NEW METHODOLOGIES FOR COMMODITY PROMOTION ECONOMICS

PROCEEDINGS FROM THE NEC-63 CONFERENCE

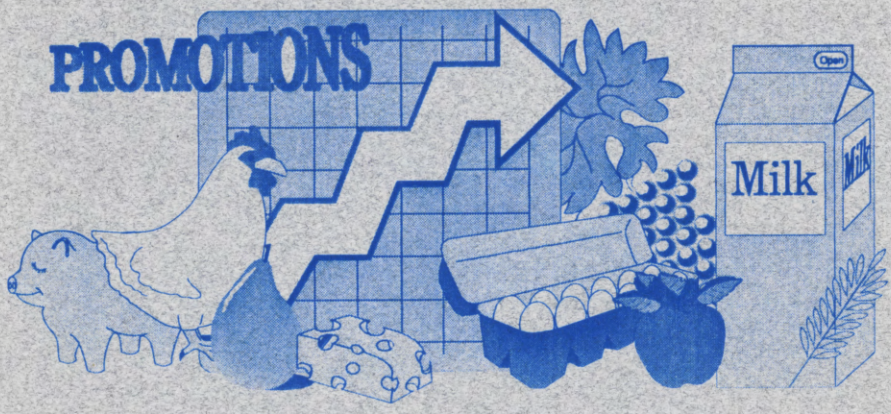
Red Lion Inn ❖ Sacramento, California ❖ October 5-6, 1995

Edited by:

Harry M. Kaiser
Henry W. Kinnucan
Jennifer L. Ferrero

SPONSORED BY AND PUBLISHED WITH THE SUPPORT OF:

The Research Committee on Commodity Promotion (NEC-63)
and
The National Institute for Commodity Promotion
Research and Evaluation



Imperfect Competition Models and Commodity Promotion Evaluation: The Case of U.S. Generic Dairy Advertising
(review)

Kurt A. Carlson

One issue raised by academic and industry representatives at the October 1995 meeting of NEC-63 was:

Does the model accurately reflect market structure?

The paper I reviewed addresses this question by attempting to determine the level of market power exhibited by cooperatives over milk markets and subsequently to measure the bias in producer surplus due to an assumption of perfect competition in the face of imperfect competition.

The phrase "imperfect competition" was used by the authors, Harry Kaiser and Nobuhiro Suzuki, to indicate a power structure wherein one or more market participants have some influence over price. That is, imperfect competition exists whenever one or more agents are <u>not</u> price takers but <u>are</u> price makers.

Kaiser and Suzuki stated as their objective "to determine whether the assumption of perfect competition in the U.S. dairy industry biased the finding of economic impacts of generic dairy advertising." To address this issue, the authors developed a model to simulate both perfect and imperfect competition markets. Kaiser and Suzuki started from the assumption that all participants were price takers (perfect competition). Two imperfect competition scenarios, wherein

co-ops exhibited different degrees of power over price received for raw milk sold to manufacturing and fluid markets, were compared to the perfect competition scenario. Results of the model estimations were used to simulate producer surplus under each scenario. The authors claimed that producer surplus differentials, across market competition scenarios, were a good measure of bias due to making an assumption of perfect competition in the face of imperfect competition.

Prior to developing their model, the authors made three claims. The first and second followed from observation of dairy markets and the third followed from the first two. The first and second claims were:

(1)"In many markets, the effective price for fluid milk use is higher than the minimum Class I price due to over-order premiums commanded by cooperatives."

(2)"The producer's ability to negotiate over-order payments depends on the producer organization's share of total supply in addition to general demand and supply conditions."

Both of these claims appeared to be reasonable; the authors cited Fallert for support of the first. Taking both of these two claims to be true, Kaiser and Suzuki formed their third claim, an argument that the effective fluid milk price differential reflects the degree of imperfect competition in the U.S. milk market due to the influence of federal policies, dairy cooperatives, and milk handlers. The authors used this claim as the cornerstone of their model.

The price differential claim permitted the authors to construct equation (1). Equation (1) portrays the dairy cooperative's revenue maximization scheme. This equation states that, given some power variables (θ_f, θ_m), cooperatives (the producer's agents) equate marginal revenue received from milk sold to fluid and manufacturing markets. In this equation, θ_f represents amount of power that co-ops exert over price in fluid markets and θ_m is the analogous power parameter for manufacturing markets.[1]

Several methods could be used to solve equations (2)-(8). However, the authors chose to make a couple of assumptions about the values of (θ_f and θ_m), and in doing so, made estimation of their model computationally efficient. The authors assumed, in their first imperfect competition model (case 1), that $\theta_m = 0$.[2] This is equivalent to stating that co-ops exert no influence over milk price in manufacturing dairy markets. In their second scenario (case 2), Kaiser and Suzuki assumed that $\theta_f = \theta_m$, which says that power exerted by co-ops over milk price was equivalent across fluid and manufacturing markets.

The two scenarios above, taken together, placed an upper and lower bound on cooperative influence over milk price in manufacturing markets. The lower bound was zero (none) and the upper bound was θ_f (same as in fluid markets). Kaiser and Suzuki argued that this assumption was reasonable given that manufacturing markets are more national in scope, and thus, more competitive. Further, the authors stated that fluid markets were local and often dominated by a few processors over which cooperatives have little power. Thus, cooperatives should have less influence over price in manufacturing markets than in fluid markets.

Time series data (1975-1990), was used to estimate the three scenarios. From supply and demand estimates, power parameter values were calculated for each scenario on a yearly basis. These values were presented in Table 3. Two things should be noted about these parameter values. First, they are small, indicating that although some market power may exist, these markets are close to perfect competition. Second, power parameters in each scenario decrease over time, suggesting that dairy markets become more competitive over time. Kaiser and Suzuki argue that this is likely due to improvements in transportation, storage, and development of reserve areas outside of Wisconsin and Minnesota.

With competition parameters solved for, the authors proceeded with simulating producer surplus under each scenario. Table 5 shows increase in surplus over a ten year period associated with a 1 percent per year increase in advertising expenditure. Given that only a 1 percent per year change in advertising was used, it is not surprising that producer surplus magnitudes are small.

Concluding Remarks

This paper has shown that dairy milk markets in the U.S. were nearly competitive, and that competition in these markets has been decreasing over time. Further, results of this study indicate that producer surplus differences were small when comparing perfect and imperfect competition scenarios. Despite these findings, the main contribution of this paper, as I see it, is it's elegance and computational simplicity. The model requires little data and it easily endogenizes market competition so that model market structure more closely resembles reality.

It should be noted that the data used herein were aggregate U.S. data. As such, one shortcoming of this paper is that it ignores the influence of location on degree of competition. That is, competition may vary substantially from county to county, based on the institutional, industry, and market forces in each county. To overcome this problem, the authors might choose to adapt their model to include regional market power differentials.

Endnotes

[1] Definitions of other variables are provided in Table 2 of the paper. Due to the importance of the power parameters (θ_f, θ_m), they will be discussed in detail here.

[2] Note that the base scenario (perfect competition) can be recovered by setting $\theta_f = \theta_m = 0$.