REPLY TO: MANAGING CHANNEL PROFITS: COMMENT

ABEL P. JEULAND AND STEVEN M. SHUGAN
University of Chicago

We welcome Moorthy's Comment (Moorthy 1987). It provides an opportunity to clarify several issues raised in our 1983 paper. That paper was motivated by one concern—channel coordination. We believed that channel members benefit from coordination and that many institutional arrangements, such as quantity discounts, are actually coordinating mechanisms. We developed a simple model to demonstrate our belief. For historical accuracy, McGuire and Staelin (cited by Moorthy) had already independently developed a useful model of duopolistic channel competition. Being unaware of their working paper, our model not surprisingly differed from theirs. Both papers provide important but different insights into channel management.

In our 1983 paper, each channel member made one decision. These decisions determined our model's four unknowns, i.e., $G, g, p = G + g + C + c,$ and $q = D(p)$. The process repeated until reaching equilibrium where channel profits, $(p - c - C)q - f - F,$ were not maximized because the price was too high—a classic prisoner's dilemma. Thus, we introduced a function $t$ which transferred channel profits, i.e., $(p - c - C)q - f - F,$ between channel members. We sought a transfer function which maximized channel profits, retained symmetry, and divided profits so all channel members were "better off". All channel members retained control over their respective decisions after enacting the transfer function. See Figure 1.

With transfers, each channel member made decisions and received the transfer payment until equilibrium resulted. Any transfer function making each channel member's profit a monotone increasing function of channel profits would work. Avoiding complexity, the paper limited itself to linear functions. With linear functions, the manufacturer got $k_1(p - c - C)D(p) + k_2 - F$ and the retailer got $(1 - k_1)(p - c - C)D(p) - k_2 - f$. Note, when $k_1 = 0$, the manufacturer got $k_2 - F$ regardless of his decision and, when $k_1 = 1$, the retailer got $-k_2 - f$ (here $k_2 < 0$) regardless of his decision. We wanted each channel member to have the incentive to set their decisions optimally. Hence, we required $0 < k_1 < 1$. We called our transfer function a quantity discount because the function implied a declining average transfer price in quantity.

Our function, which Moorthy calls "the Jeuland-Shugan Scheme", implies a transfer of $k_2 + CD + k_1(p(D) - c - C)D$ from the retailer to the manufacturer. This payment has three parts: a fixed payment, $k_2$: a fixed per-unit payment, $CD$; and a variable per unit payment $k_1(p(D) - c - C)D$. Moorthy argues the first two parts of this transfer (i.e., a two-part tariff) are sufficient. This conflicts with our paper (p. 254) because we do not allow $k_1 = 0$, as noted earlier.

Although this argument appears technical, it is more. In our opinion, Moorthy's view represents a possible but disparate view of the channel. Unlike Moorthy, one of our "four key assumptions" is "symmetry" (Gould 1980). Granted, this assumption is controversial. "Symmetry" implies channel members are symmetric partners who make independent decisions and share the ensuing profits. In our opinion, "symmetry"
causes our coordination problem because "symmetry" recognizes that channel members influence their profits by retaining some control over their respective decisions. Although setting prices does not require expertise, making the other decisions discussed in our paper (e.g., quality and shelf space) does. In real channels, we do not believe a channel member always has the expertise to set another's decisions. For example, even if the retailer knows the optimal product quality with certainty, the retailer may not have the expertise to produce that quality. Our work must apply to larger decision spaces. Transferring control is a tempting solution but we do not believe in solutions which supposedly optimize channel profits by removing control from the channel members. If we did, we would merely impose the optimal solution on the channel members.

Our 1983 paper already discusses one problem with two-part tariffs. Independent of Moorthy, Zusman and Etgar (cited in our 1983 paper) apply two-part tariffs from agency theory. Describing their two-part tariffs, we said: "manufacturer profits are constant and total profit variations are equal to retailer profit variations. This exemplifies a clear dissymmetry in their formulation of the channel interrelationships. For example, if . . . the manufacturer only delivers a fraction of q . . . the manufacturer suffers no penalty at all".

\[ p = c + C + g + G, \]
\[ q = D(p) \]

FIGURE 1. Determination of equilibrium

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2 In our 1983 paper, we argue for each channel member's "freedom to optimize", p. 251.
3 Their \( \beta \) is Moorthy's \( k_2 \).
We now review Moorthy’s points: (1) “that a quantity discount schedule is not necessary for channel coordination”, (2) “that under the conditions of Jeuland-Shugan’s model, a two-part tariff is the best”, (3) “there is evidence that two-part tariffs are acceptable to retailers”, (4) “[Jeuland and Shugan’s quantity discount] has more problems with the Robinson-Patman Act than does the two-part tariff” and (5) “that the channel coordination explanation for quantity discounts is weaker than the price discrimination explanation.”

Our earlier discussion explains why we respectfully disagree with Moorthy’s first point. Although two parts \(k_1 = 0\) motivate the retailer to maximize channel profits, three parts \(k_1 > 0\) are necessary to symmetrically motivate all channel members. In our opinion, rather than coordinating the channel by giving each channel member the correct incentives, Moorthy’s solution avoids the coordination problem by transferring control to one channel member. With full pricing authority, the retailer maximizes total channel profits. It works in Moorthy’s formulation because the manufacturer no longer makes margin decisions, but it contradicts the intent of our 1983 paper because we sought mechanisms which implemented a spirit of cooperation and not mechanisms which transferred control. Only \(k_1 > 0\), provides incentives for the manufacturer “to supply” and the retailer “to order” the optimal quantity (see Jeuland and Shugan, p. 251). After enacting our transfer function, channel members continue to make margins decisions and transfers occur until reaching equilibrium. Alternatively, the manufacturer can set the quantity delivered until reaching equilibrium. However, each member must keep some control.

Moorthy’s second point suggests two-part tariffs are simpler than our three-part transfer function. We agree. However, we contend that simple two-part tariffs are insufficient.

Moorthy’s third point may be true but the Evelyn Wood contract, which he cites, is more than a two-part tariff. In that contract, the sponsor pays a variable royalty (§6a of the contract) and the franchise fee (§6c) is paid only once at the signing of the original agreement (automatically renewed and updated every three years). The transfer price is larger than the Franchisor’s marginal cost and §4d of the contract takes into account the Sponsor’s costs. Perhaps, our model does not explain these deviations from Moorthy’s two-part tariff.

Moorthy’s next point involves considerable legal controversy. Two-part tariffs can create price discrimination (Oi 1971). Moorthy correctly states that third degree price discrimination between more and less price elastic buyers requires quantity discounts with declining marginal costs. But other forms of price discrimination (second degree), e.g., two-part tariffs, obviously do not require this condition. Under Robinson-Patman and a two-part tariff, a reseller might claim injury from a larger competitor, who amortized its fixed payment over more units. Furthermore, our 1983 paper states:

> ... procedures such as promotional allowances, cooperative advertising, manufacturer technical service support, manufacturer supplied promotional materials, retail displays, credit terms, consumer advertising, manufacturer training of retail sales-people, full-line supplying, price rebates and other promotional techniques are different ways in which the manufacturer and retailer can participate in profit sharing, de facto. These marketing procedures are quite common and often have the advantage of being subject to a different interpretation by the courts than quantity discounts. However, the current state of the law is constantly changing and beyond the scope of this paper. (p. 257)

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4 Even when \(k_1 = 0\), we consider the two parts, \(k_2 + CD\), as a quantity discount because \(k_2 + CD\) implies declining average costs (see p. 254 of our 1983 paper).

5 Not by accident, our three-part function symmetrically depends on all channel variables, e.g., \(c, C, q, p\). Two-part tariffs do not depend on variables such as \(c\) and \(q\). And with \(k_1 = 0\), the manufacturer has no incentive to reduce \(C\) through cost efficiencies.
Moorthy's last point is really an empirical question. Pp. 257–258 of our 1983 paper provide explicit empirical tests for competing explanations. We need more tests. However, "There is no reason why quantity discounts could not exist for a variety of purposes" (Jeuland and Shugan, p. 257).

We close by stressing the need to investigate new views of existing marketing phenomena. The chance exists to create theory unique to marketing. However, mathematical results alone are insufficient. For each result, we must pursue: the underlying logic, the testable implications and what drives the result. We thank Moorthy whose discussion helped clarify what drives our results. Obviously, our paper is only a beginning. Moorthy's comment and our reply clearly show the need for more research and richer models which include: (1) uncertainty beyond behavioral indeterminacy, (2) monitoring costs, (3) other non-price decisions (e.g., advertising, delivery, service and so on), and most importantly, (4) empirical testing. Our challenge is to produce rich yet elegant models which still provide clear insights and falsifiable implications.6

Notation

\( c, C \) = the retailer’s and manufacturer’s variable cost per unit, respectively.
\( f, F \) = the retailer’s and manufacturer’s fixed cost per unit, respectively.
\( g, G \) = the retailer’s and manufacturer’s variable profit per unit (i.e., margin), respectively.
\( t \) = a transfer function.
\( p(D) \) = the product price producing demand \( D \).
\( D(p) = q \) = the quantity demanded with price \( p \).
\( k_j \) = constants in our quantity discount schedule, \( j = 1, 2 \).

*6 This paper was received in January 1986 and has been with the authors 10 months for 3 revisions.

References