



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

IMPACT OF QUALITY ON MARKETING MARGINS:

A CASE STUDY FOR WASHINGTON APPLES

by

M. Tawhid AlSaffy, Graduate Student
and

A. Desmond O'Rourke, Professor
College of Agriculture
Washington State University

Retail prices and F.O.B. shipping point prices are responsive to differences in product quality. Although marketing margin variations at times ran counter to variations in F.O.B. shipping point prices. A more careful analysis of pricing and marketing strategies by retailers would aid profitability and help consumers.

Introduction

Consumer purchasing decisions are based on prices at the retail level, consumer incomes, tastes and preferences. However, fresh products, before they reach the consumer, go through a lengthy marketing channel from the farm gate, through intermediate points, until they are on display at retail stores. Therefore, the prices at the farm level and at the retail level can differ by quite wide marketing margins.

Because shipping point price quotes are available for a wide range of varieties, grades, sizes, pack-types, etc., information on the price of different qualities is readily available to growers and shippers. However, prices are reported in much less detail by quality characteristics at retail level, and hence marketing

margins are almost never analyzed by quality. This study attempts to indicate how this gap might be filled by examining the responsiveness of marketing margins to quality differences in a specific product, Washington State apples.

The Problem and Its Setting

Growers of crops for fresh sale in the United States face a chronic problem of maintaining a reasonably stable income over time because price varies widely between seasons and within seasons. Washington State apple growers in addition see themselves as victims of their own success. In the last 20 years, Washington State apple production has more than doubled, and the general farm-level price of apples has fallen. By 1982, Washington State contributed 34% of total U.S. commercial apple production (USDA). Since Washington State apples are considered high-quality eating apples, they rely less on the processing market to dispose of temporary surpluses (O'Rourke).

Growers are aware that the demand for apples at the farm level is derived from consumer demand, and that correct understanding of consumer demand is critical to their production and marketing plans. Retailers, in turn, observe consumer reactions to quality differences utilize that information in their pricing

decisions, and transmit that information back to the growers through the marketing system. However, empirical analyses suggest that changes in retail prices are likely to lag behind rather than lead changes in farm prices. Therefore, growers have considerable concern about how accurately the prices they receive reflect consumer demand.

Objectives

The purpose of this study was to examine the impact of fruit quality characteristics (external and internal) on marketing margins. More specifically, the objectives were to:

1. Analyze the economic implications of marketing margin variations (both absolute and as a percentage of retail price) by retail market, fruit size, storage type, and grade, and examine their relationships to quality characteristics.
2. Elicit suggestions about how information coordination between fresh crop growers and retailers could reduce selling costs and marketing losses, and thereby provide mutual advantages to each.

Data Sources

The data used in this analysis were collected as part of a comprehensive study of changes in the quality characteristics of Washington apples before they left shipping point warehouses and after they reached retail outlets in major markets throughout the U.S.

The testing required trained observers and postharvest physiology laboratory facilities both at shipping point in Washington State and at distant markets. It would have been impractical to carry out tests at a random sample of the entire U.S. retail market. However, it was possible to secure the

services of the necessary professionals and laboratories in Chicago, Baltimore, New York, California and Texas. From these centers, observers were able to collect data and carry out tests throughout major metropolitan areas which together receive over 40% of domestic fresh apple shipments from Washington State. Thus, while the results of the sample cannot provide national statistics on the relationship between apple quality and price, they can give considerable insights into those relationships.

The sample period, January-April 1983, was chosen because it is the time during which apple quality is most variable with fruit being sold both from controlled atmosphere storage and from regular refrigerated storage. Sampling at shipping point was conducted in January 1983 to establish a baseline description of quality characteristics of the apples to be marketed in the subsequent weeks. Retail sampling was conducted in over 300 stores in the five regions in both February and April, 1983. In each store visited, the observer selected 10 apples at random from the store's stockroom, purchased them at the prevailing price and then brought the apples back to the laboratory for testing. Thus, the quality of apples tested was not affected by consumer handling or by biases which might be introduced if apples were solicited free from the store.

Selection of the stores to be sampled in each region was based on the grocery market share held by different companies as reported in the 1982 Supermarket News Distribution Study of Grocery Store Sales. For example, in Chicago, where Jewel was listed as having 37% of that market's grocery store sales, approximately 37% of the samples were taken in Jewel outlets. In metropolitan markets like Los Angeles where there are many small chains, we tried to draw at least one sample from each small chain, on the assumption that more information would be gained by including at least one observation on a small chain than by

duplication of observations of outlets of larger chains which drew supplies from a common source and followed a common pricing program.

In all, over 9,000 test apples were examined. The resulting data provides one of the most comprehensive pictures ever assembled of the quality characteristics of a major produce item at different stages and locations in the marketing system.

Observers recorded (1) variety (Red Delicious and Golden Delicious), (2) type of storage, i.e., regular (RA) or controlled atmosphere (CA), (3) grade, i.e., Fancy (F) or extra fancy (XF), (4) weight in grams (which was converted to approximate count per box since shipping point prices are reported by count per box), (5) number and diameter of bruises, (6) watercore, (7) pressure (as an indicator of firmness), (8) soluble solids, (9) acidity, and (10) price per pound.

Shipping point prices for each category were estimated from the twice weekly reports of the Washington Growers Clearing House Association. Weighted average retail prices, F.O.B. shipping point prices, and absolute and percentage marketing margins were estimated for apples of different quality characteristics shipped to each of the five selected retail markets.

Methodology

The marketing margin (MM) in this study is defined as the spread between retail price (P_i^R) and F.O.B. shipping point price (P_i^{FOB}), i.e.,

$$MM = P_i^R - P_i^{FOB}, \text{ (Figure 1). Price}$$

for trayback apples at F.O.B. shipping point is reported per standard 42 lb. box. However, it was assumed that on average, 2 lbs. of fruit were lost due to damage, decay, or other reasons in the marketing channels, so that only 40

lbs. of apples from each standard carton would actually be sold by the retailer.

The marketing margin may also be defined as the price of a collection of marketing services which is the outcome of the demand for and the supply of such services (Tomek and Robinson). For a fresh product such as apples, these marketing services are associated with moving the product from the production site or intermediate points until it reaches the final consumer. Some marketing activities do take place prior to F.O.B. shipping point, but we examined only that part of the marketing function that takes place after the fresh apples are assembled, graded, stored and packed.

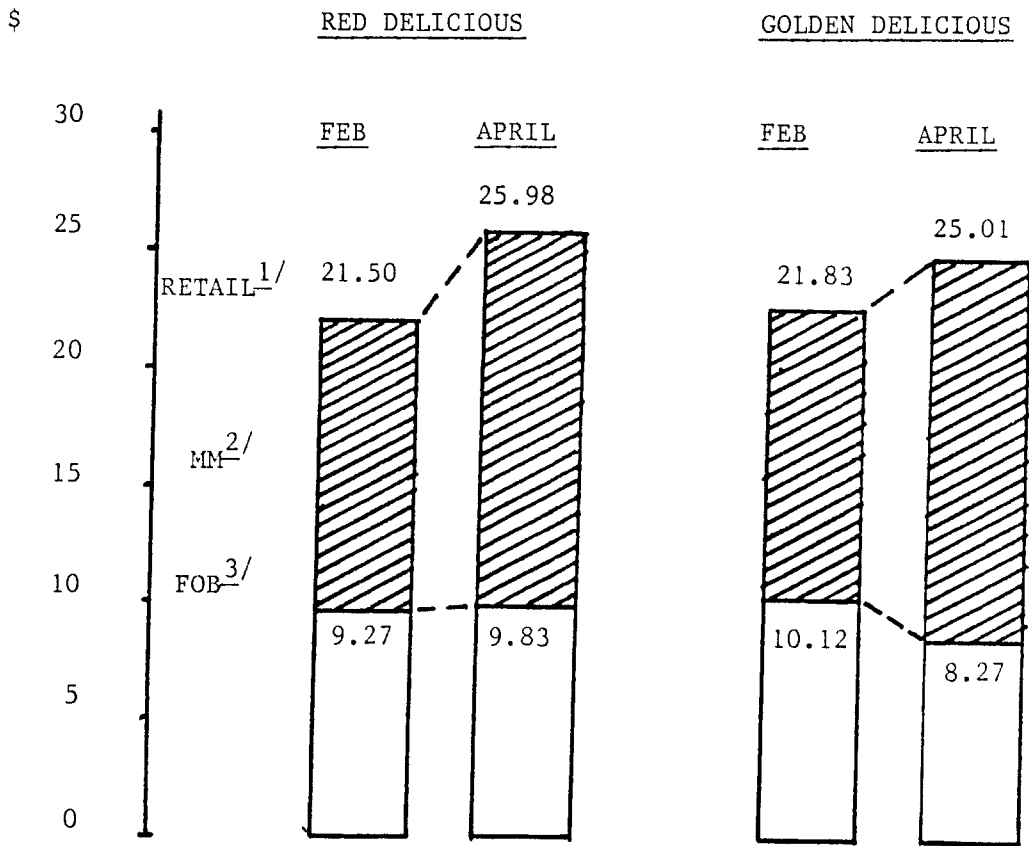
The strategy of this study was based on the inductive approach, inferring general relationships about the impact of quality characteristics on the marketing margins which could later be verified by empirical observations on Washington State apples.

Empirical Results

For the two periods studied, the sample selected was based on total season apple sales in those retail markets. There was no significant change in the planned total number of apples sampled between February and April, 1983. However, the composition of the sample in each period reflects the relative availability for each variety, of each grade, size and type of stored apple. In February, 1983, the available quantity was composed of a fairly equal division of both grades and storage types. But in April 1983, X-Fancy and CA-stored apples accounted for most of the Washington apples sampled at the selected five retail markets.

Shipments of Washington Red Delicious and of Golden Delicious were up 33% and 43% respectively in April over February, 1983. Figure 1 shows that on the average the marketing margin for both Red Delicious and Golden Delicious apples

Figure 1 WEIGHTED AVERAGE RETAIL PRICE, F.O.B. SHIPPING POINT PRICE, AND MARKETING MARGINS FOR RED DELICIOUS AND GOLDEN DELICIOUS, FEBRUARY AND APRIL 1983.



^{1/}Weighted Average Retail Price unit is \$/40 lb box

^{2/}MARKETING MARGIN (MM) = RETAIL PRICE - F.O.B. PRICE

^{3/}Weighted Average F.O.B. Shipping Point Price, unit is \$/42 lb box

was higher in April than in February, 1983, even though F.O.B. shipping point price was lower. In February, the marketing margin was about equal to the F.O.B. shipping point price for both varieties. But, in April, the marketing margin was almost half as large again as the F.O.B. shipping point price for both varieties.

The absolute marketing margin for Golden Delicious rose in all five regions and was unchanged in two. The absolute marketing margin by fruit size did not follow as consistent a pattern. For Red Delicious, the absolute marketing rose as the fruit size increased in both months. For Golden Delicious, in February 1983, the absolute marketing margin increased only up to size 100 fruit, and then declined for larger sizes, i.e., size 80-88 and 72 and larger, but in April 1983, the absolute marketing margin increased as the size of the apple increased.

The absolute marketing margin by storage type followed different patterns. Figure 2a shows that for Red Delicious, in February 1983, RA-stored apples had higher absolute marketing margins than CA-stored apples, but in April 1983 CA-stored apples had higher absolute margins. The opposite was true for Golden Delicious.

The absolute marketing margins by grade were higher for XFancy than Fancy apples, but in April 1983, the opposite was the case for Golden Delicious (Figure 2b).

Marketing margins as a percentage of retail prices were, in general, higher in April than in February, 1983. On average, percentage marketing margin increased from 57% to 62% for Red Delicious, and from 54% to 67% for Golden Delicious. In general, for both varieties, percentage marketing margins were higher than average for RA-stored apples and Fancy apples, which are usually of lower quality.

Economic Implications

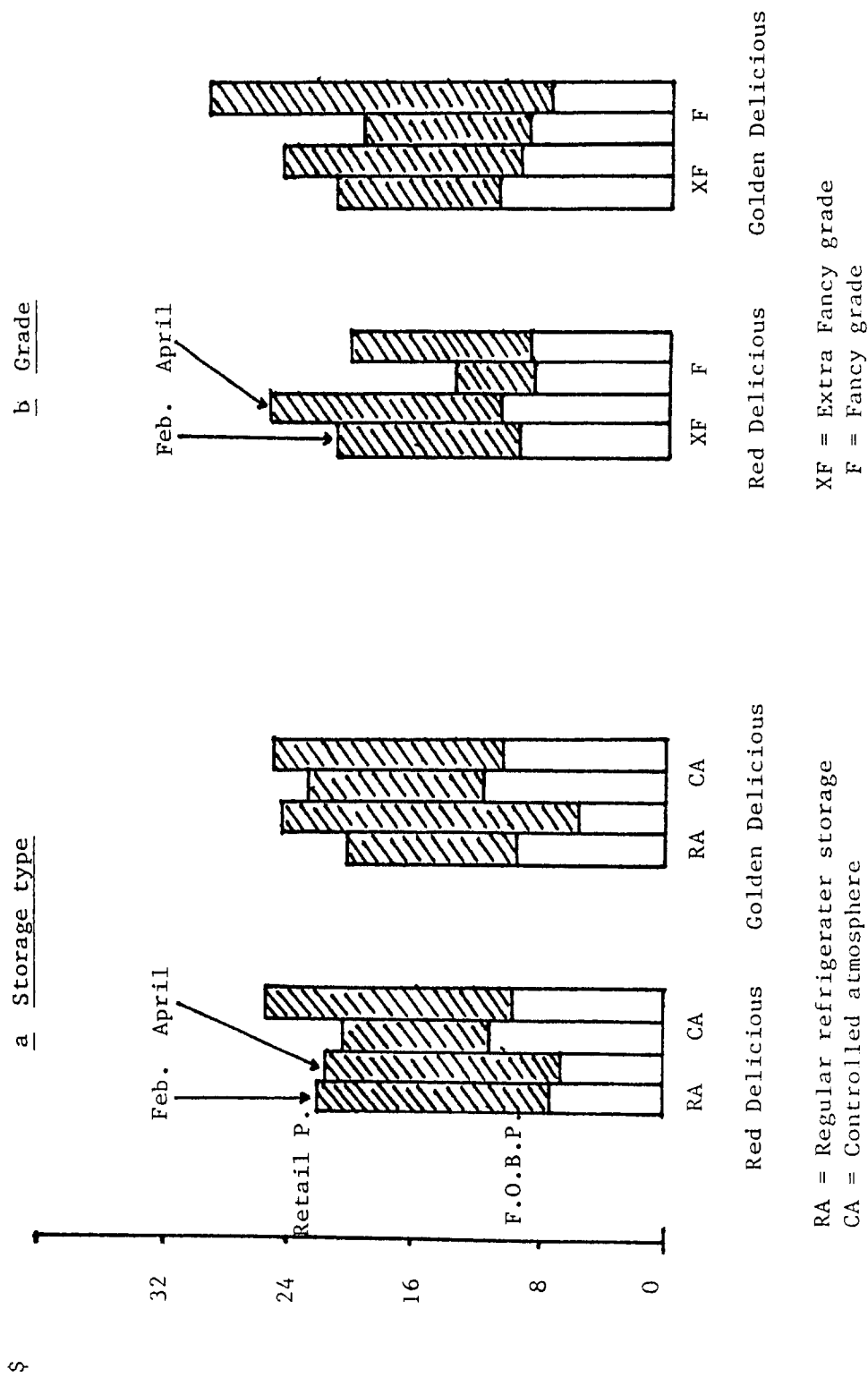
Data permitted us to do limited tests of a number of economic hypotheses that might explain these differences in marketing margins, namely, (1) differences in marketing costs, (2) quality differences, (3) economies of scale, and (4) exercise of market power by retailers. These hypotheses were suggested by preliminary analysis of the data and by the findings of previous studies.

The empirical results show that the size of the marketing margin was in general higher in April than in February. If marketing costs contributed to higher margins, we would expect to find evidence that labor costs, transportation charges, inventory costs, and other costs were higher in April. However, it is unlikely that labor costs changed significantly between February and April, 1983. Also, truck costs from shipping point at Washington State to the destinations at each of the five selected cities did not change between the two months. Inventory costs would be low as chains keep storage to a minimum. Nor was there any evidence that other costs had changed. Thus, it appears that higher marketing margins in April than in February, 1983, were not due to higher costs.

Quality difference could affect marketing costs in a number of ways. For example, lower pressure and acidity levels resulting in shorter shelf life of apples could cause more losses and added costs to retailers. In addition, greater bruising of apples diminishes external appearance, and is likely to slow purchases by consumers. This adds higher marketing costs per unit of time to retailers. However, more often than not, quality differences that one would expect to lead to higher marketing costs were found in situations of lower marketing charges and vice versa.

Economies of scale mean marketing margins decrease as quantity marketed

FIGURE 2
 WEIGHTED AVERAGE RETAIL PRICES, F.O.B. SHIPPING POINT PRICES,
 AND MARKETING MARGINS FOR RED DELICIOUS AND GOLDEN DELICIOUS,
 FEBRUARY AND APRIL 1983.



increases. The empirical observations showed that for RA-stored Red and Golden Delicious apples, the marketing margins were lower at higher volumes, but the reverse was true for CA-stored apples. This inconsistency made it difficult to accept economies of scale as an explanation for marketing margin variation.

The fourth possible explanation for marketing margin differences was the exercise of market power by retailers as evidenced by their ability to set retail prices without considering changes in the price levels at F.O.B. shipping point. The evidence from this study shows that retailers were able to set higher retail prices in April than in February 1983, even though shipping point prices, especially for Golden Delicious, had fallen in the same period. This indicates that retailers did not instantaneously adjust prices at retail level in response to changes in prices at F.O.B. shipping point. Our data did not permit us to measure the extent of the lag in adjustment of retail prices. However, it clearly was not rapid.

These findings have important implications for both shippers and retailers of fresh Washington apples. It is clear that retailers can daily acquire detailed information on F.O.B. shipping point price of different varieties, grades, storage types and sizes of apples, whereas such information at the retail level is not readily available to shippers. Secondly, the pricing practices of retailers in this particular case did not pass on very effectively to consumers correct signals about the relative availability of fresh apples. It would seem that by more closely watching changing supply conditions, retailers would be able to offer consumers more frequent and timely specials. This may be even more true in the future if supplies of Washington apples continue to increase as predicted. If, as seems likely,

marketing margins are relatively inflexible with respect to quantity, total contribution to retail gross margin could be increased by small reductions in absolute retail prices and margins.

For producers and shippers, this strongly suggests increased pressure on federal statistical agencies to produce more frequent and detailed information on retail prices. Failing this, the fruit industry needs to organize to generate this information itself. For retailers already equipped with extensive computing facilities, it appears feasible to tap the analytical capabilities of the computer to detect strategies that will more effectively serve the consumer and increase profitability. Further studies may be desirable to test whether the cost of additional information on apples and other grocery items would be justified by the improvement in service to consumers and profits to retailers.

Summary and Conclusions

The impact of quality on marketing margins for fresh apples from Washington State sold in major metropolitan markets throughout the United States in Spring, 1983 was analyzed.

The marketing margin variations (absolute and percentage) for all retail markets were higher in April than in February 1983. Marketing margin variations by size of fruit showed a reasonably consistent pattern between the two months with margins being larger for larger fruit. However, there was considerable inconsistency in both absolute and percentage margins for the different grades and storage types of Red and Golden Delicious in the two months, except that marketing margins were generally higher for lower quality fruit.

Analysis of available data on both varieties provided some evidence about the responsiveness of marketing margins

to quality changes in the fruit. The economies of scale hypothesis was rejected since there was no consistency in the variation of marketing margin with quantity marketed. While evidence of the effect of cost differences and quality differences on marketing margin variations was not consistent, it appeared that retailers could exercise considerable market power in setting marketing margins.

In general, the study showed that retail prices and F.O.B. shipping point prices are responsive to differences in product quality. However, marketing margin variations sometimes ran counter to variations in F.O.B. shipping point prices. Hence, consumers at retail stores failed to get price signals that reflected variations at farm level or at intermediate points. Improved information on retail pricing would aid shippers, while more careful analysis of pricing and marketing strategies by retailers would aid profitability and help consumers.

Because of the prohibitive cost of data collection, comparable results are not available on other products or other seasons. However, the study does raise important questions of pricing and marketing strategies for shippers and retailers of perishables which merit further examination.

References

- AlSaffy, Tawhid. "Marketing Margins for Washington State Apples in Selected Retail Markets, 1983." Unpublished M.S. paper, Dept. of A. Econ., Washington State University, Pullman, 1984.
- George, P.S. and G.A. King. "Consumer Demand for Food Commodities in the United States with Projections for 1980." University of California of Agricultural Science, Giannini

Foundation of Agricultural Economics, Monograph No. 26, March, 1971.

O'Rourke, A. Desmond and Tawhid AlSaffy. "Impact of Quality on Retail Price of Apples." Scientific Paper No. 6139, Project 0418, College of Agriculture, Washington State University, Pullman, 1983.

O'Rourke, A. Desmond. "Recent Trends in Costs, Marketing Margins and Prices of Washington Apples." Washington Ag. Exp. Sta. Bull. 745, 1972.

Robinson, K. L. and W. G. Tomek. Agricultural Product Prices. Second Edition, Cornell University Press, 1981.

U.S. Department of Agriculture. "Prices and Spreads for Selected Fruits Sold Fresh in Major Markets, 1967/68 - 1973/74." Agricultural Economic Report No. 295, Economic Research Service, Washington, DC, August, 1975.

_____. "Development in Farm to Retail Price Spreads for Food Products in 1980." Agricultural Economic Report No. 465, Economics and Statistics Services, Washington, DC, April, 1980.