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Contract Adaptation under Legal Constraints

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Abstract

This paper shows theoretically that automobile distribution contracts can be seen as efficient responses to the manufacturers' obligation to offer non-discriminatory terms to dealers. This legal rule may prevent the parties from adapting contracts to new contingencies even when performance is ex post verifiable, as manufacturers may be unable to reach advantageous bargains with heterogeneous dealers using one-size-fits-all instruments. To circumvent the law and improve adaptation, manufacturers amend contracts informally, efficiently tailoring them to dealers' characteristics. Moreover, to make future informal amendments self-enforcing, contracts assign authority to manufacturers ex ante when the dealers are strongly averse to change, so manufacturers may be tempted to renege, ex post, on the large bonuses necessary to make them accept the amendments voluntarily. The model can be extended to employment, franchising and, more generally, to all contracts linking a central party to a set of parties with inferior bargaining power, where anti-discrimination rules may apply.

Keywords: Adaptation, Decision rights, Discrimination, Relational Contracts.

JEL codes: D23; L14; L22

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1. Introduction

According to recent evidence from Spain (Arruñada *et al*. (2001)) and Italy (Zanarone (2009)), and to a survey I conducted in 2007 with Italian managers of car manufacturers and dealers, automobile distribution contracts systematically exhibit some puzzling features, regarding both how they are designed ex ante, and how they are amended ex post, in the face of unforeseen contingencies.

Ex ante, these contracts specify the required standard features of dealers—such as showrooms' design and advertising policies—and then split between manufacturers and dealers the rights to modify them as the environment changes. Specifically, they tend to assign decision rights to manufacturers when dealers are more exposed to free-riding from intra-brand competitors and, therefore, are more reluctant to provide services that benefit the network. Ex post, manufacturers unilaterally dictate many contractual amendments without offering compensation to dealers, even when they lack a formal right to do so. Moreover, when manufacturers do offer compensation, this is not given by fixed monetary transfers but, rather, by discounts on the wholesale price of cars, which insure greater rewards to large dealers than to small ones.

These facts raise several questions: why are large dealers compensated more than small ones for accepting the same contractual amendments? How can manufacturers dictate certain amendments without having a contractual right to do so, and without offering

incentives? And why aren't manufacturers assigned, ex ante, the right to impose these amendments, given that they act, ex post, as if they had such authority?

This paper develops a model that jointly explains such practices as efficient instruments to adapt dealership contracts to new contingencies, in the face of legal constraints. These constraints arise because European antitrust law, as well as national laws on retail distribution and franchising in various European and non-European countries, obliges manufacturers to offer objective, non-discriminatory contract terms to dealers. As a result, when manufacturers want to amend dealership contracts, they must set equal performance standards for all dealers, even if those may have substantially different features and preferences. Moreover, manufacturers must offer to all dealers the same incentives or, at least, tie incentives to the same verifiable dealers' characteristics.

The model first shows that, in states of the world where manufacturers and dealers must amend the contract formally—for instance, because they do not have enough reputational capital to sustain informal amendments—the legal constraints may bind, and feasible amendments may be inefficient. In these states, the ex ante allocation of decision rights will shape the parties' ex post behavior: on one hand, when manufacturers have authority, they will impose their preferred decisions to dealers, even in states where contract terms do not need to be changed. On the other hand, when manufacturers do not have authority, they will offer formal incentives to dealers in order to make them adopt the proposed amendments voluntarily. Moreover, they will base the incentives on dealers' verifiable characteristics, such as sales, to select those with a central position in the network, whose success in implementing new standards is crucial to reinforce the brand.

The model then shows that, if manufacturers have enough reputational capital, they can rely on informal agreements to modify contract terms in states where, due to the legal constraints, feasible formal amendments are inefficient. In that case, decision rights may appear, ex post, to be non-binding: when manufacturers do not have authority, they will dictate changes in dealers' performance, and pay them discretionary, personalized bonuses upon compliance. To escape legal scrutiny, these bonuses will be informal (perhaps even non-monetary) and, as such, hidden to third parties. Hence, consistent with the facts discussed before, one may observe that dealers obey orders they are actually not obliged to obey, without being offered a formal compensation.

Finally, the model shows that, at intermediate levels of the manufacturers' reputational capital, allocating decision rights ex ante may be useful even if these seem non-binding ex post, as it may reduce the manufacturer's reneging temptation, expanding the set of states where informal contractual amendments are feasible. Specifically, the model predicts that contracts will give authority, ex ante, to the manufacturer when dealers are substantially averse to change, so they would require large bonuses, ex post, in order to voluntarily accept unfavorable amendments. This is consistent with the findings in Arruñada *et al*. (2001) and Zanarone (2009), according to which manufacturers receive more decision rights as dealers face greater intra-brand competition and, therefore, are more averse to providing services that benefit the brand, like clean and comfortable showrooms and local advertising.

While the model presented here is inspired by and focuses on automobile distribution, its predictions extend to other contractual relations that have a similar structure and face similar legal constraints. Particularly, the model applies to business-format franchising,

where contracts also allocate authority between franchisors and franchisees (Hadfield (1990)), and where the law—at least in Europe—protects franchisees from discrimination. Also, the model may apply to the contracts between large retailers and networks of exclusive suppliers, who sell their products under the retailers' names (Arruñada (2000)). More generally, the model provides a basis for studying all sorts of incomplete contracts, including employment, that link a central party to a set of parties with inferior bargaining power, where some form of anti-discrimination legal rule is likely to apply.

The rest of this paper is organized as follows. Section 2 discusses the literature most closely related to this article, and highlights its contributions. Section 3 describes the key features of automobile distribution contracts, as emerging from recent empirical works and from a survey of Italian manufacturers and dealers. Section 4 presents the baseline model, derives optimal contractual instruments subject to the applicable law, and discusses how they relate to the facts from section 3. Section 5 concludes.

2. Related literature

An early literature, originated by Williamson (1975, 1979), and Klein, Crawford and Alchian (1978), has studied long-term contracts as means to protect the parties' specific investments from the risk of holdup, which may be triggered by unforeseen changes in the environment (Grossman and Hart (1986), Hart and Moore (1990), Aghion and Tirole (1994), Hart (1995), Baker *et al*. (2002)). As Williamson (2000) forcefully noted, long-term contracts also suffer from *adaptation problems*, whereby the parties may fail altogether to

update contract terms over time.[1] Adaptation problems have been addressed by a complementary stream of literature, which, building on Simon's (1951) theory of the employment relationship, has emphasized how information asymmetries and bargaining costs may prevent the parties from agreeing on new contract terms, and how the initial contract should be carefully designed, in order to minimize the resulting "maladaptations" (Masten (2009), Hart (2008)).[2] This literature is quite heterogeneous in both the addressed sources of adaptation problems and the proposed contractual solutions. Matouschek (2004) and Chakravarty and MacLeod (2009), for instance, model adaptation problems as negotiation break-ups due to information asymmetries. As a solution, Matouschek (2004) proposes to allocate control rights to minimize the parties' ex post disagreement payoffs, while Chakravarty and MacLeod (2009) advocate cost-plus contracts, whereby the informed party can require the uninformed one to perform tasks that were not initially contracted, upon covering her extra costs. Hart and Moore (2008) argue that, when parties renegotiate a contract and feel that they have not received a fair share of the surplus, they may retaliate by performing in a perfunctory way. This generates a tradeoff between adaptation and retaliation, which can be solved by fixing the price ex ante—to minimize future disagreements—while assigning one party the right to specify due performance ex post—to guarantee adaptation. Finally, Baker *et al*. (2009) argue that, when contractual performance is not verifiable in court, the parties in control may force their preferred decisions ex post, even when these are inefficient. As a solution, they propose relational

[1] See also Williamson (1975, 1991). For recent evidence that adaptation problems are quantitatively important, see Forbes and Lederman (2008, 2009).
[2] See Gibbons (2005) for an extensive discussion of the holdup and adaptation literatures in the context of the theory of the firm.

contracts where the parties in control promise efficient decisions in exchange for quasi-rents. To facilitate second-party enforcement, they also suggest allocating control rights to the parties who are less tempted to renege.

This paper contributes to the adaptation literature by studying legal constraints as a novel source of contracting costs that may cause adaptation problems. First, the paper shows how, in multilateral contractual relationships with a strong central party, such as car distribution—but also business-format franchising and, to some extent, employment—the central party's legal obligation to offer non-discriminatory terms to the others may cause the contract to be updated too often or too rarely, by forcing one-size-fits-all price adjustments for non-identical transactions. Second, and related, the paper extends the results in Baker *et al*. (2009), by showing that an appropriate ex ante allocation of decision rights can improve adaptation even in settings where decisions are ex post verifiable and, therefore, can be made the objects of formal contracts.

This paper also contributes to the literature on relational contracts, which emphasizes how informal agreements, enforced by the parties themselves rather than courts, help saving on the costs of formal contracts (Macaulay (1963)), and how formal provisions can facilitate informal agreements by keeping the parties within the "self-enforcing" range (Klein and Murphy (1988), Klein (1995, 1996, 2000), Baker *et al*. (1994, 2009), Lafontaine and Raynaud (2002), Battigalli and Maggi (2008)). The paper explores a case where informal contracts may be useful even when formal contracts on the performance variables of interest are viable and costless, but limited in scope by the law.

Finally, this paper contributes to an emerging literature emphasizing the effects of legal constraints on contracts. For instance, Brickley (2002) shows that, when the law limits

termination "at will", contracts assign greater royalties to franchisors to increase their incentives to monitor franchisees; MacLeod and Malcomson (1993), and Chakravarty and MacLeod (2009), show how long-term contracts, and construction procurement contracts, can be designed so that efficient provisions will be enforced, even when the law limits specific performance remedies; and Zanarone (2009) shows that, after European law prohibited dealer-exclusive territories, automobile franchise contracts introduced direct constraints on the dealers' inputs, such as standards on advertising and customer satisfaction, to prevent free-riding between dealers. This paper adds to such literature, by showing how the parties can altogether circumvent legal constraints via informal agreements and choose formal provisions, at the outset, to make such agreements self-enforcing.

3. A survey of contractual practices in car distribution

When prospective dealers want to sell cars of a certain brand, they must sign detailed contracts regulating their long-term relation with the manufacturer. These contracts specify in detail the standard features dealers must possess to enter the network, such as minimum yearly sales, financial health, pre-specified showrooms' design, trained and qualified salespeople, high customer ratings, and the like. Given that manufacturers and dealers are in long-term relations, a major problem is how to adapt the initial standards when they turn "obsolete", due to changes in customers' tastes and market competition. This usually generates conflicts between the parties, as dealers must incur extra costs to satisfy the new standards, which they did not forecast when entering the network. Moreover, agreeing ex

ante on how to modify standards in the future, and when, may be difficult, as changes in the market are uncertain and hard to foresee, and there are no obvious mechanisms that automatically link desired standards to future contingencies. The contractual provisions used to adapt dealers' standards over time have been recently studied by Arruñada *et al*. (2001) for Spain, and by Zanarone (2009) for Italy. Both articles find that dealership contracts split formal decision rights between the parties, sometimes allowing the manufacturer to change standards unilaterally and terminate non-compliant dealers, some other times leaving modifications up to the dealers' cooperativeness. This is shown in Table 1, which reproduces the allocation of decision rights in dealership contracts currently used in the 19 networks surveyed by Zanarone (2009).[3] Each clause allocates to the manufacturer the right to unilaterally change a given type of standard in the future. It is clear from the table that decision rights are split quite evenly: the average clause assigns the right to change standards to the manufacturer in about half contracts, leaving modifications up to the dealers in the other half.

<TABLE 1 HERE>

Arruñada *et al*. (2001) and Zanarone (2009) also find that the allocation of decision rights in dealership contracts varies systematically with dealers' incentives. Specifically, Arruñada *et al*. (2001) find that, in Spain, contracts assign more decision rights to manufacturers in networks with a large number of dealers, who have little incentives to provide services that benefit the brand, due to freeriding within the network. Similarly,

[3] The contracts represent the following brands: Ford, Opel, Toyota, Mitsubishi, Mazda, Mercedes, BMW, Volkswagen, Audi, Peugeot, Citroen, Renault, Volvo, Jaguar, Land Rover, Seat, Fiat, Alfa Romeo and Lancia. These brands accounted, in 2004, for 85% of new car sales in Italy (source: the European Car Distribution Handbook, 2005 edition).

Zanarone (2009) finds that, in Italy, contracts assigned more decision rights to manufacturers after European regulation 1400/2002 prohibited dealer-exclusive territories, thus increasing the potential for intra-brand competition and freeriding.

While dealership contracts specify adaptation mechanisms ex ante, in the form of decision rights, it is not clear from the existing evidence how parties apply such mechanisms ex post. To make progress, I collected, for 10 of the 19 Italian contracts in Table 1, annexes reporting new standards introduced by the manufacturers in 2004, and the rewards and penalties applicable in case of dealers' non-compliance.[4] Table 2 reports, for each brand, how many of the new standards are mandatory—that is, imposed by the manufacturer to all dealers, based on his contractual decision rights—and how many are optional. Optional standards generally represent refinements of obligatory ones, such as buying the furniture and machines recommended by the manufacturer, rather than simply following his guidelines. Termination for contract breach—in one case accompanied by a pecuniary penalty—is the main instrument manufacturers rely upon to enforce mandatory standards. In addition to threatening to terminate non-compliant dealers, 4 manufacturers also offer a discount to those who fulfill all of the standards.[5] On the other hand, manufacturers solely rely on incentives to insure compliance with optional standards, as they lack the right to impose them as contractual obligations. As shown in Table 2, these incentives are systematically defined as discounts on the list price of cars, except for one

[4] The brands for which contractual annexes were available accounted, in 2004, for 78% of car sales in Italy.
[5] This may be due to the fact that dealers can litigate termination in court, thus making it a less effective sanction, and that the threat of termination may not be credible for some manufacturers, due to the difficulty of promptly replacing departing dealers.

case, where they also include a fixed subsidy. Overall, this implies that large dealers tend to be rewarded more than small ones for adopting the same optional standards.

<TABLE 2 HERE>

To verify and complement the information above, I conducted, in the winter of 2007, a series of in-depth interviews with managers of Italian branches of manufacturers, dealers and dealer associations. The responses suggest it is common practice in the industry to specify formal amendments to standards in annexes to the contract, like those in Table 2, to terminate dealers who do not comply with mandatory standards, and to offer discounts to dealers who adopt optional standards.

At the same time, the respondents pointed out that, in addition to formal contractual amendments, manufacturers make frequent use of informal ones. Particularly, it is customary for manufacturers who want to introduce new standards, on which they lack explicit authority, to send dealers a notification letter, which is not preceded by negotiation or consultation with the dealers and their associations, does not require their acceptance, signature or counterproposal, and does not specify compensation for the extra costs dealers must incur to comply. These letters are not published as annexes to the dealership contracts, and they do not generate contractual obligations for dealers, who could ignore them without risking penalties or termination. Nevertheless, dealers routinely comply without bargaining for compensation. Dealers showed me samples of "intra-network" letters dictating a variety of costly new standards that, according to the franchise contracts in Table 1, manufacturers have no right to impose, such as increasing the amount of fuel injected in cars prior to

delivery, committing to deliver cars to customers within 5 days from announced date, or owning, rather than renting, the machinery and tools in repair workshops.

The practices described above raise several questions: why are large dealers compensated more than small ones for accepting the same contractual amendments? How can manufacturers dictate certain amendments without having a contractual right to do so, and without offering incentives? Why aren't these amendments formalized in annexes to dealership contracts, like those in Table 2? And why aren't manufacturers assigned, ex ante, the right to impose these amendments, given that they act, ex post, as if they had such authority? The rest of this paper develops a model that jointly explains these practices as efficient means to adapt dealership contracts to new contingencies, subject to constraints posed by the law.

4. A model of adaptation in dealership contracts

Consider a risk-neutral manufacturer, whose cars are purchased and resold to final consumers by N risk-neutral dealers. In an un-modeled stage, dealers are selected on the basis of certain standards, such as pre-specified showroom design and furniture, number and qualification of employees, large operating capital, and the like. As the environment changes, the initial standards may become obsolete, and need to be changed. To keep the analysis simple, and without loss of generality, I assume that, in any state of the world, there is only one meaningful way of changing standards, so each dealer must choose whether to implement change or keep the status quo. The payoffs stemming from dealers' decisions depend on which of S independent states of the world is realized. Specifically, I

assume that, in any state *s*, the payoffs of the manufacturer and of the i^{th} dealer are given, respectively, by $\prod_{i \in K_s} d_{is} V_s$ and $-C_{is}$, where $V_s > 0$, $C_{is} > 0$, d_{is} is a dummy variable for whether dealer *i* implements change in state *s*, and K_s is the set of "key" dealers, whose cooperation is essential for change to produce benefits in state *s*.[6] For instance, "key" dealers may be large dealers, or dealers serving urban locations, whose behavior affects how customers perceive the brand nationwide. The term V_s may be interpreted as an increase in the manufacturer's reputation due to dealers' cooperation, and C_{is} as the i^{th} dealer's opportunity cost of adapting to change in state *s*.[7]

As standard in the incomplete contracting literature, I assume the state of the world *s* and the parties' state-contingent payoffs are non-contractible, and that decisions—change or status quo—are non-contractible ex ante, but become contractible ex post, once the state is realized.[8] While the parties cannot specify future decisions in the initial contract, they can assign the right to make decisions in the future.[9] Specifically, they may or may not assign to the manufacturer the right to change existing standards. Consistent with practice, I also assume that, both ex ante and ex post, the manufacturer chooses contract terms that maximize his own payoff, subject to the dealers' participation constraints.

[6] The model's results continue to hold if one assumes that the manufacturer's payoff in state *s* is additive in the dealers' cooperation, in which key dealers are not essential but, simply, contribute more to the brand's value. I maintain the specification where key dealers are essential, because it simplifies the analysis of relational contracts in section 4.

[7] To simplify, I am assuming all dealers prefer the status quo to any form of change in the standards. The analysis would be unaffected if some—but not all—dealers were favorable to change, or if dealers favored changes different from the ones decided by the manufacturer.

[8] For related assumptions see, for instance, Grossman and Hart (1986), Hart and Moore (1990) and Baker *et al*. (2002).

[9] See Aghion and Tirole (1994), and Baker *et al*. (2009), for models where decision rights are contractually allocated ex ante.

Efficiency requires that all the "key" dealers, and only them, implement change in states that belong to the set S_C, defined as those where $V_s > \sum_{i \in K_s} C_{is}$, and that no dealers implement change in states that belong to the set S_Q, defined as those where $V_s < \sum_{i \in K_s} C_{is}$. The first best total surplus is thus given by

$$TS^{FB} = E_{s \in S_C}\left[V_s - \sum_{i \in K_s} C_{is}\right] = \sum_{s \in S_C} p_s \left[V_s - \sum_{i \in K_s} C_{is}\right] \quad (1)$$

where p_s is the probability that state *s* occurs.

Absent contracting costs, manufacturers would reach the first best by signing, after the state is realized, a formal contract with each dealer specifying the efficient decision and the side payments needed to support it. Specifically, when the manufacturer has the right to impose change, he may commit, in states that belong to S_Q, not to exert his authority, in exchange for a monetary transfer from the dealers. Similarly, when the manufacturer does not have the right to impose change, he may commit, in states that belong to S_C, to make a monetary transfer to those "key" dealers who accept to implement change.

However, the law severely limits the manufacturer's ability to contract with dealers ex post. First, the good faith and fair dealing covenants operating in most legislative systems prevent the manufacturer from using his contractual right to impose standards as a means to extract money from dealers. Second, both European antitrust law and commercial law in most European countries require that contract terms must be non-discriminatory towards dealers.[10] In practice, this has been interpreted as an obligation for the manufacturer to impose the same standards on all dealers—when the contract gives him the power to do

[10] See article 6.1 of the EC Regulation 1400/2002, which declares a dealership contract illegal when "discriminatory prices or sales conditions are applied within a geographic market".

so—and to offer them either the same incentives, or incentives tied to the same objective characteristics. The latter implies that the manufacturer may offer an identical subsidy to all dealers who implement a given standard, or an identical incentive scheme based on sales and other objective characteristics, but cannot offer to each dealer *i* a subjective bonus based on her non-verifiable opportunity cost of change C_{is}. The rest of this paper shows how well-designed contracts can neutralize these legal constraints, allowing manufacturers to efficiently adapt standards to the environment.

4.2. Spot contracts

As a benchmark, assume the parties meet only once, so they can only implement change via spot market contracts. In any given period, the contractual relation between manufacturer and dealers works as follows:

1. The manufacturer offers a contract to dealers, which may assign him the right to change the existing standards at stage 2, and may include upfront monetary payments to dealers;
2. After observing the realized state *s*, the manufacturer decides whether to request a change to the existing standards and to which dealers, possibly accompanying his request with an offer of monetary incentives;
3. Dealers decide whether to implement the manufacturer's request;
4. Payoffs are realized as a function of the dealers' decision at stage 3.

Case 1: The manufacturer has the right to change standards unilaterally

If the stage-1 contract gives him authority, the manufacturer will efficiently order change to the "key" dealers, at stage 2, when the realized state belongs to S_C. To escape legal scrutiny for discriminatory behavior, he will order change informally—that is, without framing the order as a formal contractual amendment—whenever $K_s \subset N$, while threatening to formally impose it on all dealers in case of non-compliance.

To achieve the first best, the manufacturer should also agree with each dealer not to order change when the realized state belongs to S_Q, in exchange for a monetary transfer. However, since such a monetary transfer would be considered as an illegal bribe, the manufacturer will instead impose change to the "key" dealers in all states. Assuming it is worthwhile for the manufacturer to pay dealers upfront, at stage 1, so that they are willing to enter the network at these conditions, expected total surplus will thus be given by

$$TS_M^{SP} = E_{s\in S}\left[V_s - \sum_{i\in K_s} C_{is}\right] \leq TS^{FB} \qquad (2)$$

Note that $TS_M^{SP} = TS^{FB}$ only if $S_C = S$. Otherwise, standards will be changed even in states belonging to S_Q, which is inefficient.

Case 2: The manufacturer does not have the right to change standards unilaterally

When the stage-1 contract does not assign her authority, the manufacturer could achieve the first best by agreeing, whenever the realized state belongs to S_C, to pay C_{is} to any key dealer who accepts change. This is not feasible, however, because contract terms must be non-discriminatory and C_{is} is non-verifiable, so the manufacturer cannot write an objective

cost-plus contract based on C_{is}. At best, the manufacturer can offer an incentive contract based on dealers' verifiable characteristics. Denote a generic incentive contract for state *s* by $t_s(\mathbf{x})$, where **x** is the complete vector of objective dealers' characteristics. Also, denote by $H_s[t_s(\mathbf{x})]$ the set of dealers who would accept contract $t_s(\mathbf{x})$ in state *s*. This set includes any dealer *i* for whom $t_s(\mathbf{x}_i) - C_{is} \geq 0$. When $s \in S_C$, the manufacturer will choose $t_s(\mathbf{x})$ to maximize his state-contingent payoff $V_s - \sum_{i \in H_s(t_s(\mathbf{x}))} t_s(\mathbf{x}_i)$. Denote the solution to the manufacturer's problem by $t_s^*(\mathbf{x})$. In general, there may be states in S_C where $H_s\left(t_s^*(\mathbf{x})\right) = K_s$, so change is only implemented by "key" dealers, as in the first best; states where $H_s\left(t_s^*(\mathbf{x})\right) \supset K_s$, so change is implemented by key dealers, but also by some non-key dealers; and states where $H_s\left(t_s^*(\mathbf{x})\right) \subset K_s$, so efficient change is not implemented at all. Expected total surplus will thus be given by

$$TS_D^{SP} = E_{s \in S_C}[\delta_s(V_s - \sum_{i \in N} h_{is} C_{is})] \leq TS^{FB} \qquad (3)$$

where δ_s is a dummy for whether $H_s\left(t_s^*(\mathbf{x})\right) \supseteq K_s$ and h_{is} is a dummy for whether $i \in H_s\left(t_s^*(\mathbf{x})\right)$. Note that $TS_D^{SP} = TS^{FB}$ only if objective incentive contracts exist such that $H_s\left(t_s^*(\mathbf{x})\right) = K_s$ in every state in S_C. Otherwise, standards may not be changed even in states where it would be efficient to do so, and, when change occurs, it may be implemented by too many dealers.

4.3. Relational contracts

Suppose, now, that the parties repeat the spot game forever. Then, they may opt for informal, dealer-specific contract amendments in states where the formal, one-size-fits-all ones required by the law are inefficient. Provided that their reputational capital is large enough, this will allow them to efficiently adapt standards to the environment. As we will see, the optimal ex post terms in relational contracts typically differ, depending on whether the contract assigns authority to the manufacturer ex ante or not. Moreover, assigning authority to the manufacturer ex ante may or may not be efficient, depending on the manufacturer's and dealers' incentives.

Case 1: The manufacturer has the right to change standards unilaterally

When the manufacturer has authority, a relational contract will improve on the spot market outcome if it insures that, at least in some of the states in S_Q, the manufacturer does not impose change. Denote this targeted set of states by $S_Q^- \subseteq S_Q$. The relational contract proceeds then as follows: at stage 1 of any period *t*, the manufacturer makes an informal, personalized payment w_i to each dealer *i*, which is used to split expected surplus.[11] At stage 2, if the realized state belongs to S_C, the manufacturer asks the "key" dealers to implement change, as he would do in a spot market contract; if the realized state belongs to S_Q^-, the

[11] See Levin (2003), and Baker *et al.* (2002, 2009).

manufacturer does not require change;[12] finally, if the realized state belongs to $S_Q - S_{\bar{Q}}^-$, the manufacturer orders change to all dealers, as he would do in a spot market contract. If the manufacturer keeps all of his promises, the game is repeated identically at time t+1. If the manufacturer reneges on the stage-1 payments, the parties revert to the optimal spot contract from the current period t and thereafter. Finally, if the manufacturer reneges, at stage 2, on the promise not to impose change in states that belong to $S_{\bar{Q}}^-$, the parties revert to the optimal spot contract from period t+1 and thereafter.[13]

Because the manufacturer's promise to spare change to the dealers in states that belong to $S_{\bar{Q}}^-$ is not enforceable in court, it must be self-enforcing. To simplify formal statement of the self-enforcement constraints, let the manufacturer and i^{th} dealer's expected per period payoffs, gross of the stage 1 payments, be, respectively:

$$M^M\left(S_{\bar{Q}}^-\right) = E_{s\in S_C}[V_s] + E_{s\in\left(S_Q - S_{\bar{Q}}^-\right)}[V_s]$$

$$D_i^M\left(S_{\bar{Q}}^-\right) = -k_{is}E_{s\in S_C}[C_{is}] - E_{s\in\left(S_Q - S_{\bar{Q}}^-\right)}[C_{is}]$$

where the "M" superscript indicates that the manufacturer has been given authority ex ante, and k_{is} is a dummy for whether $i \in K_s$, that is, wether dealer i is "key" in state s. Given this notation, the relational contract will be self-enforcing if, and only if:

$$M^M\left(S_{\bar{Q}}^-\right) - \sum_i w_i \geq M^{SP} \qquad (4)$$

[12] One may think that, for the relational contract to be viable, dealers must also promise not to sue the manufacturer for illegal discrimination. I am implicitly assuming that, once payments are not formalized in a contract, it is imposible to prove discrimination. This is not unrealistic, especially if one considers that informal payments can also be non-monetary.

[13] Reversion to spot contracting may involve reallocation of authority. Following Baker *et al*. (2002, 2009), I assume the parties cannot reallocate authority in the middle of a period—that is, after the state is revealed, but before the decision is implemented. However, they can do so at the beginning of a period—before the state is revealed—or at the end—after the decision is implemented.

$$w_i + D_i^M\left(S_Q^-\right) \geq D_i^{SP} \text{ for every } i \in N \quad (5)$$

$$\frac{1}{r}\left[M^M\left(S_Q^-\right) - \sum_i w_i\right] \geq V_s + \frac{1}{r} M^{SP} \text{ for every } s \in S_Q^- \quad (6)$$

where r is the parties' common interest rate, and M^{SP} and D_i^{SP} are the manufacturer's and the i^{th} dealer's per-period expected payoffs, respectively, under the optimal spot contract. Conditions (4) and (5) are the manufacturer's and dealers' participation constraints, respectively, while condition (6) is the manufacturer's inter-temporal incentive constraint. By setting the w_i's so that (5) binds for each dealer, the manufacturer's participation constraint boils down to

$$M^M\left(S_Q^-\right) + \sum_{i \in N} D_i^M\left(S_Q^-\right) = TS^M\left(S_Q^-\right) \geq TS^{SP} = M^{SP} + \sum_{i \in N} D_i^{SP} \quad (7)$$

where $TS^M\left(S_Q^-\right)$ is the expected total surplus under relational contract S_Q^-, given that the manufacturer has been given authority ex ante, and and $TS^{SP} = \max\{TS_M^{SP}, TS_D^{SP}\}$ is total surplus under the optimal spot contract. Plugging these values of the w_i's into (6) turns the manufacturer's incentive constraint into:

$$TS^M\left(S_Q^-\right) \geq TS^{SP} + rV_s \text{ for every } s \in S_Q^- \quad (8)$$

Note that, if (8) is satisfied, (7) will be satisfied as well, so (8) is necessary and sufficient for self-enforcement. Hence, the manufacturer will choose the target set of states S_Q^- to maximize $TS^M\left(S_Q^-\right)$, subject to (8).

Case 2: The manufacturer does not have the right to change standards unilaterally

In this case, a relational contract will improve on the spot market outcome if it insures that the "key" dealers implement change in some of the states in S_C. Denote the targeted set of states by $S_C^- \subseteq S_C$. The contract proceeds then as follows: at stage 1 of any period *t*, the manufacturer makes an informal, personalized payment w_i to each dealer *i*. If, at stage 2, the realized state belongs to S_C^-, the manufacturer asks each "key" dealer *i* to implement change and, if she obeys, pays her an informal, discretionary bonus equal to her opportunity cost C_{is}. Conversely, if the realized state belongs to $S_C - S_C^-$, the manufacturer offers the optimal formal incentive scheme t_s^* to all dealers, as he would do in a spot market contract. As a result, dealers in the set $H_s(t_s^*)$ implement change, while the other dealers do nothing. If the manufacturer reneges on any of his promises, the parties implement trigger strategies, as before. Let the manufacturer's and i^{th} dealer's per period expected payoffs, gross of the stage 1 payments, be, respectively:

$$M^D(S_C^-) = E_{s\in S_C^-}\left[V_s - \sum_{i\in K_s} C_{is}\right] + E_{s\in(S_C - S_C^-)}[\delta_s(V_s - \sum_{i\in N} h_{is} t_s^*(\mathbf{x}_i))]$$

$$D_i^M(S_C^-) = E_{s\in(S_C - S_C^-)}[\delta_s h_{is}(t_s^*(\mathbf{x}_i) - C_{is})]$$

where the "D" superscript indicates that the manufacturer has not been given authority ex ante. Given this notation, the relational contract will be self-enforcing if, and only if:

$$M^D(S_C^-) - \sum_i w_i \geq M^{SP} \qquad (9)$$

$$w_i + D_i^D(S_C^-) \geq D_i^{SP} \text{ for every } i \in N \qquad (10)$$

$$-\sum_{i\in K_s} C_{is} + \frac{1}{r}[M^D(S_C^-) - \sum_i w_i] \geq \frac{1}{r} M^{SP} \text{ for every } s \in S_C^- \quad (11)$$

Conditions (9) and (10) are the manufacturer's and the dealers' participation constraints, respectively, (11) is the manufacturer's incentive constraint, and the dealers' incentive constraints are satisfied by construction. As before, by setting the w_i's so that each dealer's participation constraint binds and plugging them into (11), we obtain a necessary and sufficient condition for the relational contract to be self-enforcing, which is given by

$$TS^D(S_C^-) \geq TS^{SP} + r\sum_{i\in K_s} C_{is} \text{ for every } s \in S_C^- \quad (12)$$

where $TS^D(S_C^-)$ is the expected total surplus under relational contract S_C^-, given that the manufacturer has not been given authority ex ante. Hence, the manufacturer will choose the target set of states S_C^- to maximize $TS^D(S_C^-)$, subject to (12).

4.4. Ex ante governance

The above analysis of relational contracts has implications on the optimal ex ante allocation of authority. These can be summarized in the following

Proposition 1: When the dealers' opportunity cost of implementing efficient change is large, it is optimal to give authority to the manufacturer ex ante. Conversely, when the manufacturer's benefit from imposing inefficient change is large, it is optimal not to give authority to the manufacturer ex ante.

Proof: Suppose the optimal relational contract when the manufacturer does (does not) have authority is initially $S_Q^* \subseteq S_Q$ ($S_C^* \subseteq S_C$), and denote the corresponding total surplus by

$TS^M(S_Q^*)$ (by $TS^D(S_C^*)$). Suppose, further, that, after an increase in V_s for some states in S_Q^* (an increase in C_{is} for some states in S_C^* and some dealers in K_s), the new optimal relational contract is $S_Q^{**} \subseteq S_Q$ (is $S_C^{**} \subseteq S_C$). Since increases in V_s for some states in S_Q (increases in C_{is} for some states in S_C and some dealers in K_s) tighten constraint (8) (constraint (12)) while leaving constraint (12) (constraint (8)) unaffected, for large enough increases in V_s (in C_{is}), it must be that $TS^M(S_Q^{**}) < TS^D(S_C^*)$ (that $TS^D(S_C^{**}) < TS^M(S_Q^*)$). QED.

Proposition 1 is consistent with Arruñada *et al*. (2001), who find that more decision rights are assigned to the manufacturer in larger networks, and with Zanarone (2009), who finds that more decision rights were assigned to car manufacturers after European competition law prohibited dealer-exclusive territories. In both cases, an increase in the degree of intra-brand competition, due to either market structure (Arruñada *et al*. (2001)) or liberalization (Zanarone (2009)), is associated to an increase in the ex ante decision rights of car manufacturers. More intra-brand competition implies that dealers appropriate less of the benefits from innovative standards, such as sophisticated showroom design, or test-drives for customers. Consequently, when the manufacturer does not have the right to impose new standards, he must promise larger bonuses to dealers in networks with high intra-brand competition, in order to make them cooperate. This, in turn, increases the manufacturer's reneging temptation.

Note that the opposite predictions would obtain if the manufacturer and the dealers were in a spot market relationship. Specifically, from (2) and (3) one obtains that $\frac{\partial TS_M^{SP}}{\partial V_s} = p_s > 0 = \frac{\partial TS_D^{SP}}{\partial V_s}$ for any $s \in S_Q$, and that $\frac{\partial TS_M^{SP}}{\partial C_{is}} = -p_s \leq -\delta_s h_{is} p_s = \frac{\partial TS_D^{SP}}{\partial C_{is}}$ for any

$i \in K_s$ and $s \in S_C$. This implies that, in the spot market, an increase in the manufacturer's benefit from change in states where change is inefficient favors assigning authority to him, and an increase in the key dealers' opportunity costs of change in states where change is efficient cannot favor—and, in some states, may disfavor—assigning authority to the manufacturer.

Intuitively, this occurs because, in the spot market, assigning authority to the manufacturer ex ante generates change in every state. Hence, the total surplus generated under this governance form increases in the manufacturer's benefit and decreases in the key dealers' opportunity costs from change. Conversely, not assigning authority to the manufacturer generates change in some of the states where change is efficient, and no change in states where it is inefficient. Hence, the total surplus generated under this governance form does not depend on the manufacturer's benefit from change in states where change is inefficient. Moreover, total surplus when the manufacturer does not have authority decreases in the key dealers' opportunity cost of change more weakly than when the manufacturer has authority, because there may be states where the feasible formal incentive schemes fail to select the key dealers, so efficient change is not implemented, and the related opportunity costs are not incurred.

From a theoretical point of view, an interesting implication of Proposition 1 is that, in the presence of anti-discrimination legal constraints, assigning decision rights ex ante is useful even when decisions are ex post contractible but, unlike in the Grossman-Hart-Moore type of models, there are no ex ante specific investments to protect. Specifically, Proposition 1 shows that the optimal allocation of decision rights in an environment with

ex-post-contractible decisions and legal constraints minimizes the parties' temptation to renege on relational contracts, which extends the result Baker *et al*. (2009) obtain in an environment with non-contractible decisions.

4.5. Ex post adaptation

The model also predicts how optimal relational contracts should be amended ex post, that is, once the state is realized and the efficient state-contingent decision is revealed.

Proposition 2: When the manufacturer does not have authority, he may reward obedient dealers, ex post, through a mix of formal and informal incentives. When present, formal incentives will be designed to select the "key" dealers.

Proof: Denote by $S_C^* \subseteq S_C$ the relational contract that maximizes $TS^D(S_C^-)$, subject to (12). By definition, S_C^* must contain a mix of formal and informal incentives when $S_C^* \neq \emptyset$, $S_C^* \subset S_C$, and $H_s\left(t_s^*(\mathbf{x})\right) \supseteq K_s$ for some $s \in (S_C - S_C^-)$. Moreover, a necessary condition for $H_s\left(t_s^*(\mathbf{x})\right) \supseteq K_s$ is that $t_s^*(\mathbf{x}_i) - C_{is} \geq 0$ for every $i \in K_s$, that is, the "key" dealers must self-select. QED.

The use of informal bonuses is consistent with the fact, reported in section 3, that manufacturers dictate standards to dealers without offering explicit compensation, even when they lack the contractual right to impose standards under the threat of termination. To see why, note that, because informal bonuses are offered in the shadow of the law, manufacturers have an incentive to keep them hidden to third parties—including researchers—and, therefore, to exclude them from formal documents such as notification

letters and contract annexes, and even to neglect their existence in the course of interviews. Indeed, manufacturers may even want to design informal bonuses as non-monetary rewards, such as soft and infrequent inspections, or tolerance of late payments, which would be especially hard to observe for third parties.[14]

Proposition 2 is also consistent with the fact, documented in section 3, that manufacturers sometimes offer formal discounts on the wholesale price of cars to dealers who accept optional standards. This type of incentive scheme implies that large dealers are rewarded more than small ones for adopting the same standards. According to Proposition 2, these discounts can be seen as means to secure compliance from large dealers, whose services have the greatest impact on local sales and on the brand's image, and to discourage compliance from the smallest dealers, whose cost of adopting extra standards may outweigh their added value to the network. While informal, dealer-specific bonuses are, in general, a more efficient way of selecting the "key" dealers, formal discounts may be the best available instrument in states where the manufacturer's temptation to renege on informal bonuses is too high.

A key parameter in the model is the interest rate, which can be interpreted as a proxy for how impatient the parties are—that is, how little they value their future relationship. The self-enforcement conditions (8) and (12) imply that, as the parties become less patient, the set of states where the manufacturer can commit to informal obligations shrinks, so formal, less efficient contractual amendments will tend to replace informal ones. This has some testable implications, summarized by the two following propositions.

[14] Iossa and Spagnolo (2009) show that tolerating non-compliance with formal contractual provisions can help enforce informal ones.

Proposition 3: Suppose the manufacturer does not have authority. Then, contractual amendments will more frequently include formal incentives as the parties become less patient.

Proof: Suppose the manufacturer promises to pay informal bonuses in states that belong to $S_C^* \subseteq S_C$. From (12), we can define $\overline{r}(S_C^*) = \frac{TS^D(S_C^*) - TS^{SP}}{\max_{s \in S_C^*} \sum_{i \in K_s} C_{is}}$ as the maximum interest rate such that the manufacturer can commit to honor this promise. Then, for $r > \overline{r}(S_C^*)$, the promise is unenforceable, and the manufacturer must replace informal bonuses with formal ones in some of the states in S_C^*. QED.

Proposition 4: Suppose the manufacturer has authority. Then, standards are changed more frequently as the parties become less patient.

Proof: Suppose the manufacturer promises not to impose change in states that belong to $S_Q^* \subseteq S_Q$. From (8), we can define $\overline{r}(S_Q^*) = \frac{TS^M(S_Q^*) - TS^{SP}}{\max_{s \in S_Q^*} V_s}$ as the maximum interest rate such that the manufacturer can commit to honor this promise. Then, for $r > \overline{r}(S_Q^*)$, the promise is unenforceable, and the manufacturer imposes change in some of the states in S_Q^*. QED.

Empirically, Proposition 4 implies that, as the parties' time horizon diminishes, we should observe more contractual amendments imposing new standards on the dealers.

While I do not know of evidence on the relation between the parties' time horizon and the frequency of formal and informal contractual amendments, propositions 3 and 4 seem precise enough to inspire empirical analysis. For instance, one could collect data on physical characteristics, customer service procedures and formal incentives for different

dealers, networks and years, and study how these change depending on whether dealers plan to be in service for long or to leave the dealership to family members upon retirement, and whether the manufacturer has solid prospects in the local market.[15] Similar tests could also be conducted in franchise networks, which share with automobile distribution most of the features modeled here—including, at least in Europe, the anti-discrimination legal constraints. I leave these extensions for future work.

5. Conclusion

This paper has shown that automobile distribution contracts can be seen as efficient responses to legal provisions forcing manufacturers to offer objective, non-discriminatory terms to dealers. Due to this legal constraint, the parties may disagree on when to amend the initial contract and how, thus failing to adapt to a changing environment. To circumvent the law and improve adaptation, manufacturers may resort to informal contract amendments, efficiently tailored to dealers' characteristics. Informal amendments may sometimes be unenforceable, so optimal relational contracts will be mixed sequences of formal and informal amendments. Relational contracts will also include ex ante governance clauses designed to reduce the parties' reneging temptations and keep future informal amendments within the "self-enforcing range". Particularly, manufacturers will be assigned the authority to unilaterally amend contracts when their temptation to impose inefficient

[15] Measuring the prospect of future interactions is difficult, so empirical studies of relational contracts have often relied on measures of past interactions as proxies for r (Corts and Singh (2004), Kalnins and Mayer (2004)). An exception is Gil and Marion (2009), where highway construction schedules issued by the Californian public administration are used as exogenous proxies for the prospect of future interactions between contractors and subcontractors.

changes is small, and when the dealers are highly averse to change, so manufacturers would be tempted to renege on the large bonuses necessary to make them cooperate.

This model is largely consistent with real-world automobile franchising. On one hand, previous empirical works have shown that manufacturers receive greater authority, ex ante, when dealers are more exposed to intra-brand competition and, therefore, more averse to changes the manufacturer may require (Arruñada *et al*. (2001), Zanarone (2009)). On the other hand, the survey and contractual data presented here suggest that, even when they do not have authority, manufacturers often amend contracts, ex post, without offering formal compensation to dealers, and, when using formal incentives, they design them to select "key" dealers to whom contract amendments should apply.

The model presented here applies, more generally, to multi-party contracts where a central player is obliged to treat the others equitably. This seems to be the case in business-format franchising, where the franchisors' obligation not to abuse bargaining power against franchisees has been often interpreted, at least in Europe, as implying a non-discrimination rule. The model may also be extended to study adaptation in settings, like the employment relationship, where "fair" contract terms are desired by the parties, as in Hart and Moore (2008), rather than imposed by the law. In that case, employees may be averse to unequal amendments irrespective of whether these are formal or informal. However, the employer may still want to use a mix of formal and informal amendments, as it may be harder for dealers to discover the latter. While this extension is beyond the scope of the present paper, I hope to pursue it in future research on incomplete contracts.

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Table 1. Ex ante allocation of decision rights in dealership contracts [*]

Clause assigning to manufacturer the right to modify:	Proportion of clause in contracts
Showroom design	0.73
Advertising contribution	0.52
Advertising policy	0.52
Advertising budget	0.15
Size of personnel	0.47
Qualification of personnel	0.36
Mandatory training of personnel	0.73
Minimum operating capital	0.36
Customer satisfaction programs	0.47
Customer satisfaction targets	0.52
Dealers' working hours	0.15
Clause assigning to the manufacturer a general right to set standards	0.63
Number of contracts	19

[*] The table, adapted from Zanarone (2009), includes clauses assigning to the manufacturer the right to modify a given type of standard, which are present in at least one of the contracts currently used by 19 manufacturers in Italy.

Table 2. Formal amendments to dealership contracts in 2004[*]

Brand	Mandatory standards (number)	Optional standards (number)	Consequences of dealer's failure to adopt:	
			Mandatory standards	Optional standards
A	19	3	Termination Loss of discount (up to 10% list price)	Loss of discount (up to 1% list price)
B	16	3	Termination Penalty (1.5% list price)	Loss of discount (up to 1.55% list price)
C	16	3	Termination Penalty (1.5% list price)	Loss of discount (up to 1.55% list price)
D	16	Any[**]	Termination Loss of discount (up to 10% list price)	Loss of discount (up to 10.5% list price)
E	15	None	Termination Loss of discount (up to 0.7% list price)	N/A
F	10	5	Termination	Loss of fixed subsidy (up to 55000€) Loss of discount (up to 2.5% list price)
G	10	5	Termination	Loss of fixed subsidy (up to 55000€) Loss of discount (up to 2.5% list price)
H	10	5	Termination	Loss of fixed subsidy (up to 55000€) Loss of discount (up to 2.5% list price)
I	21	8	Termination	Loss of discount (up to 5.55% list price)
J	10	10	Termination Loss of discount (up to 4% list price)	Loss of discount (up to 3% list price)

[*] Source: annexes to 10 of the 19 dealership contracts from Table 1. The annexes were published in 2004. Manufacturers' names are replaced by letters, to avoid disclosure of confidential information.

[**] Dealers may choose to adopt any last-minute request by the manufacturer, in exchange for a discretionary discount of up to 10.5%.