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Contract Design with a Dominant Retailer and a Competitive Fringe

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We show that under some conditions, quantity discounts and two-part tariffs are equivalent as mechanisms for channel coordination when an upstream firm sells its product in a downstream market that is characterized by a dominant retailer and a competitive fringe. We consider a setting in which discriminatory offers are feasible and a setting in which the same menu of options must be offered to all retailers. We find that the upstream firm's profit in both settings is independent of whether quantity discounts or two-part tariffs are used. The implication of this finding is that the firm's choice of contract design may turn on which one is easier to implement.

Key words: marketing; channels of distribution; competitive strategy; pricing

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1. Introduction

Channel coordination has been and continues to be a major focus of the literature on vertical contracting ever since the seminal works of Jeuland and Shugan (1983) and Moorthy (1987). The starting point of this literature is a recognition of the fact that each channel member's decisions may affect other channel members' profits, and thus a lack of coordination among these decisions can lead to lower profits for all. It follows that by ensuring that channel members' incentives are fully aligned through its choice of contract terms, a manufacturer can either directly or indirectly (through redistributive means) increase not only its own profit but also those of its downstream partners.

In this paper, we consider channel coordination and contract design in a downstream market characterized by a dominant retailer and a competitive fringe. This is an important market structure to consider because of the increasing attention given to dominant firms in both the popular media and in policy circles. Although the focus of this attention is often on whether a dominant firm may have an incentive to exclude its rivals, it is equally important in our view to consider whether and how an upstream firm acting unilaterally or in conjunction with the dominant retailer can coordinate the channel, thereby mitigating or preventing, among other things, such anti-competitive behavior.

Using a similar setting to that in Raju and Zhang (2005), we ask the following questions: (i) Can channel

members' incentives be fully aligned via arms-length contracting (i.e., short of the manufacturer fully integrating forward)? (ii) How should the manufacturer optimally design its contracts? We consider the case in which discriminatory contracts are feasible, and the case in which the same menu of options must be offered to all. We find that, as in Raju and Zhang's (2005) model, the channel can always be fully coordinated. However, given these different conditions on the contract space, we find that, unlike in their model, the manufacturer's profit is independent of whether the optimal two-part tariff contracts or Jeuland–Shugan quantity-discount schedules are used. The implication of this finding is that the choice of contract design may turn on which one is easier to implement.

To place our findings in context, it is by now well established that contracts that consist of wholesale prices only (i.e., linear contracts) rarely suffice to coordinate the channel. Typically, what is minimally needed for coordination are contracts that have both fixed and marginal components (i.e., nonlinear contracts), where the marginal components such as wholesale prices are chosen to align incentives, and the fixed (or inframarginal) components are chosen to divide the surplus.

The early work in this area suggested the equivalence of broad classes of contracts that met the basic requirement of nonlinearity. Jeuland and Shugan (1983, 1988) and Moorthy (1987) were among the first to establish the equivalence of quantity-discount

schedules and two-part tariffs in terms of both (i) coordinating the channel and (ii) dividing the surplus. That is, they found that it was possible to coordinate the channel with either form of contract, and that by appropriately choosing the parameters in these contracts, any division of surplus was possible. However, their results were established in a bilateral-monopoly setting with one firm upstream and downstream.¹

Since then, Mathewson and Winter (1984), Ingene and Parry (1995, 2000), Iyer (1998), and Raju and Zhang (2005), among others, have suggested that this equivalence need not extend to settings in which downstream firms compete. They find that when retailers choose both prices and other elements of the marketing mix, it may not be possible for the manufacturer to coordinate the channel with non-linear contracts alone. Moreover, the equivalence of quantity-discount schedules and two-part tariffs in dividing the surplus and maximizing the manufacturer's profit also may not hold, especially when firms are asymmetric. The reason is that downstream competition introduces horizontal externalities in addition to the usual vertical externalities already present in the channel.

Of this work, only Raju and Zhang (2005) looks at channel coordination in the context of a dominant retailer and a competitive fringe of price-taking firms who do not make any productive downstream decisions of their own. Retail markets with these characteristics present unique challenges for channel coordination because in addition to being the principal driver in setting the market price, the dominant retailer often generates positive externalities for its fringe competitors by engaging in demand-enhancing services that then spill over and benefit the entire retail industry. Comparing the profitability of Jeuland–Shugan quantity-discount schedules and the profitability of two-part tariff contracts, Raju and Zhang (2005) find that although the channel can be fully coordinated in both cases, the manufacturer may prefer one over the other depending upon parameter values.

Our findings differ from theirs because we extend their contract space to include customized two-part tariffs in addition to customized quantity-discount schedules, and a menu of quantity-discount schedules in addition to a menu of two-part tariffs. We further differentiate our work from their work by distinguishing between two settings, one in which overt

discrimination is possible, such that retailers can be offered different contracts, and one in which it is not possible, such that the same menu of options must be offered to all retailers.² Our finding that the manufacturer's profit is independent in both settings of whether quantity discounts or two-part tariffs are offered is surprising because the upstream firm is constrained to charging a single per-unit price under a two-part tariff, whereas it can choose different per-unit prices for different quantity levels (both on and off the equilibrium path) under a quantity-discount schedule. As we will show, however, this additional flexibility is unneeded in the settings and particular market structure that we consider.

2. Model

We consider a similar setting to that in Raju and Zhang (2005) but with an expanded set of contracts. In the model, a manufacturer sells its products to a downstream market that consists of a single dominant retailer and a competitive fringe. All costs of production and distribution are zero.

The dominant retailer has market power and faces the following demand curve:

$$Q_d(p, s) = \gamma(\alpha - \beta p + s),$$

where $\gamma \in (0, 1]$ denotes the share of the downstream market that is served by the dominant retailer; $p > 0$ denotes the market price, which is set by the dominant retailer; and $s \in \{0, \bar{s}\}$ captures the presence or absence of a demand-enhancing service that only the dominant retailer can provide. The cost of providing the service \bar{s} is given by $f > 0$ and is incurred if and only if it is provided.

Given price p and service level s , the residual demand facing the fringe firms is thus given by

$$Q_f(p, s) = (1 - \gamma)(\alpha - \beta p + s),$$

or, equivalently, on a per-firm basis

$$q_f(p, s) = \frac{Q_f}{N},$$

where N is the number of fringe firms and $1 - \gamma$ measures their collective share of the market.

As in Raju and Zhang (2005), we place the following restrictions on the parameters α , γ , and f :

$$\alpha \geq 7\bar{s}, \quad \gamma \geq \frac{(\alpha + \bar{s})}{(\alpha + \bar{s} + N\bar{s})}, \quad f \leq \frac{\gamma\bar{s}(2\alpha + \bar{s})}{4\beta}. \quad (1)$$

The first restriction places a lower bound on α . It says that α , which measures the preservice level of

¹ The results of Jeuland and Shugan (1983, 1988) and Moorthy (1987) were also established for the case in which demand is known and all actions are observable. When these assumptions are relaxed, the equivalence need not hold. Iyer and Villas-Boas (2003), for example, show that a linear contract may be preferred to a two-part tariff contract in a bilateral monopoly setting in which demand is uncertain, the downstream firm's actions are unobservable, and the product cannot be fully specified in the contract.

² The former case is relevant, for example, when there are no institutional constraints against price discrimination. The latter case is relevant, for example, when there are such constraints (e.g., the Robinson–Patman Act of 1936 (Pub. L. No. 74-692)).

demand when the market price is zero, must be sufficiently large relative to the incremental effect of service on demand. The second restriction places a lower bound on the share of the market served by the dominant retailer. It says that the dominant retailer must be sufficiently large relative to the size of each fringe firm (which varies inversely with N). The third restriction places an upper bound on the cost of providing service. It ensures that the dominant retailer will provide the service and choose the channel profit-maximizing price if it can buy the manufacturer's product at cost.

2.1. Roadmap of the Analysis to Follow

With these assumptions, a fully integrated firm would maximize channel profit by solving

$$\max_{p, \lambda \in [0, 1]} p(\alpha - \beta p + \lambda \bar{s}) - \lambda f. \quad (2)$$

At the optimum, such a firm would provide the service ($s = \bar{s}$) and choose a market price of $p = p^*(\bar{s}) \equiv (\alpha + \bar{s})/(2\beta)$, thereby achieving a maximized channel profit of $\Pi^I \equiv (\alpha + \bar{s})^2/(4\beta) - f$.

To see whether this outcome can be achieved via arms-length contracting, we consider the following three-stage game: (i) in stage one, the manufacturer chooses the terms of its contract offers; (ii) in stage two, retailers accept or reject their offers; (iii) in stage three, the dominant retailer chooses the market price p and whether or not to provide the service level \bar{s} . If the vertically integrated outcome can be achieved, we say that the channel can be fully coordinated.

The problem is that in setting the market price and deciding whether to offer service, the dominant retailer will act like a downstream monopolist—in the absence of coordination, its decisions need not be aligned with the manufacturer's interests or with maximizing channel profit. The potential for misalignment arises because for any per-unit cost of the good $t > 0$ that it might be offered, its profit margin will be smaller than what an integrated firm would earn. Moreover, it will receive only a fraction γ of the market demand. Thus, its optimization problem will differ from the one in (2) in that it will choose both p and λ (whether to provide the service) to solve

$$\max_{p, \lambda \in [0, 1]} (p - t)\gamma(\alpha - \beta p + \lambda \bar{s}) - \lambda f. \quad (3)$$

Given this, we ask whether the dominant retailer's incentives can be aligned with those of a hypothetical firm that solves (2), and if so, whether the manufacturer's profit would be higher under the optimal Jeuland–Shugan quantity-discount schedules or two-part tariff contracts.

In §3, we consider the case in which overt discrimination is allowed, such that the manufacturer can offer the dominant retailer and fringe firms different

contracts. Then, in §4, we consider the case in which overt discrimination is not allowed, such that the manufacturer must offer the same menu of options in its contracts to all retailers and induce them to self-select.

3. When Discriminatory Offers Are Feasible

With Jeuland–Shugan quantity-discount schedules, the per-unit price depends on how much is purchased. For example, it can take the following form when offered to the dominant retailer:

$$t_d(q; \bar{s}, f) \equiv \frac{\gamma - k_1}{\gamma} \left(\frac{\alpha + \bar{s}}{\beta} - \frac{q}{\gamma\beta} \right) - \frac{(1 - k_2)f}{q}, \quad (4)$$

where $q \geq 0$ is the quantity purchased, and $k_1 \in [0, \gamma]$ and $k_2 \geq 0$ are nonnegative parameters.

Conditional on providing service, the dominant retailer's problem then simplifies to

$$\max_p k_1 p(\alpha - \beta p + \bar{s}) - k_2 f, \quad (5)$$

whereas conditional on not providing service, the dominant retailer's problem simplifies to³

$$\max_p \frac{\beta k_1 p + (k_1 - \gamma)\bar{s}}{\beta} (\alpha - \beta p) + (1 - k_2)f. \quad (6)$$

Comparing (5), (6), and (2), it can be seen that the manufacturer can induce the dominant retailer to choose the channel profit-maximizing retail price if and only if it can induce it to provide the service. And it can induce it to provide the service if and only if there exists a k_1 such that the retailer's maximized profit from (5) can be made at least as large as its maximized profit from (6).

In a previous version of this paper, we showed that such a k_1 does indeed exist (e.g., using the bounds in (1), it can be shown that the dominant retailer can be induced to provide the service when $k_1 = \gamma$). The manufacturer then sets k_2 , which acts as a fixed fee, to extract the surplus.

Turning to the fringe firms, it should be clear that the manufacturer can do no better than to extract all of their surplus when service is provided and the dominant retailer chooses $p = p^*(\bar{s})$. This can be achieved by offering them a contract with a constant per-unit price of $t_f(q) = p^*(\bar{s})$.

PROPOSITION 1. *There exist discriminatory quantity-discount schedules that align channel incentives and allow the manufacturer to extract all the surplus. The fringe firms are offered a constant per-unit price of $t_f(q) \equiv p^*(\bar{s})$,*

³ The maximization problem in (5) is obtained by setting $\lambda = 1$, substituting $t_d(q; \bar{s}, f)$ from (4) into (3), and evaluating it at $q = Q_d(p, \lambda \bar{s})$. The maximization problem in (6) is obtained similarly from (3) by setting $\lambda = 0$.

and the contract offered to the dominant retailer takes the form

$$\tilde{t}_d(q; \bar{s}, f) \equiv \frac{\gamma - \tilde{k}_1}{\gamma} \left(\frac{\alpha + \bar{s}}{\beta} - \frac{q}{\gamma\beta} \right) - \frac{(1 - \tilde{k}_2)f}{q},$$

where \tilde{k}_1 and \tilde{k}_2 are chosen such that its profit in (5) is zero and weakly exceeds its profit in (6).

Note that this result holds whether or not the service provision can be monitored perfectly and hence contracted for separately. We have implicitly assumed that service provision cannot be contracted for separately, which can be seen from the fact that the dominant retailer's terms in Proposition 1 are the same whether or not service is provided. However, even if service could be contracted for separately (e.g., the manufacturer might offer the terms in Proposition 1 subject to the service being provided, while threatening to withhold supply otherwise), it would make no difference for the results. The reason is that the manufacturer can already fully coordinate the channel and extract all of the available surplus even without the added contractual flexibility.

3.1. Two-Part Tariffs

Suppose that instead of a Jeuland–Shugan quantity-discount schedule, the dominant retailer is offered a two-part tariff contract consisting of a per-unit price $w_d \geq 0$ and fixed fee $F_d \geq 0$. Then, conditional on providing service, the dominant retailer's maximization problem in (3) simplifies to

$$\max_p (p - w_d)\gamma(\alpha - \beta p + \bar{s}) - f - F_d, \quad (7)$$

whereas conditional on not providing the service, the dominant retailer's problem simplifies to

$$\max_p (p - w_d)\gamma(\alpha - \beta p) - F_d. \quad (8)$$

Note that F_d plays a role similar to that played by k_2 in the sense that the dominant retailer's decision whether to provide the demand-enhancing service does not depend on its value. It follows that F_d will be chosen to fully extract the dominant retailer's surplus. Note also that to solve the double marginalization problem, the manufacturer must sell its product at cost, which implies that the manufacturer must set $w_d = 0$. Note finally that the upper bound on f ensures that the dominant retailer's profit in (7) will exceed its profit in (8) when w_d is set at this level.

PROPOSITION 2. *There exist discriminatory two-part tariff contracts that align channel incentives and allow the manufacturer to extract all the surplus. The dominant retailer is offered the contract*

$$(w_d = 0, F_d = p^*(\bar{s})\gamma(\alpha - \beta p^*(\bar{s}) + \bar{s}) - f),$$

and the fringe firms are offered a contract that extracts their surplus when $s = \bar{s}$ and $p = p^*(\bar{s})$.⁴

As with Proposition 1, this result holds whether or not service provision can be contracted for separately. This follows because even if contingent contracts could be written, it is still the case that the manufacturer would need to set $w_d = 0$ to induce the channel-profit-maximizing retail price, and it is still the case that F_d would be chosen to fully extract the dominant retailer's surplus. Hence, the added flexibility of the contingent contracts would make no difference for the results.

It follows from Propositions 1 and 2 that both quantity-discount schedules and two-part tariff contracts can coordinate the channel when discriminatory offers are feasible. Moreover, because the manufacturer extracts all the surplus in both cases, it has no reason to prefer one over the other.

4. When Discriminatory Offers Are Not Feasible

We now suppose that the manufacturer cannot directly discriminate among the different firms. When this is the case, the best the manufacturer can do is to offer a menu of options within the contract and allow the firms to self-select the option they prefer. It is well known in such cases that the optimal menu will consist of at most two options (because there are only two types of retailers), one designed for the fringe firms and the other designed for the dominant retailer. Moreover, the option that is intended for the dominant retailer will be designed such that the dominant retailer will prefer its option to the option that is intended for the fringe firms, and vice versa (the fringe firms will prefer the option intended for them to the option intended for the dominant retailer).

We compare and contrast the performance of menus of quantity-discount schedules and two-part tariffs. The first-best contract in this setting would be such that the option meant for the dominant retailer would induce it to choose the channel-profit maximizing price and provide the service, while minimizing the profit it could earn by choosing the option meant for the fringe firms. In addition, the option meant for the latter would fully extract their surplus, given $p^*(\bar{s})$ and $s = \bar{s}$.

Perhaps the simplest way to accomplish these objectives, assuming incentive-compatibility constraints can be satisfied, is to offer a menu that combines (4) with an offer to sell at a constant per-unit price of $p^*(\bar{s})$. Then choose k_1 and k_2 such that k_1 induces if possible the dominant retailer to provide the service and k_2 equates the dominant retailer's profit in (5), which

⁴ The optimal contract offered to the fringe retailers takes the form $w_f \in [0, p^*(\bar{s})]$, $F_f = (p^*(\bar{s}) - w_f)q_f(p^*(\bar{s}), \bar{s})$.

is the most it could earn under the first option, with the profit it could earn if instead it chose the option $t(q) = p^*(\bar{s})$:

$$\max_{p, \lambda \in [0, 1]} (p - p^*(\bar{s}))\gamma(\alpha - \beta p + \lambda \bar{s}) - \lambda f. \quad (9)$$

That is, choose k_2 to ensure that the dominant retailer is just indifferent between the two options.

It then remains to show that the fringe firms would not want to choose the option meant for the dominant retailer, and that there exists a k_1 such that the dominant retailer would want to provide the service. The former is straightforward to show and the latter holds because the manufacturer can always choose $k_1 = \gamma$ and allow the dominant retailer to be the residual claimant of its revenue.

It also remains to show that the offer to sell at a constant per-unit price of $p^*(\bar{s})$, which is the offer intended for the fringe firms, does indeed minimize the profit that must be given to the dominant retailer. The issue is whether the manufacturer could do better by charging the fringe firms different per-unit prices out of equilibrium, such that the dominant retailer would be worse off if it were to operate under the option meant for the fringe firms and buy a quantity other than $q_f(p^*(\bar{s}), \bar{s})$. As we showed in a previous version of this paper, however, the dominant firm would never want to buy less than $q_f(p^*(\bar{s}), \bar{s})$ in this case, and the manufacturer would never want to offer additional quantities at a lower per-unit price. It follows that the proposed menu is optimal.

PROPOSITION 3. *When retailers must be offered the same menu of options, there exists a menu of quantity-discount schedules that align channel incentives. The optimal such menu takes the form*

$$\left(t_1(q) \equiv \frac{\gamma - \hat{k}_1}{\gamma} \left(\frac{\alpha + \bar{s}}{\beta} - \frac{q}{\gamma\beta} \right) - \frac{(1 - \hat{k}_2)f}{q}, t_2(q) \equiv p^*(\bar{s}) \right),$$

where \hat{k}_1 and \hat{k}_2 are chosen such that the dominant retailer's profit in (5) is the same as its profit in (9), and its profit in (5) exceeds its profit in (6) (which ensures that the service is provided).

Note that the option meant for the dominant retailer, $t_1(q)$, induces it to charge the channel-profit-maximizing price and provide the service, and the option meant for the fringe firms, $t_2(q)$, fully extracts their surplus. It follows that the manufacturer's profit in Proposition 3 is equal to what a vertically integrated firm would earn minus what the dominant retailer earns (profit in (9)).

4.1. Two-Part Tariffs

We now solve for the manufacturer's optimal menu of two-part tariffs. In this case, unlike in the previous

case, no candidate menu of two-part tariff options immediately stands out, because there are a continuum of ways to extract the fringe firms' surplus. Nevertheless, it should be clear that the optimal menu will specify a wholesale price of $w_d = 0$ for the dominant retailer (to align her incentives with those of the channel) and an F_f to leave the fringe firms with zero surplus. That is, given $w_d = 0$, for any $w_f \in [0, p^*(\bar{s})]$, F_f will be chosen to satisfy $F_f = (p^*(\bar{s}) - w_f) \cdot q_f(p^*(\bar{s}), \bar{s})$.⁵

Moreover, F_d must be chosen to satisfy the dominant retailer's incentive-compatibility constraint. Formally, let $\Pi_d(w) \equiv \max_{p, \lambda \in [0, 1]} (p - w)\gamma(\alpha - \beta p + \lambda \bar{s}) - \lambda f$ denote the dominant retailer's maximized profit gross of any fixed fee when it faces a per-unit price of w . Then the profit the dominant retailer could earn by instead choosing the option meant for the fringe firms is given by $\Pi_d(w_f) - F_f$, and thus it must be that F_d will be chosen to satisfy $F_d = \Pi_d(0) - (\Pi_d(w_f) - F_f)$.

The only remaining choice is w_f , which will be chosen by the manufacturer to make the option intended for the fringe firms as unattractive to the dominant retailer as possible. To this end, we substitute the optimal choice of F_f into $\Pi_d(w_f) - F_f$ and write the manufacturer's problem as

$$\max_{w_f} -\Pi_d(w_f) + (p^*(\bar{s}) - w_f)q_f(p^*(\bar{s}), \bar{s}). \quad (10)$$

Differentiating the expression in (10) with respect to w_f , it follows, after noting that the derivative of the first term is equal to the quantity sold by the dominant retailer when faced with a per-unit price of w_f , that the manufacturer should increase w_f as long as the dominant retailer would sell more than the equilibrium quantities of the individual fringe firms. Because this always holds given the bounded conditions in (1), it is optimal for the manufacturer to set $w_f = p^*(\bar{s})$ and thus $F_f = 0$.

PROPOSITION 4. *When retailers must be offered the same menu of options, there exists a menu of two-part tariffs that align channel incentives. The optimal such menu takes the form*

$$(w_d^*, F_d^*) = (0, \Pi_d(0) - \Pi_d(p^*(\bar{s}))), \quad (w_f^*, F_f^*) = (p^*(\bar{s}), 0).$$

Given the choices in Proposition 4, the dominant retailer will choose to operate under the option (w_d^*, F_d^*) , and the fringe firms will choose to operate under the option (w_f^*, F_f^*) . It follows that channel profits will be maximized and the dominant retailer will earn a profit of $\Pi_d(p^*(\bar{s}))$. In contrast, the fringe firms will earn zero. Because the dominant retailer earns $\Pi_d(p^*(\bar{s}))$ regardless of which option it chooses, and because its incentives are exactly aligned with those of

⁵ We have implicitly ruled out setting $w_f < 0$ or $w_f > p^*(\bar{s})$ for the usual moral hazard reasons.

the channel when it chooses option (w_d^*, F_d^*) , it is optimal for it to choose this option, provide the service, and set $p = p^*(\bar{s})$. Moreover, given that the dominant retailer is providing the service and setting $p = p^*(\bar{s})$, it is optimal for the fringe firms to choose the option (w_f^*, F_f^*) and earn zero profit rather than the option that was intended for the dominant retailer, (w_d^*, F_d^*) , and thereby earn negative profit.

Comparing the manufacturer's profit in the optimal menu of two-part tariffs with its profit in the optimal menu of quantity-discount schedules, it can be seen that in both cases channel profit is maximized and the fringe firms earn zero profit. This means that in both cases the same maximized profit is split between the same two firms. Because the dominant retailer's profit is the same in both cases (that is, because the profit $\Pi_d(p^*(\bar{s}))$ is the same as the profit in (9)), it follows immediately that the manufacturer's profit must also be the same. This gives rise to the following proposition.

PROPOSITION 5. *When retailers must be offered the same menu of options, the manufacturer will be indifferent between the optimal menu of two-part tariffs and the optimal menu of quantity-discount schedules. Both are equally good at aligning incentives and both yield the same division of surplus.*

Proposition 5 suggests that the manufacturer will be indifferent between quantity discounts and two-part tariffs even when overt discrimination is not feasible. This is surprising because one might think that the former would do strictly better because of the added flexibility it gives the manufacturer in offering different per-unit prices both on and off the equilibrium path depending on the quantity purchased. Nevertheless, this additional flexibility turns out to be unneeded. The intuition for the result is as follows. In both cases, the optimal menu of options coordinates the channel.⁶ Thus, the profit comparison turns on which menu is better at minimizing the dominant retailer's share of the overall profit. Under the optimal menus, the dominant retailer's share of the overall profit is equal to the profit it could earn by foregoing its own contract and instead choosing the contract meant for the fringe firms. Because the latter obtain the manufacturer's product at the per-unit price of $p^*(\bar{s})$ in both cases, the dominant retailer's profit in both cases is the same.

⁶ As a referee points out, it is well known that, in problems of adverse selection, the optimal offering for the high type (i.e., the dominant retailer) is efficient without distortion, whereas the offering for the low type (i.e., the fringe firms) is inefficient. In the current setup, the fringe firms do not make any demand-related decisions. It therefore follows that if it is optimal to coordinate the channel with discriminatory contracts, then it will also be optimal to coordinate the channel even when the same menu must be offered to both the dominant retailer and the fringe firms.

5. Conclusion

We considered the coordination problem of a manufacturer selling to a dominant retailer and a competitive fringe, where the dominant retailer was responsible for choosing the market price and whether to offer a demand-enhancing service. Two types of contractual situations were analyzed. In the first scenario, the manufacturer was allowed to offer discriminatory contracts to the dominant retailer and fringe firms. In the second scenario, the manufacturer was constrained to offer the same menu of options to all firms and induce them to self-select into the right contract. We found that the channel could be fully coordinated in both cases. We further found that quantity discounts and two-part tariffs were isomorphic in terms of coordination and extraction of retailer surplus.

A useful avenue for future work would be to compare still other classes of contracts in this market setting to determine whether and to what extent they might do better from the manufacturer's perspective. It may be, for example, that contracts that feature discounts that apply to all units purchased once a threshold is reached, or that allow for revenue sharing, or that impose minimum market-share requirements on retailers, may yield higher profits for the manufacturer than the contract forms considered here when there are market imperfections that prevent full extraction.⁷

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⁷ See, for example, Kolay et al. (2004) and Majumdar and Shaffer (2009), who compare and contrast the efficacy of all-units discounts and menus of two-part tariffs, and of market-share contracts and menus of two-part tariffs, respectively, in a bilateral monopoly setting in which consumer demand is unknown at the time of contracting. They find that these other contracts can yield higher profit for the manufacturer by reducing the monopolist retailer's information rent.