Countervailing Power and Chain Stores

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Abstract

The countervailing power of large buyers subdues the market power of sellers, but price concessions won by large buyers in upstream markets may or may not translate into lower prices downstream. This paper presents a model in which upstream price concessions leads to lower downstream prices. In this model, the countervailing power of a large retail chain store enables the firm to play one large supplier off against another to win lower prices. An indirect effect of these interactions is that small retailers also pay lower prices, although not as low as the chain. To the extent that the chain's countervailing power stems from its multi-market operations, and local retail markets remain competitive, the chain's countervailing power translates into lower retail prices.

Keywords

countervailing power, buyer power, chain store

[1] The author thanks Emanuela Ciapanna, Maxim Engers and Nathan Larson for insightful comments.

I. Introduction

The notion that the "countervailing power" of large buyers subdues the market power of sellers has a long history, beginning with Galbraith (1954, 1956).[2] Galbraith's further claim that price concessions won by large buyers in upstream markets translate into lower retail prices was and remains controversial.[3] In answering his critics, Galbraith acknowledged that the second claim probably requires competition in retail markets (1954, p. 4). Subsequent research on countervailing power has ratified this concession.

For instance, Dobson and Waterson (1997) and von Ungern-Sternberg (1996) revisited Galbraith's claim by examining the downstream price effects of increased retail concentration when retailers buy from a monopolist. More in line with Galbraith's analysis, Chen (2003) examined the downstream price effects of a dominant retailer who buys from a monopolist. Each of these papers found specialized structural conditions where upstream price concessions reduce retail prices. All of these conditions involve vigorous retail competition.

These papers limit their examination of the downstream price effects of countervailing power to situations in which there is an upstream monopolist. Situations with an upstream monopolist do not exhaust the relevant possibilities, and they may not even address the interactions between buyers and sellers that were foremost in Galbraith's mind. Although Galbraith was never explicit about the structural conditions that cause "the gains . . . won by the mass buyer to be passed along to the consumer" (1954, p. 3), he did not have an upstream

[2] A note on terminology: *countervailing power* is market power on the demand side of a market in which sellers also have market power. This term is distinguished from *monopsony power*, which generally refers to market power on the demand side of a market in which the supply side is structurally competitive. *Buyer power* is a related term. Inderst and Shaffer (2008, p. 1612) define buyer power as "the ability of buyers to obtain advantageous terms of trade from their suppliers." In principle, the suppliers of the buyer in question may or may not have market power themselves. Whether or not they do has significant implications for market outcomes (Chen (2007) and Mills (2010)).

[3] See Stigler (1954). Snyder (2008) summarizes the legacy of Galbraith's claim in the economics literature.

monopolist only or mainly in mind. For instance, he wrote a great deal about supplier oligopolies and "the opportunity of a strong buyer to play one seller off against the other" (1956, p. 123). "Playing off" takes on so much significance in Galbraith's argument that he identifies supplier oligopolies, rather than monopolies, as the place where countervailing power is most effective: "Mistrust and uncertainty can be developed in the mind of one entrepreneur as to the intentions and good faith of others. These, in turn, can be translated into bargaining concessions. Such opportunities abruptly disappear when the number is reduced to one" (p. 145).

This paper revisits the downstream price effects of a dominant retailer in a simple model with a supplier duopoly in which the retailer's playing one seller off against the other is a central feature. The goal is to recreate a theoretical framework that is closer to Galbraith's narrative than those laid out in previous papers, and to assess the plausibility of Galbraith's second claim – that countervailing power upstream translates into lower prices downstream – within that framework. Also in keeping with the goal of reconstructing a theoretical framework that is faithful to Galbraith's ruminations about countervailing power, the retailer's dominance as a buyer in this model is explicitly due to the firm's organization as a multi-market "chain store." This feature of the model reflects the prominence Galbraith gave to then-large chains such as Sears and A&P (1956, p. 119).

II. A Multi-market Model

Consider two manufacturers $1,2$ who produce a homogeneous good at a constant marginal cost $c > 0$. The firms' fixed costs are sunk. The good is sold to retailers, dealers or

distributors in *m* identical, geographically separated markets.[4] The wholesale price in a representative market is *w*. Retailers in that market incur no costs beyond the cost of goods sold *w* and resell the good to consumers for a retail price *p*. Retail market structure is atomistic and entry is free, so retailers compete *p* down to *w*. Consumers' (inverse) demand for the good in the representative market is $p = R(y)$ with $R'(y) < 0$ and $R''(y) \leq 0$ for any $y \geq 0$ and $R(0) > c$.

Suppose that retailers within and across markets are independent, and suppose that manufacturers choose outputs y_1, y_2 in the representative market simultaneously. Manufacturer *1's* profits in that market are:

$$\pi^1(y_1, y_2) = (R(y_1 + y_2) - c) \cdot y_1 \tag{1}$$

and similarly for manufacturer *2*. When solved simultaneously, the firm's first-order conditions yield $y_1 = y_2 = y_c$. The equilibrium wholesale and retail prices are:

$$w_c = p_c = R(2y_c). \tag{2}$$

III. The Chain Store

Next, suppose there is a chain store that operates an outlet in each of the *m* geographic markets. Everything else remains the same. Because entry is free, and because there are no retail scale economies, independent retailers remain in each retail market and those markets remain competitive. From the manufacturers' perspective, the chain is distinguished from other retailers by its size. Even if the chain's outlet in each market is the same size as other retailers, the chain is *m* times larger than other retailers. This size asymmetry is even greater if, as this model suggests, the chain's outlets are larger than other downstream firms.

[4] Although the model depicts a vertical structure with downstream retailers, dealers or distributors, it applies to other kinds of intermediate goods markets.

If the chain is large enough in relation to the other retailers (e.g., if *m* is large), the chain is unlikely to exhibit the passive, price-taking behavior of atomistic buyers in a competitive market. This is because the chain's size confers some countervailing power that is lacking where all buyers are atomistic. The chain wields its countervailing power against the suppliers to win advantageous terms of sale that are not available to small buyers.

A widely recognized source of countervailing power is the ability of a large buyer to self-supply by vertically integrating upstream or by sponsoring a captive, upstream entrant. This idea was developed rigorously by Katz, but Galbraith anticipated this line of reasoning when he observed that dominant buyers "have a variety of weapons at their disposal to use against the market power of their suppliers. Their ultimate sanction is to develop their own source of supply as the . . . [large] chains . . . have extensively done. They can also concentrate their entire patronage on a single supplier and, in turn for a lower price, give him security in his volume . . ." (p. 120). A small buyer lacks the ability to self supply because entry on the appropriate scale is prohibitively expensive due to economies of scale.

In the present instance, suppose a retailer can vertically integrate upstream and supply its own requirements of the good for a marginal cost *c*. To do this, the firm must incur set-up costs *F>0*. Assume that set-up costs are so large that:

$$F > \max_{y}\{[\,R(y) - c\,] \cdot y\,\}. \tag{3}$$

This assumption means that the option to self-supply cannot be profitable for any retailer whose operations are confined to a single downstream market. Even a retailer who *monopolizes* a single downstream market cannot profitably vertically integrate upstream. However, the chain can overcome the barrier to upstream entry and supply its own requirements of the good if it is active in sufficiently many downstream markets.

IV. The Option to Self Supply

If the chain vertically integrates to supply its own requirements of the good, the marginal cost of each unit the firm sells is no longer the wholesale price of the good in the upstream market, but the marginal cost of manufacture *c*. Also, because the chain self supplies, it can formulate long-run production and distribution plans that precede the short-run output decisions incumbent manufacturers make in each market period. This is a strategic advantage that enables the chain to preempt oligopolistic interactions in the upstream market. By vertically integrating upstream, the chain acquires, in effect, a first-mover advantage. This state of affairs is depicted in the following two-stage game, representing interactions in the representative downstream market:

> *Stage I:* The chain vertically integrates upstream and produces *x* units of the good to be sold in the representative downstream market.
>
> *Stage II:* The incumbent manufacturers play Cournot with the representative market's residual demand function $R(y+x)$.

The incumbent manufacturers' first-order conditions for maximizing profit at *Stage II*, once the chain has chosen *x*, are:

$$R(x+y_1+y_2)+y_i \cdot R'(x+y_1+y_2)-c=0 \text{ for } i=1,2. \tag{4}$$

Solved simultaneously, these conditions imply that $y_1 = y_2 = f(x)$ where $f(x)$ is defined by:

$$f(x)=\frac{R(x+2f(x))-c}{-R'(x+2f(x))} \tag{5}$$

This function has $f(x)>0$ and $f'(x)<0$ for all $x \in [0, R^{-1}(0)]$ with $f(0)=y_c$. Together, the manufacturers supply $2f(x)$ units of the good.

At *Stage I* the chain invests F to vertically integrate upstream and, anticipating $f(x)$, it next chooses the quantity x to maximize its own profit in the representative market:

$$\pi^d(x_b) = [R(x_b + 2f(x_b)) - c] \cdot x_b, \tag{6}$$

where:

$$x_b = \arg\max_x \{[R(x + 2f(x)) - c] \cdot x\}. \tag{7}$$

It follows from $R(0) > c$ that $x_b > 0$ and $R(x_b + 2f(x_b)) > c$ so that $\pi^d(x_b) > 0$. To confine the analysis to the interesting case in which self supply is profitable, assume that:

$$m \cdot \pi^d(x_b) - F > 0. \tag{8}$$

The retail price of the good is:

$$p_b = R(x_b + 2f(x_b)), \tag{9}$$

and the incumbent manufacturers' profits are:

$$\hat{\pi}^1(x_b) = \hat{\pi}^2(x_b) = [R(x_b + 2f(x_b)) - c] \cdot f(x_b). \tag{10}$$

These outcomes are more profitable for the chain than adopting the posture of a passive buyer in the representative market, paying w_c for the good and reselling it for $p_c = w_c$.

V. Playing Suppliers Off Against Each Other

While the ability to self supply confers countervailing power on the chain, there is a more profitable way than self supply for the firm to exercise this power. Galbraith's reasoning was that the chain would exploit its countervailing power by playing one supplier off against the other to win favorable terms of sale. Suppose that, in lieu of integrating upstream and supplying its own requirements of the good, the chain preempts oligopolistic interactions in the upstream

market by soliciting a long-term, bilateral, supply contract from the manufacturers. This solicitation plays the suppliers off against each other because it induces competition to become the chain's exclusive supplier.

Rather than soliciting offers of a low linear price, suppose the chain designates a *fixed quantity* and solicits fixed-payment offers for that quantity.[5] Acquiring a long-term supply contract with one of the manufacturers in this way allows the chain to make a quantity commitment before the manufacturers play Cournot with the residual demand for the good by small, independent retailers. Contracts of this kind are not unusual for large buyers and their suppliers. Noll, for instance, observes that large buyers often do not exercise their dominance by "posting a low buying price and waiting for sellers to arrive. Instead the common practice is for buyers and sellers to negotiate a long-term contract that specifies both price and quantity" (2005, p. 603).

Dealings along these lines are depicted in an alternative two-stage game, representing interactions in the representative downstream market:

> *Stage I:* The chain offers a contract for x units of the good to that manufacturer who agrees to accept the lower fixed payment T.
>
> *Stage II:* If either seller contracts with the chain, the manufacturers play Cournot with the market's residual demand. Otherwise the manufacturers play Cournot with the market's total demand.

Contracting with a manufacturer for a fixed quantity at *Stage I* preempts the manufacturers' Cournot interactions to serve the residual demand at *Stage II*. With a random tie-breaking provision, this game has a unique subgame-perfect equilibrium in which one

[5] Soliciting a linear price for a designated quantity would be equivalent.

manufacturer wins the contract.[6] Suppose manufacturer *1* contracts with the chain to supply *x* units of the good at stage *I*. The equilibrium values of *x* and *T* are found as follows. Bertrand competition between the manufacturers at stage *I* drives the fixed payment manufacturer *1* accepts down to $T = cx$. If one manufacturer offers to sell the chain *x* units of the good for a payment that is greater than *cx*, its rival would undercut that offer. This is because the manufacturers' profits from sales to the small retailers at *Stage II* are the same whether or not they win the chain's contract. Winning the chain's contract at any price greater than or equal to *cx* is better than losing it. Further, neither manufacturer would undercut a rival's offer to supply the requisite quantity for a payment of *cx*.

In this equilibrium, the chain pays an effective wholesale price equal to *c*, the marginal cost of the good. Anticipating this, the chain maximizes its profit by soliciting contracts for x_b units in the representative market. The chain pays one of the manufacturers a fixed payment of $T_b = cx_b$ for those units, and earns a profit of $\pi^d(x_b)$ in that market. Its total profit is $m \cdot \pi^d(x_b)$. This exceeds the firm's profit in the first game by the amount *F*, the averted set-up cost of integrating upstream. As before, the manufacturers' profits are $\hat{\pi}^1(x_b) = \hat{\pi}^2(x_b)$.

The main effects of the chain's exercise of countervailing power in this model are summarized in:

Proposition 1: $\boldsymbol{T_b / x_b < w_b = p_b < w_c = p_c}$ ***and*** $\boldsymbol{x_b + 2f(x_b) > 2y_c}$.

Proof: Evaluating equation (2) at $x = 0$ and $x = x_b$ yields:

$$f(0) = \frac{R(2y_c) - c}{-R'(2y_c)} \text{ and } f(x_b) = \frac{R(x_b + 2f(x_b)) - c}{-R'(x_b + 2f(x_b))} \qquad (11)$$

[6] With order splitting, a needless complication for purposes here, there would be an infinity of equilibria in which the manufacturers jointly supply the chain with the requisite number of units at the same effective price.

Because $f'(x) < 0$ for all $x \in [0, R^{-1}(0)]$, the expressions in (11) imply that $f(x_b) < f(0)$ or:

$$\frac{R(x_b + 2f(x_b)) - c}{-R'(x_b + 2f(x_b))} < \frac{R(2y_c) - c}{-R'(2y_c)}. \tag{12}$$

Equivalently,

$$\left| \frac{R'(2y_c)}{R'(x_b + 2f(x_b))} \right| < \frac{R(2y_c) - c}{R(x_b + 2f(x_b)) - c}. \tag{13}$$

Because $R'(y) < 0$ and $R''(y) \leq 0$ for any $y \geq 0$, inequality (13) implies that $x_b + 2f(x_b) > 2y_c$. In turn, this inequality implies that $w_b = p_b < w_c = p_c$. The fact that $R(x_b + 2f(x_b)) > c$ implies that $T_b / x_b < w_b$. ■

In this equilibrium the chain uses the countervailing power it acquires from being able to self supply to obviate the necessity of supplying its own requirements and to make more profit in the process. One interpretation of this arrangement is that by co-opting a supplier's production capacity, the chain uses its countervailing power to become a third producer who is distinguished from the others by a first-mover advantage. In doing this, the chain earns more profit than it would by vertically integrating upstream because it does not incur the set-up costs of entry.

By using its countervailing power to play one supplier off against the other, the chain pays an effective price $(T_b / x_b = c)$ that is lower than the wholesale price (w_b) other retailers pay.[7] But *all* retailers pay a lower wholesale price with a chain in the market (w_b) than without (w_c). This lower wholesale price is explained as follows. Cournot interactions between the manufacturers lead to a lower price if demand is more elastic. When the chain contracts for

[7] The chain also captures a significant market share in the representative market. In the linear demand case, the chain's market share is 60 percent.

some quantity at *Stage I* before the manufacturers play Cournot, the residual demand the manufacturers face at *Stage II* is more elastic (at any price for which the quantity demanded is positive) than the full market demand. This intensifies competition between the manufacturers at *Stage II* and leads to a lower wholesale price. The small, independent retailers pay a lower price for the good, but the chain pays a lower price still.

The result that $w_b < w_c$ stands in contrast with the exercise of monopsony power by a dominant buyer against competitive suppliers. In that instance, the small buyers would pay the same low price that the dominant buyer pays (Blair and Harrison (1993) and Mills (2010)). Also, the result that $w_b < w_c$ is exactly the opposite of a "waterbed effect," where the discount a large buyer wrests out of its supplier triggers higher prices for the remaining small buyers (Inderst and Valletti (2009), Majumdar (2005) and Mills (2010)). When the chain in the model at hand exercises countervailing power to win favorable terms of sale, this exercise triggers lower prices for the chain's rivals as well.

Although the wholesale price falls for the small, independent retailers, competition deprives these firms of any benefit from the price drop. The chain is the only retailer that earns more profit. However, the chain store is not the only beneficiary of the countervailing power it exercises in this model. Because $p_b < p_c$, consumers purchase more of the good than otherwise and share some of the gains won by the chain. This is the result that Galbraith had in mind when he claimed that the countervailing power of a dominant buyer translates into lower retail prices.

Galbraith's claim does not hold generally, of course, so there is an important caveat to these results in ***Proposition 1***. Although the chain store exercises buyer power upstream in this model, retail competition is preserved downstream because of constant returns to scale and free entry in retail markets. These assumptions are necessary to prevent the chain from using its

upstream buyer power to exclude rivals and acquire market power downstream by means of a price squeeze. In this respect, this paper shares the insight of the earlier papers mentioned previously that downstream competition is necessary to assure that an upstream discount translates into lower prices downstream.

VI. An Example

The relevance of this paper's analysis of the downstream price effects of a dominant buyer is not limited to retail distribution. It applies equally well to intermediate product markets. Consider an example. Masco Corporation is a nationwide construction contractor that installs about half of all the fiberglass insulation used in new-home construction in the U.S. This material is supplied to Masco and its insulation installation competitors by a small number of manufacturers. Masco's insulation installation competitors are much smaller than Masco and most only operate in local markets. In a national class-action antitrust lawsuit representing nearly 400 independent insulation installers, Masco has been accused of obtaining a price-fixing agreement with the manufacturers that allegedly guarantees Masco prices that are 12 to 15 percent lower than its rivals must pay (Karkaria (2009)). Setting aside the merits of this complaint, the model in this paper suggests that Masco should not have to resort to price-fixing to win advantageous pricing. The countervailing power Masco exercises because of its multi-market operations may suffice as an explanation for these prices.

The more interesting implication of this paper's analysis is that Masco's discounted insulation prices actually may sustain lower prices for smaller, independent insulation installers. This would suggest that new-home buyers may be beneficiaries of this arrangement. If this is a

countervailing-power episode instead of a price-fixing episode, there is no harm to competition or to consumers.

VII. Conclusion

The model presented in this paper illustrates a plausible mechanism whereby a large buyer's countervailing power translates into lower retail prices. It incorporates stylized facts that comport with Galbraith's discussion of this question in the distribution sector. While the model provides some support for the intuition that consumers may be beneficiaries of the countervailing power of a large buyer, it provides no support for Galbraith's larger argument that the countervailing power of large buyers is a *substitute* for competition in mitigating the adverse effects of upstream market power. This is because the downstream consumer benefits in this model owe as much to downstream competition as to upstream buyer power. Galbraith's speculative contentions aside, there appears to be no good substitute for competition.

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