights and benefits if the relation is broken off, whereas in the case of the inter-firm relationship, the firm keeps its nonhuman assets and can go on exchanging with other firms.

As regards with incentive mechanisms, there are equally some important differences between intra-firm incentives and inter-firm incentives. Considering the issue of make-or-buy, Holmström and Milgrom (1992) assess the opposition between two incentive systems, referring to the contract between an employer and employee – i.e. the firm – and the contract between a firm and a self-employed worker – i.e. the market. In both cases, three instruments may be used to create incentives: compensation, ownership of nonhuman assets and job design. Basically, these instruments are combined in each environment in a different way. In the case of the firm, the employee obeys an agent, uses the tools the firm owns and is paid a set wage. In the case of the market, the worker personally chooses the product system, owns the tools required and is paid in line with his level of productivity. Consequently, the firm and the market are two distinct alternatives: the market cannot replicate the firm and *vice versa*. The key argument of this approach is that, even though intra-firm incentives are by definition weaker in the firm than in the market, it is not fatally a problem because market incentives can be too high. Indeed, Roberts (2004, p.105) affirms that 'incentives for some activity are too strong if they cause excessive diversion of effort and attention from other valued activities that, for whatever reason, cannot be given similarly strong incentives'. Furthermore, as we have seen before, there are in the network-firm very specific incentives mechanisms as the selection and allocation markets and coordination devices as the logistic integration. This explains that, if identification and loyalty are two crucial coordination mechanisms in the firm, motivations and economic rewards seem to be the main coordinating devices in inter-firm networks (Simon, 1991).

That following figure synthesizes the main theoretical outcomes of this third section taking into account the contractual theories of the firm mentioned above, including the theory of critical resources.

Figure 2: Respective attributes of market, firm and network-firm governance structures

Issues	Market	Firm	Network-firm
Power and authority	<ul style="list-style-type: none"> • No power • No authority 	<ul style="list-style-type: none"> • Power over human capital due to ownership of nonhuman assets • Authority 	<ul style="list-style-type: none"> • Power of the hub-firm due to control of critical resources • No authority
Incentives	<ul style="list-style-type: none"> • Non-specific incentives • The price mechanism 	<ul style="list-style-type: none"> • Low powered incentives • Incentives linked to property rights 	<ul style="list-style-type: none"> • High specific incentives • Selection market and allocation procedure
Boundaries of the firm	<ul style="list-style-type: none"> • High competition • Measure of outcomes 	<ul style="list-style-type: none"> • Transaction costs <i>versus</i> benefits of the firm • Costs and benefits of vertical integration 	<ul style="list-style-type: none"> • Ability of the hub-firm to set the rules of the game • Network incentives <i>versus</i> coordination costs

5. Conclusion

Three results emerge from this theoretical work:

- (1) Even though they have some disagreements, the contractual theories of the firm mentioned in this paper share the view that authority is the main ontological difference between the market and the firm. The market is opposed to the firm in discrete terms regarding their incentives and coordination mechanisms. That's why the boundaries of the firm matter (Hart and Holmström, 2008). This is a crucial insight of contractual theories which are in this view very complementary.
- (2) The analysis of the network-firm allowed us to put the contractual theories to a test concerning the specific question of the boundaries of the firm. This study has shown that the incentive and coordination devices traditionally devoted to the hierarchical firm can be assured in the network-firm thanks to complex integrative mechanisms resting on the ability of the hub-firm to control critical resources. Hence, we have cast doubt on the impact of hold-up risks emphasized by the TCT and the MTPR (see Hart, 2009) on the boundaries of the firm.
- (3) The reappraisal of the relation between ownership and power structure and thus the distinction between the legal nature of the firm and the economic definition of the network-firm allowed us to propose 'a certain rehabilitation' of contractual theories of the firm, since intra-network incentives and coordination devices are strictly specific to this complex organizational form. In this sense, the boundaries of the firm are not muddled but an economic recognition of the network-firm is claimed because, owing to its specificity, the network-firm cannot be treated as an intermediate position between the firm and the market. Incentive provisions and coordination devices inside the network-firm are not exclusively contractual but based on some forms of relational and reputational commitments that bind the legal entities together to 'act' as a unified actor. Poppo and Zenger (2002, p. 707) conclude that 'formal contracts and relational governance function as complements'.

Market, hierarchy, network-firm and other organizational forms each represent separate social entities which differ from each other not in degree but in their ontological nature.

References

- Aghion, M. and Tirole, J. (1997) Formal and Real Authority in Organizations. *Journal of Political Economy* 105(1): 1-29.
- Alchian, A.A. and Demsetz, H. (1972) Production, Information Costs, and Economic Organization. *American Economic Review* 62(5) 777-795.
- Baker, G.P., Gibbons, R. and Murphy, K.J. (2002) Relational Contracts and the Theory of the Firm. *Quarterly Journal of Economics* 107(1): 39-84.
- Barney, J.B. (1991) Firm Resources and Sustained Competitive Advantage. *Journal of Management* 17(1): 99-120.
- Baudry, B. (2004) La question des frontières de la firme: Incitation et coordination dans la firme-réseau. *Revue Économique* 55(2): 247-273.
- Benson, J.K. (1975) The Interorganizational Network as a Political Economy. *Administrative Science Quarterly* 20(2): 229-249.
- Blair, M.M. (1999) Firm-specific Human Capital and Theories of the Firm. In M. BLAIR and M. ROE (eds.) *Employee and Corporate*. Washington A.C.: Brookings Institute.
- Blair, M.M. and Stout, L.A. (1999) A Team Production Theory of the Corporate Law. *Virginia Law Review* 85(2): 247-328.
- Blois, K.J. (1972) Vertical Quasi-Integration. *Journal of Industrial Economics* 20(3): 253-272.
- Bradach, J.L. and Eccles R.G. (1989) Price, Authority and Trust: From Ideal Types to Plural Forms. *Annual Review of Sociology* 15(1): 97-118.
- Chassagnon, V. (2008) The Network-Firm as a Single Real Entity: Beyond the Aggregate of Distinct Legal Entities. *Druid Working Paper*.
- Coase, R.H. (1937) The Nature of the Firm, *Economica* 4(16): 368-405.
- Coase, R.H. (1988) The Nature of the Firm: Meaning. *Journal of Law, Economics, & Organization* 4(1): 19-32.
- Collins, H. (1990) Independent Contractors and the Challenge of Vertical Disintegration to Employment Protection Laws. *Oxford Journal of Legal Studies* 10(3): 353-380.
- Cowling, K. and Sugden, R. (1998) The Essence of the Modern Corporation: Markets, Strategic Decision-Making and the Theory of the Firm. *The Manchester School* 66(1): 59-86.
- Dagnino, G.B. (2004) Complex Systems as Key Drivers for the Emergence of a Resource and Capability-Based Interorganizational Network. *Emergence: Complexity and Organization* 6(1-2): 61-69.
- Diamantopoulos, A. (1987) Vertical Quasi-Integration Revisited: The Role of Power. *Managerial and Decision Economics* 8(3): 185-194.
- Dore, R. (1983) Goodwill and the Spirit of Market Capitalism. *British Journal of Sociology* 34(4): 459-482.
- Dyer, J.H. (1997) Effective Inter-firm Collaboration: How Firms Minimize Transaction Costs and Maximise Transaction Value, *Strategic Management Journal* 18(7): 535-557.
- Dyer, J.H. and Singh, H. (1998) The Relational View: Cooperative Strategy and Sources of Interorganizational Competitive Advantage. *Academy of Management Review* 23(4) 660-679.
- Dyer, J.H. and Nobeoka, K. (2000) Creating and Managing a High-Performance Knowledge-Sharing Network: The Toyota Case. *Strategic Management Journal* 21(3): 345-367.
- Emerson, R.M. (1962) Power-Dependence Relations. *American Sociological Review* 27(1): 31-41.
- Garrouste, P. and Saussier, S. (2005) Looking for a Theory of the Firm: Future Challenges. *Journal of Economic Behavior and Organization* 58: 178-199.

- Gibbons, R. (2005) Four formal(izable) theories of the firm. *Journal of Economic Behavior & Organization* 58(2): 200-245.
- Goldberg, V.P. (1980) Relational Exchange: Economics and Complex Contracts. *American Behavioral Scientist* 23(3): 337-352.
- Grossman, S.J. and Hart, O.D. (1986) The Costs and Benefits of Ownership: A Theory of Vertical and Lateral Integration. *Journal of Political Economy* 94(2): 691-719.
- Gulati, R. and Gargiulo, M. (1999) Where Do Interorganizational Networks Come From? *American Journal of Sociology* 104(5): 1439-1493.
- Gulati, R., Nohria, N. and Zaheer, A. (2000). Strategic Networks. *Strategic Management Journal* 21(3): 203-215.
- Håkansson, H. and Johanson, J. (1993) The Network as a Governance Structure: Interfirm Cooperation Beyond Markets and Hierarchies. In G. Grabher (ed.) *The Embedded Firm*. London-New York: Routledge.
- Hart, O.D. (1989) An Economist's Perspective on the Theory of the Firm. *Columbia Law Review* 89(7): 1757-1774.
- Hart, O.D. (1995) *Firms, Contracts, and Financial Structure*. Oxford: Oxford University Press.
- Hart, O.D. (2009). Hold-up, Asset Ownership and Reference Points. *Quarterly Journal of Economics* 124(1): 267-300.
- Hart, O.D. and Moore, J.M. (1990) Property Right and the Nature of the Firm. *Journal of political Economy* 98(6): 1119-1156.
- Hart, O.D. and Moore, J.M. (2008) Contracts as Reference Points. *Quarterly Journal of Economics* 123 (1): 1-48.
- Hart, O.D. and Holmström, B. (2008). A Theory of Firm Scope. *NBER Working Paper*.
- Hodgson, G. M. (2002) The Legal Nature of the Firm and the Myth of the Firm-Market Hybrid. *International Journal of the Economics of Business* 9(1): 36-60.
- Hodgson, G.M. and Carter, R. (2006) The Impact of Empirical Tests of Transaction Cost Economics on the Debate on the Nature of the Firm. *Strategic Management Journal* 27(5): 461-76.
- Holmström, B. and Milgrom, P. (1994) The Firm as an Incentive System. *American Economic Review* 84(4): 972-991.
- Holmström, B. and Roberts, J. (1998) The Boundaries of the Firm Revisited. *Journal of Economic Perspectives* 12(4): 73-94.
- Iacobucci, E.M. and Triantis, G.G. (2007) Economic and Legal Boundaries of Firms. *Virginia Law Review* 93(3): 515-569.
- Jarillo, J.C. (1988) On Strategic Networks. *Strategic Management Journal* 9(1): 31-41.
- Jensen, M. and Meckling, W. (1976) Theory of the Firm: Managerial Behaviour, Agency Costs, and Ownership Structure. *Journal of Financial Economics* 3(2): 305-360.
- Klein, B., Crawford, G. and Alchian, A. (1978) Vertical Integration, Appropriable Rents and the Competitive Contracting Process. *Journal of Law and Economics* 21(2): 297-326.
- Langlois, R.N. (2002) Modularity in Technology and Organization. *Journal of Economic Behaviour and Organization* 49(1):19-37.
- Lorenzoni, G. and Lipparini, A. (1999) The Leveraging of Interfirm Relationships as a Distinctive Organizational Capability: A Longitudinal Study. *Strategic Management Journal* 20(4): 317-338.
- Malone, T., Yates, J. and Benjamin, R. (1986) Electronic Markets and Electronic Hierarchies: Effects of New Information Technologies on Market Structure and Corporate Strategies. *Sloan Working Paper*.
- Masten, S.E. (1988) A Legal Basis for the Firm, *Journal of Law, Economics & Organization*. 4(1): 181-198.

- Masten, S.E. and Saussier, S. (2002) Econometrics of Contracts: An Assessment of Developments in the Empirical Literature on Contracting. In E. Brousseau and J.M. Glachant (eds) *The Economics of Contracts: Theories and Applications*. Cambridge: Cambridge University Press.
- Ménard, C. (2004) The Economics of Hybrid Organizations. *Journal of Institutional and Theoretical Economics* 160(3): 345-376.
- Milgrom, P. and Roberts, J. (1992) *The Economics, Organization and Management*. Englewood Cliffs (N.J.): Prentice Hall.
- Morin, M.-L. (2005) Labour Law and New Forms of Corporate Organization. *International Labour Review* 144(1): 5-30.
- Orts, E.W. (1998) Shirking and Sharking: A Legal Theory of the Firm. *Yale Law and Policy Review* 16(2): 265- 329.
- Penrose, E.T. (1959) *The Theory of the Growth of the Firm*. New York: John Willey.
- Pfeffer, J. (1981) *Power in Organizations*. Marshfield, MA: Pitman Publishing.
- Poppo, L. and Zenger, T. (2002) Do Formal Contracts and Relational Governance Function as Substitutes or Complements. *Strategic Management Journal* 23(8): 707-725.
- Powell, W.W. (1990) Neither market nor hierarchy: network forms of organization. *Research in Organizational Behavior* 12: 295-336.
- Powell, W.W. (1998) Learning From Collaboration: Knowledge and Networks in Biotechnology and Pharmaceutical Industries. *California Management Review* 40(3): 228-240.
- Rajan, R.G. and Zingales, L. (1998) Power in a Theory of the Firm, *Quarterly Journal of Economics* 113(2): 387-432.
- Rajan, R.G. and Zingales, L. (2000) The Governance of the New Enterprise. In X. VIVES (ed.), *Corporate Governance: Theoretical and Empirical Perspectives*. Cambridge: Cambridge University Press.
- Rajan, R.G. and Zingales, L. (2001) The Firm as a Dedicated Hierarchy: A Theory of the Origins and Growth of Firms. *Quarterly Journal of Economics* 116(3): 805-851.
- Roberts, J. (2004) *The Modern Firm, Organizational Design for Performance and Growth*. Oxford: Oxford University Press.
- Robertson, P.L. and Langlois, R.N. (1995) Innovation, Networks and Vertical Integration. *Research Policy* 24(4): 543-562.
- Rubery, J., Earnshaw, J., Marchington, M., Cooke, F.L. and Vincent, S. (2002) Changing Organizational Forms and the Employment Relationship. *Journal of Management Studies* 39(5): 645-672.
- Sacchetti, S. and Sugden, R. (2003) The Governance of Networks and Economic Power: The Nature and Impact of Subcontracting Relationships. *Journal of Economic Surveys* 17(5): 669-690.
- Shelanski, H. and Klein, P.G. (1995) Empirical Research in Transaction Cost Economics: A Review and Assessment. *Journal of Law, Economics, and Organization* 11(2): 335-61.
- Simon, H.A. (1951) A Formal Theory of the Employment Relationship. *Econometrica* 19(3): 293-305.
- Simon, H.A. (1991) Organizations and Markets. *Journal of Economic Perspectives* 5(2): 25-44.
- Stinchcombe, A. (1985) Contracts as Hierarchical Documents. In A. Stinchcombe and C. Heimer (eds) *Organization Theory and Project Management*. Oslo: Norwegian University Press.
- Sturgeon, T.J (2002) Modular Production Networks: A New American Model of Industrial Organization. *Industrial and Corporate Change* 11(3): 451-496

- Teubner, G. (2002) Hybrid Laws: Constitutionalizing Private Governance Networks. In R. Kagan, M. Krygier and K. Winston (eds.) *Legality and Community*. Berkeley: Berkeley Public Policy Press.
- Tsai, W. (2002) Social Structure of ‘Coopetition’ within a Multiunit Organization: Coordination, Competition and Intraorganizational Knowledge Sharing. *Organization Science* 13(2): 179-190.
- Uzzi, B. (1997) Social Structure and Competition in interfirm networks: The Paradox of Embeddedness. *Administrative Science Quarterly* 42(1): 35-67.
- Van Alstyne, M. (1997) The State of Network Organization: A Survey of Three Frameworks. *Journal of Organizational Computing and Electronic Commerce* 7(2-3): 83-151.
- Wernerfelt, W.B. (1984) A Resource-Based View of the Firm. *Strategic Management Journal* 5(2): 171-180.
- Williamson, O.E. (1975) *Markets and Hierarchies: Analysis and Antitrust Implications*. New York: Free Press.
- Williamson, O. E. (1985) *The Economic Institutions of Capitalism*. New York: Free Press.
- Williamson, O.E. (1991) ‘Comparative Economic Organization: The Analysis of Discrete Alternative’, 36(2) *Administrative Science Quarterly* 269-296.
- Williamson, O.E. (2000) The New Institutional Economics: Taking Stock Looking Ahead. *Journal of Economic Literature* 38: 595-613.
- Williamson, O.E. (2002) The Lens of Contract: Private Ordering. *American Economic Review* 92(2): 438- 443.
- Zaheer, A. and Venkatraman, N. (1995) Relational Governance as an Interorganizational Strategy: An empirical Test of the Role of Trust in Economic Exchange. *Strategic Management Journal* 16(5): 373-392.

¹ In their 2008 paper, Hart and Moore attempt to broaden the scope of property rights approach and introduce the idea that contracts are ‘reference points’ in order to relax the assumption that decisions are *ex post* non contractible. But, here, we will focus on the basic model of the modern theory of property rights.

² We have not retained agency theory since, according to this approach, the firm does not exist as such. Indeed, the integration of a firm A by a firm B has no effect on agents’ behavior and the question of the boundaries of the firm is so devoid of sense. Jensen and Meckling (1976, p. 311) argue hence that ‘it makes little or no sense to try to distinguish those things that are ‘inside’ the firm (or any other organization) from those things that are ‘outside’ of it’.

³ But Coase (1937, p. 392) adds in a footnote (n°27) that it is difficult ‘to draw a hard and fast line which determines whether there is a firm or not’. He reiterated his position in ‘The nature of the firm: Meaning’ (Coase, 1988).

⁴ For a detailed and comprehensive synthesis of the theories of the firm, see Garrouste and Saussier (2005) and Gibbons (2005).

⁵ Thus Coase (1937) shows the concordance between his definition of the firm – as a productive entity organized by a coordinator-entrepreneur who supplants the price mechanism – and ‘the legal relationship normally called that of master and servant or employer and employee’ (p. 403). Consequently, according to Coase, it is the fact of direction that characterizes both the legal concept ‘employer and employee’ and the economic definition of the firm.

⁶ For Williamson (1985) – as well as for Coase (1937) –, employment contracts and commercial contracts differ in that the employer can have his orders obeyed and discipline employees for not obeying orders. Besides, he notes that ‘procurement of the same good or service from an autonomous supplier ordinarily lacks that command and control aspect but requires mutual consent before adaptations can be affected’ (*ibid*, p. 249).

⁷ Hart (1989) considers that this category includes machines, inventories, buildings or locations, and cash, as well as client lists, patents, copyrights, and the rights and obligations embodied in outstanding contracts, to the extent these are transferred with ownership.

⁸ Hart (1995, p.33) affirms that ‘the benefit of integration is that the acquiring firm’s incentive to make relationship-specific investments increases since, given that it has more residual control rights, it will receive a greater fraction of the *ex post* surplus created by such investments. On the other hand, the cost of integration is that the acquired firm’s incentive to make relationship-specific decreases since, given that it has fewer residual

control rights, it will receive a smaller fraction of the incremental *ex post* surplus created by its own investments’.

⁹ Indeed, the level of investment is always not optimal compared to the situation where contracts would be complete. The best solution corresponds to a situation where each party invests as though she is sheltered from hold-up risks.

¹⁰ The TCT sheds light on the problems of the *ex post* adaptation of contracts (due to specificity of assets and uncertainty), whereas the MTPR focuses on contractual difficulties resulting from *ex ante* investment distortions (due to the *ex post* difficulty of observing the outcomes of realized investments).

¹¹ For the TCT, it does matter knowing who integrates who because authority – that is the central coordination mechanism – allows the acquiring firm to determine the level of investment of the acquired firm. However, for the MTPR, the firm is not able to do this because the level of investment is supposed to be inalienable (because of specific human capital) and not contractible.

¹² Orts (1998, p. 310-311) argues that relational firms – that he defines as non traditional firms made between or among simpler firms to act in unison to compete with others in organizational metamarkets – ‘highlight the analytical difficulty in defining the boundaries of the firm’. He adds that ‘the boundaries of relational firms are dynamic and shift in response to different questions about different elements of organization’.

¹³ Rajan and Zingales (2000) make the distinction between an average effect and a marginal effect of power. The average effect means that when an agent has power, she is confident that she will get a large part of the surplus. The average effect means that power can increase with the specific human investment the agent makes, and this will increase her incentive to invest. This marginal effect is collectively efficient.

¹⁴ Baker *et al.* (2002, p. 39) define relational contracts as ‘informal agreements sustained by the value of future relationships’.

¹⁵ According to Van Alstyne (1997, p. 87), ‘to conceive of networks as falling exclusively between markets and hierarchies is to employ a false and misleading scale’.

¹⁶ Williamson focuses sometimes on the conditions for integrating the network-firm as a distinct efficient organizational form without really going into detail. For example, Williamson (1985, p. 143-144) writes that ‘a complex tradeoff situation is thus posed when the potential incentive benefits are great and the transaction is characterized by substantial asset specificity. New hybrid forms of organization may appear in response to such condition’.

¹⁷ See Aghion and Tirole (1997) for an economic distinction between real and formal authority.