Vertical Restrictions and the Number of Franchises*

OWEN R. PHILLIPS
University of Wyoming
Laramie, Wyoming

I. Introduction

Products for which a trademark is important are frequently sold through franchised distributors. Often with the franchise go exclusive rights to a specified geographic market, and distributors pay a franchise fee for the right to sell in this market.¹ Franchises are common, for example, in the distribution of newspapers, motor vehicles, apparel, gasoline, and fast foods. This paper explores how an upstream monopoly decides to set a franchise fee to downstream distributors or retailers when the number of such outlets is endogenous. When the monopoly authorizes a franchise, the retailer buys an input from the monopoly that is used to produce a product at the point of sale. For simplicity of exposition there is only one product sold to the retailer and it is assumed there is a one-to-one correspondence between this product and the units sold by the distributor.

It will come as no surprise that the franchise fee is a tool by which to extract rents from distributors, but it is shown that a franchise fee is inherently tied to the “wholesale” product price set by the monopolist. The model set forth below proves that the monopolist will set the wholesale price below its marginal cost in order to maximize profits through the franchise fee. Caves and Murphy cite a survey in which at least 25 percent of the fast-food franchises surveyed thought that the franchisor’s wholesale prices were below the perceived market price [4, 572–86]. If the market price is competitively established this paper explains why the monopoly sets lower prices.

It is also the case that franchise fees and the monopolist’s incentive to set a downstream retail price, a practice commonly known as resale price maintenance (RPM), are closely related. Resale price maintenance per se restricts intrabrand competition, but with a franchise fee the upstream monopoly has the incentive to open more franchises. This may have the counter-effect of increasing intrabrand competition over nonprice product attributes e.g., service, while also increasing interbrand competition and reducing buyer transportation costs. Any rents distributors

* The author thanks a referee for helpful comments. Early drafts of this paper were made while the author was a visitor at the Department of Justice, Antitrust Division. Members of the Economic Analysis Group provided valuable remarks. This material is based upon work supported by the National Science Foundation under grant #RII-8610680. Any opinions, findings, and conclusions or recommendations expressed in this paper are those of the authors and do not necessarily reflect the views of the National Science Foundation or the Department of Justice.

1. Caves and Murphy formally define a franchise as an agreement “lasting for a definite or indefinite period of time in which the owner of a protected trademark grants to another person or firm, for some consideration, the right to operate under this trademark for the purpose of producing or distributing a product or service.” [4, 572]. The franchisee generally receives territorial protection. A franchise fee is a charge that a franchisee pays for the right to enter into business under a franchise agreement.

earn from RPM can be extracted through the franchise fee. Altogether, rents to distributors are provided through territorial restrictions, wholesale prices below marginal cost, and resale price maintenance. A franchise fee is then set to extract these rents. To maximize profits the monopoly producer literally employs the franchise fee as the fixed part of a two-part tariff.

Other reasons for the downstream control of prices and distribution are recognized, and these present persuasive explanations given particular features of the market structure. When information (service in general) is important, vertical restrictions such as franchise fees and RPM have been explained as tools by which to block the free riding of discount retailers on the service provided by specialized dealers [8, 86–105]. The argument here is that consumers will collect information from the specialized dealer, but buy the product from the discounter. Gresham's law arises in this provision of service, and the bad drives out the good. If downstream distribution is an oligopoly, these restrictions have also been modeled as a means by which to facilitate collusion and restrict entry among retailers [6; 1]. High franchise fees block entry and RPM can be used to set a collusive price. The upstream monopoly acts as a cartel manager, enforcing the RPM restrictions. Before "fair trade" laws were repealed this appeared to be viable cartel arrangement. Finally, it has been suggested that franchises and RPM act as signals of high quality to final buyers [5, 346–59]. If consumers use the reputation of the dealer and the product's price as signals of quality, the monopoly may maximize profit by preserving these signals.²

That franchising is a two-part tariff is described graphically in Blair and Kaserman [3, 367–68] and also discussed in Tirole [9, 171–76]. But when the number of franchises can vary, the relations between the franchise fee, the wholesale price, and resale price maintenance have not been formally modeled. Nor has it been shown in this context that franchise fees and below marginal cost pricing is optimal for an upstream monopolist who distributes a product through retail dealers. Also, if a producer chooses to charge a franchise fee to downstream dealers, it has not been recognized that resale price maintenance is a complementary tool by which profits to the producer can be further increased.³

II. The Vertical Relationship

The producer has two sources of income when deciding the number of downstream franchises: (1) the one time franchise payment and (2) revenue from sales to the dealer-customer. When sales are made there may be a royalty payment attached, based on the quantities purchased by the dealer. Royalties on sales could easily be an implicit part of the exchange price between the producer and dealer and so will not be considered directly in this model.

The following notation is now defined. Let:

F = the one time franchise payment set by the monopoly producer.

P = product price set by the upstream producer to the downstream dealer. This shall be referred to as the wholesale price.

2. Scherer and Tirole give a more extensive survey of the literature and discussion of past theory on vertical restrictions [7; 9].

3. Tirole's excellent survey of the theory on vertical restraints suggests that a franchise fee and RPM are substitute strategies used by the upstream seller to increase profits [9, 177]. This result comes from fixed the number of downstream franchises. In this paper franchises are endogenous to the monopoly. The monopoly choose between having a large number franchises with relatively small geographical markets and a small number of franchises with larger market areas.

- R = the final price of the product charged by dealers
 N = number of identical franchised dealers. And
 S = sales by the producer to a franchised dealer.

The focus of this model is on the optimal F , P and R when the monopolist knows there will be multiple franchises each with a distinct geographical market. For simplicity retailers are identical.

At first it shall be assumed that there is no RPM, therefore the producer has no direct control over R . Nevertheless the producer understands that R is indirectly affected by the wholesale price and the number of franchises. The monopoly producer faces a distinct demand schedule for N . And for each retailer the monopoly faces a demand schedule for sales S . Hence the producer has two demand schedules that result from the profit maximizing behavior of retailers, $N = N(F, P)$ and $S = S(F, P)$. The producer wants to set N and S in order to maximize profits.

Several sign restrictions are put on the slopes of these functions. An increase in the franchise fee has the effects: $\partial N / \partial F < 0$ and $\partial S / \partial F > 0$. The first inequality makes the demand for franchises downward sloping in its own price. For the second inequality, if an increase in F decreases N , each franchise has a larger market area and more sales. Hence F has a positive impact on S .⁴ The signs $\partial N / \partial P < 0$ and $\partial S / \partial P < 0$ are imposed, where in the first case it is argued that an increase in the wholesale price P increases the cost of operating a franchise and therefore reduces their number. In the second case the effect of P on S comes directly from the assumption that the demand schedules are downward sloping in their own price.⁵

The number of franchises (N) is determined by the monopoly. By setting P and F the monopoly is choosing between large N and small geographical markets or small N and large geographical markets. As P and F are set, the number of franchises is determined under the conditions that franchisees maximize profits through their choice of R and that they break even in the downstream market.

III. Wholesale Prices and the Franchise Fee

The monopoly is a profit maximizer with choice variables F and P . The objective is to

$$\text{Max}_{F,P} \Pi_m = F \cdot N(F, P) + P \cdot N(F, P) \cdot S(F, P) - C(N \cdot S). \quad (1)$$

Total sales for the manufacturer are $X = N \cdot S$. This allows the profit function to be rewritten as

$$\Pi_m = F \cdot N(F, P) + P \cdot X(F, P) - C(X). \quad (2)$$

The necessary first order conditions for (2) can be written in terms of the price elasticities:

$$N + N n_{NF} + (P - C_x)(X/F) \cdot n_{XP} = 0 \quad (3)$$

4. Retail demand for the monopoly's product may be written as

$$S = \bar{S}[N(F, P), P] = S(F, P).$$

Then $\partial S / \partial F = \partial \bar{S} / \partial N \cdot \partial N / \partial F$. If a reduction in N increases sales for each franchise, then $\partial \bar{S} / \partial N < 0$, and the sign on $\partial S / \partial F$ is therefore positive.

5. Battalio, Kagel, and Phillips show empirical evidence supporting these sign restrictions [2, 181–94].

$$F \cdot (N/P) \cdot n_{NP} + X + [(P - C_x)/P] \cdot n_{XP} = 0, \quad (4)$$

where $C_x = dC/dX$ and $n_{ij} = (\partial i / \partial j) \cdot (i/j)$. Equation (3) can be solved for $P - C_x$ then substituted in (4) to yield:

$$\begin{aligned} F/(PS) &= -n_{XF}/(n_{NP}n_{XF} - n_{XP} - n_{XP}n_{NF}) \\ &= (n_{NF} + n_{SF})/[n_{SF}(1 + n_{NF}) + n_{NP}(1 - n_{SF})]. \end{aligned} \quad (5)$$

The larger the response of sales to a franchise fee and the less elastic the response of outlets, the greater will be the franchise charge. This most aptly describes a product for which convenience is important. The average buyer does not travel far to make a purchase, but within a specified geographical market sales are sensitive to price. The franchise fee will be zero only when $n_{XF} = n_{NF} + n_{SF} = 0$.⁶ Hence the optimal franchise fee will be zero only when the percent reduction in dealers from raising the franchise fee is exactly offset by the percent increase in dealer sales.

The percentage mark up $(P - C_x)$ over price can be solved by dividing (4) by X and then substituting for $F/(P \cdot S)$ from (5). The result is:

$$(P - C_x)/P = -(1 + n_{NF})/[n_{SP}(1 + n_{NF}) + n_{NP}(1 - n_{SF})]. \quad (6)$$

It can be proven that (5) will in general be positive i.e., a profit maximizing producer will always charge a franchise fee, and (6) will be negative. The producer sets the wholesale price below marginal costs. The proof follows from the second order sufficient conditions:

$$\Pi_{FF} = \partial^2 \Pi / \partial F^2 = F n_{NF}(1 + n_{NF}) + S n_{XF}(P - C_x)(n_{XF} - 1) < 0. \quad (7)$$

There are three possible price configurations that the producer can use

- (i) $F < 0$; $(P - C_x)/P > 0 \Leftrightarrow n_{SP}(1 + n_{NF}) + n_{NP}(1 - n_{SF}) > 0$ and $(1 + n_{NF}) < 0$.
 - (ii) $F > 0$; $(P - C_x)/P < 0 \Leftrightarrow n_{SP}(1 + n_{NF}) + n_{NP}(1 - n_{SF}) < 0$ and $(1 + n_{NF}) < 0$.
 - (iii) $F > 0$; $(P - C_x)/P > 0 \Leftrightarrow n_{SP}(1 + n_{NF}) + n_{NP}(1 - n_{SF}) < 0$ and $(1 + n_{NF}) > 0$.
- (8)

Condition (i) implies that $\Pi_{FF} > 0$ and therefore contradicts the sufficiency condition. This always leaves $F > 0$ in (8).

The second order condition (7) can be rewritten by substituting (5) and (6) to yield:

$$\Pi_{FF} = [n_{SF}(1 + n_{NF})(1 - n_{SF})]/[n_{SP}(1 + n_{NF}) + n_{NP}(1 - n_{SF})] < 0.$$

In (8.iii) $(1 + n_{NF}) > 0$ restricts $n_{SF} < 1$. Consequently $\Pi_{FF} > 0$ in the above expression. Condition (ii) is therefore the only price configuration that satisfies the second order conditions. In

6. It is easily shown that $-n_{XF} = -(n_{NF} + n_{SF})$. For the denominator in (5), note that

$$\begin{aligned} n_{NP}n_{XF} - n_{XP} - n_{XP}n_{NF} &= n_{NP}(n_{NF} + n_{SF}) - n_{NP} - n_{NP}(n_{NP} + n_{SP}) \\ &= -n_{SP}(1 + n_{NF}) - n_{NP}(1 - n_{SF}). \end{aligned}$$

Figure 1

general a monopolist will extract maximum surplus from dealers by setting a high franchise fee while supplying the product at prices below marginal cost. The explanation for this pricing behavior is that for any demand $X(F, P)$, setting P low increases total sales for the monopolist. Hence by increasing X the monopolist can squeeze more franchises into a geographic region and extract more rents through the franchise fee.

Figure 1 shows at the margin what the monopolist loses and gains by increasing the number of franchises. For an incumbent franchise, beginning at $P = C_x$ and then setting price below marginal cost, causes the monopolist to lose profit equivalent to area D on previous sales and take losses equal to areas $A + B$ on new sales of the product, but by adjusting the franchise fee upward the monopolist can regain area $D + A$. On net the loss is area B for each incumbent franchise. In return, the monopolist can license another franchise and extract rents that give the monopolist $E + D + A$ in additional income for the new franchise. The monopolist increases N until this marginal benefit is equal to the marginal cost or $E + D + A = \sum_{i=1}^N B_i$. The increased sales by incumbent franchises $S_1 - S_0$, and consequently the areas A and B , are kept small through territorial restrictions.

IV. Resale Price Maintenance and Franchise Fees

Suppose the monopolist can set the retail price R in (2). A third first order condition then arises:

$$F n_{NR} + S(P - C_x) n_{XR} = 0, \quad (9)$$

and the solution for R is implicit. It can be shown that RPM is inherently tied to the franchise fee. Equations (5) and (6) may be combined to yield the inequality

$$F/[S(P - C_x)] = n_{XF}/-(1 + n_{NF}) < 0. \quad (10)$$

The sign is negative since price is set below marginal cost by the monopolist. Clearly first order condition (9) may also be solved for this profit ratio. The result is an equilibrium condition for the monopolist:

$$F/[S(P - C_X)] = n_{XF}/-(1 + n_{NF}) = -n_{XR}/n_{NR}. \quad (11)$$

A zero franchise fee implies no RPM, since $F = 0$ implies $n_{XR} = 0$ and this means (9) has no solution for R . For $F > 0$ and holding $S(P - C_X)$ constant, the franchise fee can be set larger, the greater the magnitude of n_{SR} and the smaller the magnitude n_{NR} . Thus responsive sales, but an inelastic response in the number of outlets, promote franchise fees when there is RPM. Once again, outlets where convenience is important to the final consumer fit this description. RPM offers the retailer greater potential profits that are then extracted by the monopolist through F .

V. Discussion

Monopoly incentives to collect franchise fees, therefore, work toward increasing the number of distributors. Rents to distributors are raised by setting wholesale prices below marginal cost and mandating a high resale price (if legal). These rents are then extracted through a lump sum payment to the franchisor. From a public policy point of view there is likely to be increased interbrand competition. However, it is difficult to predict the net effect on intrabrand competition. Certainly if there is no RPM, more outlets will lead to greater intrabrand price and quality competition. With RPM and a franchise fee there are likely to be even more outlets, but competition will be directed towards improved service and better product provision by the distributor. With RPM, service at the margin may be inefficient; buyers might prefer less service to lower prices. Franchise fees in general will have the impact of reducing the transport costs of consumers. Hence in general less price competition may be offset by other gains to consumers.

By employing a two-part tariff with prices below marginal cost the monopoly creates a net inefficiency in market surplus equivalent to area B in Figure 1. Dynamically, losses attributed to $P < C_x$ may be much greater. The low price is a strong deterrent to entry in the upstream market. It may not be possible to contractually bind a downstream franchise to buying the monopoly's product.⁷ Nevertheless whenever the competitive provision of materials e.g., hamburger buns at a fast food franchise, threatened the monopoly, entry could be effectively blocked by setting the price of these materials below their marginal cost.⁸ Indeed the monopoly, when it provides an array of downstream products to the franchise has the capability to choose a combination of product prices that most effectively blocks the entry of potential suppliers. Prices can be set

7. Frequently a contractual requirement that a franchisee buy from the franchisor, as in the case of the fast-food franchise buying ingredients from a franchisor, is interpreted as an illegal tie-in. Coercion is the necessary element in gaining a judgment against the provision [See *Ungar v. Dunkin Donuts*, 531 F.2d 1211 (3rd Cir.), cert. denied, 429 U.S. 823 (1976).] For more discussion see Areeda and Kaplow [1, 723–72]. The courts have not looked favorably on exclusive dealing and requirements contracts in a franchise that substantially lessen competition or tend to create a monopoly in any line of commerce. Since *Standard Oil Co. of California v. United States (Standard Stations)* 377 U.S. 293 (1949) the focus of antitrust concern with exclusive dealings and requirements contracts has been on their potential for exclusion of the seller's competitors. See also *Barry Wright Corp v. ITT Grinnell Corp.* 724 F.2d 227, 236 (1st Cir. 1983).

8. The monopoly must be careful about driving competitors out of the market with a wholesale price below marginal cost. Such a predatory tactic would satisfy the Areeda-Turner pricing rule, which stipulates that a necessary condition for predation is price below marginal cost. Most courts use this rule in judging the validity of a predatory claim.

lowest in those markets where the threat of entry is greatest, and then profits recouped through the franchise fee.

The strategic manipulation of F and P can also be used to circumvent contractual relationships the monopoly finds undesirable. Evidence of such behavior appears in gasoline retailing. Arco, for example [see *Craig D. Corp. v. Atlantic Richfield Co.*, 45 Wash. App. 563, 726 p. 2d66 (1986)] desired more 24 hour distributors. In order to encourage more "AM/PM" franchises, it reduced the royalty rate on sales to 11 percent in return for a relatively higher franchise fee to new distributors and those who changed over. Lower marginal costs would lead to lower gasoline prices and the higher cost distributors would have difficulty surviving in the market. Eventually Arco would get the distributors it wanted without breaking contractual agreements. In another court record [*Hamro v. Shell Oil Co.* 674 F. 2d 784 (9th Cir. 1982)] Shell was accused of forcing a retailer out of business by setting different wholesale prices for its gasoline. Hamro, a relatively low volume, low return outlet, paid a relatively high wholesale price for gasoline, while other nearby dealers with higher volumes and higher returns, allegedly paid less. In both of these cases F and P not only determined the number of franchise outlets, but also acted as tools controlling franchise behavior.

Since the 1911 *Dr. Miles* decision [*Dr. Miles Medical Co. v. John D. Park & Sons Co.*, 220 U.S. 373 (1911)], RPM has been a per se violation of Section 1 of the Sherman Act. This stand has recently been reaffirmed by the Department of Justice.⁹ Other vertical restraints that come with franchising have received a rule of reason treatment since *Sylvania* [*Continental TV v. GTE Sylvania*, 433 U.S. 36 (1977)]. For instance, the legality of territorial restrictions depends on their effect on intrabrand and interbrand competition. Because of the potential benefits from RPM when there is franchising, it is not clear that even this practice should be a per se violation of the law.

9. See *Antitrust Enforcement: An Agenda for the 1990s*, remarks of James F. Rill, Assistant Attorney General, Antitrust Division, before the 23rd Annual New England Antitrust Conference, Cambridge, MA, November 3, 1989.

References

1. Areeda, Phillip and Louis Kaplow. *Antitrust Analysis: Problems Text, Cases*. Boston: Little Brown, 1988.
2. Battalio, Raymond C., John H. Kagel, and Owen R. Phillips, "Optimal Prices and Animal Consumers in Congested Markets." *Economic Inquiry*, April 1986, 181-94.
3. Blair, Roger D. and David L. Kaserman. *Antitrust Economics*. Homewood, Ill.: Irwin, 1985.
4. Caves, Richard E. and William F. Murphy II, "Franchising: Firms, Markets, and Intangible Assets." *Southern Economic Journal*, April 1976, 572-86.
5. Marvel, Howard P. and Stephen McCafferty, "Resale Price Maintenance and Quality Certification." *Rand Journal of Economics*, Autumn 1984, 346-59.
6. Overstreet, Thomas R. *Resale Price Maintenance: Economic Theories and Empirical Evidence*. Washington: Federal Trade Commission Bureau of Economics Staff Report, November 1983.
7. Scherer, F. M. and David Ross. *Industrial Market Structure and Economic Performance*, 3rd ed. Boston: Houghton Mifflin, 1990, chapter 15.
8. Telser, Lester D., "Why Should Manufacturers Want Fair Trade?" *Journal of Law and Economics*, October 1960, 86-105.
9. Tirole, Jean. *The Theory of Industrial Organization*. Cambridge: MIT Press, 1989.