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Food Marketing Policy Center

Beyond Illinois Brick: The Law and Economics Of Cost Pass-Through in the ADM Price Fixing Case

By Ronald W. Cotterill
Leonard Egan and William Buckhold

Food Marketing Policy Center
Research Report No. 42
December 1998

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University of Connecticut
Department of Agricultural and Resource Economics

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Abstract

This article reviews the legal standards and the economics of indirect purchaser cases. Drawn from recent cases on behalf of consumers in the ADM price fixing case, it presents cost pass through models for high fructose corn syrup (HFCS), one of the alleged price fixes in the wet corn milling industry. If soft drink bottlers, a primary user of HFCS, have fixed proportion production, constant returns to scale, and if other bottlers input prices are unaffected by variations in soft drink output due to the price fix, then the impact of the price fix on bottlers' cost is equal to the increase in the price of HFCS. The extent of pass through of the increase by bottlers is shown to depend critically upon the market structure of the bottling industry and the shape of the retail demand curve. Flexible demand functional forms are needed to avoid constraining estimated pass through rates to levels above or below full, 100 percent, pass through.

1. Legal Views on Indirect Purchases

Under federal law, only parties that are directly affected have the right to sue for antitrust injury and recover damages. However, under several states' antitrust laws, indirect parties such as consumers in the ADM price fixing cases can sue for antitrust injury and damages. In the latter case the extent to which input cost increases (due to the antitrust violation) at the direct purchaser level are passed through to indirect purchasers is a critical issue. Here we present a synopsis of the relevant law and an economic model in the context of the ADM price fixing case for analyzing whether a cost increase due to price fixing in an input market is passed on by direct purchasers to intermediaries and ultimately to consumers.

Prior to the late 1960's the issue of whether anyone other than the first-level purchaser from a member of a horizontal price-fixing conspiracy could recover under the federal antitrust laws was unsettled. Central to the issue was the problem of duplicative recovery at different levels of distribution for the same injury. In *Hanover Shoe, Inc. v. United Shoe Machinery Corp.*, 392 U.S. 481 (1968), the Supreme Court held that a defendant could not normally use the fact—which no one seriously disputed—that all or some of the overcharge at the first level was passed on down the distribution chain as a defense or set off. Then in *Illinois Brick Co. v. Illinois*, 431 U.S. 720 (1977) the Court held as a corollary that in normal circumstances only the first level purchaser, commonly called the direct purchaser, had standing to recover under the federal antitrust laws. The Court based its decision on the possibility that defendants would, under *Hanover Shoe*, be fully liable at the direct purchaser level and should not be subjected to downstream liability; apportioning damages to the various levels would be complex and burdensome; and, somewhat delphically, "the antitrust laws will be more effectively enforced by concentrating the full recovery for the overcharge in the direct purchasers." *Id.* at 734-35. For federal law the matter stands there today.

Justice Brennan dissented. In his view the question of whether the purchasers down the distribution chain were injured was a factual one which was not determinable by a strict rule of law. Based on this dissent and perhaps the notion that the federal law was compensating the wrong parties, a minority of the States, most significantly California, and the District of Columbia passed so-called Illinois brick repealers, which specially preserved the right of indirect purchasers to recover damages.

¹The states are Alabama, California, Hawaii, Illinois, Kansas, Maine, Maryland, Michigan, Minnesota, Mississippi,

But were such laws preempted by federal law which, as definitively interpreted by the Supreme Court, afforded the direct purchaser the right to recover the totality of the overcharge even if it passed it along through the distribution chain? Could it be that the direct purchaser could recover trebled damages under federal law and indirect purchasers could also recover trebled damages under state law as well? With surprising ease the Supreme Court answered yes. *California v. ARC America*, 490 U.S. 93 (1989).

Most civil price-fixing cases are brought as class actions and indirect purchaser cases almost invariably are. The central issue in determining whether a class will be certified is normally whether common issues predominate over individual ones. Fed. R.C.P 23(b)(3). This generally comes down to the question whether liability and damages can be determined by common proof with individual damages computed by formula. It is traditional—probably almost mandatory now—for the parties to retain economists as experts to analyze this issue and develop or critique, as the case may be, economic models of common impacts and post hoc procedures for allocating damages to individuals.

2. Direct versus Indirect Purchaser Cases

In a direct purchaser case the issue normally comes down to a dispute as to whether a common overcharge can be measured which, with relatively few variables expressed in a mathematical formula, can be modified to determine each individual's damages. This damage estimation procedure does not have to meet the strictest of standards. Once so called "injury-in-fact" is shown—and in a price-fixing conspiracy this normally can be done by proving the existence of a conspiracy generally directed at the members of the class—a lessened standard of approximation is permitted to a plaintiff to show damages. *Bigelow v. RKO Radio Pictures*, 327 U.S. 251 (1946).

Indirect purchaser cases launched on behalf of consumers are more complex because they involve the distribution channel and the transmission, or pass through, of the price overcharge down that channel to consumers. If marketing intermediaries partially or completely absorb the overcharge, consumer damages are lower and possibly vanish.

3. Cost Pass Through Models

In this section we present an economic framework for analyzing cost pass through in the ADM cases. Due to space limitations, we will focus only on the HFCS carbonated soft drink channel. A description of that channel

New Mexico, Rhode Island, South Dakota and Wisconsin.

is available in Cotterill [1998]. We will also assume that the price of HFCS, a commodity, was fixed and uniformly elevated to direct purchasers. At issue here is analyzing of the extent that the overcharge, once established, is passed through to consumers.

Agricultural economists have led in the analysis of price transmission. Specifically, they have focused considerable effort upon developing theoretical models and measuring how changes in farm prices are transmitted through marketing channels to produce changes in consumer prices (see Gardner 1975, Kinnucan and Forker 1987, Jacobson 1991, Sexton and LaVoie 1999). For HFCS if one can document that consumers have *imperfect information* about retail prices of carbonated soft drinks (CSD) so that small price changes essentially go unnoticed then consumer purchase behavior does not change. Then 100% of any overcharge for HFCS will be passed on to consumers if the following two conditions hold:

- HFCS is used in a fixed proportion production technology (recipe) to produce CSD.
- the monetary value of the HFCS used in CSD is very small relative to the retail value of the products, so only small retail price changes result from the full pass through of overcharge.

Cotterill (1998) analyzes this imperfect information case.

A more general price transmission model that relaxes the imperfect information condition will be presented here. When retail price increases are of a size that triggers a reduction in consumer purchases, the analysis of pass through is more complicated. Yet if one has, in addition to fixed proportions, constant returns to scale, and the fact that the prices of inputs other than HFCS do not change when output drops due to higher retail prices, then CSD bottler total costs increase by the amount of the overcharge by the HFCS manufacturers. Furthermore, under commonly observed demand elasticity conditions, the structure of the market (competitive, oligopoly, or monopoly) will not reduce the pass through rate below 100%. Given sufficient data, one can measure the actual pass through rate. Let us explore each of these necessary economic conditions for 100% or higher pass through rates.

3.1 Returns to Scale

When CRTS in CSD bottling holds, increasing all inputs 1% increases output 1%. Connor et al. (1985) summarize research on economies of scale in food manufacturing at the plant and multi-plant level. The minimum efficient scale (MES) of a plant is defined as

the volume that the plant must obtain to achieve constant returns to scale. At smaller volumes than MES one gets more than a 1% increase in output for a 1% increase in all inputs, i.e., there are increasing returns to scale (IRTS). Connor et al. summarize research for the 46 food manufacturing industries, writing:

only two industries had MES estimates over 10% (of industry shipments); Chewing gum was the extreme with 19.8%. One fifth of the industries had MES estimates over 5% of industry shipments [Connor et al., 1985, p. 94].

Thus 80% of all food manufacturing industries attain constant returns to scale in plants that produce less than 5% of the industry's total shipments. Studies of multi-plant economies for beer, cigarettes, and breakfast cereal by Scherer (1975, p. 334-335; 1982) indicate that multi plant economies of scale are not that great. A firm with 2 or 3 plants exhausts them and therefore has constant returns to scale. Other food industries are similar. Therefore, one can conclude that manufactured food products in the U.S. are generally produced by firms that enjoy constant returns to scale.

Assume that CSD bottlers enjoy constant returns to scale in their bottling plants. (We address the next likely alternative, IRTS, below.) Then output reduction due to higher consumer prices does not affect the physical relationship between input and output. For example, reducing output 1% reduces input requirements 1%. In other words, the amount of the input per unit is constant. This seems reasonable for HFCS given that CSD are produced by strict adherence to product formulae. Under CRTS the change in output cost, other factors remaining the same, is equal to the change in HFCS input cost.

Consider the most likely alternative to CRTS. If products are produced in plants or firms operating below MES, where there are increasing returns to scale, then when output decreases one needs more of each input to produce a given output so that costs go up by more than the overcharge paid to HFCS producers. Even if all other conditions point to 100% pass through, pass through of the overcharge to total firm costs would be greater than 100% if firms are on the increasing returns to scale portion of their cost curves.

3.2 Supply Price of Other Bottling Inputs

The other production condition concerning the relationship of the overcharge by HFCS manufacturers to CSD bottlers' costs is the question of whether the supply price of other bottling inputs used is constant. This is a commonly acknowledged fact for most individual industries. Soft drinks use only a very small proportion of other inputs

(glass bottles, cans, labor) used by the economy. Also, since the consumer demand reducing effect of the overcharge is small, there are only small changes in the demand for these other inputs. Thus, there is no discernable change in the supply price of these other inputs when the overcharge is passed on to consumers. Any increase in costs due to the overcharge is not offset by savings via lower prices of other inputs.

3.3 Total Impact on Bottler Costs

Given fixed proportions production, constant returns to scale, and the fact that food manufacturers use only a small proportion of other inputs, a change in the price of HFCS due to a price-fixing conspiracy produces an equal change in the total cost of the CSD bottler. Also, with constant returns to scale, average variable cost (total variable cost divided by the number of units produced) and marginal costs (the incremental cost of producing another item) are constant and equal to each other. An increase in the price of HFCS shifts these flat cost curves up by a constant amount that equals the increase in the price of HFCS times the amount used to produce one unit of processed product.

3.4 The Transmission of Bottler Costs to Consumers

Given that one has 100% transmission of the HFCS overcharge to CSD firm costs, the next step is to ask how much of the cost increase is transmitted to the price of soft drinks?² The answer to this question depends upon two factors for a profit maximizing bottler: the market elasticity of demand, and the market structure of the industry.

Harris and Sullivan (1979) provide the most complete analysis of price pass through under these different scenarios, although it is not comprehensive. Cotterill (1998) expands their analysis and applies the results, as they suggest, to determine the rate of pass through under different elasticity, and structural conditions. Here we summarize that expanded formal mathematical analysis of pass through.

If food manufacturing industries are competitively structured and firms maximize profits, then the rate of pass through of costs to wholesale prices is 100%, irrespective of the value of the market elasticity of demand. The shift up in the industry supply curve is equal to the shift in marginal costs and the new equilibrium wholesale market price is higher by the same amount (Harris and Sullivan 1979, Figure 2a).

If the food manufacturing industry is a monopoly, demand for its product is linear and it maximizes profits,

² We assume that food retailers use a fixed dollar markup pricing rule so that changes in retail prices are due only to changes in CSD bottler wholesale prices. This assumption can be relaxed (Cotterill 1999).

then pass through is less than 100%. If CRTS holds (constant marginal costs) the pass through rate is always 50%. Harris and Sullivan stopped their analysis of noncompetitive market structures at this point leaving readers with the implication that pass through is always less than 100% in monopolistic markets. Harris and Sullivan's result, however, depends critically upon the linear demand assumption.

If demand is nonlinear and the profit maximizing monopolist faces constant elasticity over the relatively small range of price variation that occurs due to the HFCS overcharge, the rate of pass through is always greater than 100%. The pass through rate for changes in marginal costs (which are equal in our analysis to the HFCS overcharge) is given by the following formula assuming n equals 1:

$$\frac{\partial P}{\partial MC} = \left(\frac{1}{1 - \frac{1}{n\eta}} \right) \quad (1)$$

Where:

$\frac{\partial P}{\partial MC}$ = the change in CSD price for a given change in marginal cost.

n = the number of CSD firms in the market.

η = the market elasticity of demand for CSD.

As the constant market demand elasticity in equation 1 increases in value (e.g., from 2 to 4) the industry is becoming effectively more competitive and the pass through rate decreases and converges to 100% as elasticity becomes infinite. A monopolist facing an infinitely elastic demand curve essentially is not a monopolist; rather, it is a perfectly competitive firm in a broader industry because any price increase causes buyers to switch to some other perfect substitute product.

If the CSD industry is an oligopoly and each firm independently maximizes profits (no collusion), the same general result holds. As the number of firms in the industry, n , decreases, the pass through rate converges to the monopoly rate. Therefore, all firms in noncompetitively structured industries that face a constant elasticity market demand curve have a pass through rate, which is greater than 100%.

If one relaxes the constant demand elasticity assumption and allows demand to become more elastic as price increases, the pass through rate for profit maximizing monopolists and oligopolists decreases. Figure 1 illustrates how the shape of the demand curve affects the pass through rate. There are intermediate shaped demand curves (between

linear and constant elasticity) where pass through is 100% for a monopoly or oligopoly.

4. Conclusions

The key conclusion from our economic analysis is that one must know more than the fact that the demand curve has negative slope: one must know its curvature as well. Although economic textbooks use linear demand curves, economists know from empirical evidence that demand curves are nonlinear in the real world. Often constant elasticity demand curves are estimated (e.g., Hausman 1994, Cotterill 1994). Increasingly, however, flexible functional forms such as the Linear Approximate Almost Ideal Demand system (Hausman 1994, Cotterill et al. 1996) are used to estimate nonconstant elasticity demand curves. From the standpoint of price transmission this is crucial, because it allows us to estimate a pass through rate that can range from zero to well over 100% rather than restrict it, *a priori*, to the linear (less than 100%) or constant elasticity case (greater than 100%). This estimate will also depend on the market structure of the industry.

More generally, it is contrary to common sense to conclude as one does in the linear demand case that competitive industries have more power to pass cost increases forward to consumers than monopolies or oligopolies. That belief suggests that economic power resides with competitive firms, and that monopolies and oligopolies are victims of price fixers and other market shocks that increase their costs. Conversely it suggests that monopolists and oligopolists would fare better with price deflation. Baumol (1972, p. 327) explains that firms in noncompetitive markets will use nonprice strategies such as advertising to influence the shape of the demand curve. Other economists have also developed empirically supported theories that show product differentiation strategies influence consumer demand relationships (Scherer and Ross, 1990, Chapter 16 especially pp. 580-588). Thus oligopolies and monopolies undertake nonprice strategies that shape demand curves into distinctly non linear forms to ensure that pass through is 100% or greater. If these firms could not do so under persistent cost inflation, their industries would collapse into competitive industries, which, as we have shown, enjoy 100% pass through.

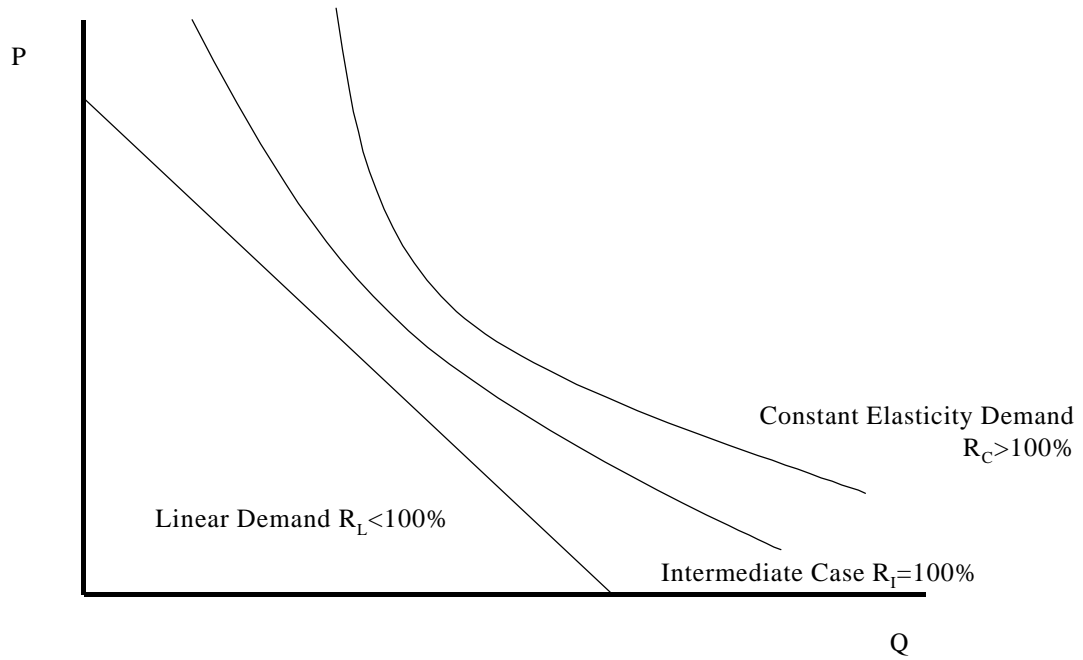
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Figure 1. The Relationship Between Demand Curve Shape and the Pass Through Rate (R)



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