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On the Nonequivalence of Maximum Resale Price Maintenance and Vertical Integration†

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Resale price maintenance is a form of vertical restriction in which a supplier imposes the price that retailers must charge the consumers. Several papers have compared resale price maintenance (RPM) to forward vertical integration (VI). While the analysis of RPM traditionally concerns the imposition of a *minimum* price (5, 10, 11, 15), recently a few models of *maximum* resale price maintenance (2, 3, 4, 12, 14), have appeared. All of the models, however, use the restrictive assumption that the supplier is a pure monopoly. VI and maximum RPM can be compared more generally using a model in which the pure monopoly assumption is relaxed (8). Then, contrary to the pure monopoly analysis, maximum RPM is not, in general, a contractual equivalent of VI. In the more general case, when VI and RPM are profitable they have opposite effects on output and economic welfare, rather than identical effects.

Blair and Kaserman (3, 4) analyze a monopoly supplier's incentives for VI and maximum RPM for a homogeneous product. The motive for either restriction arises only when the retail industry is not perfectly competitive. Then, the monopoly supplier could increase its profit by forward VI, because VI would eliminate the restriction of output by noncompetitive retailers. The supplier could use maximum RPM to the same effect. By imposing a price ceiling that would return only a normal profit to retailers, the monopolist again would prevent the noncompetitive retailers from raising price and restricting output. In the monopoly model, either VI or maximum RPM would increase total output and economic welfare. Maximum RPM would be equivalent to VI, since both have the same price and output.

The equivalence of VI and maximum RPM also has been demonstrated when the monopolist supplies a homogeneous good to retailers who then differentiate the product and are monopolistically competitive. Perry and Groff (14) use a constant elasticity of consumer substitution model of product differentiation. Unlike the homogeneous product model, Perry and Groff find that economic welfare is reduced (equivalently) by both VI and maximum RPM. Mathewson and Winter (12) and Bittlingmayer (2) both use a spatial model of retail monopolistic competition. In their models, VI and maximum RPM are equivalent and always would increase output and welfare. Bittlingmayer also shows that maximum RPM would prevent retailers from acting collusively.

This paper analyzes only the case of a homogenous product. One reason is that the antitrust cases dealing with maximum RPM concern homogeneous goods (1, 9, 13). Apparent-

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ly, this is the empirically more important case. Second, product differentiation raises other independent issues that are more clearly analyzed separately (7).

MODEL ASSUMPTIONS

The model of inter-industrial equilibrium in this paper has the following assumptions.

1. A single firm supplies the product. Unlike previous models, the supplier is not assumed to be a pure monopoly. It would have a pure monopoly only if entry was not a threat. Instead, the supplier has a maximum sustainable wholesale price (w_s) that it could charge without new firms entering production: to define w_s sharply, assume the supplier would sell nothing during any time that it set $w > w_s$ (8). The supplier's market power is characterized objectively by the difference between the wholesale price (w) it charges retailers and its constant marginal cost of production (mcp): the less the entry threats, the larger the margin.
2. The product is not physically altered as it moves from supplier to retailer to final customer. Thus, the retail firms have a fixed proportion between the quantity purchased and the quantity sold.[1]
3. The retail product is homogeneous: consumers can freely substitute among retailers. The inverse market demand is $p = D(q)$.
4. Retailers are not perfectly competitive. Retailers' market power is characterized also by the difference between the retail price (p) and their constant marginal cost, which is the sum of the constant marginal cost of retailing (mcr) and the wholesale price (w). The size of this margin ($p - w - mcr$) is directly related to the degree of collusion among retail firms and to the threat of entry: the higher the degree of collusion or the less significant the potential entry, the larger the margin. The maximum sustainable price that retailers can charge without inducing entry (given w_s and mcr), is p_s. Retailers could not charge $p = p_s$, however, unless collusion was sufficient. If it was not, the retail margin would depend on the degree of collusion. If $p < p_s$, retail price could rise only if collusion among retailers improved. If $p = p_s$, then retail price could rise only if entry barriers rose. Also p_s is the maximum sustainable price against integrated entrants (8).
5. Economic welfare (W) is the sum of the consumer and producer surpluses. For a given output level, $W = \int_0^q (D - mcr - mcp)dq$, for which $\partial W/\partial q > 0$.

NONINTEGRATED EQUILIBRIUM

In Figure 1, D is the retail demand for the homogeneous product, and $f = D - mcr$. Thus, f is the derived demand for the wholesale good by a perfectly competitive retail industry. If the retail industry was a pure monopoly, its derived demand would be the industry marginal revenue less the marginal cost of retailing, shown as g in Figure 1.[2] If the retail industry was neither perfectly competitive nor a pure monopoly, its derived demand would be $\bar{g}$, which would lie between f and g, as shown in Figure 1. The location of $\bar{g}$ relative to f and g depends on the market power of the retail industry, which is manifested in the retail margin ($p - mcr - w$) = $f - w$. Thus, in Figure 1, suppose the wholesale price is w_0 and retailers have power to set the margin ($p_0 - mcr - w_0$). Since q_0 is sold at p_0, then q_0 is the derived demand for the wholesale good at w_0. Considering all w defines $w = \bar{g}(q)$ as the derived demand. Thus, $\bar{g}$ incorporates whatever market power the retailers have, regardless of how that market power is achieved (8).

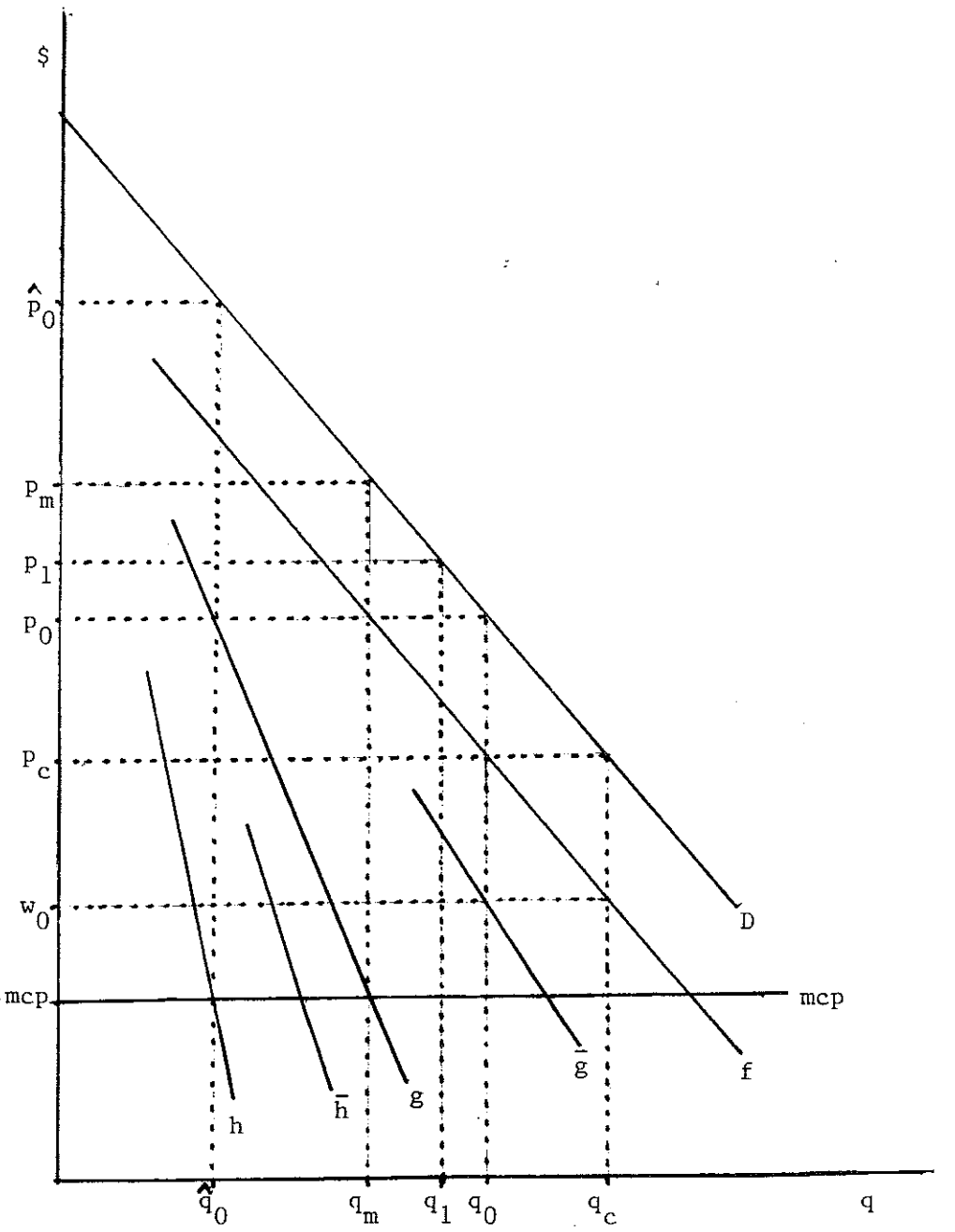

Figure 1

For a given wholesale price, the smaller is retail market power, the smaller is f − w, and the closer $\bar{g}$ lies to f, while the greater the market power, the closer $\bar{g}$ lies to g.

If both the supplier and retailer are pure monopolists, then h is the supplier's marginal revenue from the retailer's derived demand (g). The supplier would produce $\hat{q}_0$, since $h(\hat{q}_0) = mcp$, as in Figure 1. If the supplier is a pure monopolist but the retail industry is not, then $\bar{h}$ in Figure 1 is the supplier's marginal revenue from the retail derived demand ($\bar{g}$).[3] Then the supplier would produce so that $\bar{h}(q) = mcp$. If the supplier also is not a pure monopolist, then suppose that the supplier could sustain ($w_0 - mcp$) as its margin. Given the derived demand ($\bar{g}$) and the supplier's margin ($w_0 - mcp$), then $w_0 = \bar{g}(q_0)$ gives the equilibrium output of the product, as in Figure 1.

The combined market power of the successive nonintegrated industries is their combined margin: $(p - mcr - w) + (w - mcp) = (p - mcr - mcp) = f - mcp$. Similarly, their joint profit is $(f - mcp)q$. The joint profit is a maximum at q_m defined by $g(q_m) = mcp$. As in Figure 1, the retail price would be p_m.

If the supplier did not have pure monopoly power, it could not produce q_m, because at this output level ($q_m < q_0$) the wholesale price would not be sustainable ($w > w_s$). Thus, the supplier could only set its maximum sustainable wholesale price ($w_0 = w_s$), and produce q_0, on which it would earn profit, $\pi_M = (w_0 - mcp)q_0$. Retailers would resell q_0 units at p_0, which is the maximum retail price they are able to set for a given w_0. Total retail profits would be $\pi_R = (p_0 - mcr - w_0)q_0$.

VERTICAL INTEGRATION

The supplier would integrate forward into retail distribution only if to do so was profitable. For integration to be profitable, assuming that production and distribution costs remain unchanged, the market power of the newly integrated firms must exceed the joint market power of the nonintegrated supplier and retailers. When potential entry imposes w_0, then $q_0 > q_m$ implies that $g(q_0) < mcp$. Consequently, integration would increase joint profits only if the quantity of output produced under vertical integration (q_1) was less than the quantity produced by successive industries (q_0). To reduce q, the retail price must be increased above p_0. A price increase would be possible, however, only if integration increased market power. For example, if integration were to consolidate an imperfectly collusive retailing industry that had $p_0 < p_s$, then the integrated industry could set $p = p_s$. Or, if the retailers had $p_0 = p_s$, then integration would have to raise entry barriers to raise p. In either case, only a decrease in output would increase joint profit of the two industries. If the integrated firm was successful in raising the retail price to p_1 in Figure 1, for example, it would earn a profit, $\pi_I = (p_1 - mcr - mcp)q_1$.

Retailers also must find integration more profitable than independence, since VI requires that retailers (or their shareholders) voluntarily merge with the supplier. Joint industry profits would increase since $\pi_I > \pi_M + \pi_R$ when $g(q_0) < mcp$. Therefore, the supplier and retailers could share this profit increment, providing both groups with the necessary incentive for VI. Economic welfare would, however, be decreased as output is reduced.

If vertical integration neither increases collusion or raises entry barriers, however, then the maximum sustainable price would remain unchanged at $w_0 = w_s$. Assuming that production and distribution costs remain unchanged, the integrated firm would continue to produce q_0 to sell at p_0. Since profits for the integrated firm would equal the sum of the profits of the supplier and the retail industry prior to integration, there would be no incentive for vertical integration and no change in economic welfare for the consumer.

MAXIMUM RESALE PRICE MAINTENANCE

When the retail margin is greater than zero, the supplier could use maximum resale price maintenance to increase its profits without vertically integrating. If the retail industry were perfectly competitive, the derived retail demand would be f in Figure 1. Assuming that w_0 still was the maximum sustainable price for a nonintegrated supplier, then $w_0 = f(q_c)$ would determine the output level and retail price (p_c). Given w_0, supplier's profits would be maximized at q_c, because that is the maximum output that could be sold at w_0. Thus, $\pi'_M = (w - mcr)q_c$. Since $p_c = w_0 + mcr$, retail profits would be zero: $\pi'_R = 0$. If the retail industry was not prefectly competitive, however, so that $p = p_0$ and $q = q_0$ as above, then it would behoove the supplier to set p_c as the *maximum* resale price, which would increase its output to q_c and increase its profit from π_M to π'_M. Economic welfare would be increased, since $q_c > q_0$. Even though the supplier's profit would be greater, joint industry profits would decrease, since $\pi'_M + \pi'_R < \pi_M + \pi_R$, and since $g(q_c) < g(q_0) < mcp$. Thus, total profit extracted from the consumer would be less with RPM than with VI, since the increase in the supplier's profits would not offset the decrease in retail profits.

Thus, when the supplier is not a pure monopoly, so that $q_0 > q_m$, and assuming no change in production and distribution costs, then vertical integration and maximum resale price maintenance would have opposite effects on output and, therefore, on economic welfare. Where VI would be profitable only if it *reduced* output from q_0 to q_1, maximum RPM would be profitable by reducing price and *increasing* output from q_0 to q_c. While profitable VI would *reduce* welfare, profitable RPM would *increase* it.

THE PURE MONOPOLY CASE

The preceding demonstration that profitable VI and maximum RPM would have opposite effects on welfare contradicts the analysis based on the assumption that the supplier is a pure monopoly. In the monopoly model, VI and RPM are equivalent and both increase output and welfare. Blair and Kaserman (3, 4) rely on the special case of successive pure monopolies. In terms of the model here, they assume that $\bar{g} = g$ and $\bar{h} = h$. Consequently, in Figure 1, the nonintegrated unrestricted equilibrium is $\hat{q}_0 < q_m$, where $h(\hat{q}_0) = mcp$. In this case, the successive margins of the two industries ($\hat{p}_0 - mcr - mcp$) exceed the margin that a pure integrated monopolist would charge for the product. If the supplier acquired the retail monopoly, the integrated monopoly would maximize profits by setting p_m and producing q_m, since $g(q_m) = mcp$. In this special case, VI would reduce retail price from $\hat{p}_0$ to p_m, increase output from $\hat{q}_0$ to q_m, and improve economic welfare. The joint profits of the supplier and the retailer would increase from $(\hat{p}_0 - mcr - mcp)\hat{q}_0$ to $(p_m - mcr - mcp)q_m$, since $g(\hat{q}_0) > mcp$. The same result follows from any $q_0 < q_m$, because in those cases, even if neither industry was a pure monopoly before vertical integration, they would be afterwards.

With the pure monopoly model, maximum RPM would achieve identical joint profits as VI. In Figure 1, a pure monopoly supplier would set the maximum resale price at p_m, then set $w = p_m - mcr$, thereby eliminating the market power of the retail industry. Since the retailer would sell q_m at p_m, output and economic welfare would be the same as with VI.

If pure monopoly is not an empirically likely event, either prior to integration or as a consequence, then only the case of $q_0 > q_m$ has any empirical relevance as a guide to antitrust policy. In both this case and the pure monopoly case, maximum RPM that is profitable would improve economic welfare, because output would increase. However, the nonequivalence of VI

and maximum RPM in the limited market power model contradicts the equivalence found in the pure monopoly model, because profitable VI has opposite effects on output and economic welfare in the two models.

THE CHOICE BETWEEN VI AND RPM

The supplier's decision to vertically integrate or use maximum resale price maintenance would depend on the profits that could be earned with each strategy. When production and distribution costs remain unchanged, and if the transaction costs of each strategy are zero, then in many circumstances the supplier would choose maximum RPM over vertical integration.[4]

The supplier's preference for maximum RPM is shown in Figure 2. As in Figure 1, the supplier has the margin (w_0 – mcp) and sells q_0 at w_0 to retailers, whose own margin is p_0 – mcr – w_0 = $f(q_0)$ – w_0. The supplier's profit is $\pi_M = (w_0 - \text{mcp})q_0$, while the retailers have $\pi_R = (p_0 - \text{mcr} - w_0)q_0$. Assuming that $q_0 > q_m$, then VI would not be profitable, since a price increase is necessary, as shown above. By contrast, the supplier still could profit from maximum RPM. Since it could set $p_c < p_0$ as the maximum resale price without any increase in its market power, it could increase its profits to $\pi'_M = (w_0 - \text{mcp})q_c$. The increment of profit is ABCE in Figure 2.

Even for the supplier to be indifferent between VI and RPM, VI must increase barriers and market power. Define p* in Figure 2 as the price at which VI would be just as profitable as maximum RPM at p_c. (This assumes that maximum RPM would not convey any increase in the supplier's market power). The integrated supplier's profit at p* would be $\pi_I^* = (p^* - \text{mcr} - \text{mcp})q^*$. However, π_I^* cannot be compared simply to π'_M. While the supplier profits from RPM partly by diverting the retailer's profits to itself, VI also must increase the profit of the retailers in order to induce them to merge voluntarily. Thus, while RPM *may reduce* the combined profit of the two industries, VI *must increase* total profit in order to provide an increment for the retailers and still leave an increment for the supplier that is as large as the increment ABCE it would realize with maximum RPM. Therefore, p* must be high enough that $\pi_I^* - \pi_R - \delta = \pi_M$, where δ is the profit increment necessary to induce the retailers to integrate.

The supplier would prefer maximum RPM over VI, then, *except* (1) when VI increases the market power of the integrated firm beyond the joint market power of the nonintegrated industries enough that $p > p^*$, and/or (2) when transaction costs of establishing and enforcing a maximum RPM are high enough relative to the transaction costs of VI to dissipate any profit differential, and/or (3) when maximum RPM is impossible for other reasons (e.g., retailer market power is too strong). These matters now are considered in turn.

VI could increase market power in one of several ways. First, if $p_0 < p_s$, then monopolization of an imperfectly collusive retail industry could create the increased market power to raise p and make integration profitable. Second, if $p_0 = p_s$, then VI could raise p only if it raised entry barriers and increased p_s. For example, VI would require multistage entry by potential entrants, if an independent retail industry no longer existed, or if lower production costs due to transaction cost savings or the ability to circumvent non-competitive pricing in the input market made single stage entry uncompetitive (16). In either case, integrated entry would be at least as difficult as single stage entry at the stage with the highest barriers. Greater capital also would be required for multistage entry (14). These circumstances might raise entry barriers and help the integrated firm to sustain a higher retail price, $p_1 > p_0$. Such market power considerations

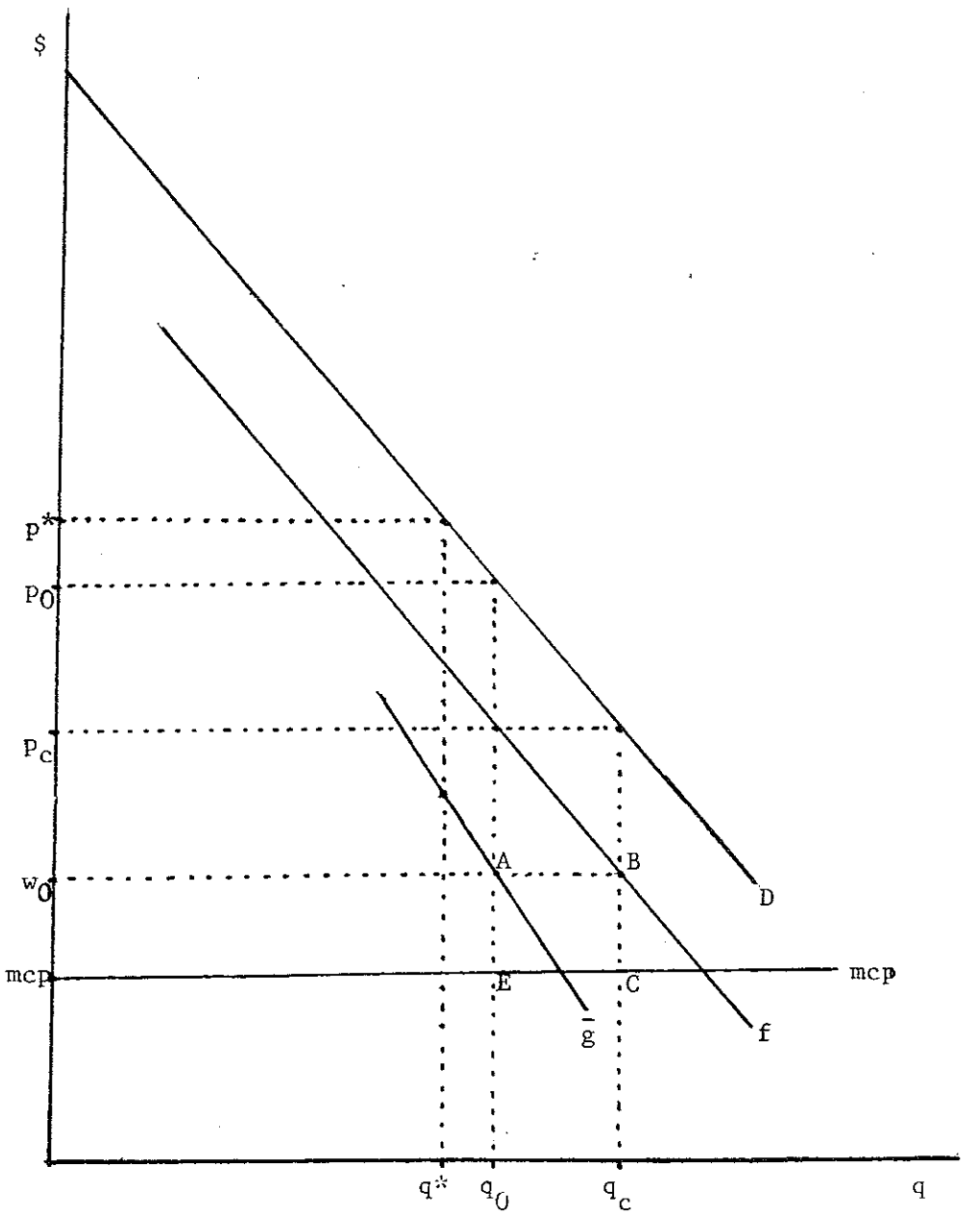

Figure 2

are not relevant in the pure monopoly model, since the supplier is assumed to be immune to the threat of entry.

The transaction costs of establishing and enforcing a maximum resale price must be compared to the transaction costs of VI. For example, VI could reduce the cost of contract across markets. VI also could exploit any economies of scale in retailing to reduce costs. Such reductions in mcr might make VI preferable to a maximum RPM contract. However, VI also could increase retailing costs due to managerial inefficiencies of a larger organization or an unfamiliar business. Moreover, adding RPM conditions to contracts would increase the transaction costs of negotiating, drawing, and enforcing contracts.

The supplier's costs of establishing and enforcing a maximum resale price may even be prohibitively high. The retailers have a strong motive to resist a maximum resale price, since it would eliminate retail profits. Resistance would be facilitated if collusion already existed among the retailers: the degree of resistance would depend on the strength of their prior collusive agreements. And the threat of RPM would be an incentive to settle any unresolved differences that heretofore had limited cooperation. If retailers were successful in resisting the supplier's price ceiling, the supplier might be forced to share its profits with retailers (by lowering w to maintain p_c, or by maintaining both w and p_0). With the pure monopoly model, since joint profits increase as output increases to q_m, the supplier could leave retail profit unchanged, but keep the entire profit increment for itself. With the limited market power model, however, joint industry profits decrease as output is increased to q_c. Then, maximum RPM would be profitable for the supplier only if it diverted some of the retailer's profits to itself. Failure to enforce the maximum resale price (p_c) for a given w_0 then would reduce the supplier's profits. If resistance is effective, then rather than try to drive retail profits to zero by setting p_c as the maximum resale price, the supplier could impose p such that $p_c < p < p_0$. The supplier could still increase its own profits, while not totally eliminating retail profits. If retailer collusion is strong enough, however, retailers may resist any erosion of their profits. If so, p may not be any easier to enforce than p_c.

POLICY IMPLICATIONS

The Supreme Court has judged maximum price fixing illegal *per se* in the *Kiefer-Stewart* (9) and *Albrecht* (10) decisions. Although the Court has also treated vertical integration harshly under its foreclosure doctrine, VI would expose a supplier to a smaller risk of antitrust litigation than would maximum RPM. Consequently, the current antitrust policy biases a firm's decision towards integration.[5]

In the pure monopoly model, vertical integration and maximum resale price maintenance are not only identical, but favorable to consumers' economic welfare, which implies that antitrust treatment of both be equivalent and be more tolerant than at present. The assumption of pure monopoly is found to be a highly restrictive case, however.

In the more general case, VI would be profitable only if it raised entry barriers or facilitated collusion. Without any accompanying cost savings, VI would *reduce* welfare, *not increase* it. Since some economists and others doubt that VI would affect market power, and since VI often may reduce costs, a *per se* rule against VI would still seem to be inappropriate. But an appropriate policy would scrutinize VI carefully for anticompetitive effects.

On the other hand, maximum RPM *would improve* welfare for consumers, at least in the homogeneous goods case. While the supplier would profit at the expense of retailers, the only motivation for maximum RPM would be to reduce collusion among retailers. In a single-

supplier market, maximum RPM has not been alleged to erect entry barriers (6). But in an industry with several collusive suppliers, maximum RPM also could be scrutinized to ensure that it is not used as a mechanism to increase market power. While a *per se* legality rule does not seem appropriate, certainly the current *per se* illegality rule is not appropriate either. The nonequivalence of maximum RPM and VI found here also suggests that maximum RPM receive *more* tolerance than VI, rather than *less*.

FOOTNOTES

1. If this proportion is variable, it raises other issues that are more clearly analyzed separately.
2. An equivalent expression to $g = MR - mcr$ is $g = f + qf'$.
3. $h = g + qg'$ and $\bar{h} = \bar{g} + q\bar{g}'$. The only restriction imposed on these functions is that they have negative slopes.
4. If the retail market were already perfectly competitive, maximum resale price maintenance would not be profitable, because retailers would have no profits for the supplier to divert to itself.
5. P. Areeda, commenting on the *Paschall* case, has noted that the Kansas City Star Co.'s decision to vertically integrate into newspaper distribution to set an area-wide uniform retail price to facilitate in-paper advertising could have been achieved with maximum resale price maintenance had it not been illegal *per se* (14, p. 700).

REFERENCES

1. *Albrecht v. Herald Co.* 390 U.S. 145 (1968).
2. Bittlingmayer, G. "A Model of Vertical Restriction and Equilibrium in Retailing." *Journal of Business* 56 (October, 1983), 477–96.
3. Blair, R.D., and D.L. Kaserman. *Antitrust Economics.* Homewood: Irwin Publications in Economics, 1985.
4. Blair, R.D., and D.L. Kaserman. *Law and Economics of Vertical Integration and Control.* New York: Academic Press, 1983.
5. Dixit, A. "Vertical Integration in a Monopolistically Competitive Industry." *International Journal of Industrial Organization* 1 (March, 1983), 63-78.
6. Easterbrook, F.H. "Maximum Price Fixing." *University of Chicago Law Review* 48 (Fall, 1981), 886-910.
7. Hamilton, J.L. "On Vertical Integration and Monopolistic Competition." Unpublished, 1987.
8. Hamilton, J.L., and S.B. Lee. "The Paradox of Vertical Integration." *Southern Economic Journal* 53 (July, 1986), 110-126.
9. *Kiefer-Stewart Co. v. Joseph E. Seagram and Sons.* 340 U.S. 211 (1951).
10. Mathewson, G.F., and R.A. Winter. "An Economic Theory of Vertical Restraints." *Rand Journal of Economics* 15 (Spring, 1984), 27-38.
11. Mathewson, G.F., and R.A. Winter. "The Incentives for Resale Price Maintenance Under Imperfect Information." *Economic Inquiry* 21 (July, 1983), 337-348.
12. Mathewson, G.F., and R.A. Winter. "Vertical Integration by Contractual Restraints in Spatial Markets." *Journal of Business* 56 (October, 1983), 477-496.
13. *Paschall v. Kansas City Star.* 727 U.S. 692 (1984).
14. Perry, M.K., and R.H. Groff. "Resale Price Maintenance and Forward Integration into a Monopolistically Competitive Industry." *Quarterly Journal of Economics* 99 (October, 1985), 1293-1311.
15. Telser, L. "Why Should Manufacturers Want Fair Trade?" *Journal of Law and Economics* 3 (October, 1960), 86-105.
16. Williamson, O.E. "Assessing Vertical Market Restrictions: Antitrust Ramifications of the Transaction Cost Approach." *University of Pennsylvania Law Review* 127 (April 1979), 953-993.