Slotting Allowances and Conditional Payments

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March 2005

Abstract

In this paper, we analyze the competitive effects of upfront payments made by manufacturers to retailers. We consider a contracting situation in which rival retailers offer contracts to a single manufacturer. As Bernheim & Whinston (1998), who look at a situation in which competing manufacturers offer contracts to a single retailer, the resulting equilibrium outcome maximizes industry profits. Yet, while non-contingent two-part tariffs suffice to implement the monopoly outcome in the situation considered by Bernheim & Whinston, more complex contracts are required here to eliminate all contracting externalities from common agency. Two-part tariffs that are contingent on common agency versus exclusivity may for example yield common agency but can never sustain the monopoly outcome. Once upfront slotting allowances are added, however, the monopoly outcome can be restored. This suggests that slotting allowances, as widely observed in the contracts between manufacturers and large distributors, may be detrimental to consumer and total welfare.

keywords: vertical contracts, slotting allowances, buyer power, common agency

JEL classification codes: L14, L42

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1 Introduction

In recent years, payments made by manufacturers to retailers have been one of the most controversial practices in vertical supply arrangements. Especially when dealing with supermarket chains, manufacturers often make upfront payments at the time when the contract is signed, or at the beginning of each year in long-term relationships. Examples are slotting allowances paid to gain access to a slot on the retailer’s shelf, ’listing fees’ to become or remain one of the retailer’s potential suppliers, or ’pay-to-stay’ fees.

Most of the past policy discussion and literature has focused on the potential of slotting allowances to induce upstream exclusion. The main concern there is that large manufacturers may use slotting allowances to exclude smaller competitors from scarce shelf space. Recently, however, the perceived shift of bargaining power from manufacturers to retail multiples has led to new questions. As underlined by Marx & Shaﬀer (2004) in a paper closely related to ours, real-world evidence indicates that both the incidence and the magnitude of slotting allowances is associated with the exercise of retail bargaining power. Possible explanations brought forward for this so far are that strong retailers may use upfront payments to exclude other retailers, or that slotting allowances are a way to shift a larger share of profits to retailers. Contributing to this discussion, we show that retailers may use contracts including slotting allowances to achieve monopoly profits under common agency, i.e. in a situation where rival retailers distribute the same good.

In particular, we consider the role of conditional fixed fees and upfront payments in determining (i) whether exclusion is a proﬁtable strategy for a retailer, and (ii) the competitiveness of prices in a common agency situation. Conditional fixed fees, in contrast to upfront payments, are only charged once the retailer places an actual order with the manufacturer. We examine a contracting situation in which rival retailers offer public take-it-or-leave-it contracts to a single manufacturer. Contract offers can be contingent on common versus exclusive agency. We ﬁnd that the industry structure, either exclusive or common agency, is selected by the retailers so as to maximize industry proﬁts, since each retailer’s proﬁt is bounded above by its contribution to industry proﬁts.

Standard two-part tariffs however cannot yield monopoly common agency proﬁts. Maximizing industry proﬁts requires wholesale prices

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2This is a main conclusion of Marx & Shaﬀer (2004) whose contribution will be discussed in more detail later.
above marginal costs, to compensate for the competitive pressure on retail margins. At these wholesale prices however, each vertical pair has an incentive to free-ride on the rival retailer’s revenue by reducing its own wholesale price. This may prevent common agency in equilibrium, as one retailer’s exclusive profits could be higher than the maximum achievable common agency profit. Conditioning fixed fees on actual trade may help to reestablish the existence of common agency: each retailer now commits only to produce if its retail profit is high enough to cover the conditional payment.

Finally, when combined with upfront payments by the manufacturer to the retailers, conditional fixed fees will always lead to common agency as the preferred equilibrium of the retailers: common agency now generates integrated monopoly profits. Conditional payments equal to each retailer’s ex post profit serve as a commitment to maintain monopoly prices. Upfront payments by the manufacturer can then be used to share the profits such that each retailer earns its full contribution to the integrated monopoly profits. Retailers obviously want to use such three-part tariffs whenever permitted.

Our analysis thus confirms the observation that slotting allowances are associated with retail bargaining power. Were bargaining power upstream, the integrated monopoly solution could be achieved without upfront payments; classic two-part tariffs suffice. Once retailers have the bargaining power, however, upfront payments are necessary to maintain monopoly prices. Strong retailers always want to offer three-part tariffs to maximize their equilibrium rents.

As mentioned, a large part of the existing literature on upfront payments focuses on slotting allowances offered by manufacturers to “buy” scarce shelf space. Bloom et al. (2000), for example, argue that a large manufacturer can offer a large slotting allowance to the retailer expecting to recover it later through the wholesale margin. Smaller manufacturers are unable to match such offers because their pockets are not deep enough. This argument is formalized in Shaffer (2004). In another paper, Shaffer (1991) shows that even perfectly competitive manufacturers may use slotting allowances to dampen retail competition. Manufacturers offer wholesale prices above marginal cost, compensated by slotting allowances, which will limit the impact of retail competition.

Our paper is more closely related to the literature on exclusive versus common dealing. Most of this literature assumes upstream bargaining power, and then examines whether a manufacturer can profitably exclude a rival from distribution. Bernheim & Whinston (1998) show that the compensation that would need to be left to a monopoly retailer to obtain exclusion is indeed so high that exclusion cannot profitable,
unless even an integrated monopolist would only distribute one product. This result is true in the absence of any contracting externalities that may prevent the firms from maximizing industry profits under common agency: a restriction to linear prices for example would change the general result. Standard (non-contingent) two-part tariffs however are sufficient to establish the result. In that case, only externalities on third parties not present at the contracting stage may lead to an exclusionary outcome. In Aghion and Bolton (1987) or Rasmusen et al. (1991), for example, the incumbent manufacturer can profitably exclude a potential future rival.

The paper most closely related to ours is Marx & Shaffer (2004). They were the first to consider three-part tariffs in a setup where two rival retailers have the bargaining power in negotiations with an upstream monopoly. Restricting attention to non-contingent supply contracts, they find that all equilibria are exclusive. The idea is to let conditional fixed fees be equal to bilateral monopoly profits, so that each retailer can commit to stay out of the market if the other retailer is active. The slotting allowance is then needed to leave a share of profits to the exclusive retailer. In equilibrium, the more efficient retailer is the exclusive distributor and receive a slotting allowance.

The main modelling difference of our paper is that we allow for contracts contingent on exclusive vs. common agency. This modifies the conclusions substantially. With contingent offers, three-part tariffs do not have an exclusionary effect, but may instead be necessary for the existence of common agency equilibria. Three-part tariffs are nevertheless potentially detrimental for welfare, as they permit the retailers to eliminate retail competition.

The remainder of this paper is organized as follows. Section 2 lines out the general framework. In section 3, we derive upper bounds on the retailers common agency rents, which will serve as benchmarks in the following analysis. In sections 4 to 6, we consider different classes of contracts: classic two-part tariffs with an upfront fixed fee, two-part tariffs with a conditional fixed fee, and finally three-part tariffs combining upfront and a conditional fixed payments. The final section concludes.

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3See Mathewson & Winter (1987).
5When retailers are equally efficient, no slotting allowance is paid, and the manufacturer extracts all the surplus.
2 Framework

Two differentiated retailers, $R_1$ and $R_2$, distribute the product of a manufacturer $M$. The manufacturer produces at constant marginal cost $c$, while retailers incur no additional distribution costs. Retailers have all the bargaining power in their bilateral relations with the manufacturer; their interaction is therefore modelled as a three-stage game, where at stage 1 $R_1$ and $R_2$ simultaneously make take-it-or-leave-it offers to $M$; offers can be contingent on exclusivity. At stage 2, $M$ decides whether to accept both, only one, or none of the offers; all offers and acceptance decisions are public. At stage 3, the retailer(s) with accepted contracts decide how much to purchase, pay the manufacturer according to the contracts signed, and finally compete with each other; $R_i$’s revenue, as a function of the quantities bought, is given by $R_i(q_i, q_{-i})$, which we assume to be twice differentiable.

Total industry profits are thus

$$\Pi(q_1, q_2) = \sum_{i=1,2} R_i(q_i, q_{-i}) - cq_i.$$  

A fully integrated firm would produce and sell

$$(q_1^M, q_2^M) = \arg \max_{q_1,q_2} \Pi(q_1, q_2),$$

which we assume to be unique. The corresponding industry profits are denoted by $\Pi^M$. Were only product $i$ available, a vertically integrated firm would choose

$q_i^m = \arg \max_{q_i} R_i(q_i, 0) - cq_i,$

earning total profits of $\Pi_i^m$.

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6It does not matter here whether contract offers are public; for our analysis it is sufficient that acceptance decisions are ex post observable before the retailers compete at stage 3. Since the monopoly manufacturer observes both offers at stage 1, no problem of opportunism arises even when the retailers cannot observe contracts at this stage.

7Throughout the paper, we will use the notation “$-i$” to refer to the rival retailer. Note that the general formulation of the revenue function allows for the possibility that a retailer does not resell all units.

8We thus cast retail competition in terms of “quantities”: retailers order quantities, which determine their capacities, before competing for consumers; the analysis would however apply as well to “price competition”, where retailers would first set prices and then order quantities so as to satisfy demand. See the remark in the concluding section. [TO BE COMPLETED.]
We make the following assumptions about revenues and profits. First, the two retailers are imperfect substitutes for consumers: that is, \( \frac{\partial R_i}{\partial q_{-i}}(q_i, q_{-i}) < 0 \) when \( q_i > 0 \) and

\[
\Pi_1^m + \Pi_2^m > \Pi^M > \Pi_1^m.
\]
Second, without loss of generality, \( R_1 \) at least as profitable as \( R_2 \):

\[\Pi_1^m \geq \Pi_2^m.\]

3 Common agency profits

Before turning to specific contractual relationships, it is useful to derive bounds on equilibrium payoffs for common agency situations. We will only assume here that each pair \( R_i - M \) can achieve and share the bilateral monopoly profit \( \Pi_i^m \) as desired.\(^9\) We denote by \( \Pi^C \) the equilibrium industry profits under common agency, and by \( r_1^C \), \( r_2^C \) and \( r_M^C \), respectively, the retailers’ and the manufacturer’s equilibrium profits; by definition, \( \Pi^C \) cannot exceed the integrated monopoly profits \( \Pi^M \); it may however be lower if contracting externalities prevent the maximization of joint profits in equilibrium.

We first note that, in any common agency equilibrium, the joint profit of the vertical pair \( R_i - M \) must exceed the bilateral profit it could achieve by excluding \( R_{-i} \); indeed, if \( r_i^C + r_M^C < \Pi_i^m \), then \( R_i \) could profitably deviate by offering an exclusive contract generating the bilateral monopoly profit and leaving a slightly higher payoff to \( M \).\(^10\) Since \( r_i^C + r_M^C = \Pi^C - r_{-i}^C \), there is no deviation to exclusivity (\( NDE \) for short) if, for \( i = 1, 2 \):

\[
\Pi^C - r_{-i}^C \geq \Pi_i^m, \tag{1}
\]
Condition \( \text{(NDE}_{-i} \) implies in turn that \( R_i \)'s equilibrium profit cannot exceed its contribution to total profits: for \( i = 1, 2 \):

\[
r_i^C \leq \Pi^C - \Pi_{-i}^m. \tag{2}
\]
Since these upper bounds increase with \( \Pi^C \), common agency is potentially most attractive for the retailers when equilibrium industry profits are large. These upper bounds moreover imply that the manufacturer’s

\(^9\) Standard two-part tariffs, for example, are sufficient to achieve this.

\(^{10}\) For example, a two-part tariff \( F_i + cq_i \), with \( F_i \) just above \( r_M^C \), would do.
equilibrium payoff $r^C_M$ is always positive:

$$
r^C_M = \Pi^C - r^C_1 - r^C_2
\geq \Pi^C - (\Pi^C - \Pi^m_2) - (\Pi^C - \Pi^m_1)
= \Pi^m_1 + \Pi^m_2 - \Pi^C
\geq \Pi^m_1 + \Pi^m_2 - \Pi^M
> 0.
$$

$M$’s individual rationality constraint is thus strictly satisfied in any common agency equilibrium; since individual rationality also requires $r^C_i \geq 0$ for all $i$, condition (2) implies that a common agency equilibrium exists only if

$$
\Pi^C \geq \Pi^m.
$$

(3)

4 Two-part tariffs

We suppose in this section that retailers offer two-part tariffs, of the form $t_i(q) = F_i + w_i q$. Bernheim and Whinston have shown that, when rival manufacturers deal with a common retailer, two-part tariffs suffice to achieve the integrated industry monopoly profits.\footnote{Bernheim and Whinston focussed on the case where manufacturers have the bargaining power in their bilateral relations with the common retailer. The conclusion remains however valid when the retailer has all the bargaining power: in both instances, the retailer plays the role of a unique “gatekeeper” for access to consumers and fully internalizes through marginal cost pricing any contracting externalities. This moreover remains the case when contracts are not publicly observable – contract observability is irrelevant when the manufacturers are the ones that make the offers; if instead the retailer makes take-it-or-leave-it offers, it would require the manufacturers to supply at cost and have no incentive to behave opportunistically (altering one contract cannot hurt the other manufacturer).} As we will see, this is no longer the case when rival retailers distribute a common manufacturer’s product and have substantial bargaining power in their relations with the manufacturer.

In addition, in the context studied by Bernheim & Whinston (1998), or when a single manufacturer offers (public) contracts to competing retailers, two-part tariffs do not need to be contingent on common agency to sustain the common agency equilibrium. It is an equilibrium for the manufacturer to offer (non-contingent) contracts with wholesale prices at marginal cost and fixed fees up to their contribution to industry profits, and this equilibrium yields the desired common agency outcome. In the setup we consider, Marx & Shaffer (2004) illustrate that, with non-contingent contracts the bilateral common agency profits of any vertical pair must always lie strictly below this pair’s bilateral monopoly profits. A profitable exclusion to an exclusive offer that generates monopoly
profits therefore always exists. As shown by Marx & Shafer, profitable deviations to exclusivity are also possible by means of a non-contingent three-part tariff that contains both an upfront fixed fee and a conditional fixed fee. In the following, we therefore consider contingent two-part tariffs of the form \( \{(F_i^C, w_i^C), (F_i^E, w_i^E)\} \), and establish the existence of a common agency equilibrium in this context.

**Exclusive dealing** We first note that there always exist an exclusive dealing equilibrium. Clearly, if \( R_i \) insists on exclusivity (e.g., by offering only exclusivity, or by degrading its offer for common agency), \( R_{-i} \) cannot do better than insist on exclusivity as well. In addition, if \( M \) sells at cost exclusively to \( R_i \) \((w_i = c, w_{-i} = +\infty, \text{say})\), \( R_i \) will then maximize \( R_i (q_i, 0) - cq_i - F_i \) and thus choose the quantity \( q_i^m \) that maximizes the joint profits with \( M \), thus generating a total profit of \( \Pi_i^m \). The fixed fee \( F_i \) can then be used to share these profits as desired. As a result:

**Lemma 1** There always exists an exclusive dealing equilibrium. In addition:

- If \( \Pi_1^m > \Pi_2^m \), in any such equilibrium \( R_1 \) is the active retailer while \( R_2 \) gets zero profit; among these equilibria, the unique trembling-hand perfect equilibrium, which is also the most favorable to the retailers, yields \( \Pi_1^m - \Pi_2^m \) for \( R_1 \) and \( \Pi_2^m \) for \( M \).

- If \( \Pi_1^m = \Pi_2^m \), there exist two exclusive dealing equilibria, where either retailer is active; in both cases, retailers get zero profit and \( M \) gets \( \Pi_2^m \).

**Proof.** If one retailer offers only an exclusive dealing contract, there is no gain for the other retailer from offering a common agency equilibrium. Hence, without loss of generality we can restrict attention to equilibria in which both retailers offer only exclusive dealing contracts.

In any such equilibrium, the joint profits of the manufacturer and the active retailer, \( R_i \), must be maximized; otherwise \( R_i \) could profitably deviate to a different exclusive contract. \( R_i \) therefore sets the wholesale \( w_i \) equal to the marginal cost \( c \), and industry equilibrium profits are \( \Pi_i^m \).

For \( \Pi_1^m > \Pi_2^m \), \( R_2 \) cannot be an exclusive retailer, since \( R_1 \) can outbid any exclusive deal. In addition, \( R_1 \)'s equilibrium fixed fee \( F_1^E \)

\[ \text{Lemma 1 Under certain conditions on demand, a retailer could also profitably deviate to a (non-contingent) two-part tariff with a slightly higher wholesale price that induces de facto exclusivity.} \]
must be in the range \([\Pi_2^m, \Pi_1^m]\): if \(F^E_1 < \Pi_2^m\), then \(R_2\) could and would outbid \(R_1\)'s offer; and if \(F^E_1 > \Pi_1^m\), then \(R_1\) would be better-off not offering any contract at all. Conversely, any \(F^E_1 \in [\Pi_2^m, \Pi_1^m]\) can sustain an exclusive dealing equilibrium, in which both retailers offer (only) the same exclusive dealing contract \(t^E_i(q) = F^E_i + cq\). The best equilibrium for \(R_1\) (and thus the Pareto-undominated equilibrium for both retailers) is such that \(F^E_1 = \Pi_2^m\), in which case \(R_1\)'s payoff is \(\Pi_1^m - \Pi_2^m\). In addition, for \(F^E_1 > \Pi_2^m\), \(R_2\)'s equilibrium offer is unprofitable and would thus not be made if it could be mistakenly accepted; therefore, such equilibrium is not trembling-hand perfect.\(^\text{13}\)

For \(\Pi_1^m = \Pi_2^m = \Pi^m\), the same reasoning implies that exclusive dealing offers must be efficient \((w_1 = w_2 = c)\) and yield exactly \(\Pi^m\) to \(M\): it would be unprofitable for the active retailer to offer a higher fixed fee, and its rival could outbid any lower fixed fee; conversely, it is an equilibrium for both retailers to offer (only) the exclusive dealing contract \(t^E(q) = \Pi^m + cq\).

Thus, there always exists an exclusive dealing equilibrium where the more efficient retailer, \(R_1\), outbids its rival and generates the maximal bilateral profits, \(\Pi^m\). When both retailers are equally efficient, standard competition à la Bertrand leaves all the profit to \(M\), otherwise \(R_1\) can earn up to its contribution to bilateral profits, \(\Pi_1^m - \Pi_2^m\).

**Common agency** We first stress that, unlike under exclusivity, marginal cost pricing cannot implement the monopoly outcome in a common agency situation. Indeed, if wholesale marginal prices reflect the production cost \(c\), each retailer earns the full margin on each unit sold. But then, since retailers compete for consumers, when maximizing its profits, each retailer ignores the impact of its own actions on the competitor’s sales and thus profits. This leads to a competitive outcome, with final prices below those of an integrated monopoly.

For the sake of exposition, we will assume from now on that, for any \((w_1, w_2)\):

- each retailer has a unique best response function
  
  \[
  \text{for } i = 1, 2 : BR_i(q_{-i}; w_i) \equiv \arg \max_{q_i \geq 0} R_i(q_i, q_{-i}) - w_i q_i;
  \]

- there is a unique retail equilibrium \((q_1^C, q_2^C)\), characterized by:
  
  \[
  \text{for } i \neq -i \in \{1, 2\} : q_i^C(w_i, w_{-i}) = BR_i(q_{-i}^C(w_{-i}, w_i); w_i),
  \]

  which varies continuously with wholesale prices.

\(^{13}\)The situation is formally the same as Bertrand competition between asymmetric firms, where one firm has a lower cost or offers a higher quality.
A simple revealed preference argument confirms that marginal cost pricing induces retailers to compete more aggressively than required for joint profit maximization. Letting \( \hat{q}_i \equiv BR_i (q_i^M, c) \) denote for simplicity \( R_i \)'s best response to its rival’s monopoly quantity, we have:

\[
R_i \left( \hat{q}_i, q_i^M \right) - c \hat{q}_i \geq R_i \left( q_i^M, q_i^M \right) - c q_i^M,
\]
\[
R_i \left( q_i^M, q_i^M \right) + R_{-i} \left( q_{-i}^M, q_i^M \right) - c q_i^M \geq R_i \left( \hat{q}_i, q_i^M \right) + R_{-i} \left( q_{-i}^M, \hat{q}_i \right) - c \hat{q}_i.
\]

In addition, the assumption \( \partial R_i / \partial q_{-i} < 0 \) for \( q_i > 0 \) implies that the first inequality is strict.\(^{14}\) Therefore, summing up:

\[
R_{-i} \left( q_{-i}^M, q_i^M \right) > R_{-i} \left( q_{-i}^M, \hat{q}_i \right),
\]

which in turn implies \( \hat{q}_i > q_i^M.\(^{15}\)

Wholesale prices above cost can however be used to offset the impact of retail competition and sustain the monopoly outcome. Indeed, if the best responses decrease continuously as wholesale prices increase, there exist wholesale prices \( (w_1^M, w_2^M) \) sustaining the monopoly outcome; it suffices to choose, for each \( R_i, w_i^M > c \) such that \( BR_i(q_{-i}^M, w_i^M) = q_i^M \).

For \( i = 1, 2 \) and a given pair of wholesale prices \( (w_i, w_{-i}) \), it will be convenient to denote (with a slight abuse of notation) the continuation equilibrium profits for \( R_i, M \), and the entire industry, respectively, by

\[
\left\{ \begin{array}{l}
\Pi_i^C \left( w_i, w_{-i} \right) = R_i \left( q_i^C \left( w_i, w_{-i} \right), q_{-i}^C \left( w_{-i}, w_i \right) \right) - w_i q_i^C \left( w_i, w_{-i} \right), \\
\Pi_M^C \left( w_i, w_{-i} \right) = \left( w_i - c \right) q_i^C \left( w_i, w_{-i} \right) + \left( w_{-i} - c \right) q_{-i}^C \left( w_{-i}, w_i \right), \\
\Pi \left( w_i, w_{-i} \right) = \Pi_M^C \left( w_i, w_{-i} \right) + \sum_{j=1,2} \Pi_i^C \left( w_j, w_{-j} \right). 
\end{array} \right.
\]

By construction, the wholesale prices \( (w_1^M, w_2^M) \) maximize industry profits: \( \Pi \left( w_1^M, w_2^M \right) = \Pi^M \). Thus, if \( M \) could make take-it-or-leave-it offers to the retailers, it would indeed choose these wholesale prices and set fixed fees so as to recover retail margins: in this way, \( M \) would gener-

\(^{14}\)\(^{14}\)\(\Pi^M > \Pi_i^m \) implies \( q_{-i}^M > 0 \) and thus, by assumption, \( \partial R_{-i} \left( q_{-i}^M, q_i^M \right) / \partial q_i^M < 0 \). Therefore, the first-order condition characterizing \( q_i^M \) implies

\[
\frac{\partial R_i}{\partial q_i} \left( q_i^M, q_i^M \right) - c = - \frac{\partial R_{-i}}{\partial q_i} \left( q_{-i}^M, q_i^M \right) > 0.
\]

Thus, starting from \( q_i = q_i^M \), a small increase in \( q_i \) increases \( R_i \)'s profit; the uniqueness of the best-reply \( BR_i \left( q_{-i}^M, c \right) \) in turn implies \( \hat{q}_i \neq q_i^M \), and the first inequality is thus strict.

\(^{15}\)Both quantities will exceed monopoly levels if the retail equilibrium is “well-behaved”, e.g. if, as in standard Cournot models, retail best responses are decreasing and generate a “stable” equilibrium: \(-1 < \partial BR_i / \partial q_{-i} < 0 \).
ate and appropriate the monopoly profits \( \Pi^M \).\(^\text{16}\) If retailers have the bargaining power, however, this monopoly outcome cannot be an equilibrium. This is because while each retailer internalizes \( M \)'s upstream margin on all sales, by adjusting the fixed fee appropriately, it still has an incentive to “free-ride” on its rival’s downstream margin. Thus, suppose that \( R_{-i} \) chooses \( w_{M_{-i}} \); setting \( w_i = w_{iM} \) would maximize the total profits \( \Pi^C (w_i, w_{M_i}) \), but does not maximize the bilateral joint profits of \( R_i \) and \( M \), which are given by:

\[
\Pi^C_i (w_i, w_{-i}) + \Pi^C_M (w_i, w_{-i}) = \Pi^C (w_i, w_{M_i}) - \Pi^C (w_{M_i}, w_i).
\]

Thus, whenever the wholesale price \( w_i \) affects the rival retailer’s profit, the equilibrium cannot yield the integrated monopoly outcome. To fix ideas, we will suppose that a retailer always benefits from any increase in its rival’s wholesale price: for \( i = 1, 2 \),

\[
\frac{\partial \Pi^C_i}{\partial w_i} > 0.
\]

A simple revealed preference argument then shows that \( R_i \) has an incentive to offer a wholesale price lower than \( w_{iM} \), and to adjust the fixed fee \( F_i \) so as to absorb any increase in \( M \)'s profit.

More generally, this reasoning implies that, in any common agency equilibrium, each wholesale price \( w_i \) must maximize the bilateral profits that \( R_i \) can achieve with \( M \), given \( R_{-i} \)'s wholesale price. That is, equilibrium wholesale prices \( (w^C_1, w^C_2) \) must satisfy, for \( i = 1, 2 \):

\[
w^C_i = W^{BR}_i (w^C_{-i}) = \arg \max_{w_i} \Pi^C_i (w_i, w^C_{-i}) + \Pi^C_M (w_i, w^C_{-i}). \quad (4)
\]

The system (4) has a unique solution in standard cases (e.g., when demand is linear). For the sake of exposition, we will suppose that there exists indeed at least one solution,\(^\text{17}\) and denote by \((\tilde{w}_1, \tilde{w}_2)\) the solution for which the industry profits are the largest, and by \( \Pi \equiv \Pi (\tilde{w}_1, \tilde{w}_2) \) these profits. Since \( W^{BR}_i (w_{M_i}) < w^M_i \), \((\tilde{w}_1, \tilde{w}_2) \neq (w^M_1, w^M_2) \) and thus \( \Pi < \Pi^M \).

Two-part tariffs thus cannot implement the integrated monopoly outcome: even if common agency arises, contracting externalities prevent

\(^{16}\)This is indeed an equilibrium when contract offers are public. Private offers give \( M \) the opportunity to behave opportunistically, which in turn is likely to prevent \( M \) from sustaining the monopoly outcome. See Hart-Tirole (1990) and McAfee-Schwartz (1994) for the case of Cournot downstream competition and O’Brien-Shaffer (1992) and Rey-Verge (2004) for the case of Bertrand competition. Rey-Tirole (2004) offers an overview of this literature.

\(^{17}\)If this is not the case, there is no common agency equilibrium.
the retailers from using the manufacturer as perfect coordination device. This lack of coordination may in turn prevent common agency from arising in equilibrium. Indeed, we have seen in the previous section that common agency can prevail only if it generates more profits than exclusive dealing, that is if:

\[ \Pi \geq \Pi_1^m. \]  

(5)

Since \( \tilde{\Pi} < \Pi^M \), condition (5) may be violated, in which case common agency cannot arise in equilibrium, even though an integrated structure would always opt for it.

We now show that \( \Pi \geq \Pi_1^m \) is not only a necessary but also a sufficient condition for the existence of a common agency equilibrium with contingent two-part tariffs. As before, let \( r_1^C, r_2^C \) and \( r_M^C \) denote the two retailers’ and the manufacturer’s equilibrium profits. We have already seen that, in any common agency equilibrium, \( R_i \) cannot earn more than its contribution to the equilibrium profits, which is \( \Pi - \Pi_{1-i}^m \) here. Conversely, it is straightforward to check that there exists an equilibrium where both retailers earn these maximal profits. To see this, suppose that each \( R_i \) offers

- \( w_i^C = \tilde{w}_i \), so that industry profits are equal to \( \tilde{\Pi} \),
- \( F_i^C = \Pi_i(\tilde{w}_i, \tilde{w}_{-i}) - \left[ \tilde{\Pi} - \Pi_{1-i}^m \right] \) so that \( R_i \) gets exactly \( r_i^C = \tilde{\Pi} - \Pi_{1-i}^m \geq 0 \) and \( M \) gets \( r_M^C = \Pi_1^m + \Pi_2^m - \tilde{\Pi} > 0 \),
- \( w_i^E = c \), so that industry profits would be equal to \( \Pi_i^m \) if this exclusive offer was accepted,
- \( F_i^E = r_M^C \).

By construction, \( M \) earns positive profits and is indifferent between accepting one or both offers.\(^{18}\) In addition, wholesale prices are by definition such that no retailer can benefit from deviating to another common agency outcome. It thus only remains to check that no retailer \( R_i \) can benefit from deviating to an exclusive dealing arrangement. But since \( M \)

\(^{18}\)Whenever contracts allow the partners to share their bilateral profits as desired (as here through the fixed fee), in any common agency equilibrium \( M \) must be indifferent between dealing with both retailers or with either retailer on an exclusive basis: if \( M \) strictly preferred common agency to dealing exclusively with \( R_i \), say, then \( R_{-i} \) could profitably deviate by both decreasing \( F_i^C \) and withdrawing or degrading its own exclusivity offer.
can always secure $r^C_M$ by accepting $R_{-i}$’s exclusive contract, with such a deviation $R_i$ cannot get more than

$$\Pi^m_i - r^C_M = \Pi^m_i - (\Pi^m_1 + \Pi^m_2 - \tilde{\Pi}) = \tilde{\Pi} - \Pi^m_{-i} = r^C_i.$$  

Note that when this equilibrium exists (that is, when $\tilde{\Pi} \geq \Pi^m_1$), it is preferred by the retailers to any exclusive dealing equilibrium; finally, in the limit case where $\tilde{\Pi} = \Pi^m_1$, it is by construction the only possible equilibrium with common agency. The following proposition summarizes this discussion:

**Proposition 1** When contract offers are restricted to two-part tariffs, common agency equilibria exist if and only if $\tilde{\Pi} \geq \Pi^m_1$, in which case:

- **industry profits** are $\tilde{\Pi} < \Pi^M$;  
- if $\tilde{\Pi} > \Pi^m_1$, both retailers prefer the common agency equilibrium in which each retailer $R_i$ earns its marginal contribution to total profits, $\tilde{\Pi} - \Pi^m_i$, while the manufacturer earns $\Pi^m_1 + \Pi^m_2 - \tilde{\Pi}$, to all other equilibria, common or exclusive. For $\tilde{\Pi} = \Pi^m_1$, the unique common agency equilibrium is payoff equivalent to the retailers’ preferred exclusive equilibrium.

**Comparison with Bernheim-Whinston (1998)** At this point, it is useful to compare our analysis with Bernheim & Whinston’s (1998) seminal exclusive dealing paper. In their model, two manufacturers of imperfect substitutes offer contingent supply contracts to a monopolistic retailer. Focussing on equilibria that are Pareto-undominated for the manufacturers, who are the first-movers, they find that the equilibrium market structure maximizes industry profits, given the profits that each structure can generate, and in particular given the contracting externalities that may prevent achieving monopoly profits with exclusive dealing. The same result prevails here: given the wholesale prices that can arise in a common agency equilibrium, and the resulting industry profits, common agency can arise in equilibrium (and is then Pareto-undominated for the retailers) if and only if these profits exceed the bilateral monopoly profits.

In Bernheim & Whinston, two-part tariffs with marginal cost pricing moreover implement the integrated monopoly profits under common agency: when wholesale prices reflect the marginal costs of production, the monopoly retailer is the residual claimant on all sales and sets quantities so as to maximize joint industry profits; in addition, these wholesale
prices form an equilibrium. First, through its fixed fee each manufacturer internalizes any impact of its own wholesale price on the retailer’s revenue; therefore, just as in our model, each vertical pair maximizes its joint profits. Second, the retailer being the residual claimant on all sales of the rival product, the joint profits of a vertical pair coincide, up to a constant (the rival’s fixed fee), with the industry profits. Hence, if the other manufacturer prices at marginal cost, each vertical contracting pair sets its own wholesale price so as to maximize industry profits, that is at marginal cost. With two-part tariffs, the retailers’ preferred equilibrium therefore involves common agency.

The crucial difference in our framework is the role of (imperfect) retail competition. Maximizing industry profit requires wholesale prices above marginal costs, to compensate for the competitive pressure on retail margins. However, for these wholesale prices, none of the vertical pairs unilaterally maximizes its joint profits: each pair has an incentive to free-ride on the rival retailer’s revenue. Thus, with two-part tariffs the integrated monopoly solution cannot be sustained in a common agency equilibrium. Common agency is thus less profitable and, as a result, may even not be sustainable in equilibrium.

5 Conditional fixed payments

Standard two-part tariffs thus fail to sustain the monopoly outcome when retailers have the bargaining power but compete against each other. We now show that fixed payments that are conditional on the quantity bought being strictly positive, can help eliminate contracting externalities and allow the parties to sustain the monopoly outcome. The basic intuition is that retailers can commit to higher profits by proposing high conditional fixed fees.

We now consider contracts of the form, for all \( i = 1, 2 \):

\[
t_i(q) = F_i + w_i q \quad \text{for all } q > 0, \quad \text{and } t_i(0) = 0.
\]

The marginal price is thus constant except at \( q = 0 \). A retailer with a signed contract faces the following profit maximization program at the retail competition stage:

\[
\max \left[ 0, \max_q \{ \pi_i(q_i, q_{-i}; w_i) - F_i \} \right].
\]

The best response function is therefore truncated:

\[
BR_i \left( q_{-i}; w_i^C, F_i^C \right) = BR_i \left( q_{-i}; w_i^C \right) = 0 \quad \text{if } \Pi_i \left( q_{-i}; w_i^C \right) \geq F_i^C,
\]

\[
= \text{otherwise}.
\]
Note that retailers’ individual rationality constraints are trivially satisfied here, since retailers can avoid any loss by choosing not to buy in the last stage.

**Exclusive equilibria** With standard two-part tariffs, the unique trembling-hand perfect exclusive equilibrium, which coincides with the Pareto-dominated exclusive equilibrium, is such that only the more efficient retailer $R_1$ is active and earns its contribution to industry profits, $\Pi_1^m - \Pi_2^m$. When fixed fees are conditional, this is the unique exclusive equilibrium. $R_2$ can now secure non-negative profits by not buying in the last stage, and would do so if its contract specified a fixed fee exceeding $\Pi_2^m$. Hence, $M$ cannot earn more than $\Pi_2^m$ by accepting $R_2$’s exclusive offer, and $R_1$ thus never needs to offer a fixed fee above $\Pi_2^m$.

*Remark:* There can exist “pseudo” common equilibria where $M$ accepts both offers, but eventually only one retailer is active (i.e., buys a positive quantity). However, it is straightforward to check that any such common equilibrium is outcome equivalent to the unique exclusive equilibrium. We focus in what follows on “proper” common equilibrium where both retailers eventually buy positive quantities.

**Common equilibria** We now consider common agency equilibria where both retailers buy positive quantities; we must therefore have

$$\Pi_i (w_i^C, w_{-i}^C) \geq F_i^C. \quad (6)$$

If the inequality (6) is strict for $R_i$, then it still holds for small variations of the rival’s wholesale price. Hence, $R_{-i}$ could slightly modify $w_{-i}^C$ in any direction and maintain a common agency outcome, by adjusting $F_{-i}$ so as to appropriate any resulting modification in $M$’s profit. To rule out such deviations, $w_{-i}^C$ must maximize (at least locally) the joint profits of $M$ and $R_{-i}$ among (proper) common agency situations, that is, $R_{-i}$ must be on its above-described best reply: $w_{-i}^C = W_{BR}^{R_i}(w_i^C)$.

If the inequality (6) is strict for $i = 1, 2$, both retailers must therefore be on their best replies; industry profits are then bounded above

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19Since $\partial R_i / \partial q_i < 0$ and quantities are likely to be strategic substitutes, “proper” common agency equilibria may co-exist, for given wholesale prices and fixed fees, with de facto exclusive equilibria: increasing $R_i$’s quantity may induce $R_{-i}$ to exit, which indeed encourages $R_i$ to expand. We assume in this section that the “proper” common agency equilibrium is played whenever it exists (that is, when $\Pi_i (w_i^C, w_{-i}^C) \geq F_i^C$ for $i = 1, 2$). This assumption, which is also made for example in Marx & Shaffer (2004), can be justified by the fact that buying a positive quantity is a dominant strategy for each retailer. Still, this assumption possibly restrict the analysis; a common agency equilibrium might for example be sustained by switching to de facto exclusivity in case of a deviation. We show however in the next section that conditional upfront payments suffice to sustain common agency and the integrated monopoly outcome when combined with classic two-part tariffs.
by $\tilde{\Pi}$ and $R_i$ cannot hope to earn more than $\tilde{\Pi} - \Pi^m_i$. Conversely, it is straightforward to check that, whenever $\tilde{\Pi} \geq \Pi^m_1$, the previously described equilibrium, where each $R_i$ gets $\tilde{\Pi} - \Pi^m_i$ and $M$ gets $\Pi^m_1 + \Pi^m_2 - \tilde{\Pi}$, remains an equilibrium.

We now look for equilibria where (6) is binding for at least one retailer. For expositional purposes, we consider here the case where $R_1$ is strictly more profitable: $\Pi^m_1 > \Pi^m_2$; we briefly discuss the case $\Pi^m_1 = \Pi^m_2$ at the end of the section.

We first show that (6) cannot be binding for $R_1$. Indeed, in a common agency equilibrium $M$ must be indifferent between dealing with both retailers or only with $R_2$, otherwise, $R_1$ could profitably deviate by slightly lowering its fixed fee $F^C_1$ (and degrading its exclusive dealing offer): $M$ would still accept both contracts rather than dealing only with $R_2$, and $R_1$ would increase its profit. But $R_2$’s exclusive dealing contract cannot offer $M$ more than $\Pi^m_2$, since otherwise $R_2$ would rather not buy at the last stage. Therefore, in equilibrium, $M$ cannot earn more than $\Pi^m_2$:

$$r^C_M \leq \Pi^m_2. \quad (7)$$

In addition, it is still the case that no retailer can earn more than its contribution to the industry profits, $\Pi^C$. Hence:

$$r^C_2 \leq \Pi^C - \Pi^m_1. \quad (8)$$

Summing up (7) and (8) yields:

$$\Pi^C - \Pi^m_1 + \Pi^m_2 \geq r^C_M + r^C_2 = \Pi^C - r^C_1,$$

and thus

$$r^C_1 \geq \Pi^m_1 - \Pi^m_2 > 0,$$

which implies

$$\Pi_1 (w^C_1, w^C_2) > F^C_1.$$

Given the above discussion, we must therefore have:

$$w^C_2 = W^{BR}_2 (w^C_1).$$

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20 It suffices to check additionally that a retailer $R_i$ cannot generate higher bilateral profits by deviating to a pseudo common agency situation. Such a deviation cannot generate joint profits higher than $\Pi^m_i$, which is precisely what $M$ and $R_i$ get in equilibrium: $r^C_i + r^C_M = (\tilde{\Pi} - \Pi^m_i) + (\Pi^m_1 + \Pi^m_2 - \tilde{\Pi}) = \Pi^m_i$.

21 This condition is indeed satisfied in the common agency equilibrium just described, since $M$ then gets

$$\Pi^m_1 + \Pi^m_2 - \tilde{\Pi} = \Pi^m_2 - (\tilde{\Pi} - \Pi^m_1) \leq \Pi^m_2.$$
As a result, $R_1$ cannot hope to earn more than $\hat{\Pi}_1 - \Pi^m_2$, where
\[
\hat{\Pi}_1 \equiv \max_{w_1} \Pi(w_1, W^{BR}_2(w_1)) \in \left(\Pi, \Pi^M\right).
\]

As before, this common agency situation cannot be an equilibrium if it is less profitable than exclusivity (that is, $\hat{\Pi}_1 < \Pi^m_1$). Conversely, we show below that, whenever $\hat{\Pi}_1 \geq \Pi^m_1$, there exists an equilibrium where (6) is binding for $R_2$ (and thus $R_2$ get zero profit) and $R_1$ gets $\hat{\Pi}_1 - \Pi^m_2$.

**Proposition 2** When contract offers are restricted to two-part tariffs with conditional payments, common agency equilibria exist if and only if $\hat{\Pi}_1 \geq \Pi^m_1$. Moreover, if $\Pi^m_1 > \Pi^m_2$, then:

- if $\hat{\Pi}_1 \geq \Pi^m_1 > \hat{\Pi}$, in any (common agency or exclusive dealing) equilibrium $R_2$ gets zero profit and $M$ gets $\Pi^m_2$. The best equilibrium for $R_1$ (and thus the unique Pareto-undominated equilibrium) involves common agency and gives a profit $\hat{\Pi}_1 - \Pi^m_2$ to $R_1$.

- if $\hat{\Pi} \geq \Pi^m_1$, there are two Pareto-undominated equilibria for the retailers, which both involve common agency: the equilibrium just described, which yields $\hat{\Pi}_1 - \Pi^m_2$ to $R_1$ and 0 to $R_2$, and the equilibrium described in the previous section, which yields a lower profit $\hat{\Pi} - \Pi^m_2$ to $R_1$ but a positive profit $\hat{\Pi} - \Pi^m_1$ to $R_2$.

**Proof.** As already noted, the common agency equilibrium studied in the previous section remains an equilibrium when $\hat{\Pi} \geq \Pi^m_1$. Suppose now $\hat{\Pi}_1 \geq \Pi^m_1$ and consider the following candidate equilibrium:

- $w^C_1 = \hat{w}_1 \equiv \arg \max_{w_1} \Pi(w_1, W^{BR}_2(\hat{w}_1))$ and $w^C_2 = W^{BR}_2(\hat{w}_1)$, so that industry profits are equal to $\hat{\Pi}_1$,

- $F^C_i$ such that $R_i$ gets exactly $r^C_i = \hat{\Pi}_1 - \Pi^m_2 \geq 0$ and $F^C_2 = \Pi_2(w^C_2, w^C_1)$, so that $R_2$ gets $r^C_2 = 0$ and $M$ gets $r^C_M = \Pi^m_2 > 0$,

- for $i = 1, 2$, $w^E_i = c$ and $F^E_i = r^C_M = \Pi^m_2$.

By construction, $M$ earns $\Pi^m_2$, which it can also secure by opting for either retailer’s exclusive offer. Hence a deviation by any retailer $R_i$ must increase the joint profits of $M$ and $R_i$ to be profitable. This cannot be the case for $R_2$, since it cannot offer more than $\Pi^m_2 = r^C_M + r^C_2$ through exclusivity (or pseudo-common agency) and, given $w^C_1$, already
maximizes the joint bilateral profit among common agency situations.\textsuperscript{22} Similarly, $R_1$ cannot increase its joint profit with $M$ by deviating to exclusivity or pseudo common agency, since this would generate at most $\Pi^m_{i} \leq \Pi_{i} = r_{M}^{C} + r_{1}^{C}$. And $R_1$ cannot profitably deviate to another proper common agency outcome either, since $w_{C}^{C}$ maximizes the joint profits with $M$, under the constraint that $R_2$ remains active. Thus the above contracts constitute an equilibrium.

When $\Pi_{1} \geq \Pi^m_{1} > \Pi$, there exist no common agency equilibrium where conditions (6) are strictly satisfied for both retailers, since in any such candidate equilibrium industry profits are bounded above by $\Pi$ and would therefore not survive deviations to exclusive dealing. The only common agency equilibria are thus such that $R_2$ get 0, and $R_1$ gets at most $\Pi_{1} - \Pi^m_{2}$. All other equilibria are such that $R_2$ is inactive and thus gets again 0, while $M$ gets $\Pi^m_{1}$ and $R_1$ gets $\Pi^m_{1} - \Pi^m_{2}$. Hence the common agency equilibrium where $R_1$ gets $\Pi_{1} - \Pi^m_{2}$ is the unique Pareto-undominated equilibrium.

When $e \Pi \geq \Pi^m_{1}$, in addition to the equilibria just mentioned there also exists common agency equilibria where conditions (6) are strictly satisfied for both retailers, and in the best of these equilibria for the retailers each $R_i$ gets $\Pi - \Pi^m_{i}$. The conclusion follows. \textsuperscript{22}

Conditional payments thus increase the scope for common agency equilibria: with unconditional fixed fees they exist only when $\Pi \geq \Pi^m_{1}$, while with conditional payments they exist whenever $\widehat{\Pi}_{1} \geq \Pi^m_{1}$, where by construction $\widehat{\Pi}_{1} > \Pi$. In the additional common agency equilibria, however, the less profitable retailer gets zero profit; hence when $\Pi \geq \Pi^m_{1}$, the retailers may disagree over the equilibrium selection: the more profitable retailer would rather opt for the new “asymmetric” equilibrium, while the other retailer would favor the previous, more balanced equilibrium.

Finally, it is straightforward to check that, when the two retailers are equally profitable ($\Pi^m_{1} = \Pi^m_{2} = \Pi^m$), there exists two types of asymmetric equilibria, in which either retailer $R_i$ gets up to $\Pi_{i} - \Pi^m_{i}$, where $\widehat{\Pi}_{i} \equiv \max_{w_i} \Pi(w_i, W^BR_i(w_i))$, while the other retailer gets zero profit.

\textbf{Remark}: When contracts are ex post verifiable, conditional payments solve the problem of opportunism in the Hart & Tirole (1990) framework, where the manufacturer makes unobservable offers to the retailers. Since conditional fixed fees give retailers the opportunity to ”exit”, they are willing to accept high fixed fees at stage 1 even without observing the offer the manufacturer makes to the rival retailer.

\textsuperscript{22}More precisely, $w_{C}^{C}$ maximizes the joint profit of $M$ and $R_2$ among those situations, even when ignoring the constraint that $R_1$ must remain active, and this constraint is indeed satisfied for $w_{C}^{C}$; $w_{C}^{C}$ therefore also maximizes these profits when taking the constraint into account.
6 Three-part tariffs

We now consider so-called three-part tariffs that combine classic two-part tariffs with conditional fixed payments. Such tariffs are of the form:

\[ t_i(q_i) = \begin{cases} U_i & \text{if } q_i = 0 \\ U_i + F_i + w_i q_i & \text{if } q_i > 0 \end{cases} \]

We now show that these tariffs can implement the integrated monopoly profits \( \Pi^M \), and indeed allows each retailer \( R_i \) to earn its own contribution \( \Pi^m_i - \Pi^m_i \). To see this, consider the contracts, for \( i = 1, 2 \):

- \( U_i^C = -[\Pi^M - \Pi^m_i] \), so that retailers get their contributions to industry profits through the upfront payments,
- \( w_i^C = w_i^M \), so that wholesale prices sustain the monopoly prices and quantities,
- \( F_i^C = \Pi_i(w_i^M, w_{-i}^M) \), so that \( M \) recovers ex post all retail margins and thus gets overall \( r_M^C = \Pi^m_1 + \Pi^m_2 - \Pi^M \),
- \( w_i^E = c \) and \( F_i^E = r_M^C \), \(^{23}\) so that \( M \) can secure as well its equilibrium profit by dealing exclusively with either retailer.

\( M \) is willing to accept both contracts (it earns the same positive profit by accepting either one or both); doing so induces the retailers to implement the monopoly outcome: each retailer is willing to buy (in which case wholesale prices lead to the monopoly quantities), since its conditional payment is just equal to its variable profit. Finally, the slotting allowances are designed so as to give each retailer its contribution to profits.

Therefore, if both contracts are proposed, they are accepted by \( M \) and yield the desired monopoly outcome. We now check that no retailer has an incentive to offer any alternative contract (even outside the particular class of three-part tariffs).

By construction, \( M \) can get its equilibrium profit \( r_M^C \) by opting as well for either retailer’s exclusive offer; therefore, in order to benefit from a deviation, \( R_i \) must increase its joint profits with \( M \). Since these are equal to \( \Pi^m_i \) in equilibrium, \( R_i \) cannot lure \( M \) into a more profitable exclusive dealing arrangement. And given the contract offered by \( R_{-i} \), bilateral profits cannot be higher than \( \Pi^m_i \) either in any (pseudo or proper) common agency situation: total industry profits then cannot exceed \( \Pi^M \) and,

\(^{23}\)It does not matter whether fixed fees are upfront or conditional in the exclusive offers, since even in the latter case the retailer would find it profitable to buy.
since $R_{-i}$ can always choose not to buy in the last stage, $R_{-i}$’s overall profit is at least equal to its slotting allowance $\Pi^M - \Pi^m_i$; hence the joint profits of $M$ and $R_i$ cannot exceed $\Pi^M - (\Pi^m - \Pi^m_i) = \Pi^m_i$.

The above contracts thus constitute a common agency equilibrium where each retailer $R_i$ earns the maximal achievable profit, $\Pi^M - \Pi^m_i$. Both retailers thus prefer this equilibrium to any other exclusive or common agency equilibrium. The following proposition summarizes this discussion:

**Proposition 3** When retailers can offer three-part tariffs (or more general contracts), common equilibria in which total industry profits are $\Pi^M$ exist.

The retailers’ preferred equilibrium (out of all exclusive dealing and common agency equilibria) is the common agency equilibrium in which industry profits are $\Pi^M$, $M$ pays an initial slotting allowance of $\Pi^M - \Pi^m_i$ to each $R_i$, and then receives $R_i$’s variable profits $\Pi_i(w_i^M, w_{-i}^M)$ as a conditional fixed fee.

Conditional payments can thus be used as a commitment to maintain high prices; indeed, if a retailer tries to undercut its rival, this will induce the rival to “exit” and waive the conditional payment to the manufacturer. This generates a loss for $M$, that needs to be compensated, which reduces the profitability of any such deviation. In the limit, conditional payments equal to the profits that retailers expect to achieve ex post can sustain the desired outcome.\(^{24}\) Upfront payments by the manufacturer can then be used to share the profits with the retailers.

There exist for example other common agency equilibria where three-part tariffs still sustain monopoly prices and quantities, but are more favorable to the manufacturer – who can get up to all of $\Pi^M$.\(^{25}\) Conditional payments are however always required to sustain the monopoly outcome; they must moreover be equal to the retailers’ ex post variable profits, implying that upfront payments must be negative (as is the case for slotting allowances).

7 Conclusion

Our analysis confirms the Chicago critique, as formalized by Bernheim & Whinston (1998), in a model where competing retailers have all the bargaining power when negotiating with an upstream monopolist. Given

\(^{24}\) Note that while retailers are then ex post indifferent between buying or not, buying does constitute a weakly dominant strategy.

\(^{25}\) The equilibria most favorable to $M$ require non-profitable exclusive offers, and are thus not trembling-hand perfect.
whichever contracting restrictions may prevail, the equilibrium market structure is chosen so as to maximize total industry profits. Thus, an exclusionary strategy cannot be profitable as long as common agency profits exceed exclusive profits.

The main contribution of our paper is then to examine the role upfront payments and conditional fixed fees play in determining the market structure and retail prices. We first show that with classic two-part tariffs that contain an upfront fixed fee, a common agency structure cannot achieve integrated monopoly profits in equilibrium. This implies that all equilibria may be such that the less efficient retailer is excluded. We then show that conditioning fixed fees permits firms to increase the common agency profits, as high conditional fixed fees may serve as a commitment to stay out of the market if retail prices are low.

Finally, combining conditional fixed fees with slotting allowances suffices to generate monopoly profits in a common agency equilibrium. The idea is that retailers can commit to monopoly prices by offering conditional fixed fees just equal to their respective shares of monopoly profits. The slotting allowances are then used to share monopoly profits with the manufacturer. If contracts are not restricted, it is optimal for the retailers to offer three-part tariffs and induce a common agency with monopoly prices.

These results are robust to whether retail competition is in quantities or prices. They also do not rely on the observability of contract offers, it is sufficient that contract acceptance decisions are ex post verifiable before the retailers compete.

The welfare implications of banning slotting allowances are ambiguous. On the one hand, slotting allowances in combination with conditional fixed fees may in some situations lead to common agency where classic two-part tariffs would be exclusionary. In that sense, three-part tariffs can be competition enhancing. On the other hand, given common agency, three-part tariffs lead to the complete elimination of downstream competition, which clearly harms consumer and total welfare. Further research on the determining factors of common agency profits when contracts are restricted to two-part tariffs is needed to identify which situation may be relevant in any particular market.

Our analysis also contributes to the discussion around bargaining power. As mentioned earlier, bargaining power is assumed to be upstream in much of the previous literature on vertical contracting. Yet, in the grocery industry for example, the general perception is that bargaining power has shifted towards large multiples in recent years. When dealing with smaller manufacturers, multiples often account for a high share of the manufacturer’s’ total production. Larger manufacturers cer-
tainly possess a strong bargaining position when it comes to some must-stock brands, but this strength does not necessarily carry over to other goods, since negotiations mostly take place on a product-by-product basis.\textsuperscript{26} Real-world evidence indicates that the strong position of the retailers is positively related to both the incidence and the magnitude of slotting allowances. Our analysis confirms this observation. Were bargaining power upstream, the integrated monopoly solution could be achieved without upfront payments; classic two-part tariffs would suffice. Once retailers have the bargaining power, however, upfront payments are necessary to maintain monopoly prices. Note that negative upfront payments always arise in the retailers’ preferred equilibrium, and this equilibrium always involves common agency. In Marx & Shaffer (2004), on the other hand, where contracts are non-contingent and upfront payments always lead to exclusion, they only arise when retailers are asymmetric.

An interesting extension would be to allow for mixed bargaining. Our feeling is that the results will be robust in the sense that, as soon as retailers possess some bargaining power, three-part tariffs are needed to achieve the common agency monopoly outcome.

\textsuperscript{26}see OFT supermarket report
References


