Retail Alliances: On the Bargaining Effects of Uncertainty about Escalation*

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Abstract

We examine the sources of bargaining power provided by international retail alliances and factors contributing to their instability. A retail alliance is understood as a "mutual defense agreement": if there is a conflict between a retailer and a manufacturer, then the other alliance members may take escalating actions (delisting of the product) against the manufacturer. The paper analyzes how the uncertainty of this threat affects the buyer power of an alliance member and the manufacturer's response to the escalation threat build up by the alliance. If the alliance cannot reveal its escalating type to the manufacturer before contracting, then the manufacturer may want to force a conflict (i.e., breakdown of bargaining) to learn the escalating type of the alliance, which could make the formation of the alliance ineffective.

Keywords: Retail Alliance, Buyer Power, Conflict, Uncertainty.

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1 Introduction

The emergence of international retail alliances (in short: RAs) has become a characteristic feature of the European retailing sector. RAs as Agecore, AMS, Coopernik, or EMD are typically formed by independent retailers of different countries.[1] As in the case of national buyer groups like Edeka in Germany or Leclerc and Intermarché in France, the formation of international RAs is driven by purchasing economies of scale. In contrast to national buyer groups where those economies are realized to a large extent by a centralized organization of procurement logistics, such as transport, storage, and warehousing, in the case of international RAs economies from a centralized organization of the procurement logistics are irrelevant as retailers operate in different countries. Rather, the main driver of the formation of international RAs is the creation of "countervailing bargaining power" vis-á-vis large international food manufacturers as Nestlé, Montelez, Unilever, and Coca-Cola (see OFT, 2007, and EC, 2020). However, national buyer groups either "merge" the procurement businesses (negotiations and contracting) of their members in a single unit or implement centralized listing procedures, whereas in the case of international RAs such commitment devices are absent and contracting between member retailers and suppliers remains decentralized. So, how do RAs create purchasing economies of scale in the form of enhanced buyer power?

We suppose that the RA creates buyer power from the implicit agreement to support each other in case an international supplier insists on excessively high prices (or other contractual conditions unfavorable for the retailer). An example, where such a mutual support agreement became evident is the dispute between the French retailer Intermarché (a member of the RA Agecore) and Coca-Cola which happened around the turn of the year 2019/2020. Here Coca-Cola insisted on contractual conditions that Intermarché was not willing to consent to, which in turn caused Coca-Cola to increase the "pressure" on Intermarché by terminating the negotiations and discontinuing delivery of its products.[2] Next, this conflict caused Edeka (another member

[1] For instance, Agecore was an alliance of the retailers Conad (I), Colruyt (B), Coop (CH), Edeka (D), Eroski (E), and Intermarché (F). Agecore was established in 2015 and de facto disbanded in 2021 (after major retailers declared to terminate their membership). For an overview of European RAs see EC (2020, Table 2, p. 12).

[2] For a description of this case see "Coke wird zum Test für Agecore" (*"Coke becomes a touchstone for Agecore"*), *Lebensmittel Zeitung*, 10th January, 2020, p. 12; `https://www.lebensmittelzeitung.net/industrie/nachrichten/Konditionen-Coke-wird-zum-Test-fuer-Agecore-144240?crefresh=1` [retrieved 4th of Decem-

of Agecore) to escalate the conflict by delisting parts of Coca-Cola's assortment; that is, Edeka reduced its demand for Coca-Cola products to put pressure on Coca-Cola to bring it back to the bargaining table.[3] Notably, this conflict was seen by business experts as a "touchstone" for the effectiveness of the alliances, which hints at the fundamental problem an RA has to create countervailing bargaining power: first, is there support by member retailers in case of conflict, and second, how far does this support go?

From this ankle, an RA can be interpreted in analogy to a military defense alliance. For instance, in case of NATO, Article 5 of the North Atlantic Treaty governs mutual defense in the event of an attack on a member nation. It requires all members to regard an attack on one member as an attack on themselves. However, whether or not the threat of escalation is carried out remains uncertain.[4] The analogy between an RA and a mutual defense alliance is also expressed in EC (2020, p. 15): *"Suppliers (...) negotiations may become confrontational. Retailers can possibly include (threats of) delisting and manufacturers may use the non-supply of crucial A-brands as a way to increase pressure in negotiations. When a conflict with an individual retailer escalates, it may be brought to the alliance level. The RA may help to mediate, but they may also allow alliance members to coordinate their actions and make use of the large joint sales volumes of the RA (e.g. in the form of collective delisting) to increase pressure on the supplier."*

We incorporate both features of an international RA, the uncertainty about the escalation threat and the extent of the escalation (in terms of the demand reductions in case of conflict) into a standard model of supplier-retailing bargaining. If the manufacturer induces a breakdown of bargaining with one retailer, then the manufacturer expects that other retailers of the RA may escalate the conflict by reducing their demand for the manufacturer's products. We suppose that the escalation threat is not only uncertain for the manufacturer but also for the retailer and is only revealed in case of a breakdown of bargaining; i.e., when there is a conflict.[5]

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[3] `https://www.sueddeutsche.de/wirtschaft/edeka-coca-cola-preise-streit-1.4777956` [retrieved 4th of December 2023].

[4] Currently, NATO's deterrence has come under scrutiny, particularly in scenarios where smaller nations as the Baltic states face an attack (Veebel and Ploom, 2018).

[5] Uncertainty about the escalation threat arises naturally because of the impossibility of specifying and enforcing

In our model, we assume a setting with a single manufacturer M, which (Nash) bargains first with retailer 1, and then makes an offer to retailer 2. If the bargaining between M and retailer 1 is successful and retailer 2 has accepted the offered contract, then the retailers choose the retail price in their selling areas (as retailers operate in different countries there is not competition between the retailers). An alliance of retailers 1 and 2 introduces uncertainty about retailer 2' escalating behavior, where both the manufacturer and retailer 1 have the same prior belief about retailer 2's type. The setting mirrors the Agecore case mentioned above, where Coca-Cola terminated the negotiations with Intermarché, which tested the credibility of the RA's threat to escalate the conflict. Analyzing the mechanics of this setting, we consider three different regimes concerning the timing of the revelation of the RA's type (which is either escalating or not escalating). The RA always creates buyer power (i.e., a wholesale price reduction for retailer 1), but the profit effects depend critically on the escalation regime. We show that if revelation only comes when there is a conflict between the manufacturer and retailer 1, then the manufacturer has strong incentives to trigger a conflict to learn the RA's type. However, if the RA triggers a conflict by the manufacturer, then the formation of the RA may become unprofitable altogether.

Our approach is related to the literature on the sources and consequences of retailer bargaining power.[6] One strand centers around the impact of buyer size on the manufacturer's disagreement point. For instance, Inderst and Wey (2007) demonstrate that a retail merger serves to prevent the marginalization of retailers, particularly when manufacturers face increasing unit costs. Other studies argue that as the retailer grows larger, it negatively affects the manufacturer's disagreement point. Raskovic (2003) highlights the concept of dependency, while Inderst and Wey (2007) suggest that reallocating a larger production quantity to other retailers becomes more challenging in such scenarios.

Additionally, Inderst and Shaffer (2007) provide further insights into the bargaining power that a large retailer can commit to a single-sourcing strategy to drive otherwise differentiated

such a contract. Supposedly such agreements would also be not compatible with the EU and EU members' competition regulations (EC, 2020, pp. 57-60).

[6] Our work builds on the general conditions of the Nash bargaining solution. Here, the work of Chun and Thomson (1990) about threat point uncertainty is related to our model, as this kind of uncertainty could make negotiations fail.

manufacturers into intense competition for getting listed.[7] This approach is also employed by Dana (2012) in the context of buyer groups, and by Allain et al. (2020) when examining retail alliances, differently to us, with joint sourcing, both showing that this mechanism can lift bargaining power.[8] Other approaches focus on the retailer's outside option. Katz (1987), for instance, argues that a larger retailer can vertically integrate backwards which a small retailer cannot do because of fixed costs. Here the size of the retailer directly improves the outside option of the retailer and hence its bargaining power when negotiating with the manufacturer. Closely related to our paper is Caprice and Rey (2015), which analyzes how a buyer group creates buyer power through a joint listing decision. This joint listing decision ensures that a single retailer is better off when all retailers revert to their outside option and not only a single retailer. Notably, Caprice and Rey (2015) assume take it or leave it power of the manufacturer so that the buyer group enhance their outside options which translates into better deals obtained from the supplier. Differently to us, the buyer group does not affect the manufacturers disagreement point. Thus, our analysis is complementary to Caprice and Rey (2015).

Our results are also interesting for the formation of RA's from a competition policy perspective. As stated above, we considered three institutional settings of the alliance. The EC (2020, p. 57-60) report, however, highlights the existing uncertainty surrounding the ability of RAs to formally commit to mutual defense agreement clauses, given antitrust regulations. Moreover, legal enforcement of such clauses, even when aligned with antitrust rules, in the absence of retaliation, may pose challenges. These limitations force retail alliances into the late uncertainty revelation scenario. This late disclosure of uncertainty may then trigger conflicts that could substantially diminish or even eliminate the profitability of RAs. Considering the detrimental impact of conflict on welfare, the paper raises a critical question for antitrust agencies: whether alliances contemplating the use of this strategy should be categorically prohibited or permitted to transparently adopt codified escalation strategies to mitigate the detrimental effects of conflict on welfare. Still, in the latter scenario, members of RAs must develop strategies to genuinely commit to joint retaliation, especially if legal enforcement of non-retaliation proves challenging.

[7] See also Matthewson and Winter (1996) in a less general framework.

[8] Doh-Shin and Menicucci (2019) generalize those findings and show that the results of Inderst and Shaffer (2007) and Dana (2012), however, are conditional on the convexity of the sellers cost function and does not hold if this is concave.

The paper proceeds as follows: Section 2 provides the general model, Section 3 analyzes the equilibrium outcomes under several escalation regimes, and Section 4 compares those regimes. Section 5 extends the model towards repeated interaction and shows why the formation of an RA could be unprofitable for its members. Finally, Section 6 concludes.

2 The Model

A manufacturer M ("she") sells her good via retailer $R1$ ("he") to consumers in country 1 and via retailer $R2$ ("he") to consumers in country 2. Consumer demands in both countries are independent and we assume the same linear demand function in each country:[9]

$$D(p_i) = 1 - p_i, \text{ for } i = 1, 2, \tag{1}$$

where p_i is the retail price charged in country $i = 1, 2$. M produces the good with constant marginal cost, which we set to zero. We consider the following three-stage game: In the first stage, M Nash-bargains with $R1$ over the wholesale price w_1, and in the second stage M sets the wholesale price w_2 for $R2$.[10] Afterwards—in the third stage—the retailers choose their retail prices. This bilateral contracting structure and timing holds when both retailers are independent and when they have formed a retail alliance (RA).

Critically, the formation of an RA creates uncertainty about the escalating behavior of $R2$ in case of a break-down of bargaining between M and $R1$. We assume that $R2$ either escalates or he does not. In the latter case ("no escalation"), $R2$ behaves as if both retailers are independent; that is, the formation of an RA has no effect at all. In the former case ("escalation"), $R2$ is assumed to take actions to reduce the effective demand for M's good by $\Delta > 0$, so that consumer demand becomes

$$D(p_2, \Delta) = D(p_2) - \Delta = 1 - p_2 - \Delta. \tag{2}$$

Such a demand reduction can be achieved by constraining the available shelf space for M's product; for instance, by $R2$'s decision to stock a substitute product in case of conflict between

[9]Below in Section 6 we show that our results also hold under general demand functions.

[10]By assuming perfect price-setting power of M vis-à-vis $R2$, we can focus on the effects of an RA on the Nash-bargaining relation between M and a single retailer; namely $R1$.

M and $R1$.[11] We abstract from any additional profits or losses $R2$ could realize by stocking a rival good.[12]

We assume that M and $R1$ have a common belief about the likelihood of the escalating behavior of $R2$, where $R2$'s behavior ultimately determines the RA's escalating type.[13] Let ρ be the common belief that $R2$ escalates and $1 - \rho$ be the counterprobability that $R2$ does not escalate, when M and $R1$ fail to reach an agreement.

We distinguish three regimes concerning the timing of the revelation of the RA's escalating behavior in case of conflict.

First, under *committed escalation* (regime "C") the RA's type becomes public information right before M starts to Nash bargain with $R1$ over the wholesale price w_1. Thus, there is only ex ante uncertainty about the escalating type, while it fully disappears when M enters negotiations with $R1$ in the first stage of the game. This regime serves as a benchmark vis-á-vis the next two regimes, where M and $R1$ bargain over the wholesale price w_1 under uncertainty about $R2$'s escalating behavior in case of conflict.

Second, under *public escalation* (regime "P") M learns the RA's escalating type when negotiations between M and $R1$ resulted in disagreement. The RA's type, therefore, becomes public information before M makes her contract offer to $R2$ (right at the beginning of stage 2) and can, therefore, condition her wholesale price offer, w_2, on $R2$'s escalating behavior.

Third, under *secret escalation* (regime "S") M only learns the RA's type when negotiations with $R1$ failed and not before M has made an acceptable contract offer to $R2$ subsequently. Only in this instance, $R2$ reveals the RA's type by its actual demand for M's product, which is

[11] We think of Δ being the result of the stocking decision of a substitute product σ at retail price p_σ. For instance, the resulting demand for M's good may then be $D(p, p_\sigma) = a - p - \gamma p_\sigma$, where $0 < \gamma < 1$ measures the substitutability of both goods. Fixing p_σ, we then get $\Delta \equiv \gamma p_\sigma$, which gives the downward distorted demand for M's product when $R2$ is of the escalating type.

[12] For instance, under conflict-free contracting (i.e., in the absence of an RA) it might be optimal to stock only M's product because of fixed costs associated with the listing of another substitute product. In case of escalation, however, $R2$ is willing to incur these fixed costs even though this reduces his profits.

[13] This assumption mirrors the weak organizational commitment achieved under an RA, which leaves not only M but also $R1$ uncertain about $R2$ actual behavior in case of conflict. With this assumption, we can abstract from the complicated issue of bargaining under asymmetric information, which is another source of inefficient bargaining outcomes.

either derived from (1) or (2).

Figure 1 shows the timing of the game and the three different regimes concering the timing of the revelation of the RA's escalating type.

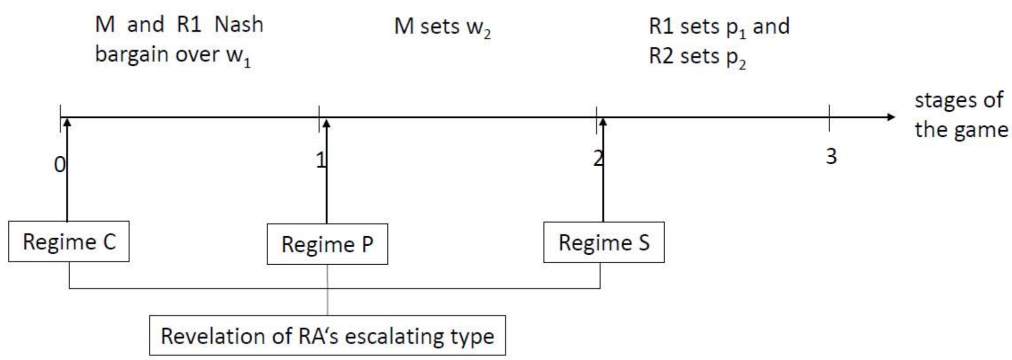

Figure 1: Timing of the Game and Escalation Regimes

We denote M's expected equilibrium profit under regime $r = C, P, S$ at point zero from transacting with Ri by π^r_{Mi}, with $i = 1, 2$. M's total expected profit under regime r is then given by $\pi^r_M = \pi^r_{M1} + \pi^r_{M2}$. Accordingly, π^r_i stands for Ri's expected equilibrium profit under regime r at stage zero. Finally, we invoke the parameter restriction $\Delta < \frac{1}{2}$, which ensures that $R2$ always sells a strictly positive quantity to consumers even in case of escalation under all regimes.

3 Analysis of the Escalation Regimes

We solve the game by backward induction under the three regimes. We start with the analysis of regime C, which serves as a benchmark for the remaining two regimes, where disagreement-point uncertainty in the Nash-bargaining relation between M and $R1$ is critically determining the equilibrium outcome.

Committed escalation (regime "C"). Right after the start of the game, the RA's escalating type becomes public information. If the RA does not escalate, then the solution is the same as when the retailers are independent. We first solve this case and then turn to the case when the

RA is of the escalating type. Taken together, we then get the firms'expected profits.

Case i) (R2 does not escalate: indexed by "0"). We obtain the derived demands of $R1$ and $R2$ for M's product from solving the retailer problem

$$\max_{p_i \geq 0} \pi_i = D(p_i)(p_i - w_i), \text{ for } i = 1, 2,$$

which gives the solution

$$p_i(w_i) = \frac{1 + w_i}{2} \text{for } i = 1, 2. \tag{3}$$

Substituting (3) into (1), Ri's derived demand for M's product is given by

$$D(p_i(w_i)) = \max\left\{\frac{1 - w_i}{2}, 0\right\}, \text{ for } i = 1, 2. \tag{4}$$

M's profit from serving Ri is $\pi_{Mi} = D(p_i(w_i))w_i$. The wholesale price w_2—M offers $R2$—solves

$$\max_{w_2 \geq 0} \pi_{M2} = D(p_2(w_2))w_2, \tag{5}$$

which yields the solution $w_2^0 = 1/2$. The profit levels of M and $R2$ are then $\pi_{M2}^0 = 1/8$ and $\pi_2^0 = 1/16$, respectively.

The Nash-bargaining problem between M and $R1$ also builds on the derived demand of $R1$ for M's good, which is given by (4). Thus, $R1$ enters the negotiations with the (reduced) profit function

$$\widehat{\pi}_1 = D(p_1(w_1))(p_1(w_1) - w_1) \tag{6}$$

and M with the (reduced) profit function

$$\widehat{\pi}_{M1} = D(p_1(w_1))w_1. \tag{7}$$

The disagreement payoffs of both M and $R1$ are zero, because the RA is assumed to be of the non-escalating type. Thus, the Nash-bargaining solution solves

$$\max_{w_1 \geq 0} NP = \widehat{\pi}_1 \cdot \widehat{\pi}_{M1},$$

which gives the solution $w_1^0 = \frac{1}{4}$. M's and $R1$'s profit from transacting with each other are then given by $\pi_{M1}^0 = \frac{3}{32}$ and $\pi_1^0 = \frac{9}{64}$, respectively.

Case ii) (R2 escalates: indexed by "Δ"). If $R2$ is of the escalating type, then M and $R1$ know that $R2$ will reduce his demand to (2), whenever they end up in disagreement. If, however, bargaining between M and $R1$ leads to an agreement, then $R2$ will operate with the undistorted demand (1). In the latter case, we get the same wholesale price as in *case i)* above: $w_2 = 1/2$. In the former case, $R2$ escalates and reduces its demand to (2), which implies that $R2$'s optimally chosen retail price becomes

$$p_2(w_2, \Delta) = \frac{1 - \Delta + w_2}{2}. \tag{8}$$

Substituting (8) into (2), we obtain the derived demand of $R2$ for M's product in case of escalation:

$$D(p_2(w_2, \Delta), \Delta) = \max \left\{ \frac{1 - \Delta - w_2}{2}, 0 \right\}.$$

The wholesale price M charges $R2$, therefore, solves

$$\max_{p_2 \geq 0} D(p_2(w_2, \Delta), \Delta) \cdot w_2, \tag{9}$$

which yields the optimal wholesale price $w_2^\Delta = \frac{1-\Delta}{2}$. M and $R2$ then realize profits of $\pi_{M2}^\Delta = \frac{1}{8}(1-\Delta)^2$ and $\pi_2^\Delta = \frac{1}{16}(1-\Delta)^2$, respectively.

If $R2$ escalates, then the bargaining problem between M and $R1$ and the contracting problem between M and $R2$ are interdependent, because M's threat point when bargaining with $R1$ is now given by

$$d_M^\Delta = \pi_{M2}^\Delta - \pi_{M2}^0 = -\frac{1}{8}\Delta(2-\Delta), \tag{10}$$

i.e., by the profit loss M realizes with $R2$ because of $R2$'s escalation in case of disagreement with $R1$. The Nash-bargaining problem between M and $R1$ builds again on the reduced profit functions (6)-(7). However, we have to take account of the worsened threat point of M (see 10). Accordingly, the Nash solution solves

$$\max_{w_1 \geq 0} NP = \widehat{\pi}_{R1} \cdot \left(\widehat{\pi}_{M1} - d_M^\Delta\right),$$

which yields the solution

$$w_1^\Delta = \frac{5 - \sqrt{9 + 8\Delta(2-\Delta)}}{8}.$$

Clearly, $w_1^\Delta < w_1^0$, so that the threat of escalation leads to a lower wholesale price $R1$ has to pay. Moreover, the price-reducing effect of the threat of escalation increases in Δ. The profit level of $R1$ is then given by

$$\pi_1^\Delta = \frac{1}{256}\left(\sqrt{9 + 8\Delta(2-\Delta)} + 3\right)^2,$$

while M's profit from transacting with $R1$ is

$$\pi_{M1}^{\Delta} = \frac{1}{64}\left[\sqrt{9+8\Delta(2-\Delta)} + 3 - 4\Delta(2-\Delta)\right].$$

With those results at hand, we can summarize the equilibrium outcome under regime C as follows.

Lemma 1. *Assume regime C. M, $R1$, and $R2$ realize the following expected profits:*

i) M's expected profit is $\pi_M^C = (1-\rho)(\pi_{M1}^0 + \pi_{M2}^0) + \rho(\pi_{M1}^{\Delta} + \pi_{M2}^{\Delta})$, with $\pi_{Mi}^0 > \pi_{Mi}^{\Delta}$ for $i = 1, 2$.

ii) $R1$'s expected profit is $\pi_1^C = (1-\rho)\pi_1^0 + \rho\pi_1^{\Delta}$, with $\pi_1^0 < \pi_1^{\Delta}$.

iii) $R2$'s expected profit is $\pi_2^C = \pi_2^0$.

The ability of an RA to induce escalation in case of conflict between M and $R1$ increases the RA's joint profits relative to the independent-retailers case, because $R1$ manages to increase his profit while $R2$'s profits is not affected.[14] Accordingly, M's expected profit is reduced relative to the independent-retailers case. Moreover, the change in profits increases in the probability of escalation ρ and the extent of it in terms of Δ.

Public escalation (regime "P"). Under regime P, M only learns the RA's escalating type if negotiations with $R1$ fail. Thus, both M and $R1$ are uncertain about $R2$'s behavior in case of conflict when they enter negotiations; that is, M and $R1$ Nash-bargain under *disagreement point uncertainty* (Chun and Thomson 1990). If bargaining between M and $R1$ is successful, then M sets the same wholesale price w_2 as in case *i)* of regime C. Accordingly, M and $R2$ realize the profits π_{M2}^0 and π_2^0 in this case.

However, when bargaining between M and $R1$ fails, then $R2$ makes his escalating behavior public before M makes her wholesale price offer to $R2$. M can, therefore, condition her wholesale price offer on the RA's type as under regime C. Using our results from regime C, M's expected profit from contracting with $R2$—given there is disagreement with $R1$—is given then by

$$\pi_{M2}^{P,D} = (1-\rho)\pi_{M2}^0 + \rho\pi_{M2}^{\Delta}.$$

The threat point of M—when bargaining with $R1$—is then given by

$$d_M^P = \pi_{M2}^{P,D} - \pi_{M2}^0 = -\frac{1}{8}\Delta\rho\,(2-\Delta)\,; \tag{11}$$

[14] $R2$ can also profit from the RA when $R1$'s and $R2$'s roles alternate across different powerful manufacturers.

i.e., by the expected profit loss M realizes with $R2$, because of $R2$'s possible escalating behavior. We next turn to the bargaining problem between M and $R1$. The Nash-bargaining problem between M and $R1$ builds again on the derived demand of $R1$ for M's good given by (4), which implies the reduced profit functions (6) and (7). However, we now have to take account of the worsened threat point of M given by (11), so that the Nash solution solves

$$\max_{w_1 \geq 0} NP = \widehat{\pi}_{R1} \cdot \left(\widehat{\pi}_{M1} - d_M^P \right),$$

which yields the solution

$$w_1^P = \frac{1}{8} \left(5 - \sqrt{9 + 8\Delta\rho(2 - \Delta)} \right).$$

M's profit from transacting with $R1$ is then given by

$$\pi_{M1}^P = \frac{1}{64} \left[\sqrt{9 + 8\Delta\rho(2 - \Delta)} + 3 - 4\Delta\rho(2 - \Delta) \right],$$

and $R1$'s profit by

$$\pi_1^P = \frac{1}{256} \left(\sqrt{9 + 8\Delta\rho(2 - \Delta)} + 3 \right)^2.$$

With those results at hand, we can summarize the equilibrium outcome of regime P as follows.

Lemma 2. *Assume regime P. M, $R1$, and $R2$ realize the following expected profits:*
i) M's expected profit is $\pi_M^P = \pi_{M1}^P + \pi_{M2}^0$.
ii) $R1$'s expected profit is π_1^P.
iii) $R2$'s expected profit is $\pi_2^P = \pi_2^0$.

Secret escalation (regime "S"). We proceed backward and first solve the contracting problem between M and $R2$. Again, we have to consider two cases: *i)* bargaining between M and $R1$ was successful and *ii)* bargaining between M and $R1$ resulted in disagreement. In case *i)*, we get the same solution for the contracting problem between M and $R2$ as in case *i)* of regime C.

Turning to case *ii)*—i.e., bargaining between M and $R1$ failed—$R2$ escalates with probabilty ρ and does not escalate with counterprobabilty $1 - \rho$. In the latter case, $R2$ operates with the undistorted demand (1) and in the former case he distorts his demand downward to (2). M is uncertain which of both demands $R2$ uses when making her wholesale price offer to $R2$. However, $R2$ makes its price-setting decision optimally given its type. That is—given w_2—$R2$ maximizes his profit depending on consumer demand which is either (1)—if $R2$ does not escalate—or (2)—if

$R2$ escalates. Solving $R2$'s problem, $\max_{p_2 \geq 0} \pi_2$, depending on whether (1) or (2) applies, we get that $R2$ sets either (3) with probabilty $1-\rho$ or (8) with probability ρ.

M, therefore, faces the expected derived demand of $R2$

$$D^{S,D}(w_2) = (1-\rho)D(p_2(w_2)) + \rho D(p_2(w_2, \Delta), \Delta).$$

M sets the wholesale price w_2 depending on $R2$'s expected derived demand $D^{S,D}(w_2)$ to maximize her expected profit with $R2$, which is given by

$$\pi_{M2}(D^{S,D}(w_2)) = \left[(1-\rho)D(p_2(w_2)) + \rho D(p_2(w_2, \Delta), \Delta)\right] w_2.$$

From the first-order condition, we get the optimal wholesale price

$$w_2(D^{S,D}) = \frac{1}{2}(1 - \Delta\rho).$$

Note that $\Delta < 1/2$ ensures that the derived demand of $R2$ is strictly positive even when $R2$ escalates.[15] Substituting $w_2(D^{S,D})$ into M's profit gives the expected profit M realizes with $R2$, when bargaining with $R1$ failed:

$$\pi_{M2}^{S,D} = \frac{1}{8}\left(1 - \Delta\rho\right)^2. \tag{12}$$

In turn, $R2$ realizes the expected profit level

$$\pi_2^{S,D} = (1-\rho)\frac{1}{16}(1+\Delta\rho)^2 + \rho\frac{1}{16}(1 + \Delta\rho - 2\Delta)^2.$$

Turning to the bargaining problem between M and $R1$, we thus get the threat-point of M,

$$d_M^S = \pi_{M2}^{S,D} - \pi_{M2}^0 = -\frac{1}{8}\Delta\rho\left(2 - \Delta\rho\right), \tag{13}$$

which is given by the profit loss M expects to realize from contracting with $R2$, when bargaining with $R1$ failed. The Nash-bargaining problem between M and $R1$ builds again on the derived demand of $R1$ for M's good (4) and the associated reduced profit levels (6) and (7). However, we have to take account of the worsened threat point of M given by (13), so that the Nash bargaining solution solves

$$\max_{w_1 \geq 0} NP = \widehat{\pi}_{R1} \cdot \left(\widehat{\pi}_{M1} - d_M^S\right),$$

[15]The derived demand of $R2$ is strictly positive if $\Delta < \frac{1}{2-\rho}$ holds.

which yields

$$w_1^S = \frac{1}{8}\left(5 - \sqrt{9 + 8\Delta\rho(2 - \Delta\rho)}\right). \tag{14}$$

Substituting (14) into M's reduced profits (7), we get the equilibrium profit M realizes with $R1$:

$$\pi_{M1}^S = \frac{1}{64}\left[\sqrt{9 + 8\Delta\rho(2 - \Delta\rho)} + 3 - 4\Delta\rho(2 - \Delta\rho)\right].$$

Accordingly, $R1$'s profit is given by

$$\pi_1^S = \frac{1}{256}\left(\sqrt{9 + 8\Delta\rho(2 - \Delta\rho)} + 3\right)^2.$$

Lemma 3. *Assume regime S. M, $R1$, and $R2$ realize the following expected equilibrium profits:*

i) M's profit is $\pi_M^S = \pi_{M1}^S + \pi_{M2}^0$.

ii) $R1$'s profit is π_1^S.

iii) $R2$'s profit is $\pi_2^S = \pi_2^0$.

In the next section, we compare the equilibrium outcomes under the three different regimes.

4 Comparison of the Regimes

Relative to the independent retailers case (see case *i)* of regime C), the only effect of the RA is to change the disagreement point of M when M Nash bargains with $R1$ about the wholesale price w_1. In particular, the RA has no real effect on the joint surplus created by the vertical chain. We then showed that the RA's impact on M's disagreement point critically depends on the RA's ability to credibly to commit to escalation, which gives rise to the three possible regimes C, P, and S.

We first compare how M's disagreement point is affected by the RA under the three escalation regimes (note that $R1$'s disagreement point is zero under all regimes). Under the benchmark regime C, M's disagreement point is either zero—when the RA is of the non-escalating type—or it is given by (10), when $R2$ escalates. Notably, the threat point becomes certain under regime C, right before M starts to negotiate with $R1$, while there is *disagreement point uncertainty* under regimes P and S. Under regime P, M's disagreement point when bargaining with $R1$ is given by (11), whereas it is given by (13) under regime S. We can summarize our findings concerning M's disagreement points under regimes P and S—relative to the certain disagreement points d_M^0 and d_M^Δ under regime C and its expected value d_M^C) as follows.

Lemma 4. *The comparison of M's disagreement points under regimes P and S yields the following ordering:*

$$d_M^0 = 0 \geq d_M^C = d_M^P \geq d_M^S \geq d_M^\Delta,$$

with equality holding $d_M^P = d_M^S = d_M^\Delta$ *for* $\rho = 1$ *and* $d_M^P = d_M^S = 0$ *for* $\rho = 0$*. Moreover,* $\frac{\partial d_M^r}{\partial \rho} < 0$*, for* $r = P, S$*, and* $\frac{\partial^2 d_M^P}{\partial \rho^2} = 0$*, while* $\frac{\partial^2 d_M^S}{\partial \rho^2} > 0$*; i.e., the threat point is strictly convex in* ρ *under regime* S*.*

Lemma 4 follows directly from inspection of the disagreement points under the three different regimes. Clearly, the escalation threat becomes maximal when escalation is certain (i.e., $\rho = 1$). If, however, the threat is uncertain, then M's disagreement point is better under regime P than under regime S.[16] The reason is that M can condition its wholesale price offer to $R2$ in the former case on the revealed type of the RA, while this is not possible under regime S. Consequently, M's ability to extract rents from $R2$ under regime S is restricted by a uniform pricing rule, so that her threat point is worse under regime S when compared with regime P.

Lemma 4 also states that uncertainty impacts negatively on M's disagreement point under regimes P and S. Moreover, the relation is linear under regime P and convex under regime S. This means, together with the other properties of both disagreement points stated in Lemma 4, that the difference between both disagreement points, $d_M^P - d_M^S$, must increase at relative small values of ρ and converge at relatively large values of ρ. In other words, the bargaining power effect of disagreement point uncertainty is particularly strong for intermediate values of ρ under regime S relative to regime P.

According to the Nash bargaining solution, the different disagreement points M has under the different regimes, must also affect the bargaining outcomes between M and $R1$, which is confirmed by the next lemma.

Lemma 5. *The comparison of the expected wholesale price* w_1 *under regimes P and S yields the following ordering:*

$$w_1^0 \geq w_1^P \geq w_1^S \geq w_1^\Delta,$$

with equality holding $w_1^P = w_1^S = w_1^\Delta$ *for* $\rho = 1$ *and* $w_1^P = w_1^S = w_1^0$ *for* $\rho = 0$*. Moreover,* $\frac{\partial w_1^r}{\partial \Delta} < 0$ *and* $\frac{\partial w_1^r}{\partial \rho} < 0$*, for* $r = P, S$*.*

[16] Interestingly, the disagreement point of regime P is equal to the expected disagreement point under regime C (a feature we will come back to below).

Next we turn to the comparison of the firms'profit levels under the three regimes.

Proposition 1. *The comparison of the expected profits under regimes C, P, and S yields the following orderings:*

i) M's profits: $\pi_{M1}^{0} \geq \pi_{M1}^{P} \geq \pi_{M1}^{C} \geq \pi_{M1}^{S} \geq \pi_{M1}^{\Delta}$, *with equality holding at* $\rho = \{0, 1\}$.

ii) R1's profits: $\pi_{1}^{\Delta} \geq \pi_{1}^{S} \geq \pi_{1}^{P} \geq \pi_{1}^{C} \geq \pi_{1}^{0}$, *with equality holding at* $\rho = \{0, 1\}$.

Moreover, π_{M1}^{S} *is strictly convex in* ρ, π_{M1}^{P}, π_{1}^{P}, *and* π_{1}^{S} *are strictly concave in* ρ, *while* π_{M1}^{C} and π_{1}^{C} *are linear in* ρ. *Finally, R2's profit level is independent of the escalation regime.*

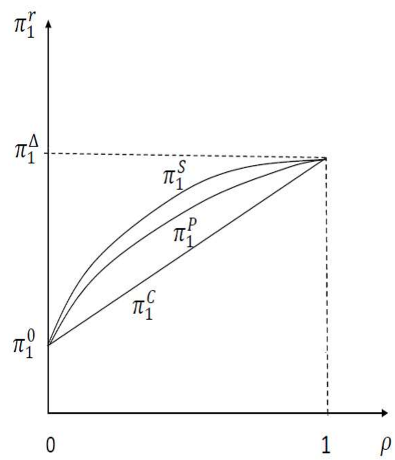

Figure 2: $R1$'s Equilibrium Profits

$R1$'s profit is depicted in Figure 2. Given that escalation is strcitly uncertain ($\rho > 0$), $R1$ (and thus the RA) realizes the highest expected profit under regime S; i.e., when the escalating type remains secret as long as possible. Under regime S the RA unfolds the strongest possible threat-point effect which results in the lowest expected wholesale price, w_1, $R1$ has to pay to M. Interestingly, public escalation also leads to higher profits for $R1$ than committed escalation.

These results show that it is not necessarily optimal for an RA to engage in committing practices which lead to the revelation of the escalating type of the RA at an early stage before the negotiation process starts. Rather the opposite holds: the RA maximizes its expected profits by keeping the uncertainty about its escalating type uncertain as long as possible; that is not before a disagreement occured with $R1$ and not before M has made an offer to the remaining member of the RA.

Figure 3 depicts M's equilibrium profits under the three regimes depending in ρ. M's profit is clearly the lowest under regime S. Interestingly, given that uncertainty about the RA's escalating type is strict ($\rho > 0$), M realizes a strictly higher expected profit under regime P than under regime C. The reason is that the expected profit under regime C is a linear combination of the benchmark profit levels π_{M1}^{0} and π_{M1}^{Δ}, while M's expected profit under regime P is strictly concave in ρ. It follows that regime C is Pareto-dominated by regime P. Given that an RA has formed, both M and $R1$ prefer regime P over regime C.

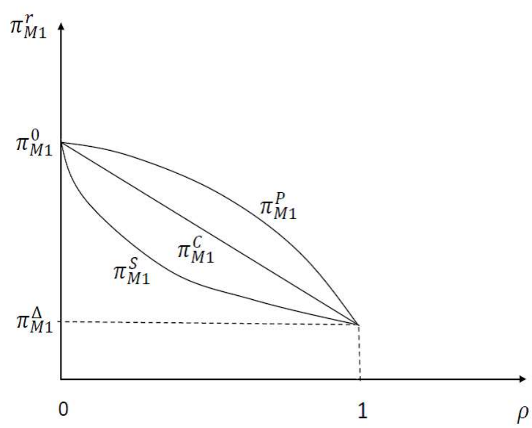

Figure 3: M's Equilibrium Profits

Under regime S the situation is quite different. Critically, M's expected profit under regime S is strictly convex in ρ, which implies that M would benefit—in expected terms—from learning the RA's type in advance before negotiations with $R1$ start. In other words, M has a clear incentive to trigger a conflict under regime S in order to learn the RA's type. In contrast, $R1$ has no such an incentive because his profit is always higher under regime S than under regime C.

We, therefore, have identified a possible source of conflict which is due to the disagreement-point uncertainty associated with an RA under regime S. Our finding is related Chun and Thompson (1990), which introduces the requirement of disagreement-point concavity into the cooperative bargaining model. Interestingly, our model fulfills Chun and Thompson's (1990) requirement of disagreement point concavity, which follows from noticing that the solution of regime C corresponds to x^1 and the solution of regime P to x^2 in the above quote. According to Lemma 4, we have $d_M^C = d_M^P$, while π_{M1}^P is strictly concave in ρ.

However, the situation is different under regime S. *First*, the threat-point of M under regime S is worse than the expected value of the disagreement points under regime C; i.e., $d_M^S < d_M^C$ according to Lemma 4. *Second*, M's disagreement point is convex in ρ, so that regime S provokes the problem of conflict as spelled out by Thomson in the above quote.

Figure 4 visualizes the solutions of the Nash-bargaining problem between M and $R1$ under the different regimes. Note that the bargaining frontier is the same for all regimes, while M's disagreement differ among the regimes.

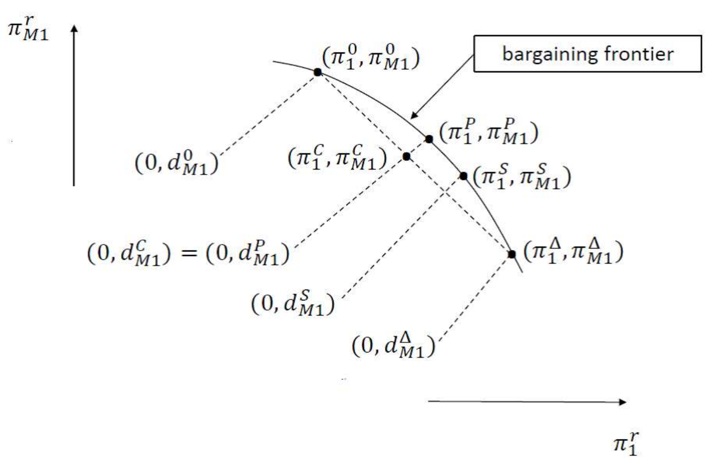

Figure 4: Expected Profits on the Bargaining Frontier

As can be seen from Figure 4, the bargaining solutions under regimes C and P correspond to Chun and Thompson's analysis. As the requirement of disagreement-point concavity holds, the bargaining solution under regime P, (π_1^P, π_M^P) Pareto-dominates the expected bargaining solution under regime C, given by (π_1^C, π_M^C). However, regime S leads to a bargaining solution (π_1^S, π_M^S) which is preferred by $R1$ but not by M, when compared with the expected solution under regime C. Thus, there is a potential for conflict under regime S, which we make explicit in the next section.

5 Incentives for Conflict and RA Formation

Assume now an infinite horizon game with $t = 0, 1, 2, \ldots$ contracting periods. Each contracting period is given by the stage game analyzed in the previous section (see Figure 1). Thus $D(p_i)$ becomes the per-period demand in country i and π stands for a firm's per-period profit. The common discount factor is $\delta \in (0, 1)$. Suppose that $R1$ and $R2$ form an RA before the game starts. Assume also $0 < \rho < 1$, so that there is strict uncertainty about the escalating behavior of the RA.

Suppose that escalation is secret so that regime S applies. We focus on the subgame perfect equilibrium of the infinitely repeated game, where firms play the equilibrium in the stage game as analyzed in the previsous section. That is, a firm's strategy at stage t is independent of the history of the game and only depends on whether or not the RA's type has been revealed in the past. However, we suppose that M can trigger a conflict with $R1$ at the beginning of stage 1 in the stage game (Figure 1) in any period of contracting, $t = 1, 2, \ldots$; for instance, by committing to insist on an inacceptable wholesale price w_1 (say, $w_1 = +\infty$), in which case bargaining with $R1$ must break down. It then follows that $R2$ is forced to reveal its type after M made an offer to $R2$ in the next stage of the game. If M does not want to trigger such a conflict, then bargaining between M and $R1$ will be successul according to the Nash bargaining solution as analyzed in the previous section.

The per-period profits of M, $R1$, and $R2$, when M does not trigger a conflict are given by π_M^S, π_1^S, and π_2^S respectively. If, however, M triggers a conflict in contracting period t, then she realizes in this period the expected one-period profit $\pi_M^{S,D}$ with $R2$ (see (12)) and the expected per-period profit π_M^C (see Lemma 1) in all subsequent contracting periods.

Thus, M has an incentive to trigger a conflict with $R1$ to learn the RA's escalating type if

$$\frac{1}{1-\delta}\pi_M^S \leq \pi_M^{S,D} + \frac{\delta}{1-\delta}\pi_M^C,$$

which can be re-written as

$$\delta > \widetilde{\delta} = \frac{\pi_M^S - \pi_M^{S,D}}{\pi_M^C - \pi_M^{S,D}}, \tag{15}$$

where $\widetilde{\delta} < 1$ because $\pi_M^S < \pi_M^C$ for $0 < \rho < 1$. It follows that M always triggers a conflict in order to learn the RA's escalating type, whenever her discount factor is large enough. When regime P holds, then M never finds it optimal to trigger a conflict because $\pi_M^P > \pi_M^C$.

We finally analyze the incentive to form an RA in the first place. We invoke the additional assumption that the operation of the RA is costly (otherwise, the formation of an RA is always optimal). Let $k > 0$ be the per-period operating costs $R1$ has to incur.[17] Assuming that $\delta > \widetilde{\delta}$ holds (i.e., the formation of an RA triggers a conflict according to (15)), we then get that the RA is not profitable for $R1$ if

$$\frac{1}{1-\delta}\pi_1^0 > -k + \frac{\delta}{1-\delta}(\pi_1^C - k),$$

which implies the condition

$$\delta < \frac{\pi_1^0 + k}{\pi_1^C}.$$

Note that $\frac{\pi_1^0+k}{\pi_1^C} > 1$ if $k > \pi_1^C - \pi_1^0$. Thus, $k > \pi_1^C - \pi_1^0$ is sufficient to make the RA unattractive from $R1$'s perspective whenever $\delta > \widetilde{\delta}$ holds; i.e., when M finds it optimal to trigger a conflict to learn the RA's escalating type. However, the formation of an RA could be unattractive for $R1$ even for $k = 0$, if $\widetilde{\delta} < \frac{\pi_1^0}{\pi_1^C}$ holds. Then, discount factors $\delta \in \left(\widetilde{\delta}, \frac{\pi_1^0}{\pi_1^C}\right)$ ensure that M wants to trigger a conflict after the formation of the RA, while $\delta < \frac{\pi_1^0}{\pi_1^C}$ makes sure that $R1$ realizes a higher present value when staying independent than under an RA that is fraught with conflict.

Clearly, the RA can avoid such a gloomy outcome when being able to commit to regime P. The outcome of regime P Pareto-dominates the outcome under regime C, so that there can be no conflict as under regime S. However, antitrust rules against supplier boycotts by powerful buyers may prevent such a commitment strategy, so that the RA is doomed to revert to the secret escalation regime, which may turn out to be unprofitable when it triggers conflict.

6 Discussion and Extensions

Efficient Contracting

We showed that uncertainty about the escalating behavior of a member of the RA can create an incentive to trigger a conflict on the manufacturer's side. A necessary condition for such a conflict to occur is that M's threat point is convex in ρ, which holds under regime S (Lemma 4). It then follows that M's expected profit from bargaining with $R1$ also becomes a convex function of the escalation probability (Proposition 1), which in turn is responsible for M's incentives to trigger a conflict in order to learn the escalating type of the RA.

[17] Here, we focus on the unilateral incentive of $R1$ to form an RA with $R2$.

Here, we show that for our main case, i.e. the secret escalation, this line of reasoning stays valid also under efficient bargaining (e.g., over a two-part tariff contract) as long as there remains some degree of inefficiency (i.e., double mark-up inefficiency) in the contracting process between M and $R2$. To see this, assume first that M and $R1$ bargain over a two-part tariff contract which consists of a unit price w and a fixed fee F. Clearly, with a two-part tariff contract at hand, the double mark-up problem is avoided, so that the unit price is set equal to marginal cost; here, $w = 0$. Thus, $R1$ sets the joint profit maximizing price $p_1 = \frac{1}{2}$, so that the reduced profits are given by $\widehat{\pi}_{M1} = F$ and $\widehat{\pi}_1 = \frac{1}{4} - F$ for M and $R1$, respectively. Given M's threat point in regime S, d_M^S, the Nash bargaining solution then requires

$$F - d_M^S = \frac{1}{4} - F,$$

from which we get the fixed fee and hence M's equilibrium profit

$$\pi_{M1}^S(F) = \frac{1 + d_M^S}{8}.$$

Thus, we get $\frac{\partial^2 \pi_{M1}^S(F)}{\partial \rho^2} > 0$ if and only if $\frac{\partial^2 d_M^S}{\partial \rho^2} > 0$. This means that the potential for conflict stays valid even when M and $R1$ Nash bargain over a two-part tariff contract. Assuming a general demand function $D_1(p_1)$, with $D_1' < 0$ and strictly positive production costs $c > 0$ would not affect this statement. So our finding that there is potential for conflict because of threat point uncertainty under regime S stays valid when we allow M and $R1$ to bargain over an efficient contract and when we consider a general downward sloping demand function $D_1(p_1)$ and strictly positive marginal production costs.

We next turn to the contracting problem between M and $R2$, when bargaining between M and $R1$ was not successful (i.e., in the conflict case). Under regime S, M is uncertain about $R2$'s escalating type when making her contract offer. If we assume that M can make an unconstrained two-part tariff contract offer to $R2$, then M's expected profit must be linear in $R2$'s escalating probability ρ, because M would always set the unit-price equal to her marginal products cost (here $w_2 = 0$) to avoid the double mark-up inefficiency. But then $R2$'s pricing decisions depending on his escalating type are also independent of ρ, so that the expected profit of $R2$ (which must be equal to the fixed fee M charges from $R2$) must be linear in ρ. Thus, if M can set an unconstrained two-part tariff contract, then M's threat point is also linear in ρ even under regime S. Consequently, a necessary condition for our results to stay valid is that there is some double mark-up inefficiency in the contracting process between M and $R2$, which leads to a convex threat point for M; for instance, because of a binding liquidity constraint so that the fixed fee cannot be so high that the entire expected retailer profit can be extracted.[18]

Moral Hazard and Signalling Behavior.

In our model we focused on the Nash bargaining problem between M and $R1$ and how $R2$'s escalating behavior affects the bargaining outcome. Critically, we assumed that $R2$'s escalating type is predetermined by "nature" and cannot be changed by $R2$ himself. With this we can rule out moral hazard on $R2$'s side in case of conflict between M and $R1$ and also the issue of signalling in the repeated game context. The problem of moral hazard could become important, when the burden of escalation is asymmetrically distributed among members of the RA. For instance, in our setting $R2$ bears the burden of escalation while he does not benefit from a better deal with M latter on. Here, only $R1$ benefits from better deals with M, when M has learned that the RA is indeed of the escalating type. Similarly, $R2$ could also pretend to be of the escalating type by reducing his demand in case of conflict so as to signal that the RA is of the escalating type.

We can extend our setting to take care of both issues. First, the moral hazard problem can be overcome when $R1$ and $R2$ change their roles with different suppliers. So suppose that there are two suppliers $M1$ and $M2$, while $R1$ ($R2$) Nash bargains first with $M1$ ($M2$) and $R2$ ($R1$) gets a take-it or leave-it offer from $M1$ ($M2$) thereafter. In this setting, the burden of escalation is distributed equally among the RA members, which should help to overcome possible moral hazard problems to carry the burden of escalation.

The problem of a strategic escalation by $R2$ so as to signal that the RA is of the escalating type even though it is not, could either lead to a "pooling" outcome, where M is never sure about the true type of the RA—in which case it cannot gain from a conflict with $R1$—or a "separating" outcome where M boycotts $R1$ for a long time so as to induce revelation of the RA's type.

[18]Two prominent arguments for a double mark-up problem to occur even under two-part tariffs are provided by Rey and Tirole (1986) and Romano (1994). In the former paper a double mark-up follows from risk-aversion on the retailer's side and in the latter paper it follows from a double moral hazard problem.

7 Conclusion

Our analysis elucidates the underlying determinants of bargaining power in Retail Alliances (RAs). We introduce a novel mechanism that exerts a negative impact on the outside option of manufacturers in relation to retailers, thereby enhancing the bargaining position of retailers through an externality on each others' RA members' outside options. Remarkably, this mechanism operates independently of joint sourcing or joint listing arrangements, relying instead on a mutual defense mechanism.

Significantly, we integrate uncertainty, a clear characteristic of such alliances, into our analysis. We demonstrate that the implications of this mechanism and its associated uncertainty lead to inherent instability in the RA dynamics. Consequently, we are able to offer an explanation for the behavior observed in international RAs, such as AGECORE.

Our model unveils two key insights. Firstly, without binding sources, RAs become attractive to new members as a means to augment their bargaining power—an aspect not explicable using conventional models. Secondly, conflicts within RAs may lack stability, leading to the dissolution of these alliances. This reveals that uncertainty plays a crucial role in explaining conflicts as equilibrium outcomes rather than mere off-equilibrium observations, a distinction from conventional Nash-in-Nash bargaining scenarios.

Moreover, our findings have significant implications for antitrust analysis. The relevance of regime C is underscored, while the potential infeasibility of implementing regimes P or C lies - besides potential enforcement problems of mutual defense contracts- in competition rules that prohibit seller boycotts when buyers possess market buyer power (or relative market power) over the targeted seller.

We show that endeavors to regulate retailer practices concerning their suppliers invariably engender conflicts and operational inefficiencies. Consequently, the role of competition policy necessitates a nuanced evaluation, contemplating whether to endorse such practices, or to prohibit such retaliatory actions more clearly. Should the decision lean towards endorsing these practices, RAs engaged in retaliatory mechanisms require truthful commitment strategies.

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