Concentration in Beef Packing

Do Gains Outweigh Losses?

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In 1888, the U.S. Senate adopted a resolution appointing five senators "to examine fully all the questions touching the meat products of the United States" and to investigate whether "there exists or has existed any combination of any kind, ... by reason of which the prices of beef and beef cattle have been so controlled or affected as to diminish the price paid the producer without lessening the cost of meat to the consumer." Thus began the first in a series of federal investigations of the meat packing industry spanning a century. The first resulted in the Vest Report in 1890. The most recent, in 1996, resulted in the Packers and Stockyards Administration's report on Concentration in the Red Meat Packing Industry.

The central concern prompting the federal investigation in 1996 was pretty much the same as that expressed in the Senate resolution of over one hundred years ago: the impact of increased concentration in the meat packing industry on prices paid to producers of livestock, particularly cattle. Consumer prices have been mentioned here and there but, unlike producer prices, have not occupied center stage. Historically, slaughter concentration did indeed reach levels high enough to alarm even the casual observer. In 1888, the Big Four (then Swift, Armour, Hammond, and Morris) slaughtered 89 percent of the cattle in Chicago and produced two-thirds of the country's dressed beef supply. In 1905, when the first official data on concentration became available, the packing giants, or "Beef Trust," including the Big Four and the Cudahy Packing Company, slaughtered 45 percent of the cattle in the country, and close to 98 percent in the West. Their share in cattle slaughter continued to rise until 1918 when it reached about 55 percent. Even after the signing of the Consent decree of 1920, requiring the Big Five to divest themselves of their transportation and distribution networks, they continued to maintain their shares until the late 1930s. Only after rapid developments in transportation and refrigeration technology, which reduced the locational advantage of terminal stockyards and plants owned by large packers, did concentration start to decline, reaching a low in 1977 with 22 percent of cattle slaughter and 20 percent of fed steer and heifer slaughter controlled by the four largest packers.

By 1977, the industry was well on its way to adoption of a whole new system of operation involving large-scale boxed-beef production. In the new technology, pioneered by IBP, carcasses are broken, boned, and cut in primal and subprimal, and individual cuts are vacuum packed in plastic and shipped in boxes. By the same year, the industry was also operating with excess slaughter capacity occasioned by declining consumption of red meat in general and of beef in particular. Consolidation swept beef packing, leading to concentration levels unprecedented in the history of the industry. Between 1978 and 1994, the share of the top four packers in steer and heifer slaughter rose from 30 to 82 percent, an increase of nearly three-fold.

Should these high levels of concentration be of concern again, as they have been in the past? The answer, like most answers from "two-handed" economists, is that it depends. On the one hand, high levels of concentration may facilitate collusion among packers, thereby depressing cattle prices and elevating consumer prices. On the other hand, consolidation-induced increases in concentration also carry the promise of slaughter-cost efficiency gains, due to economies of plant scale or multiplant operation. This "two-handed" response to the effects of concentration brings us to an obvious question: Have the benefits of increased concentration, realized through slaughter and processing cost savings, been large enough to offset the losses to cattle producers and beef consumers from concentration-induced market power?

The tradeoff

To provide a framework for thinking about the market-power-cost-efficiency tradeoff in beef packing, we start with a familiar paradigm of economic analysis: the "competitive" market, a market in which many sellers of a commodity face many buyers with each market participant being essentially...
powerless to affect price. The U.S. beef packing industry, in contrast, is an example of an “oligopsony”: a market in which the buyer’s side of the market is highly concentrated. Relatively few large buyers of a commodity (packers) face relatively many small sellers (cattle feeders). In this kind of market environment, packers, collectively, have both the incentive and the capability to exercise “market power,” that is, to depress cattle prices to levels below the level that would prevail were the market competitively organized. To the extent that packers succeed in achieving this objective, they earn supra-competitive profits which can be regarded as a return to their oligopsony status: an oligopsony “rent,” so to speak. In this case, the packers’ benefit would come partly at the expense of cattle producers, who lose due to lower cattle prices, and partly at the expense of beef consumers; for them, lower prices offered for cattle mean fewer cattle slaughtered, less beef on the market, and, consequently, higher beef prices. The dollar value of the losses sustained by cattle producers and consumers can be assessed using the theoretical concepts of producer and consumer “surpluses.” Interestingly, however, the rent gains extracted by packers do not fully offset the surplus losses sustained by producers and consumers. Moving the market outcome away from the competitive ideal diminishes the total surplus available for distribution among market participants. A fundamental lesson of the theory of markets, therefore, is that the consequences of the exercise of market power are not merely redistributive in nature. A net loss, or “deadweight loss,” also results.

Generally speaking, one would expect that an increase in concentration in the beef packing oligopsony would increase packers’ market power as measured by their ability to hold cattle prices below the competitive level. For example, if market power were the result of an explicitly collusive agreement among packers, such an agreement would be easier to monitor and enforce with fewer larger parties to it. More than likely, however, if packers do exercise market power, it is the result, not of overt collusion, but of tacit collusion (conduct often referred to by antitrust lawyers as “conscious parallelism”) in which packers simply observe an unspoken mutual agreement to avoid direct price competition for available supplies of cattle. In this case, too, greater concentration would undoubtedly improve the sustainability of such a tacit agreement and lead to an increase in market power. So, other things being equal, greater concentration is likely to lead to greater market power, greater surplus losses for cattle producers and beef consumers, and a greater deadweight loss for the market as a whole. This, of course, is the logic supporting the traditional concerns about high concentration in the industry.

Concentration can have a positive side, however, if it is driven by a movement toward larger-scale plants and firms which, due to technological factors, are more cost efficient than smaller enterprises. Certainly there has been a steady recent trend toward larger packing plants. For example, the “large plant” (250,000 head annual capacity or larger) share of steer and heifer slaughter in plants reporting to the Packers and Stockyards Administration increased from about 49 percent in 1980 to 86 percent in 1990. Moreover, large-scale operations do deliver indisputable cost savings. In a 1991 U.S. Department of Agriculture publication, Duewer and Nelson report operating cost estimates for slaughter/processing plants of various sizes. Their figures suggest that operating costs per head can be on the order of 17 percent lower in plants with slaughter capacity of 300 head/hour than in plants with a 75 head/hour capacity. Such cost efficiency gains would, by themselves, be welfare enhancing. In a competitive market, for example, consumers, cattle
The Model

In a recent paper in the *American Journal of Agricultural Economics*, we developed an oligopsony model of the beef packing industry that can be used to address the market-power–cost-efficiency tradeoff. Like all models, ours involves some simplifying assumptions. First, the stylized “industry” of our model encompasses both slaughter and initial processing stages, because execution of both stages of production in a single plant has essentially become the standard of operation in beef packing. Second, attention is limited to the fed steer and heifer sector because of its predominance in the industry as a whole. Third, the cost savings from consolidation are assumed to arise entirely from plant scale economies rather than multiprocess plant operating economies. Finally, the model requires calibration using data and estimates from a variety of sources, including, most importantly, Duewer and Nelson’s detailed operating cost estimates. All of the estimates used to calibrate the model, in spite of being the best available, are, nonetheless, subject to challenge.

The effects of concentration

In our analysis (see the box on “The Model”), we wanted to answer the following question: For a specific increase in concentration, what percentage reduction in marginal costs of slaughter/processing plant operation would have to be realized in order to offset the adverse welfare effects of greater market power? The answer depends on the particular consolidation scenario investigated. Here we describe just one representative result.

In this case, we started from concentration levels characteristic of the industry in the late 1980s, and then increased concentration as actually occurred over the past decade. For this particular scenario, our study shows that the anticompetitive effects of the increase in market power would be neutralized by a reduction in marginal costs on the order of 2 to 3 percent. On the other hand, based on the Duewer and Nelson figures, the cost savings actually achieved through consolidation would, in this case, amount to approximately 4 percent. This comparison suggests that recent structural changes in beef packing may actually have been welfare enhancing on balance.

These results seem to counter alarmist concerns about market power in beef packing. But at least two qualifications must be emphasized. First, our finding that greater concentration has the potential to improve welfare refers only to net improvements in welfare; there is no assurance that all market participants necessarily share in the benefits. Indeed, a concentration increase leading to greater cost efficiency while promoting greater market power may well reward beef packers with increased oligopsony rents, partly at the expense of cattle producers and consumers who would sustain surplus losses. Second, our model, because it assesses welfare gains and losses in the industry on a national scale, necessarily抽象s from detailed events at the regional level. Indeed, the high costs of shipping livestock make slaughter cattle markets essentially regional in scope, with a packing plant’s cattle purchases often confined to a radius of 300 miles or less. For some cattle producers, the practical effect of increased consolidation/concentration in beef packing may mean the closing of an area plant that had been one of only two or three viable buyers for their livestock. Obviously, producers in such a predicament would fare more poorly than cattle producers on average. In the end, the consequences and policy implications of increased concentration in the beef packing industry are not yet fully understood and remain an important topic of economic research.

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