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Local monopsony and free riders

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Abstract

In an industry with upstream economies of scale in the distribution of differentiated products to retailers which have monopoly power within separate local market areas, the retailers have an *incentive* to exert monopsony power due to the divergence between average and marginal costs in the distribution of those inputs. The retailers increase their *ability* to exert monopsony power by forming coalitions (that is, chains) across local markets. Sufficiently large retail chains may force input price below the seller's average cost, thus 'free riding' on the level of product variety supported by other retailers. Vertical integration, cartels, or other cooperative behavior, however, can be means to control the level of product variety, and may increase both industry profits and economic welfare. Policy applications to the cable television, motion picture, and pharmaceutical industries are discussed.

Key words: Monopsony; Vertical integration; Cable television; Motion pictures; Pharmaceutical

JEL Classification: D42; L12; L82

1. Introduction

Accompanying recent growth of the cable television industry has been marked change in the industry's ownership structure. From 1985 to 1995, the national market shares of the four largest multiple cable television system operators (MSOs) increased from 24.9% to 54.6% (61.3% including announced transactions)

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of U.S. basic cable subscribers (FCC, 1990, Appendix G; FCC, 1995, Appendix G.) Vertical ties between MSOs and cable programming networks have also become widespread. Of 129 nationally distributed networks that the FCC identified in November, 1995, 66 had ownership ties to cable system operators, including 11 of the 15 most widely distributed basic cable networks, and 4 of the 6 largest premium networks. An interesting feature of vertical relationships in cable is that many involve 'equity sharing' arrangements in which two or more MSOs each have partial ownership of a single cable network; MSOs shared equity in 23 of the 66 integrated networks in 1995 (FCC, 1995, Appendix H).

These horizontal and vertical ownership ties have attracted policy scrutiny, especially those of the two largest MSOs, Telecommunications, Inc. (TCI) and Time-Warner, which respectively accounted for 26% and 16% of U.S. cable subscribers in November, 1995 (29% and 19% including announced transactions), and had 5% or greater ownership interests in 38 and 18 nationally distributed cable networks (FCC, 1995, Appendix G, H). As mandated by the 1992 *Cable Television Consumer Protection and Competition Act*,[1] the FCC set a limit of 30% on the proportion of U.S. homes passed by cable that can be accounted for by a single MSO and a limit of 40% on the proportion of a cable system's channels which the system can fill with programming in which it has an equity interest (FCC, 1993).[2] The Justice Department and the Federal Trade Commission have also investigated recent horizontal and vertical merger activity in the cable industry.[3]

One aim of this paper is to better explain the motives behind these and similar structural developments in other industries, and to assess their welfare consequences. I hypothesize that an incentive for formation of horizontal coalitions such as MSOs or movie theater chains may be to exert monopsony power with product suppliers upstream (that is, cable networks or movie producer/distributors). The theoretical model I develop also suggests that vertical integration, cartels, or other forms of industry-wide cooperation may be means to limit detrimental effects which the exercise of monopsony power may have on aggregate industry profits, and that such 'solutions' to monopsony power may be welfare increasing.

A second aim of the paper is to contribute to the economic theory of monopsony, and in that process, to identify misdirected public policies that have resulted from incorrect application of monopsony theory. In the standard textbook treatment, monopsony is a 'flip side'[4] version of monopoly. A firm's incentive to exercise monopsony power depends on an input supply curve which slopes upward

[1] Cable television consumer and competition protection act, Pub. L. No. 102-385, 106 Stat. 1460, 1992, codified at 47 U.S.C. 521–55.

[2] The FCC's 30% limit was struck down by a lower court, and at this writing is pending appellate review (FCC, 1994, par. 140).

[3] Andrews (1995); FCC (1995, Appendix G); FCC (1994, Appendix G); Robichaux (1995).

[4] Carlton and Perloff (1990) use this term.

because additional inputs can be attracted into the market only at increasing marginal prices. Analogous to the monopolist's incentive to restrict output because of downward sloping demand, the monopsonist restricts input purchases because it considers the higher prices it must pay for all inframarginal input units. In the model of this paper, a firm's incentive to exercise monopsony power has a different origin, and has policy implications which depart from those of the 'flip side' model.

In the present model, competing upstream suppliers manufacture differentiated products (the inputs) under constant returns to scale, but they distribute these inputs under conditions of increasing returns with respect to the number of downstream firms that buy them. The downstream firms are geographically separated local retailers with monopoly power. These retailers simply offer the differentiated products they buy from upstream to consumers; they are, that is, simultaneously both monopolists and monopsonists at the local level. The mass media are prominent among industries that appear to have these characteristics. Cable programming networks, for example, incur a 'first copy' cost in the creation of their programming, but those programs can be electronically distributed by satellite to additional local cable systems by little more than the flip of a switch; thus the economies in input distribution. Cable systems typically enjoy monopolies of cable service within local market areas; as input buyers, they provide the only practical outlet for large numbers of television productions.[5]

The basic incentive to exercise monopsony power in this model arises because upstream economies of scale in distribution lead to a divergence between marginal and average costs at the input level. A localized downstream buyer would like to exercise monopsony power to force it's input price near to the supplier's marginal cost of distribution while still enjoying the product variety created by an upstream industry selling at average cost to downstream buyers in all other local markets. The successful exercise of monopsony power by this downstream buyer necessarily reduces the equilibrium amount of product variety supplied from upstream, because suppliers exit the industry in response. This reduction in variety occurs only in proportion to the downstream monopsonist's share of the national market, however, permitting it to substantially 'free ride' on contributions to upstream suppliers' fixed costs made by other downstream firms.

An important distinction made in this paper is that between the *incentive* and the *ability* of a firm to exercise monopsony power at the local level. While the downstream coalition's incentive to exert monopsony power follows as described from the upstream cost conditions it faces, that power only materializes in this

[5] Although several competitors to cable systems exist, including Direct Broadcast Satellite (DBS) operators, Multichannel Multipoint Distribution Systems (MMDS), Satellite Master Antenna Systems (SMATV), and Home Satellite Dishes (HSD), and 'overbuild' cable systems have entered several local markets, the national market shares of the 'multichannel video programming distribution' market aggregated to under 9% as of September, 1995 (FCC, 1995, Appendix G, Table 1).

model with the bargaining leverage that comes from having a substantial national market share.

A failure to distinguish clearly between the incentive and the ability to exercise monopsony power has led to controversy in the literature and confusion among policymakers. Matthewson and Winter (1987) refer to the presumption that a retailer can exert monopsony power with its supplier simply because it has the only outlet for a given product within a local area as "intuitive, popular, and wrong" (p. 1058), but they offer no further explanation. The general notion that a local monopoly retailer with a relatively small fraction of the national market would have relatively little buying power appears to underlie the early 'countervailing power' hypothesis of Galbraith (1952), as well as Matthewson and Winter's assertion about monopsony. As the latter authors note, however, no analytic basis for the hypothesis that both local *and* national market shares are relevant to monopsony power has been offered. I provide this basis with a simple bilateral bargaining model. I further argue that failure to recognize the importance of both local and national market shares of buyers has led regulatory and antitrust authorities to misjudge the threat of monopsony power in cable television and perhaps other industries.

There is an extensive general literature on monopsony and its relationship to vertical integration, but this literature mostly focusses on the theoretical effects of monopsony on efficient vertical contracting. For surveys, see Scherer and Ross (1990, ch. 14), Perry (1989) and Blair and Harrison (1993). Blair and Harrison offer a brief graphical treatment of monopsony and economies of scale and they analyze a taxonomy of antitrust cases involving monopsony. Previous authors, however, do not treat geographically localized monopsony, or the effects of monopsony on product variety, in an explicit or substantial way. The significance of monopsony power has been recognized in previous studies of some mass media industries, notably by Conant (1960) in the case of the theatrical motion picture industry and by Besen and Johnson (1984) in the case of broadcast television. These authors, however, do not explicitly consider how chain ownership across different local markets might affect monopsony power or product variety.

I begin in Sections 2.1 and 2.2 below by setting out the parameters of a basic one period bargaining model between upstream and downstream firms. This model defines the incentives of both upstream and downstream firms to accumulate bargaining power in the input market by forming horizontal coalitions. Then in Sections 2.3 and 2.4, I develop alternative comparative statics models which define the endpoints of the input price contract curve, or bargaining set.

The focus of the analysis is on downstream coalitions. One end of the contract curve is defined by the input 'price taker' retailer model, in which the reservation input price of downstream coalitions is established as the level at which all of their local monopoly profits are extracted by upstream suppliers. The other end of the contract curve is defined by a downstream 'single price maker' model that establishes the reservation input prices of upstream suppliers. In that model, a

single retailer coalition forces input prices near to marginal costs of distribution, reducing the supply of differentiated products produced upstream. The incentives for this downstream coalition to exert monopsony power diminish as it becomes larger, however, because the coalition internalizes a larger proportion of the negative externality which its price making behavior has on the supply of differentiated products available to all markets. The balance of these opposing forces as a retailer coalition becomes larger – increasing power to exert monopsony power, but decreasing incentives to do so – determines the extent to which such power will actually be exerted by downstream firms, and thus the equilibrium level of product variety. In Section 2.5, an example illustrates the effects of the various bargaining outcomes on product variety in the 'price taker' and 'single price maker' models.

In Section 2.6, the destructive effects on product variety arising from myopic behavior by downstream retailer coalitions throughout the industry are first shown. How vertical integration or cooperative behavior could increase industry profits by moving product variety back toward the industry profit maximizing level is then discussed (Section 2.7). As a next step (Section 2.8), I make economic welfare comparisons to show whether consumers are better or worse off due to the formation of horizontal coalitions, vertical coalitions, or cooperative behavior. Finally in Section 3, I summarize and discuss implications for antitrust and regulatory enforcement in the media and also in the pharmaceuticals industry.

2. The model

2.1. Basic assumptions

There are M local markets of equal size with symmetric demand conditions, $i = 1, \ldots, M$. In each one of these markets, a single monopoly retailer markets a menu of up to N differentiated products supplied to it by upstream firms, $j = 1, \ldots, N$. For the downstream retailer in market i:

$$\Pi_i = \sum_{j=1}^{N} [q_{ij}(p_{ij} - c) - Z_{ij}] \tag{1}$$

where q is the number of buyers per product offered, p is final price for each sale, and c is a constant marginal cost of retail distribution. The term Z represents a negotiated lump sum to be paid back to suppliers from retail revenues. Thus there are no transactions costs and no marginal component to the input price contract.

There are N upstream producer/distributors, one for each product. For each of these firms:

$$\Pi_j = \sum_{i=1}^{M} Z_{ij} - K \tag{2}$$

where K is a fixed cost of producing each product, which is assumed constant across products. Marginal costs of upstream distribution are zero.

As a result of entry and exit in the upstream industry, N is determined as an equilibrium condition of the model. For simplicity, I assume that each of these products is equally attractive to consumers. That is, the N products are always symmetrically distributed in some product space. No entry is permitted in the downstream market.

Demand is defined directly, $q_{ij} = q_{ij}(p_{ij}, p_{i,-j}, N)$ where the subscript, $-j$, indicates the vector of prices of all products except j. $p_{ij} = \infty$ for all services not in the market. $\partial q_{ij}/\partial p_{ij} < 0$; $\partial q_{ij}/\partial p_{i,-j} > 0$; $\partial q_{ij}/\partial N < 0$; and $\partial^2 q_{ij}/\partial N^2 > 0$. The latter two derivatives indicate that all products are substitutes, but that demand for an individual product decreases with an increase in variety, but at a decreasing rate.

2.2. Bargaining power and horizontal coalitions

I now describe a simplified one period input price bargaining process between upstream suppliers and downstream retailers. At the beginning of the period, there is simultaneous negotiation across the nation between suppliers and retailers for all potentially available products in all local markets. There is no uncertainty about final demand and there is complete information about the reservation prices of all parties. As noted above, Eq. (1) and Eq. (2) reflect zero bargaining costs. Based on results of the bargaining, upstream firms decide whether or not to produce, and downstream firms decide which products, if any, to offer to consumers. During the period, retail transactions take place and settlements between producers and retailers are made. The entire process is then repeated in the next period.

Note that since there is no marginal input price component, double marginalization is not involved in this model. That is, settlements are made in terms of lump sum Z's without a priori uncertainty of what final demand will be. However, alternative equilibria can be more usefully compared if we consider the negotiations to actually take place in terms of another variable, r, $0 < r < 1$, the percentage share of total retail revenues which will accrue to either party after transactions are completed. That is,

$$r_{ij} = \frac{Z_{ij}}{p_{ij} q_{ij}}. \tag{3}$$

Horizontal coalitions may be formed among upstream or downstream firms for the purpose of increasing those firms' bargaining power in the input market. Local monopolists may combine across local markets into 'chain coalitions', which may be of different sizes (the largest possible would combine all local markets into one national firm). Let m_d, $d = 1, \ldots, D$, define the sizes of downstream chain coalitions, so that m_d/M measures the proportion of the national market controlled

by the dth coalition. For tractability, upstream coalitions are restricted to be of equal, that is, symmetric, sizes. Let n be the size of the representative supplier coalition, so that n/N is the proportion of all differentiated products controlled by each of the upstream coalitions.

If a supplier coalition fails to make a sale to the dth coalition, that supplier coalition can receive no revenues from m_d/M of the national market. Comparably, a downstream coalition risks the increment to its retail revenues which the products controlled by the nth coalition contribute.[6] This circumstance suggests a range over which the input price contracts, i.e., the r_{ij}s, may lie. As Eq. (2), Eq. (3), and the assumption of upstream entry and exit imply, the r_{ij}s in turn determine equilibrium N.

What determines the point along the relevant contract curve at which a deal negotiated between a given downstream and upstream coalition will be transacted? I hypothesize the following general solution:

$$r^{\mathrm{e}} = r^{\min} + g(r^{\max} - r^{\min}) \tag{4}$$

where the subscript e, indicates the equilibrium solution, the superscript 'min' indicates the reservation price of the downstream coalition in the bargain, and 'max' indicates reservation price for the upstream firm. Define $g = g(m_d/M, n/N)$, such that $0<g<1$ and $\partial g/\partial(m_d/M)<0$ and $\partial g/\partial(n/N)>0$. That is, bargaining power is determined by the relative national market shares of the upstream and downstream coalitions.

The function (4) reflects a central postulate of cooperative game theory: that relative bargaining power in a bilateral game is inversely related to how much either party has to lose if no deal is struck. As m_d rises from 0 to 1, the proportion of the upstream supplier's total revenues at risk in the bargain increases linearly, while those of the retailer coalition remain constant. Conversely, as n/N increases, the retailer coalition's proportion of revenues at risk increases at an increasing rate, depending on $\partial q_{ij}/\partial N$ *and* $\partial^2 q/\partial N^2$, while those of the upstream coalition remain constant. An implication of Eq. (4) is thus that even though a downstream retailer is by definition a monopsonist as well as a monopolist within its local market area, that retailer may exercise negligible monopsony power with sellers if it accounts for a negligible proportion of the sellers' national market.

The next step is to define $r^{\max}$ and $r^{\min}$, which are equivalent to the reservation input prices of the downstream and upstream coalitions, respectively, in any given bargaining game. As will be seen, $r^{\min}$ varies directly with m_d because the larger is

[6] Even when upstream entry is possible, as I assume to be the case, successful entrants must attract revenues from all local markets combined to cover fixed production costs plus prevailing profit margins. An individual local monopsonist thus cannot anticipate that if a bargain with one potential supplier potential fails, the incremental reduction in the number of products it offers to consumers will be made up by a new supplier during that period.

m_d, the greater is the negative effect that input price setting by the retailer coalition would have on N, and thus on the product variety which coalition m_d can offer its local consumers. I consider two extreme alternative models in order to identify the end points of these contract curves in terms of r. In the 'price taker' model immediately below, equilibrium r is at the reservation level of the downstream coalition, $r^{\max}$. In the 'single price maker' model, r is at the reservation level of the upstream coalition, $r^{\min}$.

2.3. Price taking retailer coalitions

For each downstream coalition,

$$\Pi_{m_d} = \sum_{i=1}^{m_d} \Pi_i. \tag{5}$$

For the representative upstream coalition,

$$\Pi_n = \sum_{j=1}^{n} \Pi_j. \tag{6}$$

Downstream firms maximize profit w.r.t. all p_{ij}s within m_d. To find equilibrium solutions, I apply symmetry across and within markets and set Eq. (5) = 0. That is, the downstream firms behave as monopolists in the final market, but all their revenues above costs are extracted by the upstream firms. Further let Eq. (6) = $\delta >$ 0 for upstream coalitions. That is, some level of excess profit per product may be earned by upstream coalitions before entry occurs. Maximization yields the following first order conditions:

$$rpQM = (K + \delta)N, \tag{7}$$

$$(p - c)\frac{\partial Q}{\partial P} + Q = 0, \tag{8}$$

$$(1 - r)p - c = 0, \tag{9}$$

which are three equations in p, N and r.

In order to solve this and subsequent systems, I specify the following specific aggregate demand function for each local market area:

$$Q_i = \sum_{j=1}^{N} q_{ij} = (J - \alpha p_i)N^{\beta} \tag{10}$$

where $J, \alpha > 0$, and $0 < \beta < 1$. The parameter β thus measures the elasticity of aggregate demand with respect to product variety. Consistent with the general demand function above, $\partial Q_i / \partial N > 0$, and $\partial^2 Q_i / \partial N^2 < 0$.

Using (10), the solutions are:

$$p^{pt} = \frac{J + \alpha c}{2\alpha}, \tag{11}$$

$$r^{pt} = \frac{p^{pt} - c}{p^{pt}}, \tag{12}$$

$$N^{pt} = \left[\frac{(p^{pt} - c)(J - \alpha p^{pt})}{K + \delta}\right]^{\frac{1}{1-\beta}}, \tag{13}$$

where 'pt' indicates the price taker solution.

Note from (11) that final prices are independent of product variety. Reflecting the condition of zero profits downstream, the equilibrium division of revenues, r^{pt}, is equal to the per-final-sale markup over retailer marginal costs. The equilibrium number of products, N^{pt}, is increasing in β, the elasticity of consumer demand w.r.t. product variety, and decreasing in K, production costs.

2.4. Price making retailer coalitions

To establish the other end of the contract curve, imagine that one retail chain coalition, m_1, manages to challenge the price making behavior of upstream firms, while other downstream coalitions remain as price takers. All downstream coalitions maximize w.r.t retail prices as before. As an input price maker, however, m_1 also controls theZ_{ij}s relevant to the markets in its coalition.

Two further assumptions are introduced at this point. The first is that successful bargains are actually struck for all available products in all local markets at some set of input prices. That is, $N_{m_1} = N_{-m_1} = N$, where $-m_1$ indicates all other price taking retailer coalitions. The second assumption is that the price making coalition makes symmetric bargains with supplier coalitions in all markets which it controls; that is, a given downstream coalition makes bargains with each supplier coalition on the assumption that the same bargain will be made with all other supplier coalitions.

The following Lagrangian objective function can then be written for m_1:

$$L_{m_1} = m_1[(p_{m_1} - c)Q_{m_1} - Z_{m_1}] + \lambda N[(m_1 Z_{m_1} + (M - m_1)Z_{m_1}) - (K + \delta)]. \tag{14}$$

That is, the downstream coalition maximizes profits subject to the constraint that all upstream firms or coalitions must at least earn δ per product.

Maximization of Eq. (14) w.r.t. p_{m1}, Z_{m1}, λ, and N yields $\lambda = 1$ and three other equations in five unknowns, p_{m_1}, p_{-m_1}, r_{m_1}, r_{-m_1}, and N. There is no reason for price making behavior in one market to affect the equilibrium in other price taking local markets, so Eq. (8) and Eq. (9) can be applied to the $M - m_1$ price taking markets. Using Eq. (10), these five equations solve to the following:

$$p_{m_1}^{\text{spm}} = p_{-m_1}^{\text{spm}} = p^{\text{pt}} = p^* = \frac{J - \alpha c}{2\alpha}, \tag{15}$$

$$r_{m_1}^{\text{spm}} = \beta \frac{m_1}{M}\left[\frac{p^* - c}{p^*}\right], \tag{16}$$

$$r_{-m_1}^{\text{spm}} = r^{\text{pt}} = \frac{p^* - c}{p^*}, \tag{17}$$

$$N^{\text{spm}} = \left[\frac{\left(\beta\frac{m_1}{M} + \frac{M - m_1}{M}\right)(p^* - c)(J - \alpha p^*)}{K + \delta}\right]^{1/(1-\beta)} \tag{18}$$

where 'spm' indicates the single price maker solution.

Comparing these results with those of the price taker model, note that retail prices are independent of N and are unchanged. Equilibrium retail prices are indicated by p^* in this and all models henceforth, because they do not vary in any of the cases we consider. However, $r_{m_1}^{\text{spm}}$ falls to a fraction of r^{pt} and $N^{\text{spm}} < N^{\text{pt}}$, these differences depending on the magnitudes of β and m_1/M. The price making coalition's actions have a negative externality effect on product variety. That is, the retailer coalition behaves myopically, considering only the relatively marginal impact of its setting of r on the supply of differentiated products which can be made available by upstream firms.

If m_1 is very small, then $r_{m_1}^{\text{spm}}$ goes to zero. That is, the actions of a price making retailer coalition having a very small national market share will have a negligible effect on product variety. At the other extreme, if $m_1 = M$, then $r^{\text{spm}} = \beta r^{\text{pt}}$ and $N^{\text{pm}} = \beta^{\beta/(1-\beta)} N^{\text{pt}}$. The latter solutions for r and N represents those of a price making nationwide retailer chain coalition; the externality problem of local myopic behavior thus disappears because the retailer suffers the full effects of its input pricing behavior.

The downstream coalition with a small fraction of the national market thus perceives a relatively inelastic supply of differentiated products w.r.t. r. This supply function becomes flatter, however, as the downstream coalition's national market share increases. Reflecting the assumption of constant costs, K, in upstream input production, the supply curve faced by the single national retailer coalition becomes perfectly flat. For this reason, the national retailer no longer has an incentive to exert monopsony power. Equilibrium product variety bought from upstream suppliers and offered to consumers by the national price making downstream retailer coalition is below that of the price taker model, not due to monopsony power, but because the national firm can now coordinate a monopolistic restriction of product variety at the output level. A monopolist's incentive to restrict product variety has been shown by White (1977), Mussa and Rosen (1978), and other later authors.

In terms of r, the extreme points on a set of contract curves which retailer and

supplier coalitions face in their negotiations over input price are represented by (12) and (16). Note that while this model is basically set out as a cooperative game, there are differences with the usual formulation. First, while the upper limit of the contract curve, $r=(p^*-c)/p^*$, is also the retailer coalition's threat point, the lower limit of the contract curve, $\beta m_1/M[(p-c)/p^*]$, is not the threat point of an individual supplier coalition in the usual sense. That is, if no deal is struck, the upstream coalition effectively realizes a division of profits equivalent to $r=0$ (its threat point). However, it would be irrational for the retailer coalition to force r below $\beta m_1/M[(p^*-c)/p^*]$, given the assumption that identical deals are struck with all other supplier coalitions.

A second difference is that while any bargain in r must be locally Pareto superior for the two parties to find it in their interest, any bargain in r below $(p^*-c)/p^*$ is not necessarily Pareto superior at the national market level (unless $m_1=M$). The latter result may occur due to the negative externality on product variety which affects retailers in other markets.

2.5. The bargaining outcome illustrated

The extreme points and other potential possible bargaining outcomes along the contract curve are illustrated in Fig. 1 for the case in which $(p^*-c)/p^*=0.8$ and $\beta=0.5$. Reflecting the solution of the price maker model, the reservation price of the representative upstream coalition, and thus the lower limit of r, increases with m_1/M, as indicated by the line AB. The line CD shows the reservation price of any given sized retailer coalition; this reservation price does not vary with m_1/M due to the assumption of constant returns to scale downstream. The relevant contract curve is thus a vertical line between CD and AB, intersecting AB at the appropriate value of m_1/M.

It can easily be shown that point B in Fig. 1, where the downstream coalition has 100% of the national market and extracts all revenues over costs from upstream firms, is the industry joint profit maximization point for r, and thus N. Of particular interest, it is evident from Fig. 1 that the actual bargaining outcome, r^c, could fall above or below this point. A specific logit function for g demonstrates. Let

$$g=\frac{2}{1+e^{-x}}-1, \quad \text{where} \quad x=\frac{n/N}{m_1/M}. \tag{19}$$

As x goes to 0, g goes to zero. As x becomes large, g goes to 1. The function g thus varies monotonically between 0 and 1, depending on the relative market share of the upstream and downstream firms as hypothesized in Eq. (4). The family of curved lines in Fig. 1 illustrates the resulting bargaining outcome for several alternative given values of n/N, the representative supplier coalition's national market share. In cases where market shares are relatively low upstream (for example, where $n/N<0.2$), r^c falls below B for some values of m_1/M.

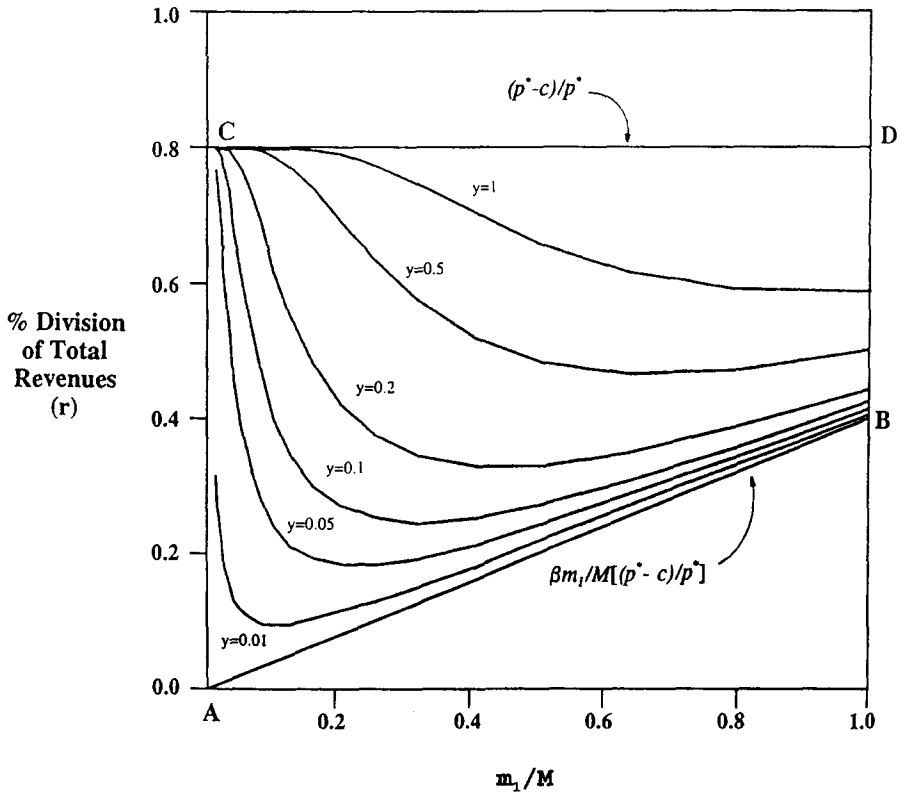

Fig. 1. Equilibrium input prices: % division of revenues vs. national market share of representative retailer coalition for various national market shares of representative supplier coalitions ($y = n/N$).

The Fig. 1 illustration is, of course, just that. The model nevertheless demonstrates that myopic behavior of downstream firms may leave product variety below the industry profit maximizing level.

2.6. Industry-wide price making behavior

If price making behavior were successfully practised by all of many local monopoly retailer coalitions, rather than just one, the cumulative effects of this myopic behavior could essentially shut down the industry. If all retailer coalitions are of size m_1 and practice price making behavior, then

$$r^{\text{apm}} = \left[\frac{m_1}{M-(M-m_1)\beta}\right]^{1/(1-\beta)} \beta\left(\frac{p^*-c}{p^*}\right), \tag{20}$$

$$N^{\text{apm}} = \left[\frac{(m_1\beta/[M-(M-m_1)\beta])(p^*-c)(J-\alpha p^*)}{K+\delta}\right]^{1/(1-\beta)} \tag{21}$$

where 'apm' indicates the 'all price maker' retailer solution. Both of these expressions go to zero as m_1 goes to 0.

2.7. Vertical integration and cooperative behavior

The ability of individual downstream retailer coalitions to myopically reduce input prices below the industry's joint profit maximizing level creates an incentive for firms to form structural or other relationships which limit the externality effects of that behavior. It was noted above that one way to resolve the myopia problem is the formation of downstream horizontal coalitions so large that they substantially internalize the coalition's incentive to impose a negative externality on other retailers.

It is also easily shown that a vertically integrated national coalition of all retailers and suppliers produces the industry profit maximizing level of product variety (at B in Fig. 1) by implicitly setting $r^c = \beta(p^* - c)/p^*$. This result would be achieved, of course, if the entire industry had a common owner, or if there were an industry-wide cartel among separately owned firms.

2.8. Welfare analysis

Since optimal retail price does not vary with product variety in the models presented, product variety is the only variable affecting economic welfare. We can therefore compare the welfare outcomes of the various comparative statics models simply in terms of optimal N. Total welfare, the sum of producer's surplus (net industry profits) and consumer's surplus is defined as

$$W = M(p - c)Q - NK + \int_{p^*}^{J/2} (J - \alpha p)N^{\beta} \mathrm{d}p. \tag{22}$$

Maximizing w.r.t. N yields

$$N^{\mathrm{w}} = \left[\frac{\beta(p^* - c)(J - \alpha p^*) + (J - \alpha p^*)^2/2\alpha}{K} \right]^{1/(1-\beta)}. \tag{23}$$

As would be expected, welfare increases in β and falls in K.

Comparison with the price taker, single price maker, industry profit maximizing, and all price maker industry equilibria for product variety derived above, yields:

$$N^{\mathrm{apm}} < N^{\mathrm{c}} < N^{\mathrm{w}}, \tag{24}$$

$$N^{\mathrm{apm}} < N^{\mathrm{c}} < N^{\mathrm{spm}} < N^{\mathrm{pt}}, \tag{25}$$

$$N^{\mathrm{w}} \lesseqgtr N^{\mathrm{spm}}; \quad N^{\mathrm{w}} \lesseqgtr N^{\mathrm{pt}},$$

where N^{c} indicates the cartel, or industry profit maximizing equilibrium obtained

by setting $m_1 = M$ in Eq. (18). Whether N^{w} is greater or less than N^{spm} or N^{pt} depends on the parameters of the demand function: J, α, and β; on the amount of excess profits earned upstream, δ; and for the case of N^{spm}, on the national market share of the single price maker retail coalition.

Based on the assumed demand function (4), these results thus show that industry-wide coordination, as represented by N^{c}, unambiguously improves welfare over the destructive 'all price maker' case, represented by N^{apm}. Both the N^{c} and N^{apm} cases, however, leave product variety unambiguously below the welfare optimum. Cartel behavior in this model is thus helpful, but not ideal, from the public viewpoint.

The ambiguous relationship of N^{w} to N^{spm} and N^{pt}, is to be expected since the total amount of producers' and consumers' surplus necessarily depends on specific parameters of the demand function. In fact, it is well-known that optimal product variety depends more generally on the form of the demand function (Spence, 1976; Dixit and Stiglitz, 1977; Tirole, 1988). The welfare results in Eq. (24) are thus not necessarily robust to alternative specifications of Eq. (4).

The welfare results using Eq. (4) are nevertheless a reasonable example of how vertical integration or collusion can improve economic welfare even in the absence of transactions cost savings. Note also that even though the successful exercise of myopic monopsony power on product diversity can reach anticompetitive levels, its exercise could improve welfare within a certain range, as could the countervailing exercise of bargaining power upstream. In the case of media industries such as cable television, one might also argue on non-economic grounds that there is a social value to high product diversity.

3. Summary and policy discussion

In an industry with upstream economies of scale in the distribution of differentiated products to retailers which have monpopoly power within separate geographic areas, the retailers have an incentive to exert monopsony power. Unlike the standard textbook model, the firm's incentive is to exploit the difference between average and marginal costs in the distribution of those inputs, in order to free ride on the level of product variety supported by other downstream firms. This incentive to exercise monopsony power does *not* imply, however, the ability to do. To gain that ability, downstream retailers form coalitions across local markets.

Successful exertion of monopsony power by downstream coalitions having less than 100% of the national market may reduce product variety below industry profit maximizing levels. Economic welfare may rise or fall, depending on the optimum product variety, but if monopsony power is exerted beyond a certain level, welfare unambiguously falls. The model suggests that vertical integration or industry-wide cooperative behavior can serve to internalize the negative externality of myopic

input pricing behavior, returning the industry toward a joint profit maximizing equilibrium. Such coalitions may increase consumer welfare by returning product variety toward the welfare optimum.

The free rider model suggests one rationale for recent structural developments in the cable television industry. Horizontal growth by the larger MSOs may be attempts to exercise monopsony power with programming suppliers. Chipty (1995) reports econometric evidence suggesting that larger MSOs receive substantial discounts from programming suppliers due to the exertion of monopsony power. Large and widely acknowledged differentials between the (relatively low) licensing fees that larger MSOs have paid for basic and premium cable programming networks and the (relatively high) fees paid by smaller 'independent' cable operators, and 'wireless' cable operators for the same networks are also consistent with the monopsony hypothesis (National Telecommunications and Information Administration, 1988; Waterman and Weiss, 1996).

The extensive vertical integration into programming by the largest MSOs, and more generally, the common practice of 'equity sharing' in networks by MSOs, may be attempts to internalize the negative externality which opportunistic input price setting by larger MSOs creates in the absence of integration. Of course, control of 25–30% of the national market by the leading firm (TCI) may not seem excessive. In the presence of upstream economies of scale in cable networking, however, the bargaining model suggests that substantial monopsony power over programming suppliers could be exerted by such a firm.

In defending its choice of 30% of U.S. cable homes passed for the size limit on MSOs, the FCC has argued that although local cable systems typically have nearly 100% local market shares, the national market concentration of MSOs, based on their shares of all U.S. cable subscribers and as measured by the HHI, was at or below the Justice Department's minimum '1000' standard ordinarily warranting investigation in horizontal merger cases (FCC, 1994, 1995; see also FCC, 1990). The FCC is simply wrong to interpret an HHI measure in this way. As the *1992 Horizontal Merger Guidelines* (United States Department of Justice and Federal Trade Commission, 1992) make clear, the HHI standards are concerned with the accretion of market power through unilateral or coordinated behavior that would result from a merger within a particular market within which other firms compete for the *same* customers (or inputs). Obviously, however, there is no national market for cable subscriberships. A similar critique applies to rules of thumb about the relationship between market power and the national market share of a single firm (e.g., that a firm having less than 35 or 40% of the market is unlikely to have excessive market power). Such rules of thumb were relied upon by many commenters in the FCC proceedings to argue for an MSO size limit of 40% or more. The appropriate criteria for assessing monopsony power in such cases is the relative bargaining power of the MSO and the various program suppliers, which in turn depends on the extent of upstream economies of scale and alternative means of distribution which the program suppliers may have.

Among other media industries to which the free rider model may apply, I focus on theatrical motion pictures. The model suggests motives behind the extensive horizontal and vertical integration and apparent cartel behavior in this industry prior to *U.S. v. Paramount Pictures, Inc.* et al. (1948).[7] In *Paramount,* the U.S. government achieved a major antitrust victory over eight motion picture distributors, five of which were integrated with movie theater chains. These integrated theater chains accounted for 70% of all 'first run' box office receipts at the time, and were heavily concentrated within local market areas; in 34 of the 85 largest U.S. cities, one chain controlled 75% or more of first run capacity; one chain controlled over 50% of capacity in 63 of the markets, and in these and other cities, 'pooling agreements' among theater owners limited competition (Loew's Exhibit L-13).

The government's case, which was basically accepted by the Supreme Court, was that the integrated distributors operated as a cartel in order to exchange access to each other's controlled theater markets, to the exclusion of independently owned distributors and theaters. The Court decision mandated complete vertical disintegration and extensive horizontal divestiture by the theater chains. The free rider model suggests that theater chain formation may have been driven by the incentive to exert monopsony power. The vertical integration (which mostly followed the theater chain formation in time) and eventual formation of the *Paramount* cartel may have been to limit opportunistic price setting behavior by the theater coalitions.[8] While other factors are clearly relevant, the model's welfare results suggest that the vertical integration and apparent cartel behavior among integrated motion picture firms may have served a pro-competitive function.

With minor tinkering, the free rider model can be applied to developing market structure and recent antitrust controversy in the pharmaceuticals industry. Patent drug manufacturers must recapture large R&D expenditures by selling their products to retail pharmacies, hospitals, and Health Maintenance Organizations (HMOs) at prices well above their marginal costs of production and distribution, at least on average (Caves et al., 1991). In this respect, cost structure of pharmaceuticals manufacturing and distribution is analogous to that of media product creation and distribution.

The free rider model suggests that recent growth of hospital chains, HMOs, and retail pharmacy chains may be motivated or encouraged by the benefits of 'free riding' in the wholesale purchase of patent drugs. Although the basis for monopsony bargaining power by these downstream drug buyers is more complicated than the simple accumulation of geographic local market territories, the underlying principles are analogous.[9]

[7] United States v. Paramount Pictures, et al., 1948, U.S. 334 US 1.

[8] Hampton (1970) and Lewis (1933) offer early histories of market structure formation in the motion picture industry.

[9] See, for example, the Frech (1978) analysis of monopsony power in health insurance markets.

In a recent and highly publicized class action suit, independently owned pharmacies successfully sued 22 drug manufacturers for discriminatory pricing (and price fixing) because of large discounts given by the manufacturers to HMOs, hospital chains, and mail order pharmacies (France, 1996). A Federal Trade Commission investigation into these alleged discriminatory pricing practices has followed. The alleged price differentials are analogous to the differentials between input prices paid by larger v. smaller programming buyers in the cable television case. To the extent that the free rider model applies, it suggests that powerful drug buyers may exert negative effects on the variety and quality of pharmaceutical products by reducing aggregate R&D expenditures. Such reductions may cause consumer welfare to fall. The ambiguity of the present model's welfare results, however, reminds us of the difficultly in making confident efficiency judgements where questions of product variety are concerned.

In conclusion, consider explicitly the distinction made in this paper between the *incentive* and the *ability* to exercise monopsony power at the local level. A recent landmark antitrust case also in the movie industry, *U.S. v. Syufy Enterprises and Raymond Syufy* (1990),[10] shows how a failure to recognize the significance of national market shares in determining that ability may lead to an *overestimate* of monopsony power.

In 1981, Syufy entered the first run Las Vegas movie theater market by building a new theater complex. Syufy then proceeded to buy out each of his three main competitors to obtain by 1984 a virtual monopoly of the first run theater market in Las Vegas. In 1985, the Justice Dept sued Syufy under the Sherman Act.

The government's case was not based on monopolization of the consumer market. In fact, the government admitted that Las Vegas ticket and concession prices were no higher than in comparable cities having competitive theaters. Rather, the government based its case on Syufy's alleged monopsonization against his Hollywood suppliers within the city of Las Vegas. (Six or seven firms controlled the national film distribution market). The government lost in the District Court, and that decision was then upheld in a notorious Appeals Court decision in which Judge Kozinski humiliated the government by incorporating the titles of over 200 classic movies into the written opinion.

The key premise of the Appeals Court decision was that although Syufy may have acquired a virtual monopoly of first run theater seats in Las Vegas, entry into theater operation was not difficult. Entry did in fact occur during the trial and appeal period, reportedly reducing Syufy's market share from 93% in 1984 to 75% in 1988. The decision also reported at some length that the Hollywood distributors consistently testified at trial that Syufy did not receive input terms any more favorable than those paid by competing theater operators in other cities, and that the distributors were satisfied with Syufy's terms.

The free rider model suggests a different interpretation of why the government's

[10] United States v. Syufy Enterprises and Raymond Syufy, 9th Circuit, 1990, 903 F.2d 659.

case in *Syufy* was weak. As the Appeals Court decision at one point referred to Syufy, he was 'a relatively tiny regional entrepreneur' (pp. 63, 576), having in 1986 a 1.3% national market share of theater screens and apparently no significant holdings in major markets other than Las Vegas (compared to a 9.1% national market share for United Artists, the largest theater chain in the U.S.) (Motion Picture Association of America, 1990; Variety, January 14, 1987). The suggestion of the free rider model is that control of the Las Vegas market was in itself simply not a formidable threat to hang over the heads of theatrical distributors, who received about 99% of their revenues from other sources. As one of the distributors, James Spitz, testified at the trial, "...if he [Syufy] would have pressed, if he would have come to Jimmie Spitz and said, 'I'm not going to pay you this percentage for the film'", I would have said, "Fine, Ray, we'll just stay out of the [Las Vegas] marketplace". (pp. 63, 582).

In short, both local *and* national market shares are relevant to the exercise of monopsony power. Antitrust and regulatory policies must recognize this distinction explicitly.

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