

**THE CHANGING STRUCTURE OF
GLOBAL FOOD MARKETS:
DIMENSIONS, EFFECTS, AND POLICY
IMPLICATIONS**

By

John M. Connor

Staff Paper #03-02

February 2003

Department of Agricultural Economics

Purdue University

Purdue University is committed to the policy that all persons shall have equal access to its programs and employment without regard to race, color, creed, religion, national origin, sex, age, marital status, disability, public assistance status, veteran status, or sexual orientation.

THE CHANGING STRUCTURE OF GLOBAL FOOD MARKETS: DIMENSIONS, EFFECTS, AND POLICY IMPLICATIONS

by

John M. Connor

Dept. of Agricultural Economics, Purdue University

West Lafayette, IN 47907-2056

jconnor@purdue.edu

Staff Paper #03-02

February 2003

Abstract

The paper discusses trends in ownership concentration in three principal stages of the food system: food retailing, food manufacturing, and selected inputs purchased by agricultural producers and by food processors. In each of these levels, the available information from North America, Western Europe, or global sources shows that sales concentration is increasing. An attempt is then made to assess the impact on performance of these concentration trends for final consumers and to a lesser extent for agricultural producers. Performance measures most of interest are the traditional ones derived from economic welfare analysis of imperfect competition. Market performance is analyzed one level at a time but the more difficult arena of vertical subsector performance is also examined. The current role played by public policies in ameliorating consumer and producer welfare as it is affected by the exercise of market power is also assessed. In general, competition laws that apply to horizontal conduct are more settled and more easily enforced than are public policies directed at vertical strategic conduct.

Copyright © by John M. Connor. All rights reserved. Readers may make verbatim copies of this document for non-commercial purposes by any means, provided that this copyright notice appears on all such copies.

THE CHANGING STRUCTURE OF GLOBAL FOOD MARKETS: DIMENSIONS, EFFECTS, AND POLICY IMPLICATIONS

by
John M. Connor

In this paper I discuss trends in ownership concentration in three principal stages of the food system: food retailing, food manufacturing, and selected inputs purchased by agricultural producers and by food processors. In each of these levels, the available information from North America, Western Europe, or global sources shows that sales concentration is increasing. I then attempt to assess the impact on performance of these concentration trends for final consumers and to a lesser extent for agricultural producers. Performance measures most of interest are the traditional ones derived from economic welfare analysis of imperfect competition. Finally, I assess the current role played by public policies in ameliorating consumer and producer welfare as it is affected by the exercise of market power.

Traditionally, economists have focused on horizontal market performance issues. That is, market performance is analyzed one level at a time. I will consider some recent findings of this type but will also venture into the more difficult arena of vertical subsector performance. Assessing vertical (distribution-channel) performance requires somewhat different tools and data sets. In general, competition laws that apply to horizontal conduct are more settled and more easily enforced than are public policies directed at vertical strategic conduct.

Concentration Trends

While there are a number of subtle measurement issues surrounding definitions of seller concentration, on average it is high and has been increasing for several decades in all the OECD countries for which the data exist.

Food Manufacturing

The evidence for high concentration in the U.S. food manufacturers was thoroughly analyzed in Connor *et al.* (1985). Concentration at levels high enough to generate significant departures from effective competition were found in more than half of the food and tobacco processing industries. High concentration in the 1980s was most commonly found in beverages, tobacco products, and heavily advertised packaged food products. On the other hand, food industries that made industrial foodstuffs (flour, sugar, vegetable oils and the like) or undifferentiated consumer products (such as fresh meats) were generally at low to moderate levels of concentration. The structure-performance studies conducted in the 1970s and 1980s generally found that manufacturers' prices for packaged foods were elevated by approximately 10% above the prices one would expect to see in perfectly competitive industries.¹ These results imply that consumers were being overcharged by several tens of billions of dollars annually as a result of oligopolistic industry behavior.

¹ The perfect-competition standard is a tough one. Under the best of circumstances one is unlikely to observe perfectly competitive industry performance, but such outcomes are a widely accepted economic benchmark for assessing competition.

Since the early 1980s, average concentration levels in the U.S. food manufacturing industries have continued to rise (Cotterill 1999). A somewhat unexpected development was the rapid consolidation of food industries that produced homogeneous producer and consumer goods. Previously unconcentrated industries like pork slaughtering, butter, flour, sugar, pasta, and soybean oil experienced rapid increases in industry consolidation through mergers and acquisitions (Rogers 1999). The most egregious example of structural change occurred in beef packing, the largest U.S. food-processing industry. In the mid-1970s the top four beef packers controlled only 25% of the U.S. market, but by 1999 they accounted for more than 80% of the principal types of beef-animal slaughter (Ward 2002). As a result of these developments, the share of value added by the top U.S. food and tobacco manufacturers continued to rise (Figure 1). The share held by the top 50 of total industry value added climbed by 55% from 1967 to 1995; however, nearly all of that increase was driven by the increasing dominance of the top 20 companies, whose share rose by a striking 122%. These 20 companies are all purveyors of globally recognized brands.

Comparable concentration data for Europe are difficult to obtain. An OECD (1983) report found that the food-processing industries of five of Europe's larger member countries were also experiencing similar increases in sales concentration. Moreover, most of the industries that were highly concentrated in one country were also highly concentrated in the other countries.² In general, the smaller the size of a national market, the higher the calculated average level of food-industry concentration. Geography also plays a strong role in the measurement of concentration of regional markets; official measures understate the degree of sales concentration when the indexes are based on national data.³

More current concentration data for selected food industries in the EU appear to confirm the earlier patterns. Average concentration is highest in the smallest member state (Ireland, Finland, etc.) and lowest in the biggest economies (the UK and Germany) (Cotterill 1999: Table 5). Moreover, across Europe and the USA as well, the most concentrated food industries tend to be the same: baby foods, soups, coffee, chocolate confectionery, tea, and breakfast cereals, to name a few. Canned fruits, vegetables, and fish tend to be relatively unconcentrated among all the OECD food industries. The evolution of concentration in many of these food industries, and the economic causes of contemporary levels of concentration, is best explained by Sutton (1991). Cotterill (1999) believes that the drive for being an early entrant in developing pan-European brands will stimulate merger activity among European food companies that will further concentrate those industries.

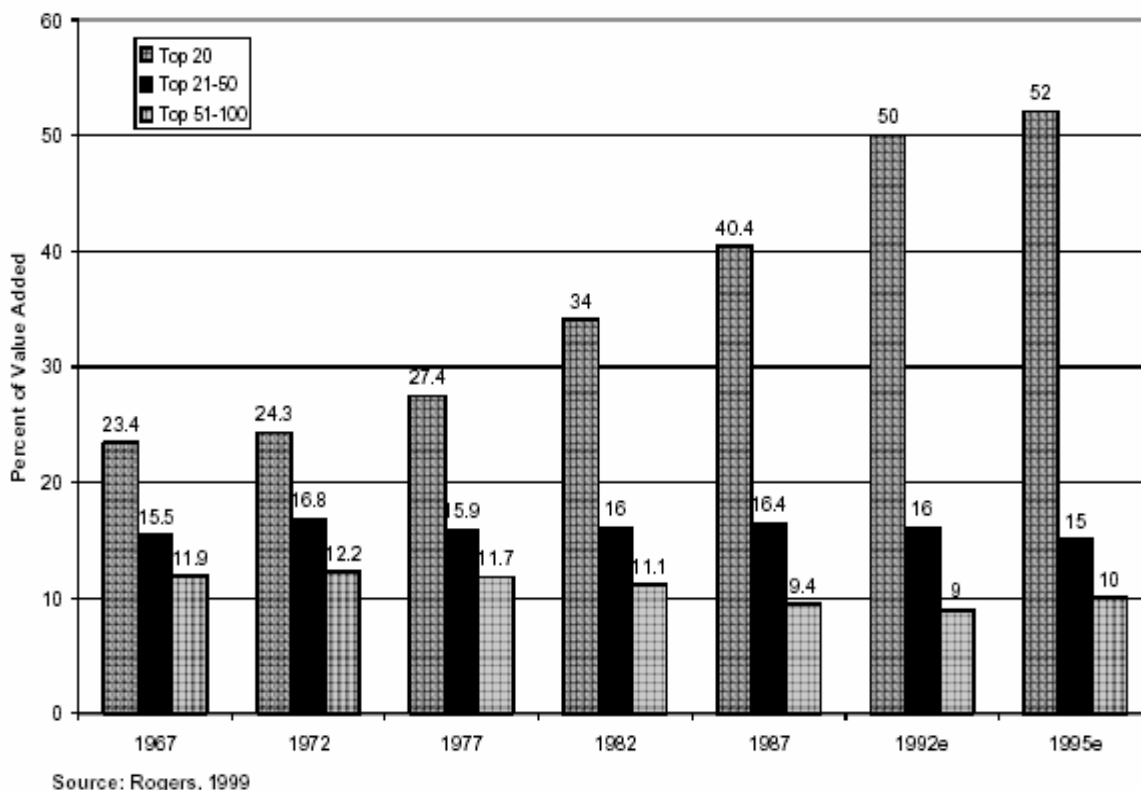
Food Retailing

Measuring the degree of food-retailing concentration is also fraught with difficulties surrounding alternative retail formats (supermarkets, mass merchandisers, warehouse stores,

² Simple Pearson correlation coefficients of concentration ratios across pairs of these six countries were generally between +0.6 and +0.8. Given international differences in the definitions of the ratios and the industries, these are fairly strong correlations.

³ Similarly, if industry concentration is measured at the national level but rivalry is EU- or NAFTA-wide, then national concentration ratios will overstate the extent of concentration within the unified market.

Figure 1. Increasing Dominance by the Top 20 Food and Tobacco Manufacturing Companies
 Census Years 1967-1995



hypermarkets, petrol stations and the like) and appropriate geographic boundaries (Connor 1999). Moreover, there are significant organizational and strategic differences between North American and European retailers (Connor 1999). Except for a few mass merchandisers like Wal-Mart, there are no national chains of food retailers in the United States, whereas supermarket chains with national coverage are the rule in most EU countries. European grocery retailers tend to be more vertically integrated toward agricultural suppliers and tend to have broader store-brand programs than U.S. grocery retailers, though these features may be converging via foreign direct investment into the United States. Apart from Wal-Mart, U.S. food retailers have no significant foreign investments.

Because few U.S. food retailers have broad geographic sales, national concentration of supermarket sales tends to be low by international standards. Until the late 1970s, retail-grocery-industry mergers had been virtually frozen by consent decrees monitored by the U.S. Federal Trade Commission (Balto 2001). In 1992 the top three grocery retailers accounted for only 19.6% of the U.S. market. By 1998 a wave of grocery mergers had increased the three-firm U.S. concentration ratio to 25.9% (Cotterill 1999: Tables 11 to 13). Mergers have continued despite the disappointing financial results of many of them (Bjornson and Sykuta 2002).

In Europe, national concentration among food retailers tends to be much higher, partly because of the smaller economic size of Europe's national markets relative to the U.S. market. Except for Greece, retail concentration is highest in the smallest European countries; three firms account for more than 70% of sales in Sweden, Norway, Finland, the Netherlands, and Switzerland (Cotterill 1999: Figure 3). In the largest European countries, three-firm concentration generally ranges from 40% to 50% of national sales. Because European food retailers rarely have leading positions outside their home countries, pan-European concentration is very low, probably lower than that in the United States.

Large aggregate sales may confer bargaining advantages for some retailers vis-à-vis manufacturers and probably is a necessary condition for an active private-label program. However, it is *local-market* concentration that is the principal determinant of price competition (Connor 1997). In the United States, sales concentration at the level of the metropolitan area is very high and increasing. In the 1960s, the average metro area was controlled by four retailers with 50% of area sales (Connor and Schiek 1997: Tables 10-12). By 1998, that concentration had risen by 49% to an average of 74.7% (Cotterill 1999: Table 8). Concentration in non-metro areas is probably even higher. Comparable data for European cities are difficult to find. However, Drescher and Connor (1999) obtained five-firm food store sales for the 50 largest German cities taken from a 1993 government survey; the 50-city average was 86%. Whether these German data are typical for other European countries is not known, but it is doubtless the case that local-market concentration will on average be higher than national data reveal.

Food and Agricultural Inputs

Agricultural producers face highly concentrated sellers when they buy most of their biological, chemical, and mechanical inputs (Buccirossi *et al.* 2002). As a result, the agricultural-input industries have been a major preoccupation of antitrust and merger-control enforcement in the European Union.

Further up the food chain, food processors generally have large numbers of suppliers for the major food ingredients and other materials that they purchase. However, somewhat less appreciated is the fact that food manufacturers also procure thousands of minor ingredients required for modern formulations typical of highly processed foods. Preservatives, flavorings, fortifications, colorants, emulsifiers, texturizers, and many other organic chemicals are sold by industries that are typically very highly concentrated on a global scale. In these industries, three or four firms typically control more than 80% of global supply under conditions of blockaded entry (for examples, see Connor 2001). Many of these industries were pure monopolies a few decades ago. While concentration may be decreasing for most of these industries, the rate of decline has been glacial.

Horizontal Competition

For more than 50 years, industrial economists have pursued hundreds of empirical studies that measure the relationship between market structure and industrial performance (Scherer and Ross 1990). More than a score of such studies have focused on the food processing or food retailing industry. Most of these studies are cross-sectional, either groups of food products with varying structural conditions or food prices observed across local markets with varying market structures. Research methods have tended to draw upon formal oligopoly models, and the data

sets have increasingly been tested with microeconomic observations of prices. The more widespread availability of sophisticated, micro data sets has encouraged the most advanced work in this area to exploit mostly U.S. data sets.

Food Manufacturing

In studies of food manufacturing, nearly all carefully crafted empirical investigations have found a positive relationship between market concentration (including a firm's market share) and one of the alternative forms of the Lerner Index of market power.⁴ The strength of this relationship is sensitive to the time period being observed and to the assumed form of oligopoly conduct. However, while the average levels of welfare losses are sensitive to the oligopoly model being tested, Peterson and Connor (1995) found that the industry rankings of the welfare losses tended to be highly correlated. That is, no matter the specification of the model and the data set tested, the most concentrated industries generated relatively larger overcharges and deadweight losses. This result is comforting from a public-policy perspective because it is the high concentration industries that have been the object of greatest scrutiny for antitrust and merger-control enforcement (Preston and Connor 1992).

A burning issue in the estimation of concentration-performance relationships is the role played by concentration in efficiency. In a nutshell, the concern is whether increasing concentration may have dual effects – degrading consumer welfare while simultaneously improving efficiency. This issue has been most assiduously applied to data from the U.S. red meat industries. Evidence of market power-efficiency tradeoffs has been found in several studies (e.g., Azzam 1997).

Most recently, Lopez and Liron-Espana (2003) tested a model capable of distinguishing the two effects in the context of 35 U.S. food manufacturers for the years 1972-1992.⁵ They find that small increases in concentration have positive effects on industrial efficiency (and, hence, producer welfare) in most food industries; in a few industries, such as meatpacking, these producer gains are passed on to consumers in the form of lower prices; but in the aggregate, manufacturers do not pass on their efficiency gains to consumers. The industries that are most exploitive of consumers are cheese, canned soups and baby food, frozen foods, starch, pet food, confectionery, beer, and soft drinks.

Food Retailing

Empirical studies of food retailing examine the geographic variation in retail grocery-price indexes. Their behavioral equations control for local-market cost variations. The studies generally find that high metropolitan-area concentration is associated with high food prices (Connor 1997, Yu and Connor 2002). Some economists interpret the resulting effect as “small” because the maximum change in four-firm concentration causes prices to rise by “only” 3 to 8

⁴ The Lerner Index measures the wedge between market price and full economic costs or between market price and the perfectly competitive price. Certain types of profit, the price-cost margin, and price indexes are variations of the Lerner Index.

⁵ These models are quite new and often have rather spare specifications of demand or supply. They also are applied to rather aggregated data sets.

percent.⁶ At these rates, the huge size of the U.S. retail market implies tens of billions of dollars in income transfers from consumers to powerful retailers. Moreover, given the low average after-tax profit rates of food retailers, the increase in profits from small changes in concentration is quite substantial.

International Ingredient Cartels

The sudden discovery of a global pandemic of international cartels in the mid 1990s, after a hiatus of a half century, is puzzling (Connor 2001). That the greatest number and most injurious conspiracies should be clustered in the food and feed ingredients industries adds another element of mystery to the puzzle. Whatever the causes of this unexpected resurgence of global price fixing, the reaction of the antitrust-enforcement agencies has been fascinating (Connor 2003, OECD 2002). If the burst of illegal price fixing exposes one of the dark sides of globalization, the strong responses of antitrust agencies to the challenge of global cartels is one of the bright aspects.

International private cartels are hardly new phenomena.⁷ Most economists would identify the period 1920-1940 as the heyday of such cartels. The interwar cartels were ambitious in scope, often incorporating agreements with U.S. manufacturers that divided the markets of Western Europe, Africa, and the New World into two hegemonies. By 1920 the United States had an effective anticartel law, the Sherman Act, that made U.S. producers wary of joining formed price-fixing agreements with European firms. Many U.S. firms may have believed that arrangements that merely created spheres of influence or patent pooling were legal under the Sherman Act, but events would prove them wrong. From 1946 to 1950, a crusading U.S. Attorney General made the criminal prosecution of scores of these interwar cartels his highest priority (Wells 2002). Aided by public revulsion about the assistance given by these cartels to the rise of National Socialism and the rearming of Germany during 1933-1941, the U.S. government enjoyed a long string of successes in the courts. The court victories apparently chilled the formation of international cartels for the next 40 years.

The international cartels discovered and prosecuted since 1995 are qualitatively different from those operating in the interwar period. They are truly *global* cartels and as such represent the ultimate stage in the evolution of the cartel as a form of business enterprise. Contemporary international cartels incorporate a refinement of operational techniques, a global perspective, a multicultural pluralism, a leadership style, a degree of longevity, and a scale of operation that the world has never before seen. Needless to say, global cartels are also the most injurious price fixing ventures yet devised, causing massive losses in market efficiency, losses in income for customers and losses in faith in the honesty of businessmen and the integrity of market institutions.

⁶ The easiest way to compare such effects across studies is to compare prices in the last concentrated retail markets with prices in the most concentrated.

⁷ Many cartels, such as the Hansa League and the Organization of Petroleum Exporting Countries (OPEC), operated under the protection of state sovereignty. Other commodity-stabilization cartels are effectively parastatal organizations. This paper discusses only cartels that are not sanctioned by law, hence, "private."

Vertical Competition

Agricultural economists have lavished much attention to the vertical-subsector coordinating mechanisms affecting agricultural producers. In the brief space available to me in this paper, it seems best to concentrate on two specific issues about which there is a good deal of public controversy. The first is attempts to ban the ownership and feeding of beef cattle and hogs by meat packers – the so-called “captive supplies” issue. Second is the competitive impacts of chain management – the tight coordination of food-supply channels by a single dominant actor.

Captive Livestock Supplies

Laws and proposed laws to ban packer control (through ownership or certain types of contracts) are a response to the perceived increase in oligopsony power of the U.S. meatpacking industry. Concentration tripled between the late 1970s and the late 1990s (MacDonald *et al.* 2000). At the same time, contractual integration has increased. For example, the share of U.S. hogs sold for slaughter in spot or cash markets declined from over 60% in 1994 to about 15% in 2002 (Hahn 2002: 17). Most of the remainder were contracted or “captive” hog supplies. It is the rare economist who is unconcerned about oligopsony power in the livestock channel (Tweeten 2000). More balanced accounts see problems that need further research that may contribute to sound competition policy solutions (Foster *et al.* 2002).

The wisdom and efficacy of such laws has split the economics profession (compare Feuz *et al.* 2002 and Connor *et al.* 2002). The proximate cause of the debate was the introduction of national legislation that would enforce a packer ban, legislation that was already in force in a few large cattle-raising states. In late 2002, despite the fierce opposition of the meatpackers, the proposed “packer ban” passed a vote in the U.S. Senate; however, in the final stage of writing a law (a secret process that occurs during an *ad hoc* “conference committee” meeting of the U.S. Congress), the packer ban disappeared from the law. (The proposed ban was reintroduced in the 2003 Congress.)

The debate centers on the effects of packer ownership or control of live cattle and hog supplies on competition, especially prices received by agricultural producers (Ward 2002). The question is whether this type of backward vertical integration can cause live cattle prices to be systematically lower and more variable than in the absence of such vertical control (Hahn 2002). In addition, if prices are lower and more variable, are there compensating benefits to producers? Finally, does the presence of captive supplies, perhaps above some threshold level, foreclose market access to some producers?

Economic theory and empirical evidence have long supported the assertion that captive supplies increase the *instability* of prices for suppliers outside the integrated channel. This in turn increases the business risk faced by independent producers. Beginning about 20 years ago, empirical studies of increasing sophistication began to support the idea that buyer concentration in a live-cattle or hog markets systematically *suppressed* prices. However, the size of the price effect is much debated; studies show monopsony price effects from as little as 0.5% to as high as 3.4%.⁸ The degree of oligopsony power seems to vary across geographic regions and time

⁸ Only one or two studies find no relationship in peer-reviewed journals.

periods (Foster *et al.* 2002) and it may vary across integrated versus independent agricultural producers. The precise mechanisms by which buyers force down prices probably vary according to market circumstances, but captive supplies may play a facilitating role.

Empirical studies have shown that the effects of packer-controlled supplies on livestock prices are also negative. The size of these price effects is often characterized as “small” (Ward 2002), but even the smaller estimates would represent quite large impacts on the average profits of livestock producers. It is only in the last ten years or so that theoretical oligopoly models have been developed to demonstrate that captive supplies can be profit-increasing strategy for meatpackers (Love and Burton 1997). When a dominant firm partially integrates backward, it will pay a higher price for the contracted supplies, but the effects on the price of noncontracted supplies is ambiguous (depending on the elasticities of input demand and residual supply).

Captive supplies have undeniable financial benefits for meatpackers in the form of greater economies of scale and tighter standards of quality control. It is possible that producers who contract with packers also benefit in the form of initially higher prices (when packer control is complete, this benefit may disappear), lower marketing transactions costs, and lower sales risk. However, because average livestock prices decline and become more volatile, it appears that unintegrated suppliers incur economic losses and reduced market access.

An agribusiness modeling analysis by Poray (2002) is one of the few empirical analyses of the economic consequences of alternative vertical coordination systems. Poray examines the impacts of three starkly different forms of channel organization (traditional spot markets, contractual integration/chain management by the packers, and ownership of farms by packers) on pork quality (yields of carcasses), price variability over time, and the financial returns to both pork producers and to packers. The results are interesting. Unsurprisingly, ownership integration resulted in the greatest degree pork “quality” (carcass yields). Surprisingly, there were little differences among the three modes of channel coordination with respect to price variability; most economists have hypothesized that tighter forms of vertical control would lead to greater price stability. Finally, the traditional spot-market system of coordination is the most competitive; that is, the total profits generated in the subsector are highest (and about equal) for contractual chain management and for ownership integration. However, the *distribution* of financial profits differs markedly between the contractual and ownership forms of integration: packer profits are greatest under vertical ownership integration but lowest under contractual integration. While Poray’s model is only a two-stage system, the results may well apply to more complex chains where the retailers are channel “captains.”

Vertical Chain Management

Up to the late 19th century, a good case can be made that wholesalers were the captains of the farmer-to-consumer food system. The rising importance of brands for highly processed packaged foods shifted channel control largely to leading oligopolistic food manufacturers in the early 20th century (Connor and Schiek 1997). U.S. manufacturers largely held the upper hand in most categories of grocery products until the 1980s or so (Connor *et al.* 1985); in the UK and other European countries the shift toward greater power for retailers in vertical chains probably began in the 1960s (Connor 1997, Cotterill 1999, Bell 1999, Howe 1998).

The shift towards channel captaincy is more pronounced in Europe than in North America.⁹ It is symbolized by extensive backward vertical integration into wholesale distribution facilities, broad and innovative store-brand programs, strategic alliances with food manufacturers, increased capacity to profitably exploit in-store microdata for category management, and the substitution of consumer loyalty to manufacturers' brands by loyalty to a retailer's store brands (or indeed its entire enterprise image). The combination of forward vertical integration of food manufacturers and backward integration by leading retailers has left only a withered and shrinking role for independent wholesalers, which disadvantages existing smaller unintegrated grocery retailers and creates substantial barriers to new entry into grocery retailing.

Food manufacturers are fighting back against the presumptive increase in retailer market power over consumers of food. The largest global food processors -- perhaps about 50 firms mostly headquartered in North America and Western Europe -- are continuing to spend mightily on advertising and promoting their brands. For example, in 2001 Kraft, the packaged-foods arm of Phillip Morris, spent \$850 million on advertising and promotion. Powerful manufacturers increasingly use their information resources and such trade promotions as coupons and slotting allowances to influence product placement in grocery stores (Copples 2002). These plans for shelf and special-display arrangements often extend to the brands of rival manufacturers, a situation that raises antitrust concerns (e.g., FTC 2001). Allowing a single manufacturer to decide on retail product placement for an entire category (e.g., all cheese or breakfast cereals) can encourage collusion among retailers in a single market, collusion among manufacturers in the category, or by withholding grocery information exclude smaller manufacturers from retail exposure.¹⁰

A well-documented case in which a category captain abused its dominant position through category management is found in the U.S. moist snuff market (Cross 2003). U.S. Tobacco Co. was a pure monopolist in this market from 1911 until the late 1970s when Conwood Co. began to sell moist snuff. Because tobacco advertising is forbidden by law, the only effective method of reaching consumers is through point-of-sale promotion, i.e., installing special racks in retail stores with small advertising banners affixed to them. From 1990 to 2000, U.S. Tobacco instructed its visiting salesmen to remove Conwood's racks and advertising in certain stores; in larger retail chains, U.S. Tobacco paid retailers to become the category captain. Both actions reduced Conwood's market shares, a federal jury decided. In 2002, Conwood received an antitrust award of \$1.3 billion and U.S. Tobacco was ordered to stop illegal conduct typical of a category captain, a decision recently upheld by the U.S. Supreme Court (Greenberger and Fairclough 2003).

Some economists believe that the "UK model" of grocery retailing, with its strong reliance on a broad program of store brands, will bring more benefits to consumers than the former manufacturer-led systems (Cotterill 1999). This scenario assumes that such store brands will be innovative and formulated (and accepted by consumers) as equal to or superior to leading

⁹ In the United States, Wal-Mart and some European-owned grocery chains in the Northeast come close to the "UK model" of retail chain management.

¹⁰ These concerns are not raised by business-management analysts or economists in the agribusiness field of economics, in which large savings of transactions costs are asserted. However, economists trained in industrial economics are more skeptical of these vertical alliances. Cotterill (1999) provides a formal analysis of double marginalization as an explanation of the profitability of trade promotions.

manufacturers' brands. In this scenario, retailers will have to assume both the advertising and R&D functions currently controlled by major processors.

Other economists have taken the view that retailers' private-label programs can have salutary effects on manufacturers' market power. The hypothesis is that extensive private-label control of a channel can cause a deconcentrating effect on the manufacturing level through a change in the balance of bargaining power. Earlier empirical studies found only mixed verification of this hypothesis (Connor *et al.* 1996). However, a more recent empirical examination based on a two-stage game theory developed by Sutton (1991) did find a deconcentrating effect (Venturini and Connor 2002). Unlike earlier tests, the effect depends on manufacturers adopting a "dual brand" strategy, which is not common among leading food processors.

One final effect of the oligopsony power of retailers is their influence on price stability. It is a well-known principle of economics that firms with market power display more price rigidity over time than powerless firms. In particular, as food retailers' market power has increased in recent decades, they are less inclined to reprice individual products in response to changes in agricultural price changes. Moreover, some empirical studies of farm-to-retail price transmission have found asymmetry in price responses; retail prices often do not fall as much as farm prices fall, and they rise less than proportionately to farm-price increases. Backward vertical integration of retailers increases the likelihood of direct buying from agricultural producers (fresh fruits and vegetables, artisanal cheeses, fresh meats, etc.). Price rigidity, price elevation, and price asymmetry all contribute to reductions in producer welfare and suggest a need for better antitrust enforcement for agriculture (Carstensen 2000).

Public Policies

In the area of horizontal collusion, the antitrust laws are generally being well enforced by the North American and European antitrust authorities. Until ten years ago, doubts may have been expressed about the ability of the U.S. Department of Justice's (DOJ's) ability to successfully prosecute international cartels because of problems relating to the gathering of evidence about conspiracies when the evidence was located outside of the DOJ's jurisdiction. But a combination of improved prosecutorial techniques and greater cooperation among national antitrust agencies has resulted in significant prosecutions of international cartels since 1995 (Connor 2001, Connor 2003). About \$4 billion in fines have been collected from international price fixers by the U.S., Canadian, and EU antitrust agencies.

Despite these antitrust successes, the size of the fines may be inadequate to deter future violations. Several multinational food and food-ingredient manufacturers have been identified as repeat offenders. EU rules are particularly constraining on the ability to impose fines high enough to deter recidivism. I have found that the *average* overcharge by international cartels prosecuted since 1995 is 25%, and the cartel activity typically persisted for six years; that is roughly 150% of annual industry sales (Connor 2003). Because EU regulations place an upper limit on fines of 10% of sales, even the maximum cartel fine cannot recoup the economic injury caused by a specialized member of a typical cartel.¹¹ Another limitation on EU sanctions is the

¹¹ Fortunately, most of the guilty firms have been diversified and have colluded on minor lines of business, which has permitted partially deterring fines to be imposed.

fact that the individual high-level executives who have committed the price fixing cannot be prosecuted under EU rules. Although the UK has as new law proposing the criminalization of individual cartel behavior (Bloom 2002), the rest of the world has been free-riding on the U.S. policy of aggressively imposing prison sentences on price-fixing executives.

There are even a couple of public policies that are having the perverse effects of promoting international cartel behavior. Antidumping laws can work at cross-purposes to competition laws. In some cases, cartelists have even used antidumping proceedings to extend and bolster the effectiveness of their cartels! A second deficiency in public policy is the ambiguous relationship between governments and industry trade associations. Trade groups are frequently used as covers for illegal cartel discussions. Yet, Brussels continues to foster the formation of international industry associations and given them quasi-official status even though more than one such group has been manipulated by international cartelists to assist in their conspiracies.¹²

A second important area of public policy is merger control. This is the first line of defense against unwarranted and potentially injurious increases in industrial concentration. The current merger wave that began around 1993, and may have slowed in 2001-2002, has a distinctly international character (Black 2000).

In the EU, it appears that the main direction of merger control for the food system has been directed at food manufacturers (Buccirosi *et al.* 2002). The Competition Directorate of the EC has been quite innovative in developing legal theories to attack non-price competition based on the unilateral market power of brands. EC-COMP has been considering the concepts of the “must-stock brand” by retailers and the synergistic “portfolio effect” that may confer market power on diversified food processors.

By contrast, the U.S. DOJ and Federal Trade Commission (FTC) remain mired in a merger process that focuses almost exclusively on horizontal market overlaps between the merging parties (Foer 2001). Product market definitions are often exceedingly narrow (e.g., the FTC distinguishes between canned cat food and dry cat food). Pursuing such a policy allows even highly diversified food manufacturers to merge, if they hire the right legal advisors and submit a modest divestiture plan in advance of the merger (this is called the “fix-it-first” policy). Thus, it is rare for the DOJ or FTC to oppose proposed mergers of food manufacturers. However, in 2001, the FTC did successfully prevent two of the three remaining manufacturers of canned baby foods from merging.

In the area of retailing mergers, the U.S. antitrust agencies have been much more active than in Europe. During the years 1996-2000, the FTC received 157 supermarket merger applications, of which 14 resulted in enforcement actions (either a consent decree requiring divestiture or abandonment of the merger after a full investigation) (Balto 2001). Prior to 1960 the federal government had never challenged a supermarket merger. Perhaps the most important enforcement action was the 1997 suit *FTC v. Staples*; although concerned with office-supply superstores, the decision is directly relevant to supermarket mergers. Sophisticated econometric

¹² The lysine and citric acid cartels were both aided by EC-sponsored industry “task-forces” (Connor 2001).

models using store-level prices were critical in establishing the appropriate market definition (office-supply superstores in a single metropolitan area) and in proving substantial price effects should the merger be consummated. In many cities, only two national chains would have remained; in some a monopoly would have resulted. The merger was successfully opposed.

Today U.S. grocery retailing merger control is fairly stringent. Supermarkets in a single city are the relevant market in most cases (small “convenience” stores and hypermarkets are considered noncompetitive with supermarkets). High metropolitan concentration is likely to be the critical criterion in supporting the probability of multilateral market power, and market shares above 35% are typically seen as sufficient to prove likely unilateral market power. Entry barriers are often present in supermarket operations because of the slowness and difficulty of finding efficient store locations and because piecemeal entry is often inefficient given the economies that result from dedicated grocery warehouses that serve dozens of stores. Finally the *Staples* case shows that the courts are likely to react to claims of merger-induced synergies with great skepticism.

Although U.S. merger standards have stiffened since the mid 1990s, one concern about mergers that does not seem to have been addressed by the authorities is the buying power of retail chains. Whether through extracting lower prices or greater promotional payments from manufacturers, the exercise of buyer power could result in higher prices being paid for processed foods by smaller retailers. At least one case (*FTC v. Toys-R-Us*) has suggested that a procurement share of only 20% could be dangerous for competition.

References

- Azzam, Azzedine M. Measuring Market Power and Cost-Efficiency Effects of Industrial Concentration. *Journal of Industrial Economics* 45(1997): 377-386.
- Balto, David. Supermarket Merger Enforcement. *Journal of Public Policy & Marketing*. 38(Spring 2001): 1-17.
- Bell, Richard. The Challenge of Food Distribution, in *The Future of the Global Food Industry – Strategic Directions*, B. Ramsay (editor). London: Financial Times Retail and Consumer Publishing Monograph Series (1999).
- Bjornson, Bruce and Michael E. Sykuta. Growth by Acquisition and the Performance of Large Food Retailers. *Agribusiness* 18(2002): 263-287.
- Black, Bernard S. The First International Merger Wave. *University of Miami Law Review* 54(2000): 799-818.
- Bloom, Margaret. The UK Criminalization Initiative. *Antitrust* 17(Fall 2002): 59-60.
- Buccirossi, Paolo. Competition Policy and the Agribusiness Sector in the European Union. *European Review of Agricultural Economics* 29(2002): 373-397.
- Carstensen, Peter C. Concentration and the Destruction of Competition in Agricultural Markets: The Case for Change in Public Policy. *Wisconsin Law Review* (2000): 525-537.
- Connor, John M. Economic Overview and Research Issues. *Agribusiness* 13(1997): 253-259.
- Connor, John M. Evolving Research on Price Competition in the Grocery Retailing Industry. *Agricultural and Resource Economics Review*. 28(1999): 119-127.
- Connor, John M. *Global Price Fixing*. Boston: Kluwer Academic (2001).
- Connor, John M. *The Globalization of Corporate Crime: Food and Agricultural Cartels of the 1990s*, paper to be presented at a Congress of the Societe Francaise d'Economie Rurale, Paris (March 2003). (Forthcoming in *La Revue d'Economie Rurale*).
- Connor, John M. and William A. Schiek. *Food Processing: An Industrial Powerhouse in Transition, Second Edition*. New York: Wiley (1997).
- Connor, John M. *et al. The Food Manufacturing Industries: Structure, Strategies, Performance, and Policies*. Lexington, Mass.: Lexington Books (1985).

Connor, John M. *et al.* *The Ban on Packer Ownership and Feeding of Livestock: Legal and Economic Implications*. White Paper of the Organization for Competitive Markets (2002). [[www.competitivemarkets.com/library/academic/Connor-et-al.031202%20\(1\).htm](http://www.competitivemarkets.com/library/academic/Connor-et-al.031202%20(1).htm)].

Connor, John M., Richard T. Rogers, and Vijay Baghavan. Concentration Change and Countervailing Power. *Review of Industrial Organization* 10(1996): 473-492.

Copple, Brandon. Shelf-Determination. *Forbes* (April 15, 2002).

Cotterill, Ronald W. *Continuing Concentration in the Food Industries Globally: Strategic Challenges to an Unstable Status Quo*. Research Report No. 49. Storrs, Connecticut: Food Marketing Policy Center, University of Connecticut (1999).

Cotterill, Ronald W. *A Critique of the Current Food System*. Issue Paper No. 20. Storrs, Connecticut: University of Connecticut, Food Marketing Policy Center (May 2000).

Cristser, Greg. *Fat Land: How Americans Became the Fattest People in the World*. Boston: Houghton-Mifflin Co. (2002).

Cross, W. Dennis. Report from the Snuff Wars. *Antitrust* 17(Fall 2002): 61-66.

Drescher, Klaus and John M. Connor. Market Power in the German Food-Retailing Industry, presented at the European Association for Research in Industrial Economics (EARIE) meeting, Torino, Italy, September 4-7, 1999.

Feuz, Dillon, *et al.* *Comments on Economic Impacts of Proposed Legislation to Prohibit Beef and Pork Packer Ownership, Feeding, or Control of Livestock*, unpublished manuscript, January 14, 2002.

Foer, Albert A. The Category Captain and the Consolidating Food Industry. *FTC Watch* 566(May 16, 2001).

Foster, Ken *et al.* Letter to U.S. Representative Larry Combest and Questionnaire Response (September 20, 2002).

FTC. *Staff Report on the Federal Trade Commission Workshop on slotting Allowances and Other Marketing Practices in the Grocery Industry*. Washington, DC: U.S. Federal Trade Commission (Feb. 2001).

Greenberger, Robert S. and Gordon Fairclough. UST Must Pay \$1.05 Billion in Tobacco Antitrust Case. *Wall Street Journal* (January 14, 2003).

Hahn, William F. Controversies in Livestock Pricing. *Agricultural Outlook* (December 2002): 16-20.

- Howe, W. Stewart. Vertical Market Relations in the UK Grocery Trade: Analysis and Government Policy. *International Journal of Retail & Distribution Management* (June 16, 1998): 212-223.
- Lopez, Rigoberto A. *et al.* Market Power and/or Efficiency: A Structural Approach. *Review of Industrial Organization* 20(2002): 115-126.
- Love, H. Alan and Diana M. Burton. A Rationale for Captive Supplies in *Strategy and Policy in the Food System: Emerging Issues*, Julie A. Caswell and Ronald W. Cotterill (editors), Storrs, Connecticut: NE-165 (1997).
- MacDonald, James M. *et al.* *Consolidation in U.S. Meatpacking: Agricultural Economics Report No. 785*. Washington, DC: Economic Research Service, USDA (February 2000).
- OECD. *OECD Food Industries in the 1980s*. Paris: OECD(1983).
- OECD. *Report on the Nature and Impact of Hard Core Cartels and Sanctions against Cartels under National Competition Laws: (DAFFE/COMP(2002)7)*. Paris: OECD (April 2002).
- Peterson, Everett B. and John M. Connor. A Comparison of Welfare Loss Estimates for U.S. Food Manufacturing. *American Journal of Agricultural Economics* 77(1995): 300-308.
- Poray, Michael C. *Measuring the Impacts of Alternative Coordination Mechanisms on the Pork Industry*. Ph.D. Dissertation. West Lafayette, IN: Purdue University (2002).
- Posner, Richard A. *et al.* Decision of the U.S. Court of Appeals of the Seventh Circuit, *In re High Fructose Corn Syrup Antitrust Litigation* (295 F.3d 651)(August 5, 2002).
- Preston, Warren P. and John M. Connor. An Economic Evaluation of Federal Antitrust Activity in the Manufacturing Industries: 1980-1985. *Antitrust Bulletin* 34(1992): 969-996.
- Rogers, Richard T. The U.S. Food Marketing System, in *Wiley Encyclopedia of Food Science and Technology: Second Edition*, F.J. Francis (ed.) New York: Wiley (1999).
- Scherer, F.M. and David Ross. *Industrial Market Structure and Economic Performance: Third Edition*. Boston: Houghton Mifflin (1990).
- Sutton, John. *Sunk Costs and Market Structure*. Cambridge: MIT Press (1991).
- Tweeten, Luther. Impact of Agricultural Consolidation on Competition, testimony before the U.S. Senate Subcommittee on Antitrust, Washington, DC, September 28, 2000.
- Venturini, Luciano and John M. Connor. Vertical Relationships, Dual Branding Strategies and Concentration Changes, manuscript in journal review (2002).
- Ward, Clement E. *Packer Concentration and Captive Supplies*, FW-554. Stillwater, Oklahoma: Oklahoma Cooperative Extension Service (2002).

Wells, Wyatt. *Antitrust and the Formation of the Postwar World*. New York: Columbia University Press (2002).

World Bank. *Global Economic Prospects and the Developing Countries*. Washington, DC: the IBRD(2003).

Yu, Chih-ching and John M. Connor. Retesting the Price-Concentration Relationship in Grocery Retailing. *Agribusiness* 18(2002): 413-426.