Market Performance of Poultry Industries under Different North American and European Market Structures

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Abstract: The broiler chicken and egg industries are compared across the economies of the USA, Canada, FRG, and Switzerland to contrast the impacts on market performance of different market structures due to different government policies. The US industries approximate free market conditions whereas the other three countries use different methods to restrict entry or expansion or to set prices. Two different data sets show substantially higher retail prices for broilers and eggs in Canada and Western Europe than in the USA. Producer egg prices were 34 to 166 percent above and live broiler chicken prices 29 to 110 percent higher than those in the USA during 1980-85.

Introduction

Comparison of the market performance of poultry under four different market structures in four countries offers substantial insight into the role of different market structures in shaping market conduct and performance. The broiler chicken and egg industries are compared across the economies of the USA, Canada, FRG, and Switzerland to contrast market structure and performance due to government policies. The field of industrial organization is concerned with policies that produce good market performance; however, measures of different levels of market performance are often difficult to interpret unless appropriate comparisons can be made.

The advantages of using the poultry industries as examples are that reasonably good data are available, and the industries are not as resource specific as many other agricultural product industries. The poultry industries (broilers, eggs, and turkeys) have made substantial management and technological advances since World War II, and these advances have been generally adopted in most developed countries and many developing countries. Evidence will be provided that these the poultry industries have performed well in terms of efficiency, progressiveness, and innovation. Performance is not as good in equity and efficient resource allocation where market entry is limited.

Because of the lack of regulation or government subsidy in the USA, the benefits from this rapid progress have been passed on to domestic consumers and to some US trading partners, with relatively low returns to producing and marketing firms compared to other agricultural enterprises (Farris *et al.*, 1966). Innovators often had high returns for only a relatively short period in the USA because the innovations were generally easy for competitors to copy and adopt (Singleton, 1986). Comparison of the US industries with those in other countries could be considered similar to comparing alternative market structures where one approaching pure competition, while each of the other three countries provides different levels of protection and/or subsidies. Although elements of oligopoly/ oligopsony exist in all four countries, this is expected to have little impact compared to government control of prices or entry.

Evaluation of market performance must consider the goals of society, and, in this cross-country comparison, the goals of each of the four countries. The primary objective of the study, however, is to demonstrate the impact of alternative policies on market performance and to contribute to more enlightened policy not only in the poultry industry but in other industries as well.

The hypotheses derived from economic theory that apply here are: (1) the USA, being a major exporter of poultry products and feed grains, would have the lowest producer and retail prices among the countries considered; and (2) general equilibrium theory can show that, without barriers, adjacent countries should have only small price differences at the producer and retail levels.

Market Structure

Barriers to entry are generally the market structure characteristic found to be the greatest deterrent to good market performance, and Brozen (1969) shows that government is the principal cause of barriers to entry resulting in lower market performance.

This study will show that trade barriers are the major (but not the only) method used by governments resulting in reduced market performance of the poultry industries of the countries selected.

The four countries studied are: (1) the USA, with no effective barriers to entry and no subsidies (except some recent retaliatory export subsidies); (2) Canada, whose market structure for broiler chickens and eggs controls entry and expansion by establishing (via marketing boards) national and regional marketing quotas and import quotas; (3) the FRG, a member of the EC, where the EC restricts entry from third countries by a high variable levy while maintaining a high domestic (EC) target price and subsidizing the export of surplus product; and (4) Switzerland, a high-cost producer that protects domestic producers by an import tariff and requires buyers to purchase a minimum percentage of their product from domestic production (a federal council sets domestic guide prices and, as a result of this system, imports are limited and high domestic prices are maintained).

The key market structure variable in these industries is barriers to entry; the market conduct variable is government setting the price level in the case of the EC and Switzerland; in the case of Canada, output and imports are limited. Efficiency and equity are the key market performance variables affected; however, full employment of societies' resources and progressiveness are also influenced.

Market Performance

Data on all aspects of efficiency were not readily available, but most of the developed countries have adopted much of the available technology, management, marketing, and financing innovations. The significant differences relate mostly to input costs. In other words, the sharp reduction in feed required per pound of bird, the low labour requirement per thousand birds, and the low-cost processing and distribution that have been generally achieved in the developed countries. The big differences are the costs of feed, housing, fuel, processing, and distribution. Advantages of economies of scale, risk management, and marketing from vertical and horizontal integration are also significant but difficult to measure.

The efficiency of poultry production and marketing compared to other important agricultural enterprises in the USA has been remarkable since 1940 when the broiler chicken industry was in its infancy. In 1980, the average deflated price that US farmers received for broilers was only 30 percent of the 1940 price, whereas the prices for beef, soyabeans, cotton, wheat, and maize were 141, 144, 115, 101, and 93 percent, respectively, of their 1940 deflated prices (Table 1).

Table 1–Index of Average Annual Deflated Prices Received by US Farmers for Selected Commodities as a Percent of 1940*

Year	Wheat	Maize	Cotton	Soyabeans	Beef	Poultry
1940	100	100	100	100	100	100
1950	173	147	206	160	179	94
1960	123	79	126	112	128	47
1970	72	80	70	114	129	30
1980	101	93	115	144	141	30

*Actual prices deflated by the CPI index to 1970 = 100, yet indexed to 1940 = 100.
Source: Calculated from Kohls, R.L., and Uhl, J.M. (1985) *Marketing of Agricultural Products*, 6th Ed.

This dramatic real price reduction was made possible by the feed required to produce a pound of live bird being cut from 100 to 49 percent from 1940 to 1978 and pounds of broiler production per hour of grow-out labour increasing from 12 to 776—or 6,467 percent (Table 2). At the same time, the industry shifted to areas with mild climates for lower cost housing and heating and lower labour and land costs.

Table 2–Feed Efficiency, Labour Efficiency, and Broiler Prices

Year	Feed Used per Pound of Broiler	Broiler Production per Hour of Grow-Out Labour	Market Value of Live Weight Broilers, 1967 Dollars
	– – – – Pounds – – – –		*Cents/lb*
1940	4.22	12	43.2
1950	3.27	31	26.6
1955	2.80	64	27.1
1960	2.41	98	17.8
1965	2.28	134	15.3
1970	2.15	258	12.4
1975	2.10	537	14.2
1978	2.05 (49%)*	776 (6,467%)*	12.5 (29%)*

*Percentage of 1940 values.
Source: Brooks, C.R. (1980) *Tar Heel Economist*, April.

Comparison of Prices and Price Spreads

The advantage of comparing the same industry across countries is that the price level at each stage in the production and marketing system can be related to market structure differences to identify market performance differences. Precise comparisons must depend on comparable quality at each point and comparable services and/or processing. This is somewhat easier in poultry than some other industries, but, with the rapid growth of further processing, it may also become more difficult. Other difficulties are fluctuations of currency exchange values and different price reporting procedures. Nevertheless, price levels indicate the degrees of efficiency and equity and the levels of market performance.

Chickens

Production and marketing charges for broilers and for eggs are compared for the 1980-85 period. Prices at both the producer and retail level were lower in the USA than in the three other countries that protect their markets from entry by outside competitors. Canada limits domestic production expansion by marketing quotas as well as imports. Producer prices there were 32 percent higher and retail prices 51 percent higher than in the USA. The result has also been a significantly higher retail price for Canadian broilers than for those in the FRG ($2.48/kg vs. $1.93/kg), where the EC has not limited Community production or intra-EC trade (Table 3a). Since 1960, the original EC-5 has increased broiler output about 500 percent (USDA). Switzerland manages price levels as well as import levels, resulting in producer prices being 110 percent and retail prices 79 percent above US levels. The marketing price spread in the USA was also the lowest at $.77/kg, while the FRG averaged only 4 cents per kg higher. Canada's, at $1.33/kg, was even higher than Switzerland's marketing charge (Table 3a).

Producer and retail prices would be expected to be lowest in the USA, as the leading exporting country. Switzerland would be expected to have the highest prices. With relatively free trade, however, the price difference among neighbouring countries such as the USA and Canada or the FRG and Switzerland would be small and probably not exceed 10 percent.

The existing market structure suggests that producers are being favoured in the three protected markets at the expense of consumers. Processor and/or marketing firms are also being favoured in the Canadian and Swiss methods of control. In the USA, on the other hand, producers have experienced some periods of low returns (Farris *et al.*, 1966).

Table 3a–Prices and Price Spreads for Broiler Chickens, 1980–85 Average

Country	Retail	Producer*	Producer-to-Retailer Price Spread	Producer's Share
	Dollars per kilogram, retail basis			*Percent*
USA	1.64	0.87	0.77	53
Canada	2.48	1.15	1.33	46
FRG	1.93	1.12	0.81	58
Switzerland	2.93	1.83	1.10	62

*Producer price multiplied by 1.333 to convert to a retail weight basis (except for Switzerland, where prices were quoted on retail weight).

Table 3b–Prices and Price Spreads for Eggs, 1980–85 Average

Country	Retail	Producer*	Producer-to-Retailer Price Spread	Producer's Share
	Dollars per kilogram, retail basis			*Percent*
USA	7.56	4.93	2.63	65
Canada	8.44	6.59	1.85	78
FRG	9.53	7.27	2.26	76
Switzerland	19.15	13.14	6.01	69

*1.03 times producer price for breakage, etc.
Sources: Calculated from USDA, *Livestock and Poultry Situation*; Agriculture Canada, *Market Commentary*; ZMP Bilanz 1983 and 1985; and Eiler and Gefluegel.

From these data, one cannot infer that processors and/or marketing firms in the FRG have been favoured substantially. Taxpayers, on the other hand, have had to support export subsidies from overproduction due to the domestic price support. On November 24, 1987, the intervention price for ready-to-cook broilers at the German border was $1,676 per ton, while the US broiler price was $954/ton. The EC import levy was $546/ton and EC export restitutions (subsidies) were $453/ton.

Eggs

As with broilers, the USA had the lowest egg prices for the 1980-85 period, as expected, while the producer and retail prices were significantly higher in the three protected markets. Producer prices were 34, 47, and 166 percent higher in Canada, the FRG, and Switzerland, respectively. Retail prices were not as high, at 12, 26, and 153 percent above the USA (Table 3b). With broilers and eggs in the FRG, however, producer and retail price premiums over the USA declined as the US dollar gained in value up to 1985.

Surprisingly, marketing margins for eggs were higher in the USA than in Canada and the FRG for the 6-year period, at $2.63 per 100 eggs. Whether this a measurement problem, where producer cooperatives in Canada and the FRG account for some of this difference with more marketing service, is not clear. The available data do not provide information on the cause of the higher US marketing margin.

The Swiss price leveis are among the highest in the world for both eggs and broilers. In May 1987, retail prices of large eggs reported by the USDA in major capital cities were $3.84 per dozen in Bern, $3.37 in Stockholm, $1.36 in Bonn (the lowest of the five EC capitals listed), $0.74 in Ottawa, and $0.73 in Washington, D.C. Ottawa is generally one of the lower retail price markets for eggs in Canada, while this is not the case for Washington, D.C., with respect to the US egg market. Country average prices given previously show a

7-cent-per-dozen higher price in Canada, on average. The median for the 16 capital cities reported by the USDA was $1.27 or 74 percent above Washington, D.C., and Ottawa. The price pattern is clear. Switzerland and Sweden have the highest retail prices for eggs—even higher than Tokyo (because Japan has lower barriers on feed grain imports). The EC retail market is next highest among important poultry markets. These price levels relate directly to the degree of market protection.

Summary and Conclusions

International poultry market prices are badly distorted. Two different data sets were used to show this: (1) the standard country annual average time series of producer and retail prices for broiler chickens and eggs; and (2) the USDA's periodic survey of retail food prices in capital cities. Examination of government policies affecting market structure of four countries, namely the USA, Canada, FRG, and Switzerland, shows that market performance follows from the market structure as theory suggests. The US poultry industries represent purely competitive industries with open market structures that have no protection or subsidies (Table 4).

Table 4–Summary of Key Differences in Poultry Market Structure, Conduct, and Performance in Four Different Countries*

Country	Structure	Conduct	Performance
USA	No entry restrictions. No subsidies (except some retaliatory export subsidies). Processor oligopoly/ oligopsony. Demand increasing.	Price and output policies set by individual firms in response to national and international market prices.	Lower prices than most countries. Real poultry meat prices declined from 44 cents/lb in 1950 to 14 cents/lb in 1980 (in 1970 dollars).
Canada	National and regional marketing quotas. Import quotas.	Marketing boards set output policy and import quotas to protect domestic price.	Price of broilers 30-50 percent above USA prices. Egg prices higher by 34 percent at producer level and 12 percent at retail.
FRG	EC policy restricts non-EC imports with high variable levy. Grain costs high for same reason. Export subsidy disposes of surpluses.	Target price and import tariff maintain high domestic price. No output restrictions.	Broiler and egg prices at retail 18 and 26 percent above USA, at producer level 29 and 47 percent above.
Switzerland	High import tariff to protect high cost producers. Maximum of 12,000 head of poultry per farm.	Importer pays high tariff and must buy a certain percent of domestic supplies. Federal council sets guide prices.	Producer and retail prices two to three times USA.

*Other market structure variables such as industry concentration, rate of growth in demand, and degree of product differentiation are relatively minor in their impacts, compared to the differences in price levels caused by differences in government policy. Costs are influenced greatly by input prices and especially by policies that influence feed prices.

Producer prices for broilers in Canada, FRG, and Switzerland averaged 32, 29, and 110 percent higher, respectively, than those in the USA during 1980-85. At retail, they were 51, 18, and 79 percent higher, respectively. For eggs, producer prices were 34, 47, and 166 percent higher, and, at retail, they were 12, 26, and 153 percent higher, respectively.

Within-country market performance problems may exist, but these are generally small compared to those caused by restrictive trade policies. Most of the trade barriers have some elements of nontariff barriers that effectively limit imports. The EC problem is

especially disruptive because not only is the EC a high-cost producer, but also protection has sharply increased output and resulted in export subsidies that generally depress the international market. As a result of widespread protection in high-cost markets, prices are enhanced in these markets and depressed in the lower cost markets. The reaction by the lower cost producers to the EC "dumping" has been to subsidize exports. The likelihood of multilateral trade improvements is slim, but even unilateral changes could improve market performance in poultry. The result would be improvement in equity and more efficient allocation of resource use. The market structure, conduct, and performance paradigm for each country is summarized in Table 4.

Note

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DISCUSSION OPENING—*Carol A. Goodloe* (Economic Research Service, US Department of Agriculture)

The basic question with which this paper is concerned is that public policy directly or indirectly influences market performance of an industry. The authors attempt to answer this question by comparing producer and retail prices across four countries for a six-year period. The conclusion of this comparison is that the more market-oriented policies of the USA have resulted in relatively lower producer and retail prices and that these lower prices are evidence of good market performance.

One cannot accept or reject this conclusion because the authors only define "market performance" in the context of US prices. The authors talk about "good" and "reduced" market performance, but these terms simply mean that prices in the other three countries are lower or higher than US prices. To equate low relative prices with a concept as broad as market performance is not justified by either economic theory or practice.

For example, producer prices for grains in Argentina are often below US and world prices, just as consumer prices for many basic staples in Romania are below comparable US and world prices. But would anyone want to cite the agricultural sectors of those two countries as evidence of good market performance? From whose perspective do low relative prices indicate good market performance? Canadian producers no doubt accept the relatively higher Canadian prices as evidence of good market performance, just as Canadian consumers reject the same evidence.

In several other respects, the paper promised more than it delivered. The authors state that they will provide evidence to "document that the poultry industries have performed well in efficiency, progressiveness, and innovation categories." They do provide data for

the USA on prices received and feed and labour efficiency as evidence of efficiency gains. But no linkages are made between these data and progressiveness or innovation. Neither is progressiveness defined. Data are not provided for the other three countries, so one cannot draw conclusions about relative efficiency among the countries.

The authors also state that "performance is not as good in equity and efficient resource allocation where market entry is limited," but provide no empirical evidence for that statement. The authors say that "the goals of each of the four countries must be considered," but then fail to do so. An understanding of such public policy goals is crucial to understanding market performance of the three highly regulated poultry sectors of Canada, Switzerland, and the FRG. Assuming that the three countries did not leap from a free market system to a highly regulated system overnight, what were the reasons underlying the Government's action? Was the Government trying to correct for market failure in Canada? Did Switzerland adopt a system similar to the CAP to prevent its poultry farmers from moving to the FRG?

A last point concerns the authors' hypothesis that the USA, as a major exporter of poultry and feed grains, would have the lowest prices. This relationship simply does not hold because a country can achieve large exports through the use of subsidies; the EC is a good example of this for many commodities, including poultry.

In conclusion, this paper raises two basic questions: (1) how does one define market performance, and (2) how and from whose perspective—producers, consumers, or taxpayers—does one measure that performance? Although one can agree that US prices are lower than those in the other three countries, to draw conclusions about market performance based on price comparisons alone is not justified.

GENERAL DISCUSSION—*K. Sain, Rapporteur* (Bidhan Chandra Krishi Viswavidyalaya)

A comment was made that because of how different markets are affected by the existence of tariffs and producer quotas and the widely different extent of quality control, the performance of poultry industries in different situations are not strictly comparable. One participant stated that the extent of vertical integration and marketing efficiency was not adequately related to concentration and monopoly power. Another question was raised as to why the US poultry prices were taken as the basis for comparison to all other countries. One participant suggested that the extent of linkage between different market channels and production units might have been examined in more detail. Finally, a participant stated that the method adopted for ascertaining market performance was not optimal because of an inadequate database.

Participants in the discussion included U. Koester.