

Liberal Returns Policy: Communication and Performance of the Marketing Channel

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The performance of a marketing channel depends on its information structure. It is high when both manufacturer and retailers have accurate information about demand conditions. Accordingly, in the case where only the manufacturer has such information, it has an incentive to transmit its information to the retailers. In the outright sales contracts (spot-market transactions), the manufacturer overstates demand conditions to encourage large orders by the retailers and thus earn a large profit. Hence, the retailers do not believe the transmitted information. However, in the case in which the manufacturer has to accept any unsold goods, it does not have any incentives to pass on misleading information. Therefore, the retailers believe the transmitted information. In this sense, the liberal returns policy is the basis for efficient communication in the channel.

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1. Introduction

The information, knowledge, and know-how necessary to construct an efficient marketing channel is so diversified that it is only rarely fulfilled by a single economic agent. In most cases, various participants hold separate parts of such information and expertise. The appropriate application of information can yield profits. One method of exploiting information is to sell it directly in a market. However, trading information is not always possible due to its specific characteristics. The owner of information is often the only one capable of evaluating it. Buyers of information cannot determine its value ex-ante, and often cannot correctly judge information even after it is acquired. In this situation, the seller may not divulge all the information he knows but only a portion of it, or in worse cases, he may intentionally transmit false information.

Another method to convert information into profit for holders is to utilize it

directly. Efficient methods depend on the properties of the information. In some cases, the holder benefits from participating in the distribution process. Thus, many agents participate in various capacities in a marketing channel.

The efficiency of a marketing channel depends on the coordination among the channel members¹⁾, which in turn depends on the information structure (i.e., on whether each channel member has accurate information or not). Adopting the framework of the Stackelberg game where a manufacturer is the leader and competitive retailers are the followers, we first analyze how the information structure affects the performance of the channel. The expected profit of the channel is maximized when both the manufacturer and the retailers have accurate information about demand. Accordingly, if only the manufacturer has accurate information, it has an incentive to communicate its information to the retailers. In this paper, we shall discuss how communication in the channel becomes possible in the case of asymmetric information.

In an outright sales contract (OSC), the manufacturer has an incentive to transmit misleading information so as to encourage large-quantity orders by the retailers, in this way increasing its own profit. Since the large quantity of supply reduces the retail price, as a result, the retailers may suffer losses. Accordingly, they do not rely on the information given by the manufacturer, and communication in the channel will not take place. In the case in which the manufacturer liberally accepts returns of unsold goods, if it overstates information about the demand, it will suffer a loss through increasing production costs. As a result, the manufacturer will hand on accurate information and the retailers will believe it. In this sense, the liberal returns policy (LRP) becomes the basis for communication in the channel²⁾.

In the next section we shall calculate the (expected) profits of the manufacturer and the retailers in different information structure, and show that the manufacturer gains the maximal profits when both the manufacturer and the retailers have accurate information. When the retailers do not have accurate information, the manufacturer cannot make best use of its own information. In section 3 we see that communication from the manufacturer to the retailers is not possible in the OSC, but it becomes possible under the LRP. In section 4, we discuss the role of the wholesaler and the evolution of Japan's marketing system as empirical implications.

2. Model

The monopolistic manufacturer produces goods at the constant marginal costs c ,

¹⁾ The coordination problems in marketing channels are studied by, for example, McGuire and Staelin (1983), Jeuland and Shugan (1983), Gauyschi (1983), Coughlan (1985), Bucklin and Carman (1986), Pellegrini and Reddy (1986), Moorthy (1987), and Feaizier (1992).

²⁾ The important function of the LRP is the allocation of sales risk in the channel. By returning unsold goods, the sales risk shifts from the retailers to the manufacturer. For more on the LRP, see Flath and Nariu (1989), and Nariu (1996).

and sells the products through competitive retailers. For simplicity, the market demand is assumed to be expressed by

$$D(p, \theta) = \theta - p \quad \text{or} \quad p = \theta - D,^{3)} \quad (1)$$

where p is the retail price and θ represents the demand condition that is a random variable such that $\text{Min}\{\theta\} > c$. The manufacturer as a Stackelberg leader, sets the shipping price r , and the retailers, as the followers, decide the order quantities, q . Then the retail price is determined by the market (i.e., matching of actual demand and market supply). We calculate and compare the manufacturer's profit in the following information structures:

- 1) Neither the manufacturer nor retailers has accurate information; (0, 0),
- 2) Only the manufacturer has accurate true information; (1, 0),
- 3) Only the retailers have accurate information; (0, 1),
- 4) Both have accurate information; (1, 1).

Here, the first number in the parenthesis indicates whether the manufacturer has accurate information or not [$1 = \text{has}$, $0 = \text{does not have}$]. The second number indicates whether the retailers have the information or not. In what follows, we assume that both the manufacturer and the retailers are risk neutral and that they know the information structures in which they play the game.

2.1. No information: (0, 0)

In a competitive market, the retail price is determined at the point where the total order quantity, $Q = \sum q$, is equal to the actual demand, $D(p, \theta)$. The retailers, as a whole, prefer a small total order quantity (= market supply) because the equilibrium retail price is expected to be high and they get large profits. However, in a competitive market, the risk-neutral retailer increases its order quantity, q , as long as the expected retail price, $E[p] = E\theta - Q$, is higher than the shipping price. As a result, the equilibrium total order quantity is determined by the zero expected profit condition: $E[y] = E[(p - r)Q] = E[(\theta - Q - r)Q] = 0$, and it is expressed by

$$Q(r) = E\theta - r, \quad (2)$$

which does not depend on the actual state θ , and is a decreasing function of the shipping price.

Considering the retailer's behavior described by equation (2), the manufacturer sets the shipping price so as to maximize its profit, $\pi = (r - c)Q(r)$. From the first order condition (FOC), the optimal shipping price is $r(0, 0) = (E\theta + c)/2$, and the manufacturer gets a profit of $\pi(0, 0) = (E\theta - c)^2/4^{4)}$.

³⁾ The linearity of the demand function is not essential. The discussions in this paper still hold under more general demand functions.

⁴⁾ In this case, the total order amount is always $Q = (E\theta - c)/2$, regardless of the actual demand condition θ .

2.2. Manufacturer's private information: (1, 0)

In this case, the retailers' ordering behavior is the same as before and is given by equation (2), because they do not have accurate demand information. On the other hand, since the manufacturer has accurate information, it can set the shipping price on the basis of θ . In this case, the manufacturer's profit can be expressed by

$$\pi = (r(\theta) - c)Q(r(\theta)) = (r(\theta) - c)(E\theta - r).$$

Thus, from the FOC, an optimal shipping price is set by $r(\theta; 1, 0) = (E\theta + c)/2$, which is independent of θ , and the manufacturer's profit can be calculated as $\pi(1, 0) = (E\theta - c)^2/4$. These results are the same as the case of no information. Since the retailers' order quantity is independent from θ , the manufacturer cannot utilize its own information.

2.3. Retailer's private information: (0, 1)

In the case where the retailers know the realization of θ , they increase the total order quantity as long as $p(\theta) = \theta - Q > r$. Accordingly, the zero profit condition $y(\theta) = (p - r)Q = (\theta - Q - r)Q = 0$, is held at a competitive equilibrium. Thus, the total order quantity is determined by

$$Q(r, \theta) = \theta - r, \quad (3)$$

which depends on θ .

Since the manufacturer has no information, he cannot set the shipping price on the basis of θ . If the shipping price is r , the expected order quantity is calculated as $E[Q(r, \theta)] = E\theta - r$, hence, the manufacturer's maximization problem can be shown by

$$\text{Max } E\pi = (r - c)E[Q(r, \theta)] = (r - c)(E\theta - r), \text{ w.r.t. } r.$$

Therefore, from the FOC, the optimal shipping price and the manufacturer's profit are calculated as $r = (E\theta + c)/2$ and $E\pi(0, 1) = (E\theta - c)^2/4$ ⁵⁾. These results are the same as the case of no information.

2.4. Common information: (1, 1)

Since the retailers know the realization of θ , their total order quantity is given by equation (3). Moreover, since the manufacturer also has the information, it can set the shipping price on the basis of θ . Taking the retailers' behavior into account, the manufacturer sets the shipping price, $r(\theta)$, so as to maximize its own profit:

$$\pi(\theta) = (r(\theta) - c)Q(r(\theta), \theta).$$

⁵⁾ The total order amount in the state θ is $Q(\theta) = (2\theta - E\theta - c)/2$, and the expected order quantity is $EQ = (E\theta - c)/2$, which is the same as that in information structure (0, 0).

Thus, from the FOC, an optimal shipment price is calculated by $r(\theta; 1, 1) = (\theta + c)/2$, and the manufacturer can earn the expected profit of $E\pi(1, 1) = E(\theta - c)^2/4$ ⁶⁾.

By comparing the manufacturer's profit in various information structures, the following proposition is derived.

Proposition 1:

$$E[\pi(1, 1)] > \pi(1, 0) = E[\pi(0, 1)] = \pi(0, 0).$$

Note that the manufacturer's information cannot be utilized in the case (1, 0), because the retailers do not have accurate information. If the manufacturer could transmit its information to the retailers, the manufacturer would obtain more profit in the order of $E[\pi(1, 1)]$. In the next section, we discuss this problem.

3. Liberal Returns Policy as the basis for Communication

In the OSC, the manufacturer may not necessarily reveal accurate information to the retailers, that is, it has an incentive to overstate demand conditions. By doing so, it can induce the retailers to order in large quantity and thus earn a large profit. Suppose that, in reporting the state of demand, $\underline{\theta}$, the manufacturer sets the shipping price at $r(\underline{\theta}) = (\underline{\theta} + c)/2$ ⁷⁾. If the retailers believe the manufacturer, they estimate the state as $\underline{\theta} = 2r - c$ based on the shipping price. Then, from a zero-profit condition, the retailers' total order becomes

$$Q(r(\underline{\theta})) = \underline{\theta} - r(\underline{\theta}) = (\underline{\theta} - c)/2. \quad (4)$$

In this situation, the manufacturer's profit is shown by

$$\pi = (r(\underline{\theta}) - c)Q(r(\underline{\theta})) = (r(\underline{\theta}) - c)(\underline{\theta} - r(\underline{\theta})) = (\underline{\theta} - c)^2/4.$$

From $d\pi/d\underline{\theta} > 0$, the manufacturer passes on a false figure $\underline{\theta}$ that is much larger than the true demand θ . In this case, the equilibrium retail price is

$$p(\theta, \underline{\theta}) = \theta - Q(r(\underline{\theta})) = (\theta + c)/2 - (\underline{\theta} - \theta)/2 \leq (\theta + c)/2 \leq (\underline{\theta} + c)/2 = r(\underline{\theta}).$$

Accordingly, as long as $\theta \leq \underline{\theta}$, the retail price is lower than the shipping price and the retailers' profits are negative. Therefore, the retailers cannot believe the transmitted information.

Under the LRP, unsold goods are returned from the retailers to the manufacturer. Suppose the buy-back price is equal to the shipping price. Since retailers can return

⁶⁾ In this case, the total order amount is $Q(\theta) = (\theta - c)/2$, and the profit of the manufacturer in the state θ is calculated as $\pi(\theta) = (\theta - c)^2/4$.

⁷⁾ When the retailers know the marginal (= average) production cost c , $r(\underline{\theta})$ is the only shipping price that is consistent with the revealed information $\underline{\theta}$.

any unsold goods, they need not sell the goods at a retail price lower than the shipping price. In the case where the true state is θ , suppose that the manufacturer sends the information $\underline{\theta}$ and sets the shipping price at $r(\theta) = (\theta + c)/2$. If the retailers believe the manufacturer's information, they would order more than the quantity given in equation (4). For simplicity, we assume that the retailers would order the exact quantity given in equation (4) in order to reduce the transport or storage costs⁸⁾.

In the case where the manufacturer passes on the information $\underline{\theta} \leq \theta$, then the equilibrium retail price in the true state θ is,

$$p(\theta, \underline{\theta}) = \theta - Q(r(\underline{\theta})) = \theta - (\underline{\theta} - c)/2 = (\theta + c)/2 + (\theta - \underline{\theta})/2 \geq (\underline{\theta} + c)/2 = r(\underline{\theta}).$$

Accordingly, the quantity ordered by the retailers is sold at a retail price higher than the shipping price, and the retailers would not return the goods to the manufacturer⁹⁾. Taking this into account, the manufacturer chooses the message $\underline{\theta}$ so as to maximize its profit,

$$\pi(\theta, \underline{\theta}) = (r(\underline{\theta}) - c)Q(r(\underline{\theta})) = (\underline{\theta} - c)^2/4.$$

Noting that $d\pi/d\underline{\theta} = (\underline{\theta} - c)/2 > 0$, the manufacturer selects the largest $\underline{\theta}$ in the range of $\underline{\theta} \leq \theta$, that is, it reveals the accurate figure of θ .

On the other hand, suppose that the manufacturer sends the information $\underline{\theta} \geq \theta$. In this case, the total quantity ordered by the retailers is also given by equation (4). Even if the retail price is supposed to be equal to the shipping price, the retailer cannot sell all the goods in the true state, because

$$D(\theta, \underline{\theta}) = \theta - r(\underline{\theta}) = \theta - (\underline{\theta} + c)/2 = [(\theta - c)/2] - [(\underline{\theta} - \theta)/2] \leq (\underline{\theta} - c)/2 = Q(r(\underline{\theta})).$$

Under the LRP, the retailers have the advantage of returning goods in spite of selling them at a retail price lower than the shipping price. As a result, they actually return the quantity of $Q(r(\underline{\theta})) - D(\theta, \underline{\theta})$. With this consideration in mind, the manufacturer chooses the message θ to maximize its profit,

$$\pi(\theta, \underline{\theta}) = r(\underline{\theta})D(\theta, \underline{\theta}) - cQ(r(\underline{\theta})) = [(\underline{\theta} + c)/2][\theta - (\underline{\theta} + c)/2] - c(\underline{\theta} - c)/2.$$

Noting that $d\pi/d\underline{\theta} = [(\theta - \underline{\theta})/2] - c < 0$, the manufacturer selects the smallest $\underline{\theta}$ in the range of $\underline{\theta} \geq \theta$ to reduce the loss in production costs.

From the above discussion, it is clear that the manufacturer will pass on the

⁸⁾ The competitive retailers increase their order as long as the expected retail price exceeds the shipping price, hence their total order is no less than the quantity given by equation (4). Moreover, quantities more than that given by equation (4) make no difference to the retailers because they can return unsold goods.

⁹⁾ In this case, $p(\theta, \underline{\theta}) > r(\theta)$, and the retailers gain positive profits.

accurate information $\varrho = \theta$. Thus, the retailers will believe the transmitted information, and communication between the manufacturer and the retailers becomes possible. In this sense, the LRP is the basis of communication in the distribution channel. On the basis of proposition 1, we can establish the next proposition.

Proposition 2:

In the case of information structure (1, 0), the manufacturer can transmit its own information and get more profit by adopting the LRP.

Note here that if the retailers know the true demand, the LRP is meaningless in terms of communicating information. The same is true in the case where the manufacturer does not have any information to give. Therefore, from the viewpoint of communication in the channel, the LRP is adopted only in the case of information structure (1, 0). Moreover, in our model the retailers do not return any unsold goods under the LRP because the manufacturer has accurate information on the demand and passes it on to the retailers. Receiving this information, the retailers order the exact quantity that will be sold at the competitive retail price. This fact can be modified when the manufacturer has finer (not accurate) information than the retailers¹⁰⁾, and it tells the true state of demand which is in the range of $[\theta_L, \theta_H]$. In this case, from a zero-profit condition, the competitive retailers would order

$$Q(r, \theta_H) = \theta_H - r, \quad (5)$$

under the LRP, because they can return any unsold goods.

In fact, as long as $Q < Q(r, \theta_H)$, the equilibrium retail price is higher than the shipping price when θ is large, and the retailers get a positive expected profit. Therefore, when the retailers order the quantity given by equation (5), they will always return unsold goods in the state $\theta < \theta_H$. Note that the loss involved in a LRP (i.e., the production costs of unsold goods) becomes large when the manufacturer has vague information and production costs are high. Accordingly, a LRP is introduced in the case in which the manufacturer has fine information and production costs are low¹¹⁾.

We summarize our discussion. Under information structure (1, 0), if communication between the manufacturer and the retailers is possible, the performance of the channel is improved. However, in the OSC, communication may not be possible because the manufacturer has an incentive to pass on misleading information. In the LRP the manufacturer has to accept any unsold goods returned, hence it has no incentive to overstate the demand condition, and passes on accurate information. Therefore, communication in the channel becomes possible, and in this sense, the LRP becomes the basis for communication. Moreover, the performance of the

¹⁰⁾ Here, "finer" means with smaller bias and/or variance.

¹¹⁾ See Nariu (1996) and Flath and Nariu (2000).

channel is improved and the manufacturer obtains a higher expected profit.

4. Discussion

Many marketing researchers agree that communication plays an important role in channel functioning. As mentioned in proposition 1, better communication induces efficient coordination among channel members and improves the performance of the channel¹²⁾. However, how to establish better communication — in other words, how to offer incentives for channel members to share their private information? This is the problem of “contract design”, and few studies have been done on this topic in the area of marketing. In this section, we discuss the roles of wholesalers and the evolution of Japan’s marketing systems as empirical implications.

4.1. The Roles of the Wholesaler

In Japan, there are wholesalers in the channels of a wide range of products. The main reason for the existence of wholesalers rests on the information to which they have access. They have an abundance of information about demand conditions in their area. In order to convert this information into profit, they mediate between manufacturers and retailers. The multi-step channel is the result of this mediation.

Why don’t manufacturers trade directly with retailers in order to learn more information about demand? For manufacturers, who plan and design new products, more information should be desirable. Although they could acquire more information from transactions with retailers, they incur in costs in doing so. For some goods, consumer preferences differ from person to person and region to region, but the average demand trends are stable. In such conditions, the benefits from the information gathered from a large number of small retailers are outweighed by its costs.

Next, let’s examine the retailers’ responses. Retailers can acquire much information about their customers, since they face consumers directly. Those retailers can trade directly with manufacturers, by-passing the wholesalers, as they select their assortments based on their own information. Why, don’t they do so? By the same reason described above, there should be economies of scale in gathering information about, and analyzing demand conditions. These economies of scale and the specialized knowledge needed for analysis is the basis for the wholesaler’s mediation.

Most retailers may be able to save cost by delegating such analyzing activities to specialists rather than doing it themselves. However, trading information is difficult because of the specific nature of information. To avoid such problems, wholesalers engage in distributional trades. The risk taking activity, accompanied with a buying-back offer guarantee the reliability of information as stated in the proposition 2. Thus wholesalers transfer summarized product information to retailers,

¹²⁾ See, for example, Mohr and Nevin (1990), and Stern and El-Ansary (1992).

bridging the information gap between manufacturers and retailers.

Note that wholesalers have an advantage over retailers in assortments. For practical reasons, retailers sometimes delegate assortment-selection responsibilities to wholesalers. However, wholesalers have a lot of information, but it is not necessarily perfect. So, even if they base the purchases of products on their rich information, significant risks remain. Under the OSC, these risks are borne by retailers. Since wholesalers are without risks, they might buy inappropriate amounts of products, which may lead to problems in the trading system. The LRP can be understood as an instrument to alleviate this problem. Under such a policy, the wholesalers themselves bear the risks from unsold goods, that is, inappropriate assortments are penalized. Therefore, they attempt to make appropriate assortments based on the market trend information they have gathered and analyzed. Needless to say, this mechanism improves the reliability of the assortments and the information they supply.

4.2. The Evolution of Japan's Marketing System

Now, we can explain the evolution of Japan's distribution system. In the 1950s, both manufacturers and retailers were small, and neither of them had scale economies in gathering and analyzing information. Retailers did not have enough information about what kinds of goods each manufacturer produced, and manufacturers had little information about the assortment of each retailer. Under this circumstance, where the information gap between manufacturers and retailers was large, the mediations by wholesalers were important; hence they were channel-leaders in the distribution systems of a wide range of products. At that time, wholesalers gathered information about consumption trends and determined what to make and how to sell. Then, they bought goods from manufacturers and sold them to retailers by adopting the LRP to transfer the acquired information to them.

Under this circumstance, a source of competitive advantage for manufacturer was the low-cost production. Accordingly, manufacturers adopted large-scale production systems. Then, technological know-how to manage these systems became important. In such situations, manufacturers who possessed this know-how began to play important roles in channels¹³⁾. They gathered information of demand conditions and determined design of products as channel leaders¹⁴⁾. Sometimes, they established brands of high reputation through which retailers knew about manufacturers. These brands reduced the information gap between manufacturers and retailers; hence mediations by wholesaler became less important. In these situations, manufacturers adopted the LRP to transfer their information to distributors¹⁵⁾.

¹³⁾ Some wholesalers who acquired technological know-how produced goods by themselves.

¹⁴⁾ These information were sources of a leadership in the distribution KEIRETSU.

¹⁵⁾ As for fashionable and perishable apparels, displays in shop fronts were indispensable to promote sales of such goods. Therefore, manufacturers and wholesalers would transfer to retailers correct information about market demand and draw out orders from them to secure an optimal amount of displayed goods. The LRP enabled such information transfers as well as mitigated the sales risks of retailers.

Under this circumstance, a competitive advantage of retailers was the ability to sell in large quantities. Recent growth of large scale retailers and the developments in information technology allowed some retailers access to more information than wholesalers. Actually, they have scale economies in gathering and analysing information. Under these circumstances, retailers started to plan and design new products (private brand), as channel leaders. At the same time, they consigned production to manufacturers directly, while they bought the whole goods produced and bore all sales risks. The exclusion of wholesalers and the shortening of the channel were the direct results of retailers' activities.

5. Conclusions

The performance of a marketing channel depends on its information structure. It is high when both a manufacturer and retailers have accurate information about demand conditions as mentioned in proposition 1. Accordingly, in the case where only the manufacturer has such information, it has an incentive to transmit its information to the retailers. In the outright sales contracts, the manufacturer overstates demand conditions to encourage large orders by the retailers and thus earn a large profit. Hence, the retailers do not believe the transmitted information. However, in the case where the manufacturer has to accept any unsold goods, it does not have any incentives to pass on misleading information as stated in proposition 2. Therefore, the retailers believe the transmitted information. In this sense, the liberal returns policy is the basis for communication in the channel.

The above arguments shed light on the evolution of Japan's distribution system. In the 1950's, wholesalers who planned and designed products as channel leaders, had much information about demand conditions. After adopting large scale production systems, manufacturers who possessed the know-hows to manage these systems became channel leaders. In any situation, the economic agent who possesses important know-how for planning and designing products becomes a channel leader, and he gathers the information about consumers' needs and demand conditions. Accordingly, he transmits his information to distributors by adopting liberal returns policies.

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