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ORDERLY MARKETING: A COMPARATIVE INSTITUTIONAL ANALYSIS OF COORDINATION PERFORMANCE IN THE APPLE AND CELERY SUBSECTORS

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ORDERLY MARKETING: A COMPARATIVE INSTITUTIONAL ANALYSIS OF COORDINATION PERFORMANCE IN THE APPLE AND CELERY SUBSECTORS

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ABSTRACT

ORDERLY MARKETING: A COMPARATIVE INSTITUTIONAL ANALYSIS OF COORDINATION PERFORMANCE IN THE APPLE AND CELERY SUBSECTORS

By

Leslie Ann Berger

Coordination, both vertical and horizontal, is needed to move a commodity from producer to consumer in an orderly fashion. This study evaluates coordination performance at the producer-first handler level in the apple and celery subsectors.

Several key performance areas were designated as those important for orderly marketing conditions. A set of research questions was designed and presented to subsector participants concerning the performance of particular coordination mechanisms. Where problems in coordination were discovered, alternative arrangements were suggested. Coordination performance was compared across the two subsectors.

Interviews with subsector participants, review of selected industry literature and analysis of secondary price, production and consumption data were the major techniques used in this research.

Considerable differences were discovered in the organization and performance of the two subsectors. The degree of collective action and the availability and flow of market information within each subsector was found to be influential in affecting coordination performance.

To my Mother,

Dorine Berger

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Due to the applied nature of this research, subsector

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CHAPTER 1

ORDERLY MARKETING: A RATIONALE FOR ANALYZING COORDINATION PERFORMANCE IN COMMODITY SUBSECTORS

1.1 Purpose of Research

This research will address the overall question of how well do specific coordinating mechanisms presently in practice in specific fruit and vegetable subsectors perform in matching supply with demand at various levels in the marketing channel.

This study deals extensively with vertical coordination which was described by Mighell and Jones (Mighell,R. and L. Jones 1963, p.1) in the following way:

> "Vertical coordination is the general term that includes all the ways of harmonizing the vertical stages of production and marketing. The market-price system, vertical integration, contracting, and cooperation singly or in combination are some of the alternative means of coordination."

Coordination is particularly complicated in the fruit and vegetable subsectors due to the perishable nature of the product and the prevailing uncertainty which occurs due to the long lag (especially for perennial crops), between production decisions and harvest. Tree crop industries and some annual crops require long term, specialized investments which lead to complex vertical coordination challenges. Due to the nature of these investments, grower-investors must be commodity-oriented1 and have a long run orientation in their investment decisions. Grower-investors need to balance aggregate production capacity with aggregate long term

demand. Due to the uncertainties in long term prediction of either supply or demand for these commodities, this task is most difficult (Ricks, Ward 1978).

Most production decisions are based on supply and demand information from the past which may or may not be indicative of market conditions in the future. Problems occur when incomplete supply and demand information is used in the price discovery process. Because of the unique characteristics of perishable crops, as well as the existence of less than perfect competition in fruit and vegetable markets (ie. uncertainty, transaction costs and ill- defined property rights), various mechanisms (alternatives to the spot market auction mechanism) have been employed to facilitate orderly and efficient movement of product from producer to consumer.

The purpose of this study is to analyze some of the coordinating mechanisms functioning in the celery and apple subsectors. A comparative analysis will be conducted to assess performance of these coordination mechanisms in matching supply with demand in each subsector. Alternative arrangements will be suggested where present coordination mechanisms do not appear to result in good coordination performance.

1.2 Background

The basic economic problem of coordinating supply with demand has been faced by food system participants since the

beginning of the commercialization of agriculture. In the 1920's when farm prices declined, government and industry attention turned to development of arrangements that would manage the quantity and quality of fruits and vegetables produced and marketed. Growers attempted to develop "clearinghouses" to function as coordinating agencies between growers, handlers and buyers. The objectives of these voluntary arrangements were to attain more orderly marketing conditions and higher prices for growers. Some of these arrangements succeeded in the short run at improving conditions for growers; however, the underlying problem that frequently emerged was the organization's inability to "induce or maintain participation by sufficient number of producers and handlers" (AMS 1982). Since non-members could often enjoy the same benefits as members, there was little incentive to join such voluntary organizations. Free-riders often undermined the effectiveness of these organizations in coordinating supply with demand.

In the mid 1920's, the government's attitude began to change from taking a passive role in relation to agriculture to becoming more directly involved. The Agricultural Adjustment Act of 1933 authorized the Secretary of Agriculture to form marketing agreements with handlers and associations of producers and processors of fruits and vegetables. In this way, handlers were firmly encouraged to participate in marketing agreements. In 1937, The Agricultural Marketing Agreement Act was passed by Congress

to provide a tool for "....establishing and maintaining orderly marketing conditions and achieving parity prices for farmers" (Armbruster 1983). This act sets some of the guidelines for instituting various coordinating mechanisms. Some of these mechanisms described in the legislation include control of quantity produced and marketed, quality and flow to market as well as standardization of pack and other market supporting activities accomplished through federal marketing orders for particular commodities. This piece of legislation provided a stepping stone for the creation of further marketing arrangements to facilitate more orderly marketing.

Although important to good coordination in the fruit and vegetable subsectors, marketing orders are but one mechanism to improve the match of supply and demand. Improvements in market coordination have been achieved through other government and industry generated policies and institutions. Some of these alternative market coordinating institutions will be discussed in this research.

The meaning of the concept "orderly marketing" as used in the AMAA of 1937 has not been well understood over the years. In a general sense, the term implies, "...ensuring that the correct amount of product is produced and distributed in a timely fashion to consumers, when and how they want it" (Dalziell 1985). This concept remains unclear without clarification of what is the "correct" amount in this context.

An analysis of the performance of coordinating mechanisms in a subsector necessitates a more explicit definition of orderly marketing. Agricultural subsector participant's input concerning orderly marketing conditions was considered by Shaffer in light of the enabling legislation (Shaffer 1986). The ultimate goal of an orderly market as identified by Shaffer is the consistent balance of supply with demand avoiding gluts or shortages. This balance must result in a price which allows a typical well-managed firm to cover costs of production and marketing while earning a reasonable return on investment. Orderly market conditions require the product to be of the quality and form and packaged in the size and style that is preferred by buyers. Supplies must be reasonably stable to minimize wide variations in price and grower returns. Fluctuations in prices should be consistent with changes in costs and should not be random except in cases of where random uncontrollable shocks such as weather interfere. The author adds that adequate sources of information and estimation regarding current and future supply and demand conditions must be available and utilized by producers to guide investment and allocation decisions. An interpretation of orderly marketing is offered by Shaffer (Shaffer 1986):

> "Orderly marketing refers to a process of economic coordination by transactions among buyers and sellers which consistently matches supply with the potential demand at prices reflecting the costs of producing and marketing the commodity (by a typical well-managed firm in the industry)."

This definition of orderly marketing will provide the basis for the discussion of coordination performance in each subsector.

1.3 Objectives

This research focuses on evaluating the degree of coordination achieved in each subsector. Firm-to-firm coordination as well as coordination of aggregate supply with demand across markets at the producer-first handler level will be considered. Coordination of these crops in Michigan and where possible, in the major competing states and between the states will be evaluated.

The objectives of this study are to identify key coordination problems between producers and first handlers. Once the major coordination problems are identified, the environment and behavior of participants will be analyzed to determine the factors contributing to these problems in coordination performance. The major coordinating mechanisms will be evaluated according to how well they perform in matching supply with demand at the specified stages in the market channel. Suggestions will be put forth for improving performance in coordination in each subsector. A comparison will be made of how well the coordinating mechansims in the two subsectors perform in matching supply with demand according to specified performance areas which will be outlined in section 1.4.3.

1.4 Research Design

1.4.1 Subsector Approach

A subsector approach will provide the framework for analysis of coordination performance for each commodity. This approach has been chosen because of its usefulness in systematically analyzing the several industries involved in moving a product from producer to consumer. Analysis of the environment and behavior variables within a commodity system permits an in-depth study of the market performance of an agricultural commodity. The subsector approach places emphasis on the forces of change in the food system and in the economy. Important questions such as "Who has control over strategic aspects of a subsector?" and "How has this control shifted over time?" are addressed in subsector analysis. The subsector approach gives consideration to vertical coordination relationships, not just to horizontal coordination as in some past industry studies.

For the purposes of this research, a subsector will be defined as follows:

> "A subsector is an independent array of organizations, resources, laws and institutions involved in producing, processing and distributing an agricultural commodity" (Marion 1985).

Limited time and resources will not permit a complete subsector description and analysis for the two commodities chosen; therefore, this study will slice into each subsector to analyze the vertical coordination performance which results from transactions between producers, first handlers

and buyers. Transactions involving input suppliers will not be included.

Vertical coordination in a commodity subsector has been cited as the most difficult aspect to understand and the most critical part of subsector analysis (Marion 1985). Vertical coordination in a commodity subsector depends upon certain characteristics inherent within the subsector. These aspects include: the number of stages in the subsector, types of resources involved, length of production period and geographic dispersion of the organizations performing the various coordinating functions. The perishable or storable nature of the product also affects its vertical coordination performance. The more complex a subsector becomes in these characteristics, the more complex and important vertical coordination becomes for good performance (Marion 1985). Analysis of the commodity subsectors in this research will highlight some of the complexities which pertain to these characteristics.

1.4.2 Case Studies

Case studies will be used to illustrate the major coordination mechanisms and to analyze the coordination performance in each subsector. Apples and celery were chosen as commodities for research because of their inherent differences in type of coordination mechanisms, different production periods, different type and degree of collective action used and different coordination successes and

failures. It is hoped that a cross subsector comparison will yield valuable knowledge to subsector participants and policymakers on a variety of different coordination mechanisms to aid in the achievement of more orderly marketing conditions.

The case studies will be based on industry information and literature regarding key coordinating mechanisms such as producer cooperatives, consignment sales, vertical integration, forward contracting and marketing orders. Research will also draw heavily upon personal interview with producers, handlers, processors, cooperative managers and members, extension agents as well as university professors and other key informants.

The research will take a Michigan perspective in order to capitalize on first hand information about local coordinating institutions; however, a less comprehensive analysis of the other major producing states for each commodity will be included to identify the nature of competition and coordination within the subsector as a whole.

1.4.3 Analysis

Industry participants and policy makers have instituted a variety of coordinating mechanisms in attempts to perform the coordinating functions necessary to move products from producer to consumer in an orderly fashion. Analysis of the performance of these coordinating mechanisms requires a set

of performance criteria. Although the development of performance criteria is beyond the scope of this research, performance areas have been defined and will be useful in further research to establish performance criteria. The coordinating mechanisms used in the celery and apple subsectors will be assessed in the following performance areas:

1. The quality and form of product needs to be consistent with consumer demand;
2. The risks incurred in production and marketing of a commodity should be borne by those who can best minimize or best bear the risk.
3. An effective price formation process is needed where producers and sellers have some influence over price and where prices are accurate representations of supply and demand conditions;
4. Prices need to be sufficient to cover the costs of production for a typical, well-managed producer;
5. Information needs to move up and down in the vertical marketing system so that subsector participants are informed about market alternatives;
6. Quantity supplied needs to match quantity demanded of the various forms of product with an avoidance of gluts and shortages.

According to our working definition of orderly marketing, there is a relationship between a subsector's

performance in these areas and the attainment of an orderly market.

Throughout this research, key research questions will be used as a basis for evaluating the nature of marketing coordination in each performance area. It is hoped that responses to these questions will give subsector participants and policymakers understanding of orderly marketing problems. A better understanding of the problems is the first step toward improved coordination in the apple and celery subsectors. The key research questions posed by the author include:

1. What are the coordination functions that must be performed in each subsector for a good match of supply with demand?
2. Are there mechanisms in use to effectively perform this coordination job?
3. How do these mechanisms work? How much of the production is affected? How effective are these mechanisms?
4. Does the mechanism play a role in helping growers make short and long term investment decisions?
5. Are there coordination functions which the mechanisms do not perform?
6. What alternative mechanisms could be employed instead of the current ones.

One of the major aspects of the research will be in the verbal analysis of several performance dimensions important

to these particular commodities. Although largely descriptive, with many of the coordinating functions and resulting performance impossible to quantify, an attempt will be made to do a statistical analysis of annual and monthly price variability for apples and celery as well as yield variability for celery. Seasonal indicies will be estimated to determine how variable or stable are seasonal price patterns.

Price trends will be compared with trends in cost of production and production will be compared with trends in consumption to determine adequacy of pricing and other coordination mechanisms in assuring a reliable supply consistent with consumer demand. For orderly marketing we expect that prices will be directly related to costs and that production will be directly related to consumption.

Variability in apple and celery prices in the major producing areas will be measured using an index of instability created by Ian Dalziell (Dalziell 1985 pp.49-55). This measure can be described as the variance of percentage changes from one period to the next. Price variability for the same crop in different areas and between crops, will be compared. Variabliity of both monthly and annual price series will be considered. Results of these tests will be discussed in light of the particular coordination mechanisms present in the various producing areas and for the different crops.

It is important to note here that this research will

not attempt to set a value on the amount of variability which indicates orderly or disorderly marketing. The setting of numerical standards or measures for orderly marketing will no doubt vary with each particular subsector and has been left for future research.

CHAPTER 2

THE FRESH APPLE SUBSECTOR: OVERVIEW

2.1 Introduction

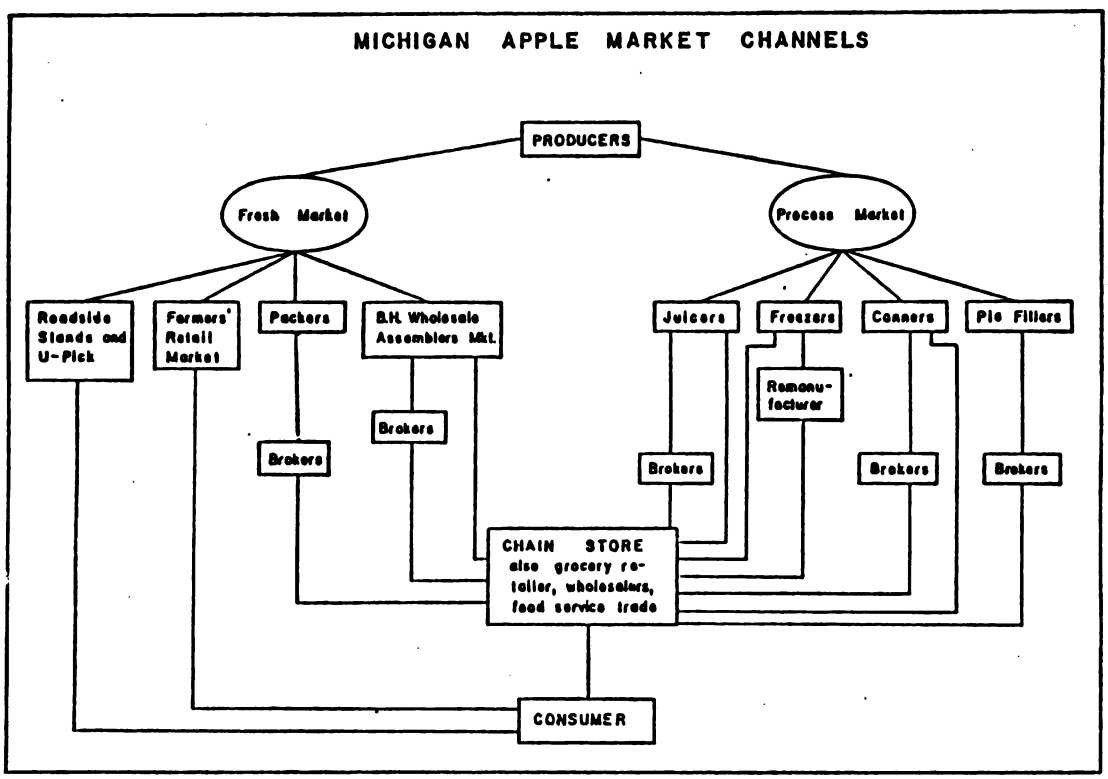
Before a thorough analysis of coordination performance can be made, it is useful to understand the organization of the fresh apple subsector and the behavior of its participants. The purpose of this chapter is to provide an overview description of the subsector, including major participants and their interaction within the marketing system, and to describe those coordination functions which are important for orderly marketing of fresh apples. Those problems which affect good coordination performance will be identified in this chapter; however, the analysis of these problems will be done in Chapter 3.

2.2 Brief Overview of Apple Subsector

The major apple producing areas in the U.S. include Washington, New York, Michigan, North Carolina, California and the Appalachian states which include Pennsylvania, Maryland, Virginia and West Virginia. Washington is by far the largest producer of both fresh and processing apples, while Michigan and New York produce many apples for processing as well as important amounts for fresh. Growers in all states may be described as atomistically competitive except where the structure in some processing markets is modified by bargaining associations.

Apple supplies may be channelled into fresh or

processed markets depending on variety, size, quality and relative prices for fresh and processed apples. Sometimes multi-year committments to processing cooperatives affect grower's allocation decisions (Figure 1).

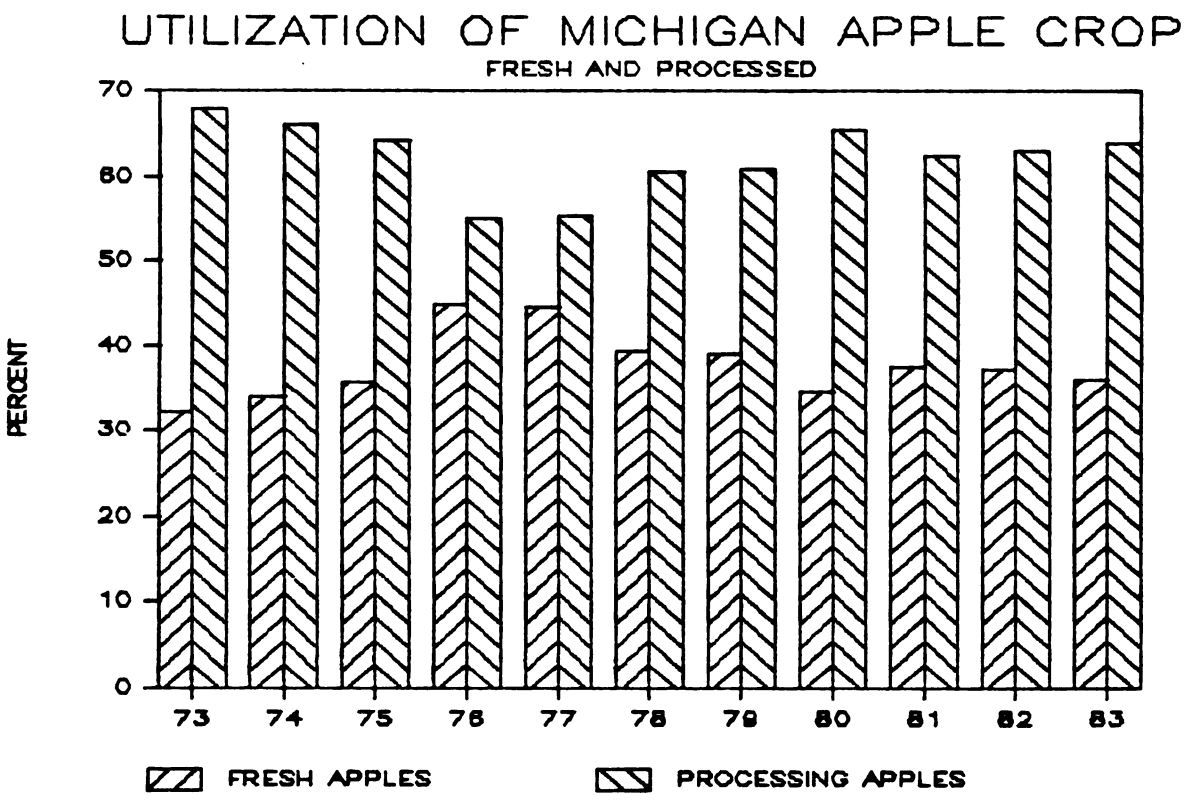


Source: Christy, R. and D. Ricks, 1981

Figure 1

Growers in certain states specialize in particular varieties depending on climatic and market conditions. Because of its comparative advantage for fresh market apples, Washington tends to produce varieties such as Red and Golden Delicious (Ricks 1977). Michigan however, produces many varieties including some which are primarily for the fresh market, some primarily for processing and some

which are dual purpose. Data reported by Apple Crop Statistics and Market Analysis (Butler 1985) show the percent of Michigan apples going toward fresh and processed markets (Figure 2). Although there is some variation in utilization, on average in recent years sixty-five percent of the Michigan crop has been sold for processing and thirty-five percent for fresh market use.



Source: Butler 1985
Figure 2

Market structure and behavior of participants varies depending on market channel and method of sale (Ricks, Christy 1981). In the fresh market, producer-first handler

linkages include fresh market consignment, wholesale cash market and direct to consumer marketing. Fresh market consignment from grower to packer is by far the most predominantly used method, especially in large crop years. According to experts in the subsector, over fifty-five percent of all Michigan fresh apples are moved through this channel. The consignment system of sales is the prodominant method used for fresh apple marketing in most states. With this method, FOB prices for packed apples are determined between packer-sellers and grocery buyers. Then, charges for packer's costs are subtracted from F.O.B. shipper prices received to determine grower returns for the consigned apples. The packing of apples for the fresh market includes the sorting out of those apples which will go toward processing. This research will focus on the consignment method of producer-first handler interaction due to its relative importance compared to the other market channels.

Other fresh market linkages between growers and handlers in the apple subsector can be briefly described. The wholesale cash market includes: 1. Orchard run sales[1] to packer-storage operators; 2. Wholesale markets such as at Benton Harbor or Detroit and 3. Sales to truckers by growers. Buyers in the cash wholesale market may buy apples to store for later sale, may act as buying agents for grocery firms, may operate roadside stands or may act as truckers for sellers in other produce markets. This arrangement is atomistic on the seller side and somewhat

oligopsonistic on the buyer side. Sales in this type of market have declined relative to total fresh sales in Michigan.

Another linkage for fresh apples is from producer direct to consumer via roadside stands, farmer's markets and "U-pick" enterprises. This market is atomistic on the buyer side although in some localities, grower-retailers may have some elements of a local oligopoly.

To best understand how the fresh apple subsector functions, it is useful to highlight the major functions of the participants. Most growers do not pack and ship their own apples. Generally growers produce the apples and bring them to a packinghouse. Some growers however do have their own storage and/or packing facilities.

Most growers rely on others packing operations for sorting, storing, cooling, grading, packing and selling of their apples. In Michigan there are forty to fifty shippers with even more packing houses. Most packers are also large growers who pack their own apples and those of other growers. Not all packers are shippers but most shippers are packers. Shippers generally ship for more than one packinghouse. According to local extension agents, Michigan has approximately twenty-six year round shippers while the figure jumps to forty to fifty in the fall. The additional shippers pack and sell apples only during the fall harvest period. In this study, the term packer/shipper is used to describe participants who perform the functions of both

packinghouse and of shipper.

Packer/shippers sell predominantly to retail grocery chains and to food service organizations. Retail outlets exert a substantial amount of market power due to their accessibility to the consumer. For this reason the behavior of wholesale/retailers is important in the coordination of supply and demand of the apple crop. Major wholesale/retail buyers are relatively few in number and therefore may be in a position to behave in an oligopsonistic manner. Prices in the retail market are determined by the retailer by adding a margin or mark-up to the price of product from the processor or handler to arrive at a partially "administered" retail price (Ricks, Christy 1981). Retailers are influential due to their role as gatekeepers, determining which products, suppliers and processors will gain access to their grocery stores.

2.3 Coordination Functions Necessary for Good Coordination in the Apple Subsector

2.3.1 Apple Quality Supplied Needs to Match Quality Demanded

The apple subsector needs to provide the type of product demanded by consumers. Informed subsector participants close to the consumer level such as shippers and retailers agree that producers, shippers and retailers need to work together to provide consumers what they want in quality and pack. The general subsector perception is that most consumers want large, red, crisp, non-bruised, good

tasting apples, with a preference by some for the Red Delicious variety. An increasing percent of consumers want to be able to purchase their apples from bulk displays so they may physically inspect the apples before purchase. Consumers generally do not want soft, bruised or small apples. Consumers who encounter poor characteristics in apples after purchase, such as soft or immature fruit, may no longer trust apples from a particular state, of a certain variety or from a particular store's produce department. Both characteristics which may be seen and those that cannot be seen by the consumer are important. According to certain retailers, consistency, uniformity in size within pack, long shelf life and other quality characteristics have become increasingly important for successful marketing of apples.

2.3.2 Risk Bearing

Risk should be borne by those subsector participants who can best minimize it or best bear it. Risk bearing should serve as an incentive to improve the quality of the product and the coordination performance. This usually means risk should be primarily borne by the participant who has most control over it. Risk should not be borne by those who cannot minimize it due to lack of control. Giving greater risk exposure to those who can minimize it will contribute to more orderly marketing since this risk will serve to encourage the participant to take measures to avoid the attendant losses.

2.3.3 Price Discovery

An effective price discovery process is needed for price to give the proper signals to subsector participants. Opening prices[2] should accurately reflect the price that the market will bear. Supply and demand information which is as complete as possible should be available to those who participate in price discovery to aid in making the most informed decisions. Shippers need to seek the strongest possible price that is still realistic to move the available supplies of their growers' product for effective price discovery from the grower's point of view.

Within season price fluctuations should reflect supply and demand conditions at any point in time. Prices should also reflect differences in quality and type of pack so that those producing the highest quality are rewarded for their efforts while lower quality is priced accordingly. Fluctuations in prices should not be eratic but should accurately reflect supply and demand conditions. Relatively stable prices are a sign of orderly marketing conditions.

2.3.4 Return on Investment

Producer prices should be sufficient to cover costs of production for typical well-managed firms. Typical well-managed producers should be able to cover their costs over the long run, as well as to earn a reasonable return on investment for their resources employed. However, those producers who do not produce the quality and pack demanded

should not receive the signal to continue to produce but rather should experience lower or possibly negative returns. These non-progressive producers need to be informed as to why their returns are low, otherwise they will not know how to gain a higher price for their apples. Supply and demand need to be equated so that resulting market prices are sufficient to cover the well-managed growers' costs. Coordination mechanisms are needed to improve subsector participants' ability to predict and adjust to shifts in demand and supply.

2.3.5 Flow of Market Information

Accurate and complete information on supply, demand and price needs to be transmitted up and down the vertical system. Information on consumer demand and supply conditions needs to be transmitted up and down in the vertical marketing system. Since retailers are closest to the consumer, they are in an advantageous position to understand the state of demand. Some Michigan retailers say however, that manufacturers, other suppliers and specialized market analysis agencies should analyze retail and consumer preference information. This information must be communicated back to the shippers, packers and growers. To complete this flow of information, the handler must communicate that information back to the grower in a meaningful fashion to aid in production and marketing decisions.

The producers are closest to the source of supply and over a period of years have substantial control over changing the level of supply as well as the variety mix and the quality. Accurate supply information needs to be available for accurate price decisions to be made in the marketing system. Supply information needs to be communicated forward to retailers and consumers by the marketing system.

2.3.6 Avoidance of Gluts and Shortages

Allocation of the apple crop to the various product forms needs to be consistent with demand to avoid gluts and shortages. Allocation of the apple crop between major markets such as slices, juice, sauce and fresh market is an important coordination function. Demand in each of these markets is subject to changing trends in preferences and consumption over a period of several years. Allocation must be consistent with these changes to avoid gluts and shortages in the various markets. Allocation to the different product forms depends on annual supply conditions and quality variations as well as consumer preferences.

2.4 Coordination Performance Problems in the Fresh Apple Market

The apple subsector, as with other perennial crops, has some special coordination problems associated with the long life of specialized assets (trees can live several decades)

and the long lag between planting and actual production. This long production period contributes to uncertainty of future supply and demand conditions. Mistakes are often made when attempting to estimate future market conditions. This uncertainty is exacerbated by the lack of effective long term supply/demand coordinating mechanisms.

An examination of coordination performance in the Michigan fresh apple subsector has identified the following problems which are particularly relevant to Michigan; however in some cases, the problems are common in many apple producing areas. These problems will be discussed in detail in Chapter 3.

1. Some of the U.S. apple subsector has been slow in adjusting to changing consumer and trade preferences regarding quality, size and pack. This has resulted in a mismatch of supply with demand for the type of apples most desired by consumers.
2. The current method of consignment sales for fresh apples puts most of the of risk of price and quality variability on growers who are not in the best position to minimize this risk. The consigning grower has virtually no influence on this risk nor ability to minimize it.

   Consignment to storage run by a packer means that if the packer uses poor storage practices the related costs and product losses will be borne by the grower, who has no control over these practices. The packer-

shipper bears little of the cost of apples that deteriorate in quality during storage. Since the grower price is determined at the time of sale of packed fruit between shipper and buyer, which may be one to nine months after harvest, monthly price variability and quality deterioration for stored apples creates variable and uncertain returns for growers. Growers typically bear all of this price risk.

3. The current price discovery system is hindered by uncertainty. Opening prices which are influenced by many shippers may not reflect the price the market will bear. Prices have in the past been set at unduly low levels by shippers trying to make a sale. Price discovery difficulties are magnified by the fact that consequences of unnecessarily low prices are mostly borne by grower/consignors of apples not by shippers who actually influence the price discovery. This problem is closely related to those discussed under consignment sales.

4. Michigan growers have been increasingly unable to cover their costs of production. Low prices received for Michigan apples have contributed to the low profit margins received by growers in the last four years. Low returns affect coordination performance since producers have neither resources to make necessary improvements in their orchards nor the capital to cover improved packaging techniques. In Michigan, growers do not seem

to have learned why their prices are low.

5. There are no effective mechanisms to match long run supply with demand in the fresh apple market. Supply is subject to unexpected shifts due to weather variability or unexpected changes in acreage. Demand shifts due to changes in consumer preferences are easier to predict; however, may also create uncertainties in the future supply/demand balance.

Without institutions to help match future supply with demand, imbalances frequently occur. These imbalances may lead to short run gluts or shortages caused by weather or to long run imbalances caused by acreage changes. The most predominant problem occurring in the fresh apple subsector over the past five to ten years has been chronic excess supply. This is an indication of poor long run coordination of supply and demand with excess supplies resulting in low prices and returns for producers. Low returns act as a further disincentive to producers to improve quality.

It is important to bear in mind the interrelatedness of these problems as they are discussed. These problems were identified through interviews with key subsector participants who were chosen with the help of extension staff who work with the apple industry. Some of the problems are particular to practices within the state of Michigan while other problems plague the entire U.S. apple subsector. Each problem will be

discussed in Chapter 3 as it pertains to the Michigan situation and in cases where information is available from other producing areas, the problem will be discussed as it pertains to these areas. In a number of cases, the Washington experience will be elaborated upon since Washington is the major apple producing area in the country.

CHAPTER 3

THE FRESH APPLE SUBSECTOR: AN ANALYSIS OF COORDINATION PERFORMANCE

3.1 Introduction

The purpose of this chapter is to describe and analyze coordination performance in the fresh apple subsector. Major coordination performance problems in the apple subsector will be presented with reference to the relevant structural and behavioral characteristics contributing to the problem. Current and past coordination mechanisms will be evaluated in terms of their effectiveness in accomplishing the necessary coordination. Alternative arrangements to improve coordination in the fresh apple subsector will be outlined.

3.2 Coordination Problems in the Fresh Apple Subsector

3.2.1 Problem 1: Quality and Pack Supplied do not Match Demand

Michigan and other apple producing areas have not adjusted the types of products supplied to match consumer preferences. This problem as described by knowledgeable subsector participants occurs because the Michigan apple subsector is adjusting slowly to changing market preferences in regard to quality, fruit size, and pack. To improve coordination and consumer satisfaction, Michigan and other states with this problem need to cater more closely to their

consumers' needs and preferences. Most consumers want uniform sized, generally large, red, crisp, non-bruised, good tasting apples. Retail outlets and consumers increasingly want more apples packed in tray-packs for bulk display. In contrast, Michigan apple marketing experts believe that too much of the Michigan apple subsector is producing apples of inconsistent, though generally small size, less than fully red, not always crisp and too often bruised apples. Most of Michigan apples are packaged in poly bags which lack uniform size of apples or quality within bags and often variable quality from one shipment to another. However, according to the Michigan Apple Committee, Michigan producers and shippers have begun to pack more apples in tray pack, moving in the last five years from approximately five percent to twenty percent of the total crop packed in this way.

Apples packed in bags are viewed by some retailers as low priced apples for the relatively few consumers who give high priority to price rather than consistently high quality. Both retailers' perceptions and market segmentation studies seem to indicate that consumers valuing price above quality are becoming less prevalent today.

One example to illustrate this point was described by a produce director of a major retail chain. Both high and low quality apples were offered in the produce department of several stores in Michigan. Farmer's market type bags were placed near the low quality, bulk displayed apples to

encourage consumers to choose these apples and carry them in the bags to the check-out. Most consumers, instead of using the bags for the low quality apples, carried the bags to the higher quality apple display and filled them with these apples. This is one example indicating that many of today's consumers are willing to pay higher prices for high quality apples.

To a large degree, the Michigan apple subsector's primary marketing strategies are aimed for a low-priced market segment which has a decreasing demand for bagged apples of variable quality. At the same time, some competing regions, such as Washington are marketing apples of the more desired quality, size and pack. These areas are capitalizing on the main growth portion of the fresh apple market.

Consumers' increased demand for fresh produce, including fresh apples, is primarily oriented towards high quality goods. A 1981 survey by Chain Store Age Supermarkets showed that when consumers were asked to rank those factors they viewed as most important in a grocery store, "Quality Produce" was listed as the highest priority in every market surveyed. "High Quality" was ranked ahead of "Low Prices" in this survey (Chain Store Age Supermarkets 1981,1982).

Increases in fresh apple demand are part of a general trend toward greater consumer interest in nutrition, diet and healthfulness. This interest has been encouraged by many national organizations such as U.S. Department of Agriculture and the Department of Health and Human Services

(Mclaughlin, Pierson 1983).

The quality characteristics which are important to successful apple marketing include size, condition (crispness), color, taste and degree of bruising. Of these, crispness and taste cannot be identified by looking at the apple. Presently, Michigan has a generally poor reputation for providing large, crisp and red apples. Factors affecting Michigan's ability to produce the type of apples consumers demand will be outlined.

The crispness of apples purchased by consumers depends on some factors which are controllable to a certain degree by growers. These factors include proper timing of harvest and quick delivery to storage. For an apple to maintain its crispness over an extended period of time, it must be picked at the appropriate stage of ripeness. Use of growth regulators such as "Alar" have lengthened the period of harvest which will provide top quality apples for long-term storage with crisp apples resulting. However, growers are still under great pressure to carry out harvesting activities in a short period of time to ensure crispness. This time pressure will be increased due to the Environmental Protection Agency's recent publicity leading to consumer scares and hence, in effect, an unofficial ban on the use of Alar by those in the trade.

Many Michigan apples are harvested at less than the ideal time needed to maintain the most crisp apples, especially for long term storage. Harvest at the ideal time

is a difficult job since most growers must harvest large volumes of apples in a matter of a few days with all the risks of variable weather. Key informants indicate that the factors contributing to the problem include: 1. Difficulty in getting sufficiently colored apples by the prime harvest time for crispness; 2. Too many apples to be harvested in a short time to assure good quality; 3. Inadequate communication between packer/shippers and growers regarding ideal harvest dates; 4. Poor management practices; and at times 5. Inadequate harvest labor.

Many in the apple subsector say that packer/shippers and retailers also contribute to this condition problem due to their less than ideal storage and handling practices. In some cases, storage rooms may not be filled and cooled or the proper CA (controlled atmosphere) conditions may not be established rapidly enough to ensure apples of the best condition. Sometimes temperature and atmosphere are not maintained well enough during the storage period. Shippers may take too long emptying apples from storage as well as packing and shipping them to maintain the best quality. Retailers in most cases display apples at room temperature and are not as careful as they should be when handling apples. One Michigan shipper noted that in some retail chain stores, over seventy-five percent of the store employees are part-time, with little incentive for ensuring quality of produce in the retail market. These retailer characteristics can hurt the quality of apples consumers

face in retail outlets.

The need to supply crisp, red apples can be especially challenging in some years in Michigan because apples may not gain sufficient color until after the optimum harvest date for maintaining ideal crispness during long term storage. A conflict sometimes arises when shippers encourage their growers to harvest their apples for color since this may not coincide with the optimum time for harvest to maintain top condition. Weather conditions and to some extent certain Michigan varieties contribute to this color/condition conflict. In many cases, producers must trade-off between color and crispness. High color "sports" (genetic mutations of particular varieties) are more likely to gain their red color early enough most years to allow for harvest for opportune crispness. Michigan growers have been planting more of these sports, especially of the Red Delicious variety.

Various tests have been developed to better signal the ideal time to pick apples. Condition and maturity can be monitered through pressure, ethrel and starch testing. Presently, only some Michigan shippers moniter their growers' apples using these techniques. The present system of grades does not indicate a precise condition rating although some individual shippers do use these tests both when the apples are still on the tree and at the time of pack[1].

USDA apple grades include extra-fancy and fancy. The

extra fancy generally signals a two-thirds red, regular shaped, unbruised apple with minimal defects. Fancy grade allows less red, more bruised, slightly misshapen apples (Antle, Johnson 1981). The other attributes of apples such as condition and maturity are not precisely graded. According to many shippers, grades set by USDA are lower than the standards at which these shippers pack and ship.

Most buyers demand higher quality apples than those that just pass minimum USDA standards. Therefore, many buyers and packinghouse sellers trade based on their own standards above the USDA grade. This is most common for the color characteristic. These unofficial standards will vary from packinghouse to packinghouse and from buyer to buyer. Currently, most Michigan shippers mix extra fancy with fancy grade apples and label them as fancy. It is clear that the question of apple standards is complicated, characterized by a lack of uniformity within the state and across the states and among various lots of packed apples.

Michigan has traditionally grown medium to rather small apples and packed them in plastic (poly) bags. In the 1960-1970 period, this was the main type of package demanded for fresh apples. In more recent years, demand by retailers and consumers has shifted increasingly toward larger apples packed in tray-packs. The redesign of the produce departments in retail outlets and to a lesser degree, the increased importance of food service organizations has increased the demand for apples in bulk form. Retailers, who

buy the greatest volume of produce, increasingly want more apples in tray-pack, with a decreasing percent in poly bags. Although there are consumers who are still willing to purchase bagged apples, a general consensus of retailers who were questioned agreed that the trend toward more bulk displays of larger, better quality products in the produce department is likely to continue.

The directors of the produce departments of two major retail outlets in Michigan were asked about the percentage of apples purchased in tray packs versus bags. One leading retail grocery chain in Michigan presently purchases approximately thirty-five percent of their apples in tray packs and sixty-five percent in plastic bags while another has shifted from purchasing only ten percent of their apples in tray packs in 1980 to purchasing twenty to twenty-five percent of their apple supplies in this form today. The percentages for tray packs are much higher for retail outlets in Washington D.C and other parts of the country. Produce buyers for the two largest retail chains in Washington D.C. estimated that seventy to seventy-five percent of the fresh apples they purchase are in tray packed cartons. According to these produce marketing experts, the general trend in most retail outlets in the U.S. is toward more bulk displays of produce requiring tray packed apples.

The directors of produce interviewed in Michigan agreed that if growers in the state could produce more high quality, larger size, tray packed apples, they would be

willing to purchase more tray packed apples from Michigan sellers rather than from Washington. More local purchases would mean retailers could avoid the high costs of transportation from more distant markets such as Washington.

The Michigan apple subsector has been growing and packing more tray pack apples in the last two years. There is however, some resistance to more tray pack apples by some growers and some packer/shippers.

Some of the reasons why Michigan growers have not produced more, larger apples that can be tray packed and why tray packs are not used more often have been explained by informed subsector participants in the following way. Some growers in Michigan argue that in the short run, production of larger apples is more costly and generates a lower return because of lower yields per acre than production of smaller apples. Prices for Michigan trays have been barely high enough or not high enough to justify the costs of growing for trays. To obtain large apples, special practices including hand thinning, require higher labor costs and result in lower yields. Some growers in western Michigan feel the price of tray packed apples should be five dollars higher than bagged apples to provide sufficient incentive for a grower to grow for tray packs. This price spread has not usually been achieved in the past for Michigan trays.

Progressive shippers believe that if growers produce larger apples of better quality, they will gain a higher return. The rationale for this belief is that once Michigan

apple producers and shippers establish a reputation within the grocery produce trade as consistant suppliers of trays, they will gain higher prices for their apples. This belief is substantiated when retailers do pay higher prices for high quality, tray packed apples from the well-established regions in this market. According to Larry Volink, produce director of Spartan Stores, "There's money in selling tray pack apples.....We're selling the heck out of them" (Anonymous article in The Great Lakes Vegetable Grower News March 1986).

A study was done by Thomas Pierson and Philip Schwaillier to examine packer/shipper handling charges including storage, packing and selling costs. The differences in grading, packing and actual package charges for bagged versus tray packed apples were documented. In the 1983-84 season, the additional charges incurred in packing for trays versus for bags equal approximately seventy-four cents per bushel (Pierson, Schwaillier 1984).

To determine the profitability of growing larger apples for the tray pack market, the additional costs for labor and other operating costs must be estimated. To be attractive to the grower, the price received for his tray packed apples would have to be greater than his costs, which include these additional input costs and any costs due to lower yields.

Prices reported by Michigan Market News for Red Delicious tray packed versus bagged apples can be compared in the 1985-86 season. The season average price (Sept.-

Dec.) for 125 size tray packed apples from regular storage was $8.94 per box while the season average price (Jan.-May) for the same size, same variety apples from controlled atmosphere storage was $10.23. In comparison, Red Delicious apples packed in 12-3 lb. plastic bags of grade U.S. Fancy or better, size 2 1/4" minimum, sold for $6.28 per box from regular storage (Sept.-Jan) and for $8.34 per box from controlled atmosphere storage (Jan.-May).

The price differential between Red Delicious apples in trays versus bags out of CA storage is $1.89, while the price difference between trays and bags out of regular storage is $2.66 for the 1985-86 season. It is important to note that a box of tray packed apples weighs four pounds more than a box of bagged apples (12-3's). However, at $6.28 for bagged apples, this is equivalent to a loss of $0.70 per box for Michigan trays. With the $8.34 CA price, this factor is equivalent to a loss of $0.93 per box. Subtracting these figures reduces the price advantage for trays to $1.96 from regular storage and $0.96 from CA storage. These price comparisons illustrate that for the 1985-86 marketing season, there was not sufficient price advantage from trays to create a positive incentive for growers to grow for the tray pack market. Although this is true in the short run, in the longer run, Michigan needs to aim for the growing tray pack market.

For a grower to choose to grow tray pack size apples, the additional costs incurred must be less than the price

differential so that returns to the grower are more than those from marketing bagged apples. One of these additional costs incurred with tray pack operations is for thinning the apples. Often, hand thinning along with the less expensive chemical thinning is necessary to produce larger apples for the tray pack. Further cost studies are presently being conducted to determine the feasibility of producing larger apples for tray packs in Michigan.

There are several other reasons why Michigan does not produce more apples for the tray pack market. In addition to the uncertain and in some cases insufficient returns to the producer associated with growing larger, high quality apples, some shippers do not encourage growers to aim for this market. Furthermore, the previously mentioned quality problems and low minimum quality grades prevent Michigan growers from becoming well established in the premium, tray pack market.

3.2.2 Alternatives to Address Problem 1a: Provide Adequate Supply of Tray Packed Apples in Michigan

There are various approaches which may be taken to encourage more of the apple subsector to switch to growing and packing large apples for the tray pack market. Some individual packers are deciding to pack and sell substantial amounts of tray pack apples thus building this market and Michigan's image in the trade. These packer/shippers can be influential in addressing this problem.

Packer/shippers can encourage growers to consistently grow tray pack size and quality apples. Packer/shippers can be instrumental in explaining the changing market preferences and long term trends for tray packed apples. Packer/shippers and cooperative extension can work together to explain to growers what steps are required to grow tray pack apples and how they can make this a profitable venture. Packer/shippers need to be sure to pack growers' tray pack size and quality apples appropriately and not mix these apples in bags with smaller sized apples.

Prices to growers for tray pack apples need to be sufficiently higher than for bagging size apples for there to be adequate economic incentive to grow for the tray market. Since many shippers expect that tray prices will increase relative to bagged apple prices once Michigan has become more established in the tray pack market, these shippers believe that the long run price prospects for this market are more favorable than past prices show and should be emphasized to growers. Some retailers in the state agreed that they would prefer to purchase tray packed apples in Michigan if the quality and supply were acceptable. The high cost of transport incurred when purchasing apples from Washington is an incentive to retailers to purchase more apples locally.

Packer/shippers should do everything they can to pay growers the highest possible prices for their tray packed apples. Presently, tray packing is not viewed as a viable

alternative by many Michigan growers due to the additional cost and decreased yield which occurs when switching from bags to trays. Until Michigan becomes well established in the tray market, returns from the sale of Michigan trays may be questionable. For this reason, low price signals to Michigan growers do not encourage them to move into this market, in spite of the increased growth in demand and higher prices received by other states producing high quality tray packed apples.

One alternative which could be used to encourage Michigan growers to move into the expanding tray pack market is through cross-subsidization. There is some evidence that some shippers actually charge prices higher than their costs for tray packed apples, which in effect subsidizes the packing of bagged apples. In setting the packer/shipper's charges and thus the grower's ultimate return, cross-subsidization could be used to favor trays rather than to favor bags. In this way, some of the costs of handling apples for trays could be spread out over the costs for bagged apples, making tray pack more attractive to growers.

Growers can take steps toward filling this demand for tray packed apples by committing some of their orchard blocks, especially Red Delicious, to be grown for tray pack size every year. In the short run, their returns may be lower for this tonnage than if it were used to grow smaller size apples; however, key informants believe that returns will likely be higher in the longer run. Growers who want to

sell tray packed apples need to sell these apples through a packer/shipper who is committed to a long-run tray pack marketing approach and who has a comprehensive and consistently effective tray pack marketing strategy.

In addition to not producing enough apples packed in trays, the Michigan apple subsector has other quality problems. Gaining a good reputation for larger, better quality apples which will earn growers a higher return is a goal held by some, but not all shippers. Poor quality, mixed quality in the same bag or tray and traditional methods of pack are some of the reasons for the low prices received by Michigan apple producers. Inadequate vertical coordination performance is the main consequence of these problems. Much of the apple subsector is producing apples for a declining demand and not producing the main type of apple wanted by buyers. Michigan has a difficult time obtaining prices for apples which make production worthwhile. Small, poor quality apples sold under the Michigan name perpetuate Michigan's bad reputation and erode consumer confidence in the product. Demand for high quality, higher priced, larger, bulk apples is not adequately reflected back to growers particularly in Michigan. For this reason, growers are reluctant to change their practices.

3.2.3 Alternatives to Address Problem 1b: Supply Quality of Product Most Demanded by Consumers

Producers, packers, and shippers need to supply the

type of product demanded by consumers at a price they are willing to pay. This may be accomplished in various ways which will be outlined below.

Alternative 1: Voluntary Quality Standards

The problem of not providing the quality of product demanded may be addressed in a number of ways. Voluntary quality standards could be used by some shippers. These standards could include a grade with specific condition requirements through use of pressure tests. Early season maturity requirements could also be graded through starch and sugar content tests. These same shippers could make use of fieldmen to moniter quality while the crop is still on the tree, to signal to growers when to pick and to moniter actual harvesting practices.

The recent organization of shippers into an informal association could provide the setting in which shippers could work together to design and apply these new grading standards and to encourage more communication between shippers and growers regarding quality problems.

Advantages of Voluntary Quality Standards

Voluntary quality standards allow shippers and growers to maintain their independence and ability to affect their own change without mandatory intervention. This idea can be implemented by progressive shippers to start without waiting and convincing those who do not want to change. If these

shippers obtain a higher price for their better quality pack, this system will encourage the best growers to want to use the shippers who can reward them more fully for their good quality. The best shippers will probably want the best growers. It may happen in this case that quality growers and shippers will gravitate toward one another. Shippers who maintain consistently high quality packs have the potential to convince retailers to buy from them. These voluntary standards may reduce somewhat the supply/demand imbalance for tray packed vs. bagged apples and encourage the production of apples as desired by consumers.

Since these grades are voluntary, they will not stir up as much of a fight from those in the subsector who do not wish to change and will not be viewed as interventionist by those in favor of free market competition. This method may be used as an initial step to prove the benefits, with a mandatory, industry-wide program later to remove the free-rider problem and obtain more significant results.

Disadvantages of Voluntary Quality Standards

Much variable quality, apples would still be produced, possibly pulling down Michigan's image, decreasing demand and pulling down price of better quality apples. It may be difficult to get shippers to agree on a uniform set of grades. Shippers and growers using the grading system would have to bear the whole cost incurred by the grading process, while the whole subsector stands to gain from the

improvements. However, to the extent that buyers know which shippers stand for top quality and are willing to pay a higher price for better quality, this free-rider problem may be reduced.

Alternative 2: Establishment of New, Higher Grade Standards

Another method of improving the fresh apple quality problem in Michigan is through development of some new, higher grade standards. A set of grades could be established which better reflect those attributes deemed most important by consumers such as condition and early season maturity. The new standards could include a grade for Michigan extra fancy and perhaps Michigan fancy with condition a part of grade. All apples could be inspected and labeled to facilitate pricing practices so that price differentials better reflect differing quality. These particular suggestions could be instituted through Michigan Department of Agriculture's administrative action on grades and inspection or through a state marketing order. These new grades could also be combined with voluntary shipper quality standards. The new, more precise set of grades would facilitate pricing. Producers growing superior quality would be rewarded while producers of poorer quality would be compensated accordingly.

Alternative 3: A State Marketing Order with Minimum Quality Standards

Advantages of the Marketing Order Solution

There are several advantages to the marketing order approach in terms of its ability to make significant improvements in providing apples that consumers demand. Since all growers and shippers would be included, the average quality of product moving to the market would be improved. Higher average quality should face a higher demand.

Disadvantages of Marketing Order

There are many disadvantages to using a marketing order in this situation. Firstly, a marketing order reduces subsector participants' degree of independence since opponents to the order will be bound to its jurisdiction. Instituting a state marketing order of this nature would require a lot of convincing of those who don't want to change. Those advocating no change could block initial changes from being made. Secondly, unless a federal marketing order is used, problems of variable quality from state-to-state will continue to complicate U.S. apple pricing. Thirdly, minimum quality standards may discriminate against those consumers who want lower quality produce at lower prices.

3.2.4 Problem 2: Inappropriate Sharing of Risk

Another major problem in fresh apple market coordination occurs due to the inappropriate sharing of risk associated with the consignment system of sales from producer to first handler. This system, which is predominant in almost all fresh produce subsectors across the nation, developed as a way for handlers to shift much of the risk associated with buying and selling perishable products in markets which may fluctuate widely. The highly perishable nature of fresh produce creates an environment of unusual uncertainty as to the quality of the product that will result after the period of production, harvest and storage.

The structure of the subsector as well as the incentives of the participants help to explain how the burden of risk is shifted. Shippers are fewer in number than growers and conditions of excess supply often exist. For these reasons shippers have the opportunity to shift some of the costs associated with apple deterioration in handling and in storage as well as the risk of market price fluctuations onto the grower. Since the shipper does not want to bear the risk of quality problems or market price fluctuations while the apples are in his possession, the consignment system provides the packer/shipper supplies by the grower but does not commit the packer/shipper to a price until after the sale of the packed fruit is made by the shipper to the retailer. This sale may not occur for zero to

nine months after harvest. The grower's price is then based on the shipper's FOB price minus the packer/shipper's margin (Figure 1).

Since Michigan growers' apples are put into storage in bulk form, ungraded and unpriced, the grower must bear the risk of market price fluctuations and deterioration that may occur during the storage and packing period. This problem is partly related to the quality problem above since many grades of apples are stored however the apples are not usually graded before storage (at least in Michigan). Apples which are of excellent quality when put into storage may emerge as average quality due to storage management problems. The grower has little ability to minimize these risks since he no longer has control over the apples once they go into storage. However, after a bad experience, a grower can switch to another packer/shipper or storage operator.

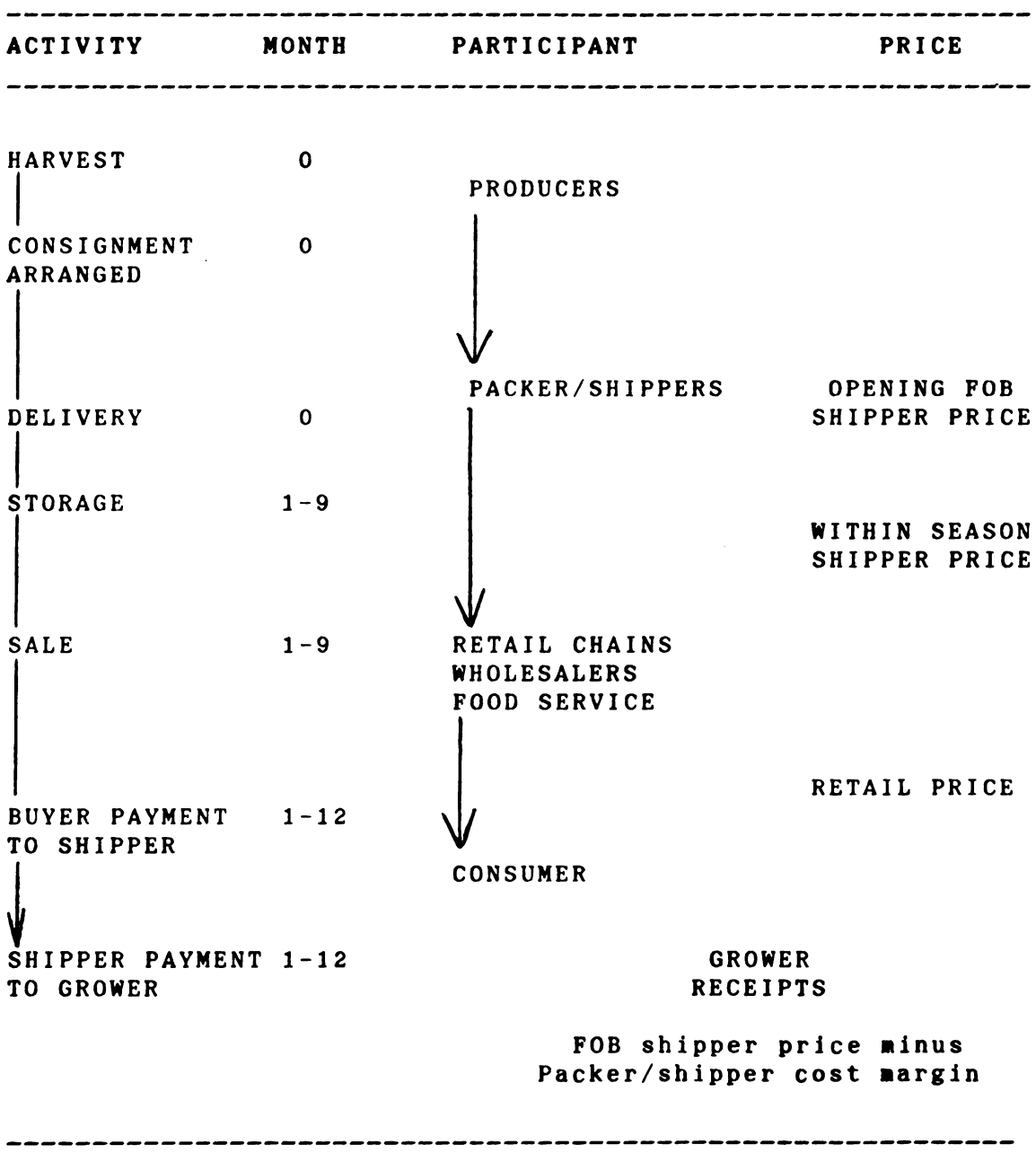
Often there is a lag between the sale and the payment by the retailer to the shipper. This lag further delays the payment to the grower. When growers are not paid promptly, they must incur higher costs of financing the reduced cash flow of their operation.

Since shippers receive a relatively fixed margin per bushel for handling, packing, storage and other charges, their net returns are mainly dependent on the quantity handled. Shippers' returns could be inversely related to price received if a higher price were to reduce volume sold.

FIGURE 1

FRESH APPLE MARKET

CONSIGNMENT SALES SYSTEM



This aspect provides little incentive for packer/shippers to work at getting higher prices for their growers' apples. Some shippers often take the easy alternative and reduce price as a competitive action to gain buyers and sales volume. This can result in less than the best possible price for growers. Shippers receive their fee regardless of price, while they do receive less if they move less quantity.

The consequences of this problem affect vertical coordination performance in the apple subsector. Growers bear almost all of the price risk and risk of deterioration while apples are in storage with almost no ability to do anything about it. The incentive system for shippers can encourage inappropriate actions which are detrimental to the growers and to coordination between participants.

Growers can shift from a shipper who the grower perceives to be performing poorly to a stronger shipper. However, since information is not always freely transmitted in the fresh apple subsector, growers may not always have the necessary information required to find the shippers that do the best job storing their apples, communicating quality problems or obtaining higher prices. For this reason, competition among shippers does not always serve to improve shipper performance in the fresh apple market.

Low and variable returns and delayed payment to growers sometimes make them angry at shippers and less willing to work together on changes which are needed for better performance and which need cooperation by both groups. Low

returns can also inhibit growers from making needed changes such as to improve their quality, to modernize their orchards etc. This situation can accentuate the image of low price and low quality because of the incentive of shippers to cut prices to get the business with little regard for the real supply and demand situation.

3.2.5 Alternatives to Address Problem 2: Place Risk on Those Who Can Best Minimize it

Growers should and do bear the risk for those aspects of apple quality within their control. Size, variety, color, degree of bruising at harvest, insect and pest damage and some aspects of condition are to some extent within the grower's control. With proper testing equipment and feedback from the shipper, the grower is in a position to influence to a substantial degree the risk of poor quality in regard to condition. Bearing of this risk acts as an incentive to the grower to produce the best apples possible. Performance in this aspect of apple production has been good in Michigan and other production areas. As long as packinghouses pay their growers individually, according to their pack-out[2], which is an almost universal practice for fresh apples, each grower will be rewarded or penalized for his quality efforts.

To improve coordination performance and to minimize the costs that fall on the grower over which he has no control, there should be a cut-off point when the shipper/storage

operator takes responsibility for the deterioration which may occur while the product is in his care, and bears the risk of market price fluctuations. Since the shipper has more control over his own storage practices and can decide when is the best moment to sell apples to gain the best prices, it is more logical that he bear these risks.

For some of Washington state's apple tonnage, the apple crop is graded and sorted before going into storage. Tests for condition are voluntarily applied by some shippers and only the higher grades are put in storage. Washington growers are less vulnerable than Michigan growers to risks of deterioration in storage since the quality of the apple is recorded upon entry to storage with only top quality allowed. Michigan stores apples of varying qualities and these are graded just prior to sale to the retailer.

Improving the quality of apples put into storage perhaps by only storing the better grades could improve Michigan's quality reputation and decrease the risk for growers. Grading the apples before storage would establish the state of the product as produced by the grower. This is important for both fresh and processed forms of apples. Holding the shipper/storage operator liable for damages occurring over the storage period will serve as an incentive to improve storage techniques. However, it is also important for growers to harvest at the opportune moment to ensure a long storage life.

A grower should be encouraged to question the shipper's

practices and offer input as to how his apples will be handled, stored, packed and sold. Shippers should encourage more grower interaction since the fruit technically still belongs to the grower. According to key apple experts, most shippers do not encourage grower input. The situation is slowly changing; many growers are becoming more involved with their shippers since they lost money in their apple operations in the last four years.

Further improvements to minimize risk and improve vertical coordination could be made in the following ways. Shippers could charge a percentage sales fee for their services rather than a flat rate per box. This would raise shippers'incentives to get a higher price for their growers' apples since they would also be rewarded with a percent of the higher price.

Another possible method is for shippers to pay growers an agreed upon price at harvest for various grades of packed fruit. In this way the shipper takes more of the price risk. If the apples were graded before storage, the packer/shipper could more logically bear the risk of deterioration during the storage period.

Advantages to Reallocating Risk

Making the participants in the various stages of the apple subsector liable for the costs over which they have control will lead to better performance within those subsector stages. For example, placing the cost of

deterioration of apples in storage on the storage operator will encourage better storage management techniques. However, placing more risk on the shipper will likely lead him to raise prices to compensate for this additional risk bearing.

Another alternative is for more producers and shippers to agree on a price at the time of harvest. These alternatives will give more incentives to shippers to maintain apple quality in storage and will more evenly distribute the uncertainty of price fluctuations with shippers bearing more of the variable price risk.

Disadvantages

It is doubtful that shippers will voluntarily take on more risk since they are protected from losses by not incurring risk. A system to grade apples before storage may increase the costs of handling and may result in more bruise damage due to increased handling of the apples. Few Michigan shippers are equipped for efficient pre-storage grading, therefore additional costs would have to be borne by them.

3.2.6 Price Levels, Seasonal Patterns and Price Variability Importance to Orderly Marketing

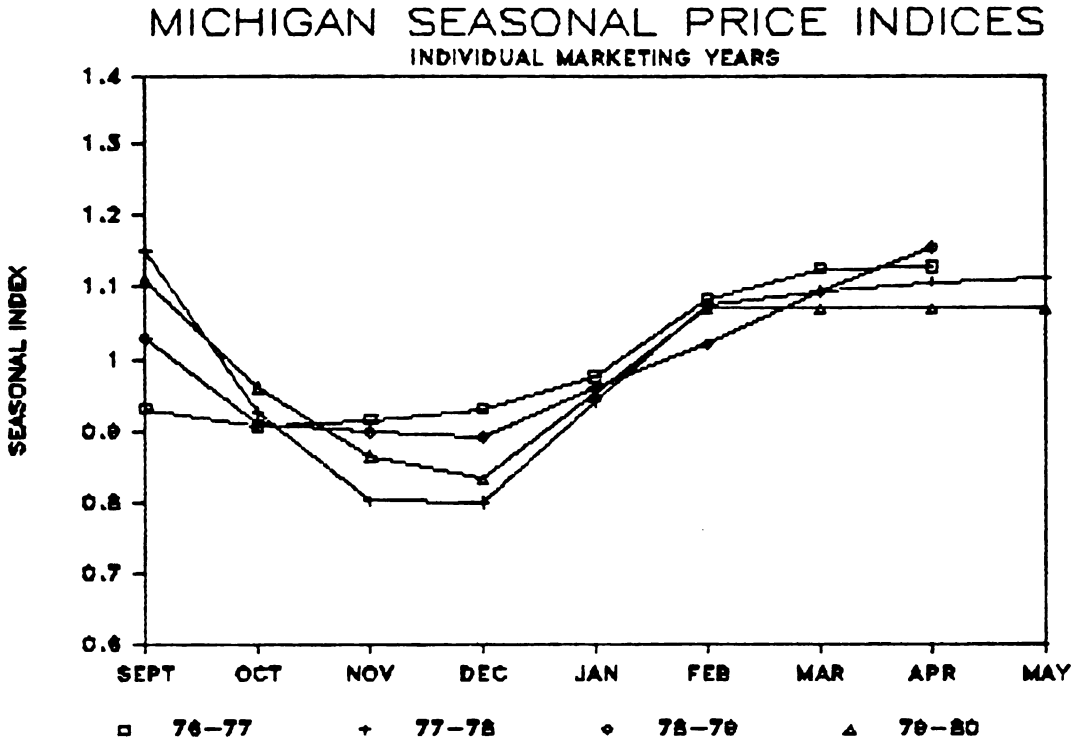
The analysis of risk and market coordination will be more complete with a closer look at average annual apple price levels, seasonal patterns and variability of monthly prices over the period of harvest and storage. Comparison of

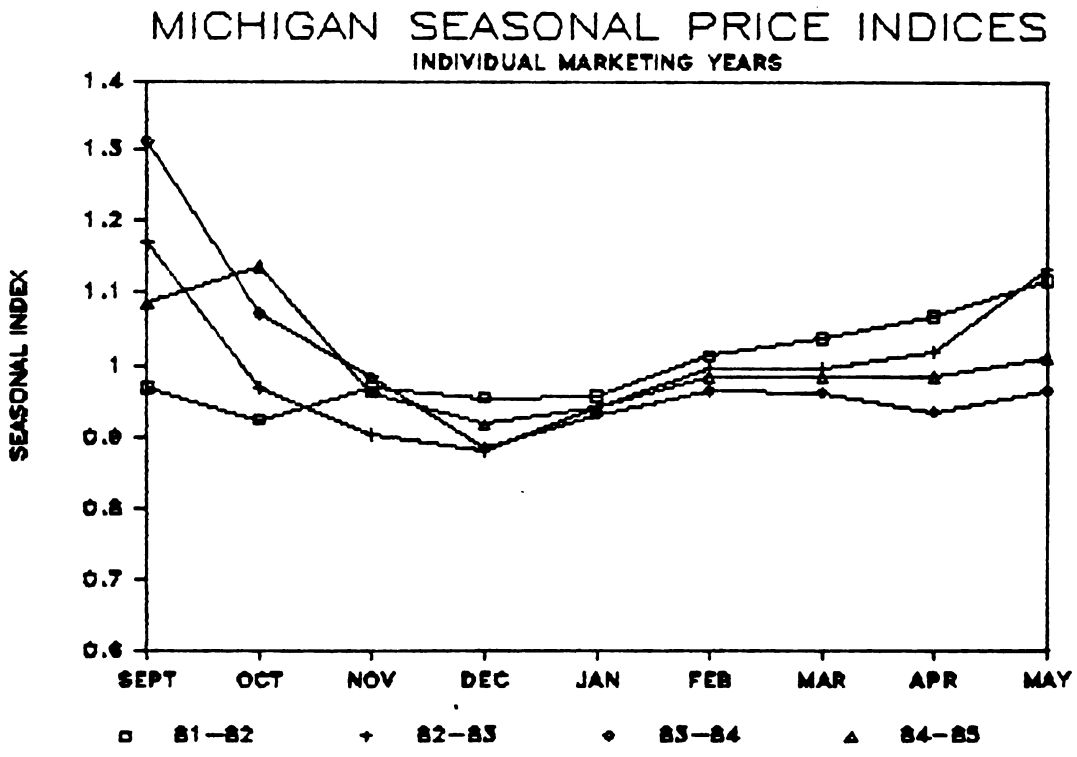
prices in Washington and Michigan apple producing areas will be made.

Average FOB shipper price levels are important since higher season average prices will allow producers a greater chance of covering costs of production. Average undeflated price levels in Washington and Michigan over the period from 1977-1984 are compared. Washington averages $11.02 per bushel while Michigan average price was $7.06 for the same period. Consistently higher prices received for Washington apples may be the result of good vertical coordination performance. Washington has been able to produce good quality, large apples suitable for the growing tray pack market. These apples command a higher price at all levels in the marketing system. With higher grower prices, producers are more apt to cover the costs of production and to make additional orchard improvements.

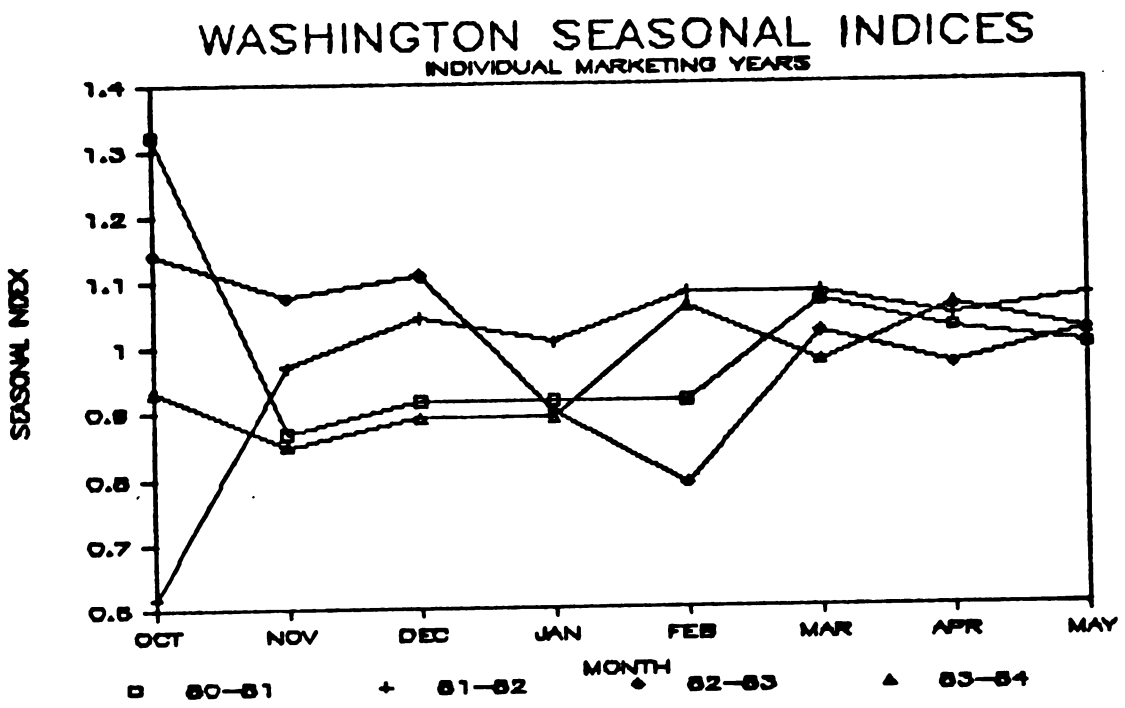
The seasonal patterns of Washington and Michigan monthly shipper prices are examined by dividing each month's price by the season average price (Figures 2a-c) (Market News Reports and ERS/USDA statistics 1977-1985). These figures show seasonal indices for individual marketing years over the period from 1977-1984.

Construction of these seasonal indices for both states show that over the period from 1977-1984, Michigan prices seem to follow regular patterns with high prices in September, declining until December, increasing when apples from controlled atmosphere storage come out in January and





Sources: Market News Reports, USDA/ERS Statistics
Figure 2a and 2b



Source: Market News Reports, USDA/ERS Statistics

Figure 2c

leveling off near the season average price in May. However, in the years 1983 and 1984, the Michigan seasonal price indices for March through April are lower than the indices for March through April in the earlier years. Since relative prices in 1983 and 1984 for Michigan CA stored apples are no higher in May than they were in February, it did not pay the individual grower to store Michigan apples in controlled atmosphere storage in these years.

Seasonal patterns are more difficult to observe in the

Washington price data. Washington prices seem to be below their season average price from October to February and above or near the season average price from March to June. Seasonal price patterns for apples, when predictable and somewhat regular, can be useful to producers and shippers when making marketing decisions. Regular seasonal price patterns may be seen as expected price variability.

The degree of monthly and annual price variability for apples is an important indicator of coordination performance in the subsector. According to our description of coordination in the apple subsector, a certain degree of price stability is desired for orderly marketing conditions.

Although we do not have a standard for indicating when prices have become too variable for orderly marketing to occur, we can make the following statements regarding price variability.

1. As annual grower price variability rises, there is a greater chance that grower prices in a particular year will be less than costs of production Our criteria for orderly marketing suggest that problems arise when producers cannot cover their costs of production. Negative returns, due to intra-annual price instability, may discourage production or may send the wrong signals to producers about long term demand;

2. Increased variability in grower prices affect grower profitability. Since many improvements depend upon a grower's profitability, increases in price variability may

affect a grower's ability to make improvements which will result in better quality and/or improved coordination. More variable prices lead to uncertainty which may discourage further investments. Decreased investment decreases the chances of improving apple quality to best match consumer demand;

3. Variability in grower prices may be due to poor coordination in releasing apple stocks from storage or to poor storage or handling techniques. Prices which vary due to these factors may send the wrong signals back to growers regarding consumer demand. These wrong signals may lead to inappropriate investment decisions which lead to a quantity produced that does not match the effective demand.

After examining graphically the seasonal patterns for both Michigan and Washington fresh apple prices, we may mathematically measure the degree of instability of monthly and annual prices. Annual and monthly apple price variability can be measured using the INS measure of instability developed by Ian Dalziell (Dalziell 1985 pp.49-55). The INS measures instability as the variance of the percent change from one period to the next. The INS will be applied to monthly and annual apple prices to determine the degree of price instability both within the year and over the period from 1976-1984. The formula for the INS index is as follows:

$$VAR\ (dP/P)$$

$$\text{where } dP/P = [P_t - P_{t-1}/(P_t + P_{t-1})/2]*100$$

The INS measure has overcome some of the shortfalls of other measures of instability. In particular, the INS: 1.uses the midpoint of the change as the base for calculating the percent change between two periods, therefore giving equal treatment to increases and decreases in prices; 2. detrends the series so that instability apart from any constant percent increase or decrease can be seen. Trends are less important since we assume that a producer can respond to a constant percent increase or decrease but will have more difficulties if price changes are highly variable; 3. gives more weight to short run changes so is useful for month-to-month analysis; 4. is unitless, therefore instability can be compared across crops. This is useful for cross-subsector comparison.

The INS measure is applied to monthly FOB prices for Red Delicious apples in Washington and Michigan. Washington prices from October to June and Michigan prices from September to May were used. The period from 1976-1984 was used for both states; however, missing data in 1979 prevented use of these prices for construction of the INS index for Washington in this year. Missing data for October through December biased the 1980 Washington INS downward and biased the average monthly INS over the period for Washington upward (Figure 3)

Table 3.1 shows the results of the instablility measures. The INS for average monthly price instability over the nine year period is 125 for Washington and 55 for

TABLE 3.1

INS ANALYSIS OF APPLE PRICE INSTABILITY

MICHIGAN AND WASHINGTON FOB SHIPPER PRICES FOR RED DELICIOUS

INS MONTH-TO-MONTH (M-T-M)

	MICHIGAN	WASHINGTON
1976	NA	144.45
1977	13.63	38.04
1978	125.22	52.74
1979	52.52	NA
1980	72.03	9.63
1981	9.99	220.00
1982	67.83	312.06
1983	61.18	159.65
1984	39.18	63.46
AVERAGE INS M-T-M	55.20	125.00
INS YEAR-TO-YEAR	159.68	432.39

INS MONTH-TO-MONTH - Index to measure the variance of the percent changes in price from month-to-month.

AVERAGE INS M-T-M - The average month-to-month variability in prices over the nine month season calculated for the period 1976-1984.

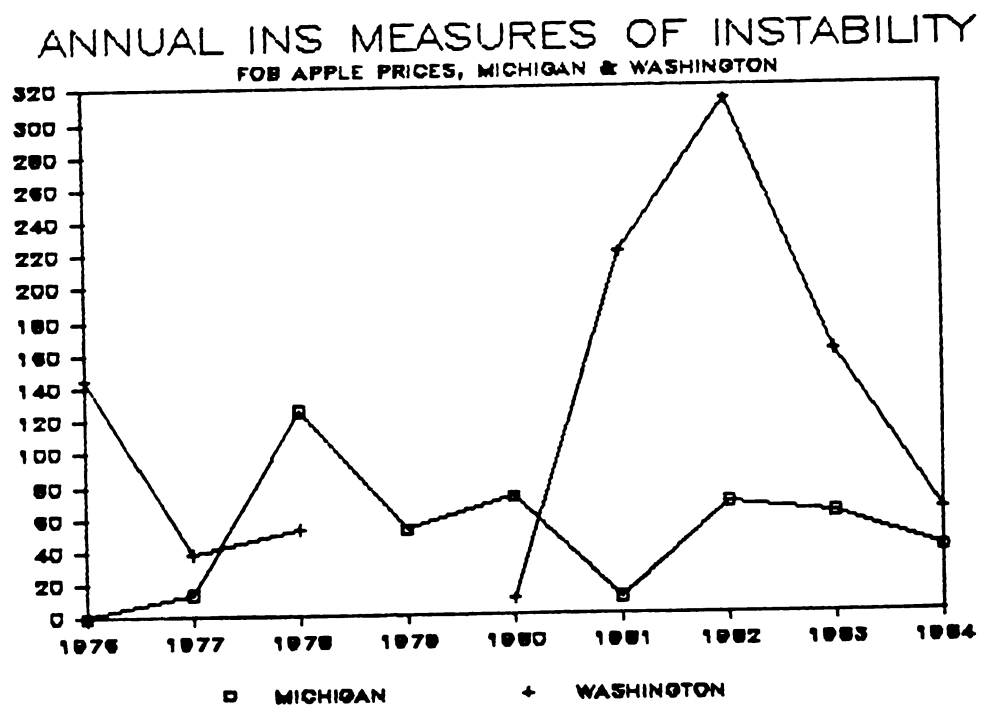
INS YEAR-TO-YEAR - Index to measure the variance of the percent changes in annual price from year-to-year.

Sources: 1.USDA/ERS, 2.Federal/State Market News

Michigan. The plot of the INS over the years for both states shows Washington prices to be relatively unstable in 1981, 1982 and 1983 when compared to Michigan prices.

When the INS measure is applied to annual prices, Washington annual prices are almost four times more unstable than Michigan's. In both states, annual price instability is greater than monthly price instability.

The differences between the INS measures in the two states are somewhat surprising since it is assumed that Washington prices strongly influence Michigan prices. The relative stability shown by the Michigan INS measure is also puzzling since one of the major coordination problems cited in the Michigan market involves pricing difficulties and the lack of complete information necessary for pricing decisions.



Source: USDA, Market News and USDA/ERS Statistics
Figure 3

A plot of Michigan INS over the nine year period seems to follow a pattern with greater price instability occurring in the larger crop years of 1978, 1980, 1982 and 1983. This would indicate that prices fluctuated more from month-to-month in years when ample supplies were available. Washington's INS does not seem to correspond to Washington's production figures.

This price analysis is limited due to the short period of time considered, the incomplete knowledge regarding factors affecting Washington prices in the years when variability is highest and the missing data in one series which biases the Washington INS upward. In spite of these limiting factors, measuring instability with the INS is one way to help us understnad price fluctuations. The INS measure may be used to compare intraannual and annual price instability across states and across crops.

It is important to note that some apple marketing experts believe that within season price variability is not necessarily bad. Some Michigan growers think that more variability to balance higher late season CA costs would actually improve coordination performance.

3.2.7 Problem 3: Ineffective Price Discovery System

For fresh apples handled on consignment by a packer/shipper, there are no definite grower prices at delivery time. Price is determined at the pricing point between the packer/shipper and the retailer or other buyer

(Christy, Ricks 1981 p. 19)(Figure 1). Grower price is determined by shippers who act as sales agents for consigning growers. There are many shippers quoting prices based on their expectations of market conditions. The resulting price depends on their perceptions, bargaining skills and influence in the market (Halloran 1981 p. 5).

It is important to distinguish between opening prices and within season prices. Opening prices are those determined by shippers at the start of the season, for example, when the first Michigan apples are harvested and sold in late August-September. Within season prices are those which are formed through competition between shippers searching for buyers and buyers seeking supplies throughout the season. The factors affecting both opening price and within season prices include: size of apple crop in competing areas; size of crop in Michigan; inventories; quality; and expectations of demand. There is a lack of information to be used as input in the negotiation process at the beginning of the fresh apple marketing season (Halloran 1981 p.6). This makes the discovery of opening prices particularly difficult.

It has been alleged by subsector participants that opening prices, set by influential shippers, are sometimes lower than the price the market will bear. Sometimes prices are set too low due to the varying objectives of the packer/shippers or due to a lack of information. Some shippers only sell for other growers and do not grow their

own apples. Other shippers grow some apples and pack and ship for other growers as well. The priorities of these two types of shippers may vary. Those who grow most of their own apples which they ship may attempt to get the maximum price for their apples. Those who do not grow apples are more concerned with moving volume to maximize their total revenue (flat fee per bushel * bushels sold) earned through the consignment system which increases with increases in volume not with price.

This problem is closely related to the previous problems surrounding the use of the consignment sales system. Since growers have little input in the negotiations for price, some shippers, especially those who are not also growers, may use price reductions as a way of protecting themselves when in doubt about how high a price the market will bear. Shippers have relatively little incentive to raise prices. Growers do not always have the necessary information or flexibility to search for those shippers who will earn the highest prices for their apples.

The current price discovery system for fresh apples is hindered by uncertainty due to lack of complete knowledge of supply and demand conditions which would better indicate the equilibrium market price. The published market information available today is reported in averages or ranges over a period of time. This information is not as up-to-date as is needed.

Another facet in the price discovery problem can be

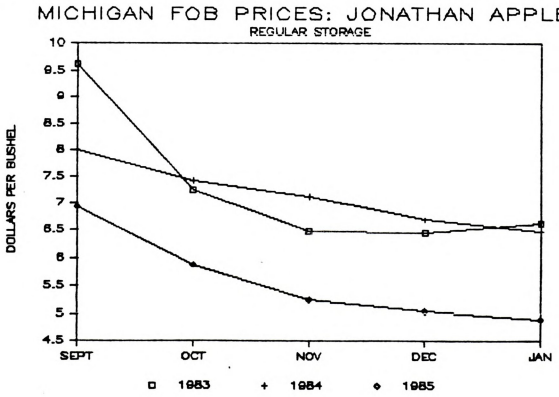
attributed to the structure of the first handler and retail levels within the subsector. Some in the apple subsector say that there are too many sales agents (shippers) competing for the same big retail buyers. Unless shippers have strong bargaining power, apple prices tend to spiral downward.

The consequences of this ineffective price discovery system are similar to those stated when the price risk is borne by the growers. Opening prices sometimes tend to be lower than the price the market will bear. Unduly low opening prices tend to influence prices in a low fashion over much of the fresh apple marketing season.

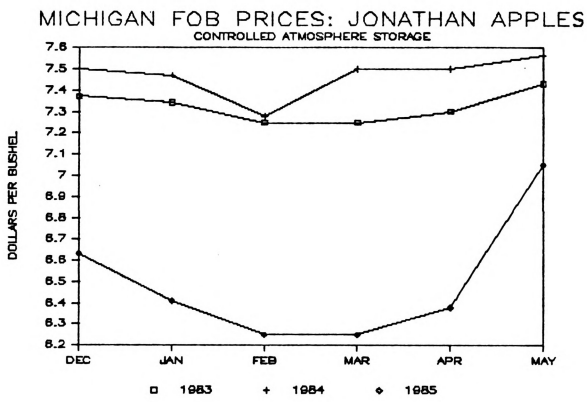
Within season prices received for stored apples based on incomplete information regarding amount of apples in storage of particular varieties may result in mistakes made in price discovery. The problems that occur without such information available can be illustrated by the following example. There is sometimes confusion among Michigan shippers as to the amount of each variety available in the various storage facilities at any one point in time. In the 1985 season, Michigan had a large apple crop with ample supplies of Jonathan apples, while supplies in certain other producing states were low. In this situation, prices for Michigan's Jonathan apples should have been on the high side; however, these high prices did not occur in 1985. The reasons for unnecessarily low prices in 1985 may be explained as follows. One influential shipper quoted a low price in August for Jonathans to be delivered to a buyer in

October. This same shipper had substantial supplies of Jonathans in his regular storage while most other shippers in the state did not. These other shippers, oblivious to the fact that Jonathans were still available in regular storage, opened up their controlled atmosphere storage. Generally, all the apples from regular storage should be sold before CA storage is opened since apples do not keep as long in regular storage as in CA storage.

The combined effects of quoting a low price early in the season and of opening CA storage of Jonathans before those in cold storage were finished led to depressed prices for all Michigan Jonathan apples in the 1985 season. The existence of regular storage apples pulled down the price of



Source: USDA, Market News
Figure 4a



Source: USDA, Market News

Figure 4b

This example illustrates how lack of information regarding amounts of stored apples by variety can lead to pricing problems. The many apple varieties available in Michigan, each with its own schedule of harvest and storage, complicate Michigan's marketing problems and create a need for more market information to improve price discovery.

3.2.8 Alternatives to Address Problem 3: Improve Price Discovery System

To improve price discovery procedures, growers should

have more input in the formation of price and more market information should be available to growers and shippers to aid in price discovery. This could be accomplished through grower organization in the form of a grower's clearinghouse. The clearinghouse would function to provide more complete, up to date information for growers and shippers. This would serve to influence price by quoting daily or weekly prices and supply/demand information. A clearinghouse system could improve communication among growers, among shippers and between growers and shippers. The Market News Agency could serve as headquarters for this clearinghouse or it could be done by a separate organization.

All shippers would report to a central office on prices, movements and availability of each variety in storage. Weekly meetings could be held with key shippers in the Michigan apple area. A newsletter with this information could be circulated to all growers and shippers on a bi-weekly basis. A recorded telephone message would be used to provide growers and shippers prompt and accurate market information. This additional information would aid in price discovery and would strengthen the market so that price is a closer reflection of supply and demand conditions. Similar clearinghouses in other producing areas could be linked together for better interregional communication.

A clearinghouse in the Wenatchee region in north central Washington has increased the flow of market information to growers and shippers to aid in price

discovery. However, the clearinghouse does not seem to reduce Washington apple price volatility as seen in the INS measures for Washington price instability. This clearinghouse, established in 1941, functions as a service organization, sponsored, financed and directed by the growers in this region. Grower/members are assessed per bushel of fruit to cover administrative costs.

The clearinghouse performs some important coordinating functions. 1.) Market information is collected and disseminated on apples, pears, peaches, apricots and other fruits. Market bulletins are published once a week and mailed to grower members and shippers; 2.) Although the clearinghouse does not set prices, its policy committee may use its influence to encourage shippers not to sell at unduly low prices 3.) The clearinghouse considers legislative changes and their affect on the industry.

The clearinghouse is voluntarily supported by the majority of growers in this region and provides an organization to collectively influence public policy. (Washington Growers' Clearinghouse Association, undated).

Advantages of the Grower Clearinghouse Alternative

More complete market information regarding prices, movements, storage, marketing trends, etc. would aid shippers in price discovery. If the additional information more accurately reflects the supply and demand situation, then prices would send more appropriate signals to growers

to guide their investment and marketing decisions. The clearinghouse could reduce the problem of the same size and quality apples being sold for different prices in the same area. Grower/member participation in the clearinghouse contributes to the price discovery process. Growers collectively may influence shippers' prices and thus gain a small degree of countervailing power in the pricing process.

Disadvantages of Grower Clearinghouse

There are several disadvantages to the clearinghouse alternative. 1.) Unless the present grading system was improved, then variable quality within grades would still result in pricing problems. Mandatory inspection and labeling might improve this, however, the clearinghouse alone can not solve the quality problem; 2.) Organization and maintainance of a clearinghouse would involve some costs, with the cost falling on growers who may or may not be willing to pay. However, relative to the gains from a clearinghouse, these costs may be low; 3.) If participation was voluntary, some growers or shippers may be unwilling to participate. If they do not participate, market information would be weakened and the free rider problem would prevail; 4.) There is no guarantee that information reported to the clearinghouse would be accurate. There may be incentives to give misinformation for opportunistic reasons.

Other Possible Alternatives

There are several other alternatives which may improve price discovery in the apple subsector. 1. A system in which shippers take some of the price risk by promising the grower a definite price per packed box before grower delivery. This might be brought about and influenced by bargaining as in the processing market; 2. Changes in the structure and marketing strategies of shippers to emphasize quality, dependability, and service more than price cutting as their primary competitive strategy; 3. A grower cooperative similar to the Michigan Celery Promotion Cooperative which compiles market information and quotes price on a regular basis which all shippers must pay to growers; 4. A shipper organization or traffic association to improve market information; 5. A grower association to influence and set price guidelines for shippers' prices and price discovery. This could be a cross between a growers' clearinghouse and a bargaining association; 6. A large efficient fresh market cooperative like Sunkist or the Michigan Blueberry Cooperative to facilitate the marketing and sales functions for fresh apple producers; 7. Use of electronic information services such as PRONET could be useful on a nationwide level if more producers, shippers, retailers hooked in to the system. This method of information dissemination is not widely used in the apple subsector at this point.

3.2.9 Problem 4: Negative Returns

Some subsector experts allege that grower price is not always sufficient to cover total costs of production. A n analysis of costs and returns can shed some light on how various performance problems affect growers. Costs of production studies done by M. Kelsey and others were used to calculate the profitability of apple production in south-western Michigan, one of the major producing areas in the state. The cost figures were obtained through small group discussions with growers from this area. These growers described common growing and harvesting practices as well as prices paid for inputs used by average producers in the area. These costs are not average costs for all growers since costs vary from farm-to-farm.

The costs were calculated for a hypothetical farm of one hundred acres of diversified tree fruit, with forty acres of apples. Costs are divided into variable growing and harvest costs and fixed costs. Variable harvest costs are assumed to be constant for different yields; however, cost per bushel is expected to increase somewhat for yields less than 400 bushels per acre and decrease for yields over 400 bushel per acre (M. Kelsey 1971).

Similar cost studies include Kelsey, Harsh, Belter 1971, Kelsey, Ricks,VanDerBeck 1977, Kelsey, Johnson 1979, Kelsey, Bradford 1985. Using these four years where costs were calculated in the previously described manner, a cost of production series was constructed. The index of prices

paid by farmers was used to interpolate fixed, variable and total costs for the missing years in the period from 1970-1984. Since each cost study reported variable and fixed costs under varying yield conditions, the most appropriate cost for a given year was that cost associated with the yield figure closest to the actual yield.

The season average prices of the commercial Michigan apple crop for the period 1970-1985 were compared to total cost figures to obtain an estimate of grower returns. The percent of fixed costs which producers were able to recover after payment of operating costs was examined. All figures were converted to cents per pound basis to facilitate calculations. Prices and costs were deflated by the consumer price index (Table 3.2).

The data reveal that prices were less than total costs every year from 1980 to 1984. Negative grower returns were also earned in 1970, 1971,1972,1974 and 1975 (Figures 5a and b). These findings were consistent with explanations given by extension agents in western Michigan who work closely with the producers in this area.

The percent of fixed costs recovered by growers was calculated for each year in the period 1970-1984 (Table 3.3). This table shows that growers had difficulties covering their fixed costs both in the early 1970's and early 1980's.

Michigan prices for fresh apples have shown a downward trend while costs have increased over this period. Today's

TABLE 3.2

MICHIGAN GROWER RETURNS

SEASON AVERAGE PRICES AND COSTS OF PRODUCTION

1970-1984

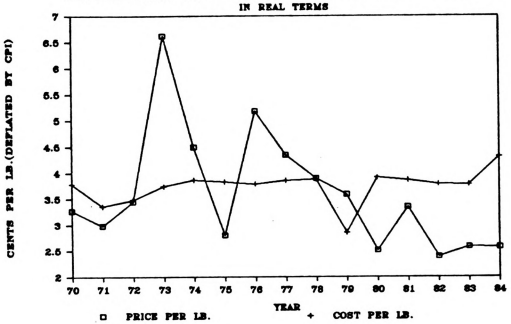
YEAR	MI.PRICE	VC	FC	TC	P-VC	P-TC
1970 *	3.27	2.75	1.04	3.79	0.52	-0.52
1971	2.98	2.18	1.17	3.36	0.80	-0.38
1972	3.44	2.26	1.22	3.48	1.18	-0.04
1973	6.62	2.43	1.31	3.74	4.19	2.88
1974	4.49	2.51	1.35	3.86	1.98	-0.63
1975	2.80	2.48	1.34	3.83	0.32	-1.03
1976 *	5.18	2.74	1.05	3.79	2.44	1.39
1977	4.34	2.50	1.35	3.85	1.84	0.49
1978	3.90	2.52	1.36	3.88	1.38	0.02
1979 *	3.59	2.01	0.83	2.85	1.58	0.74
1980	2.51	2.54	1.37	3.91	-0.03	-1.40
1981	3.35	2.51	1.35	3.86	0.84	-0.51
1982	2.39	2.46	1.32	3.79	-0.07	-1.40
1983	2.58	2.46	1.32	3.78	0.12	-1.21
1984 *	2.57	2.06	2.25	4.31	0.51	-1.75

KEY

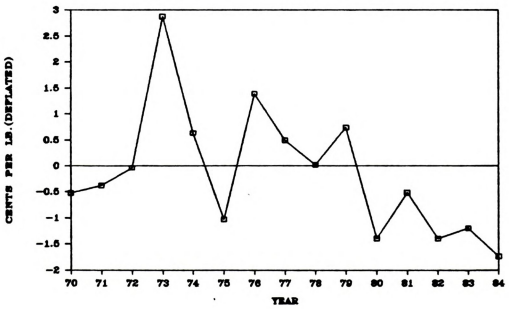
MI.PRICE - Michigan annual apple prices, deflated by CPI, prices are on a cents per pound basis
VC - Variable Costs, cents per pound, deflated by CPI
FC - Fixed Costs, cents per pound, deflated by CPI
P-VC - Michigan price minus variable cost
P-TC - Michigan price minus total cost

Sources: 1. Kelsey, Harsh, Belter 1971
2. Kelsey, Ricks, VanDerBeck 1977
3. Kelsey, Johnson 1979
4. Kelsey, Bradford 1985
5. Michigan Agricultural Statistics 1970-1984

MICHIGAN APPLES: PRICES AND COSTS



MICHIGAN APPLE GROWER RETURNS



SOURCES: Butler, 1985 and Michigan Agricultural Statistics,1970-85
Figures 5a and 5b

low apple prices are the result of planting decisions made ten to twenty years ago. The decrease in prices paid for Michigan apples, together with the increase in fixed costs have made it more difficult for growers to cover their costs of production.

TABLE 3.3

MICHIGAN FRESH APPLE PRODUCTION
ANALYSIS OF FIXED COSTS

YEAR	FC	VC	P-VC	% OF FC COVERED
1970	1.04	2.75	0.52	50%
1971	1.17	2.18	0.80	68%
1972	1.22	2.26	1.18	97%
1973	1.31	2.43	4.19	320%
1974	1.35	2.51	1.98	147%
1975	1.34	2.48	0.32	24%
1976	1.05	2.74	2.44	232%
1977	1.35	2.50	1.84	136%
1978	1.36	2.52	1.38	101%
1979	0.83	2.01	1.58	190%
1980	1.37	2.54	-0.03	0%
1981	1.35	2.51	0.84	62%
1982	1.32	2.46	-0.07	0%
1983	1.32	2.46	0.12	9%
1984	2.25	2.06	0.51	23%

* For Key, see Table 3.2

Kelsey, Johnson 1979, Kelsey, Bradford 1985, Market News Reports various issues

It is interesting to note the large increase in fixed costs in the period from 1970-1984. Those costs with the largest increase include changes in land value from $400 to

$1200 per acre in Michigan, changes in interest rates on real estate value from six percent to ten percent and changes in orchard value from $600 to $6500 per acre (Kelsey, Harsh, Belter 1971, Kelsey, Bradford 1985) (Tables 3.4a and b). When deflated by CPI, orchard values have quadrupled in the period under study. Consequently, the large increase in orchard value raises the grower's interest charges which leads to higher fixed costs.

This would be especially true in the late 1970's and early 1980's for farmers wishing to expand their orchards. At this time, high interest rates together with high orchard costs substantially increased fixed costs to apple growers.

However, for growers whose orchards have been paid for over the generations, increasing orchard values leads to increases in net wealth to the producer. The higher orchard values indicate that apple production has been profitable. If land appreciation is included in the calculation of grower returns, net returns to the grower over the latter half of the period may not be negative. Land appreciation may help to explain why more Michigan apple growers have not left the subsector in spite of apparently negative returns. Further analysis of apple grower returns to include this possibility is a topic for future research.

Variable costs and prices are important reasons why those in the subsector need effective ways to equate supply and demand many years in the future to improve grower investment decisions today.

TABLES 3.4a and 3.4b

ALLOCATED FIXED COSTS FOR GROWING AND HARVESTING APPLES
SouthWestern Michigan 1970

Item	Hours Use	Rate/ Hour	Total Cost	Individual Farm Analysis
3 Plow Tractor (20)	102.5	$1.46	$149.65	$
2 Plow Tractor	222	.95	210.90	
2 Ton Truck	440 Mi.	.11	48.40	
Air Blast Sprayer	36.5	2.21	80.66	
Weed Sprayer	5	.54	2.70	
Mounted Fork Lift	50	.54	27.00	
Rotary Mower	9	.81	7.29	
Fertilizer Spreader	7	.73	5.11	
Ladders & Pick Bags	10 A	2.54	25.40	
Brush Rake	10	1.30	13.00	
Chain Saw	15	.85	12.75	
Power Pruners	150	.14	21.00	
Duster	2	.36	.72	
Trailer	57	.42	23.94	
Well & Tank	30 MG	.61 MG	18.30	
Labor Cabins	110 MD	.63 MD	69.30	
Total Machinery & Equipment			$716.12	$
Orchard Overhead:				
Interest - Orchard and Land - Interest on average value of orchard ($600 orchard value and $400 land value) 6% x $700 - average value per acre			$420.00	$
Depreciation: Orchard depreciation - Age 9-29 ($600 ÷ 20 years = $30/Acre)			$300.00	$
Taxes @ $8.00 per acre			$ 80.00	$
Total Orchard Overhead			$800.00	$
Total Fixed Costs			$1516.12	$
Fixed Costs Per Bushel			$ 0.38	$

Overhead Cost for Growing and Harvesting 10 Acres of Apples, Semi-Dwarf Orchard, Western Michigan, 1984

	Total	Your farm cost
Equipment, growing	$ 1,907.84	
Equipment, harvest	423.00	
Interest on real estate value (10% × $1,200/acre)	1,200.00	
Property taxes	200.00	
Interest on average orchard value ($6,500/acre ÷ 2 × 12.5%)	4,062.50	
Orchard depreciation ($6,500/acre ÷ 20)	3,250.00	
Interest on growing and harvest cost ($11,813.63 × .5 × 12.5%)	738.35	
Total	$11,781.69	

Sources: Kelsey, Harsh, Belter, 1981 and Kelsey, Bradford, 1985

Although it appears that many growers have not been doing well in Michigan in the last five years, the extent of their losses may not be as great as the data show. This may be explained by the long-term family nature of apple production. Since orchards are often passed down from generation to generation, some of a grower's fixed costs may be paid for in earlier years. As a result, the fixed cost figures used in this study may tend to overestimate actual fixed costs thereby underestimating actual returns. However, producers in this situation may not be able to cover the costs of orchard replacement.

It is useful to analyze price and cost data in this way; however, it is important to mention the limitations of such an analysis. Firstly, the costs calculated through interpolation assume a constant average yield of 300 bushels per acre. This does not reflect the varying yields over the years. Secondly the actual cost figures calculated in the studies do not account for varying harvest costs which may indeed vary with yields. Thirdly, a grower may be willing to accept lower returns for the fixed inputs than those charged in the cost studies ie. return to assets and to family labor. A grower may not require returns as high as estimated in the cost figures but may derive psychic pleasure from his farming enterprise. Fourthly, the analysis of grower returns does not include addition of the benefits due to orchard value appreciation.

The consequences which would occur if producer prices

did not cover costs of production can be stated simply. Growers cannot sustain long periods of negative returns without dropping out. Repeated years of low or negative returns may increase a producer's reliance on sources of credit which may or may not be available. According to apple marketing experts in Michigan, many producers have been experiencing these difficulties.

A desirable consequence would be for producers, shippers and buyers to improve communication pertaining to the optimal supply necessary to meet demand at a price sufficient to cover costs in the long term. This may be a painful process since the optimal level of supply may mean that some producers must drop out or limit production. This will never be a simple task to accomplish due to the long production cycle of perennial crops as well as the entrepreneurial nature of producers. Estimation of optimal supply and communication of this information must be done on a national basis since Michigan implementing this alone is not likely to be successful.

3.3.0 Alternatives to Address Problem 4: Toward Positive Grower Returns

Typical well managed growers should be able to cover their average variable costs and their fixed costs adjusted for appreciation. The alternatives to address this problem depend upon whether a grower's inability to cover costs is the result of over supply conditions or due to poor quality.

If the problem is due to over supply conditions, the alternatives to address this problem will be presented in the following section. If the problem is due to poor quality, the alternatives are the same as those presented in the section on subsector inability to provide type of product demanded (Section 3.2.1).

3.3.1 Problem 5: Frequent Substantial Imbalances of Long Term Supply and Demand

Coordination of long term supply and demand is a difficult task. Within an individual firm at the grower level, decisions to invest to expand or change production are based on incomplete information. Most available information is from the past; while too frequently the only indication as to future demand and supply is the result of speculation or estimation.

Growers too often do not have long term plans for production and marketing. Sometimes they do not know where they will sell their apples. Growers do not make planting decisions based on demand since future demand is unknown. The local nursery in the area which may be promoting a particular variety will too often be influential in the grower/investor's planting decisions. The grower's shipper and local extension agent may have some input into the investment decisions. Trade journals such as **The Packer** or **American Fruit Growers** may be consulted. Growers may not adequately consider supply expansion occurring in other

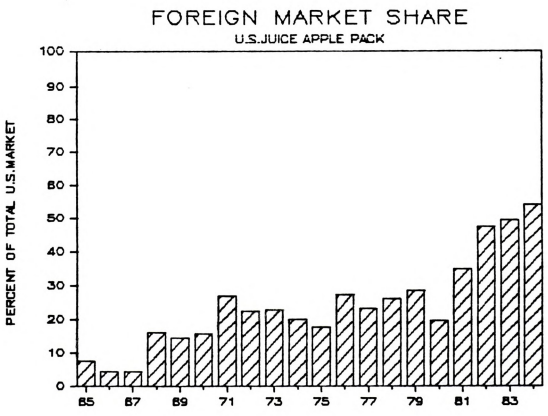
states and its likely impact on price and demand. Growers do not adequately consider changing consumer demand for particular varieties, size and pack when making their investment decisions. Most often planting decisions are based on past prices and net returns.

The structure of the apple subsector and behavior of its participants contribute to the supply/demand imbalance problem. Growers are small relative to the market and widely dispersed across the nation. Each producer seeks to achieve economies of scale for his own enterprise, without considering the implications of his, and many other growers' planting actions on the national situation. Extension programs tend to focus on production rather than marketing issues which can contribute to a mismatch of supply and demand. Shippers and processors may encourage greater production to assure themselves of adequate volume of raw product. This is due in part to their high fixed costs and also to their need for a reliable supply. A shipper's gross and net income depend on a large volume of grower produced fruit.

Effective mechanisms to match future supply with future demand within regions or within the nation are not used in a widespread fashion. Because of the non-use of long term coordinating mechanisms, the U.S. is often faced with excess supplies of apples. According to key informants, substantial excess supplies are likely to be a problem for the next five to ten years. These will occur primarily because of huge

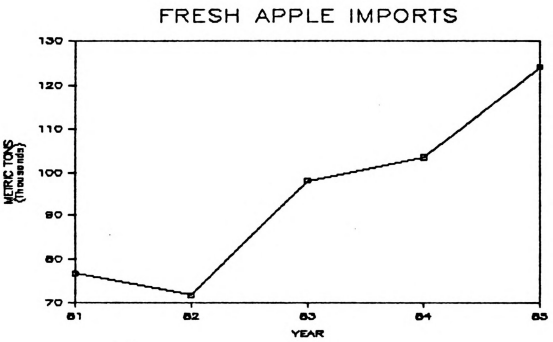
young plantings in Washington. This dilemma is worsened by the arrival of heavily subsidized imported apple products. For example, the U.S. grower has lost much of his market share of the growing U.S. apple juice market to foreign suppliers (Figure 6). Imports of fresh apples have also increased significantly over the past five years (Figure 7).

The consequences of this problem are that long term supply trends do not correspond closely to demand trends. Conditions of oversupply result in low producer prices, inability on the part of producers to cover costs and wasteful readjustment by orchard removals.



Sources: Butler 1985, U.S. Bureau of Census data, 1980-1985

Figure 6



Sources: Butler 1985, Bureau of Census data, 1980- 1985

Figure 7

3.3.2 Alternatives to Address Problem 5: Develop Long Term Mechanisms to Match Supply and Demand

A long term plan to better balance supply and demand is needed in the apple subsector. This plan will have to include all the major producing areas to be most effective. Interregional and international trade necessitates a national and perhaps even global outlook for improving coordination. In this section, three alternative arrangements will be outlined.

Alternative 1 Single Federal Marketing Order to Limit Apples Marketed in the U.S.

One alternative is for a federal marketing order with marketing quotas among U.S.growers. This marketing order could limit acreage or quantity marketed for each producing area. This method would allow for a long term planting scheme based on long term expected demand including exports and all domestic uses. Each year the administrative committee for the marketing order could adjust the marketing quotas to allow for future demand growth. Since total fresh apples marketed would be controlled, large surpluses could be avoided and price may more likely be sufficient to cover grower's costs of production. If marketing quota amounts were appropriately set, supply would not be limited sufficiently to encourage less efficient growers to stay in the market.

Although this arrangement has substantial potential to improve coordination of long run supply and demand, it also has some potential problems. Federal marketing orders of this nature are perceived to operate monopolistically with respect to price. Although such market allotment marketing orders are legal, they are not readily passed under present USDA marketing order guidelines. Passing of such a market quota marketing order for all U.S. fresh apples would require some ideological changes within the administration. These changes may take a number of years to affect.

One federal marketing order with marketing quotas would

have a potential drawback since this method could lock in historical, regional production patterns, and might not adequately allow for regional shifts to areas producing at lowest cost and producing the product consumers most demand. However, administrative procedures might be developed to minimize this potential drawback.

Alternative 2 Regional Market Quota Marketing Orders

An alternative to the single federal marketing order might be a series of regional marketing orders which would maintain a degree of competitiveness by allowing the regions to decide between themselves how many apples each area will market. A series of marketing orders of this nature to limit amount of apples marketed would require some legislative changes to the present marketing order guidelines. The U.S. could be divided into five apple producing regions as follows: 1. Washington, Oregon, Idaho; 2. Michigan, Illinois, Wisconsin, Ohio; 3. New York and New England; 4. North and South Carolina and Appalachia including Pennsylvania, Maryland, Virginia and West Virginia; and 5. California.

A marketing board made up of representatives from each region could meet on a regular basis for market planning, supply management, demand estimation and quality improvement decisions. Marketing quotas could be distributed based on historical production. Quota amounts could be adjusted for expected demand increases. Quotas could be bought and sold

on the open market to encourage shifts within and between regions. In this way, a more competitive structure than that with just one marketing order for the U.S.could be achieved which would perform better at matching supply with demand.

Advantages of Regional Market Quota Marketing Orders

This arrangement would be effective in balancing and stabilizing long run supply with demand by affecting amount of apples marketed. A market quota marketing order could facilitate the adjustment of orchard investment or disinvestment to be more in line with changing market conditions compared to the situation without a marketing order. Allowing a series of regional marketing orders where the regions make quota decisions jointly maintains flexibility for regional shifts in production and maintains a degree of independence for subsector participants. This type of market quota marketing order could improve communication between apple producing areas.

Disadvantages of Regional Market Quota Marketing Orders

There are some disadvantages to the regional marketing order approach. 1.)There is no guarantee that an administrative board would have greater success in estimating future supply and demand than would an individual; 2.) Cooperation among the various producing regions may be difficult to accomplish. Decisions regarding initial amounts allocated and annual changes in quotas would

probably be hotly disputed among area representatives. This would negate the supply/demand balancing objective of the marketing order; 3.) The marketing order may result in large benefits to established growers with limited benefits to new growers; 4.) Both growers and shippers may feel a loss of the ability to make individual decisions. However, this may be balanced out by an increased ability to cover all costs and earn a positive return on investment. 5.) Control of fresh apples marketed may not curtail excess supplies of apples moving toward secondary outlets.

Alternative 3 Long Term Pre-Planting Contracts

Pre-planting contracts function today between a few apple processing firms and their member growers. Examples of this in Michigan are Profac, Knouse and Speas. These firms contract with their growers for up to a certain tonnage every season. Other long term contracts such as the system used by Welsh, may involve a certain acreage to be contracted.

In the fresh apple marketing system, long term contracts would serve to specify the quantity of apples to be purchased by shippers from growers each year. This could improve the balance of supply and demand at least for the contracted portion of the crop. Contracting also reduces the risk on a producer of not finding a buyer for his product as well as reducing the risk on the buyer of obtaining a reliable supply. This type of long term contracting has been

used by some coops for processed vegetables and fruits for many years.

It may be possible to use a similar arrangement of pre-planting contracts between growers and shippers for fresh apple marketing. Initially growers could contract for a small portion of their production. Formal contracts would most likely occur between a shipper and his "nucleus" of good growers. The amount to be contracted might be dependent on the shipper's storage and packing capacity.

To be most effective, contracts should be for a period equal to the expected orchard life (Ricks 1978, Leaflet 7). This would reduce the risk a grower would have to bear when his contract ran out but his production did not. The contract could include a range of prices depending on total industry supplies and a range of tonnages depending on the grower's production that year. If contracts were arranged for top quality apples, growers would be assured a market for their best efforts. This may create more incentive to produce top quality apples to secure a contract and reduce uncertainty.

Advantages to long term pre-planting contracts

Long term contracts provide greater market outlet certainty and perhaps greater price certainty for growers. Shippers benefit by decreased transaction costs. Contracts decrease the cost of searching for new suppliers each year and decrease the risks of not having adequate supplies.

Also, by getting to know their growers in a more established relationship, shipper/grower communication regarding quality may be improved. If a range of prices is specified by a contract, price risk to buyers and sellers is diminished. The certainty created through the contract can aid the grower in planting and removal decisions and improve the long run balance of supply and demand with a greater likelihood that price will approximate average total costs in the long run.

Since the contract specifies quantities to be sold, the grower's risk of not finding a market outlet and the shipper's risk of not finding adequate supplies even in short crop years, is decreased. Contracting can also reduce the chance that shippers will be faced with growers trying to sell them much more than they can market in a large crop year. Long term contracting, if more widely practiced, has the potential to greatly improve the supply/demand balance in the apple subsector. Unfortunately, most fresh apple shippers oppose any type of contract for a many reasons.

Disadvantages of long term, pre-planting contracts

There are several drawbacks involved with long term contracting of this nature. Contracts with strict minimum tonnage requirements place a lot of risk on the producer since he may have to purchase on the open market to meet his obligation when his crop is short. When his crop is large however, the grower also encounters risk of not finding a

market outlet for the excess supply not covered by the contract. However, a grower may adjust his acreage accordingly to improve coordination in this situation. Without a tonnage requirement, shippers will bear the risk of not obtaining adequate supplies in short-crop years. Without tonnage specifications, the supply/demand balance may not be effectively coordinated.

Long term contracting reduces the flexibility of buyers who are in this case shippers. Fresh market shippers are unwilling to give up their flexibility to handle supplies from whomever they wish. Many growers and shippers feel that due to the high degree of perishability of fresh produce, they do not wish to be bound by a contract. If contracting is voluntary, many shippers may be unwilling to participate.

Contracting, as with any agreement between two parties, is subject to the risk of non-performance. This may occur if a firm goes out of business or when market prices are very different from contract prices. In these cases, all of the coordination problems which occur without contracting will once again prevail.

Market access for new producers may be reduced if a large enough percentage of the apple crop is contracted. This may be considered poor performance from an equity perspective; however, this may improve performance in coordinating supply with demand.

Long term contracting may increase price variations in the non-contracted portion of the market. This will depend

on the proportion of the apple crop which is contracted.

3.4 Conclusions

Many alternatives have been presented to address the many market coordination problems in the fresh apple subsector. This section was not intended to present one correct solution for any of the problems, but to provide a concise description of the problems, present some of the possible options in addressing these problems, and consider the advantages and disadvantages of each alternative. In Chapter 6, this performance evaluation will be compared to that in the celery subsector.

CHAPTER 4

THE U.S. CELERY SUBSECTOR: AN OVERVIEW

4.1 Introduction

4.1.1 Purpose of Chapter

This chapter will provide an overview of the celery subsector. Since little in-depth research has been done on the success or failure of coordination mechanisms for marketing this vegetable, emphasis will be placed in this area. The coordination functions necessary for orderly production and marketing will be outlined. Performance in the subsector will be evaluated on how well the present system works to accomplish these coordination functions.

Both fresh and processing markets will be considered with the major emphasis on the fresh market due to its greater relative importance in the subsector. Before coordination can be evaluated, it is necessary to understand the organization of the U.S. celery subsector.

4.1.2 Overview of Celery Subsector

Historical Production Patterns

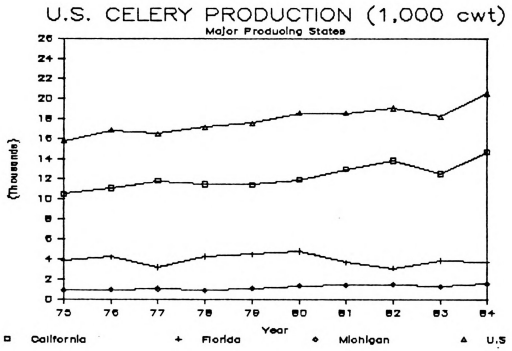
Celery was first produced commercially in the U.S. in Kalamazoo, Michigan in 1856. The seed was brought to the U.S. by Dutch settlers although it is said to have originated in Great Britain. From Michigan, celery production spread to Florida in the late 1800's. Within that state the crop was first produced in the north central

and western counties. It was not until the 1950's that the Everglade area became the largest producing area in Florida. Today Florida produces approximately thirty-three percent of the U.S. supplies from November to May (Talbott 1985). California, the number one state for celery production, has only been producing the crop commercially since 1905. It was a popular belief that celery could only be grown on organic soil, hence California growers farming on mineral soils were discouraged. However, by the mid-1930's, the southern districts of Salinas, Watsonville and Santa Maria, California had become the principal celery growing areas as we now know them (Carpenter 1975).

Celery is produced year-round in the U.S. with Florida and southern California comprising the bulk of the fall to spring production. California, Michigan, New York, New Jersey and Ohio produce most of the summer supply along with small amounts from Colorado, Massachusetts, Oregon, Pennsylvania, Utah, Washington, Wisconsin and some imports from Canada. Figure 1 shows production in the three major producing states and the total for the U.S.

Production Practices

Celery grows mainly in muck soil in the central and eastern states but thrives just as well in the more mineral soils of the west. The cycle from planting to harvest ranges from 75-100 days. Celery is one of the most labor intensive of the major vegetable crops. A study done in



Source: Batkin, Holt, McMilin, 1986

Figure 1

Florida recorded average hourly labor requirements of 273-302 hours per acre (Carpenter 1975). All celery grown in the U.S. is started in a greenhouse or seedbed due to the tiny size of the seed, and later transplanted. Some northern and central states have mechanized planting, transplanting and harvesting practices thus reducing labor requirements; however, both Florida and California still do most of their harvesting manually. Other inputs necessary for production

include large amounts of fertilizer, pesticides and water. Irrigation is important for a reliable crop in most states.

U.S. celery farms range in size from less than 20 acres to 700 acres; however, the majority of celery is produced on large, commercial farms. Location of farms in some states such as Michigan and Florida is confined to concentrated areas due to limited availability of muck soil.

Market Channels

Approximately eighty percent of total U.S. production goes toward the primary, fresh market while the remainder is processed for use in prepared foods such as soup, juice and convenience dinners. There is no distinction made between varieties of celery which will go toward each market. Market channel decisions are made near harvest time, depending on quality and size of the mature vegetable. However, some producers do contract with processors for a certain tonnage so these growers must make these market channel decisions before planting.

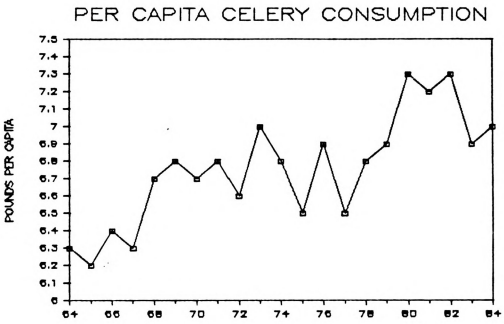
Fresh market celery moves from producer to shipper who acts as initial broker. Some producers also serve as shippers. The packing function is done by producers or shippers. Temporary storage is sometimes done at the shipper level; however, due to the perishability of the product, period of storage is limited to just a few days. Buyers who purchase celery from shippers include chain stores and other retailer/wholesalers, brokers at terminal

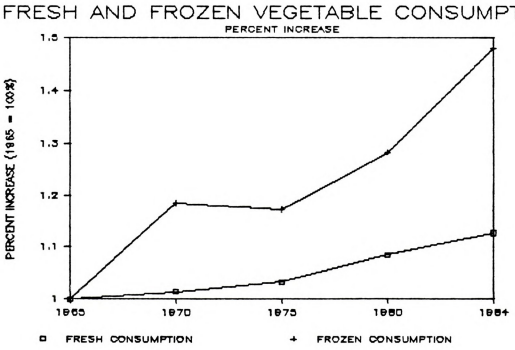
markets, wholesale handlers, military and food processors. Processors may also obtain their supplies from producers on a contractual basis. In some states such as Michigan, these transactions are organized by marketing cooperatives.

Nature of Demand

Due to the unique characteristics of celery, there are no clear substitutes. Per capita consumption of celery has not varied much with only an eight percent increase in the past ten years (Figure 2). However the relative demand for the various forms has changed over the years. Some examples of these shifts in demand include the increased demand for canned foods in the 1960-1970's which led to an increased demand for celery in its processed form. The available celery consumption figures show no distinction between celery for fresh vs. processed markets; however these shifts in demand have been described by informed subsector participants.

The more recent patterns of demand have been for produce in its fresh or frozen state. Per capita consumption of these forms of vegetables, including celery, has increased over the past ten years (Figure 3). This is due to consumer perceptions that fresh produce is nutritionally healthy and that frozen forms of produce maintain many of the characteristics of fresh produce. Consumer interest in fresh produce has been spurred on by endorsements made by national organizations such as USDA and the Department of





Source: USDA/ERS, 1985

Figures 2 and 3

Health and Human Services. These organizations have called for an increase in consumption of fresh vegetables and fruit to reduce health risks (McLaughlin 1983 p. 152). The change in consumer preferences was well stated by Peter A. Magowam, Chairman of Safeway, Inc., one of the worlds largest food distributers. "The market for produce is undergoing a dramatic change because consumers are changing...placing produce at the top of their list (for choosing a supermarket)" (Magowam as quoted in Mclaughlin 1983 p. 322).

Demand for frozen celery has increased since it is used in the production of frozen convenience dinners, especially the more popular ethnic styles. Future demand for frozen convenience foods and for fresh produce is expected to increase, resulting in possible gains to the fresh and frozen celery market.

Seasonality of Production

The Michigan celery marketing season lasts from July to October. At this time, Michigan and New York compete with California celery in eastern markets. Michigan production peaks in August. At this time, imports from Canada also compete, creating some problems and putting downward pressure on U.S. prices. It is alleged that federal and provincial governments in Canada subsidize vegetable production directly, permitting lower prices for Canadian celery. More on this issue will follow in Chapter 5.

Some subsector participants believe that in addition to

large supplies, further problems arise in the summer months because California growers sell at prices below their cost of production, compensating for this with higher prices in the winter months. There is no clear evidence of this occurence. Florida production is available from November to July, competing with California and Texas supplies.

Although Michigan and New York producers have a freight advantage over California in markets east of a line drawn from North Dakota to Texas, both retailers and consumers often prefer California celery since supply and quality can be relied upon any month of the year.

Other producing areas which compete for niches in the market include Texas and Wisconsin. The Texas market is comprised of a few growers only producing about 1500-2000 acres of celery. The Texas season starts in the winter and ends at the start of the summer. Approximately eighty percent of Texas production goes into the fresh market with the remainder to processing markets. The quality of Texas' celery is quite variable. Data on supplies and prices for Texas celery are unavailable. Wisconsin produces celery as well as many other vegetables mostly for the processing market, and has a season similar, though somewhat shorter than Michigan's. A table showing the particular months when celery is harvested will help clarify the seasonality of supply.

Table 4.1

Seasonal Production

	J	F	M	A	M	J	J	A	S	O	N	D
CA	----------											
MI							----------					
NY							----------					
CAN								----------				
FLA	----------										--------	
TX	----------										------	
WI								---------				

California is the only state that can produce and ship celery year round. Five out of the seven producing areas compete in the summer months.

4.2 Coordination Functions Necessary for Orderly Marketing

As described for apples in Chapter 2, the achievement of orderly marketing in a subsector is contingent on the accomplishment of particular coordinating functions. The necessary coordination functions for orderly marketing of celery will be reviewed briefly.

1. It is necessary that producers provide the type of product demanded by consumers of the quality form and package desired.

2. The risks associated with the specific practices of actors at specific levels in the subsystem should be borne by these actors. Risks which may be influenced by certain participants should not be borne by those who have no influence over these risks.

3. Producers should participate to some extent in the price formation process. Resulting prices should reflect the prevailing supply and demand situation.

4. Prices need to be sufficient to cover the costs of production for a typical well-managed firm.

5. Information needs to move up and down in the vertical marketing system so that subsector participants are informed about market alternatives, supply and demand conditions etc.

6. The crop needs to be allocated to the various forms of product according to demand. Gluts and shortages should be minimized.

4.3 Coordination Mechanisms in Various States

4.3.1 Michigan Overview

The Michigan celery industry has been dominated since the early 1960's by the Michigan Celery Promotion Cooperative (MCPC). This coop today markets approximately sixty-five percent of the celery in the state. A multi-commodity cooperative as well as independent, non-coop growers and shippers also function within the state to produce and market celery. The MCPC is supported by forty to

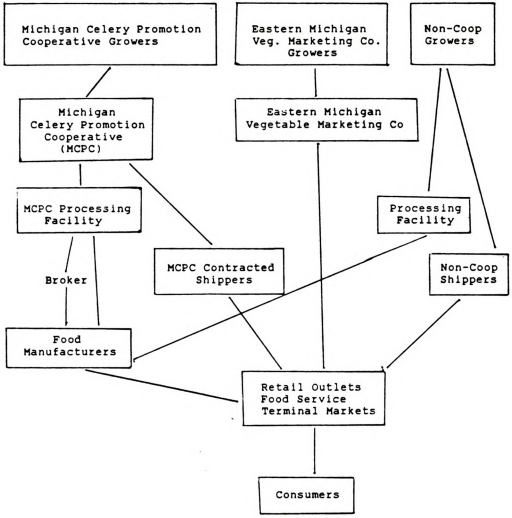
forty-five growers who are located on the western side of the state. The multi-commodity cooperative called The Eastern Michigan Vegetable Marketing Company is supported by one large celery grower while there are ten to fifteen celery producers with no cooperative affiliation (Figure 4). Approximately eighty percent of Michigan celery goes to the fresh market with the remaining used for processing. Michigan production is not covered by any marketing orders.

Celery acreages in Michigan are small with expansion limited by capital and cultural requirements as well as location of markets. Production requires high capital investments and significant technical know-how. These conditions seem to provide a suitable environment for group action in celery production and marketing.

4.3.2 Coordinating Functions of the Michigan Celery Promotion Cooperative

The MCPC, through a set of standard operating procedures has served to perform a number of important coordinating mechanisms which help to match supply and demand within the state. Some of these functions include price discovery, standardizing and raising quality standards to produce the products most demanded by consumers, assuring a reliable supply of product without gluts and shortages, collecting and disseminating market information.improving grower access to markets for fresh and processed products, strengthening the link between growers and shippers, and

MICHIGAN CELERY MARKETING SYSTEM



Source: Discussions with subsector experts

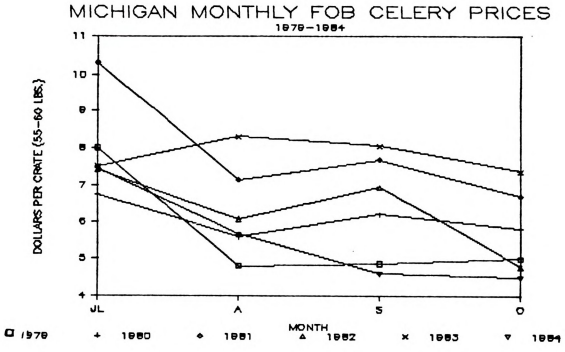
Figure 4

specifying the terms of trade through contracts with processors. Each of these functions will be described and evaluated in more detail in the following sections.

Price Discovery

Since the MCPC markets at least sixty-five percent of the production of celery in the state of Michigan, the coop exerts a strong influence over Michigan prices. Improving celery pricing performance is the most important coordination function that the MCPC accomplishes. In contrast to the apple subsector where prices are formed often with very incomplete information, the celery coop works to compile market information to make appropriate weekly pricing decisions.

The price for fresh coop celery is determined by a price committee composed of both growers and shippers. Celery prices are affected primarily by availability of supplies in other producing areas, population, consumer income and changing consumer tastes and preferences. A graph of monthly FOB prices in Michigan show the seasonal price patterns. Prices are high early in the season (July) and generally decline from July to August (Figure 5). The MCPC's price committee meets twice weekly on Wednesdays and Saturdays to make pricing decisions. The price committee is comprised of three growers, two grower-shippers and one shipper who is not a grower. The three shippers on the committee represent the contracted, coop shippers, of which



Source: Federal/State Market News Reports, 1979-1984

Figure 5

there are eleven, and indirectly represent the non-coop shippers. Five out of the six members of the committee have voting privledges while the sixth member (the non-grower shipper) serves in an advisory capacity and is alternated each week.

The presence of shippers on this committee means the resulting price should better reflect the supply and demand situation than if there were only growers on the committee. Shippers are closer to the retail level than growers, hence have more insight to the demand requirements of consumers. Shippers additional information can help the price committee

to make rapid adjustments to changing market conditions. Coop shippers have access to more information because they tend to cooperate with one another and pool their information.

According to the chairman of the Price Committee, the information used in pricing decisions includes each shipper's sales from the previous week and estimated production of each coop grower for the next two weeks. The price committee telephones five or six shippers in California as well as shippers in New York, Ohio and Canada to determine how much they will be shipping to the various markets each week. Since California supplies influence Michigan prices significantly, members of the Price Committee must anticipate California arrivals in eastern terminal markets one week in advance due to freight time. Market News Reports, reports from terminal markets and trade journals are used as additional sources of information in the pricing process.

Once the price is decided upon by the coop, a fixed commission charge of eight and one half percent per crate for the service of selling as well as the additional costs of handling and cooling are subtracted to cover the services and costs of the shipper. It is possible for shippers to negotiate with buyers for a higher price than that set by the MCPC; however, the additional revenue goes back to the coop, not to the shipper securing the higher price. For this reason, there is little incentive for shippers to get higher

than coop prices. Shippers may not however, sell at prices below the coop determined price.

Establishing Relationships between Producers and Shippers.

The MCPC has established formal contracts for marketing of their growers' celery. Membership with the coop means that the coop serves as exclusive agent for a grower's product. On the fresh side, shippers function as sales agents for the coop. These shippers have entered into agreement with the coop to ship only coop celery. Each shipper has a particular growers' production allocated to him by the coop. Once a grower is accustomed to selling to a shipper, he does not usually shift to another. Each shipper indicates to his growers how much he can sell in a season; however, each producer must make individual decisions on how much to produce. The coop does not and has never set production levels for its producers. There are no formal contracts between shippers and growers but informal contracts based on personal trust take their place.

Growers are permitted to sell to the shipper they prefer; however, the coop has the final word if there are problems with allocation. If, however, a shipper is short one week while another shipper has excess, negotiations between shippers are allowed. If this situation repeats itself too often, reallocation of grower supply may be arranged by the coop. This arrangement requires cooperation and trust among shippers as well as loyalty by all

participants toward the cooperative. Various conversations with coop shippers indicated a general respect and appreciation for the coop's services. Little shifting around of growers from shipper to shipper indicates that the coop has contributed to stability for buyers and sellers.

The present system encourages cooperation between shippers and reduces price cutting among coop shippers. Shippers, who are in contact with buyers, perform a coordinating role by indicating to the coop and to growers the shippers estimates of how much the market will absorb at what prices. This pricing method has reduced price cutting among non-coop shippers since the established pattern is for non-coop shippers to charge twenty-five cents per crate less than the MCPC price.

Access to Markets/Processing

On the processing side, the cooperative has its own plant for slicing and dicing celery. By performing these intermediate processing functions, the coop helps to transform the raw product into the form desired by food manufacturers. This service functions to aid growers who need access to the processing market for their celery. Since much of the celery in the U.S. sold to processors is done on a contractual basis, partially transforming the product through processing opens up more opportunities for coop growers to match the demand for a specialized product. Transformation of celery into various slice sizes means

Michigan coop celery is eligible for more contracts with food manufacturers for various forms of product.

Diversion of excess celery supplies to the processing market also serves to stabilize fresh market prices. To avoid drastic declines in price in situations of oversupply, the coop can choose to divert celery to the processing outlet. This outlet can also be used for lower quality celery or for sizes which will not sell readily on the fresh market. In the coop's agreements with food manufacturers such as Campbell Soup, celery supplies in addition to the contracted portion, may be accepted in times of oversupply. However, processors can only increase or decrease their purchases by small amounts, since they can not vary their plant capacity significantly.

The contracting procedure works in three ways for processing celery: 1. The MCPC contracts with the processor (Campbell Soup) both directly and through the use of A.Duda and Sons, a broker who in turn contracts with LaChoy, DelMonte and occasionally other processing companies. The use of a broker is advantageous in this situation since Duda provides more than just celery to the food manufacturers. By providing mixed loads, Duda provides the mix of products and services food manufacturers want; 2. Coop members contract directly with processors. The coop allows its member-growers the freedom of contracting independently for Campbell's "V-8" Juice. The coop prefers to allow its members the freedom of contracting directly using this

option; 3. Coop members sell to processors without a contract.

Terms of trade determined by contracts with celery processors include: 1. Quantity of celery; 2. Product form; 3. Price; 4. Delivery date; 5. Allowance for unforseeable occurences which prevent delivery as specified; 6. Transportation responsibility; 7. Liability (terms to determine who is liable if damage occurs on route or if quality is not that which was specified). The product form and other specifications vary slightly from processor to processor however, the coop sells predominantly to only two processors, Campbell Soup and LaChoy Chinese Foods. When a coop grower negotiates individually for a contract with a food manufacturer, the terms of trade are the same as those between the coop and food manufacturer.

One example of the timing of contract decisions and the specifications of a contract is that of the contract with Campbell Soup for their soup. In this case, pre-planting contracts are negotiated in February between the processor and the coop. Price, tonnage and the form of the product are determined at this time. This contract requires celery processed into 4" sticks and packaged in fifty pound plastic bags. The coop telephones Campbell's each week during the Michigan harvest season to set the delivery time. According to one of Campbell's Marketing Specialists, this system of contracts works well and satisfies Campbell's need for reliable supplies.

Cutbacks in Campbell's budget for advertising and promotion for "V8 Juice" in favor of a new product "Juiceworks" has decreased their "V8 Juice" sales. For these internal reasons, Campbell Soup has decreased their demand for celery channelled toward "V8 Juice" ; however, the firm has increased its demand for MCPC celery for soup in the 1986 season.

Of the total coop celery processed, sixty percent of the member's tonnage is sold on contract between the coop and the processor, leaving the remaining forty percent to be sold either by the coop or by the individual producer without a contract. The individual producer also has the option to establish his own contracts with processors. Price for the uncontracted celery is based on a formula which uses FOB fresh market prices for four different sizes of celery. In this way, there are few pricing misunderstandings between growers and processors.

Quality Standards

The MCPC has developed and implemented its own quality standards which are higher than USDA standards. Careful monitering of production practices and stringent quality requirements for packed celery have resulted in Michigan's reputation nationwide for excellent quality celery. According to one coop shipper, Michigan quality is considered second only to California quality in eastern markets. The coop markets a range of sizes and qualities

which have a corresponding range of prices set by the price committee. The explicit and uniform quality specifications facilitate the pricing procedure. The coop pools the supplies of all member growers by size and quality to arrive at the administered prices for each category.

Quality is also important to processors. Campbell Soup requires celery of U.S. No. 1 quality, free from insect damage, decay, and chemical residues and having good color. Conversations with Campbell's celery buyer confirmed that the company was generally satisfied with the quality of Michigan coop celery.

Reliability of Supply /Avoidance of Gluts and Shortages

A carefully coordinated system of staggered planting and harvesting helps to assure a reliable supply of celery throughout the Michigan harvesting/marketing season. By extending the harvest period as long as possible, gluts and shortages are minimized; however, due to the climate and seasonal nature of celery production, the harvest period in northern states such as Michigan only lasts a few months.

The coop encourages staggered planting and harvesting to lengthen the season as much as possible. During the harvest period, growers are required to report weekly to the coop on amount harvested that week and remaining supply by size to be harvested in the remaining weeks of the season. Supply and price information is reported in a weekly newsletter **Stalk Talks** for all growers and shippers.

If it appears that an oversupply situation is threatening, the coop has the right to impose harvest quotas to avoid surpluses on the market and hence drastic falls in price. Since celery can stay in the field for a few days once it is ripe, the coop may recommend that producers do not harvest all of their crop in order to avoid gluts. According to the coop manager, this action has not been taken by the coop since 1982. This seems to imply that oversupply situations have been minimized by the standard operating procedures (such as staggered planting) of the coop to effectively match supply with demand.

Although the coop does not control acreage planted, coordination within the year is improved by the system of staggered planting and harvesting. The coop indirectly affects celery supplies from year to year by providing marketing support for its members. Without the help of the coop, celery supplied may not be as reliable from year to year.

Michigan Celery not Marketed by the Michigan Celery Promotion Cooperative

Two outlets exist for the Michigan celery not marketed through the coop. Of the growers who are not members of the MCPC, one belongs to a multi-commodity coop. This coop acts as sales agent for this grower as well as performing the functions of washing, trimming, sizing and packing. This coop sells all of its grower's celery on the fresh market.

In the case of independent growers with no affiliation to any sort of cooperative, informal agreements exist between producers and independent shippers. These agreements are based on personal relations and trust. In situations of oversupply, the independent shippers can undercut the coop's price. It is widely recognized that the coop holds an umbrella over the independent producers and shippers, allowing them to benefit from selling at slightly lower prices. These free-riders weaken the "umbrella holding" ability of the coop. To hold on to its members, the coop provides additional services to its members such as opportunities for participation on decision making committees, more complete market information, access to processing facilities, etc.

4.3.3 Florida Overview

Florida's celery production is characterized by few growers with approximately eighty-two percent of the state's supplies grown in the Everglades area, near Lake Okeechobee. The remainder of the Florida supply is produced in the North Central and Sarasota areas (Florida Agricultural Statistics 1984).

Most Florida growers have diversified farms, producing leaf vegetables such as chicory, endive, cabbage and often produce sweet corn, radishes, carrots and sugar cane. The number of celery farms in Florida decreased from 320 farms in 1945 to 18 farms in 1978, while the average number of

acres per farm increased from 33 in 1945 to 642 in 1978. Celery is no longer produced by small farmers in Florida (Bureau of Census, U.S. Dept of Commerce 1979). Approximately ninety percent of Florida's celery is grown for fresh market consumption, while the remaining goes toward processing, a residual market in Florida.

4.3.4 Coordinating Mechanisms in Florida

Celery production and marketing is coordinated in part at the producer-first-handler level by two institutions: the Florida Celery Exchange and Federal Marketing Order #967 established in 1965.

The Exchange is a voluntary sales cooperative whose members are growers and shippers. In Florida, all handlers are also growers. Of the seven coop shippers or sales agents, one is particularly influential and functions also as a celery processor. These shippers are linked formally to the exchange by ten year contracts which are subject to termination for failure to abide by the coop's regulations. According to the manager of the Exchange, all celery growers in Florida, with a few minor exceptions, have joined the Celery Exchange.

The Exchange was first established in 1961, under cooperative legislation. The original objectives of the sales coop were to improve pricing stability, standardize marketing operations for the whole Florida market and generate and disseminate more accurate market information

(Talbott, undated).

Grower-members of the Exchange have voluntarily passed marketing control and title of their celery over to the Exchange by means of grower's contracts. Thus the Exchange has sole marketing rights and control over a member's celery. The Exchange has signed handler contracts with existing celery shippers who act as sales agents for the Exchange. These contracts require the agents to abide by all the regulations of the Exchange including selling celery for the grower-members at the prices established by the directors of the Exchange. Contracts between grower-members, sales agents and the Exchange have penalty clauses written in to assure that participants follow the stated regulations.

The Exchange is organized into a Board of Directors, comprised of fifteen members and one public representative. All of the members of the celery exchange sit on the board. The Board appoints a three-person Executive Committee that has the same rights as the Board of Directors. Under the jurisdiction of the Executive Committee is a general manager who administers three divisions which include informational services, compliance and promotion and merchandising (Talbott, undated).

Standard operating procedures of the Exchange include the employment of fieldmen who evaluate supply and quality conditions while the crop is in the field. The fieldmen phone in to the Exchange pertinent information regarding

total harvest for the previous day by sizes, expected harvest for that day, amount on hand and amount to be sold at the time of the call. The Exchange office consolidates the information and relays it to the Executive Committee. The committee members contact specific sales agents assigned to them to discuss market conditions and trends. The Executive Committee meets daily through a special, private telephone system. Prices are determined by careful consideration of celery movements, competition, weather, supplies on hand and supply prospects. The Executive Committee establishes celery prices by sizes in this way. Celery prices are determined every Monday and Wednesday and passed on to the sales agents by the General Manager. In addition to the pricing function, the Exchange promotes Florida celery and collects and disseminates market information.

The Florida Exchange functions in tandem with the federal marketing order for fresh celery. This marketing order, established in 1965 has provisions for quality, size, pack and container, flow-to-market, research and development, advertising and producer allotments (USDA 1986). Unlike the Florida Exchange, the marketing order is a mandatory program which was voted in by the producers and handlers. All celery growers and handlers in Florida sit on the Celery Administrative Committee. This committee has the power to vote in any of the above mentioned provisions which are included in the original marketing order mandate.

Although the Florida celery marketing order has provisions to perform many important coordinating functions, only some of these provisions are used. The Florida celery marketing order includes a producer allotment program but it has never actually been used to limit production. The allotment provision does set a "marketable quantity" to be apportioned among producers according to their celery sales during a representative period. Each producer's allotment is considered their "base quantity". In theory, the producer's base quantity could be limited through use of the "uniform rule" which simply applies a percentage to the base quantity to arrive at the producer's marketable allotment. Since the 1975-76 season, the uniform percent has been 100% meaning that producers were free to market all their base quantities with no limitation (Florida Celery Committee Records 1985). The allotments have always been greater than the amount each grower can actually sell. In fact, total fresh market shipments have always been less than the marketable allotments permitted (Table 4.2).

Florida celery shipments have been less than the marketable allotments due to arrivals of competitive supplies from California and perhaps due to the efforts of the marketing order committee not to limit production. Limiting supplies in the short term through producer allotments could disadvantage Florida producers since their major competitor, California, does not limit production. The marketable allotment decision is made in June, before

Table 4.2

Florida Celery Marketing Order 967
Regulations and Shipments in Crates

Season (8/1-7/31)	Base Quantities	Uniform Percent	Marketable Allotments	Fresh Market Shipments 1/	Total Shipments
1965-66	9,223,520	86.327	8,055,092	7,695,000	8,145,000
1966-67	9,223,520	84.128	7,887,375	7,350,190	7,702,000
1967-68	9,223,520	84.231	7,887,375	6,867,955	7,248,000
1968-69	9,223,520	84.312	7,887,375	6,996,509	7,533,766
1969-70	9,223,520	84.312	7,887,375	6,128,179	6,611,556
1970-71	9,223,520	84.312	7,887,375	7,174,326	7,747,234
1971-72	9,223,520	84.312	7,887,375	7,069,104	7,524,428
1972-73	9,223,520	90.000	8,371,803	7,366,023	7,815,194
1973-74	9,223,520	95.000	8,796,555	6,071,364	6,484,155
1974-75	9,223,520	90.000	8,353,744	6,554,645	6,890,272
1975-76	9,223,520	90.000	8,326,671	5,686,934	6,484,747
1976-77	9,223,520	100.000	9,223,520	5,529,505	5,686,934
1977-78	9,223,520	100.000 2/	8,082,572	5,979,463	6,107,937
1978-79	9,323,520	100.000 2/	8,433,388	7,741,160	7,916,952
1979-80	9,644,210	100.000 2/	8,828,667	7,782,900	7,924,969
1980-81	8,601,309	100.000 2/	8,601,309	5,556,013	5,691,032
1981-82	8,651,309	100.000 2/	8,238,685	4,542,686	4,625,017
1982-83	8,651,309	100.000 2/	7,503,282	5,803,932	5,850,919
1983-84	7,712,819	100.000 2/	6,875,737	5,580,534	5,676,145
1984-85	7,299,496	100.000 2/	6,789,738	5,145,279	5,444,374 3/
1985-86	6,929,738	100.000 2/	6,929,738		

Source: Florida Celery Committee Records

1/ Total shipments minus canning or freezing exemption certificates actually returned; usually 2/3 are not returned.

2/ Per § 967.38, Marketable Allotments only issued to producers who have registered under § 967.37(f) as amended 6/22/77.

3/ Preliminary.

planting seed beds in July, which makes possible production decisions aimed at producing less than the allotted amount (Interagency Task Force 1975).

Beginning with the 1978-79 season, a reserve of six percent of the total base quantities was set aside for the issuance of base quantities to new and expanding producers. Fifty percent of this was available for new production and fifty percent for producers with existing base quantities (Federal Register 1977). According to Florida celery marketing experts, this system is still functioning. If a producer does not make an effort to produce and sell celery for two consecutive seasons, his base quantity will be declared invalid (Federal Register 1977).

In addition to the allotment program, the advertising and research provisions of the marketing order are utilized. In the 1984-85 season, a handler assessment of two cents per crate was charged, resulting in a budget of $125,000 to cover these expenses.

The quality control provision of the marketing order is not utilized. Growers must individually request and finance Federal/State inspection services if they would like their celery inspected. It is not mandatory to apply USDA grades to Florida celery for domestic consumption; however, for celery to be exported, USDA inspection is necessary. According to members of the marketing order committee, growers prefer to have the option of inspecting or not inspecting their celery for domestic use, rather than having

mandatory quality control. This is true especially in short crop years when buyers may settle for lower grades of celery to avoid shortages.

4.3.5 California Overview

California produces approximately seventy percent of the U.S. supply of celery of which approximately eighty-five percent goes toward the fresh market and the remainder toward processing. Most of the production occurs in the central coast and south coast regions of the state. The average celery acreage for California growers is 400-500 acres. Other crops produced by California celery farmers include broccoli, cauliflower, lettuce, cabbage, green onions and occasionally dry beans.

4.3.6 Coordinating Mechanisms in California

Most California producers have integrated forward into the packing and shipping function. Producers have not organized into any sort of cooperative for the marketing of their celery. There seem to be several reasons for this lack of group action. Because most California growers are large scale, performing growing, packing, selling and shipping functions, they have found little need to collectivize. Also, since California producers have diversified into production of other vegetables, there has been little interest in organizing a celery marketing cooperative. A state marketing order exists for California celery which is

primarily involved with production and marketing research. Presently, quality standards are set by each firm individually, using the USDA standards as the minimum.

Celery prices are determined daily, through market transactions. Information relevant to pricing is communicated mostly through personal contacts among the shippers. Market News also publishes supply and demand information, however according to the Director of the Celery Research Advisory Board, this source is not relied upon since it is not considered to be accurate or up-to-date.

Production decisions are based on individual producer's perceptions of what the market will absorb. There are no collective supply controls functioning in the state. Supply management responsibilities are in the hands of the individual producers.

4.4 Evaluation of Coordination Performance

An evaluation of coordination performance in the celery subsector will include a verbal analysis of how well each major producing area has done performing the coordination functions necessary for orderly marketing as well as a quantitative analysis of price variability in the three major producing states. The aspects of coordination which will be examined are those mentioned in section 4.2. Both good performance and coordination problems will be examined.

4.4.1 Michigan Market

In Michigan, the actions of the Michigan Celery Promotion Cooperative have led to many improvements in coordination performance. The coop has made strides toward producing the products most demanded by consumers. Examples of this may be seen by the improvements in quality and uniformity of celery sold through the coop. Several coop celery buyers (shippers and processors) agreed upon this point. Improvements such as minimizing many forms of disease and pests, sorting and sizing celery for different buyer's needs and packaging coop celery uniformly in fifty-five to sixty pound cartons are but some of the improvements made by the coop in its efforts to cater to the buyer. These improvements have helped Michigan earn a good reputation for its celery and have helped raise celery standards across the nation.

The organization of the celery coop ensures that producers/members and contracted shippers share the risks and costs involved in celery production and marketing. Since celery cannot be stored, and celery prices are determined twice weekly, producers do not bear the risk of shipper's poor storage techniques. However, producers do bear the risks of price fluctuations over the harvest/marketing season. This risk is reduced somewhat compared to a non-coop situation because the coop has some price influencing ability.

Producers are paid through a pooling system at the end

of each week in the season. Although there is a two week lag at the beginning of the season in July, growers are paid at the end of each of the following weeks in the season. Under this system, the risk to producers of late payment for their celery is reduced.

Improvements made by the coop which strengthen producer/shipper relations have contributed to stability and reliability in the Michigan celery market. These relationships have lowered the search costs for Michigan growers and shippers. Increasing grower's access to a processing facility decreases the risk and uncertainty associated with securing a contract once the celery is harvested. However, the coop can not decrease producer and handler uncertainty due to variable weather conditions and levels of production across the nation.

One of the most important improvements to market coordination made by the coop has been to strengthen the pricing procedure compared to the consignment system of sales used for other produce. Since the coop members elect a price committee comprised of growers and shippers, both grower-sellers and shipper-marketers actively participate in the formation of celery prices. In this way, growers feel they will not be taken advantage of by handlers of their celery. Prices which are formulated based on the collective information of various growers and shippers tend to be more indicative of actual supply and demand conditions. According to our concept of orderly marketing, the MCPC has achieved

good performance through improvements in price discovery.

A closer look at the variability of Michigan celery prices indicates whether the pricing procedure of the MCPC has served to decrease the amount of variability of Michigan celery prices.

The INS measure, as used on monthly and annual apple prices, was applied to Michigan, California and Florida's monthly and annual celery prices. A plot of the INS over the period from 1977-1984 shows that month-to-month price variability for Michigan celery is very low when compared to both California and Florida figures (Tables 4.3 and 4.4, Figure 6). These results support the belief that the Michigan Celery Promotion Cooperative helps to stabilize Michigan celery prices.

Although more stable prices remove some of the uncertainty for producers, there are some shippers who argue that the pricing procedure of the MCPC does not allow prices to adjust quickly enough to changing supply and demand conditions. The Price Committee members believe that decisions to raise prices are made more conservatively than those to lower prices. A general consensus of coop producers indicates that price adjustments are made appropriately.

The MCPC has increased the flow of information between producers, handlers and buyers. This is especially true for producers and shippers. Each shipper works closely with their producers since they are the same over the years. Since the shipper has close contact with the buyer, he has a

TABLE 4.3

ANALYSIS OF CELERY PRICE INSTABILITY

CALIFORNIA, FLORIDA AND MICHIGAN FOB SHIPPER PRICES

	INS MONTH-TO-MONTH (M-T-M)		
YEAR	CALIFORNIA	FLORIDA	MICHIGAN
1977	881.95	490.00	31.21
1978	774.47	530.85	290.21
1979	1354.13	805.05	490.40
1980	1347.68	805.18	112.97
1981	1758.37	1491.19	276.91
1982	659.78	802.31	363.18
1983	1824.66	1263.63	47.81
1984	1074.69	731.79	136.67
AVERAGE INS (M-T-M)	1209.47	865.00	218.67
STANDARD DEV.	436.97	334.79	167.77
INS YEAR TO YEAR	696.05	253.58	1057.50
AVERAGE PRICE PER CRATE 77-84	$6.54	$7.04	$6.84

EXPLANATION OF TERMS

INS M-T-M - MEASURE OF THE VARIANCE OF THE PERCENT CHANGES IN PRICE FROM MONTH TO MONTH

AVERAGE INS M-T-M - AVERAGE MONTH TO MONTH VARIABILITY IN PRICES OVER THE SEASON FOR EACH STATE CALCULATED FOR THE PERIOD 1977-1984

INS YEAR-TO-YEAR - MEASURE OF THE VARIANCE OF THE PERCENT CHANGE IN ANNUAL PRICE FROM YEAR TO YEAR

AVERAGE PRICE PER CRATE - AVERAGE OF ANNUAL PRICES OVER 8 YEAR PERIOD FOR 55-60 LB. CRATE

Sources: See Table 4.4

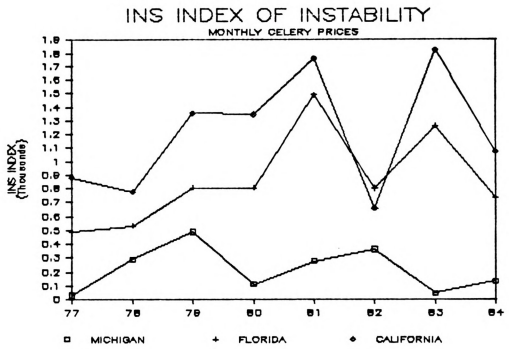
Table 4.4

Monthly Celery Prices: Major Producing States

	1977	1978	1979	1980	1981	1982	1983	1984
				MICHIGAN FOB SHIPPING POINT PRICES				
JULY	6.65	12.38	8.00	6.75	10.33	7.41	7.50	7.44
AUGUST	5.69	8.50	4.81	5.58	7.15	6.06	8.31	5.65
SEPTEMBER	5.28	8.95	4.87	6.19	7.69	6.94	8.06	4.60
OCTOBER	5.00	9.00	5.00	5.81	6.69	4.80	7.38	4.50
SEASON AVERAGE	5.66	9.71	5.67	6.08	7.97	6.30	7.81	5.55
				FLORIDA FOB SHIPPING POINT PRICE				
DECEMBER	3.95	3.80	5.75	4.65	6.00	8.05	5.05	13.50
JANUARY	5.13	4.11	4.75	7.25	9.75	8.50	5.25	15.00
FEBRUARY	8.00	3.63	6.25	4.13	5.65	8.55	5.75	14.50
MARCH	7.25	7.00	6.05	4.38	4.50	10.10	5.25	12.50
APRIL	5.50	6.73	5.00	4.65	4.50	5.30	8.50	6.00
MAY	5.88	7.40	4.85	5.63	9.50	6.15	16.00	5.75
JUNE	5.38	9.00	9.75	4.75	9.62	8.75	9.00	7.00
SEASON AVERAGE	5.87	5.95	6.06	5.06	7.07	7.91	7.83	10.61
				CALIFORNIA FOB SHIPPING POINT PRICE				
JANUARY	7.00	5.88	6.69	7.56	12.00	8.00	4.25	16.50
FEBRUARY	9.90	3.45	6.70	3.25	5.00	9.31	5.75	15.00
MARCH	7.13	6.25	5.95	4.08	4.10	8.15	5.00	8.50
APRIL	5.75	7.40	3.70	6.30	3.60	7.50	8.75	5.00
MAY	6.25	8.70	4.80	6.00	10.13	5.70	16.50	6.50
JUNE	3.94	12.13	9.33	4.38	10.25	7.42	8.50	4.50
JULY	4.08	12.50	8.94	4.17	8.69	6.63	8.50	4.00
AUGUST	4.00	10.90	3.20	3.20	7.50	4.25	5.25	4.00
SEPTEMBER	3.25	9.00	2.95	5.15	6.00	6.45	8.00	3.75
OCTOBER	3.25	6.55	3.25	3.70	4.85	3.85	5.25	3.75
NOVEMBER	5.69	6.50	3.70	6.05	7.85	4.00	10.50	7.50
DECEMBER	3.31	6.00	3.95	6.92	5.18	4.25	14.50	5.00
SEASON AVERAGE	5.30	7.94	5.26	5.06	7.10	6.29	8.40	7.00

NOTE: PRICES IN NOMINAL DOLLARS PER CRATE (55-60 LBS.)

Sources: Federal/State Market News Reports, 1977-1984,
USDA/ERS Statistics 1977-1984



Sources: Federal/State Market News Reports, 1977-1984
USDA/ERS Statistics, 1977-1984
Figure 6

clear idea of demand at any point in time. The shipper has approximate information on how much he can sell. This information is communicated back to the grower to be used in planting decisions. The shipper is also in a position to moniter the grower's quality, making suggestions when appropriate and having the coop set grades to use as standards.

One coop shipper interviewed said that seventy-five percent of his buyers are the same each year. In this case, anticipating their needs from month to month and from year to year is not as difficult as it is with new buyers.

Information on supply and demand conditions is disseminated through a coop publication of a newsletter called **Stalk Talks**, involvement of shippers and producers on the various coop decision making committees and through frequent coop meetings. Most coop members participate on at least one committee.

Production levels and allocation to the fresh or processed market are influenced by the MCPC. Growers are permitted to sell their celery only through authorized coop shippers. The program of staggered planting and harvesting encouraged by the coop acts to even out the flow to market of celery over the season. Lengthening the marketing season and limiting the quantity sold per week through occasional harvest quotas helps to avoid gluts and shortages. The coop gives producers the incentive to sell to the coop every week of the season by taxing them for every week they choose not to contract with the coop. This method smooths out the flow of celery to market. The benefits of these procedures are somewhat mitigated by the actions of the independent producers who do not practice similar supply management techniques.

The coop provides a mechanism to aid in allocating the crop to the various forms most demanded by consumers. This is done by diverting lower quality, less demanded sizes or excess supplies to a processing facility. These practices avoid waste and keep fresh market prices more stable. Michigan's low INS measure of instability (Table 4.3)

confirms how successful the MCPC has been in keeping prices relatively stable.

According to MCPC members and non-members, the sucessful performance of the coordination functions of the coop are contingent upon the amount of acreage the coop markets. Presently the coop markets approximately sixty-five percent of the total acreage in the state. This is down from a high of ninety percent of total Michigan acreage in the 1970's. This drop from ninety percent to sixty-five percent of Michigan celery acreage marketed by the MCPC means that free-riders have become more of a problem to the coop. The decrease in acreage marketed by the coop leads to more difficulties in achieving pricing goals. Continued decreases in acreage would eventually challenge the effectiveness of the coop in price discovery.

4.4.2 California Market

The evaluation of coordination performance in California is less detailed than that of performance in Michigan or Florida due to the limited contacts made with California subsector participants. Observation and conversation with retail produce buyers have pointed out the fact that California has managed to produce consistently high quality celery which is available year round. California producers and handlers, by imposing their own standards, have earned a good reputation for growing top quality celery. California celery is preferred over other

states by many retailers due to its consistent quality and reliable year round supply.

One example of California's ability to provide the retail trade and the ultimate consumer the type and quality of celery preferred can be seen by improvements made in California celery packaging techniques. Bud Antle, one of the largest producers and handlers in California, introduced sleeved celery in California in August, 1985. The advantages for retailers of this method of packaging include:

1. Decreased labor costs since celery is already trimmed when it arrives; 2. The plastic sleeve maintains moisture and prevents oxidation which leads to a longer shelf life; 3. The plastic sleeve reduces shrink at the retail level since there is no backroom waste

(Holstead 1986).

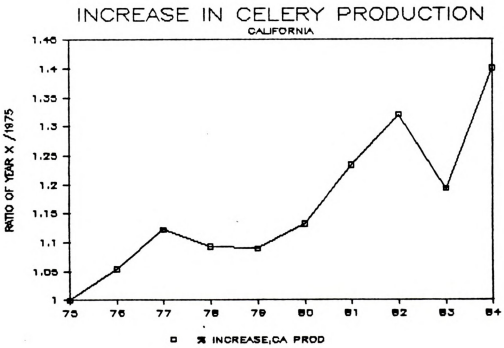
Since there is a high degree of vertical integration of California producers into the shipping function, it is impossible to separate the risk borne by producers versus handlers in the production and marketing of California celery. For this reason, we assume that producers and shippers have an equal say in the formation of California celery prices. However, research to date has not focused on price formation in California which is primarily the result of individual transactions clearing the market.

The INS measure of instability in California monthly and annual prices, calculated over the range 1977-1984, shows that California prices are the most variable compared

to Michigan and Florida (Figure 6). It seems logical that prices formed without formal pricing mechanisms which aim to stabilize prices, would be more variable than those formed under specified arrangements.

Discussion with several subsector participants knowledgeable on California's celery market revealed that the most common method of information exchange among producers, handlers and buyers is through verbal communication. The Market News Service is not considered a reliable source of information by Californians, with inaccuracy and less than prompt dissemination of information cited as the main problems.

Supply decisions in California are made by the individual producers (Figure 7).



Source: Batkin, Holt and McMilin, 1986

Figure 7

There is no mechanism to manage the overall supply of celery produced in this state. A graph of the percentage increases in California production from 1975 to 1984 shows the large expansion which occurred over that time. California supply increased forty percent from 10,542,000 cwt to 14,760,000 cwt in the period from 1975-1984 (Batkin, Holt, MacMilin 1985). This rapid increase in California's production leads to coordination problems in other areas as will be discussed later.

4.4.3 Florida Market

The Florida Celery Exchange has attempted to provide some of the coordinating functions needed for orderly marketing.

In Florida, pricing is handled by the Exchange in a similar way to that of the MCPC in Michigan where grower/members sit on a pricing board. The board serves to gather and interpret the supply/demand information for the determination of price.

A study by J.Scott Shonkwiler suggests that prices determined by the Exchange in the period from 1972-73 to 1977-78 closely approximated the equilibrium price in the short run (Shonkwiler 1979 p.5). According to Breimyer, this type of pricing mechanism is called "supply-demand estimation pricing" (Breimyer 1976, p.116). This term implies that the set price acts to clear the market, therefore should be representative of supply and demand

conditions.

A closer look at the level and variability of Florida prices will be useful in evaluating how well the celery crop is coordinated in this state. The average annual price over the period from 1977-1984 is $7.04 per crate. In comparison to celery prices in the other two states, Florida annual prices are the highest (Table 4.3).

The INS measure for monthly price instability shows that instability in Florida closely follows the patterns of California, though at a lower level (Figure 6). Although the Florida Celery Exchange has attempted to improve pricing performance by generating and compiling additional supply and demand information, monthly prices are only somewhat more stable than those formed with no celery association.

The concentration of producers and shippers in a few areas of the state should facilitate the flow of information between them. Since Florida production is in the hands of only a few, large producers, market information does not have far to travel. Without more in depth interviews with Florida producer/shippers, it is difficult to determine whether there is a smooth flow of information amongst producer/shippers and between these participants and those further up the vertical marketing system.

Analysis of the performance of the allotment provision of the Florida celery marketing order is confused by the varying opinions of celery experts. The provision has never been a limiting factor for Florida celery production since

the total fresh market shipments have always been less than the marketable allotments permitted. The allotment program does set an upper bound on production which may limit unreasonable expansion which is not in line with demand. The marketing order also sets aside six percent of the total base quantities to be reserved partly for new entrants and partly for expansion of existing producers. In this way, the marketing order allows entry but guards against unreasonable expansion. Florida has not shown the rapid expansion in production that states such as California have shown. This may be due to weather variability, cultural practices or financial obstacles. The moderate increases in Florida's production do not seem to upset the supply/demand balance.

The allotment provision may create incentives to keep those producers in the business producing to ensure an adequate supply. Since producers lose their allotment after two years if they choose not to produce, the provision encourages orderly production each year. When a producer loses his allotment, this allotment becomes available for a new producer wishing to enter the market. However, as a short term tool for balancing supply with demand, the allotment provision as it now functions, contributes little toward more orderly marketing.

This brief description of the environment and behavior of subsector participants as well as coordinating functions available will facilitate the reader's understanding of coordination performance problems in celery marketing. The

following chapter will address the specific market coordination performance problems discovered through discussions with key subsector informants.

CHAPTER 5

THE U.S. CELERY SUBSECTOR:

ANALYSIS OF COORDINATION PERFORMANCE PROBLEMS

5.1 Introduction

In this chapter, coordination performance problems in the celery subsector will be analyzed. Major coordination problems will be presented with reference to the relevant structural and behavioral characteristics contributing to the problem. Alternative arrangements to improve coordination in the celery subsector will be outlined.

5.2 Coordination Problems in the U.S. Celery Subsector

In spite of the various coordination mechanisms which have arisen to facilitate more orderly marketing in the celery subsector, there are still several coordination problems which inhibit the successful matching of supply and demand in the U.S. celery subsector.

5.2.1 Supply Problems

Celery production requires very specialized production equipment as well as specialized knowledge of cultural practices. These factors prevent producers from rapidly shifting their resources out of production when prices are low. Instead, there is a tendency for producers to produce to earn as much revenue as possible, given low prices. There seems to be a range of prices within which producers

will continue to produce the same amount of supplies due to their highly specialized and fixed assets. (Johnson in Gibbs M.,C. Carlson 1985 p.58).

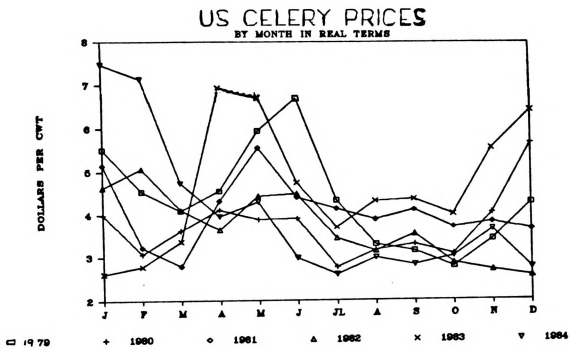
According to a large produce grower and shipper in Michigan, "The potential for overproduction is there every year (even without new entrants)" (Anonymous author in The Packer, July 1986). This grower/shipper believes that producers let Mother Nature solve the overproduction problem without resorting to more institutional or scientific methods. This idea was repeated in a document by the California Celery Research Advisory Board when referring to the celery subsector "...the key problem is oversupply.... There is just too much celery planted and it takes a disaster in some area to keep price at a profitable level" (Batkin, Holt, MacMilin 1986 p. 19). Subsector participants in the major producing areas have agreed that there is a tendency toward oversupply in celery production.

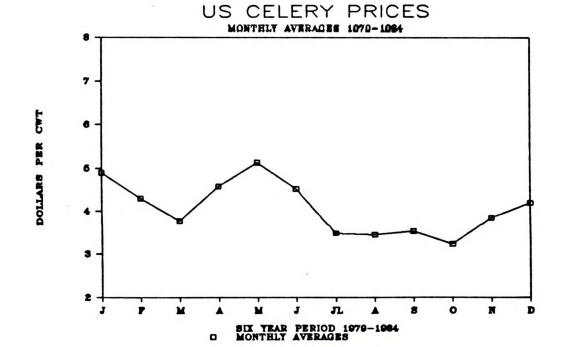
A member of the Michigan Vegetable Council, Inc. a local trade association, feels the problem is severe enough that he tries to discourage new producers from getting into vegetable production due to the overproduction problems as well as the specialized knowledge necessary for success (Anonymous author,The Packer, July 1986). Neither reliance on Mother Nature nor limits to entry will consistently eliminate the oversupply problems in the celery subsector.

The supply problems can be defined in the following way. Total U.S. celery production has increased in the

period from 1975 to 1984 by thirty percent while total U.S. consumption defined as per capita consumption multiplied by population has increased at a lower rate. Increases in exports have absorbed some of the excess supply; however, conditions of oversupply seem to have a depressing effect on prices. This suggests an excess of total celery supplies.

From the perspective of midwestern producers and extension agents, the oversupply problem seems to be the most disruptive in the summer months when celery arrivals from Canada and California add to the local supplies in some of the eastern markets, making it difficult for eastern and midwestern producers to find outlets for their celery. Producers are faced with low prices for their celery in the summer months. This can be seen in the plot of average monthly U.S. celery prices over the period from 1979-1984 (Figures 1a and b). Large shipments arriving from California in the summer months are often shipped without being sold and with no pre-arranged destination. These loads may be handled in terminal markets or are sold directly to chain stores. Eastern and midwestern producers have difficulties predicting the arrival of this celery since they may only have contact with a few shippers in California. This may suggest a seasonal oversupply problem as well as problems with timing, incomplete information and poor planning by California shippers. However, we may assume that California shippers would not ship to eastern markets unless their net gains were positive. Although their practices may be





Figures 1a and 1b
Source: USDA/ERS Statistics

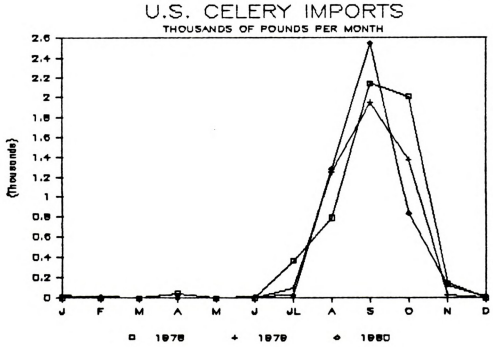
disruptive to other producers and shippers, California shippers may, in fact, be maximizing their own returns. Until profitability studies are done for California shippers, it is impossible to draw conclusions on this aspect. We may however, point out the coordination problems which occur as a result of California celery shipments to eastern markets.

Another factor contributing to the seasonal glut in eastern and midwestern markets is an increase in celery imports from Canada. Arrivals from Canada have increased due to: 1. The exchange rate where the U.S. dollar has remained strong against the Canadian dollar; 2. A variety of potential subsidies available to Canadian producers; 3. Unequal tariff rates. In 1985, the tariff between July 10th and October 1st on each crate of celery shipped from U.S. to Canada was $1.40. The tariff on Canadian celery which came into the U.S. was only $0.50 per crate at this time. Total celery imports to the U.S. are highest from July to October (Figure 2) while Canadian shipments to eastern markets are highest in July and August. U.S. celery imports from Canada increased from 7,301,502 pounds in 1981 to 10,141,695 pounds in 1983, These figures show a thirty-nine percent increase in two years (Bureau of Census 1982,1984) (Table 5.1). The size of the Canadian celery crop seems to be increased due to the aid given to producers by both provincial and national governments. This contributes to the summer glut and depressed prices for celery.

TABLE 5.1

U.S. CELERY IMPORTS

YEAR	DATE	ORIGIN	LBS.	CANADA AS A % OF TOTAL	TOTAL LBS IMPORTED
1981	4/15-7/31	CANADA	530,387	97.6%	
	4/15-7/31	OTHER	13,188		543,597
	8/1-4/14	CANADA	6,771,115	98%	
	8/1-4/14	OTHER	111,449		6,882,564
					7,426,139
1983	4/15-7/31	CANADA	-	-	
	4/15-7/31	OTHER	288,238		288,238
	8/1-4/14	CANADA	10,112,497	99.7%	
	8/1-4/14	OTHER	29,198		10,141,695
					10,429,933



Source: Bureau of Census, U.S. Imports for Consumption,1979-84
Figure 2

It has been alleged that Canada's low prices are due to various forms of government subsidies on vegetable production. A study done by the International Trade Commission has compared the competitive position of selected Canadian and U.S. vegetables in U.S. markets by evaluating the different types of federal programs available. Federal programs for U.S. vegetable producers are limited to marketing orders which are not presently in affect in the Great Lakes area for celery, carrots, onions, lettuce, cabbage, or radishes. There are no known federal or state programs for fresh vegetable growers that provide financial assistance such as price supports, export promotion rebates or financial assistance for storage construction.

In contrast, Canada has federal programs for financial assistance for storage construction, interest free cash advances, government purchases of unmarketed products, price supports, long-term loans, crop insurance and trade promotion programs.

Provincial governments also provide support programs such as financial assistance for construction of storage, processing and grading facilities, installation of energy efficient technology and cooling systems, construction or renovation of seasonal worker housing, installation of drainage systems, farm ponds, erosion control, provision of credit and rebates of taxes and interest to young farmers (Hager 1986 printed in The Packer).

These differences in support programs for Canadian

versus U.S. producers help to explain why Canadian producers can produce and ship fresh vegetables, including celery, to the U.S. at such low prices. The existence of these differing subsidies contributes to one of the coordination problems in the celery subsector.

Cooperative organization in Florida and Michigan have provided some coordinating functions including a limited supply management program and information collection which are necessary for orderly marketing. Since these cooperatives function within one state only, and do not cooperate with one another, they are limited in their ability to match supply and demand on a national or international level.

The largest producing state, California, does not have a supply management system which helps producers to make accurate production decisions appropriate to the level of demand. The lack of supply management has resulted in a large expansion in California production, inappropriate timing of celery shipments from California to the east and highly variable California monthly celery prices. These factors have inhibited good coordination performance in the whole celery subsector.

5.2.2 Alternatives to Address Supply Problems

Various alternatives will be presented to address the supply problems discovered in this research. Some combinations of alternatives may be applied to address a

number of coordination problems while use of some of the other suggested alternatives may preclude the rest. The suggestions are presented to give the reader a sense of what could be done to improve the present situation, not to prescribe a solution.

Alternative: Research on Consumer Demand

Celery producers and market participants do not seem to have a clear picture of the effective demand for celery and celery products. Any program to improve coordination of supplies with demand should begin with a closer assessment of consumer demand for the product. The amount of funding for market research to better understand the level of demand and quality of produce that consumers demand has been quite low in the past.

Alternative: Market Quota Marketing Order

Once the demand levels and characteristics for celery are understood more completely, supply management could be used to match supply with the demand at prices more consistent with cost of production. One method of managing supply is through use of a market quota marketing order. A closer look at demand in different months of the year, could serve as a guide to the quota amount granted to each producer.

Advantages

A more concerted effort to produce for the effective demand, instead of producing and then hoping to expand demand may help to stabilize prices. Supply limitations, if appropriately applied, may raise producer prices slightly without significant losses to consumers. This is because a small increase in the producer's price per crate makes a big difference to the producer's total revenue, but might not significantly change the retail price seen by the consumer. Further analysis of producer and consumer welfare at different supply levels would be necessary to complete this discussion. This will be left for future research.

Many coordination problems could be solved if California producers could be convinced that by balancing total U.S. production with demand, prices could be raised enough to make it worthwhile for them to stop producing in the summer months and still increase their returns. In this way, a marketing quota marketing order could lead to more orderly marketing conditions. The marketing order could help producers to supply the amount of celery that will satisfy demand at a price sufficient to cover the cost of production. Producers in areas outside of California would have an easier time finding outlets for their summer product, overall U.S. prices would not be as depressed and California would not be producing at below their cost of production in the summer months.

Disadvantages

It is difficult to accurately predict future demand; however, changes in consumer preferences do not happen overnight and can be estimated with proper research. Unless research is conducted to determine expected future supply and demand trends, it would be difficult to select the appropriate quota level which will result in slightly increased prices and more stable returns for producers.

Supply control marketing orders are not well appreciated by the present administration due to their perceived ability to raise consumer prices. At present, producer quotas on marketing are legal while production quotas are not. Even if production quotas of this nature were legal, celery producers in some of the producing areas seem to have a general mistrust of introducing group action or government involvement of any kind. It would be difficult to convince producers in California and elsewhere, that cutting back on production would increase their returns. Supply cutbacks may be seen as a risky venture with the possibility of lower volume of shipment leading to lower returns, therefore producers may not be in favor of this plan. Without approval of California producers, a referendum for a national marketing order could not be passed.

Another alternative is to encourage group action in each major celery producing area. For example, a coop similar to the Michigan Celery Promotion Cooperative with additional provisions for acreage contracts with its members

could improve the supply/demand balance in the celery subsector.

To Address Problem of Seasonal Glut in Summer Months

Orderly marketing of celery seems to be affected by a glut of produce arriving to be marketed in midwestern and eastern cities in the summer months. This glut seems to be caused by the large supplies arriving from California combining with high levels of production in eastern and midwestern producing areas. The domestic oversupply is exacerbated by increases in celery imports from Canada at this time. This glut, which seems to be more disruptive in eastern markets such as Buffalo, Boston and New York in the summer months, results in low producer prices for all celery growers and handlers who trade in these markets. The low prices result in low producer returns at this time.

Alternative: Handler Prorates

The analysis of price instability in each producing area shows evidence that celery prices in California and Florida are quite unstable from month to month. Smoothing out the flow of celery to the market may correct the problem of low summer prices and instability in Florida and California prices. The flow of celery to the market can be evened out through use of a marketing order with prorates to set the maximum shipping allotments per week.

Advantages

Handler prorates could be used to improve the distribution of celery among shippers. This mechanism has potential to improve the timing of when shipments reach particular markets. This seems to be a facet of the seasonal oversupply problem which is not presently being addressed. Prorates may be used only when they are absolutely necessary, for example during the summer months when large supplies generally pull down prices. Limiting weekly shipments in the summer months may eliminate the summer glut, raise prices in these months and stabilize producer returns.

Disadvantages

One marketing order for lemons which has a provision for handler prorates has been accused of leading to inefficient allocation of resources. It is believed by some members of the present administration that prorates may lead to vegetables suitable for the fresh market going toward the processing market. Since there is a limited demand for celery in its processed form, this may solve a problem while creating another problem. Celery is only used in small quantities in processed products and has a limited potential for expansion. Handler prorates may not be the best alternative for a perishable crop since celery cannot remain in the field once it is ripe for more than a few days before it is harvested. Once harvested, the crop can only be stored

for a few days. For these reasons, prorates might lead to celery rotting in the field. In this case, curtailed production would be a better use of resources. However, to address this, if growers could adjust acreage planted in response to the known prorate amounts for each week, this alternative may improve coordination.

Alternative: Equal Countervailing Tariffs with Canada

Low priced celery arrivals from Canada could be taxed at the same rate as that applied to U.S. celery going to Canada. An equal countervailing tariff may slow down the flow of Canadian celery to U.S. markets in the summer months when additional supplies are not needed. However, imposing this new tariff would very likely disrupt the present trade patterns. Since U.S.exports of celery to Canada from July to October are much greater than U.S. imports from Canada at this time, increasing tariffs in this way may lead to retaliation which may worsen the present supply situation.

Alternative: Improvements in California's Market Targetting

Since the largest expansion in production and a large percentage of the supplies arriving in eastern markets come from California, improvements in this state's supply management techniques may improve the situation.

It has been alleged by some subsector participants that California ships celery to the eastern markets in the summer at less than their cost of production, since they can

compensate for these losses in the winter months. The motivation for continuing to ship at such low prices may be because it would cost California more to curtail summer production than to continue to ship at low prices in the summer months. Since California producers are diversified, producing many other vegetable crops and shipping mixed loads, their costs such as labor must be paid regardless of whether or not they produce celery. In addition, California's reputation as a year-round producer would be hurt if no shipments from California were available in the summer months.

To confirm the allegations that California is cross-subsidizing their summer celery production with winter celery production it would be necessary to study the cost of celery production in California on a monthly or seasonal basis. If this allegation is confirmed, alternatives to improve coordination would include finding a more suitable market for California celery or curtailing production. By not shipping celery east at this time, California producers would be saving the high costs for freight. Presently it costs California shippers two dollars per crate more than Michigan producers for freight charges to eastern markets.

One alternative for California would be to alter their target markets in the summer months to gain higher returns at this time and to avoid the price depressing affects their celery has in eastern markets. California could expand their exports to the Pacific Rim countries which have shown

increases in import demand for fresh vegetables. Celery has been ranked sixth in the exporting of fresh vegetables to this area for the past two years (Batkin, Holt, McMilin 1986). There seems to be potential for increasing fresh vegetable exports to this part of the world and California is in a prime location to conduct this trade.

Disadvantages

The problems which may be encountered by shifting target markets is that transportation to other areas may be just as expensive. If California shippers are willing to ship to the east at prices which are perhaps below the cost of production, it may be even more expensive to curtail shipping during the summer if other markets are not located.

California shippers may in fact be operating above their cost of production for a mix of vegetables. If there are losses incurred by shipping celery at low prices in the summer months, they may be compensated by higher prices for other vegetables.

Dictating to which markets California shippers should sell overlooks the fact that these shippers are assumed to be profit maximizers. Although their practices may not lead to good coordination in the subsector as a whole, they may be effective for the individual participants.

5.2.3 Incomplete Information Problem

Another coordination performance problem discovered through personal interview with subsector participants in Michigan, Florida and California is the dearth of accurate, timely supply and demand information to aid producers and handlers in making production and marketing decisions. Since production is dispersed in concentrated pockets across the nation, with differences in production practices and in the timing of harvest, communication is extremely important.

Sources of information available to subsector participants include: Market News publications, electronic news services, trade journals and conversations with other members of the subsector. Each of these sources has been judged to be unreliable by subsector members interviewed. The Market News Service has been criticised by subsector members in the major producing states because it does not include all the relevant information needed. Market News has been accused of inaccuracy and less than prompt transmission of necessary news.

Electronic news services such as PRONET which provide industry news, weather reports, supply, demand and price information, as well as providing the opportunity to post notices to buy and sell produce, are not widely used. Some of the reasons why this service has not been accepted in the celery subsector have been described by knowledgeable participants as follows: 1. Weather reports can be obtained easily at a lower cost from the T.V. or newspaper; 2.

Commodity information is printed in The Packer newspaper; 3. Trading activity tends to pull down prices; 4. Membership rates are expensive. Unless such electronic systems are used by a majority of producers for a particular commodity, they will not be effective sources of information and will not serve to improve coordination in any subsector.

Personal conversations among subsector participants is useful to a degree; however, in a competitive environment, news passed in this way tends to become distorted and value-laden. The judgements of individual participants may be inaccurate.

5.2.4 Alternative to Address Information Problem

Industry Generated Information Network

A new electronic information system is in the works in California. This could be an important tool in improving coordination in the celery subsector. The information that producers in the various parts of the country need includes: weekly plantings; timing of harvest in each region; daily shipments and the destination market; estimations of the following week's supply in each area and data on Texas as well as all other areas. To date, no information has been made available on Texas' production. An electronic information system for celery which was available for use by producers and handlers in all states could improve communication between producing regions and reduce errors in production and marketing decisions. This system could help

producers better anticipate amount of supplies that will hit particular markets on specific days. Since fresh celery is not sold under formal contracts which would generate information, this information is crucial for orderly marketing.

Disadvantages

As with other industry generated programs, there are costs to generating, collecting and disseminating information. These costs would have to be borne by the users. Producers and handlers may be unwilling to accept the added costs of the service if they cannot perceive the benefit they will gain from its use. Since the project has been developed without the help of those in the other producing areas, there may be a tendency for California to supply information that is most relevant for their own purposes. Not enough is presently known about what information will be provided by this new system. It may work out to be information less relevant for those in other areas. Furthermore, if the observations are valid that California shippers ship east with no prearranged destination, then information about these transactions will not be available until after the sale, unless California shippers were willing to give separate information on unsold lots.

5.2.5 Variable Quality Problem

Subsector participants in the three major producing areas have pointed out a problem with celery grading standards. The present USDA system for celery grading is uclear and not widely followed by producers or shippers. Those in the subsector feel that celery grading allows too much variability of quality, with many aspects of quality not graded.

According to the USDA standards, celery is categorized into three grades which include: U.S.Extra No.1; U.S.No.1 and U.S.No.2 as well as an unclassified rating for that celery which is not graded. The following information comes from the Agricultural Marketing Service publication U.S. Standards for Grades of Celery (AMS 1959, revised in 1983).

According to the USDA standards, "U.S.Extra No.1 consists of stalks of celery of similar varietal characteristics which are well-developed, well-formed, clean, well-trimmed, compact and free from blackheart, brown stem, soft rot, doubles and free from damage caused by freezing, growth cracks, horizontal cracks, pithy branches, seedstems, suckers, wilting, blight, and other disease, insects or mechanical or other means. Stalks shall be green unless specified as fairly well-blanched, or mixed blanched."

This grade includes a minimum set length (7") for the average midrib, minimum length for the whole stalk (12-14"), and tolerance levels for any lot of celery which does not

meet the requirements. These tolerance levels are ten percent for defects, five percent for off-length midribs and five percent for off-length stalks.

The U.S.No.1 standards are the same as for U.S Extra No.1 except that the minimum size for the length of the midrib is only six inches and there is no mention of penalty for the problem of brownstem. Aside from these differences, tolerance levels for off-length and defects are the same as for U.S. Extra No. 1. The wording of the paragraph describing U.S.No.1 uses the words "fairly well-developed" and "fairly well-formed" instead of simply "well-developed" or "well-formed" as in the description of U.S.Extra No.1.

U.S No.2 standards differ from U.S Extra No.1 by the size of the midrib which is four inches instead of seven inches. There is no mention of standards for compactness or whether penalties are imposed for the existence of brownstem. The wording differs again with adjectives such as "reasonably well-developed" and "reasonably well-formed" used to describe quality. U.S.No.2 celery must be free from serious damage rather than simply damage as stated for U.S.Extra No.1. Those problems which count as serious damage are well-described. Tolerances for defects and off-sizes are the same as for the other two grades.

The USDA's distinction between "well-developed", "fairly well-developed" and "reasonably well developed" is impossible to discern from the description of the grade. Descriptive terms such as "branches of a good width" and

"branches reasonably straight" are used as distinguishing factors between grades.

Certain criteria have been made explicit in the USDA standards. These include measures for the average length of the midrib, length of the whole stalk and degree of trimming required. However, many of the other criteria are not well defined by these celery grades.

According to many in the subsector, the grade of U.S.No.1 is the only federal standard which is presently considered. It is unclear whether the industry's perception of this grade is the same as the USDA description of U.S.No.1. Those in the subsector usually consider U.S.No.1 to be the lowest acceptable quality with most buyers requiring higher grades.

Most producers and handlers attempt to sell celery of higher quality; however, the higher grades are not uniformly set across the nation. Variable quality standards across the states may result in lower quality products pulling down the whole subsector price. Those growers producing superior quality may not be rewarded for their efforts; producers of inferior quality may be given inappropriate signals to continue. Variable standards confuse the pricing procedure and create uncertainties as to the quality a buyer will receive. Variability in quality may contribute to the highly unstable monthly celery prices for California and Florida. In Michigan however, the MCPC has a good performance record for quality. Mandatory quality standards

above the USDA minimum grade are set and enforced by the coop.

5.2.6 Alternatives to Address Variable Quality Problem

Alternative: Revise and Publicize AMS Quality Standards

The Agricultural Marketing Service should meet with grower representatives to explore possible changes in U.S. celery grades. A better description of celery grades would help producers know what to strive for. The extension service could serve as the vehicle for transmitting the clarified grade information to producers and handlers in the producing regions. Finer gradations are needed to better describe quality, not only size. Producers and handlers need to see that uniformity in grading standards and more specific reporting will increase their returns.

Alternatively, influential shippers could establish more specific grades and pass this information on to other subsector participants. Since the celery subsector is dominated by a few, large producer/shippers, industry action may be possible without the intervention of government.

Disadvantage

There is no guarantee that increased awareness of a new, more specific set of grading standards will encourage producers and handlers to use them.

Alternative: Federal Quality Marketing Order

If the clarification of celery grades by AMS or by influential grower/shippers does not improve the uniformity of celery grades, a federal marketing order on a national scale with quality provisions could be proposed.

Advantages

A federal marketing order could ensure quality over time, regardless of the crop size. This mechanism could prohibit shipments of clearly unsatisfactory celery. Quality standards could be adjusted periodically depending on the size of the crop to prevent drastic price changes. Well-defined grades across the country could lower marketing costs since fewer shipments would be rejected at the retail level. This means less waste within the marketing channel and higher returns for producers. Uniform standards will facilitate pricing and decrease uncertainty. One example of where a system of uniform standards seems to have had a stabilizing affect on prices is in the case of the Michigan Celery Promotion Cooperative. In this case, characteristics such as size, defects, shape, chemical residues etc. are all graded through use of a mandatory, coop initiated system. The empirical analysis of price variability indicated that Michigan monthly celery prices were the most stable when compared to the two major producing states. Although we cannot draw the conclusion that mandatory and specific grading standards led to more stable celery prices, grading

standards may be a contributing factor.

Disadvantages

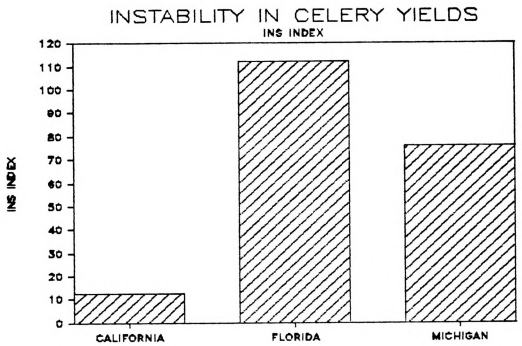
It may be difficult to institute a federal quality marketing order since producer/shippers with well known brands might be unwilling to vote for it. These firms have established their own quality standards and have been successful in their enterprises. They may not appreciate improving the quality in other areas if it means increased competition from other firms. Although some of the states such as Michigan are doing a good job with grading standards, the problem remains that different grade standards from state to state confuse pricing for U.S. celery and cause coordination problems.

5.2.7 Yield Variability

Variability in yields poses another coordination problem. Weather, cultural practices and disease related factors lead to variable yields in celery production. Fusarium Yellow disease and others can significantly alter the celery yields in a particular area. Variable yields lead to variable production which can result in unintended gluts and shortages, conditions not conducive to orderly marketing.

The INS measure of instability was used to measure the variability in yields in the three major producing areas. The results show that variability in yields is greatest for

Florida, slightly less for Michigan and relatively stable for California (Figure 3).



Source: Batkin, Holt and McMilin 1986
Figure 3

Discussions with the various shippers have pointed out that California has an ideal climate for celery production. This helps to explain the relative stability of yields in this state. Early season rains and disease are the factors leading to greater yield instability in Florida and Michigan. The relatively stable yields with relatively unstable prices for California celery suggest that the price instability (annual and perhaps monthly) is due to grower planting decisions. Further analysis of variation of

acreage planted would enhance this finding. This will be left for further research.

5.2.8 Alternatives to Address Yield Variability Problem

Improve Cultural Practices

Yield variability can be somewhat alleviated through improvements in cultural practices. On-going research to breed varieties resistent to Fusarium Yellow, the most common disease, has been conducted and should be continued. Research at the university level has been sucessful in discovering new disease-resistent varieties. Planting in more than one production area in a particular state can minimize the risk of a flood destroying a whole state's crop or of a disease wiping out production over a large area.

5.3 Conclusions

The performance problems in the celery subsector were described in somewhat less detail that those in the apple subsector. Access to fewer knowledgeable subsector participants and to little in the way of past research in this area can be cited as reasons for the lack of detail. The alternatives suggested may assist those in the industry to evaluate the various possibilities to improve coordination performance.

The Michigan Celery Promotion Cooperative is a good example for other producing areas of an effective industry-generated solution to better match supply with demand. To

avoid additional government intervention, a similar cooperative in California could help coordinate production and marketing without dictating either production or marketing. A coop in this state could help reduce mistakes in timing of shipments, pricing and quality to improve coordination in the entire celery subsector.

CHAPTER 6

CROSS-SUBSECTOR ANALYSIS OF COORDINATION PERFORMANCE IN THE CELERY AND APPLE SUBSECTORS

6.1 Introduction

These case studies emphasizing coordination mechanisms and performance in the apple and celery subsectors may be used to compare similarities and differences between subsectors. A subsector comparison can help point out the factors preventing good coordination in a particular subsector.

This section will focus on the strengths and weaknesses of particular coordination mechanisms and how well the subsectors perform in relation to one another regarding the specific functions considered necessary for orderly marketing. References will be made from time to time to relevant sections in the thesis which contribute to the description or analysis of factors leading to the resulting coordination performance. Since more detail is offered in earlier sections, this information will not be repeated.

No attempt was made to include all of the coordination problems at all levels in each subsector. Emphasis was placed on coordination between individual firms and coordination of total supply with total demand for commodities mainly at the producer-first handler level. With our present level of knowledge, we can make some comparisons between particular coordination mechanisms and the resulting

performance. This section will include a comparison of performance using different coordination mechanisms for the same crop as well as comparing performance across crops.

It is important to note that perennial and annual crops will differ in their coordination performance even if well-functioning coordination mechanisms were in place for each crop. Perennial crop production requires more complex, long term investment decisions and necessitates information on long term supply and demand which is very uncertain; therefore, perennial crops tend to be more difficult to coordinate in some respects.

6.2 Performance Comparison - Outline

The coordination functions outlined throughout this research which are important to successful matching of supply and demand in a subsector actually define particular performance areas. These performance areas will be used as the basis of comparison in the cross subsector analysis. These areas include:

1. Quality and form of product consistent with consumer demand;
2. Costs and Risks equitably and appropriately distributed between producers and handlers;
3. Effective price formation process where producers and sellers have some influence over price and where prices are accurate representations of supply and demand conditions;

4. Adequate flows of information up and down in the vertical marketing system, as well as within levels;
5. Ability to match quantity demanded with quantity supplied with an avoidance of gluts and shortages and;
6. Prices adequate to cover long run costs of production for a typical well-managed producer, or give accurate signals of needed adjustments.

To compare coordination performance in the two subsectors, each performance area as specified above will be considered. Each subsector will be assessed according to the previously stated definition of orderly marketing. The sources and institutional factors leading to performance will be highlighted to help explain why the situation of orderly or disorderly marketing prevails.

The key research questions as listed in Chapter 1 have been applied within each performance area to help arrive at more qualitative performance criteria. The establishment of qualitative performance criteria would be useful in future analysis of orderly marketing in commodity subsectors. The key research questions which provided the basis for coordination performance evaluation include:

1. What are the coordination functions that must be performed in each subsector for a good match of supply with demand?
2. Is there a mechanism in use to effectively perform this coordination function?

3. How does this mechanism work? How much of the production is affected? How effective is this mechanism?
4. Does the mechanism play a role in helping growers make short and long term investment decisions?
5. Are there coordination functions which this mechanism does not perform?
6. What alternative mechanism could be employed instead of this one?

The responses to these questions have provided a descriptive and diagnostic analysis within each performance area; bringing us one step closer to defining performance criteria for orderly marketing. The cross comparison will be organized along performance areas, noting the differences between subsectors.

6.3 Comparison Across Subsectors - Performance Areas

6.3.1 Quality and Form of Product Consistent with Consumer Demand

Orderly marketing conditions are less than ideal in parts of the fresh apple subsector because producers and handlers have only responded partially to the preferences of retailers and consumers for improved quality and pack. According to experts in the subsector, there have been some performance problems in Michigan because producers and handlers have not provided uniform, larger, high quality apples packed for bulk display. Because of many producers'

unwillingness to adapt to changing preferences, there is an oversupply of low quality apples leading to relatively weak prices as well as consumer dissatisfaction. Traditional practices of Michigan producers, less than ideal climate and uncertainty regarding the cost effectiveness of newer production practices slows down producer adjustment to consumer preference changes in states such as Michigan (Section 2.3.1).

The smaller, lower quality apples often produced in Michigan earn prices consistently lower than prices earned by those states that have made a more rapid adjustment to changing consumer preferences. For example, this differential can be noticed in the average annual prices over the period 1977-1984 for Washington versus Michigan apples. Washington earns on average $1.50 per bushel more for its higher quality, tray packed apples. Retailers confirmed their willingness to pay more for the better quality apples they receive from states such as Washington. Lower prices and a weaker demand as expressed by retailers for Michigan's lower quality apples is evidence of poor coordination performance in matching quality supplied with quality demanded in the fresh apple subsector.

Washington producers and handlers have achieved more orderly marketing conditions on this quality issue. Market oriented efforts to keep abreast of changing consumer preferences have improved Washington's ability to supply the quality most demanded by consumers. A large advertising

budget for Washington apples has convinced many consumers of the virtues of Washington apples, thus increasing demand for apples of similar quality nationwide.

In contrast to the Michigan fresh apple subsector, many in the celery subsector have come closer to matching the quality consumers demand with the quality supplied. Cooperatives and individual shippers use quality standards, derived from USDA standards though generally set somewhat higher, for the celery they produce. Although the standards are not uniform from region to region, cooperatives in some producing areas have improved the quality of their producers' celery. For example, the MCPC coop shippers in Michigan have performed well communicating the necessary quality information to producers to match retail and consumer demand.

Celery has fewer quality characteristics important to consumers than fresh apples. For example, sugar and starch content is important in apples as well as crispness and color; while celery's primary quality characteristics are only crispness, shape and color. Celery producers for the most part have provided celery with these characteristics. The celery subsector, in contrast with the apple subsector, seems to have fewer problems knowing when to harvest the crop at the opportune moment for ripeness. This is mostly because celery is not a storable crop.

Celery shippers have responded to the retail and consumer demand for celery in bulk form, with or without a

plastic sleeve. Producing and shipping celery in bulk form does not require the additional expenditures that producing apples for tray pack requires (Section 3.2.1 p.36). For this reason, it has been easier for the celery subsector to respond to consumer demand for vegetables in bulk form. There have been fewer changes occurring in consumer preferences for type of celery package therefore, producers and shippers have not had to make drastic changes in their production or packaging techniques.

Some of the institutional differences between the two subsectors can help to explain why these differences in coordination performance have occurred. In many states within the apple subsector, producers and shippers tend to be small, atomistic and widely dispersed. In the Michigan apple example, there are few formal arrangements between apple shippers or between shippers and producers. Since there is not a complete consensus among Michigan shippers of those quality characteristics most demanded by retailers and consumers, quality messages received by producers are unclear. In some cases, especially under the consignment system, producer's quality problems are never communicated back to the producer.

In Washington however, tighter links between apple producers and shippers have encouraged better communication regarding quality problems. More specific grading standards established by the Washington apple industry have facilitated the achievement of higher quality apples.

In the celery subsector, producers and shippers are fewer in number and are less widely dispersed within each producing state due to the need for specific soil conditions. Producers and shippers do not have to go far to communicate with others. In Michigan especially, there is a sense of cooperation among shippers since they are almost all under contract with the MCPC. Close proximity of shippers and close links between producers and shippers encouraged by the MCPC contributes to Michigan's success in sending appropriate quality messages to producers to match consumer demand.1

In Michigan, celery producers have gained consumer confidence for good quality celery through collective action. The standard operating procedures of the MCPC have led to improving the match of supply with demand. Three examples of how this has been accomplished include the establishment of solid relationships between producers and shippers, the collection and dissemination of market information and through use of the staggered planting schedule to lengthen the celery marketing season. The MCPC, through vertical integration into processing, has created an outlet for its growers' off-size or off-grade celery. In this way, strict standards are upheld for fresh market celery while providing a secondary outlet for coop producer's celery. These practices have led to improved coordination performance in the Michigan celery subsector.

Specific celery grading standards have been set by the

MCPC in Michigan and by individual shippers in California. The standardization of grades by a coop or a firm decreases producer uncertainty as to the quality that must be produced to satisfy consumers. Although these grades are not uniform across the country, conversations with retailers have indicated their confidence in the quality of both California and Michigan celery. Since retailers are driven by consumer demand, their acceptance of quality produced by these states indicates that orderly marketing conditions have been achieved in these areas regarding quality supplied matching quality demanded.

6.3.2 Costs and Risks Equitably Distributed

Both apple and celery production and marketing involve significant risks to the producers and handlers. In both subsectors, producers must invest in specialized assets which cannot be used for other purposes. In addition, adverse weather, volatile prices and competition from other areas increase the producers risk burden.

In both subsectors, risks due to weather and pest damage are appropriately borne by producers. Performance in both subsectors has been good. However, performance in the apple subsector regarding the appropriate distribution of other non-biological risks has been less than ideal. Producers must bear all of the long term orchard investment risks, with the sources of much of this risk out of the producer's control. These non-biological risks include long

run changes in supply and demand and changes in orchard values.

Additional risks are incurred by producers who participate in the consignment system of sales. These risks include market price fluctuations and quality deterioration in storage, each of which is out of the producer's control. Because producers do not make the decisions about when to sell and at what price to sell their apples, and do not participate in the storage function, they are in a vulnerable position vis-a-vis the shipper (Section 3.2.4 p.47).

One of the reasons why much of the risk involved in production and marketing of apples is borne by the producer is because the risk has been shifted down from the retailer to the handler (shipper or processor) and from the handler to the producer. Producers of fresh apples, who are not collectively organized, have no means to shift this risk and have difficulties bearing it.

It is alleged by some apple shippers that retailers do not adjust retail prices in response to supply and demand when wholesale prices change. As a result, there is a lag in consumer response to changing supply and demand since they do not see the price changes right away. This may contribute to more volatile grower prices thus increasing the amount of risk on the grower. Further analysis of retail price response to changing wholesale prices would be needed to complete this analysis.

The apple producer is also put in a vulnerable position because of retailers' practice of not holding much inventory while expecting a ready supply from the shipper or processor. The shipper passes the risk to the producer by not quoting a price for the grower until the sale is made at the retail level. The apple producer is not necessarily in the best position to minimize all the risk that has been transferred to him.

In some states however, the risks associated with quality deterioration over the storage period have been somewhat reduced. For example, in Washington, apples are graded before storage ensuring that producers receive a price appropriate for the quality of apples as they went in to the storage facility.

Celery producers bear considerably less risk and fewer costs which are out of their control than the fresh apple producers do. The risks involved in celery production are more equitably shared between producers and shippers than they are in the apple subsector.

In Michigan, the MCPC arrangement where the shipper receives a percentage fee per crate (instead of a flat fee) on crates sold at the coop determined price provides a greater incentive for shippers to gain higher prices for their growers' celery. Shippers may seek prices above the coop set price but may not go below this price. The extra which may be earned by the coop shipper is divided amongst the coop producers. This arrangement reduces shippers'

inclination to unduly cut prices on one another to the detriment of the grower. However, unless the shipper is also a producer, the incentive to seek higher prices may not be adequate.

In Michigan and Florida, cooperative activity in celery production has involved producers in the price formation process. The coops have also helped establish relationships between producers and shippers, since shippers are automatically required to sell each coop grower's supply.

In the largest producing state, California, producers have become vertically integrated into the shipping function therefore they are more involved in price negotiations on the open market. Producers can choose when to sell, attempting to get the best possible price for their crop. This is in contrast to the pricing procedure for consignment apples where the shipper negotiates a price for someone else's apples and then receives a fixed commission charge per bushel regardless of the price.

Since there is limited storage involved in celery production, the risk to the producer and handler of quality deterioration and market price fluctuation over the storage period is reduced in comparison to these risks which are borne by producers of fresh apples.

The small number of farms, limited supply of muck soil and high initial start-up costs for celery production provide an environment conducive for group action in both Michigan and Florida. Producers together have greater

ability to shift risk to other members of the vertical system. In the both coop situations, risk is more equitably shared by producers and shippers who sit on the various decision-making committees. A larger number of atomistic apple producing firms do not have the ability as the celery producers do to shift risk; therefore bear more of the costs of production and marketing which are out of their control.

The long lag between planting and harvest of apples and the long production cycle of an orchard create greater risks for apple producers than for celery producers. For example, in apple production, there is more time between planting and harvest for weather catastrophes, drastic price falls, entry of competitors, changes in land values etc. to occur. The existence of these long term investments creates incentives for those in the apple subsector to shift these risks to avoid bearing the brunt of the burden over such a long period of time. The shorter production cycle for celery means less risk and less incentive to shift risk.

The difference in the degree of vertical integration in the two subsectors leads to differing distributions of risk. Relatively few apple producers have integrated into the shipping function since many producers are small and cannot afford the additional investment. In contrast, many celery producers have integrated forward into the shipping function. In addition, the Michigan celery cooperative has integrated into the marketing of fresh and processing celery. Increased integration means less risk incurred by

subsector participants at individual stages.

6.3.3 Price Formation

Coordination performance in the fresh apple subsector has at times been less than ideal regarding the formation of prices which are representative of supply and demand conditions. Industry observers knowledgeable in the pricing procedure for fresh apples have pointed out the poor pricing performance which occurs in Michigan. A lack of the information necessary to make accurate pricing decisions along with the lack of organization among Michigan shippers in quoting prices have contributed to the pricing problem in Michigan. Unduly low prices as reported for Jonathan apples in Michigan in 1985, is evidence of this poor pricing performance (Section 3.2.7 p. 66).

The celery subsector has achieved better performance relative to the fresh apple subsector in price formation. Those actors who are involved in celery pricing such as producers or shippers on price committees of cooperatives or producer/shippers from vertically integrated firms, are organized to together influence pricing and price discovery in a strong way. In addition, these actors are better informed, and have improved communication with other actors involved with pricing in other states.

Price formation in the celery subsector is more of a joint arrangement between producers and shippers. For the thirty percent of the total crop coordinated through

cooperative activities in Michigan and in Florida, producer/members may influence prices through representation on price committees. For the seventy percent of the crop coordinated through independent firms in California, most of these producers have integrated vertically into the shipping function. Since producers and shippers tend to be one, producers are not isolated from the pricing process.

Since those involved in the formation of celery prices are affected by the level of prices, they are more directly involved and affected by price than some apple shippers who receive fixed margins. Shipper incentives in the celery subsector lead to more effective price formation than in the apple subsector.

The organization of a committee whose main purpose is to make pricing decisions based on market information which they collect, aids in setting prices which are representative of supply and demand conditions. The price committee, set up through cooperative efforts in Michigan, has contributed to orderly marketing conditions in the formation of prices. The participation of producers on such committees gives them some influence in pricing decisions. The degree of vertical integration of producers into the shipping function prevents such producer/shippers from being left out of the pricing procedure. Since most U.S. celery producers are either members of a cooperative or vertically integrated, performance in price formation has been good.

In contrast, those responsible for price formation in

the apple subsector have somewhat less incentive to make the strongest pricing decisions. The strong price competition among shippers and their predominant consignment sales approach leads to poorer performance in pricing. Furthermore, the apple subsector lacks the organization through which fresh market producers can participate in the pricing procedure.

6.3.4 Adequate Flows of Information

Both subsectors experience difficulties with the collection and dissemination of accurate market information in a timely manner. Predominant sources of information include regular telephone calls to key shippers in major producing areas, Market News Publications, terminal market reports and industry conversations. Each of these sources has its limitations as voiced by subsector members.

Coordination performance in the apple subsector has been hampered because of incomplete information. Information not available and most necessary to improve coordination in the apple subsector includes supplies in storage by variety and weekly shipments by variety. This is needed in Michigan at the start of the season (August) and throughout the year, so that opening prices and within year prices will accurately reflect the supply and demand situation. Since the many apple producing regions begin their seasons in different months, market information should be available to all regions on a year round basis to improve coordination at

the start of the season, within the season, and from year to year on a national level.

Performance in the apple subsector has been poor regarding collection, provision and utilization of market information. Due to the complexity of the subsector, large amounts of information are required concerning the market situation, different harvest dates, amounts in storage by variety, release of stocks from storage, etc. It is costly to collect and disseminate this type of information. No one group within the subsector can see all benefits to the subsector from taking on the responsibility of this collection and dissemination of information. For this reason, the job of collecting information from each region and providing this information for the whole U.S. apple subsector does not get done very completely.

Performance has been somewhat better in Washington where a grower clearinghouse and other organizations have attempted to provide some additional market information to improve the situation for Washington producers.

The fewer varieties, lack of storage period, and smaller number of producers located in smaller geographical areas results in fewer problems with informational flows in the celery subsector. However, performance is not perfect, affected by missing information on prices and shipments by quality, not just by size. Although all celery sold in the U.S. is presumed to be U.S. No. 1, general industry concensus points out the problem of variability of non-size

quality characteristics within a size classification. Presently, celery prices are reported by Market News Service by size only, since the grading system as used today does not specify other quality characteristics within U.S. No. 1. Shipments are also reported in total, with no reference to quality of shipment or price received for that shipment.

Although more in-depth celery supply and demand information is available in the producing areas marked by cooperative organization, collection of this information is incomplete in non-coop organized areas. Also, no mechanism exists for transferring information from region to region. This creates problems for producers who cannot accurately predict when additional supplies will be arriving in particular markets. In addition to this, information regarding quality of celery can only be collected in the present classification system unless more specific grades including non-size characteristics are instituted.

One would expect that the dissemination of information would be easier to accomplish in the celery subsector as compared to the apple subsector since there are fewer producing areas, and within those producing areas, there tends to be fewer, larger producers. This may be true within producing areas; however, interregional communication and cooperation is not easily accomplished for either crop.

The same governmental information source provides the minimum information for both the apple and celery subsector. More comprehensive information is needed for apples to

improve pricing performance. This additional information is not now provided by public or private sources. Collection of this information with so many actors involved in the apple subsector is difficult and involves added costs.

In the celery subsector, cooperatives collect and provide additional information useful to the whole subsector. For example, one telephone call to the MCPC would inform an out-of state shipper, in a fairly complete fashion, about the situation of the state's crop. The very existence of the Michigan coop and the more specific grading standards set by them leads to improved performance regarding provision and flow of information.

6.3.5 Avoidance of Gluts and Shortages

Both subsectors lack mechanisms for closely matching aggregate supply with demand. Although vertical integration and coop initiated contracts between coop producers and shippers have made strides toward improving coordination in the celery subsector, these arrangements are not effective in organizing supply at the national or international level. In both subsectors, the majority of producers produce their crops and then look for the market channel in which to sell.

Rapid expansion of domestic production of apples by twenty-four percent and celery by thirty percent in the last eight years, together with a loss of competitive advantage for fruit and vegetable production in overseas markets has resulted in oversupply conditions in the U.S. The large

supplies and weak foreign demand have had a depressing effect on prices which mean low returns for producers. The low prices seem to lead some producers to produce even more to increase their total returns (Section 5.2.1 p. 141).

The apple subsector has had poor performance in matching long term supply with demand, with frequent imbalances of supply and demand resulting (Section 3.3.1 p. 82). The supply problem is more pronounced in the long run in the apple subsector since storage and processing outlets help to alleviate short run imbalances of supply and demand of fresh apples. The imbalance often appears as a surplus today due to expansion of acreage ten years previously. Matching supply and demand years in the future is a difficult task particularly for a perennial crop with a life of forty to sixty years. Inability to accurately predict these market conditions contributes to poor coordination performance.

Performance in matching supply and demand, as affected by acreage planted, is better in the celery subsector than in the apple subsector. It is easier to adjust celery acreage if returns continue to be low over many years than it is to adjust apple acreage. Matching supply and demand of celery requires a series of short run adjustments rather than matching supply with demand years in the future. For this annual crop however, short run gluts occur in the summer months (Section 5.2.1 p. 142). General industry consensus indicates that there is a tendency toward

oversupply in the celery subsector even though acreage is more easily adjusted. The fixed and specialized nature of celery production equipment contribute to this tendency.

In spite of these problems in the U.S. celery subsector, performance in matching supply with demand in Michigan has been good due to the standard operating procedures (SOP'S) of the cooperative. Some of these SOP's include staggered planting and harvesting to even the flow to market and to lengthen the season as well as contracting between coop producers and shippers to assure a market for each producer's celery. Unfortunately these SOP's only apply to Michigan's production which is approximately eight percent of the nation's celery supply and cannot be expected to improve the overall match of supply with demand in the entire subsector.

Another mechanism exists in Florida which attempts to manage supply. This market allotment marketing order was found not to limit production in the short term, although it does seem to ensure that producers will continue to produce each year and will not unduly expand production over the long term (Section 4.4.3 p.137). Further analysis of stability of Florida supplies is needed to assess performance of the celery marketing order.

There are quite a few factors which have led producers to unduly expand production of both apples and celery. Some of these include the entrepreneurial nature of fruit and vegetable producers, processor and shipper encouragement to

increase production in order to assure a reliable supply and due to lack of information regarding effective future demand given future supplies. In addition to these factors, encouragement by the university research and extension service to make production improvements, without giving adequate thought to market demand limitations has led to a mismatch of supply and demand.

Large supplies and low prices are the case in most years for these two commodities; however, unexpected short run supply changes due to yield variability also complicate the task of matching supply with demand. Weather, disease and cultural practices sometimes affect supplies in the negative direction. Yield variabilities for both crops create uncertainties as to the supply which will result in a given month or year.

An analysis of yield instability for celery in California, Florida and Michigan revealed that two of these states have relatively high yield variability contributing to supply variability (Section 5.2.7 p. 164). Conversations with apple subsector participants have pointed out a similar concern with highly variable apple yields. For apples, variation in yields is largely due to weather; however, certain man-made factors must also be considered. For example, changing environmental regulations regarding use of chemical fertilizers or growth regulators such as "Alar" affect overall yields and are out of the control of individual producers. Clearly, unexpected supply changes due

to yield changes affect a subsector's performance in matching supply with demand.

The different production cycles, differing levels of perishability and different potentials for new forms of product in the two subsectors have led to the rise of different institutions to perform the coordinating functions necessary to match supply and demand. The success or failure of these institutions determines coordination performance in each subsector.

The celery subsector seems to perform poorly in the summer months when there is generally an excess supply and a stable demand. Subsector participants have not responded to this problem which has been occurring for many years according to subsector experts.

The storability of the apple crop seems to ease the problem of seasonal gluts or shortages in the apple subsector. The availability of stored apples from many states at many different times of the year seems to eliminate the seasonal oversupply problem; however, excess of total supply does continue to pose a coordination problem in the apple subsector.

6.3.6 Level and Stability of Prices

The following table is presented to summarize the results of analysis done in Chapters 2 and 4 to determine average price levels and degree of instability of monthly and annual prices in the apple and celery subsectors. The

INS index was used to measure price instability over the period from 1977-1984.

TABLE 6.1

APPLE AND CELERY INSTABILITY MEASURES

CROP	STATE	AVG.REAL PRICE 1977-1984	INS MO. TO MO.	INS YR. TO YR.
APPLES	WASHINGTON	$4.41/BU.	125	432
	MICHIGAN	$2.91/BU.	55	160
CELERY	CALIFORNIA	$2.66/CRATE	1209	696
	FLORIDA	$2.81/CRATE	865	253
	MICHIGAN	$2.83/CRATE	219	1057

Sources: 1. Fruit and Vegetable Division, Economic Research Service, USDA, 1985.

2. Federal State Market News, Marketing Michigan Vegetables, Benton Harbor, Michigan, 1976-1984.

Explanation of Terms

Average Real Price - The eight year average of the annual FOB prices paid to the grower for the period from 1977-1984, deflated by the consumer price index where 1977 is the base year (1977=100).

INS Mo.-to-Mo. - Index to measure the variance of the percent changes in price form month to month. Month-to-month price variability is calculated for each year in the eight year period. The average month-to-month variability per year for this period is then calculated.

INS Yr.-to-Yr. - Index to measure the variance of the percent changes in annual price from year-to-year.

The average price level for apples in the U.S. varies considerably from state to state. Presently, the state of

Washington achieves higher prices for its apples than in most other states. Washington's reputation for good quality and reliable supply helps producers gain these higher prices.

Obstacles such as climate and traditional cultural practices impede progress toward improving quality and pack in Michigan. For these reasons, Michigan apple prices are significantly lower than Washington prices.

The average annual prices for celery in the three states considered is not as drastically different as the average annual prices for apples from state to state. Michigan celery prices are slightly higher than California and Florida prices; however, the price level from highest to lowest only varies by $0.17 per crate compared with $1.50 per bushel difference in apple prices. Although celery from California is perceived to be the highest quality and therefore most demanded by consumers, producers and shippers in this state do not enjoy higher average prices for their commodity due to differences in transportation costs.

Stability of monthly and annual prices may be compared between crops with the INS index. This is possible since the INS measure is dimensionless, allowing comparison between unlike units. Monthly apple prices on average within a year vary less than monthly celery prices. The relatively more stable monthly apple prices are probably due to storage over most of the year. Storage of apples smooths out the supplies available, reducing a glut in the autumn months and

a shortage in the spring. Smoothing out supplies through storage tends to stabilize prices.

It would be possible to treat celery as a stored commodity since celery is available any month of the year. Theoretically, we should be able to predict celery demand and then set a planting schedule that performs the same function as storage for apples. Staggered planting and harvesting practices to correspond with expected demand would most likely contribute to more stable celery prices. This technique is currently practiced by the MCPC in Michigan.

Empirical results show monthly celery prices are highly variable in California and Florida and much less variable in Michigan. The relative stability in Michigan monthly prices seems to be the result of the MCPC's staggered planting and harvest schedules, careful pricing procedures and use of additional market information. Michigan coop producers and shippers have done well treating celery as a storable crop over their season.

California has a high level of monthly price instability which seems to be associated with production variability resulting from planting and marketing decisions of individual producers. Since California celery yields are relatively stable, production variations seem to be the result of acreage variations. Further analysis of planted and harvested acreage variation may help explain California's highly variable celery prices.

The relatively high level of INS in Florida monthly prices compared to Michigan is surprising since Florida producers have also joined collectively into a cooperative for the explicit purpose of reducing price instability and stabilizing producer returns. This analysis raises the question as to how effective the Florida Celery Exchange is in improving pricing performance. Since at least seventy percent of U.S.celery is not treated as a storable crop and since most of the supply is sold through free market transactions without the use of contracts, the results showing relatively high levels of instability in California monthly celery prices are not surprising. However, it was expected that the celery cooperatives would exert a stabilizing effect on U.S. prices. Since the majority of U.S. production is not sold through cooperatives, this was found to be untrue. To better understand why month-to-month celery price variability is generally high, further research of California and Florida's celery production and marketing decisions and practices is recommended.

A comparison of INS from year to year over the eight year period shows that annual apple prices vary more than monthly apple prices over the same period. One explanation as to why annual apple prices vary more than month-to-month apple prices may be due to the pricing difficulties noted in Chapter 3 (Section 3.2 7 p.63). Since shippers have a limited amount of information with which to make decisions regarding opening prices at the start of each season, this

affects overall price level for the entire year. In addition to this, storage possibilities within the year help to dampen month to month price fluctuations.

After studying instability of apple prices, it seems we may not assume that variability of apple prices is a good indicator of coordination performance in the apple subsector. Monthly apple prices were found to be quite stable; however, other coordination problems involving pricing techniques were discovered. The INS monthly measure when applied to celery prices was more useful in helping to explain coordination performance in the celery subsector than it was when applied to apple prices.

When comparing the year-to-year INS for celery between the different states, we must note the differences in length of season and the impact this has on annual prices. The instability of Michigan annual prices is likely to be greater because of the shortness of the Michigan season compared to Florida or California. Michigan's average annual price is based on only three to four months therefore must immediately adjust completely to annual changes in supply while California's price needs only to adjust slightly each month to account for changes in supply. California's annual price therefore represents a continuous adjustment to supply changes throughout the year so that on average there should be less variability from year-to-year.

6.4 Concluding Remarks

Specific commodity research accomplished through this type of subsector framework contributes to a better understanding of the problems of orderly marketing in the apple and celery subsector. By considering the institutions, behavior and resulting performance within each subsector, we can gain some valuable insights on how well coordination mechanisms are working to match supply and demand. The information provided in this research regarding how each subsector functions, the organizational changes which have occurred over the last ten years in each subsector and who within the subsector has control over strategic decisions helps us to better understand why particular coordination problems exist.

One of the strengths of this type of research lies in its descriptive and diagnostic approach. This research may add to policymaker's existing knowledge of the coordination problems pressent in particular subsectors to aid in their policy decisions. Some important lessons may be learned about how particular coordination mechanisms affect those in the industry under conditions of uncertainty and incomplete information. This research has attempted to use empirical knowledge of the industry in addition to economic theory to evaluate the impact of particular coordination mechanisms and resulting performance.

In addition to its descriptive and diagnostic value, this research has suggested alternative institutional

arrangements to better address particular coordination failures. Each suggested alternative has been presented in light of its advantages and disadvantages to particular subsector members. These alternatives presented were not intended to prescribe one right solution to any coordination problem but to suggest several alternatives, noting the trade-offs that must be made by adopting one alternative over another. Further research noting the benefits and costs of each suggested alternative needs to be conducted before approval or implementation of any alternative is possible. However, the proposed ideas may provide some background to assist policy makers in constructing programs and policies for improved coordination performance.

The cross subsector comparison of coordination in the apple and celery subsectors provides a useful framework for comparing the strengths and weaknesses of government versus industry generated coordination mechanisms, since these subsectors have responded to their problems using both types of programs. However, since the two subsectors chosen are so dissimilar in organization and production practices, the sections on individual subsector analysis may have been most useful. In some instances, too many important variables were varying, making analysis of any one variable difficult.

6.4.1 Research Findings

Some valuable lessons have been learned in the study of coordination performance in commodity subsectors. In

situations where coordination problems were discovered, various alternatives were explored; however, the feasibility of these alternatives was only superficially discussed. The information gained through interviews with subsector participants and through review of past research permits an assessment of the impact of the various AMS and industry generated programs on coordination performance.

In both subsectors Market News Reporting Service is used as one possible information source. The reputation of Market News as a reliable source of timely information varies from region to region and from crop to crop. For both apples and celery, there is additional information important for good coordination within the subsector which is not provided by Market News and is not available at the most opportune moment.

From the perspective of subsector participants, an expansion of the Market News Service is recommended, with inclusion of the additional information such as total quantity of apples in storage and stocks released from storage reported by variety as well as celery shipments classified by non-size characteristics. This additional information will contribute to more orderly pricing and decision making by subsector participants. Government involvement is suggested in performing this function due to the belief that less than the optimal amount of information will be generated by subsector members due to the public good properties of information.2 Since spot market prices

are still important coordination mechanisms in both subsectors, more information whether publically or privately provided to all those involved, will aid the pricing process. To determine the feasibility of these additions to the Market News Service, an analysis of the benefits and costs would be necessary. In the case of celery, the relatively few growers who would benefit from such a service may not justify the additional costs incurred.

In addition to continuing the Agricultural Marketing Service's (AMS) Market News Service, more research could be done on the potential for privately sponsored, user-funded information sources. Sources such as the electronic celery information system under formulation in California, or the clearinghouse for fresh apple market information in Washington could be assisted by AMS to improve coordination nationwide, instead of just regionally.

In both subsectors, the grading system is less than adequate for good coordination performance. Without standardized grades appropriate for producing the quality consumers demand, matching quality demanded with quality supplied is more difficult. Celery grades need to be better defined and differentiated. Finer grades for different quality variations, not just size, are needed. In the apple subsector, grades need to be assigned for those quality aspects that cannot be perceived simply by looking at the product. Pressure and starch tests for apples along with grades for overall quality need to be defined and enforced.

In both cases, many in the industry consider USDA standards to be the minimum standard for quality, buying and selling higher quality commodities. New systems of standards need to be designed for these two crops and subsequently enforced for improved coordination performance.

Improving quality and redefining grading standards for each commodity could be done in two ways as suggested in Sections 3.2.3 p.42 and 5.2.5 p.159). USDA/AMS standards could be redefined to include those characteristics important to consumer satisfaction which are not currently graded such as sugar content and crispness for apples and non-size characteristics for celery. These newly defined grades could be publicized in hopes of attracting producer and handler attention. The second way is through federal quality marketing orders to improve and unify quality nationwide and to clarify those characteristics which lead to increased consumer confidence and less variable prices. Since many apple producers are not producing the quality most demanded by consumers, and other organizations have initiated limited programs for improved quality, there seems to be a need for a marketing order with quality provisions in the apple subsector.

There is a need for improved education regarding produce grading standards. The gains to producers and handlers of enforcing more strict, uniform quality guidelines for fruits and vegetables should be emphasized. The problem of subsector participants' ignorance of the

current USDA/AMS set grades has been cited in both subsectors studied. Improvements could be made in AMS' method for disseminating the necessary grade information. Industry organizations currently in place such as cooperatives, clearinghouses, and producer/shipper contracts could also work toward standardizing and disseminating information on quality standards.

In addition, misinformation or lack of information regarding the benefits to producers or handlers of a marketing order for quality have also been cited as reasons that some marketing orders have not been passed. Some in the subsector argue that the opportunity to improve coordination through use of a quality marketing order is missed due to misunderstanding on the part of the subsector members.

There is a need to assess the impact of supply control marketing orders in subsectors where chronic oversupply or seasonal oversupply is a problem rather than make sweeping judgements about marketing orders and how they impact on all subsectors. Supply management is needed in both subsectors studied. Marketing orders offer a way for producers to design a program to improve coordination in their subsector at minimum expense to the government.

Various industry-generated programs such as cooperatives, clearinghouses and informal contracts between producers and shippers have been sucessful in establishing many of the coordination mechanisms needed for orderly

marketing. For example, the Michigan celery cooperative has integrated into processing celery to the specifications of food manufacturers. With this arrangement, they have increased demand for their celery through product diversification and have created an outlet for excess and off-grade celery. Without this outlet, oversupply and poor quality on the fresh market would lead to lower, more variable prices in Michigan. With this industry generated program, Michigan fresh market prices are maintained at a relatively high level with little price instability. There is potential for this type of industry generated institution to do more toward improving coordination in both subsectors. Several alternatives to improve coordination involve an expansion of the current role of these industry-generated programs (Sections 3.2.5 p.51 and 5.2.4 p. 157). The AMS can encourage such industry-generated programs by helping to inform those in other producing areas not involved with these programs of the benefits of industry run programs.

6.4.2 Future Research

This analysis of vertical coordination performance for apples and celery needs to be put in the larger context of full commodity subsector studies since there are more in-depth structural and behavioral factors which have not been covered in this research. Also, it is important to consider in more detail subsector participants at other levels within the vertical system such as input suppliers and retailers.

In addition, the vertical coordination sections of past subsector studies could be up-dated using a framework similar to this where coordination mechanisms are evaluated as to how well they function in accomplishing the necessary functions as described for orderly marketing.

Because of the uniqueness of each commodity subsector, the different coordination mechanisms that have evolved and the continually changing environment in which they function, in-depth analyses of other crops would be useful. In fact, for the purposes of clearly describing and defining the coordination problems in a subsector, it may be most useful to consider individual commodity subsectors or subsectors with similar organizations instead of lookin across widely differing subsectors, to allow for a clearer picture with fewer variables interacting at one time. For example, coordination performance within a single commodity area could be analyzed as it differs from state to state since individual state's producers and handlers often generate their own coordination mechanisms.

The evaluation of coordination performance would be improved if we could develop a more clearly defined set of standards to rate coordination performance (Marion 1986). Creation of relevant coordination standards is a difficult problem and would require substantial research. It would be useful to look at a number of the coordination functions which have been designated as important for orderly marketing of all commodities and rate the performance of a

number of commodities on these issues. This type of research has been done by Ian Dalziell using the INS index for instability of prices and production on an annual basis for approximately 100 crops (Dalziell 1985). The question remains as to whether it would be possible to rate other aspects of coordination performance to determine at what level do we consider a subsector to exhibit orderly marketing versus disorderly marketing conditions.

There are several additions which could be made to this analysis of coordination performance in the apple and celery subsectors. Some of these include an analysis of monthly and annual shipments of both commodities in the major producing states to look at the variability and patterns of shipments around the country. This would be helpful in determining how expected or unexpected shipments are from particular areas. If shipments are predictable, this information would be usedful to commodity analysts in determining whether participants react to expected shipments. Secondly, the INS index could be applied to production figures to better understand how variability of acreage and yield by state affects performance in each commodity subsector. Thirdly, cost studies for celery in the major producing areas, or at least in Michigan, would facilitate the comparison of each subsector's ability to cover their costs of production. Fourthly, more in-depth study of celery producer and handler marketing practices in California and Florida would enhance our understanding of

overall subsector coordination. The author's limited access to informants in these states has been an obstacle to further analysis. Specific information on the pricing practices for California and Florida celery would shed some light on their relatively high monthly price instability. Fifthly, the INS index could be applied to the percent difference between each month's price and the average price for that month (monthly index figure) across years for the same month for both crops. This statistic would be an indication of the variability in the seasonality of prices. If there is a high degree of instability in the seasonal prices, we have further evidence of poor coordination independent of the effects of variable yields. Lastly, the current research on the differences in cost of growing apples for bagging versus apples for tray pack in Michigan will help determine the feasibility of making this shift in Michigan. The results of this study may be used in conjunction with Section 2.3.1.

It is clear that subsector analysis is a valuable approach to understanding the organization and coordination of different commodity subsectors. It is hoped that by building on existing work in specific commodity areas, by clarifying a framework within which to analyze vertical coordination, and by expanding the approach to new commodity areas, some valuable lessons will be learned which may be useful to policy makers and subsector participants. This type of research provides some important tools which will

aid policymakers and subsector participants to contribute to more orderly marketing conditions in commodity subsectors.

ENDNOTES

Chapter 1

1. Commodity oriented - Concerned with the production and marketing of a particular commodity as opposed to concern for many products, having a subsector - wide perspective.

Chapter 2

1. Orchard run basis - Sale of fruit on a cash basis at time of harvest.

2. Opening prices - Price negotiated among shippers for early season apples, sets tone of price over season.

Chapter 3

1. Pack - Apples put in bushels at packinghouse, process of sorting, grading, packing.

2. Pack-out - The process of sorting and packing apples, inferior or low quality apples are sorted out by the packer-shipper at the packinghouse level.

Chapter 6

1. Hirschman would agree that those in the celery subsector have achieved good coordination performance through use of the "voice" concept (Hirschman, Albert O. 1970) Affiliation with the Michigan Celery Promotion Cooperative gives producers and shippers a mechanism to express their likes and dislikes. Serving on the various committees for price, quality etc. allows representation for each member. In addition, members of the MCPC have a sense of loyalty to the organization. The services offered by the coop encourage participation and raise the costs of dropping out.

   In contrast, it is much more difficult for those in the apple sector to employ the "voice" option or to experience a sense of loyalty since most apple subsector participants function as separate entities. For this reason, improvements in coordination performance are often not achieved in the apple subsector.

ENDNOTES

Chapter 6 (continued)

2. According to Tweeten and Brinkman, "Firms that cannot appropriate benefits from free riders nor exclude them do not produce the good in socially optimal amounts" (Tweeten and Brinkman as quoted in Tweeten 1979, p.539). It is unlikely for subsector participants in one region to be overly concerned with the dissemination of privately produced information to producers and handlers in other areas. The evaluation of the apple and celery subsectors has proven this to be the general attitude of participants.

Interviews: Fresh Apple Subsector Informants

1. Arney, Mark - Director Michigan Apple Committee, Dewitt, Michigan

2. Drake, Dale - Marketing Agent, Shafer Lake Fruit (packer/shipper), Hartford, Michigan

3. Kelsey, Myron - Professor Agricultural Economics, Michigan State University, E. Lansing, Michigan

4. Kropf, Roger - Owner/manager Kropf Orchards, Lowell, Michigan

5. Pierson, Thomas - Professor Agricultural Economics, Michigan State University, E. Lansing, Michigan

6. Ricks, Donald - Professor Agricultural Economics, Michigan State University, E. Lansing, Michigan

7. Schwaillier, Phillip - District Horticultural and Marketing Agent, Kent County, Michigan

8. Summers, Robert - Director of Produce, Meijers Corporation, Grand Rapids, Michigan

9. Thomas, Michael - District Horticultural and Marketing Agent,Van Buren County, Michigan

10. Volink, Roger - Director of Produce, Spartan Stores, Grand Rapids, Michigan

11. Various Produce Buyers, Giant Foods, Safeway Foods, Washington D.C.

Interviews: Celery Subsector Informants

1. Batkin, Ted - Director, California Celery Research Advisory Board Dinuba, California

2. Carpenter, Byron - Previous Manager, Michigan Celery Promotion Cooperative, Grand Haven, Michigan

3. Currey, James - Agricultural Marketing Specialist, Campbell Soup Company, Napoleon, Ohio

4. Frens, Duane - Present Manager, Michigan Celery Promotion Cooperative, Hudsonville, Michigan

5. Dudeck, Thomas - District Horticulture and Marketing Agent, Grand Haven, Michigan

6. Jager, Louis - Original Manager, Hoeksma and Jager (Producer and packer, Eastern Michigan Vegetable Marketing Co.), Michigan

7. Jager, Randy - Current Manager, Hoeksma and Jager Co., Michigan

8. Jager, Allen - Manager, Eastern Michigan Vegetable Marketing Co., Capac, Michigan

9. Nikiewicz, Leslie - Marketing Specialist, Marketing Order Division, Agricultural Marketing Service, USDA, Washington

10. Schutt, Ron - Salesman, Miedema Produce (MCPC coop shipper), Hudsonville, Michigan

11. Talbott, George - Manager of Florida Celery Exchange, Orlando, Florida

12. VandeGuchte, Randy - Salesman, Superior Brand Produce (non-coop shipper), Hudsonville, Michigan

13. Wendland, James - Analyst, Marketing Order Division, Agricultural Marketing Service, Washington D.C.

14. Workman, John - Manager DeBruyn Produce, Chairman of the Price Committee, Michigan Celery Promotion Cooperative, Michigan

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