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There is more to contracts than incompleteness:
A review and assessment of empirical research on inter-firm contracts

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ABSTRACT:

While the usefulness of contracts as a lens to investigate economic organizations hardly needs to be advocated, there is a widespread perception that actual contracts have been underinvestigated, that they do more than controlling opportunism and that some of their dimensions are not well understood. In short, contracts appear like a powerful but idealized concept that is in need of empirical enrichment. To enhance our understanding of how contracts operate in practice, we review recent empirical research on inter-firm contracting. Our examination reveals that empirical literature has progressively extended its investigations to classes of relationships that are of interest to the economics and management of networks. Yet the apparatus employed is still largely the one that was developed to analyze transactional interdependence. Under the influence of received perspectives, some issues like ‘completeness’ seems to attract undue attention and yet they are still surrounded by considerable confusion. Among the original contributions of the empirical literature is the discovery that authority allocation between the contracting parties needs not be stable and needs not correlate with ownership. Empirical literature is also pointing with increasing insistence to functions of contracting not accounted for by traditional models, like the management of coordination requirements. We conclude by proposing with Stinchcombe that looking at contracts not just as ‘promises’, or governance but as constitutions that establish organizational structures is an avenue for research that holds the promise to enrich our understanding of inter-firm relations.

1. Introduction

Contracts are a useful and powerful lens for looking at firms and at inter-organizational relations (Williamson 2003). However, similar to a well-know fact of optics, different theoretical lenses return different images of the same object. At a minimum, “the world of contract is variously described as one of (1) planning, (2) promise, (3) competition, and (4) governance (or private ordering)” (Williamson 1985: 30). At times it is necessary to ask whether the lens, as currently developed, allows us to bring into focus enough of the relevant aspects of inter-organizational relations.

Our basic understanding of contracts in terms of the purposes served owes a lot to economics (Williamson, 1985: 23). The achievements of the economics of contracts have been impressive¹. To a considerable extent the economics of contracts is co-extensive with the newly founded discipline of organizational economics. Yet, despite all the success, there is a widespread perception that a lot remains to be done.

First, a number of conceptual and empirical studies have claimed that contracts serve other purposes besides those that have been traditionally noticed in the economic literature, like the control of moral hazard or opportunism. For instance, these studies emphasize that contracts also bring organizational learning to bear on decisions (Stinchcombe, 1990); support the discovery of better outcomes (Turner 2004); serve as “blueprints for exchange” (Ryall and Sampson 2003: 6) and, more generally, enable contractors to coordinate their actions (Brousseau, 1995);

Second, despite all the progress, considerable confusion still exists with regards to the essential dimensions of contracts. As a result we are unable to make sense of the variety of contractual solutions, in a reasonably general way and we keep on relying on discrete juridical typologies (e.g. a franchising contract, a joint venture contract, a consortium contract, etc.) or on endless list of content (R&D, commercial, production etc) (Grandori and Furlotti, 2005). Needless to say, this state of things also seriously hinders the development of contract design as a distinctive field.

Finally, despite recent progress, it appears that contracts, as empirical artifacts, are yet conspicuously missing from the literature (Suchman, 2003) so that the richness of this technology of the organizational process is far from being fully understood.

Stinchcombe has expressed the gist of the previous observations in a vivid form: “when two powerful intellectual traditions have built powerful but idealized concepts, such as ‘market

¹ While we concern ourselves only with contracts and property rights, the law and economics stream of research covers a wider domain, that extends to issues like tort law, the legal process, crime and punishment, etc.. See for instance Cooter and Ulen (2000).

transaction' in economics or 'contract' in law, into powerful intellectual systems, the concepts tend to shape perception' (1990: 234).

The implication of this line of reasoning is that it is necessary to enrich the theoretical discussion with a wider-based empirical investigation of contracts. Possibly, economics and organizational research need to do some soul searching and remind the invectives addressed by Macaulay to scholarly legal thinking on contracts: "writers assume a number of things about the institution of contract ... [that are] just wrong or so greatly overstated to be seriously misleading". Scholars holding such sensitivity cannot be satisfied with the doctrinal representations of the functions of this institution but "must establish, rather than assume" how it operates in practice (Macaulay, 1985).

In what follows, we shall review the empirical economic literature about contracts with two main purposes: to look at what dimensions of contracts have been investigated and unveiled, and to discover what antecedents of various contractual mechanisms have found more support in the literature. Along the way, we shall also survey the current methods and practical problems of empirical investigation of contracts.

2. Sampling criteria

The focus of our review will be on empirical studies of formal contract design in inter-firm relationships. Making it explicit that we restrict ourselves to 'formal' contracts is by no means redundant, since a number of studies have addressed informal, not legally enforceable agreements and have revealed that they can be effective governance structures in industries as diverse as rail freight of lobster catching (Shelanski and Klein, 1995).

As to restricting our investigation to studies of 'contract design', that is intended to leave outside the scope of our survey those empirical investigations where the explanandum is the choice between discrete governance alternatives, like 'pooling contract vs. 'joint venture' (Sampson, 2004), 'formal contract' vs. 'trust' (Klein Woolthuis et al. 2005) or between discrete contract forms like 'company-owned', 'lessee-dealer' and 'open-dealer' (Shepard, 1993). Stated differently, it means that we require that in the studies we review contract terms be considered as a design variable. This also leaves out, on the opposite end of the spectrum, those studies that take a contract term for granted and focus instead on the *level* of one or more variables whose decision is assigned by

contract to the parties.² Finally, focus on inter-firm relationship leaves out other fairly well investigated fields, notably, that of employment contracts.³

A further qualification is that by ‘empirical studies’ we mean those based on observation of real-world contracting, either by means of contract analysis or by questionnaire survey. Hence, we shall not review the testing of contracting theories based on experimental approaches.⁴

Despite all the conditions we made, extant empirical literature is still too large to pretend achieving a reasonable comprehensiveness. Luckily, Shelanski and Klein (1995) provided an excellent review of literature before year 1993.⁵ Another valuable review is found in Lyons (1996). Hence, we can afford reviewing only later works. Whenever one particular dimension of contracting has been underinvestigated in recent years, we shall include in the revision also a few of the classic ‘benchmark’ studies.

3. A theoretical framework to organize our literature review

Some of the previous reviews of empirical studies of contracts have been organized by theoretical perspective (e.g. transaction costs economics, henceforth TCE) or by substantive field (e.g. franchising, land tenure, etc.). Here we adopt an integrative approach. That is to say, although the transactions they regulate can be quite different in many respects, contract belonging to different fields can be analyzed according to common dimensions that are reflected in the studies investigating them. Most of the dimensions we consider are rooted in economics. However, in the spirit of enriching our representation of contracts, we follow a suggestion first advanced by Stinchcombe (1990) and later subscribed by Gulati and Singh (1998), that contracts are an organizational phenomenon and perform their functions by incorporating organizational elements. Thus, whenever we find a minimum of evidence supporting it, we attempt an interpretation in terms of typical organizational dimensions.

Besides regrouping contributions by dimension we impose an overarching classification: ‘formal’ vs. ‘content’ dimensions. We shall briefly discuss later the theoretical considerations underpinning this classification. For the time being, we shall treat it simply as a useful heuristic

² For clarity’s sake, this means neglecting essentially those studies in the specialized literature on franchising that have investigated the antecedents of variables like the level of the ‘initial fee’, ‘royalty rate’, etc.. The interested reader may refer to Lafontaine and Slade (1998) for an excellent review of the empirical literature on franchising.

³ We neglect also some specialized literature, like that on public debt and agricultural contracts.

⁴ Readers interested in this kind of studies can refer to the paper by Keser and Willinger, in Brousseau and Glachant (2002)

⁵ While they focused only on the empirical research in the transaction cost economics perspective, we do not see their study as presenting significant omissions, both because at that time property-rights theory had yet to make a large impact on empirical research on contracting and because research in the agency theory perspective most often concerns itself with private franchising, and for the most part fails to meet our requirements for other reasons.

device to help making sense of the heterogeneity of research questions. As it will become apparent, there is often a clear duality relationship between formal and content dimensions so that empirical findings relating to either of them can often be reframed in terms of the other. This will force us to quote some studies repeatedly. We shall try to keep the inconvenience at a minimum, by being particularly concise on occasion of making successive references.

In preparing this contribution, our interest went also to the methodology of the empirical investigation of contracting. Therefore, besides describing the substantive findings, we will also touch issues of data collection and analysis for each of the paper reviewed

4. Review of literature

4.1 Content dimensions

As it is quite evident in the Shelanski and Klein's review of literature, TCE, the dominant conceptual framework that inspired empirical research on contracts, tends to impose a comparative perspective on empirical studies and, often, an ill-concealed public-policy concern. What has to be explained is why in a certain setting complex contracts can be more efficient than standard contracts. Since the implicit terms of reference – spot sales contracts – has only minimal complexity, seldom, if ever, studies in this tradition get engrossed in analyzing contracts in extenso. Most often they focus on single provisions. The most common feature by which complex contracts differ from standard ones is the *duration* of their execution, and the fact that the accompanying *compensation provisions* become more complicated. Thus it is only natural that our review sets forth from these dimensions.

4.1.1 Contract duration

According to Klein, Crawford and Alchian (1978) and Williamson (1979) contract term is a fundamental design variable in the case of exchange backed by transaction-specific investment. In fact, long term contracting is supposed to save the parties the bargaining costs of repeat negotiations, which would be unavoidable if sequential spot contracting was selected instead. However, a longer duration also increases the potential for maladaptation. Therefore, opposite transaction costs must be traded-off against each other in deciding the actual contract term.

In an early study of duration Joskow (1987) analyzed the effect of asset specificity on the duration of contracts for coal market transactions between coal producers and electric utility

operators.⁶ The analyses were carried out on a database of 277 observations of contract variables coded from secondary sources. The results strongly supported the hypothesis that higher specificity is conducive to longer duration. A further reason of interest in Joskow's study is that it provides a careful operationalization of each of the three types of specificity considered by Williamson: *site specificity*, *physical asset specificity* and *dedicated asset specificity*.

The possibility that longer contract duration *increases* transaction costs was empirically analyzed by Crocker and Masten (1988). Their investigation strategy sets forth from the idea that in certain markets like natural gas supply, price regulation induces the parties to engage in non-price competition by offering each other non-optimal contract terms (like 'take-or-pay' provisions). In turn, since a consequence of these suboptimal provisions is to raise the potential liabilities of contractual exchange, the presumption is that they would lead to shorter contracts. This proposition was tested on a database of 280 observations of contract terms from a public survey. Contract duration was regressed on incentive distortions and other control variables. The results were largely supportive of the hypothesis: the prospect of inefficient adaptation reduces the willingness of the parties to engage in long-term contracting.

In recent years, an empirical investigation of contract term has been performed by Ciccotello et al. (2004). The authors argue that while previous research has found long-term contracting to be an efficient response to hold up risks associated with investment in transaction-specific *tangible* capital, the same thing should also be true when the investment involved is in *intangible* capital (human capital). The hold-up risk – they maintain – also increases with the novelty of the technology. In fact, the more novel the technology the higher should be the probability that the behaviors that are stipulated in the agreement will become inefficient at later dates. A test was performed on a database of secondary data on 582 cooperative R&D agreements between Air Force agencies and other partners⁷ and lead to the rejection of the null hypothesis that technological novelty has no influence on contract duration. The authors discuss at some length an issue of identification (whether contract duration reflects hold-up risk or the fact that it takes longer to complete a novel project). However, as the database only contains limited information about task characteristics the suspicion remains that task characteristics have not been properly controlled and that the estimates of the relationship between hold-up risk and contract duration may be somewhat biased.

⁶ We take this article to represent a series of four that Joskow published between 1985 and 1990 on contracts between coal suppliers and electric plants.

⁷ Since the particular transaction imposed a standardized contract, propositions relating to term were about the only thing that could be tested with this database.

4.1.2 Remuneration and risk allocation

As it is apparent from the previous section, early investigations were concerned mainly with long term contracts for the exchange of goods to be produced with considerable transaction-specific investment. In such setting contracts were almost identified with the compensation mechanism they established, that had to be flexible enough to enable adaptability, while constraining the hazards of opportunism⁸. A notable example of research in this stream is found in Masten and Crocker (1985). Basing the same database of natural gas contracts as in their 1988 paper, the authors analyze the antecedents of ‘take-or-pay’, provisions that require purchasers to pay for a contractually specified minimum quantity of output. As better explained in Masten (1988), these clauses can be interpreted as a mechanism that sets appropriate incentives for contractual performance and provide flexibility in long-term contracts while reducing the number of clauses that are liable to misinterpretation or deception. Masten and Crocker’s findings are that the percentage of ‘take’ obligation varies significantly, and in the predicted direction, with characteristics that affect the value of the commodity in alternative uses. The lesson to be drawn here is that the need to increase incentive decreases with conditions that alleviate the ‘small number’ situation facing the party who has invested in specific asset. According to Masten (1998: 15) these findings support an “incentive interpretation over the alternative view that take-or-pay provisions serve distributional or risk-sharing purposes”

The study by Crocker and Reynolds (1993) is normally presented as an attempt to prove that the degree of contract completeness is endogenous to the relationship. The reason we enlist it here is that in their study the degree of completeness is operationalized simply as the kind of pricing provision adopted.⁹ In the setting they analyze (military equipment procurement) contracts are very structured and compensation provisions can take five alternative arrangements differing in the degree to which they allow for ex-post adaptation. Fixed-price complete contracts put risks on the supplier to a larger extent, while giving him high-powered incentives. On the contrary, in the pricing solution where ex-post negotiation is less constrained the parties have an implicit agreement that the risks of the collaboration will be shared. The data Crocker and Reynolds analyze relate to 45 airplane engine procurement contracts. Expected opportunism of the supplier was found to be conducive to higher incentives and less risk sharing, while task uncertainty was found to favor an opposite arrangement. One take out from this study is that ‘opportunism’ is not to be assumed; rather, in real-world contracting situations it is a trait of character that the parties try to gauge basing

⁸ “Previous literature [focused] only on the strictly ‘monetary’ aspects of the contracts” (Arruñada, Garicano and Vazquez 2001: 257).

⁹ We shall discuss the implications of this study for contract ‘completeness’ in the section on the formal dimensions of contracts.

on available information. The second take out is that as contractual performance increasingly involves unforeseen or nonquantifiable contingencies, if both parties can make a contribution to reduce it through continuous negotiation of specifications the efficient contracting solution is an agreement entailing risk-sharing.

A study that has recently focused on compensation provisions and risk allocation is Corts and Singh (2002). These authors investigated the two typical pricing solutions (turnkey and dayrate) that are commonly observed in contracts for offshore oil-drilling, a context characterized by task uncertainty and asymmetric information. The first one is essentially a fixed price contract. By setting a fixed compensation for a unique, non repetitive task, this contract ties the actual compensation of the contractor to its ability and effort to reduce the cost of works. At the same time, a turnkey contract places the risk of the project entirely on the contractor's shoulders. The flipside of this risk allocation arrangement is that empirically observed turnkey contracts require "carefully enumerating many contingencies and detailing the project specifications ex ante, making it very costly to change the project specifications once the project is underway". The alternative solution corresponds to the cost-plus contract in the construction industry and entails an agreement that "is simpler to write and gives the buyer more flexibility in altering the specifications as the project proceeds; however, this flexibility comes at the cost of introducing a moral hazard problem, as the agent may bill the principal for excessive materials and labor" (Corts and Singh 2002:1). The authors analyzed a database of 1874 oil-drilling projects, coded from secondary data, and found that the frequency of interactions on prior projects between the contracting parties reduces the probability that the high-powered incentive solution (turnkey) is chosen.

The interest of this study lies in the fact that it reveals that empirically the adoption of high-powered incentives not only shifts risks to the agent, as is known from theoretical models, but that at the same time it forces the parties to trade safeguards in a dysfunctional way. In fact one party is induced to offer the other better safeguards in the form of a higher programmability of the task (greater detail of project specifications) although this clashes with her own cognitive limits, thereby increasing the risk of contract maladaptation. This paper also reveals that at least in the context of oil drilling, the reduction of uncertainty concerning the agent's type that derives from frequent interaction is better at curing motivation problems than incomplete commitment ones.

While Corts and Singh analyze only two alternative patterns of risk allocation, a sharing of risk and remuneration is also feasible. This is the default arrangement in joint ventures and in capital ventures, where profits and risks are allocated basing on an allocation scheme defined ex-ante, normally in proportion to each party's share of capital. However, the sharing of profits and risks can also be agreed ex-post. In this case the common wisdom would be that the sharing be

based on each party's marginal productivity. In reality also a 'democratic' solution is feasible. In the case studied in Dekker 2004 where the collaboration investigated had team production characteristics, the sharing of the surplus was based on a rule that being open to the possibility of some manipulation, due to its implementation technicalities, also needed the ex-post mutual agreement of the parties to ensure medium term viability.¹⁰

In sum, the studies reviewed support the received wisdom that incentive intensity increases with the dependency on the counterparty and with expected opportunism, whereas higher uncertainty renders incentives less effective.

4.1.3 Authority

In Coase, Williamson and others, contracts have been contrasted to hierarchical administration. However some authors like Stichcombe, have noticed that hierarchical elements can also be contained in the social structures that are constructed out of contracts. That this must be the case, at least in contracts involving individuals, is immediately evident if we think of the typical contract for passenger air transportation: clearly the person who buys this service also agrees to be subjected to the airplane's captain authority during all the period of his flight. Before discussing the empirical evidence on this dimension that has been gathered in inter-firm settings, we notice that a hierarchy is usually defined as "a stable and formalized system of authority relationships" (Grandori, 1997c: 69). Thus for contracts in general, where contract term may be as short as the blink of an eye, the requirement of stability may not be fulfilled, so that we think that the expression 'authority' is to be preferred to 'hierarchy'. Besides the contributions of Williamson and transaction economics, property rights theory (PRT) has also addressed considerable attention to the role authority plays in relationship with contracting. A sentence of Lerner and Malmendier (2005:2) aptly captures the essence of the problem as perceived by most of the studies in this perspective: "in theory, the contracting parties may remedy contractual incompleteness by assigning any suitable decision right that governs the actions of the other party even though the actions themselves are not contractible". It must also be reminded that at least in the seminal works of Grossman, Hart and Moore, the 'residual' decision right that are needed to 'make up' for contractual incompleteness sprout from asset ownership that is defined precisely as the right to decide all usages of the asset that are not inconsistent with a prior contract, custom or law (Hart, 1995: 30). But how is authority allocated in real world contracts? Is it necessarily entwined with ownership and stably fixed once for all? To the

¹⁰ "For cost reductions in operating and maintenance activities, which are difficult to measure with RIB's cost data, the partners in good faith simply agreed to 'negotiate a reasonable estimate' of the savings, to come to a fair division of the alliance's financial benefits". Dekker 2004: 46)

best of our knowledge, questions like these have never been investigated systematically, with the purpose of establishing evidence generalizable across settings. Rather, most available evidence comes from studies investigating one particular contractual form (technology alliancing, venture capital, franchising) and normally concerned with testing the predictions of a given theoretical perspective (agency theory, PRT).

Lerner and Merges 1998 is an early example of a study investigating empirically a large number of clauses contained in R&D contracts, with large-sample quantitative analyses.¹¹ These authors look at biotechnology alliances through lenses provided by PRT, as it is evident from study focusing upon the allocation of ‘control rights’ between the financier and the R&D firm. The main discovery of the paper is that control rights are parsed finely. “Practitioners suggest no single control right stands out as critical. Rather, it is the accumulation of rights to control contingencies that makes an alliance particularly favorable to the R&D or to the financing firm” (Lerner and Merges, 1998: 134). Despite the realization that actual control results from bundles of rights, the possibility that the individual rights within the contract actually form configurations is passed over rather quickly. In fact, after the exploratory section, the analysis shifts to the investigation of the antecedents of the *total number* of control rights, and it is framed as a test of the Aghion and Tirole’s 1994 control model. Consistent with the model, the results confirm that the allocation of rights is strongly affected by the relative financial conditions of the contracting parties, an aspect often underplayed by the PRT tradition. However, the empirical findings also seem to contradict Aghion and Tirole, inasmuch as they show that in alliances negotiated at early stages of the discovery process, when the input of the R&D firm is supposedly more critical, R&D firms are allocated fewer control rights.¹²

Kaplan and Strömberg (2002) analyze the actual contracts between venture capitalists and entrepreneurs, with the expressed purpose of “informing theory”. Venture capital contracts sets up an ongoing relationship that is supposed to last for a long period. Accordingly much of their contractual provisions do not relate to a specific task. Rather, they allocate particular controls rights, set up governance structures and establish procedures that are supposed to steer the company through many unforeseeable contingencies. These rights and controls have been widely investigated by the financial literature, to the extent that the contractual provisions that institute them can almost directly be coded into variables. The authors regroup these variables in four major groups of rights: residual cash flow, board, voting, and liquidation rights. In substantive terms, the

¹¹ Actually the data analyzed are not exclusively contract clauses since the variables are coded from information collected by a specialized industry analyst that relies on a variety of sources, besides contracts.

¹² Given the puzzling nature of these results, it is a bit unfortunate that the authors did not discuss in detail the issue of endogeneity since it is perfectly conceivable that the financial strength of the R&D firm is affected by the number of patents it holds, the proxy for project maturity.

major finding of their analysis is that various rights are allocated separately (as found also by Lerner and Merges 1998), and are not perfectly correlated: ownership and decision right need not be perfectly aligned. This supports a view that control is more multi-dimensional and continuous than commonly thought. Rights are distributed approximately as predicted by the major extant theories, in particular by the classical principal-agent and by control theories. In particular, the findings that are more related to the allocation of authority are that, consistent with the control model of Aghion and Bolton (1992), in ventures with greater initial uncertainty about viability, venture capitalist receives more board and voting control and entrepreneur receives less.¹³ The authors also found that the frequencies and the values of contract clauses define statistically significant clusters and interpret this result as evidence of complementarities, but they do not venture into providing a substantive interpretation of clusters and in identifying antecedents of each configuration.

Kaplan and Strömberg further carry on their exploration in a later paper (2004). Here the analysis focuses on the *antecedents* of selected incentive and control mechanisms (e.g.: founder cash flow incentives, board rights, staging of funds), modelled independently from one another. The difference with the previous paper is that in order to measure the IVs the authors rely on a wholly different source of information: the venture capitalists' own assessment of risk.¹⁴ One reason of interest lies in the fact the study provides a rare test of *task complexity* (operationalized as "difficulty of execution risk") as a predictor of contractual clauses. Unfortunately, the paper investigates only the impact it may have on governance mechanisms usually associated with conflict of interests.¹⁵ The results of the analysis confirm support for the idea that internal risk (hidden information, hidden action, disagreement, and hold-up) is a powerful predictor of contractual characteristics. In particular it is associated with a greater allocation of authority to the venture capitalists (VC) in the form of board control.¹⁶ Task complexity shows a positive relation with contractual terms that are intended to reduce the entrepreneur's incentive to leave but is not

¹³ Consistent with the predictions of agency theory (Hölmstrom, 1979), the paper found that the pay-performance sensitivity of entrepreneur's remuneration decreases as asymmetric information about venture quality declines.

¹⁴ Since the variables come from a variety of documents - not just from the contract - and are often common between successive contracts, it can be said that the unit of analysis is the *deal* rather than the contract.

¹⁵ In this paper subjectivity in the measurement of this and other IVs clearly could be an issue. To circumvent this problem the authors supply readers almost literally with each sentence in the investment analyses documents that relate to the focal IV, and the way it was coded.

¹⁶ "Higher internal risk is associated with more VC control, more contingent compensation to the entrepreneur, and more contingent financing in a given round (...) Overall, we interpret these results as very positive for the agency theories (...) External uncertainty is also related to many contractual features. Like internal risk, higher external risk is associated with more VC control and more contingent compensation (...) with increases in VC liquidation rights (...) These findings are highly inconsistent with optimal risks haring between risk-averse entrepreneurs and risk-neutral investors" (Kaplan and Strömberg, 2004: 2199).

significantly related to board control.¹⁷ This can be interpreted as suggesting “that hold-up concerns matter in complex environments where the manager’s human capital is particularly important and standard incentive mechanisms are less effective” (Kaplan and Strömberg, 2004: 2200) but authority is not a proper remedy to that concern.

One contractual setting where authority has been found to be quite important is franchising. Franchising contracts are most often analyzed with principal-agency theoretical lenses. Therefore one would expect that the contracting problem can be solved through the arrangement of a proper set of incentives. However Arruñada, Garicano and Vazquez (2001) found that also authority plays a non-negligible role in that setting. In particular, they observe that franchising contracts in automobile distribution assign the manufacturer various “completion rights” that allow him to “render more precise and to adapt to environmental changes the obligations of the parties” (Arruñada, et al. 2001: 259).¹⁸ The authors posit that the allocation of authority to the car manufacturer should be positively related to horizontal network externality, that is, to the possibility for the dealers to damage brand reputation through improper behavior; and to the principal’s reputation, probably the main protection dealers have against principal’s opportunism (Arruñada, et al. 2005). The authors find that these hypotheses are supported by the evidence offered by a database of 23 franchising contracts.

Methodologically, it must be credited to this work the merit of being one of the first studies that empirically investigated the antecedents of a large number of variables directly measured from contractual clauses. A second motive of interest in the paper lies in the fact that the paper analyses both the use of incentives and the allocation of rights, as two sets of mechanism by which the relationship is governed. Finally, this paper also offers an example of investigation of complementarities among contractual clauses. Through the analysis of conditional correlations, some pair-wise complementarities are uncovered. While this represents a progress over studies investigating provisions in isolation, clearly this method does not allow us to see whether contractual clauses are bound together in wider patterns.

4.1.4 Enforcement

“Economic theories of contracting for the most part give little specific attention to enforcement issues; the presumption being that the courts will make sure (subject only to verifiability constraint) whatever terms contracting parties arrive at are fulfilled (Masten 1998: 1)”.

¹⁷ “Execution risk is significantly positively related to founder time vesting provisions and negatively related to contingent compensation and VC liquidation rights” (Kaplan and Strömberg, 2004: 2200).

¹⁸ Just to mention a few, the manufacturer has the authority to decide the sales targets, the size and décor of the show room, to set the maximum authorized price, etc.

If this portrait of economic theories of contracting is accurate, we can say that at least in this respect empirical studies are making a significant contribution to the advancement of our understanding. In this context it must be made clear that the fact of being a legally enforceable agreement is a basic trait of formal contracts that is understood by all theories of contracting. Therefore, what may or may not come under scrutiny is the extent to which contracts set up mechanisms for self-enforcement.

The above-mentioned study by Arruñada et al 2001 undertakes to investigate precisely this: whether enforcement, besides incentives, also plays a role. The mechanisms they consider are second-party termination rights¹⁹. The authors find that in the context of automotive dealership franchising, manufacturers' termination rights are positively and significantly related to variables proxing the horizontal externalities arising from dealers' shirking. A second interesting finding is that termination rights with completion rights. This suggests that second-party discretion in termination is present when that party has more scope for decision making.

Lerner and Malmendier (2005) investigate enforcement mechanisms in the context of biotechnology research agreements. They observe that contracts in this setting often assign unilateral termination rights coupled with expanded access of the financing firm to the intellectual property of the alliance. The authors propose a model that interprets this empirical feature of biotechnology R&D contracts as a way for the financing firm to achieve a higher expected payoff from the collaboration than in the alternative case of contracts without such option, when the research output is non contractible.²⁰ The rationale for this explanation is that the parties may remedy the shortcomings of contractual incompleteness (meant as the impossibility to contract over the exact nature of certain tasks and to prevent that the partner engages in multitasking) by assigning decision rights that govern the actions of the other party. The authors underline that this represents a departure from previous models that emphasized the allocation of firm ownership.

The empirical part of the paper is presented as a test of the propositions developed in the theoretical model.²¹ The findings show that non-contractible output, a proxy for contract uncompleteness, significantly affects the probability that the R&D contract contains termination and intellectual property reversion rights. The authors also discuss at some length how the results can be

¹⁹ Arruñada et al 2001 also consider monitoring rights. We shall treat monitoring as a separate dimension and report their findings under later.

²⁰ It must be noticed that the contract the authors focus upon only improves the payoff of the financing firm, not the overall surplus. Therefore the allocation of property rights it establishes is profit-maximizing for the financing firm only if it is assumed that the R&D firm is financially constrained, hence unable to compensate the financier for agreeing to a different arrangement.

²¹ The dependent variable (DV) is operationalized in two alternative ways. All the operationalizations deliver approximately the same results. The operationalization of the main independent variable (IV) (non contractibility of output) takes advantage of a particular feature of biotechnology research, were it is easy to classify projects according to the fact that a lead product candidate is specifiable or not at the time of the agreement.

better reconciled with their property-rights explanation rather than with alternative stories based on uncertainty and asymmetric information.

Contractual hostages are one particular type of contractual enforcement mechanisms that operates in a pre-emptive way. Helm and Kloyer 2004 analyze the ex-post (bonding) function of hostages in the context of R&D interfirm cooperation. In such setting, they argue the R&D exchange supplier faces a double risk. The first and foremost is that the buyer insights into his own knowledge foster the creation of a competitor. The second risk is that the potential for supplier's return on his (largely intangible) specific investment is threatened by his dependence on the buyer and by the uncontractibility of a basis for shared revenues when the R&D exchange concerns early stages of the research process. As suggested by TCE, Helm and Kloyer posit that those risks could be controlled by contractual hostages supporting an option for the supplier to negotiate a share of continuous returns when the prospects for producing a marketable product become clearer. Further, the authors analyze an array of contract clauses that could play the role of hostages thanks to the possibility they entail to block or impede the production and marketing of a final product. These clauses include supplier's threats, like the right of exploitation of further developments of the contractual project, and buyer's commitments, like the right of the supplier to be informed about further developments. Using a database of 98 questionnaire observations, Helm and Kloyer show that empirically some such hostages are perceived to be effective by the R&D suppliers that actually had them included in a contract, the more so the higher the uncontractibility of research output. The authors also find that the perceived control of both components of exchange risk increases with a growing number of contractual hostages.

The issue of intellectual property rights (IPR) in alliances is often investigated on a standalone basis. However, in most cases a deeper understanding is to be reached by setting them within a broader framework of incentives and enforcement mechanisms. This at least seems the lesson to be drawn from the case analyzed in Dekker 2004. Dekker carries out an in-depth analysis of a buyer-supplier alliance that pursued a double goal of innovation and supply in the field of railway safety systems. The parties had a long standing business relationship in which many issues, including intellectual property, had never become sensitive. The decision to strengthen the relationship into a strategic alliance brought to surface the fact that deeper interaction could expose them to different risks, both related to proprietary knowledge: the supplier could be exposed to the spillover of sensitive information while the buyer was risking excessive dependence on technical knowledge that was only partly codified. These concerns were cured through reciprocal concession of commitments, supported by greater formalization of intellectual property. Supplier agreed to formalize specifications of tasks previously held tacit and received from the buyer an explicit

recognition of IPR on all background and foreground knowledge. Conversely, the buyer was granted nontransferable and nonexclusive licence for the use of technology. While these arrangements may have contributed only marginally to altering the incentives for the parties to actively engage in the innovation task of their collaboration, at a minimum they offered them safeguards that the potential negative effects of the collaboration had been properly ‘sterilized’. One contribution of this paper is to bring our attention to the fact that appropriation concerns that must be dealt with in inter-firm relationship extend beyond the sharing of the financial proceeds from the exchange, and include also intermediate and ancillary resources that the parties bring to the collaboration.

4.1.5 Behavior control

By this expression we mean the prescription of specific behavior that is observable and verifiable and that, unlike threats, is not aimed at preempting an advantage. The expression ‘restraints’ is also used in literature with the same meaning (Klein and Murphy 1988). Even in a principal-agent perspective of control, where monetary incentives grab the lion’s share of attention, whenever behavior has such characteristics it should form the basis of contracting (Eisenhardt, 1984). Clearly, in a complete contracting perspective the prescription of observable and verifiable behavior should not pose major problems.²² Perhaps this accounts for that fact that the extent to which a contract ought to prescribe observable and verifiable actions receives only scanty attention in recent empirical literature.²³ However, even in a context, like franchising, where (linear) principal-agent models have performed best (Masten 1998: 7), contracts exhibit variance in the extent to which they specify certain obligations of the parties. This is one problem investigated in Brickley (1999). Actually, Brickley’s research question is not formulated in such general terms. Since his database relies on a publicly available source book that compiles basic contract information, he has to focus on the only three contractual clauses for which information is available. The contract clauses investigated (restrictions on *passive ownership*, *area development plans* and *mandatory advertising*) are specific of franchising contracts, but the findings relating to them can be interpreted in more general terms. In fact, restrictions on passive ownership have the effect of restricting the agent from allocating effort to other outside activities, thereby reducing the opportunity cost of working at the unit; area development plans, by granting the agent a claim on multiple positions, internalize some effects of the agent’s effort and reduce the horizontal free-

²² It may still pose a problem of adaptability in an incomplete contracting perspective. We shall discuss this later.

²³ Instead, it did not escape agency theorist that restrictions on the actions of agents may provide them incentives to exert effort on behalf of the principal.

riding problem²⁴; finally, mandatory advertising cures the free-riding problem by setting a minimum level for an observable input to be supplied by the agent. The findings support the hypothesis that use of these clauses would be increasing in the intensity of various measures of horizontal externalities. By abstracting further, we can say that the message conveyed is that contracts can help solving one classical market failure, directly dictating performance (when that is observable and enforceable) by tampering with the payoff of free-riding, and by removing externality. As a result of the first and second remedy, we should observe the obligational intensity of contracts to be increasing with the risk moral hazard.

4.1.6 Monitoring

Monitoring may be considered as an integral part of the enforcement apparatus. However there also reasons to single out it out as a significant dimension not fully overlapping with other components of enforcement. Monitoring is a process through which information is ‘purchased’ and made available, usually to the party that needs it most. Therefore besides providing the basis for rewarding performance and punishing deviations, monitoring can also serve purposes of decision-making, verification of compatibility of actions with goals, and adjustment of cognitive frameworks. This applies particularly to those terms in contracts that set up reporting and checking devices and call for written departures from the agreement. This leads us to predict that when joint action on uncertain tasks is contracted, we should expect the contract to feature monitoring in excess to what is required strictly for the purpose of rewarding performance and deterrence of misbehavior. At a minimum, even if one can screen good types from bad ones through incentives or other mechanisms, when tasks are epistemically complex she can never be sure that her partner in the relationship will be able to accomplish his share of the collaboration, and she is better advised to monitor the collaboration while it unfolds

Arruñada et al 2001 investigate the use of monitoring in franchising relationships as a device to control for franchisee’s moral hazard. They estimate the regression coefficients of the number of monitoring rights assigned by the contract to the franchisor on three independent variables capturing the cost of horizontal externalities arising from possible agent’s misbehavior, as in the analyses of control and termination rights, and find that greater risk of shirking is significantly associated to more obtrusive monitoring. Additionally, they find that the intensity of monitoring rights is complementary with the use of incentives, as to be expected.

²⁴ As argued by Klein and Murphy (1988), as long as the marginal return to a franchisee is only a fraction of the total return of an extra sale, the franchisee chooses to provide a lower amount of services than would be optimal from the point of view of the whole franchising network.

Kaplan and Strömberg 2002 only provide evidence on monitoring in the form of data and analysis on board rights in venture capital financing contracts. Besides advising and evaluating top management, the board plays other functions related to corporate decision-making. However, Kaplan and Strömberg find out that in VC financing, board rights (the number of seats allocated to the entrepreneur, to the financing company and to third parties) can be separated from voting rights through explicit agreements, and actually are, particularly in case of adverse circumstances. This separation allows us to assume that 'board rights' in that sense are somewhat decoupled from authority and decision making, and are more akin to the supervisory and monitoring dimensions of contracting. Since this interpretation is debatable, we shall not dwell further into details, but shall only take notice of the two major findings of Kaplan and Strömberg in this area: that board rights allocated to the venture capitalist can be state-contingent (typically they increase with default on dividends), and, overall, they tend to be higher if the company has no revenues at the time of financing. These findings may be taken to suggest that enhanced supervision and monitoring by the principal are required when financial adversities render mistakes more costly and when a short track record makes it more difficult to assess the founder's type.

Dekker 2004, in the above mentioned study of a buyer-supplier alliance, also observes a significant role for monitoring, in an alliance where explicit incentivization is also provided for. In the focal alliance two organizational structures in particular – the alliance board and ex-post mechanisms like open book accounting – contributed to the monitoring function and were instrumental in the reduction of information asymmetry between the partners. Dekker notices a significant influence of coordination requirements on the formal control structure – as we shall discuss later – but his findings on the specific function of monitoring are not particularly unsettling of the received wisdom. From the purposes of our study it is relevant that Dekker finds that definitely some of the mechanisms for monitoring are directly provided for in the contract. Unfortunately the paper is also a bit vague on this point, so that we are left unable to assess to what extent, the definition of certain monitoring mechanisms has been delegated to the post-contractual implementation stage.

Another study that considers monitoring an important dimension of inter-firm contracts is Ryall and Sampson 2003. These authors have developed a scheme to code variables from actual content of technology alliance contracts, and have measured five items relating to monitoring. However, the formal analyses carried out by the time their working paper was released have focused only on other dimensions. As analyses progress, we shall gain a better understanding of the role of monitoring in their setting and how much prior alliance experience with same partner

impacts on the need for monitoring. So far, the authors seem to subscribe to the conventional view that monitoring, essentially, is in response to moral hazard problems.

In sum, several of the authors reviewed and still others see a role for monitoring in contracting and, sometimes, they describe it out as a contractual dimension. The empirical evidence available is not abundant but to date it does not pose radical challenges to received views of monitoring.

4.2 Formal dimensions

Economists' contractual archetype is the complete contingent claim contract. 'Complete' means that it leaves no possibility to improve efficiency by an ex-post adjustment of actions. Ex-ante this is achieved by figuring out contingencies and prescribing a joint-surplus maximizing action in correspondence to each them.

As explained in Masten (1998), originally the complete contingent claim contract was conceived as an analytical device to model general equilibrium, rather than as a model of contracting per se. Thus, it is no wonder that it is a highly unrealistic depiction of real-world contracts. Sooner or later the assumption of 'completeness' had to be relaxed. Recalling this genealogy helps understanding that 'incompleteness' is to be simply understood as "possibility to improve efficiency ex-post" and that its main corollary is the need for governance devices in addition to the prescription of behavior. However, this change of assumptions also inspired a stream of research that focused on measuring the 'degree of completeness' or related concepts, rather than focusing on governance mechanisms. That this borders on logical impossibility escaped the attention of most. In fact, whether in a specific contracting case the possibility to improve efficiency ex-post exists or not, the researcher is quite unlikely to be able to tell, if the the contracting parties where unable to figure it out in the first place. Our classification of contract dimensions as 'formal' or 'content-related' was motivated primarily by this idea, above and beyond considerations about its heuristic usefulness.

As we shall see studies in this stream use a variety of denominations and operationalizations of concepts. We shall regroup them under three labels – complexity, contingency planning and ambiguity – that correspond to three contractual strategies that are supposedly effective to fulfill two competing requirements: reducing the risk of moral hazard and ensuring that the possibility of harmonious ex-post adaptation.

4.2.1 Complexity

Contracts are incomplete, we are told, because of the limits of our cognitive capabilities. As a result we must figure out other devices to prevent information problems, motivation problems and incomplete commitment problems. However – one could reason – the higher the stringency of the language and the harder the exertion in foreclosing the possibilities of misbehavior, the more closely real-world contracts will approach the complete contract archetype. This is approximately the reasoning that inspires the research on contract complexity. As a result of greater drafting effort – it was thought –the contract should be longer, include a higher number of clauses and provide for a larger array of enforcement mechanisms.

One early empirical study that investigated these ideas is Parkhe (1993). Actually, this study concerned itself with the wider problem of explaining differential performance of strategic alliances as a function of their structuring. However, Parkhe considers to be part of this structuring both the contractual aspects of the cooperation, and non-contractual governance mechanisms, like mutual hostages and other characteristics of the relationship that underpin social- and self-enforceability of agreements. Despite dedicating only tangential attention to the formal contract, Parkhe devises an operationalization of the degree of “contractual safeguards” that will influence many later studies on contracts in the strategic management perspective (Deeds and Hill (1998), Ariño and Reuer (2002, 2003, 2004), Reuer and Ariño and Mellewigt (2003)). What he does is to look at the presence in contracts, or absence thereof, of some clauses (out of a total set of nine) that embody the enforcement apparatus. He thinks that he can rank them in order of “increasing stringency” so that he can assign them a stringency score and summarize them in an index of “ex-post deterrents”. Given such operationalization, a contract scoring high on this index is well equipped to cure moral hazard, but can do little against incomplete commitment. Accordingly, we think it suitable to consider this a study of ‘complexity’. Parkhe’s substantive finding is that the intensity of these contractual safeguards is negatively related to the “shadow of the future”, that is, to the intended duration of the alliance and to the ease with which the partner’s actions are observed.

A study that is relevant in this context is Luo (2002). Luo realizes that what had attracted attention so far – the intended ‘completeness’ of contracts – is actually a cure to two distinct problems: of motivation and of incomplete commitment. Hence, he argues, ‘completeness’ must be itself a multidimensional concept, comprising what he calls ‘term specificity’ and ‘contingency adaptability’. The former “concerns how specific and detailed the terms are”. The latter is “the extent to which unanticipated contingencies are accounted for and relevant guidelines for handling these contingencies are delineated in a (...) contract” Luo (2002: 905). This claim is empirically validated because his study finds that the questionnaire items chosen to operationalize the two constructs load on two separate factors in the expected way, and have a high Cronbach alpha in both

cases. Unfortunately the paper does not attempt to model these variables in term of transaction characteristics or other contextual variables. In our understanding the content domain sampled by ‘term specificity’ has little to do with the articulation and extensiveness of the contract. Yet some scholar has considered it an alias of ‘complexity’.

Poppo and Zenger (2002) test the idea that the complexity of the contractual governance apparatus employed in outsourcing relations in information services increases with the intensity of exchange hazards. The interesting aspect of this paper is the fact that exchange hazards are not spelled out only as the risk of opportunism, but also include the environmental uncertainty associated with technological change. The authors find the regression coefficient of the latter to be negative. Their interpretation is that as uncertainty becomes very severe managers may lose confidence in contracts. We may advance a competing interpretation that as uncertainty increases managers resort to contracting that differs along dimensions other than complexity. Unfortunately neither hypothesis can be disproved with the data available, since all that is known about contract content in this paper comes from a single questionnaire item asking respondents about the degree of customization in their contract.

Ariño and Reuer (2002, 2003, 2004) build on Luo (2002) and explain that ‘contract complexity’ (the number and stringency of the provisions provided) is conceptually distinct from ‘contract completeness’ (the extent to which the contract accounts for unanticipated contingencies). However, departing from Luo, they propose that lack of detailed knowledge about the transaction a contract refers to (which most often obtains in cross sectional comparisons of contracts), makes it impossible to compare contracts along the second dimension. Hence they focus on contract complexity and rely on Parkhe (1993) for its operationalization. As to its antecedents, the authors argue that contract complexity depends on the strategic importance of the alliance and on variables that can be interpreted in terms of behavioural and environmental uncertainty. The empirical analyses of Ariño and Reuer (2003), based on 88 responses to a questionnaire administered to dyadic alliances, generally support these relations, particularly the one between complexity and strategic importance. However, variables relating to environmental uncertainty were not significant in several specifications of the model.

An interesting part of this study is that besides estimating models of complexity the authors also explored whether ‘complexity’ is itself multidimensional. They applied factor analysis to the contract clauses and found that they loaded on two factors, labelled by the authors ‘partner control’ and ‘operations control’. Unfortunately, the limited size of the sample, the small number of

contractual clauses that were coded and the fact that they were observed through questionnaire items rather than directly measured on contracts, somewhat limit the significance of this exercise.²⁵

Another study that provides evidence on contract complexity is Anderson and Dekker (2005). This dimension is referred to by the authors as ‘extensiveness’ and it is operationalized as the number of contract terms included in the contract, out of a pre-defined set of 24. The authors investigate the impact on contractual complexity of all the canonical TCE dimensions of transactions and find them to be significant and of the expected sign, except for uncertainty. Given the context investigated, the authors think that ‘size’ of the project captures the risk of hold up better than ‘frequency’. Quite unsurprisingly ‘size’ turns out to be by far the most significant antecedent of complexity.

Overall, we think that the available evidence on complexity and its antecedents is not very compelling, except perhaps the finding relating complexity with indexes of transaction ‘size’ and ‘importance’. Thus, the strongest indication we have that the greater the contractual hazards the more an efficient contract *ought* to be complex, is perhaps one finding in the above-mentioned study of Helm and Kloyer (2004: 1120): “The *perceived* control of both components of exchange risk increases with a *growing number* of contractual hostages” (our emphasis).

4.2.2 Contingency planning

The task of investigating the contingency adaptability horn of the question of ‘completeness’ has been undertaken by Mayer and Bercovitz (2003) who ask to what extent the parties resort to ‘contingency planning’. The operationalization of the construct is explained in rather vague terms but it appears that it contrasts ‘rough processes’ with ‘detailed response rules’.²⁶ The variable is coded from actual content of 386 contracts. The authors find that the use of contingency planning in a contract is positively related to the level of contracting problems arising from task interdependence (the higher the interdependence the more extensive the planning) and concerns about the appropriability of proprietary technology, and negatively related to the cost of specifying

²⁵ The authors rightly recognize the problem that factor analysis assumes multivariate normality and uncorrelated errors in all variables while their contractual dummies violate the assumption. They circumvent this difficulty by running factor analysis on a matrix of tetrachoric correlations that are continuous by construction. While this is technically more sophisticated than previous papers, it still does not overcome the usual limitations ascribed to factor analysis, which is known to fail frequently in the identification of substantively meaningful dimensions. More fundamental objections are that the procedure of applying factor analysis to a set of only eight variables identified from a search of the legal literature seriously risks to “tautologically echo one’s pre-existing cognitive schema” (Suchman, 1994: 315) and is unlikely to produce much new insight into the dimensions of contracts.

²⁶ “In contracts having standard levels of contingency planning, the parties acknowledge that things might go wrong and outline a rough process for dealing with problems, but they do not develop explicit response rules for specific classes of events. In contracts having high levels of contingency planning (coded as 2), in contrast, we see detailed provisions for the handling of specific concerns – such as intellectual property issues and resource allocation issues.” (Mayer and Bercovitz, 2003: 18)

contingencies. Empirical regularities notwithstanding, it is a bit difficult to make theoretical sense of these relationships, though it sounds reasonable that higher interdependence increases the risk of unexpected outcomes and calls for greater planning of alternative scenarios.

Another paper that addressed the issues of the foresight of contingencies in contracting is Elfenbein and Lerner (2004) that studied this problem in the context of alliances between internet portals and other partners. A peculiar characteristic of the setting is that the realization of contingencies – in the sense of levels of performance of the parties – would be cheaply observed and verified. However, as a matter of fact, contracts are often left less complete than would actually be feasible. Elfenbein and Lerner interpreted this with the help of recent literature on information and control, as a consequence of the fact that verifiable measures may only be noisy reflections of *desired* performance. In other words, the ease of performance measurement would only be illusory. Apart from this original finding, other indicators of contractual hazards, like anticipated conflict of interests, are found to impact on the use of contractual contingencies positively and significantly.

In this context it is worth reminding the above-mentioned classical study of Masten and Crocker (1985) that allows a dual reading of its findings in terms of contract adaptability. As said above, their study shows how long-term contracts can achieve considerable flexibility through the simple inclusions of a unilateral option ('take-or-pay'), without resorting to many clauses that are liable to misinterpretation or deception. This example indicates that perhaps adaptability is better thought of as an emergent property of contracts, rather than as a dimension. If this view is correct, the implication is that "contingency adaptability" measures at best the intended adaptability of contracts, rather than the actual one.

4.2.3 Ambiguity

While enlisting contingencies seems an unwieldy way of increasing the adaptability of a contract, an alternative strategy looks more promising, and perhaps it is applied more often. As noticed by economist Al-Najjar (1995) one way to restore flexibility in a contract is to introduce ambiguity, that is, to state broad requirements without restricting the parties to specific actions. Scholars familiar with actual business contracting practices agree that this is quite a common strategy. For instance, Turner (2004) informs us that fixed price contracts for construction projects can be based on "fixed design", on "scope design" or on design based on "cardinal points", clearly in an increasing order of specification ambiguity. In the period we are considering, we do not know of many studies that have investigated expressly contract ambiguity. However, we can gather some

empirical evidence from studies designed to investigate other concepts, and often the opposite of ambiguity: contract ‘detail’.

The study by Ryall and Sampson (2003), already mentioned for its implications about monitoring, has developed six items to measure the content relating to ambiguity in a set of over one hundred technology alliance contracts. Those items are intended to measure ‘completeness’ but in the last analysis they all relate to the degree to which required inputs, expected outputs and division of intellectual property rights are fully specified, so that, consistent with our premises, we think they suitably capture the contracts’ ambiguity. While rich in terms of measuring contract content, Ryall and Sampson’s database is somewhat limited in terms of information on transaction characteristics and other contextual variables. Thus it only allows the authors to analyze contractual complexity in terms of characteristics of the *relationship*. Their key findings are that contracts are *less* ambiguous when firms have prior alliance experience, and are *more* ambiguous when firms have prior alliance experience with same partner. These, findings point to the existence of a learning effect in contracting, whereby the capacity to draft detailed contracts increases with the experience, and to a substitutability relationship between contractual and social governance.

Another study that informs us about the use and limits of ambiguity in contracting is Corts and Singh (2002). The interested reader may refer to the comments on this paper we did in the section on remuneration and risk allocation. Here we just remark the implication that the optimal level of contract detail has to be decided by trading off the benefits of controlling moral hazard against the costs of increasing the risk of maladaptation that specification entails. In fact, Corts and Singh find that contracts based on more ambiguous terms specification are increasingly opted for when previous experience with the same partner assuages the fear of moral hazard. In a similar vein, Brickley 1999 notices that the preciseness of behavior prescriptions in franchising, increases with the horizontal externalities associated with franchisee’s moral hazard.

Finally, also the study by Crocker and Reynolds (1993) contains a message about this dimension and its antecedents: ambiguity is endogenous to the relationship and “transactors’ choice of contract terms reflects a trade-off between the specification costs and rigidities associated with specifying detailed performance obligations (...) and the greater flexibility but higher expected cost of establishing the terms of trade ex-post (Masten 1998: 16)”.²⁷ Among the factors that call for more ambiguous specifications is task uncertainty, while a known propensity of the contracting party for litigiousness advises a better definition of contractual obligations. While the last finding may seem in contrast with those of Corts and Singh, we aver that it is not. In fact the ‘propensity for

²⁷ For precision’s sake, Crocker and Reynolds use ‘completeness’ instead of ‘ambiguity’ but the contract characteristic they measure better captures the dimension of ambiguity.

litigiousness' measures a trait of character, the counterparty's proneness to opportunism, not the risk of renegotiation associated with the degree of contract specification, *given* the character of the counterparty.

4.3 Further functions and dimensions of contracts

So far we have reviewed studies that were amenable to time-honoured economic or organizational dimensions. However, there are also a few studies that identify 'anomalies' not easily explained by accepted theories of contracting, others that unveil previously not considered functions of contracts and still others that propose quite radically different interpretations for observable characteristics of real-world contracts. In the spirit of enriching our perception we shall present them in this section that concludes our review.

Robinson and Stuart (2004) carry out an investigation of financial contracting, in the biotech industry. By the authors' admission, their study is exploratory. This explains the lack of clear research question as well as a partially developed theoretical framework. Unlike Kaplan and Strömberg, these authors focus on project- as opposed to firm financing. Their investigation relies largely on contracts as a source of information. However, the authors code only the most unambiguous contract provisions (e.g.: key-man provision, possibility of contract extension, meeting frequency) and not many of them either.²⁸ Although the paper gains some insight into contract characteristics and into the antecedents of certain contract provisions (like termination and input specification), the analysis focuses more on assessing the complementarity and substitutability of contract and other forms of governance, like ownership structure and relational governance.^{29 30} This indeed is an important question, normally left unanswered by other studies. However, a more direct approach to the problem is advisable. One take out from the paper is that there is *prima facie* evidence that contract content is influenced by *firm characteristics*, besides transaction-related features. A second finding worth notice is that the parties often contract specific behaviour without establishing any mechanisms to monitor it. As a result, some payoff related variables are not observable, let alone verifiable. While social control may be the mechanisms that fill the gap, these best effort clauses also inspire an alternative conjecture that contracts also serve

²⁸ Altogether the paper mentions eighteen variables, many of which are firm-specific, rather than transaction-specific (firm age, firm centrality, prior alliances, firm value, etc.)

²⁹ Although the paper investigates the financing of R&D projects, many alliances also involve an element of equity financing, which makes it possible to investigate the issue of ownership.

³⁰ The evidence that leads to some of the key findings is actually quite indirect. In fact, the variables that operationalize different forms of governance always appear among the explanatory variables rather than among the dependent variables.

as blueprints for action, besides controlling for opportunism, a contention also advanced by Ryall and Sampson (2003).

A study that alerts us about other possible functions of contracts is Dekker 2004. Echoing Gulati (1995) the author claims that “a contract is not only used to reduce a partner’s incentives to behave opportunistically, but in addition serves as a framework for coordination in which the cooperation proceeds” (Dekker 2004: 31) and sets forth to look for supporting evidence in the case study mentioned above. His findings corroborate this view and uncover that not only inter-firm relationships have both a contractual and a procedural (coordination) dimension, as found by Sobrero and Schrader (1998), but that empirically it may not be possible to separate the two dimensions, since contracts themselves can provide for coordination mechanisms, whose intensity increases with the information processing requirements associated with higher interdependence. In the process, Dekker also unveils other functions of contractual governance. He finds that one motivation for the contract is the need to provide *stability*, an anchoring to the alliance, given the possibility that either partner’s management is replaced by another management with different ideas about the alliance. Additionally, but relatedly, Dekker finds that the contract can serve as a *repository of memory* and helps introducing new people to the alliance

In Grandori and Furlotti (2005), various contributions from extant theories of contracting and from organization studies are combined in a new perspective. This study argues that under more radical uncertainty than it is implicit in the archetypical transaction of TCE, a focus on specific tasks and on the foresight of contingencies is a wholly unsuitable contracting strategy, since what constitutes ‘proper’ behavior needs to be discovered in the first place. In such circumstances, an effective contracting strategy should be to shift the matter of contracting to something that is capable of generating actions and setting terms of exchange: resource commitments (and the property right allocations that define and protect them), and decision procedures and rights that state ways of selecting actions. In other words, contracts with such characteristics, should be concerned with setting up communities of fate, associations, and endow them with suitable decision procedures and allocation of responsibilities. Then, as a way of illustration, the paper scans three contracts of strategic alliances. The finding corroborates the claim: the contracts can be suitably described as composed of an ‘associational’ core surrounded by a belt of coordination mechanisms. Differently from what the usual ‘market + hierarchy’ notion of hybrids implies, these contracts feature multi-party ‘democratic’ decision making (through voting, negotiation and specification of discretion areas) as the main coordination mechanism, complemented by bureaucratic and market-like mechanisms, depending on the degree of uncertainty and the level of definition of the activities.

5. Methodological assessment

We shall begin our assessment of the literature we have reviewed, with some comments concerning the data and the methods used. First, it appears that about thirty years from its inception, empirical research on contracts is still quite constrained by problems of data availability. Firms do not disclose contracts easily. As a result, researchers can normally access only contract data that are disclosed on concern of public policy or in consideration of the impact they have on regulated financial markets. Clearly there is an issue of self-selection bias of the samples available, that researchers are finding almost impossible to fix. As a result of the difficulty of access, questionnaire survey is a commonly used method to acquire information on contract content, although the practical limitations of this instrument normally advise researchers not to address respondents as many questions as would be desirable.

Studies based on actual contract content are still rather few. In the sample we surveyed they were ten out of twenty seven (see a table in the Appendix on the distribution of articles by data source). Though a non-negligible proportion, the actual figure is smaller than it appears. In fact, some of the studies that investigated actual contract content based most of their analyses on readily-available variables coded by industry analysts, who had not necessarily specific theoretical concerns in mind. Others simplified the task of coding by focusing on just one or two contract terms. Thus, we can say that the richness of contracts as an empirical artefact is yet to be thoroughly investigated. However, the fact that studies based on direct content reading were all produced in the last five years indicates that a considerable effort is currently being done to fill this gap.

Scarcity of data apart, this task has been hindered also by the difficulty of mapping theoretical concepts on real contracts. As mentioned above, we often see a certain construct operationalized in quite different ways. While this advises greater attention in the operationalization stage of the research process, the theories that inspire empirical studies are not entirely blameless, since we also see considerable vagueness surrounding the intended domain of content of core constructs, like ‘completeness’, ‘contingency planning’ etc..

Finally, the empirical literature on contracts seldom engages in the task of sorting out contractual forms that proved efficient for the governance of a certain kind of inter-firm relationship, from those that were not. Among the studies in our sample only Ryall and Sampson display awareness of this issue, in the decision to base their coding scheme only on the contracts of firms that “had the opportunity to adapt alliance contract terms in response to successes and failures over time” (Ryall and Sampson, 2003: 15). Future studies will have to cure this

'naturalistic fallacy' and devise some convincing indicator of performance, for contract design to make more credible progress.

6. Substantive assessment

In his review of empirical literature on business contracting, Lyons (1996) noticed that although theoretical studies had begun in the seventies, empirical investigation on contracts did not start in earnest until ten years later. However, by the time Lyons was writing a considerable amount of empirical work already existed. Our review reveals how much progress has been achieved in the following decade. Some relations among variables have been confirmed as well supported. In particular, it is pretty well established that specific investment calls for longer contract duration and that duration has to be balanced against other transaction costs. Further, abundant evidence exists that incentive intensity increases with expected opportunism and decreases with uncertainty.

While these relations were already known from theoretical inquiry other facts and regularities may be considered as original contributions of empirical studies. We owe to recent investigations the realization that authority allocation between the contracting parties needs not be stable and that authority allocation needs not correlate with ownership. Also we can claim that empirical literature is raising our awareness on the role and working of various enforcement mechanisms. Some studies have made us realize that appropriation concerns relate to a wider number of issues than just the sharing of the net surplus of the alliance, as Gulati and Singh (1998) still seem to consider. Further, empirical investigation has begun to address the issue of complementarities between various contractual elements. There is already rather clear evidence of a complementarity relationship between authority and enforcement mechanisms and between incentives and the use of monitoring. Furthermore, the analysis of real-world contracts has exposed the fact that adaptability can be achieved by very simple means, and that the explicit foresight of contingencies is quite an unwieldy way to increase contract flexibility.

While all these may seem satisfactory results, it is also clear that a lot more remains to be done. During the last ten years the contracting situations considered in the literature have considerably expanded. In fact, while virtually all the studies reviewed in Shelanski and Klein (1995) analyzed contracts relating to the simple exchange of goods or services, recent studies are focusing more and more on relationships where the interdependence among the parties arises from the joining of resources and from collective action. Yet, it appears that the conceptual apparatus employed is still the one that was moulded essentially on transactions of the first type. The fact that most of the studies reviewed are essentially tests of existing models seems to be responsible for this

situation. Actually, during the last decade case studies have almost completely left the stage. We think that more of them are needed to attain a more nuanced understanding of contracting.

Our review also shows that the field had a considerable need that rather idiosyncratic dependent variables be harmonized within a few contract dimensions. This need was probably stronger than it appeared, since in some cases we have summarized the findings directly in terms of meta-concepts, instead of the original variables. The need for harmonization was particularly evident in the case of formal dimensions. Perhaps bringing order to this area can be regarded as the main contribution of this paper.

Our review also reveals – and emphasizes it through the classification adopted – that empirical studies have asked contracts – often without fully realizing – two different classes of questions, that correspond to different views of the same concept. The first considers formal contracts as documents containing sets of rules, and focuses on formal aspects that pertain primarily to each set of rule and to its relations with rules of higher and lower order. Studies in this perspective ask how ‘complete’ a contract is, how ‘specific’ and ‘ambiguous’ its terms are. In the future, research along these lines could further ask how ‘flexible’, ‘permeable’ or ‘durable’ it is (Suchman, 2003). Instead, the second perspective focuses on the social apparatus that yokes the parties together as a result of the contract. Simple as it is, this basic distinction seems to have escaped undetected. Our perception is that it has some heuristic value, particularly in the setting of an agenda for further inquiries.

Our review also points to some questions still open to investigation. First, it appears that the gauntlet thrown down by Stinchcombe has not been picked up yet. Stinchcombe had proposed that contracts are an organizational phenomenon, a functional unity of several elements that contracts have in common with hierarchies and other organizational forms. However, since then only very limited attempt has been done to uncover the use of new elements, besides those that had already been established: incentives and decision rights.

Similarly, and relatedly, the claim that contract governance is shaped not only by the appropriation concerns but also by the coordination requirements of a given inter-organizational relationship has been established as an issue worth studying and has been somewhat corroborated. However, the evidence available is still too scarce, and the issue definitely requires a lot more investigation.

As to the new perspectives, we think that the idea that under conditions of radical uncertainty the matter of contracting itself may switch from tasks to resources deserves serious consideration. Originally it was considered that contracts attain the adaptability required to face uncertainty by means of ‘presentiation’, that is, thorough the effort to perceive or realize future

contingencies at present (Williamson 1985: 69). Later, TCE introduced the possibility that adaptation is achieved by incompleteness, coupled with mutual hostages and the other elements that constitute a private ordering. However, the idea that contracts could obtain that end thanks to the properties of higher-order norms, that are sufficiently abstract and procedural to leave room for discretionary behaviour, and discovery, while “being acceptable for a wide range of different interests” (Grandori, 1997b) represents in our view an original concept. If this is true, and if – as a result – some contracts can be seen as having an association of resources at their core, an important implication follows. So far our understanding of contracting as an economic institution has taken advantage of contributions from the legal scholarship on contract law. However organizational law is still conspicuously missing from the textbooks of law and economics. If contracts come to be understood as sharing some traits with associations there is surely a lot to be learned also from this other branch of legal scholarship.

7. Conclusion

In this paper we have reviewed current empirical research on contracts. We have found that it lends broad supports for propositions developed by leading theoretical approaches and that it yielded a number of original findings, mostly of rather incremental nature. At the same time it appears that a rather single-minded concern with the control of appropriation concerns is hindering a more uninhibited investigation of those additional functions– like the management of coordination requirements – that more and more insistently contracts are argued to perform. It also appears that the traditional conceptual apparatus is somewhat under stretch when applied outside its original main case to interpret situations of intensive interdependence. Thus, to answer our initial question, we can say that extant theories provide a suitable tool to analyze the basic functions of contracts but at a minimum the “lens” needs polishing. And it is also possible that, if supported by systematic evidence, the hypothesis that radical uncertainty makes resource-based contracting better suitable than task-based contracting, proves even more deeply unsettling of the received wisdom.

While planning to cure these shortcomings one may find that Stinchcombe (1990) provides a useful generative metaphor that has not been put to work in earnest. Stinchcombe maintains that contracts need to achieve the same functions as ‘hierarchies’, because they face the same kind of uncertainty and achieve these functions by incorporating elements of hierarchy. Some of the ‘hierarchical’ elements of contracts have been already thoroughly investigated (in particular, incentive systems and decision rights) under the influence of this metaphor or independently from it. However others remain that require better understanding. For instance, we know little about whether and how contracts establish standard operating procedures, a typical feature of

organizations. Moreover, dispute resolution procedures provided for in contracts are also understood only partially. Focusing on these and other limitations under the metaphor that contracts are an organizational phenomenon offers a clear and challenging research agenda, one that promises to reveal that there is more to contracts than just incompleteness.

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1. Appendix – Empirical studies by data source

Study	Core DV	Data
Dekker 2004	Outcome control; Behavior control	Case study
Arruñada et al. 2001	Principal's discretion	Contract data
Elfenbein and Lerner 2004	Contingent rights	Contract data
Kaplan and Strömberg 2002	Selected incentive and control mechanisms	Contract data
Kaplan and Strömberg 2004	Selected incentive and control mechanisms	Contract data
Lerner and Malmendier 2005	Termination rights	Contract data
Lerner and Merces 1998	Control rights	Contract data
Meyer and Bercovitz 2003	Contingency planning	Contract data
Robinson and Stuart 2004	Employment provisions; termination; duration	Contract data
Ryall and Sampson 2003	Contract completeness/ complexity	Contract data
Anderson and Dekker 2005	Contract extensiveness	Questionnaire
Deeds and Hill 1998	Contractual safeguards	Questionnaire
Helm and Kloyer 2004	Perceived control of transaction risks	Questionnaire
Luo 2002	Contingency adaptability; term specificity	Questionnaire
Parkhe 1993	Contractual safeguards	Questionnaire
Poppo and Zenger 2002	Contract complexity	Questionnaire
Reuer, Ariño 2002	Contract complexity	Questionnaire
Reuer, Ariño 2003	Contract complexity	Questionnaire
Reuer, Ariño 2004	Contract complexity	Questionnaire
Reuer, Ariño and Mellewigt 2003	Contractual safeguards	Questionnaire
Brickley 1999	No passive ownership; specification of inputs; area development plan	Secondary
Ciccotello et al. 2004	Duration	Secondary
Corts and Singh 2002	Compensation provision	Secondary
Crocker and Masten 1988	Duration	Secondary
Crocker and Reynolds 1993	Completeness	Secondary
Joskow 1987	Duration	Secondary
Masten and Crocker 1985	Compensation provisions	Secondary