Regulation and Cost Allocations: The Setting of Maine's Minimum Milk Retail Margins*

by

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Introduction

Milk marketing in the U.S. has had a long history of regulation. Most of the state and federal milk regulations were initiated during the chaotic market conditions of the 1930s (Halcrow). One outcome of these regulations has been the establishment of a multiple milk pricing structure based on the utilization of the milk. Milk used for fluid milk products receives a higher price than milk used in manufactured products such as ice cream and cheese. In most markets farmers receive a weighted average price (often referred to as a blend or pooled price) based on the market's total utilization.

Maine's farmers have a higher percentage fluid utilization when Maine is considered as a milk market or pool than when Maine's milk is considered as part of the New England milk market. Maine's milk marketing regulations establish a state milk pool which retains Maine's high fluid utilization and consequently provides farmers with higher receipts than they would receive without the state regulation.

In addition to establishing the farm price of milk, the Maine Milk Commission sets minimum processor and retail resale margins. One argument in favor of this regulation is that it helps maintain the Maine milk market by protecting the processor and retail margins (Metzger). In the absence of regulation above the farm level, pressure from retailers for lower wholesale prices could lead processors to seek less expensive out-of-state milk. This action could lead to the demise of the Maine milk market.

Objective

The objective of this paper is to describe a retailing cost model developed for the Maine Milk Commission early in 1987, and to discuss the recent Maine Milk Commission action regarding minimum retail margins. The action taken by the Maine Milk Commission is of interest for theoretical and other reasons. Particularly, inquiries into the action of food industry regulators are important since regulation of the food industry appears likely to increase.

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Background

At this point it is useful to discuss briefly traditional pricing practices, the Maine milk statutes, and to mention the high level of political awareness surrounding the Maine dairy industry. Maine statutes (7 M.R.S.A. 2953 & 2954) regarding the setting of retail milk margins include the following:

> Not less than once every three years, the commission shall conduct independent studies of the economics and practices of the milk industry in order to assist the commission in establishing minimum prices . . . . In establishing and changing minimum wholesale and retail prices, the prices so established shall be just and reasonable taking into consideration . . . prevailing prices in neighboring states . . . costs of production, transportation and marketing in the milk industry, including a reasonable return to producer, dealer and store . . . .

Historically, supermarkets have been charged the minimum margin by processors, and consumers have been charged the minimum retail margin by supermarkets. However, in early 1987 when the Commission lowered the gallon container processor minimum margin from 52 to 42 cents, even the larger supermarkets were charged prices which averaged above the legal minimum. The decrease in the processor margins resulted in lower retail prices and the entire process was followed in detail by the Maine news media which gives considerable attention to the Maine milk industry.

Methodology

The most recent milk retailing cost study used by the Commission was completed in early 1987 by this author using the economic-engineering method. This methodology is characterized by the representation of a production process or other activity coupling the engineering or physical information with economic information. Although there are variations in these models, a common characteristic is that process or cost centers are used to break down the production or marketing process in order to assign costs in a logical manner.

There have been many studies which have examined the costs of retailing milk utilizing the basic elements of the economic-engineering method (Korzan and Pfanner; Davis: Aplin and German; Case and Company, Inc.; Metzger and Anderson). Commonly identified milk retailing cost categories are direct labor, cooler or refrigeration, check-out or front-end, building costs, and various combinations of administration, miscellaneous and overhead.

Four supermarkets participated in the 1987 Maine milk retailing cost study, two from each of Maine's largest supermarket chains. The supermarkets were all 45,000 square feet or larger, new or recently renovated, and used rear-loading display coolers where milk is loaded directly from the walk-in cooler to the display cooler. For each store the milk retailing costs were combined into the following four cost categories: front-end, direct labor, cooler costs, and miscellaneous and overhead. The first three cost categories are direct costs and are determined in a straightforward manner. The fourth category is not specific to any one product, and thus requires some method of allocation across all retailed items.

Comprehensive and detailed cost information was obtained from the supermarket chains. The individual store data and most of the four store compilations are confidential, but the author has obtained permission to release the information presented below. In the interest of brevity, the remainder of this paper will discuss only the gallon container retailing costs.

Front-end

The front-end cost category includes the costs of cashiers and baggers (including all fringe benefits), scanners, registers, and push carts. Cash register tape, carry-out bags and other supplies are normally considered as front-end costs although in this study they

were included in the miscellaneous and overhead cost category due to time and data limitations.

An annual cost for scanners and registers was determined as the annual capital recovery cost of the purchased equipment (with chain discount) including tax and installation. An interest rate of 12 percent and a 15 year equipment life was assumed. The front-end manager would normally be included in this category, but in this study was included in the miscellaneous and overhead cost category with the other above-department level managers, due to differing data reporting methods used by the chains. The total front-end costs were allocated to products on a per item basis. For instance, if a store had an average weekly front-end cost of $15,000 and sold 375,000 items per week, then the store's front-end cost would equal four cents per item ($15,000/375,000).

Direct Labor

The direct labor time involved in conducting the operations of receiving, ordering and stocking milk, and the cleaning of the cooler was measured. The wages applied to these time coefficients included all fringe benefits. The time coefficients utilized are very similar to those reported by Cook for similar cooler design (p. 93).

Cooler Costs

The cooler cost category includes the capital cost of the cooler and compressor, cooler-related electricity, the cooler cleaning cost, and a land and building cost. The annual cost of the cooler is allocated based on the portion of cooler space the item normally occupies. For example, if gallon containers occupy 30 percent of the display cooler then gallon containers would be allocated 30 percent of the display cooler costs of capital, electricity, cleaning, and land and building. The per gallon container cooler cost is then determined as the cooler cost attributable to gallon containers divided by the number of gallon containers sold.

The labor costs of cleaning the cooler were included in the cooler cost category, rather than the direct labor cost catetory, since allocation of the cooler costs is based upon the portion of area occupied by milk, which is a reasonable method of allocating cooler cleaning costs. A land and building cost was included since the milk directly occupies the floor space while in the coolers.

Miscellaneous and Overhead

The miscellaneous components of this category include retailing costs which are incurred in the general operation of the store and are not associated with any one product. These include the costs of uncollected checks, office supplies, telephone, non-product specific management, the costs of the non-product specific areas of the store (such as the employees' break room, the rest rooms), non-product specific advertising, etc.

The overhead component of this cost category includes a portion of the costs of operating the supermarket's division and chain headquarters. Chain overhead costs were allocated to the divisions based on division sales volume and division overhead costs were allocated to individual stores based on store sales volume.

In the study conducted for the Maine Milk Commission, two methods were initially used to allocate miscellaneous and overhead costs to the items retailed. The first method is based on an item's percent of sales value and the second method is simply a per item average. Under the percent of sales value method, if gallon containers made up 3 percent of total store dollar sales then each gallon container would be allocated 3 percent of the total miscellaneous and overhead costs divided by the number of gallon containers sold. Under the second method each item sold receives an equal share of the miscellaneous and overhead costs which equals the total store miscellaneous and overhead costs divided by the total number of items sold.

Results

The four store average retailing costs for the direct cost categories of front-end, labor, and cooler costs equaled 3.4, 3.7, and 7.7 cents per gallon container, respectively. The four store average miscellaneous and overhead cost equaled 8.1 cents using the percent of store sales allocation method and 5.0 cents using the equal per item method. Thus, the direct retailing costs equaled 14.8 cents per gallon while the total cost equaled 22.9 and 19.8 cents using the percent of sales and the simple average methods of allocating miscellaneous and overhead costs, respectively.

Retailing cost estimates for a gallon container in this range (19 to 23 cents), are above estimates found in other studies. This was expected since this study is the most recent and may be more inclusive and detailed than other studies. In a 1981 study Case and Company, Inc. estimated the gallon retailing cost in Pennsylvania supermarkets to be about 18 cents. Metzger and Anderson estimated that in December of 1980 the gallon container retailing cost in Maine equal 13.2 cents. Inflating their cost estimate to the present with the implicit price deflator (roughly a 25% increase) yields a cost of 16.5 cents per gallon. In a 1986 publication Aplin and German estimated that supermarket gallon retailing costs in New York and New Jersey range from 12.5 to 18 cents with an average of 14.6.

Maine Milk Commission Margin Setting

In accordance with Maine statutes, the Maine Milk Commission received the retailing cost estimates based on the model described above as input into their decision process. Rather than accept the study's four store average retailing cost estimates of 19 to 23 cents per gallon container, the Commission chose to alter the model and aggregation method in order to arrive at a lower retailing cost estimate. Possible reasons for this include:

1. the Commission believed that if the milk retailing margin remained below the true cost of retailing, retailers could merely increase their margins to reflect their costs,

2. the Commission, as a whole, appeared to be philosophically against setting margins for a product which generates only 2 to 4 percent of total store revenue, and

3. the Commission, just prior to examining retail margins, had lowered the processor margin 19 percent and may have wished to avoid lowering milk prices one month and increasing them the next.

In their process of cost determination the Commission threw out the highest store estimate of front-end costs and averaged the remaining three values to obtain a per item front-end cost of 2.9 cents. For the direct labor and the cooler cost categories the Commission utilized the lowest combined value for any store, which equaled 5.1 for direct labor and 4.0 cents for the cooler cost category. With these changes the Commission's per gallon direct retailing cost (which excludes miscellaneous and overhead costs) equaled 12.0 cents.

Since the miscellaneous and overhead cost category required an allocation rule to determine a per container cost, this category received particular scrutiny from the Commission. Rather than accept either of the miscellaneous and overhead cost allocation methods used in the cost study, the Commission created their own miscellaneous and overhead allocation method which is based on the portion of store shopping area occupied by each product. For example, if the produce department contained 10 percent of the store's total shopping area, then the produce department would be responsible or allocated 10 percent of total store miscellaneous and overhead costs.

A problem with this method of allocation is that some products occupy different portions of building area depending on whether one is considering total building area or shopping area. Milk might typically occupy one-half of one percent of total shopping area (the portion of display cooler occupied by milk plus an equal portion of the adjacent shopping aisle).

However, based on total building area this percentage increases to roughly one-and-a-half percent. The Maine Milk Commission chose to allocate miscellaneous and overhead costs to milk utilizing the smaller of these percentages. Using this method the four store average miscellaneous and overhead cost for the gallon container equaled 13.3 cents.

This miscellaneous and overhead cost combined with the Commission's direct retailing cost of 12 cents resulted in a Commission estimated total retailing cost of 13.3 cents. Based on this estimate and taking other information into account, the Maine Milk Commission decided not to adjust the gallon container retail margin from its 12 cent level.

Discussion

The choice of the Maine Milk Commission not to raise the minimum retail margin is interesting for several reasons, and on the surface may appear to be unfair to the retailers due to their competitive situation. Although the supermarkets have the right to set prices above the legal minimum (as indeed the processors have done recently), there are reasons why similar action should not be expected from the Maine supermarket industry. Unlike the milk processing sector where there are several firms to begin competitive pricing, there are only two major supermarket chains in most of the large market areas. The supermarkets, being oligopolists, are ". . . less prone than competitive industries to change their prices when cost or demand conditions change" (Layard and Walters, p. 251). This behavior is often explained by the kinked oligopoly demand curve which starts with all firms at the same price level. If one firm raises the price it charges, then the other oligopolists would not match the price increase and the firm which raised its price would lose sales and profit. For price decreases, however, all firms will match the price reduction, and this prevents the firm which initially lowered its price from gaining enough business to compensate for the reduced price.

The behavior of the supermarkets is consistent with the kinked demand theory, with the exception of the demand curve being truncated by the minimum retail margin. Given this price or margin floor, the relevant portion of the kinked demand curve is the upper section which represents the situation where the firm that increases its price loses sales to the other oligopolists who do not follow the price increase.

Another deterrence to the retailer increasing the margin they charge concerns the language of the statutes regarding the retail minimums. The statutes regarding the processor margin includes consideration of "a theoretically lowest achievable cost" while the retailing margin more directly and clearly considers actual costs. In a state where the dairy industry is highly visible and has received considerable news coverage, these chains run the risk of being accused of overcharging for milk if they set margins at their actual costs.

Implications

The most important implication which can be drawn from this study is that regulation of food industries may in some cases be flawed due to conflicting goals. In this case the intent of the statutes is for the Commission to establish retail margins near the actual retailing cost. The goal of the Commission was to keep the minimum margin as low as possible.

Due to the nature of the Maine dairy industry and the competitive structure of the state's supermarkets, it may be difficult for the supermarkets to charge a milk retailing margin large enough to cover their costs. Thus, the regulation and/or its implementation may be unfair to retailers.

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