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A critical factor in channel relationships between manufacturers and retailers is the relative bargaining power of both parties. In this article, the authors develop a framework to examine bargaining between channel members and demonstrate that the bargaining process actually affects the degree of coordination and that two-part tariffs will not be part of the market contract even in a simple one manufacturer–one retailer channel. To establish the institutional and theoretical bases for these results, the authors relax the conventional assumption that the product being exchanged is completely specifiable in a contract. They show that the institution of bargaining has force, and it affects channel coordination when the complexity of nonspecifiability of the product exchange is present. The authors find that greater retailer power promotes channel coordination. Thus, there are conditions in which the presence of a powerful retailer might actually be beneficial to all channel members. The authors recover the standard double-marginalization take-it-or-leave-it offer outcome as a particular case of the bargaining process. They also examine the implications of relative bargaining powers for whether the product is delivered “early” (i.e., before demand is realized) or “late” (i.e., delivered to the retailer only if there is demand). The authors present the implications for returns policies as well as of renegotiation costs and retail competition.

A Bargaining Theory of Distribution Channels

Bargaining between manufacturers and retailers over the terms of trade is an important characteristic of many distribution channels. Relationships between manufacturers and their retailers often hinge on the importance of negotiation and its effects on each party’s share of the pie, as well as on channel coordination. This role of bargaining and the exercise of bargaining power by participants exist in distribution systems in a wide range of industries. The following examples illustrate the common problems that are associated with bargaining in channels that we examine in this article.

EXAMPLES OF BARGAINING IN CHANNELS

Example 1: Grocery Channel

Vendors in the grocery industry frequently complain that powerful retailers are creative in finding unpredictable methods to extract additional revenues. For example, vendors complain—usually off the record—of an unceasing barrage of demands from powerful retailers that want everything from payment of fines for shipment errors and product labeling errors to a large number of free samples.[1] The problem of product damages (classified as such by the retailer) is another important context in which parties in a channel can be opportunistic. Kahn and McAlister (1997) note that damaged products account for $2.5 billion each year and are a cause of growing acrimony in manufacturer–distributor relationships. They point out (pp. 22–23) that “there is no clear understanding of exactly who is responsible for these growing costs. Distributors blame manufacturers: transportation accidents, package design flaws. Manufacturers blame distributors: damage at warehouse, damage at store, damage in-between.” Third parties cannot identify who is to blame.

Example 2: Construction Supplies Channel

In the $660 billion construction supplies channel, relationships depend on the negotiation power of the parties. With little placed in writing, there is often disagreement over what has been negotiated. A problem for contractors is that products are not delivered as agreed, shipments are often late, and delivery arrangements are not what was

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[1]See, for example, “Clout! More and More Retail Giants Rule the Marketplace,” *BusinessWeek*, December 21, 1992.

agreed on (e.g., suppliers fail to provide union drivers and means to unload material). For suppliers the biggest problem is that contractors often make a point to delay payments as long as possible (for details, see Eisenmann 2000).

Example 3: Automobile Channel

In recent years, there have been several reported cases of General Motors (GM) acting coercively against its upstream suppliers in squeezing procurement costs. The purchasing head of GM often disregarded contracts that had been signed with suppliers, demanding that they be renegotiated at more beneficial terms to GM (see Stern, El-Ansary, and Coughlan 1996, Ch. 7).

These examples highlight some critical issues in distribution channel management that we address in this article. First, the channel relationship involves the manufacturer and the retailer indulging in a bargaining process. It is not merely a relationship in which the manufacturer makes take-it-or-leave-it offers to the retailer. Rather, the relationship involves bargaining over the terms of trade. Furthermore, the different bargaining powers of both parties might end up significantly affecting the size of the total channel profits (i.e., the extent of channel coordination). As evident from the previous examples, occurrences of product damages or delayed payment can clearly affect the total profits in the channel.

Second, a problem faced in channel relationships is that manufacturers and/or retailers can renegotiate their earlier agreements. This renegotiation occurs because of the nonspecifiability of the product exchange, which can encourage opportunistic behavior. In nearly every channel relationship, there are aspects of the product exchange that are intangible and difficult for the parties to agree on. Consequently, the parties often find it difficult to completely specify the product exchange in a contract. In Example 1, it would be hard to ascertain who should be held responsible if the packaging of the product was found damaged (as defined by the retailer) a month after the manufacturer shipped it. A powerful retailer, in this case, may behave opportunistically and demand additional compensation.[2] Such behavior may be perceived as fraudulent, but opportunistic behavior is not necessarily illegal. All that is needed for opportunism is for a party to renege on an earlier unenforceable agreement. However, the point we highlight through this example is that the parties can be opportunistic when it is quite hard for a third party (e.g, a court of law) to enforce a contractual agreement. Indeed, this idea of intangibility of the product exchange is a basic marketing notion that is consistent with Levitt's (1969) idea of the augmented product. At a general level, and as Coase (1937) and Williamson (1975) point out, contracts on product characteristics can be incomplete because of transaction costs. These costs might arise because of unforeseeable contingencies at the contracting date, too many contingencies to write into the contract, the high cost of monitoring, or considerable legal costs of enforcing the contract. Despite the prevalence of product nonspecifiability–related problems in distribution channels, the implicit assumption in the previous research on channel coordination is that the product being exchanged is completely specifiable in a contract. However, as we show in this article, relaxing this assumption has nontrivial implications for channel coordination. Product nonspecifiability creates opportunism among the parties in a distribution system. This opportunism affects the optimal transfer arrangement and the role of the relative bargaining powers.

Third, considering product nonspecifiability and bargaining helps us address a persistent inconsistency between the theoretical literature on distribution contracting and observed managerial practice. The theoretical literature often prescribes two-part tariffs (a payment made by the retailer to the manufacturer that involves a fixed fee plus a variable fee   the quantity sold) as the optimal contract design. Indeed, in markets where retailers have some market power, two-part tariffs have been shown to be theoretically optimal under a remarkably broad range of market situations.[3] These include situations with simple double marginalization when retailers need only to set prices (e.g., Moorthy 1987), when retailers or manufacturers need to provide a noncontractible service (e.g., Lal 1990), when retailers buy other input to sell a composite output (Vernon and Graham 1971), when retailers carry a product line (Villas-Boas 1998), when there is demand uncertainty (e.g., Rey and Tirole 1986), or when either retailers or manufacturers have private information (e.g., Desai and Srinivasan 1995; Tirole 1988, p. 176). However, in actual practice, both the magnitude and the incidence of two-part tariffs may be quite insignificant. In mainstream retail sectors such as grocery retailing or departmental stores, retailers do not seem to pay lump-sum fees to manufacturers. Even in business format franchising (in which the incidence of franchise fees is the highest), the evidence indicates that franchisors often charge negligible franchise fees compared with what they could otherwise have commanded (see Kaufman and Lafontaine 1994). The bargaining framework of this article addresses this inconsistency between theory and practice.

The overall logic of this article is that the many distribution systems face problems of product nonspecifiability. Because of this nonspecifiability, channel members can be opportunistic, which has an impact on the channel relationship. Opportunism in a vertical relationship can be modeled through the possibility of renegotiation of an initial ex-ante contract, as in the previous GM example. This captures the idea that a powerful party might renege on an initial agreement, even after the product is delivered, and demand extra payment. It is the presence of such opportunism that enables the bargaining process to have an impact on the market decisions (such as setting the retail price). This article explores this logic and thereby establishes the link from nonspecifiability to opportunism to renegotiation and, therefore, to the role of bargaining on the market outcome.

[2]An example of an extreme form of such opportunism comes from a leading New York apparel vendor who mentions how a retailer will conveniently snatch an invoice off a package of goods and then tell the vendor that it is missing. As "punishment" the vendor must pay back a certain percentage of the total cost of goods on that invoice (*The Wall Street Journal* August 4, 1993).

[3]Market power should not be confused with bargaining power in the channel. The retailer has market power in the end-consumer market if it faces a downward sloping demand function (in the extreme, monopoly power). Market power might be due to factors such as locational convenience, store reputation, and so forth. In contrast, bargaining power represents the ability or skill of a party to bargain for a greater share of the pie. This article distinguishes between market and bargaining power.

We consider bargaining in a distribution channel consisting of a manufacturer that produces the product and a retail intermediary that takes a market action (e.g., setting the retail price) and sells the product to the consumer market. The retailer's action (i.e., price) is unobservable, and the manufacturer cannot fix it in a contract. We consider a market where retail demand is uncertain, which makes it difficult for the parties to contract on a fixed quantity of the product.

SUMMARY OF RESULTS

The contracting problems that we investigate are predicated on three factors: product nonspecifiability, demand uncertainty, and unobservability of retail behavior. The presence of these three factors results in the channel not being fully coordinated. In the standard case discussed in the literature, when the product is specifiable, it is well known that a two-part tariff can coordinate the channel and maximize total channel profits (see Moorthy 1988). This is the case even when demand uncertainty and unobservability of retail behavior are present in the channel. However, we show that in the comparable case of this article (represented by costless renegotiation), the nonspecifiability of the product can lead to the two-part tariff not being an equilibrium contract, even in the simplest possible channel structure involving one manufacturer and one retailer. This is because the fixed fee in the two-part tariff does not affect the opportunistic behavior on the part of the manufacturer and, therefore, will not be accepted by the retailer. Rather, bargaining takes place on a simple wholesale price, and it affects the market outcome (i.e., retail prices). Thus, trading on a simple wholesale price, and not on the more complex two-part tariff, is an equilibrium outcome.

The next result is that greater relative bargaining power of the retailer improves channel coordination in markets where retailer effort is important. Greater bargaining power helps the retailer appropriate a greater proportion of the channel profits. This gives the retailer a greater part of the channel pie (i.e., greater residual claim), thereby motivating it to choose a retail price that is closer to the coordinated level. In other words, greater retailer power can lead to a lower negotiated wholesale price and, therefore, a lower retail price that improves channel coordination. This finding is supported by both the available empirical evidence and an in-class study reported in this article, and it provides a perspective on the debate among practitioners and academics whether the growth of giant retail operations, such as Wal-Mart and Kmart, is ultimately beneficial to the channel and consumers. We also find that greater relative power of the manufacturer impedes channel coordination.When the bargaining power of the manufacturer is at an intermediate level, we find that the bargaining process exactly replicates the standard double-marginalization take-it-or-leave-it offer outcome.[4] Thus, the standard double-marginalization outcome can be recovered as a particular case of the bargaining process.

The effect of bargaining on manufacturer profits is interesting. Manufacturer profits as a function of retailer power are in the shape of an "inverted U" and are the highest at an intermediate level of retail power. This is because the increase in retailer power has two opposing effects. Although greater retailer power reduces the manufacturer's share of the total channel pie, it also reduces double marginalization and enlarges the total channel profits. Consequently, an increase in retailer power does not necessarily harm manufacturer interests. The coordinating ability of a powerful retailer can actually benefit the manufacturer.

Given that we accommodate conditions of demand uncertainty and possible bargaining after the realization of demand, a marketing strategy that is also relevant is one in which the product is first delivered to the retailer but may be returned later to the manufacturer if demand does not materialize. This strategy is called the "returns" strategy in which retailers carry inventory, and it is in contrast to the "no-returns" strategy of delivering the product to the retailer only if there is demand (in which case retailers act as order-takers and do not carry inventory). We show how these strategies can endogenously arise as a response to different bargaining power configurations in the channel. We find that the equilibrium involves retailers carrying inventory and possible returns in channels with low relative power of the retailer. This implies that a powerful manufacturer might voluntarily offer returns. With high manufacturer power, bargaining without product returns results in extreme double marginalization. By transferring the ownership of the product to the retailer, the returns contract can strategically influence the retailer's pricing behavior and thereby reduce this extreme double marginalization.

RELATION TO EXISTING LITERATURE

The focus of the economics literature on bilateral bargaining that originates in Nash (1950) has been "how to divide up a pie" that is not affected by any endogenous decisions of the parties involved. In contrast, the focus of the literature on channel coordination in marketing and in industrial organization has been "how retail prices and other market decisions should be set to maximize the channel pie" (see Iyer 1998; Jeuland and Shugan 1983, Mathewson and Winter 1984, Moorthy 1987). This article brings together these two approaches and shows how the bargaining process can simultaneously determine the size of the pie and split it up. Thus, it addresses the gap highlighted by Binmore, Osborne, and Rubinstein (1992), who point out that embedding noncooperative bargaining processes into market settings is an important research agenda. We show that bilateral bargaining can actually have an impact on the degree of channel coordination and can affect the overall size of the channel pie (in addition to the more standard function of dividing up the pie).

An important difference between this article and the existing literature on channel management (e.g., Jeuland and Shugan 1983; Moorthy 1987) is that the literature has not examined how the relative bargaining powers of different channel members affect their relationships.[5] For example, existing research does not address questions such as, Will the relationship between two equally powerful partners (e.g., Safeway and Procter & Gamble) be more coordinated than the relationship between Safeway and a small vendor?

[4]In the existing literature, this is also called the outcome in which the manufacturer is the Stackelberg leader.

[5]An exception is Carpenter and Coughlan (1999), who examine related issues in the context of the formation of strategic alliances. The results by Villas-Boas and Zhao (1999) can also be interpreted as evaluating retailer bargaining power.

and Will channel coordination be enhanced when the bargaining power of a given member is matched by the countervailing power of the other channel member or when there is no such countervailing power?[6] We investigate the effect of relative bargaining powers on channel coordination under a rich variety of relationships in which bargaining affects the market outcome. There is also a research tradition in marketing that tries to capture power in channel relationships through different timing rules with respect to the sequence of the actions of the various channel members (Choi 1991; Moorthy and Fader 1990). We subsequently discuss the relationship of our framework to this literature. Finally, there is also literature in marketing that is related to retailer pass-through of manufacturer price promotions, which can be viewed as part of the bargaining process (see, e.g., Kumar, Rajiv, and Jeuland 2001; Lal and Villas-Boas 1998).

The remainder of the article proceeds as follows: First, we provide the basic structure, the bargaining framework, and a review of the main results from the existing literature in the context of our setting. Second, we present the central results by solving for the distribution contract. Third, we present some extensions including renegotiation costs, outside options, retail competition, and retailer salvage values. We also discuss some evidence of the model's empirical validity. Finally, we provide conclusions and directions for further research.

THE BASIC STRUCTURE

The Distribution Channel

Consider a channel with a manufacturer that produces a product at a constant marginal cost of production c and a retailer that sells this product directly to the end-consumer market. The retailer decides on some marketing-mix activity that affects the end-consumer market and the retailer's profits. This activity stochastically determines the market demand for the product (i.e., market demand is uncertain given the marketing-mix activity). Considering demand uncertainty is important because it helps us highlight how the timing of product delivery and product returns can respond to coordination problems in the channel. The implications of demand uncertainty are developed in the results of the next section.

In the stylized model, the marketing-mix activity is represented by the variable retail price, p, but the model is easily generalizable to other common retailer decisions that stimulate demand, such as retail services, shelf space support, or merchandising effort. Using price as the retailer decision variable helps provide direct comparability of this model to existing research in the channels literature. The channel coordination problem that we investigate comes from three factors: unobservability of retail behavior, demand uncertainty, and incomplete specifiability of the product.

Unobservability of retail price. We assume the marketing-mix activity, or retail price in this case, to be unobservable by the manufacturer in the sense that the manufacturer cannot determine what exact retail price produced the realized demand. This means that the consumer has more information about the retail price than the manufacturer at the time of purchase. The unobservability of the retailer marketing-mix variable creates channel coordination problems, which are consistent with those discussed in the literature. The unobservability of retail price also means that the manufacturer cannot fix and enforce the retail price in a contract. This is a standard latent assumption in the existing research.[7] Similarly, we also assume that the realized demand is not observable by the manufacturer. However, the quantity ordered by the retailer reveals the realized demand to the manufacturer.

Demand uncertainty. We model demand uncertainty in a parsimonious manner, which nevertheless captures the important aspects of the coordination problem: Demand is equal to one unit with probability $q(p)$ and equal to zero with probability $1 - q(p)$, where $q\ (p) < 0$. Therefore, expected demand is equal to $q(p)$. As an example throughout this article, we consider the specific functional form $q(p) = 1 - p$. Note that this form of demand uncertainty highlights the marginal consumers for a retailer, that is, the ones who are important from the point of view of channel coordination.[8] In the Appendix, we show that the results are valid for a more general demand formulation.

Nonspecifiability. A third aspect of the model is that the product may not be completely specifiable in a contract. This inability to write the product specifications into the contract (product nonspecifiability) is in the tradition of the literature on incomplete contracts (Grossman and Hart 1986). As an example, Tirole (1988, p. 31) discusses a particular model that analyzes a "quality improvement that cannot be described" at the earlier date ("one can imagine that there is an 'infinity' of such potential improvements, of which only one will prove relevant"). The nonspecifiability of the product also represents the situations in which the retailer has the power to decide whether the product is of appropriate quality during the product delivery process. For example, a recent press article indicates that there is evidence that powerful retailers in the grocery industry have the discretion to decide whether the product delivered is according to specifications. Retailers use this discretion to make demands on their suppliers regarding product delivery, packing labels, and product damages.[9] Note that though it is possible that the parties might be able to partially specify some product characteristics, what is necessary for the subsequent results is that the parties are unable to specify all the aspects of the product relevant for the final consumer.

Finally, we assume without any loss of generality that the retailer has no marginal selling costs. We also assume (for

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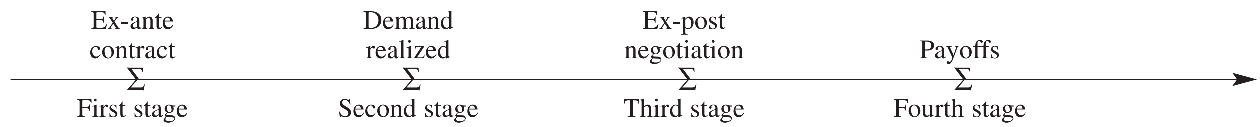
[6]An exception is the empirical work by Anderson and Weitz (1989), who find that power imbalance in channel relationships leads to conflict.

[7]For example, the double-marginalization problem analyzed in the existing literature (e.g., Jeuland and Shugan 1983; Moorthy 1987) goes away if the manufacturer is able to contract on the retail price. Note also that the retail price being unobservable to the manufacturer is a common phenomenon in mainstream retail markets. It is generally costly for the manufacturer to fully monitor retail transactions (for example, consider the case of a manufacturer selling to retailers in multiple markets). Even in the extreme case of posted prices, it is difficult for the manufacturer to continuously monitor retail prices. In most markets, retailers can offer secret price cuts or price hikes that are not easily observable to the manufacturer. Nevertheless, there are cases in which tracking retail prices might be less of a problem for the manufacturer (e.g., in certain electronic data interchange arrangements), and in those cases, the coordination problem examined in this article will be mitigated.

[8]Another interpretation of this demand setting is that the retailer's demand is realized one consumer at a time.

[9]See "Big Stores Outlandish Demands Alienate Small Suppliers," *The Wall Street Journal*, October 27, 1995.

Figure 1
TIMING OF THE MODEL



now) that the retailer has zero salvage value for an unsold product, and the manufacturer has a salvage value of f.[10] We also consider retailer salvage values. Both the retailer and the manufacturer are risk neutral.[11]

Timing

Figure 1 summarizes the timing of the actions. In the first stage, the manufacturer and retailer bargain over an "ex-ante contract," which is signed before the retailer makes the marketing-mix (pricing) decision and before the demand is realized. It is important to note that this ex-ante contract is formalized as a negotiated contract, and in this way, it differs from the more familiar take-it-or-leave-it offer contract. Because the ex-ante contract is negotiated, it may require some transfers between the retailer and the manufacturer before demand is realized. In addition, such a contract may also determine the nature of transfers after the realization of demand. The contract may also stipulate a delivery of the product before or after demand realization and any potential transfer prices for product returns. Thus, the decisions made at this stage are whether the delivery of the product will be made now or in the future, whether the wholesale price will be agreed on now or in the future, whether the fixed fee is to be paid-up independent of demand realization, and the transfer price of any potential returns. In addition, the parties can also stipulate the specifiable aspects of the product (if any) to be delivered or returned in the future. If the product is delivered to the retailer before demand realization, the wholesale price is agreed on (given that the retailer can inspect the product before the realization of demand). In the second stage, the retailer decides on the marketing-mix activity (price), and given this decision demand, it is realized as either one unit or zero units.[12]

In the third stage, the retailer and manufacturer renegotiate the ex-ante contract. In other words, they bargain on aspects of the transaction that are not completely specified in the ex-ante contract. Thus, at this stage, two cases can occur in which renegotiation plays a role: (1) demand was realized and the product has not already been delivered, or (2) demand was not realized and the product had been delivered to the retailer in the first stage. In the first case, the parties renegotiate the ex-ante contract under the threat posed by product nonspecifiability and decide on the actual wholesale transfer price. For example, suppose that consumers would like to buy the product with a particular color, red, that could not be specified in the ex-ante contract. Unless the retailer agrees to a renegotiated wholesale price, the manufacturer might deliver the product in an off-red color, which the final consumer does not buy and has no value for the retailer. In the second case, the parties renegotiate the transfer price of the returned product, again under the threat of product nonspecifiability. In the next section, we first analyze the case in which any renegotiation is costless for the two parties. This analysis helps us directly compare our results to the extant literature. Then, we examine the impact of costly renegotiation.

Finally, in the last stage, the retailer and manufacturer receive the agreed-on transfers. In addition, the retailer receives a gross revenue of p realized demand. The manufacturer bears a cost of c if it delivers the product to the retailer, and it receives a revenue of f if a delivered product is returned (with $f < c$).[13]

We clarify that the precise interpretation of the term "ex-ante contract" should be kept in mind. The interpretation of the ex-ante contract is of a contract that, in equilibrium, is immune to renegotiation in the third stage; that is, the ex-ante contract specifies transfer payments to be paid in the third stage if the product is traded, in which the payments are exactly what would have been (re)negotiated for in the third stage. In other words, and without loss of generality, we focus on the ex-ante contracts that are immune to renegotiation in the third stage.

The framework we describe previously is general in that it can accommodate the possibility of physical delivery of the product to the retailer either before or after the realization of demand. Indeed, the article shows when each of these cases will be a market outcome. Note that the case of physical delivery of the product to the retailer for the marginal demand (the one that is important from the channel coordination point-of-view) after the customers come to the store (i.e., after demand realization) is common in many real-

[10]We focus on the role of manufacturer salvage value in the basic model. Focusing on the role of manufacturer salvage value enables us to study product returns, a commonly observed phenomenon. This model structure enables us to analyze how product nonspecifiability and the relative bargaining powers affect the motivation to use returns contracts. This is a point that has not been made in the literature.

[11]We assume that the retailer knows the manufacturer's cost. This assumption is standard in the channels literature, including Jeuland and Shugan (1983), Moorthy (1987), and McGuire and Staelin (1983). This assumption is not necessary for the key results, but it simplifies the analysis. The case in which the retailer does not know the manufacturer's cost can be derived with the literature on bargaining with asymmetric information (see, e.g., Fudenberg and Tirole 1991, Ch. 10).

[12]In the case of late delivery, the retailer must choose the price while inferring the wholesale price that will result from any possible bargaining in the third stage.

[13]We assume $f < c$ because this is the interesting situation. A salvage value less than the marginal cost of production ensures that demand uncertainty has "bite." Now if the demand is not realized, the stock on hand is depreciated. This makes the decision of when to invest the marginal cost of production and the subsequent contracting meaningful. Therefore, the question is whether there should be delivery of the product before demand realization (in which the cost of production is sunk before uncertainty is revealed) or late delivery (in which the cost of production is incurred only if there is demand). If $f > c$, then we would expect delivery of the product before demand realization to be even more favored by the channel.

world markets and is a normal way of conducting business in many of the "order taking" type of retailing situations. These include markets such as appliances, furniture, automobiles, and services. In addition, this notion of demand realization before the retailer receives the actual product from the manufacturer is an accurate reflection of today's information-intensive retailing environment. Major retailers such as Wal-Mart are equipped with information technology (e.g., scanner data, electronic warehouse links, in-store audits) and ongoing marketing research information that indicate the demand they would have at a certain price. In the context of our model, these situations will mean that the physical delivery of the product to the retailer occurs in the third stage after the retailer decision and demand realization.[14] In the remainder of this article, we label this case interchangeably *as retail order-taking/no-returns* (because the product is delivered only if demand is realized) and distinguish it from the other case in which the product is delivered to the retailer before demand realization, which we label *retail inventory carrying/returns* (because if demand is not realized, the product may be returned to the manufacturer).[15] In the rest of this section, we discuss the necessary properties of the bargaining process and the results of the existing literature as they apply to this model.

The Bargaining Process

Because negotiations between the manufacturer and the retailer can occur at both the ex-ante contract and the ex-post negotiation stage, we need to specify a general bargaining process for any negotiation. The results presented in this article are valid for any bargaining process and satisfy the properties of the following general framework.

Consider two parties, 1 and 2. Denote the payoff to party i of its outside option as v_i and the total payoff of the coalition of the two parties as v_{12}. This total payoff is to be distributed between the two parties subject to bargaining. Assume $v_{12} > v_1 + v_2$. Denote the bargaining power of party i as $_i > 0$. Finally, denote the payoff to party i from the bargaining process as $_i(v_i, v_j, v_{12}, \ _i, \ _j)$, where i = 1, 2 and j = 3 – i. The properties required of the bargaining process in the context of this article are the following:[16]

1. Individual rationality: $_i \geq v_i$ for i = 1, 2.
2. Optimality: $_1 + \ _2 = v_{12}$.
3. Monotonicity: $(\partial \ _i/\partial v_i, \partial \ _i/\partial v_{12}, \partial \ _i/\partial \ _i) \geq 0$ and $(\partial \ _i/\partial v_j, \partial \ _i/\partial \ _j) \leq 0$ for i = 1, 2 and j = 3 – i.

These properties have axiomatic appeal: *Individual rationality* ensures that both parties receive at least as much from the bargaining process as their outside option. *Optimality* ensures that the two parties do not leave anything on the table and that the sum of what they get is not greater than what is available. Finally, *monotonicity* requires that the payoff of a party from the bargaining process is (1) increasing in its outside option, (2) increasing in the total payoff to the coalition, (3) increasing in its bargaining power, and (4) decreasing in the other party's outside option and in the other party's bargaining power.

We present two well-known examples that satisfy these properties: the Nash bargaining solution and the Rubinstein alternating-offers bargaining model. The Nash bargaining solution (Nash 1950) is an axiomatic approach to bargaining, which yields $_1 = \arg\max_x (x - v_1)^{\ _1} (v_{12} - x - v_2)^{\ _2}$ s.t. $x \geq v_1$ and $_2 = v_{12} - \ _1$. The maximization problem gives equation $_1 = [\ _1(v_{12} - v_2) + \ _2 v_1]/(\ _1 + \ _2)$.

The Rubinstein alternating-offers bargaining model (Rubinstein 1982) is a noncooperative approach to bargaining in which both parties make alternating offers until one of the parties accepts an offer, at which time the payoffs are distributed. Each party discounts later acceptances at a constant rate per period—discount factor $_i$ for party i (with $0 < \ _i < 1$). The discount factor $_i$ represents the patience of party i in the negotiation, that is, its ability to outlast the other party in the bargaining process (i.e., its bargaining power).[17] The subgame perfect equilibrium of this game yields immediate acceptance of the first offer and the following payoffs (in which party 1 is the party making the first offer): $_1 = \max\{v_i, \min[(1 - \ _2)/(1 - \ _1 \ _2)\, v_{12}, v_{12} - v_2]\}$ and $_2 = v_{12} - \ _1$.

In the remainder of this article, we use a notation that includes both of these cases and just represents the fraction of the coalition gain, $(v_{12} - v_1 - v_2)$, that is appropriated by each party in addition to its outside option. This fraction is denoted by   for party 2 (the retailer in what follows) and (1 –) for party 1 (the manufacturer). In the Nash bargaining solution, we have $\ = \ _2/(\ _1 + \ _2)$. In the Rubinstein model, we have $\ = \ _2(1 - \ _1)/(1 - \ _1 \ _2)$ if the outside options for both parties are zero (which is assumed to be the case for the manufacturer and retailer in the ex-ante contract).

Review of Existing Results

We briefly review the key results from the existing literature on distribution channels in which the implicit assumption is that the product is fully specifiable in a contract. This review helps us compare those results with the bargaining formulation and highlight the impact of bargaining in distribution channels. Consider first the standard double-marginalization case. Tirole (1988) describes this case for a one manufacturer–one retailer channel. Here, the manufacturer sells the product by charging a simple uniform price, w, to its retailer under the assumption that the product is completely specifiable and that the manufacturer makes a take-it-or-leave-it offer to the retailer. If the retailer accepts the offer, then given the wholesale price w, the retailer sets the

[14]Another example of product delivery after demand realization may be catalog retailing.

[15]It must be noted that in the case of a retailer such as Wal-Mart, the late delivery arrangement does not characterize many of its operations. For example, the late delivery concept might be relevant for Wal-Mart's appliances and furniture sections but not its soft goods or grocery sections. However, for these latter categories, the returns analysis of the article will apply (i.e., retail inventory is needed for selling).

[16]See Zwiebel (1995) for the statement of some of these properties in the context of multiparty bargaining.

[17]Note that the Rubinstein model has a broader interpretation than discount factors as a measure of bargaining powers. For example, it has been shown that the $_i$'s in the Rubinstein model are theoretically equivalent to the bargaining powers in the generalized Nash bargaining solution. It has also been shown that the bargaining powers can be interpreted as risk aversion and that greater risk aversion of a party leads to the attenuation of that party's bargaining power (see Binmore 1992, p. 193).

retail price $p(w) = \arg\max_x(x - w)q(x)$, and the manufacturer then sets $w = \arg\max_y(y - c)q[p(y)]$. Denote the solution to these problems as w^D and p^D. This yields the well-known double-marginalization result in which the equilibrium price set by the retailer is greater than the fully coordinated (or vertically integrated) price. This is because the marginal cost faced by the retailer (i.e., the wholesale price, w) is greater than the marginal cost of production, c. In other words, the retail price is higher than in the fully coordinated structure because of two successive markups (marginalizations). In the example $q(p) = 1 - p$, the equilibrium retail price is $p^D = (3 + c)/4$, which is greater than the coordinated retail price, $(1 + c)/2$. This leads to an uncoordinated channel in the sense that the channel profit under double marginalization is $[3(1 - c)^2/16]$ whereas the channel profit under full coordination is $(1 - c)^2/4$. In the next section, we recover this result as a particular case of the bargaining outcome.

The vertical Nash outcome (e.g., Choi 1991) assumes that the manufacturer and the retailer choose simultaneously the wholesale price, w, and the retailer margin, m, respectively. In other words, w and m satisfy $w = \arg\max_y(y - c)q(y + m)$ and $m = \arg\max_x xq(w + x)$. In this example, the wholesale and retail price for this case are $(1 + 2c)/3$ and $(2 + c)/3$, respectively. The retailer leadership outcome (e.g., Moorthy and Fader 1990) involves the retailer first committing to a margin m and then the manufacturer deciding on the wholesale price w. Formally, this means that $w(m) = \arg\max_y(y - c)q(y + m)$ and $m = \arg\max_x xq[x + w(x)]$. In the example, this yields $w = (1 + 3c)/4$ and $p = (3 + c)/4$.

It has been shown in the literature (Moorthy 1987; Tirole 1988) that the manufacturer can achieve full channel coordination using a two-part tariff instead of uniform wholesale pricing whenever the assumptions required for the double-marginalization setup are satisfied. The two-part tariff requires the retailer to pay a fixed fee plus a marginal fee per unit sold. If the marginal fee is set equal to the manufacturer's marginal cost of production, the retailer's marginal profit becomes equal to the marginal profit of the total channel. This ensures that the retailer makes the (pricing) decision that achieves full channel coordination. Typically, it is assumed that the manufacturer is able to make take-it-or-leave-it offers. In such a case, the fixed fee can be set equal to the coordinated channel profit, that is, $\max_p(p - c)q(p)$, which in the example is $(1 - c)^2/4$. Thus, the manufacturer ends up with a profit equal to the fixed fee, and the retailer ends up with zero profits and sets the channel coordination retail price, p^* (in the example, $p^* = (1 + c)/2$). For this demand example, Table 1 presents these results as well as the results of the next section.

In the two-part tariff contracting setup, the fixed fee extracts all the retailer profits. A question that logically follows is: What would happen if we allowed for a more general allocation of bargaining powers but maintained the assumption that the product is fully specifiable in a contract? In this case, the fixed fee, given the bargaining process, will be $(1 - \quad)(1 - c)^2/4$ Note that under bargaining, there is still a full channel coordination (the same market outcome as with the take-it-or-leave-it offer), but the fixed fee will not extract all the retail profits as in the case of the take-it-or-leave-it offer of a two-part tariff contract. There is now a distribution of the channel profits that is consistent with the bargaining powers of the parties. However, note that the relative bargaining powers do not have any impact on channel coordination or on the retail price. In other words, we always obtain full channel coordination regardless of the relative distribution of the bargaining powers. Recall that this is because this type of bargaining contract is based on the assumption that the manufacturer and the retailer are able to completely specify the product in the first stage. This is the basic assumption of the existing literature that we bring into question in this article. Exploring the role of bargaining on the market outcome requires us to go beyond this usual assumption of complete product specifiability and to analyze situations in which the product exchange is not fully specifiable.

BARGAINING IN CHANNELS UNDER PRODUCT NONSPECIFIABILITY

The problems created by the nonspecifiability of the product exchange in a distribution channel are at the heart of this article. Our objective is to analyze the general structure of Figure 1 for incompletely specified products and to provide a complete characterization of the equilibrium ex-ante contracts.

Two alternative types of ex-ante contracts are feasible depending on the parameters of the model and, in particular, on the salvage value that the manufacturer has for unsold goods. Positive salvage values are important to consider because they open up the possibility that the ex-ante contract might involve the return of the product from the retailer to the manufacturer in the event of insufficient demand.

Thus, for any given level of salvage value, the channel members may agree on an ex-ante contract, which might specify product delivery to the retailer by the manufacturer before or after the realization of demand, the second stage. As previously mentioned, we label these returns/retail inventory carrying contracts and no-returns/retail order-taking contracts, respectively. Note that if the product is delivered before the realization of demand and if demand does not materialize, the product will be returned to the manufacturer in the third stage because the manufacturer has a salvage value for the product at that point. In contrast, an ex-ante contract, in which the product is delivered to the retailer only if there is demand, will have no product returns.

We discuss first the no-returns case (product delivered after the realization of demand) and then the case with returns (product delivered before the realization of demand). We then compare the two types of ex-ante contracts to establish when one type of contract is preferred to the other.

The No-Returns/Retail Order-Taking Contract

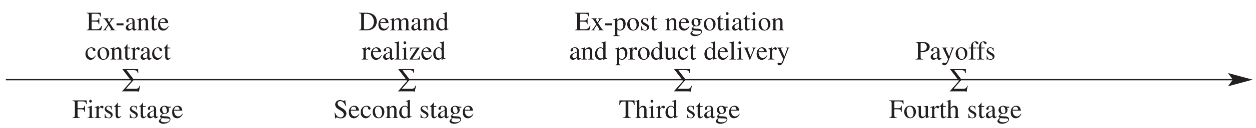
Figure 2 shows the no-returns ex-ante contract in which the product is delivered to the retailer after the realization of demand. In this case, after the retailer sets the price, and if demand is realized, the ex-post negotiation determines the effective wholesale price that will be paid. Note that the price p is not observable by the manufacturer. However, because the demand function q(p) is common knowledge, the manufacturer can rationally anticipate the retail price to be the equilibrium retail price, which we will denote by $\hat{p}$.

Table 1
EQUILIBRIUM SOLUTIONS FOR THE DEMAND EXAMPLE q(p) = 1 – p

Equilibrium Values	*Early Delivery (Returns)*	*Late Delivery (No-Returns)*	*Double Marginalization*	*Vertical Nash*	*Retailer Leadership*	*Specific Product*
Wholesale price	$c + (1 \quad)\frac{1 \quad ^{2}f^{2}}{4}$	$\frac{1 \quad + 2 \ c}{1 +}$	$\frac{1 + c}{2}$	$\frac{1 + 2c}{3}$	$\frac{1 + 3c}{4}$	c(plus F)
Retail price	$\frac{1 + \ f}{2}$	$\frac{1 + \ c}{1 +}$	$\frac{3 + c}{4}$	$\frac{2 + c}{3}$	$\frac{3 + c}{4}$	$\frac{1 + c}{2}$
Retail profits	$\frac{\{(1 + \ f)[1 + f(2 \quad)] \quad 4c\}}{4}$	$\frac{^{2}(1 \quad c)^2}{(1 + \quad)^2}$	$\frac{(1 \quad c)^2}{16}$	$\frac{(1 \quad c)^2}{9}$	$\frac{(1 \quad c)^2}{8}$	$\frac{(1 \quad c)^2}{4}$
Manufacturer profits	$\frac{(1 \quad)\{(1 + \ f)[1 + f(2 \quad)] \quad 4c\}}{4}$	$\frac{(1 \quad)(1 \quad c)^2}{(1 + \quad)^2}$	$\frac{(1 \quad c)^2}{8}$	$\frac{(1 \quad c)^2}{9}$	$\frac{(1 \quad c)^2}{16}$	$\frac{(1 \quad)(1 \quad c)^2}{4}$
Total channel profits	$\frac{\{(1 + \ f)[1 + f(2 \quad)] \quad 4c\}}{4}$	$\frac{(1 \quad c)^2}{(1 + \quad)^2}$	$\frac{3(1 \quad c)^2}{16}$	$\frac{2(1 \quad c)^2}{9}$	$\frac{3(1 \quad c)^2}{16}$	$\frac{(1 \quad c)^2}{4}$

Notes: The retailer bargaining share is .

Figure 2
LATE DELIVERY OF PRODUCT (NO-RETURNS)



Therefore, the bargaining process will result in a wholesale price profile, $\hat{w}$, which is a function of $\hat{p}$.[18] More formally, the wholesale price, which arises from the bargaining process, can be derived by means of the assumed bargaining process as,

(1) $$\hat{w} = c + (1 - \quad)(\hat{p} - c).$$

Given that the retail price is not observable by the manufacturer, $\hat{w}$ will be the result of the bargaining process whatever the price that is actually chosen by the retailer. That is, the wholesale price that is the result of the bargaining process is not a function of the actual retail price charged by the retailer. Therefore, the retailer chooses the retail price that maximizes its expected profit with $\hat{w}$ as the wholesale price held fixed; that is,

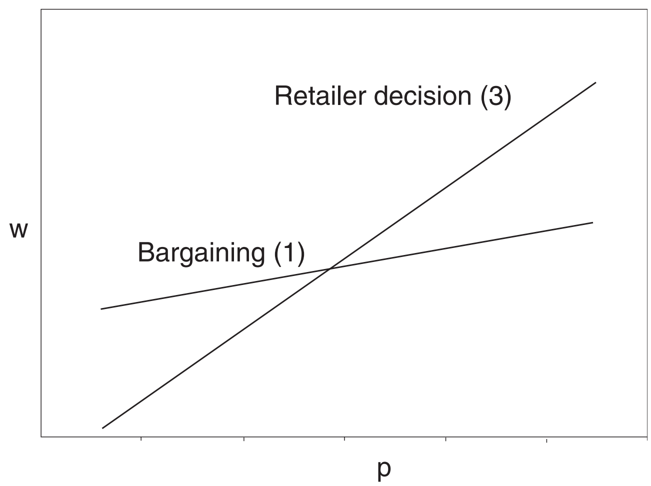
(2) $$\hat{p} = \arg\max_{p}(p \quad \hat{w})q(p).$$

The first-order condition, which determines the equilibrium retail price, is then

(3) $$(\hat{p} \quad \hat{w})q\ (\hat{p}) + q(\hat{p}) = 0.$$

We elaborate on the derivation of the equilibrium. In general, the coordinated retail price cannot be an equilibrium of this model. Rather, equilibrium retail and wholesale prices are obtained by solving Equations 1 and 3 simultaneously, with the retailer taking the wholesale price as fixed, as shown in Figure 3. In a pure-strategy equilibrium, the wholesale price is obtained from the equilibrium strategy of the retailer. However, because the retail price is not observed by the manufacturer, the retailer is just choosing its price given the equilibrium wholesale price. A numerical example helps clarify the equilibrium and the choice of the retail price. Suppose that the equilibrium retail price is the one that maximizes the channel profits and is \$10. Suppose the marginal cost is \$2 and that the bargaining power distribution is 50–50. In equilibrium, the wholesale price would then be \$6. That is, the retailer knows that when setting its retail price, it is going to pay a wholesale price of \$6. Then, the retailer's best response to this wholesale price of \$6 is a higher price than \$10 (because a monopolist's price is increasing in its marginal cost). Nothing stops the retailer from choosing such higher price, say \$14, because the manufacturer does not observe the retail price, and the retailer receives a greater profit. That is, in bargaining with the manufacturer, the retailer will still claim that it charged a price of \$10 (which is not true) and, therefore, claim that the wholesale price should be \$6. This is the reason the equilibrium in the model is obtained by solving Equations 1 and 3 simultaneously. The retailer takes the wholesale price as fixed.

Figure 3
BARGAINING EQUILIBRIUM UNDER LATE DELIVERY



Thus, in the no-returns contract, the equilibrium expected profit of the retailer (net of any fixed fees) is given by $\hat{\pi}_r = (\hat{p} - \hat{w})q(\hat{p})$. Similarly, the manufacturer's expected profit (net of fixed fees) is $\hat{\pi}_m = (\hat{w} - c)q(\hat{p})$. For the example $q(p) = 1 - p$, we have $\hat{p} = (1 + \quad c)/(1 + \quad)$, $\hat{w} = (1 - \quad + 2 \quad c)/(1 + \quad)$, $\hat{\pi}_r = \quad ^2(1 - c)^2/(1 + \quad)^2$, and $\hat{\pi}_m = \quad (1 - \quad)(1 - c)^2/(1 + \quad)^2$. Taking into account this ex-post negotiation, the analysis of the no-returns contract leads to Proposition 1. We present proofs of all the propositions in the Appendix.

> Proposition 1: With incomplete product specification and costless ex-post renegotiation, if the equilibrium contract involves product delivery after demand realization, such a contract will not be a two-part tariff. The contract will simply be on a uniform wholesale price.

Two-part tariffs will not be part of the ex-ante market contract even in a simple one manufacturer–one retailer chan-

[18] Note that the bargaining between the retailer and the manufacturer in the third stage is, in principle, one of asymmetric information in the sense that the manufacturer has not observed the retail price set by the retailer. However, given that we concentrate our attention on the pure-strategy perfect Bayesian equilibria, at the third stage, the manufacturer believes the retail price to be $\hat{p}$ whatever offers the retailer rejects; that is, the negotiation at the third stage is as if the retail price set by the retailer was common knowledge. Alternatively, there could exist mixed-strategy equilibria in which the retailer mixes on the retail price, and in that case, the negotiation in the third stage has the features of the traditional models of bargaining under asymmetric information with potential rejections of initial offers in equilibrium. Srivastava, Chakravarti, and Rapoport (2000) report an experimental study of bargaining in a channel under asymmetric information in which the bargaining does not affect the market outcome.

nel. Intuitively, the retailer will always be subjected to manufacturer opportunism if the retailer paid a lump-sum franchise fee in the ex-ante contract. To understand this, recall that the fundamental definition of a two-part tariff is that the lump-sum fee is paid independent of the level of demand (and independent of the productive actions being taken). In contrast, the variable fee is contingent on the sale of the good.[19]

Given nonspecifiability and that ex-post renegotiation costs are zero, the manufacturer will always open the ex-ante contract up for renegotiation. In other words, in the third stage, the manufacturer will hold up the retailer and only deliver the product with the appropriate specifications if it receives a negotiated amount at that point. Because the lump-sum fee is already agreed on, it is sunk and does not affect the renegotiation in the third stage. That is, the retailer does not gain anything from paying an up-front fee and will not agree to it. The retailer always receives higher final profits in the bargaining process if, instead of agreeing to a two-part tariff, the ex-ante contract is based on a simple wholesale price. Thus, an up-front fee will not be part of the vertical contract. Rather, any ex-ante contract must be a non-sunk or sale-contingent transfer price.

It is also important to point out how nonspecifiability of the product enters into the formal analysis. This is best achieved through a discussion of the logic of Proposition 1. Note that it is the nonspecifiability of the product that prevents any ex-ante contract $\ddot{C}$ with wholesale price $\ddot{w} < \hat{w}$ and with $\ddot{F}$ from being signed (see also the proof of Proposition 1 in the Appendix). Under complete product specifiability, such a contract can increase the channel profit over and above the contract that consists of only a simple wholesale price. However, because the product is nonspecifiable, the retailer will never accept $\ddot{C}$. This is because the manufacturer will always have the incentive in the third stage to renegotiate $\ddot{w}$ up to $\hat{w}$.

The proposition provides a rationalization for an inconsistency between the existing theoretical research, which is based on complete product specifiability, and the available empirical and anecdotal evidence. Although two-part tariff contracts have been shown to be theoretically optimal under a broad range of market conditions, the empirical incidence of lump-sum transfers from retailers to manufacturers is less frequent. For example, in mainstream department stores or grocery retailing, manufacturers typically do not require their retailers to pay fixed fees. The proposition provides a rationale for this that is based on incomplete product specifiability and negligible costs of ex-post renegotiation in the channel.

Another point is that, by endogenously recovering a simple uniform wholesale price rather than the two-part tariff as the equilibrium contracting outcome, this proposition legitimizes, in a broad sense, the stream of research that has adopted the uniform wholesale price double-marginalization approach (e.g., McGuire and Staelin 1983, Moorthy 1988). It has long been recognized in the literature that the manufacturer can remove double-marginalization and achieve full channel coordination by using a two-part tariff instead of uniform pricing. By showing that uniform pricing, and not a two-part tariff, occurs when channel members bargain over an incompletely specified product exchange, we provide a rationale for the observed use of simple wholesale price contracts. Note that in this model, contracts on uniform wholesale prices are viewed as indistinguishable from contracts on a fixed quantity to be purchased (see also the subsequent subsection on returns contracts).

We now develop some key implications of this no-returns case for the coordination and the function of distribution channels.

Proposition 2: Consider product nonspecifiability, demand uncertainty, and unobservable retailer actions. Then, an ex-ante contract involving bargaining with no-returns will involve a retail price, $\hat{p}$, decreasing in the retailer's bargaining share ; that is, the retail price increases in the manufacturer's bargaining power and decreases in the retailer's bargaining power. In addition, lim 0 $\hat{p} = p^0$, where p^0 is defined by $q(p^0) = 0$, and lim 1 $\hat{p} = p^*$ is the coordinated retail price.

The price difference between the retail price from the bargaining process and the coordinated retail price, $\hat{p} - p^*$, measures double marginalization in the channel. With a smaller $\hat{p} - p^*$, the double-marginalization effect is less serious and the channel is more coordinated. Proposition 2 shows that as the relative bargaining power of the manufacturer goes up, the extent of double marginalization increases and the channel is less coordinated. In contrast, greater relative power of the retailer improves coordination. To understand this, note that the retail margin for our example $q = (1 - p)$ is $\hat{p} - \hat{w} =$ $(1 - c)/(1 +$). It can now be checked that the retailer's margin unambiguously increases with . A greater helps the retailer appropriate a greater proportion of the channel profits. This gives the retailer a greater part of the channel pie (i.e., greater residual claim) and thereby motivates it to choose a retail price that is more in line with the interests of the entire channel. In other words, greater retailer power can lead to a lower negotiated wholesale price, which counteracts the double marginalization in the channel and leads to lower retail prices.

Proposition 2 also shows that for the extreme configuration of the highest retailer power (1), the channel is coordinated, and bargaining on the simple wholesale price actually results in the price p^*. In other words, the bargaining process leads to full coordination of the channel. At the other extreme, when 0, the retailer has no power in the channel relationship. In this case, the channel relationship unravels. The bargaining process will generate a wholesale price that is so high that the retailer will be unable to generate any demand at a profitable price (i.e., demand will be eliminated, and this is the meaning of $\hat{p} = p^0$).This leads to the insight that excess power of the manufacturer can lead to a breakdown of the channel relationship.

We reiterate that this coordination problem arises from nonspecifiability of the product in the presence of unobservable retail behavior and demand uncertainty. Without one of these factors, full coordination can be achieved in a setting in which the retailer takes all the productive actions. For example, suppose demand is deterministic (but with incomplete specifiability of the product and unobservability

[19]Note that the fixed fee is agreed on before demand realization and therefore can be viewed as sunk at the time of demand realization. This is irrespective of whether we consider the endogeneity of timing of the physical payments and whether the actual physical payment occurred before or after demand realization.

of price); then, it is possible to achieve full coordination because the retailer can order the good before consumers make purchases, without facing the possibility of any stock-out or manufacturer overproduction. Similarly, if the retail price is perfectly observable, the coordination problem vanishes because the retailer does not gain from deviating from the full coordination price (otherwise the retailer will just get the same share of a smaller pie).

Bargaining and Profitability

Analyzing the effect of relative bargaining powers on profits is managerially relevant as it helps us understand whether an increase in power always translates into an improved bottom line. In the behavioral literature (El-Ansary and Stern 1972; Gaski 1984), it has been generally accepted that greater relative power implies greater benefits for a channel member. Proposition 3 indicates that this might not always be the case. In this subsection, we focus on how bargaining affects the profits of the different channel members.

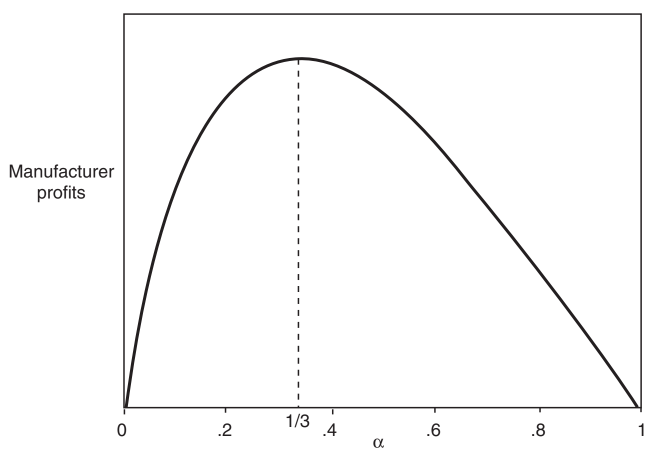
Proposition 3: Consider the no-returns ex-ante contract under incomplete product specification, demand uncertainty, and unobservability of retailer actions: (a) Both the total channel profit and the retailer profit increase with the retailer's bargaining power and decrease with the manufacturer's bargaining power. (b) When the manufacturer's (retailer's) bargaining power goes from its lower to upper limit, the manufacturer's profit first increases (decreases) and then decreases (increases). The threshold bargaining powers in which the manufacturer's profit is the highest is determined by $dp/dw(p^D,w^D) = \ /(1 - \ )$, where dp/dw is obtained from the first-order condition for the retailer, Equation 3. For the example $q(p) = 1 - p$, this threshold is determined by $\ = 1/3$.

The effect of bargaining on total channel profits follows directly from the double-marginalization effects discussed in Proposition 2. Because an increase in manufacturer power increases double marginalization, channel profits are adversely affected. In contrast, channel profits increase and move toward the coordinated level as the relative power of the retailer increases.

Conversely, bargaining affects manufacturer profits in a more subtle manner. Figure 4 shows the manufacturer's profit as a function of the retailer's bargaining power, . Consider the effect of on the manufacturer's profits. Initially, the manufacturer's profits increase with retailer power. However, when the retailer's relative power is sufficiently large ($> 1/3$ in the example), the manufacturer's profit declines. Therefore, manufacturer profits are the highest for an intermediate level of retailer power in the channel and not for low relative levels of retailer bargaining power as would have been expected. Intuitively, this is because retailer power has two distinct and opposing effects: Although an increase in retailer power has the effect of reducing the manufacturer's share of the pie, it also promotes coordination and expands the overall channel pie. Consequently, manufacturer profits are the highest at intermediate levels of . A moderate increase in retail power might actually be beneficial for the manufacturer.

An increase in manufacturer power can actually harm manufacturer profits if the level of manufacturer power in the channel is already at too high a level ($1 - \ > 2/3$ in the example). This result provides a strong contrast to the idea that greater power always implies greater benefits for a channel member. From an ex-ante and strategic perspective, high levels of power can actually hurt the manufacturer because it forces the retailer to set prices too high and thereby shrink the channel pie.[20] However, it is not possible to recover the retailer leadership outcome (Moorthy and Fader 1990) from the bargaining process.

Figure 4
EQUILIBRIUM MANUFACTURER PROFITS



Comparison with Double Marginalization and Other Solutions

It is important to provide a perspective on how the bargaining outcome is related to the standard double-marginalization outcome in which the manufacturer offers a simple wholesale price. The question that we ask in this subsection is whether it is possible to recover the double-marginalization outcome and other solutions as particular cases of the bargaining framework.

Proposition 4: The bargaining solution is equal to the double-marginalization solution; that is, $\hat{p} = p^D$ and $\hat{w} = w^D$ if $dp/dw(p^D,w^D) = \ /(1 - \ )$. In the example $q(p) = 1 - p$, this condition reduces to $\ = 1/3$.

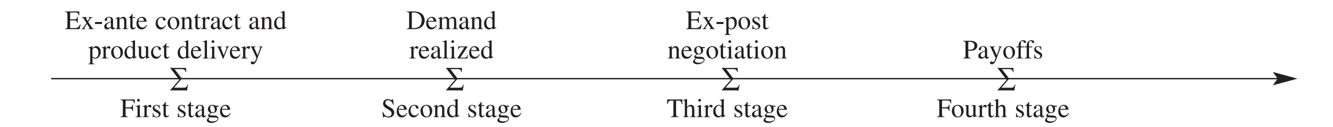
Proposition 4 establishes the unique configuration of relative power in the channel that is equivalent to the double-marginalization outcome. Thus, we recover the double-marginalization outcome as a particular case of the bargaining process. For the specific example, when $\ = 1/3$, the price under bargaining is the double-marginalization price. In addition, the relative bargaining powers distribute the total channel profits exactly as in the double-marginalization case (in the example, 2/3 for the manufacturer and 1/3 for the retailer).

Note that this is also the precise configuration of bargaining powers that yields the highest profit for the manufacturer. This is because the double-marginalization outcome obtains from the manufacturer choosing the wholesale price

[20]This discussion can also be presented in terms of the bargaining powers, $_r$ and $_m$, for the retailer and manufacturer, respectively. See Iyer and Villas-Boas (1997).

Figure 5

PRODUCT DELIVERY BEFORE DEMAND REALIZATION (RETURNS)



that maximizes its profit, given the best response of the retailer. In the bargaining framework, the retailer always uses its best response, given the wholesale price.[21] Note also that total channel profits will be larger than they will under the double-marginalization outcome as the relative power of the retailer increases beyond that which represents the double-marginalization outcome. In other words, total channel profits are greater than those under the double-marginalization outcome when > 1/3.

We must also mention that the bargaining process recovers the vertical Nash price and profit distribution for a level of retailer bargaining power that satisfies = 1/2. Under some general conditions, this retailer bargaining power is higher than the one required to recover the double-marginalization outcome.[22]

The Returns/Retail Inventory Carrying Ex-Ante Contract

We have examined the case of a channel relationship in which the ex-ante contract did not require delivery of the product to the retailer before the realization of demand and, therefore, did not result in returns. We now consider the possibility of the alternative type of ex-ante contract that involves delivery of the product before demand realization in which retailers carry inventory as presented in Figure 5. In such a case, returns may be possible. Suppose the manufacturer has some (possibly small) positive salvage value f ($f < c$) for goods that remain unsold at the retailer's outlet. This salvage value might be due to the manufacturer's ability to transship the product to another geographical market or due to its ability to store the product and sell it in the future. This salvage value (which is not the endogenous returns price chosen by the manufacturer in the subsequent discussion) is exogenous to the manufacturer.

If the game involves an ex-ante contract with returns (delivery of the product before the realization of demand), it will be as follows: Any ex-ante contract will need to satisfy what both the retailer and manufacturer can get in the ex-post bargaining process in the third stage of the game. Under such an ex-ante contract, the product is transferred to the retailer who then owns the product. The retailer then chooses the market price. Note that in contrast to the no-returns case, the retailer sets the retail price after taking up the ownership of the product. This is the economic difference between the two cases. Demand is realized with a probability q(p), in which case the retailer sells the product and the game ends. However, with a probability $1 - q(p)$, the demand for the product is not realized. In this eventuality, the manufacturer and the retailer bargain over the price at which the product will be returned back to the manufacturer (notice that this return price is negotiated between both parties). Maintaining our general assumption about product nonspecifiability means that it is also impossible to completely specify the returned product. Therefore, returns will involve price (re)negotiation as well. Thus, the ex-post negotiations will determine the price at which the product is returned back to the manufacturer. After taking possession of the product, the retailer's problem can be stated as $\max_p q(p)p + [1 - q(p)]\ \ f - \tilde{w}$, where $\tilde{w}$ is the negotiated wholesale price in the ex-ante contract under which the good is transferred to the retailer. In comparing this problem with the case in Equation 2, note that the retailer now also cares about the event in which the demand is equal to zero and pays the wholesale price whatever the demand realization is. Note that negotiating on $\tilde{w}$ is similar to negotiating on a uniform wholesale price.

The equilibrium retail price can therefore be computed as the solution to $(\tilde{p} - \ \ f)q\ (\tilde{p}) + q(\tilde{p}) = 0$. For the example $q(p) = 1 - p$, this results in $\tilde{p} = (1 + \ \ f)/2$. Given that the product is already produced, the retailer chooses a lower retail price than what would have been optimal from the overall channel perspective. This is because the retailer does not appropriate the entire salvage value f (i.e., the opportunity cost of selling the product), which is realized if the product is not sold. The retailer appropriates only a proportion of the opportunity cost.

From this analysis, it is relatively straightforward to understand the effect of the relative bargaining powers on channel coordination. Greater retailer bargaining power (or lower manufacturer bargaining power) enables the retailer to better appropriate the opportunity cost of selling the product (the salvage value). This results in higher retail prices, which leads to better coordination and greater total channel profits. That is, a retailer's greater relative power improves channel coordination. Recovering this result in the context of bargaining under returns only further reinforces the idea that the relationship between channel coordination and retailer power has relevance under a broad set of institutional situations.

Finally, we solve for the first stage ex-ante contract to assess the impact of the relative bargaining power on both the retailer and the manufacturer profits. Bargaining on the wholesale price results in the retailer payoff being a fraction, , of the total pie; that is, $\tilde{p}q(\tilde{p}) + [1 - q(\tilde{p})]\ \ f - \tilde{w} = \ \{\tilde{p}q(\tilde{p}) + [1 - q(\tilde{p})]f - c\}$, which results in $\tilde{w} = \ \ c + (1 - \ )q(\tilde{p})\tilde{p}$. For the specific example, this is $\tilde{w} = \ \ c + (1 - \ )(1 - \ ^2f^2)/4$. As expected, the wholesale price increases in the marginal cost of production and decreases in the salvage value. However, the wholesale price can be either increasing or decreasing in the relative bargaining power of the retailer. This is because greater retailer bargaining power not only

[21]Note that the manufacturer cannot guarantee itself the double-marginalization profit because of bargaining as well as nonspecifiability of the product exchange.

[22]The formal condition is that $q\ (p^D)^2 - q(p^D)q\leq(p^D) > 0$.

increases the total pie being shared but also reduces the share of the pie going to the manufacturer. The wholesale price can increase with retailer power if the first effect dominates and can decrease with retailer power when the second effect dominates.

The retailer profit, as expected, increases in the bargaining power of the retailer because of greater channel coordination and also because the retailer receives a greater share of the pie. In contrast, the manufacturer's profit is $\tilde{\pi}_m = (1 - \ )\{q(\tilde{p})\tilde{p} + [1 - q(\tilde{p})]f - c\}$, which can be either increasing or decreasing in for the same reasons as for the wholesale price. As a result, for the example q(p) = 1 – p, the manufacturer profit always decreases in the relative bargaining power of the retailer.[23]

The Choice Between the Returns and the No-Returns Contract

The choice of the type of contract by the manufacturer and the retailer will depend on which one achieves a greater expected profit for the channel as a whole. The greater the difference is between the marginal cost of production and the salvage value (i.e., a greater c – f), the more costly it will be to produce the product before the demand realization is known. Therefore, if the difference between the marginal cost of production and the salvage value is large enough, the contract with late delivery (no-returns) will be chosen. This result has also been pointed out by previous research on returns contracts (see Pasternack 1985). Padmanabhan and Png (1997) argue that returns contracts can intensify retail competition, and therefore the manufacturer can benefit from returns when the retail market is less competitive and when increased price competition can benefit the manufacturer.

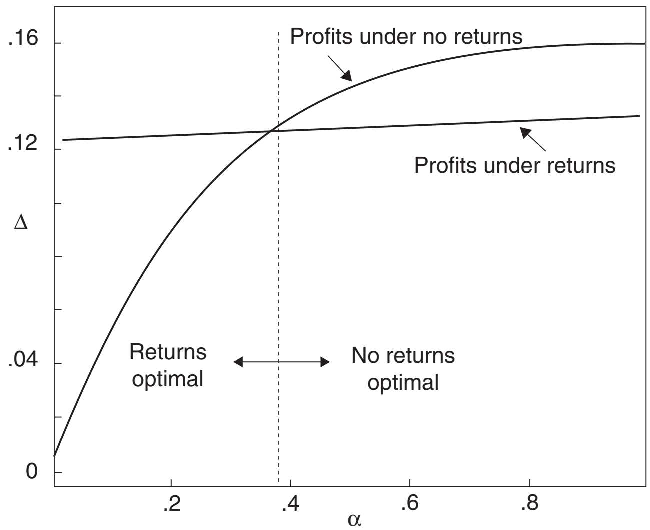
Here, we examine the impact of relative bargaining powers on the choice of the returns versus no-returns contracts—a point that has not been previously made. The greater the relative bargaining power of the retailer, the greater will be the level of channel coordination that will be achieved under both the contracts. However, this implies that the no-returns contract will be more attractive because under this contract, the retailer acts as an order-taker and the product is produced only when it is efficient to do so. In contrast, when the relative bargaining power of the retailer is low, the no-returns contract generates more serious double marginalization, and this makes the returns contract the better option. The comparison between the two types of contracts and how they are affected by the relative power of the retailer can be further highlighted by considering the two extreme cases of retailer power:

Case 1. Consider the extreme case of retailer power, represented by 1. In this case, both types of contract achieve the highest level of coordination given the delivery schedule. However, because c > f, the product should be produced only after the realization of demand, which makes the no-returns contract the superior option. For the specific example, the total channel profit under no-returns is $(1 - c)^2/4$, which is greater than the channel profit under returns, which is $(1 - f^2)/4 + f(1 + f)/4 - c$.

Case 2. At the other extreme, 0, in which the retailer does not have any power, we already know from Proposition 2 that in this case of extreme manufacturer power, the channel unravels under the no-returns contract because of extreme double marginalization. This implies that the returns contract will be attractive. Indeed, as long as the salvage value is high enough as compared with the marginal costs of production, the returns option will generate positive profits for the manufacturer and will therefore be optimal. The precise condition for the specific example can be evaluated as f > 2(c – 1/4). The returns option can be attractive even if salvage values are small (f is close to zero) as long as the marginal cost of production is not large (i.e., c < 1/4). This leads to the not so obvious insight that a manufacturer might accept returns even if the manufacturer were powerful and the product had small salvage value. To understand the reason for this, recall that with high manufacturer power, the no-returns contract results in extreme double marginalization. By transferring the ownership of the product to the retailer, the returns contract can strategically influence the retailer's pricing behavior and reduce this extreme double marginalization.

Figure 6

COMPARISON OF TOTAL CHANNEL PROFITS



Notes: For c = .2 and f = .15.

Apart from these two extreme cases, we can also use the example q(p) = 1 – p to derive the general functional form of the difference between channel profits under no-returns and returns. This can be denoted by $\ \equiv \hat{\pi}_r + \hat{\pi}_m - \tilde{\pi}_r - \tilde{\pi}_m = \ (1 - c)^2/(1 + \ )^2 - (1 - \ ^2f^2)/4 - (1 + \ f)/2\ f + c$. It is easy to observe from this that increases in the marginal cost of production, c, and decreases in the salvage value, f. It can also be shown that there is an such that for < , is negative, whereas for > , is positive. We illustrate this in Figure 6, which plots the difference in channel profits as a function of the relative bargaining power of the retailer . We chose a feasible pair of values c = .2, f = .15 to illustrate the result. However, the basic insight provided by Figure 6 is valid generally for any f < c.

In summary, we establish that in channels with high levels of retailer power, the equilibrium contract involves no-returns whereas returns contracts in which retailers hold

[23]The derivative of $\tilde{\pi}_m$ with respect to is $(1 - \ )[f^2/2(1 - \ ) - c] - [(1 - \ ^2f^2)/4 + (1 + \ f)/2\ f - c]$, which is negative for all f, , and c.

inventory are most useful in channels with high manufacturer power but low retailer power. These are channels in which the double marginalization induced by the no-returns contract is the most extreme. The returns policy helps by counteracting this extreme double marginalization. There is also an implication in the model that returns are preferred in less uncertain environments. Note that with uncertainty, q(p) is both the expected demand and the probability of one unit of demand. In this case, the no-returns may be optimal despite the possible double-marginalization inefficiency that it may create. If there is little uncertainty, then q(p) approximates the exact demand at price p. Thus, it is possible for the manufacturer and the retailer to negotiate in the ex-ante contract the quantity to be delivered before the realization of demand. In other words, with small uncertainty, the contract with the product delivered before demand realization will end up being the one that promotes better channel coordination.

It must be noted that our point about low relative bargaining power of the retailer favoring returns policies requires that there be nonspecifiability problems in the channel. In channels in which nonspecifiability is not a problem, this point might not hold. Another factor that drives returns policies, but is not discussed here, is the degree of retailer risk aversion. Greater retailer risk aversion will only increase the incentive to offer returns policies. Even in a model with risk aversion, the relationship between the relative bargaining powers and the incentive to offer returns will still be preserved.

EXTENSIONS

In this section, we discuss some extensions of the basic model. These include the role of renegotiation costs, outside options, bargaining under retail competition, and positive salvage value for the retailer. We also discuss the empirical validity of the model predictions.

Positive Renegotiation Costs

Until now, we have assumed that the terms of the product that were not fully specified in the ex-ante contract could be costlessly renegotiated in the ex-post bargaining stage of the game (i.e., the third stage in Figure 1). However, in reality, such renegotiation could be costly for both the manufacturer and the retailer. This could be due to the transaction costs that are associated with protracted haggling, which include delay costs, costs of lost demand, and manpower costs. For example, renegotiation costs could be high for products with a short selling season (e.g., fashion clothing, seasonal goods). Consider now that the manufacturer and the retailer each have a cost of renegotiating the ex-ante contract, denoted respectively by $_m$ and $_r$. To begin the analysis, suppose that the ex-ante contract specifies a wholesale price, denoted by $\overline{w}$. The equilibrium ex-ante contract must ensure that the channel members receive at least as much as they would if they rejected the contract and renegotiated. Thus, the retailer will not renegotiate if

(4) $$(\hat{p} \quad \hat{w})q(\hat{p}) \quad _r \quad [p(\overline{w}) \quad \overline{w}]q[p(\overline{w})],$$

which is the condition that ensures no-renegotiation before the pricing decision is taken (where p(w) is obtained from Equation 3), and

(5) $$\overline{w} \quad w[p(\overline{w})] + \quad _r,$$

which is the no-renegotiation condition for after the pricing decision is taken (where w(p) is obtained from Equation 1). These two inequalities translate into an inequality in which $\overline{w}$ must be smaller than some w_H, which is greater than $\hat{w}$. For the example q(p) = 1– *p*, we have $w_H = (1 - \quad + 2 \quad c + 2 \quad _r)/(1 + \quad)$. Similarly, the manufacturer will not renegotiate if

(6) $$w[p(\overline{w})] \quad _m < \overline{w},$$

which translates into $\overline{w}$ needing to be greater than some w_L, which is smaller than $\hat{w}$. For the specific example, we have $w_L = (1 - \quad + 2 \quad c - 2 \quad _m)/(1 + \quad)$. Thus, in the interval $w_L \leq \overline{w} \leq w_H$, both the channel members will have no incentive to renegotiate. Given that a lower wholesale price always achieves a greater total profit for the channel, the manufacturer and the retailer will have the incentive to agree on a wholesale price, which is at the lower limit of the interval, w_L. This wholesale price would not be renegotiated. However, because the retailer now gets a wholesale price that is less than $\hat{w}$ the retailer may agree to pay the manufacturer a fixed fee. At the lower wholesale price, the double-marginalization problem is less severe. The following proposition establishes the equilibrium of the game with renegotiation costs:

> Proposition 5: The equilibrium ex-ante contract with renegotiation costs is a two-part tariff $\overline{F} + \overline{w}q$, where $\overline{w} = \max(w_L, c)$ and $\overline{F} = (1 - \quad)[p(\overline{w}) - c]q[p(\overline{w})] - (\overline{w} - c)q[p(\overline{w})]$.

The consideration of renegotiation costs recovers a continuum between no product specification and complete product specification. The higher the manufacturer renegotiation costs are, the lower will be the wholesale price in the contract, which means that the total profits in the channel will increase. Thus, the presence of renegotiation costs can help coordinate the channel. Intuitively, this is because costly renegotiation mitigates opportunistic behavior in the channel. Indeed, if the manufacturer's renegotiation costs are sufficiently high, we recover the traditional full coordination two-part tariff contract that would result in the event the product was completely specifiable. For the specific example, this occurs for $_m \geq (1 - \quad)(1 - c)/2$. Proposition 5 establishes that a small fixed fee can arise as part of the equilibrium ex-ante contract if the manufacturer and the retailer have positive renegotiation costs.

> Corollary 1: The franchise fee $\overline{F}$ increases in the manufacturer renegotiation costs $_m$ and tends to zero when $_m \quad 0$.

The magnitude of the franchise fee is directly related to the level of renegotiation costs. Greater renegotiation costs reduce the lowest wholesale price w_L at which the manufacturer has no incentive to renegotiate. The increase in the fixed fee reflects this increase in the gains from the reduction of the double-marginalization problem. Note that as renegotiation costs become inconsequential, the fixed fee vanishes as in Proposition 1. Thus, we recover a whole continuum of fixed fee magnitudes in which the fixed fee is smaller than what is predicted under complete specifiability.

Bargaining with Outside Options for the Manufacturer

It is possible for either the manufacturer or the retailer to have an outside default option in the event that the bargaining between the two parties breaks down. The economic notion of an outside option also has a basis in the descriptive literature on power. For example, Emerson (1962, p. 32) postulates that the power that A has over B will be inversely proportional to "the availability of B's goals outside of the A–B relationship." Incorporating the possibility of an outside option for a particular channel member in our bargaining model establishes an analytical basis for understanding its impact on relative power in the channel and on coordination.

Consider the case in which the manufacturer has an outside option. In other words, if the manufacturer decides not to bargain with the retailer, the manufacturer could still guarantee itself an exogenous level of profits. One way of thinking about this outside option is to assume that the manufacturer has the flexibility to distribute the product through other retailers if it decides not to bargain. In this sense, specifying an exogenous outside option for the manufacturer in the bargaining game is a first step toward understanding the effect of competition at the retail level. This is shown in the previous section in which the salvage value, f, is greater than the marginal cost of production, c, and in which there are capacity constraints (the manufacturer cannot sell to both the outside option and the retailer). Therefore, even if $f > c$, it is possible for the ex-ante contract to involve product delivery after the realization of demand. Furthermore, note that if f is large, it interferes with the ex-post negotiation. This means that the negotiated wholesale price will be greater (i.e., there is a more serious double-marginalization problem). That is, a greater outside option for the manufacturer can hurt the channel and, in some cases, may also hurt the manufacturer.

Retail Competition

Another extension to the theory presented here is the consideration of competition among retailers that are differentiated by virtue of their location, store reputation, assortment, or other such characteristics. Competing retailers choose their retail prices, and these price choices determine probabilistically whether the demand is realized at a given retailer. However, after the demand is realized at a retailer, it remains captive to that retailer. In other words, the manufacturer, when negotiating a wholesale price with a retailer ex-post, does not have any more power than if there was no retailer competition.

The analysis of this situation reveals that with more retailer competition, retail prices are lower, which results in the manufacturer being worse off. In other words, more intense retail competition hurts the manufacturer's ability to bargain for favorable wholesale price terms. In contrast, if demand did not remain captive at the first chosen retailer, the manufacturer might be able to use the threat of "walking away" from a retailer to extract a higher wholesale price and thereby benefit from retail competition.[24]

Salvage Value for the Retailer

Until now, we have examined the case in which the manufacturer had salvage value for any unsold good. Consider now the case in which the retailer (and not the manufacturer) has salvage value s for the good. Retailer salvage values capture the ability of the retailer to divert the product to other stores in a retail chain. A retailer might also be able to sell unsold goods through an alternate channel. For this case too, the no-returns equilibrium will be exactly as discussed previously. For the returns case, after taking possession of the product, the retailer's problem can be written as $\max_p q(p)p + [1 - q(p)]s - \tilde{w}$, where $\tilde{w}$ is the negotiated wholesale price in the ex-ante contract (that is immune to ex-post renegotiation). For the example $q = 1 - p$, it can be shown that the equilibrium price will be $\tilde{p} = (1 + s)/2$. The total channel profits will be $\tilde{\pi}_T = (1 + s)^2/4 - c$, where $\tilde{\pi}_T$ is the equilibrium profit share of the retailer. Thus, as expected, the total channel profits and the equilibrium profits of both parties increase with retailer salvage value.

Furthermore, comparison with the case of no-returns shows that a contract with returns will be preferred when the retailer salvage value is high and the marginal cost of production is small enough (because total channel profits will be higher). To understand the impact of the relative bargaining powers, notice that the total channel profit under the returns case is independent of the bargaining powers of the parties. However, as previously shown, the total channel profit decreases with the relative bargaining power of the manufacturer for the no-returns case. Taken together, this implies that in the case of retailer salvage value, delivery of the product before demand realization with possible returns is more likely in channels with greater relative bargaining power for the manufacturer.

Finally, suppose that both the manufacturer and the retailer had salvage values for the product. In this case, the contract with product delivery before demand realization will dominate the contract in which the product is delivered on demand under a broader set of conditions. However, whether early delivery involves the possible return of unsold goods to the manufacturer will depend on the relative magnitudes of f and s. All else being equal, when f is sufficiently large but s is sufficiently small (close to the situation analyzed previously), early delivery is optimal.

Empirical Validity

In this subsection, we report some empirical and anecdotal evidence on (1) the lack of fixed fees in the contracts between manufacturers and retailers and (2) the idea that greater retail bargaining power may help coordinate the channel and lower retail prices.

The anecdotal evidence suggests that in the grocery and departmental store businesses, fixed payments from the retailer to the manufacturer are unimportant. Although indirectly related to this article, even in a business format franchising, in which the incidence of fixed fees is the highest, franchisors (e.g., McDonald's) charge negligible franchise fees compared with what they could otherwise have extracted. For example, Kaufman and Lafontaine (1994) find that McDonald's charged a low franchise fee of \$12.5K when it is estimated that the average present value of profits that is left unextracted is in the range of \$300K–\$455K (in 1982 dollars). In a study of contract length, Vaage (1993) points out that franchise fees in franchising contracts do not seem to extract all the potential profits of the franchisees in a variety of industries. We provide a possible rationale for small franchise fees by suggesting that the product exchange has significant intangible components. In this context, an

[24]Note that manufacturer competition may also create better outside options for the retailer (O'Brien and Shaffer 1997).

empirical study by Michael and Moore (1995) finds that, though unextracted profits are observed in a variety of industries, it is for intangible products such as business services that the incidence of unextracted rents is the highest.

We also present data from published studies and from in-class experiments with executives that support a key result of the model: the effect of the relative bargaining powers on channel coordination. Our analysis provides a rationale for why the retailer's greater relative power in the channel can lead to channel coordination, greater channel profits, and lower retail prices. This implication of the theory is consistent with the aggregate food price time-series data available in Messinger and Narasimhan's (1995) work. Throughout the 1980s, when there was an indication that retail power may have been enhanced, retail grocery food prices declined in real terms. In particular, data from Messinger and Narasimhan (1995, Table 10) show that the price index of food declined by 10% with respect to the consumer price index from 1980 to 1992. This is consistent with the result in the model that an increase in the relative power of the retailer reduces double marginalization and places a downward pressure on retail prices. An alternative explanation to Messinger and Narasimhan's results is that there was an increased intensity of competition between retailers during the period in analysis. However, this explanation could be at odds with the idea that during the period, there was an increase in the relative bargaining power of retailers.

A recent empirical investigation by Kadiyali, Chintagunta, and Vilcassim (2000) also provides data in support of the result that an increase in the relative power of the retailer reduces double marginalization and places a downward pressure on retail prices. The strongest illustration is their results for Starkist and BumbleBee brands. The retailer's share of the channel's profit is higher for Starkist when compared with BumbleBee (60.59% versus 56.59%). Consistent with the theory, the average retail price of Starkist is lower (13.96 for Starkist versus 14.65 for BumbleBee). This evidence is particularly strong because the estimated marginal costs of Starkist are higher (8.70 for Starkist versus 8.15 for BumbleBee).

In-Class Experiment

As a test of the model predictions, we checked the relationship between relative bargaining power and retail prices through an experiment with MBA students. We conducted a series of three experiments to test the prediction about the effect of relative bargaining power of the retailer on retail prices. We presented subjects with a task that closely represented a bargaining situation that was consistent with the model. We asked subjects to play the role of the decision maker for a major retailer. They were in charge of negotiating the terms of trade with a major supplier and setting the retail price for their firm. In the between-subjects experimental design, we endowed the participant with a particular configuration of relative bargaining power denoted by "N," which we conceptualized as the percentage share of the total channel profits. There were two conditions: one in which the retailer (i.e., the subject) had a 25% share and the other in which the retailer had a 75% share. The task for subjects was to pick the best retail price, given that they would be negotiating with the manufacturer for a share of the total channel profit as per the condition that we assigned to them (i.e., either 25% or 75%). Before being used in the experiment, the experimental materials were pretested to ensure that the task was well understood.

First, we conducted a small-sample and preliminary study with 27 subjects (13 subjects in the 25% condition and 14 subjects in the 75% condition). We presented subjects with a linear demand (from the demand function $q = 3 - p$). We told subjects that the demand was uncertain and that it was not possible for the manufacturer to observe the retail price set. We gave subjects the marginal cost of production as \$1. The mean price chosen in the 25% condition was \$1.96, which was higher than that for the 75% condition, which was \$1.77. A one-tailed t-test showed that the mean price was significantly lower in the 75% condition at the 10% significance level, with a *p*-value of .054. This provides some preliminary and directional support. This study was limited for several reasons: (1) The sample size was small; (2) we were restricted by the availability of only ten minutes in total for the experiment, and the exit protocols conducted indicated that subjects needed more time to process the information and do the task; (3) subjects could have benefited from having a more detailed representation of demand and demand uncertainty; and (4) we did not elicit detailed exit protocols that would indicate the factors that subjects considered in making their decision.

We then conducted a second experiment that addressed these issues. We randomly assigned a total of 42 subjects to the two conditions. There were 20 subjects in the 25% condition and 22 in the 75% condition. We presented subjects not only with a demand schedule but also with a pictorial representation of a continuous demand schedule in which a confidence region represented uncertain demand. We gave subjects a total of 20 minutes for the task. In this experiment, we used a nonlinear demand function, and we told subjects the manufacturer's marginal cost of production (which was .50 cents). Our objective in this experiment was to test the effect of relative bargaining powers on retail prices. The mean retail price for the 25% condition was \$1.30, which was higher than that for the 75% condition, which was \$1.13. The mean price was significantly lower (based on a two-tailed test) in the 75% condition at the 5% significance level with a *p*-value of .023. Thus, this experiment strongly supports the model prediction that retail prices will be lower with greater retailer bargaining power. In this experiment, we showed subjects demand for prices only in the range between .60 cents and \$1.40. Thus, the mean of the actual prices chosen by subjects were below the theoretical coordinated price of \$1.50.

Therefore, we designed a third and final experiment that tested the impact of bargaining powers and whether the prices chosen in both the conditions were higher than the theoretical coordinated price. The design of this experiment was as the previous one, except we showed subjects demand for a range of prices both above and below the coordinated price from \$1.00 to \$2.20. We randomly assigned a total of 52 subjects to the two conditions. There were 29 subjects in the 25% condition and 23 in the 75% condition. As before, we told subjects that the consumer demand in the retail market was uncertain, and we showed subjects a demand schedule that represented uncertain demand. We also presented the subjects with a pictorial representation of a continuous demand schedule.

We controlled for any possible bias introduced by our illustrative example in the "Background Information" sec-

Table 2
EXPERIMENTAL STUDY RESULTS

Variable	*25% Condition*	*75% Condition*	*Difference*	*p-Value*
Mean retail price (in dollars)	1.77 (.049)	1.59 (.047)	.18	.012
Mean anticipated wholesale price (in dollars)	1.06 (.053)	.88 (.034)	.18	.009

Notes: Standard deviations are in parentheses.

tion. We used two versions of the illustrative example with N = 30% and N = 70%, which we randomly distributed among the two conditions. In our analysis, we treated this as a factor and found that there is no significant difference in both the retail and wholesale price choices with respect to this factor for both the experimental conditions. Therefore, we combined the responses across the factor within each experimental condition.

We also elicited from the subjects the wholesale price that they expected to negotiate, in addition to the retail price that they would choose. Table 2 presents the results. The mean retail price for the 25% condition was $1.77, which was higher than that for the 75% condition, which was $1.59. The mean retail price was significantly lower (based on a two-tailed test) in the 75% condition at the 5% significance level with a *p*-value of .012. This supports the model prediction that retail prices will be lower with greater retailer bargaining power. Furthermore, the wholesale price results are also highly significant. The mean wholesale price for the 25% condition was $1.06, which was significantly higher (*p*-value .009) than that for the 75% condition, which was .88 cents. In summary, each of the studies supports the main hypothesis that greater retailer bargaining power leads to lower retail prices.

Finally, in this experiment the mean retail prices chosen by the subjects in both the experimental conditions are significantly higher (at the 5% significance level) than the perfect coordination price, $1.50 (which was not obtained in the previous experiments because of the possible reasons discussed previously). We also elicited written protocols on how the subjects reached their decision. We coded the responses and report here the major categories in which they fall. A total of 42 subjects reported profit maximization for the retailer as the objective in choosing the retail price. There were 38 subjects who explicitly indicated in some form that they made use of the negotiating power percentage in computing the retail price. In addition, 35 subjects indicated that they tried to infer what wholesale price they were likely to get before choosing the retail price.

CONCLUSION AND FURTHER RESEARCH

Channel power has been widely recognized by practitioners and academics as a critical factor governing distribution channel relationships. With the rise of the so-called power retailers, such as Toys-R-Us, there has been a continuing academic debate on how the changing configurations of channel power have affected the management and the general functioning of distribution channels (see Messinger and Narasimhan 1995). This article is an attempt to understand the relative power in a distribution channel as the bargaining power of channel members in a general and theoretically well-founded bargaining game.

Our bargaining framework examines an entire continuum of relative power configurations and recovers the standard double-marginalization result as a particular case. Consequently, we are able to answer questions such as whether the relationship between two equally powerful partners (such as Safeway and Procter & Gamble) is likely to be more coordinated than the relationship between Safeway and a small vendor. We abandon the implicit assumption that the product being exchanged is completely specifiable in a contract. A starting point of our article is the consideration of the many intangibilities and the specification difficulties that characterizes many real-life channel relationships. The institution of bargaining has substantial impact on the functioning and coordination of distribution channels when the complexities introduced by incomplete product specification are present.

Our first result is that two-part tariffs are not optimal if the product is impossible to fully specify in a contract. This finding runs counter to the existing literature on distribution contracting, which prescribes two-part tariffs under a remarkably broad range of market situations. This finding also provides an explanation for the inconsistency between the theoretical literature and the available empirical evidence, which suggests that the magnitude and the incidence of two-part tariffs may be small in actual practice. We also show that the bargaining process endogenously recovers a simple, uniform wholesale price as the equilibrium contracting outcome. In a broad sense, this legitimizes the stream of distribution channels research, which is based on the simple wholesale price (double-marginalization) approach.

We show that the relative bargaining power affects channel coordination. We find that greater relative power of the retailer in the channel coordinates the channel. Thus, the presence of a powerful retailer might be beneficial for the channel as a whole (and in some cases, beneficial to all channel members). In contrast, excess manufacturer power can increase double marginalization in the channel and reduce coordination. In the extreme, excess manufacturer power can even lead to a complete breakdown of the channel. In the same vein, we also show that a manufacturer is not always better off when its relative power increases. If the level of manufacturer power is already high, any further increase hurts the manufacturer because it drives the retailer to charge too high prices and shrink the channel pie. This result provides a contrast to the idea in the behavioral and descriptive literature that greater power always means greater benefits for a channel member. From an ex-ante and strategic perspective, high levels of power can actually hurt the manufacturer. We also form implications for returns policies and show that they are most attractive in channels with high manufacturer power and low retailer power. We also note that the manufacturer's reputation and repeated interaction may help mitigate some of the nonspecifiability issues raised previously. However, these effects may not be as strong because of quickly changing market conditions (and product characteristics). Moreover, such effects would also make two-part tariffs irrelevant, because they would guarantee perfect channel coordination by themselves.

This article opens up some possibilities for further research. A full analysis of retail competition would be an important addition to the theory. In particular, it would be important to establish when the presence of retail competition improves the manufacturer's bargaining position and leads to greater wholesale price margins. Another interesting extension would be to examine channels with common agent retailers that compete by carrying the products of multiple manufacturers.

APPENDIX

The Appendix presents the proofs of Proposition 1–5 and the general demand case.

Proof of Proposition 1

To prove the proposition, suppose that the ex-ante contract C consists of a simple uniform wholesale price $\dot{C} = \dot{w}$. Recall that any $\dot{w}$ in the ex-ante contract can be costlessly renegotiated in the third stage. Thus, the equilibrium wholesale price will be $\hat{w}$. The equilibrium retailer profit will be $\hat{\pi}_r = (\hat{p} - \hat{w})q(\hat{p})$.

Now if $\dot{w} = \hat{w} > c$, then any reduction in the ex-ante wholesale price, if possible, will increase the total channel profit, and it is then possible to make both parties better off. Therefore, there might exist a putative ex-ante contract $\ddot{C}$, with $\ddot{w} < \hat{w}$ and with $\ddot{F} > 0$ such that it offers the retailer slightly more profit than $\hat{\pi}_r$. However, the retailer will not accept such a contract over the original contract $\dot{C}$. This is because renegotiation in the third stage is costless, and the manufacturer will always have the incentive to renegotiate the lower wholesale price $\ddot{w}$ up to $\hat{w}$. Therefore, the retailer's profit from $\ddot{C}$ will be $\ddot{}_r = (\hat{p} - \hat{w})q(\hat{p}) - \ddot{F}$. Because $\ddot{}_r < \hat{\pi}_r$ always, the retailer never accepts any contract $\ddot{C}$ with $\ddot{F} > 0$, and such a contract will, therefore, never occur in equilibrium. The only contract that is renegotiation proof is the one in which the fixed fee is zero and the uniform wholesale price is $\hat{w}$. Q.E.D.

Proof of Proposition 2

First, we show that $\partial\hat{p}/\partial \quad < 0$. Note that the first-order condition (Equation 3) can be written as

$$\text{(A1)} \qquad (\hat{p} \quad c)q'(\hat{p}) + q(\hat{p}) = 0$$

by substituting it by Equation 1. Totally differentiating Equation A1 with respect to $\hat{p}$ and , we get $\partial\hat{p}/\partial \quad = -\{(\hat{p} - c)q(\hat{p})/[(1 - \quad)q(\hat{p}) + (\hat{p} - c) \quad q\trianglelefteq(\hat{p})]\}$. Given that the channel profit is concave in the retail price $(2q[p] + [p - c]q\trianglelefteq[p] < 0$, the second-order conditions for the coordinated channel problem) and $0 \leq \quad \leq 1$, the denominator is negative, and it follows that $\partial\hat{p}/\partial \quad < 0$.

To prove the next part of the proposition, note that when 0, the first-order condition in Equation A1 reduces to $q(\hat{p}) = 0$. Thus $\hat{p} \quad p^0$, where p^0 is defined by $q(p^0) = 0$. Next, when 1 the first-order condition reduces to $(\hat{p} - c)q(\hat{p}) + q(\hat{p}) = 0$, which is the first-order condition for the vertically integrated manufacturer. Thus, $\hat{p} \quad p^*$. Q.E.D.

Proof of Proposition 3

We first prove that the total channel profit in the bargaining equilibrium increases with . The channel profit function is (p) = (p – c)q(p), concave in p. The coordinated price that maximizes this profit function is denoted by p^*. Given that for ≤ 1, $\hat{p} \geq p^*$, we then have $(\hat{p})$ decreasing in $\hat{p}$. Now, using Proposition 2, we then know that the channel profit is increasing in .

Next, consider the equilibrium retailer profit. Note that the equilibrium retail profit is $_r = \quad (\hat{p})$. Then, because $(\hat{p})$ increases with , the retailer profit also increases with .

We now prove Part b of this proposition. Let us denote the equilibrium manufacturer profit as $\hat{\pi}_m = (\hat{w} - c)q[p(\hat{w})]$, which is assumed concave in $\hat{w}$ (the manufacturer second-order conditions for the double-marginalization problem) and where $p(\hat{w})$ is obtained from Equation 3. Then, there is a $\dot{w}$ that maximizes $\hat{\pi}_m$ and that is equal to the double-marginalization case wholesale price. For $\hat{w} < \dot{w}$, $\hat{\pi}_m$ is increasing in $\hat{w}$, and for $\hat{w} > \dot{w}$, $_m$ is decreasing in $\hat{w}$. Then, because $\hat{w}$ is monotone in (decreasing), we know that there is a $\dot{}$ such that for $< \dot{}$, $\hat{\pi}_m$ is decreasing in , and for $> \dot{}$, $\hat{\pi}_m$ is increasing in .

To complete the proof of the proposition, note that $\dot{}$ is obtained by $\dot{w} = \hat{w}$. The condition for $\dot{w}$ is $(\dot{w} - c)q(p^D)dp/dw(p^D,w^D) + q(p^D) = 0$. The condition for $\hat{w}$ can be obtained from Equations 1 and 3 as $(\hat{w} - c) \quad /(1 - \quad)q[p(\hat{w})] + q[p(\hat{w})] = 0$. The two conditions are the same if $dp/dw(p^D,w^D) = \quad /(1 - \quad)$. In addition, for the example, we know that $dp/dw = 1/2$, which results in the condition $= 1/3$. Q.E.D.

Proof of Proposition 4

It follows directly from the proof of Proposition 3.

Proof of Proposition 5

Consider a putative ex-ante contract $\overline{C}$ consisting of a franchise fee and a wholesale price $\overline{F}$ and $\overline{w}$, respectively. There will be no incentive to renegotiate the ex-ante contract in the interval $w_L \leq \overline{w} \leq w_H$ defined by Equations 4, 5, and 6.

The equilibrium ex-ante contract must satisfy three conditions: (1) maximize the total channel profits, (2) divide this maximized total channel profits according to the bargaining powers, and (3) be renegotiation proof. Conditions (1) and (3) will be satisfied if $\overline{w} = \max(w_L,c)$. Condition (2) implies that the equilibrium ex-ante contract must give the retailer a profit $_r(\overline{w}) = [p(\overline{w}) - c]q[p(\overline{w})]$. This means that the fixed fee will be defined by the equality $[p(\overline{w}) - c]q[p(\overline{w})] \quad = [p(\overline{w}) - \overline{w}]q[p(\overline{w})] - \overline{F}$. From this, the equilibrium fixed fee can be derived to be as shown in the proposition. Q.E.D.

The General Demand Case

We now show that the results of the article are valid for a more general demand function. Suppose that given the price p, the quantity demanded q is distributed according to the cumulative distribution G(q;p), which is common knowledge. In addition, $G_P(q,p) > 0$, and the support is $[\underline{q},\overline{q}(p)]$, where $\overline{q}(p) < 0$. This implies that the upper limit of the support interval decreases with the retail price p.

The timing of the game is similar to Figure 1 and is as follows: In the first stage, the manufacturer and the retailer bargain over an ex-ante contract, which is signed before the retailer's marketing-mix decision and before demand realization. The ex-ante contract specifies the quantity Q that is ordered and delivered before demand realization. Then in the second stage, the retailer chooses the retail price, and the actual demand is drawn from G(q;p). In the third stage, the two parties can renegotiate the terms of the ex-ante contract. Note that the actual demand that is realized can be greater or smaller than Q. Therefore, after the second stage, the retailer may face either an "underorder" or an "overorder" situation. If q > Q, then the retailer faces an underorder situation. In this case, in the third stage, the retailer has the incentive to order an additional quantity q – Q, and there can be negotiations between the parties on the terms of the additional order. If q < Q, the retailer will have excess stock, and there can be returns of Q – q units.

Given an ex-ante order quantity Q, the retail price will be chosen such that

$$\text{(A2)}\quad p(Q) = \arg\max_{p} \int_{\underline{q}}^{Q} [pq - f(Q - q)]g(q;p)dq - \tilde{w}Q + \int_{Q}^{\bar{q}(p)} [pq - \hat{w}(q - Q)]g(q;p)dq,$$

where $g(q;p) = G_q(q;p)$, α is the retailer's share of the channel pie resulting from the bargaining process, f is the salvage value of the manufacturer for unsold goods, $\tilde{w}$ is the wholesale price in the ex-ante contract for the initial order Q, and $\hat{w}$ is the negotiated price for the additional order resulting from the bargaining process. As previously argued, this negotiated wholesale price from the bargaining process is $\hat{w} = \alpha c + (1 - \alpha)p$, but this is only taken into account after computing the optimal retail price given $\hat{w}$. Now differentiating the profit function in Equation A2 with respect to p and equating to zero gives the first-order condition (assuming that second-order conditions are satisfied). Substituting $\hat{w}$ in

Figure A1
PROBABILITY OF RETURNS
(FOR A GIVEN LEVEL OF c AND f)

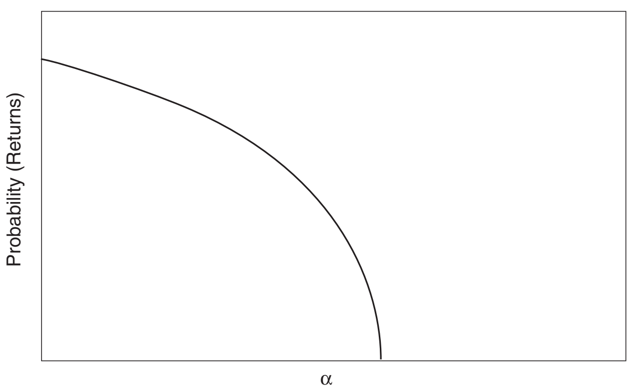


Figure A2
TOTAL CHANNEL PROFITS
(FOR A GIVEN LEVEL OF c AND f)

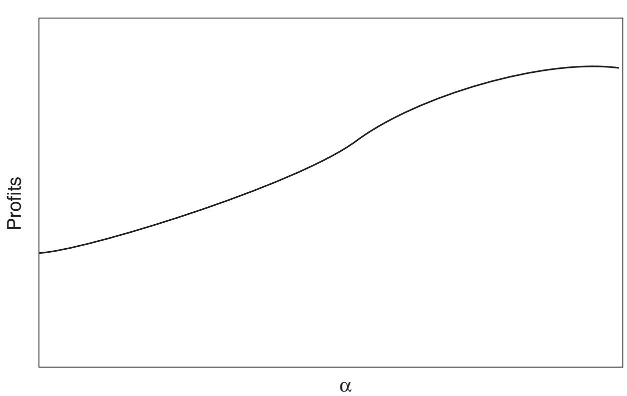


Figure A3
PROBABILITY OF RETURNS
(FOR A GIVEN LEVEL OF α AND f)

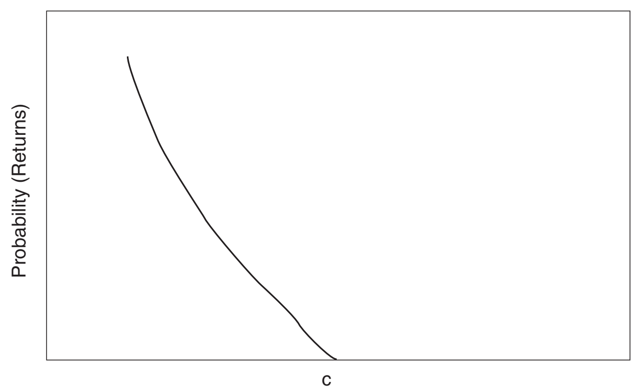
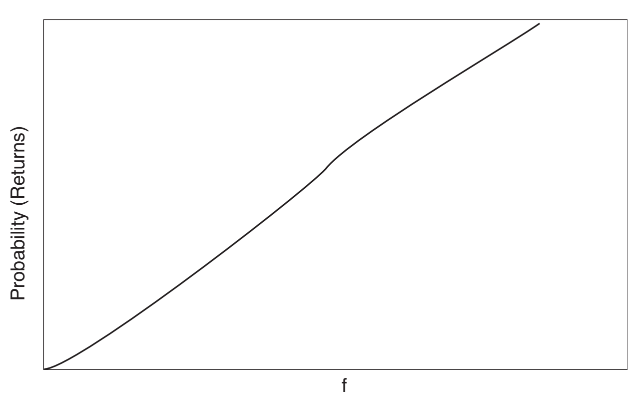


Figure A4
PROBABILITY OF RETURNS
(FOR A GIVEN LEVEL OF c AND α)



the first-order condition, we can solve for the equilibrium retail price $p^*(Q)$.

To solve for the equilibrium Q, given $p^*(Q)$, note that the choice of Q in the ex-ante contract will be the one that maximizes the total channel profits:

$$\text{(A3)}\quad Q^* = \arg\max_{Q} \int_{\underline{q}}^{Q} [p^*(Q)q + f(Q - q)]g[q; p^*(Q)]dq - cQ + \int_{Q}^{\bar{q}[p^*(Q)]} [p^*(Q)q - c(q - Q)]g[q; p^*(Q)]dq.$$

To analyze this problem further, consider the particular case $\bar{q}(p) = 1 - p$ and for a uniform distribution of demand. For this case, the first-order condition with respect to price yields $(1 - p)^2(1 + \hat{w} - 2p) + Q^2(\ f - \hat{w}) = 0$. It can also be shown that the second-order conditions are always satisfied. The equilibrium $p^*(Q)$ satisfying this first-order condition can be used to solve for the equilibrium Q^*. We present an illustration of the results in Figures A1–A4. Figure A1 shows that the probability of the retailer being left with excess stock (which implies that the bargaining process can involve product returns) is a function of retailer power (for given levels of c and f). This probability in the model will be given by $Q^*/[1 - p^*(Q^*)]$.The probability that the retailer will underorder and that there will be no-returns will therefore be $[1 - p^*(Q^*) - Q^*]/[1 - p^*(Q^*)]$. As Figure A1 shows, the probability of returns decreases with the increase in retailer power. With increasing retailer power, the no-returns outcome is more likely. This is consistent with the previous findings.

Figure A2 shows the total channel profits as a function of the for a given level of c and f. With increasing , the total profits of the channel increases. Thus, an increase in the relative power of the retailer in the channel reduces double marginalization and promotes channel coordination. Figure A3 shows that the returns outcome is less likely when excess production is more costly (i.e., when c is high), whereas Figure A4 indicates that the returns outcome is more likely when the salvage value is high.

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