Cheese Pricing

A Study of the National Cheese Exchange

Willard F. Mueller
Bruce W. Marion
Maqbool H. Sial
F. E. Geithman

Cheese Pricing:
A Study of the National Cheese Exchange

A Report of the Food System Research Group,
Department of Agricultural Economics,
University of Wisconsin-Madison

prepared for

the Wisconsin Department of
Agriculture, Trade, and Consumer Protection
Investigation into Cheese Pricing

by

Willard F. Mueller, Vilas Research Professor Emeritus
Bruce W. Marion, Professor
Maqbool H. Sial, Ph.D., Assistant Scientist
F.E. Geithman, M.S., Associate Scientist

March 1996

Contents

List of Figures vi

List of Tables viii

Chapter 1 Introduction

Organization of the Report I-3

Acknowledgments I-4

Chapter 2 Organization and Characteristics of Cheese Industry

A. Introduction II-1

B. Cheese Imports and Exports II-3

C. Cheese Consumption in U.S. II-3

D. Seasonality of Production, Consumption, and Commercial Stocks II-5

E. Pricing of Milk at Farm Level II-7

F. Cheese Pricing II-10

G. Organization of Cheese Subsector II-14
Cheese Manufacturing II-16
Economic Markets for Cheese Manufacturers II-21
Cheese Converters: Processed Cheese II-21
Converters and Marketers of Natural Cheese II-22

Importance of Different Channels II-25
Market Share and Concentration Figures II-28
Retail Cheese Sales II-30
Vertical Linkages in Cheese Subsector II-33

H. Characteristics of Major Firms in Cheese Subsector II-34
Role of Cooperatives II-35

Appendix 2.A. Comparison of NASS and Census Data on Tonnage of Cheese Produced . II-37

Chapter 3 Origins and Nature of the National Cheese Exchange

A. History of NCE III-1

B. Current Organization of NCE III-7

C. Regulation of the NCE III-9

D. The NCE is a Thin Market III-10
Previous Empirical Studies of Thin Markets III-16
Trading Volume on NCE III-18
Number and Relative Size of Traders III-23

Chapter 4 Motives of NCE Traders

A. Functions of the NCE IV-1

B. Purchases and Sales Patterns IV-7
Trading Activity in Barrels and Blocks IV-13
Trading Activity of Brokers IV-14
Conclusions IV-14

C. Business Characteristics of Leading Traders IV-15
Kraft General Foods, Inc. IV-16
Borden, Inc IV-19
Alpine Lace Brands, Inc. IV-22
Beatrice Cheese, Inc. IV-23
Schreiber Foods, Inc IV-25
Agricultural Cooperatives IV-26
Brokers: Dairystate Brands, Inc. IV-28
Other Traders IV-29
Summary IV-31

D. Spot Trading as Alternative to the NCE IV-31
NCE vs. Spot Sales of Kraft IV-37

E. Evidence of Trader Motives IV-48
Evidence of Kraft's Motives IV-48
Evidence of Other Leading Traders' Motives IV-51

F. Summary and Conclusions IV-63

Chapter 5 Trader Activity-Price Relationships

A. Introduction V-1

B. Overview of Trader Activities V-2

C. Trading Patterns of Various Traders V-5
Trading Activity of Kraft V-5
Trading Patterns of Other Leading Traders V-9
Seller-Trader Activity in Barrels V-10
Buyer-Trader Activity in Barrels V-11
Trader Activity in Blocks V-12

D. Trader Activity-Price Relationships V-13
Kraft Activity-Price Relationships V-13
Activity-Price Relationships of Leading Seller- and Buyer-Traders V-17

E. Trading to Signal Competitors and to Influence the Block-Barrel Spread V-20
Trading to Signal Competitors V-20
Trading to Influence the Block-Barrel Price Spread V-22

F. Econometric Examination of Trader-Price Relationships V-23
The Economic Model V-24
The Econometric Model V-26
Variables, Data and Hypotheses V-29
Estimation and Results V-32
WAP Prices V-35

Appendix 5.A.
Kraft's Trading Activity During 1986 and 1987 ..... V-37

Chapter 6 Kraft Trading Activity During 1990-1992

A. Price Decline and Price Bottom, January-March 1990 ..... VI-1
The Price Decline VI-3
The Price Bottom VI-7
Summary of Kraft Conduct at Price Bottom VI-8

B. Price Rise, Top and Decline, April 6-November 2, 1990 ..... VI-15
Summary of Kraft Conduct VI-20

C. Price Cycle November 1990-February 1992 ..... VI-25
The Price Bottom, November 1990-May 10, 1991 ..... VI-25
The Price Rise May 17, 1991-September 26, 1991 ..... VI-28
The Price Top and Subsequent Decline, September 1991-February 1992 .. VI-32
Summary of Kraft Conduct VI-32

D. Price Cycle February 1992-December 1992 ..... VI-33
Overview of 1992 ..... VI-33
Pricing Conduct Over Price Cycle VI-35
Summary of Kraft Conduct VI-37

E. Relationship between NCE Prices and Kraft's Wholesale Prices VI-38

F. Summary and Conclusions VI-53

Chapter 7 Summary, Conclusions, and Policy Initiatives

A. Introduction VII-1

B. Cheese Pricing and the NCE VII-2

C. Potential Problems of Thin Markets VII-3

D. NCE Functions and Trader Motivations VII-5

E. Business Characteristics of Leading Traders VII-7

F. Spot Trading as an Alternative to the NCE VII-11

G. Trading Activity of Leading Traders, 1988-1993 ..... VII-15

H. Kraft Trading Activity 1990-1992 ..... VII-18

I. Econometric Analysis VII-19

J. Conclusions VII-21

K. Public and Private Initiatives to Improve Price Discovery VII-33
The Problem of Trading Against Interest VII-34
Prohibiting Trading Against Interest VII-36
Trading Limits VII-37
Alternative Basis for Formula Pricing Cheese VII-38
Price Report for Direct Spot Transactions VII-39
Electronic Marketing Systems VII-41
Public and Private Actions to Improve Market Information VII-43
Futures Trading in Cheese VII-45

Appendix 7.A
Thin Market/Formula Pricing Problems in Other Agricultural Commodities VII-48

About the Authors

List of Figures

2.1. Utilization of Milk: United States, Selected Years II-2

2.2. Total Cheese Production by States, 1992 ..... II-2

2.3. Natural Cheese Production in the U.S. II-2

2.4. Seasonal Variation in Total Cheese Production, 1988-1993 ..... II-6

2.5. Seasonal Variation in Retail Sales of All Cheese, 1982-1991 ..... II-6

2.6. Seasonal Variation in Commercial Disappearance of Total Cheese, 1988-1993 ..... II-6

2.7. Seasonal Variation in End-of-Month Commercial Stocks of All Cheese, 1988-1993 ..... II-6

2.8. NCE and CCC Block Cheese Prices II-12

2.9. CCC Stocks of Natural Cheese II-12

2.10. Seasonal Variation in NCE Block Prices, 1988-93 Average II-13

2.11. Organization of the Cheese Subsector II-17

3.1. Barrel and Block Sales on NCE, 1989-93 ..... III-20

4.1. NCE Block Trading, August 24, 1990 ..... IV-59

5.1a,b,c. Kraft Activity on NCE, July 1988-June 1993 ..... V-6-8

A-5.1a-5.1e. NCE Barrel Activity of Leading Traders, July 1988-June 1993 ..... V-49-53

A-5.2a-5.2e. NCE Block Activity of Leading Traders, July 1988-June 1993 ..... V-54-58

A-5.3. Kraft Activity on NCE, July 1986-June 1988 ..... V-59

6.1. NCE and CCC Barrel and Block Cheese Prices, Weekly, 1990-1992 ..... VI-2

6.2. Commercial Stocks of American Cheese, 1988-1993; CCC Stocks of Natural Cheese, 1988-1993 ..... VI-9

6.3. Kraft Planned and Actual Raw Material Cheese Inventory, 1989-1992 ..... VI-23

6.4. Kraft Net Price of Processed Cheese, NCE Barrel Price and Kraft Price-NCE Price Margin, Monthly, 1989-1991 ..... VI-44

6.5. Kraft Net Price of Natural Cheese, NCE Block Price and Kraft Price-NCE Price Margin, Monthly, 1989-1991 ..... VI-44

6.6. U.S. Retail Price of Natural Cheese, NCE Block Price and Retail Price-NCE Price Margin VI-50

A6.1. Kraft/Private-Label Price Gap at Retail, by Type, 1988-1992 ..... VI-79

A6.2. Kraft, Borden, and Private Label Brands of American Cheese, Average Retail Price and Price Gaps, 1988-1992 ..... VI-80

List of Tables

2.1. Natural and Processed Cheese Produced and Marketed in the U.S., 1987 & 1992 .. II-20

2.2. Leading Manufacturers of Natural Cheese II-23

2.3. Leading Processors/Marketers of Processed Cheese Products II-23

2.4. Leading Marketers of Natural Cheese II-23

2.5. Estimate of Cheese Usage by Channel, 1993 (Mil. Of Lbs., Natural Equivalents II-27

2.6. Supermarket Sales by Type of Cheese, U.S., 1992 ..... II-31

2.7. Dollar Market Shares of Leading Cheese Brands and Companies, U.S. Supermarket Cheese Sales, 1992 ..... II-31

A2.1 Cheese Imports and Exports as Percent of Total Cheese Production, 1980-1995 ... II-39

A2.2 Total Cheese Production by State: 1940, 1950, 1960, 1980, 1994 ..... II-40

3.1. Volume of Cheese Traded on the NCE, 1974-1993 ..... III-19

3.2. Frequency of Price Changes Associated with Various Types of Trading Activity, 1988-1993 ..... III-22

3.3. Seller Concentration on the National Cheese Exchange, 1974-1993 Barrel and Block Sales III-27

3.4. Buyer Concentration on the National Cheese Exchange, 1974-1993 Barrel and Block Purchases III-28

A3.1. Number of Cheese Companies and Share of Value of Shipments by Leading Cheese Manufacturers, 1947-1987 ..... III-30

A3.2. Number of Cheese Plants in Wisconsin and United States, 1850-1992 ..... III-31

A3.3a. Seller Concentration on the National Cheese Exchange, 1974-1993, Barrel Sales III-32

A3.3b. Seller Concentration on the National Cheese Exchange, 1974-1993, Block Sales III-33

A3.4a. Buyer Concentration on the National Cheese Exchange, 1974-1993, Barrel Purchases III-34

A3.4b. Buyer Concentration on the National Cheese Exchange, 1974-1993, Block Purchases III-35

4.1. Trades on NCE by Primary Type of Business, 1980 to 1987 ..... IV-9

4.2. Trades on NCE by Primary Type of Business, 1988 to 1993 ..... IV-10

4.3. Kraft Gains or Losses on Raw Material Cheese Sales: NCE, Outside Sales, and Government, 1987-1992 ..... IV-41

4.4. Comparison of Prices Kraft Received for Spot Sales with NCE Prices, 1989-1992 ..... IV-42-43

A4.1a. Trades on NCE by Primary Type of Business, 1980 to 1987, Barrels IV-66

A4.1b. Trades on NCE by Primary Type of Business, 1980 to 1987, Blocks IV-67

A4.2a. Trades on NCE by Primary Type of Business, 1988 to 1993, Barrels IV-68

A4.2b. Trades on NCE by Primary Type of Business, 1988 to 1993, Blocks IV-69

A4.3. Gains or Losses Incurred by Kraft for Raw Material Cheese Sales NCE, Outside Sales, and Government, 1987-1992 ..... IV-70-71

A4.4. NCE Opinion Prices, Average Wisconsin Assembly Point (WAP) Prices and Premiums, Weekly, 1986-1993 ..... IV-72-81

5.1. Types of Trading Activity by Leading Traders of Barrel and Block Cheese on the NCE, 1988-1993 ..... V-3

5.2. Price Behavior During Trading Days Kraft was Active and not Active on NCE, 1988-1993 ..... V-15

5.3. Price Behavior During Trading Days Kraft was Active and not Active on NCE, 1988-1993 ..... V-16

5.4. Price Behavior on Days in Which at Least One of the Leading Traders in Each Group was Active, 1988-1993 ..... V-19

5.5. Estimated Relationship Between Trader Activity Variables and NCE Prices V-33

A5.1a. Types of Trading Activity by Leading Traders of Barrel Cheese on the NCE, 1988-1993 ..... V-40

A5.1b. Types of Trading Activity by Leading Traders of Block Cheese on the NCE, 1988-1993 ..... V-41

A5.2. Price Behavior on Days in Which at Least One of the Leading Traders in Each Group was Active, 1988-1993 ..... V-42

A5.3. Price Behavior in Days Kraft, Borden and Alpine Lace Were Active in NCE Trading, 1988-1993 ..... V-43

A5.4. Price Behavior in Days Beatrice, Mid-Am, Schreiber and AMPI Were Active in NCE Trading, 1988-1992 ..... V-44

A5.5. Estimates of Factors Affecting Monthly NCE Barrel Prices, 1988-1993 ..... V-45

A5.6. Estimates of Factors Affecting Monthly NCE Block Prices, 1988-1993 ..... V-46

A5.7. Estimates of Factors Affecting Monthly WAP Barrel Prices, 1988-1993 ..... V-47

A5.8. Estimates of Factors Affecting Monthly WAP Block Prices, 1988-1993 ..... V-48

6.1. Kraft's Estimated Gross Profit Margins for Processed and Natural Cheese, 1989-1991 ..... VI-46

6.2. Kraft Reported Retail Cheese Sales and Estimated Lost Retail Sales, 1989-1992 ..... VI-49

A6.1. Kraft Bulk Cheese Inventory, Receipts, Usage, and Sales VI-58

A6.2. Adjusted CCC Purchases (Contract Basis) by Regions, Weekly, October 12, 1990-September 26, 1991 ..... VI-59

A6.3. End-of-Month Commercial Stocks of American Cheese and CCC Stocks of Natural (Blocks and Barrels) Cheese, 1980-89 ..... VI-60

A6.4a. Kraft Share of Retail Cheese Sales, by Type, 1988-1992 ..... VI-61

A6.4b. Kraft Share of Retail Cheese Sales, by Type, 1988-1992 ..... VI-62

A6.4c. Kraft Brand Retail Cheese Sales, by Type, 1988-1992 (Sales in Millions of Pounds) VI-63

A6.4d. Kraft Brand Retail Cheese Sales, by Type, 1988-1992 (Sales in Millions of Dollars) VI-64

A6.5a. Private Label Brands Share of Total Retail Cheese Sales, by Type, 1988-1992 (Share of Pounds Sold) VI-65

A6.5b. Private Label Brands Share of Total Retail Cheese Sales, by Type, 1988-1992 (Share of Dollar Sales) VI-66

A6.5c. Total Retail Sales of Private Label Cheese Brands, by Type, 1988-1992 (Millions of Pounds) VI-67

A6.5d. Total Retail Sales of Private Label Cheese Brands, by Type, 1988-1992 (Millions of Dollars) VI-68

A6.6a. Total Retail Cheese Sales by Type, 1988-1992 (Millions of Pounds) VI-69

A6.6b. Total Retail Cheese Sales by Type, 1988-1992 (Millions of Dollars) VI-70

A6.7. Kraft and Private Label Retail Cheese Prices and Price Gaps, by Types, 1988-1992 ..... VI-71-72

A6.8. Average Retail Price Per Pound of Kraft, Borden, and Private Label Brand American Cheese VI-73

A6.9a. Market Shares of Company Brand Sales of Processed Cheeses VI-74

A6.9b. Market Shares of Company Brand Sales of Natural Cheeses VI-75

A6.9c. Market Shares of Company Brand Sales of Cream Cheese VI-76

A6.10. Average Retail Prices of Kraft and Private Label Brands VI-77

A6.11. Retail Prices of Natural and Processed Cheese, Leading Brands, 1981-1990 ..... VI-78

Chapter 1--Introduction

Since the early years of this century, the National Cheese Exchange (NCE) or one of its predecessor markets has been looked to as the best indicator of the value of cheese in the U.S. This is so even though by any definition, the Exchange is a very thin market and a market with few buyers and sellers. The importance of the prices discovered on the NCE is magnified greatly because they are the basis for formula pricing 90 to 95 percent of the bulk cheese in the U.S. It is perhaps not surprising that a price discovered by so few but used by so many should be a frequent target of criticism and questions.

In early 1992, the University of Wisconsin-Madison and the Wisconsin Department of Agriculture, Trade and Consumer Protection (DATCP) agreed to collaborate in an analysis of cheese pricing and the National Cheese Exchange. This report is the result of that collaborative effort. The study sought to ascertain whether the NCE was an efficient market, that is, one that discovers prices for cheese that accurately reflect national supply and demand conditions. And if this were not the case, whether there exist possible unfair trade practices or methods of competition in the pricing of cheese.

To achieve this objective, the study examined the organization of the cheese industry, the characteristics of those companies actively involved in cheese manufacturing, cheese marketing and trading on the NCE, the overall trading activity on the Exchange from 1974 to 1993 and a detailed analysis of the trading of leading sellers and leading buyers during 1988-1993.

These analyses are based on various sources of information. Beginning in early 1992, DATCP sent Demands for Sworn Statements and Production of Documents to the National Cheese Exchange and to over 20 cheese manufacturers, marketers and traders that had been

active on the NCE in recent years. These Demands were based on DATCP's authority under ss. 93.14 to 93.16 and 100.20(6), Wisconsin Statues, and were made pursuant to DATCP's preliminary investigation of possible unfair trade practices or methods of competition.

In addition to information obtained in response to these Demands, and in some cases follow-up Demands, we obtained from the USDA copies of the minutes of all trading activity during each trading session of the NCE from 1973 through 1993 as recorded by USDA market news reporters. Together with legal counsel of DATCP, we interviewed representatives of all but a few of the companies receiving Demands, as well as other persons affiliated with the cheese industry. From time to time, we consulted with dairy marketing specialists at the University of Wisconsin. Extensive use was also made of various relevant secondary sources.

The report was prepared pursuant to an agreement between the Wisconsin Department of Agriculture, Trade and Consumer Protection (DATCP) and the University of Wisconsin College of Agriculture and Life Sciences and College faculty members Professors Willard F. Mueller and Bruce W. Marion. It was agreed that in cooperation with DATCP, Professors Willard Mueller and Bruce Marion would prepare without cost to DATCP a study of cheese pricing and the NCE.

DATCP agreed, at its discretion, to provide the faculty members and certain support scientists with proprietary information obtained by DATCP. The faculty members agreed to protect the confidentiality of such information and not to release proprietary information without the department's written approval. The agreement also provided that the faculty members may publish any of their analyses provided they do not disclose proprietary information in violation of the agreement. The entire agreement appears in Appendix 1.A.

Organization of the Report

Chapter 2 provides an overview of the cheese subsector from the dairy farm to consumers. It indicates trends in consumption, the location and type of cheese manufactured, how milk and cheese prices are determined and the role of federal programs. The characteristics of cheese manufacturing, processing and marketing are described, along with the three major channels through which cheese is marketed. Estimates are provided of the concentration of sales in cheese manufacturing, processing and marketing. The business characteristics of major firms in the cheese subsector are described. This is the broadest and most descriptive chapter in the report and is essential reading to understand much of the rest of the report.

Chapter 3 examines various features of the National Cheese Exchange, including a brief history of predecessor exchanges dating from the 1860s; a description of the NCE's current organization and operating rules; a summary of agencies with regulatory authority over the NCE; and an overview of certain characteristics of the Exchange that create the potential for price volatility and market manipulation.

Chapter 4 examines the characteristics and motives of various companies as they may affect their interests in trading on the NCE and the spot markets. The analysis includes an examination of the business characteristics of leading traders, the reasons most cheese concerns trade in the spot market rather than on the NCE, and an examination of various documentary evidence relevant to these matters.

Chapter 5 analyzes the trading patterns of leading seller-traders and buyer-traders on the Exchange and the apparent impact the two groups of traders had on the level of NCE prices

during 1988-1993. We also make an econometric analysis of these traders' activity on NCE prices.

Chapter 6 is an in-depth analysis of Kraft's activity on the NCE during 1990-1992. It focuses on the nature and apparent impact of Kraft's trading activity on NCE prices during each period of a price cycle: the price decline, the price bottom, the price rise, and the price top. This analysis, based on trading activity and company documents, explores the apparent motives for Kraft's trading conduct and its consequences on NCE prices.

Chapter 7 provides a summary of the findings of the report, our conclusions regarding the matters studied, and some suggested private and public options that may improve the pricing process for cheese.

Acknowledgments

The authors wish to express their appreciation to the many persons who assisted in this undertaking. We received much cooperation and assistance from those companies served with Demands for information and documents, as well as the many persons we interviewed.

We are indebted to the various DATCP personnel with whom we collaborated in obtaining information for the report. Especially helpful were legal counsels Reid Klopp and Sherry Steffel, bureau director Robert Park prior to his retirement in July 1994, William Hughes until he left in July 1994, and Ann Roth.

Several university researchers were very helpful in our initial inquiry of cheese pricing, including our former graduate student in Agricultural Economics, Allan Krause, and undergraduate Gary Clough. Laura Hengehold worked as a full-time researcher during the second year of the project.

We were extremely fortunate in having knowledgeable and unselfish colleagues ever ready to share with us their special expertise. We are particularly indebted to Professors Peter Helmberger, Jean Paul Chavas, and Reuben Buse for their productive consultations on econometric matters. Likewise, we are indebted to Professors Edward Jesse and Robert Cropp for instructing us in the more arcane aspects of dairy marketing.

Finally, we extend our unqualified appreciation to Ardella Crawford, who typed our many drafts and whose editing of the manuscript extirpated the more egregious malapropisms.

The authors are proud to join the many past and present faculty members of the Department of Agricultural Economics who have studied cheese marketing. These include such distinguished economists as Henry C. Taylor, the first chair of the department, George S. Wehrwein, Benjamin H. Hibbard, Asher Hobson, Rudolph K. Froker, Hugh Cook, Truman Graf, Edward Jesse and Robert Cropp.

Our research was made possible by special USDA grant funds to the Food Systems Research Group of the Department of Agricultural Economics and the support of the College of Agriculture and Life Sciences.

Appendix 1.A

AGREEMENT

STATE OF WISCONSIN DEPARTMENT OF AGRICULTURE, TRADE AND CONSUMER PROTECTION

UNIVERSITY OF WISCONSIN

The State of Wisconsin Department of Agriculture, Trade and Consumer Protection ("department"), the University of Wisconsin College of Agricultural and Life Sciences ("college"), and college faculty members Prof. Willard F. Mueller and Prof. Bruce Marion ("faculty members") hereby agree as follows:

WHEREAS, the department is currently engaged in a study and analysis of market practices related to the purchase and sale of cheese, including transactions on the National Cheese Exchange; and

WHEREAS, college faculty members Prof. Willard Mueller and Prof. Bruce Marion ("faculty members"), and support staff scientists working for those faculty members, are also currently engaged in a study and analysis of market practices related to the purchase and sale of cheese, including transactions on the National Cheese Exchange; and

WHEREAS, the above studies and analyses are important to the State of Wisconsin, and to the state's dairy economy, and constitute an important and legitimate function of both the department and the college; and

WHEREAS, the interests of the department and the college will be mutually served by collaboration in the pursuit of the above studies and analyses; and

WHEREAS, the department is authorized by law to obtain proprietary information from private firms, including possible trade secrets, which may be necessary to complete the above studies and analyses; and

WHEREAS, the department is obliged to preserve the confidentiality of trade secrets under s. 134.90, Stats.; and is responsible for deciding whether other proprietary information received by the department may be released to the public;

NOW, THEREFORE, the following parties, in consideration of mutual benefits derived, agree as follow:

1. In cooperation with the department, college faculty members Prof. Willard Mueller and Prof. Bruce Marion ("faculty members") agree to perform a study and analysis of market practices related to the purchase and sale of cheese, including transactions on the National Cheese Exchange, and to make the results of that study and analysis available to the department. The college agrees that the faculty members may perform this

study and analysis in their capacity as faculty members of the college.

2. For purposes of the above study, the department will, in its discretion, provide the faculty members with proprietary information obtained by the department. The faculty members will protect the confidentiality of all proprietary information received from the department, and will establish reasonable security measures to protect the confidentiality of that information. The faculty members will not release proprietary information without the department's prior written approval.

3. Solely for purposes of the above study and analysis, the faculty members may give their support staff scientists access to proprietary information received from the department, provided that the support staff scientists are individually identified to the department in advance, and provided that the support staff scientists agree to protect the confidentiality of the information. The faculty members are responsible for ensuring that their support staff scientists protect the confidentiality of any proprietary information provided to them.

4. No faculty member or support staff scientist who receives proprietary information under this agreement will use that information in any way that could result in the receipt of anything of value for himself or herself, for his or her immediate family, or for any other person or organization, unless the department has made that information available to the public.

5. This agreement does not prohibit a faculty member or support staff scientist from publishing any study or analysis, provided that the publication does not disclose proprietary information in violation of this agreement.

6. This agreement does not prohibit the release or publication of proprietary information with the prior written approval of the department.

Signed this 24th day of February, 1992.

STATE OF WISCONSIN
DEPARTMENT OF AGRICULTURE,
TRADE AND CONSUMER PROTECTION

By _____
Alan T. Tracy, Secretary

Signed this 10 day of February, 1992.

By Willard F. Mueller
Prof. Willard F. Mueller
Principal Investigator

Signed this 10 day of February, 1992.

By Bruce W. Marion
Prof. Bruce Marion
Principal Investigator

Signed this 14th day of February, 1992.

UNIVERSITY OF WISCONSIN

By R W Erickson
Robert W. Erickson
Director, Research Administration
-- Financial

Chapter 2--Organization and Characteristics of Cheese Industry

A. Introduction

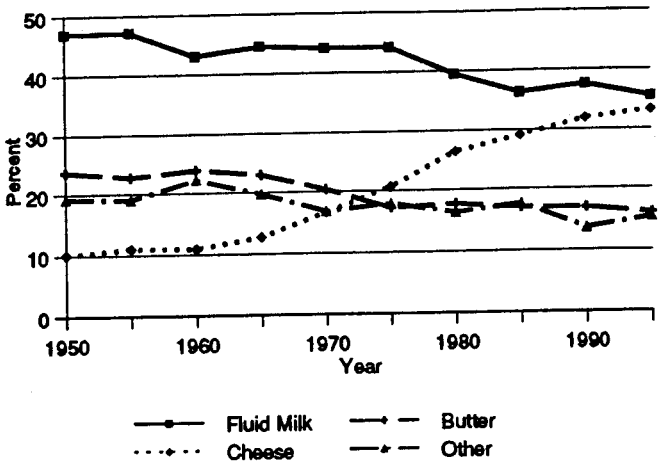
Cheese is the most important manufactured dairy product in the U.S., currently commanding 85 percent of the milk from Wisconsin and about 33 percent of all milk in the U.S. A growing share of milk is made into cheese. From 1970 to 1994, this share nearly doubled from 17 percent to 33 percent, while the proportion used for fluid milk declined from 46 percent to 36 percent (Figure 2.1).

Wisconsin is by far the leading cheese producer, accounting for about 30 percent of all U.S. natural cheese manufactured in 1994. California ranked a distant second with 14 percent, followed by Minnesota and New York (Figure 2.2).

Cheese manufacturing has become more dispersed geographically. Between 1940 and 1994, Wisconsin's share of U.S. cheese production declined from 52 percent to 30 percent. The share produced in Wisconsin, Minnesota, Iowa and Illinois went from 60 to 45 percent, the share produced in California and Idaho, two leading western states, increased from 4 to 18 percent, and the share accounted for by the two leading eastern states (New York and Pennsylvania) increased from 9 to 14 percent. The leading eight states in 1940 and 1994 accounted for the same proportion of all cheese manufactured (78 percent), but the dominance of the North Central states declined substantially (Appendix Table 2.2).

American style (includes cheddar, colby, monterey, jack, washed and stirred curd) and mozzarella cheeses accounted for 75 percent of natural cheese produced in 1994 (Figure 2.3). The manufacture of mozzarella has expanded rapidly in the U.S. and in Wisconsin: from

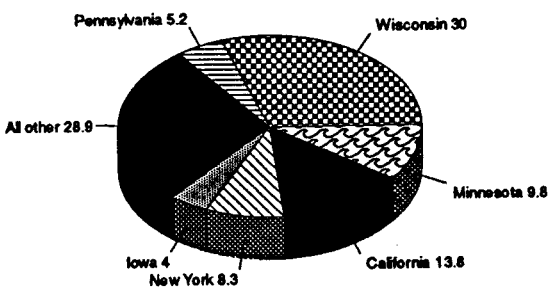
Figure 2.1. Utilization of Milk: United States, Selected Years



Source: Wisconsin Dairy Facts, 1995, Wisconsin Department of Agriculture, Trade and Consumer Protection

Figure 2.2 Total Production of Natural Cheese by States, 1994

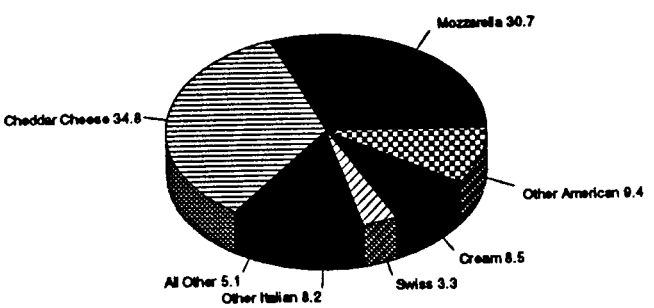
Percent of U.S. Cheese



.Source: Dairy Products, 1994 Summary, National Agricultural Statistical Service, USDA, May 1995

Figure 2.3. Natural Cheese Production in the U.S.

Percent by Type, 1994



Source: Dairy Products, 1994 Summary, National Agricultural Statistical Service, USDA, May 1995

1970 to 1992 production of American cheese in the U.S. doubled, while production of Italian cheese (80% of which was mozzarella) increased six fold.

B. Cheese Imports and Exports

Since 1980, U.S. cheese imports have been about 5 percent of total U.S. production (Appendix Table 2.1). Between 1980-1986 and 1987-1995, imports share declined modestly, partly because of a decrease in U.S. cheese support prices, from $1.40 per pound for blocks in 1981-83 to $1.12 per pound by 1990. Also affecting imports has been the significant growth in U.S. produced specialty cheeses that compete directly with some imported cheese. For example, cheese plants in Wisconsin now produce varieties such as Havarti, Brie, and Gruyere.

Most imported cheese falls in the specialty category and thus competes only in the specialty cheese niche. As a result, imports have relatively little influence on U.S. prices for such mainstream cheeses as cheddar and mozzarella.

Small though they are, imports are several times as large as exports (Appendix Table 2.1). Cheese exports dropped from 1.5 percent of U.S. production in the mid 1980s to about 0.5 percent in the early 1990s. From 1992 to 1995, export share of total production doubled, but in 1995, imports were still five times as large as exports. To date, exports are largely a non-event in the cheese industry.

C. Cheese Consumption in U.S.

Cheese is one of the few dairy products for which consumption has increased substantially since 1980. Per capita consumption of all cheese in the U.S. was 27 pounds in 1994, more than double the 11.5 pounds in 1970, and up 50 percent from 17.5 pounds in 1980. The growth in consumption of American cheeses since 1980, however, was only 18 percent,

with most of the overall increase occurring in non-American cheese, especially Italian. For both American and Italian type cheeses, there has been substantial growth in the more convenient forms of cheese (i.e., shredded, sliced, grated, individual wrapped, etc.).

Studies of cheese demand have concluded that, overall, cheese consumption is relatively price inelastic at retail. Gould and Lin estimated that all cheese combined has a price elasticity of demand of -0.57.[1] That is, a 10 percent increase in average cheese prices would result in a 5.7 percent decline in consumption. This result is similar to the elasticity estimates of others.[2] However, as one moves from the retail level back to the cheese factory, demand becomes even more inelastic. For raw material cheese, such as that priced on the NCE, the elasticity of demand may be only -0.25, i.e., a 10 per cent increase in cheese prices would lead to a 2.5 percent decline in quantity taken.

The quantity consumed of specific types of cheese is more price sensitive. For example, the price elasticity estimates for natural American, other natural, American and other processed, and processed snack at retail are respectively -1.07, -1.43, -.44 and -1.12. Specific types of cheese are more price sensitive than all cheese because of the ability of consumers to substitute one type of cheese for another.

Cheese consumption rises with increases in income. Estimates of income elasticity range

---

1 Brian Gould and H.C. Lin, "The Demand for Cheese in the United States: The Role of Household Composition," *Agribusiness* 10: 43-59, 1994.

2 W.T. Boehm and E.M. Babb, "Household Consumption of Storable Manufactured Dairy Products," Department of Agricultural Economics, Purdue University, West Lafayette, IN, Agricultural Experiment Station Bulletin no. 85, 1975. D. Heien and Cr. Wessells, "The Demand for Dairy Products: Structure, Prediction, and Decomposition," *AJAE*, 70(2), 219, 1988.

from .045[3] to 0.32.[4] An income elasticity of 0.20 means that as real income increases 10 percent, cheese consumption increases by 2 percent.

D. Seasonality of Production, Consumption, and Commercial Stocks

During the period 1988-1993 cheese production peaked during March through June at about 4 percent above average due to flush milk production during those months (Figure 2.4).[5] Average *daily* production then dropped sharply during July, August and September to about 4 percent below average.

Data on the seasonality of cheese consumption are not readily available. Figure 2.5 indicates the seasonality of cheese sales through retail food stores. *Daily* retail sales of cheese peak in December and trough in July and August. Note that this chart ignores that portion of cheese used in food service establishments or as ingredients by food manufacturers. By most estimates, these latter two channels account for 60 to 65 percent of the cheese usage in the U.S. Seasonal peaks and valleys in cheese usage are more pronounced for retail sales than for food service/industrial sales.

Figure 2.6 shows the seasonal pattern of *commercial disappearance*, a term which refers

---

3 Gould and Lin, *op. cit.*

4 J. Blaylock and D. Smallwood, "Effects of Household Socioeconomic Features on Dairy Purchases," *Technical Bulletin* No. 1686, USDA Economic Research Service, Washington, D.C., 1983; "U.S. Demand for Food, Household Expenditures, Demographics, and Projections," *Technical Bulletin* No 1714, USDA Economics Research Service, Washington, D.C., 1988.

5 The sources for Figures 2.4-2.7 are:
- Figure 2.4--Dairy Products, 1988-1993 Annual Summaries, NASS, USDA.
- Figure 2.5--Unpublished data from ERS, USDA.
- Figure 2.6--Dairy Products, Annual Summaries, NASS, USDA; Dairy Market Statistics, Annual Summaries, AMS, USDA; and ASCS Commodity Fact Sheet, USDA.
- Figure 2.7--Dairy Market Statistics, Annual Summaries, AMS, USDA.

Figure 2.4. Seasonal Variation in Total Cheese Production, 1988-1993
Adjusted for Number of Calendar Days in Each Month

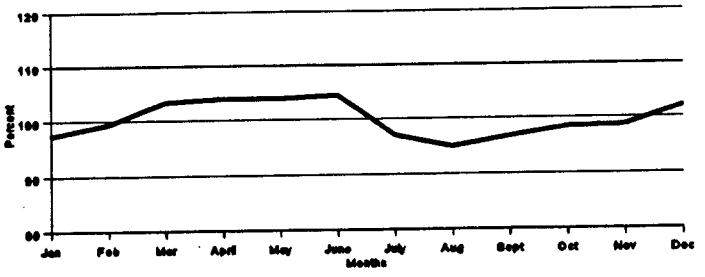


Figure 2.5. Seasonal Variation in Retail Sales of All Cheese, 1982-1991
Adjusted for Number of Calendar Days in Each Month

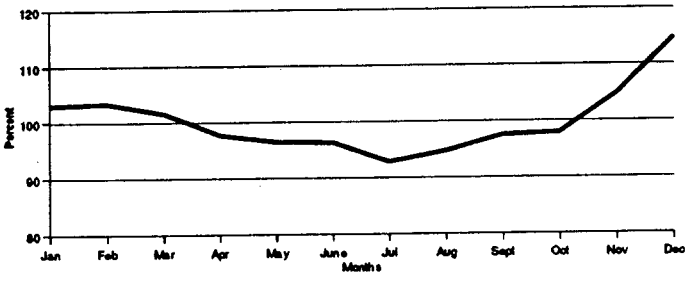


Figure 2.6. Seasonal Variation in Commercial Disappearance of Total Cheese, 1988-1993
Adjusted for Number of Calendar Days in Each Month

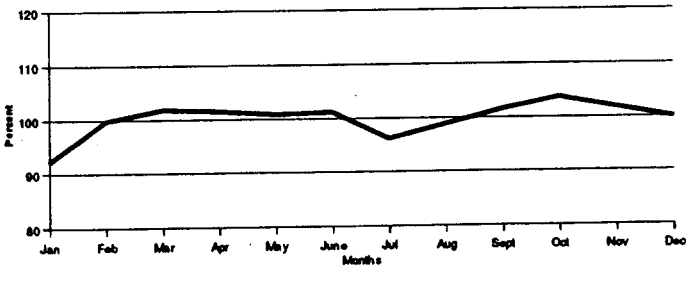
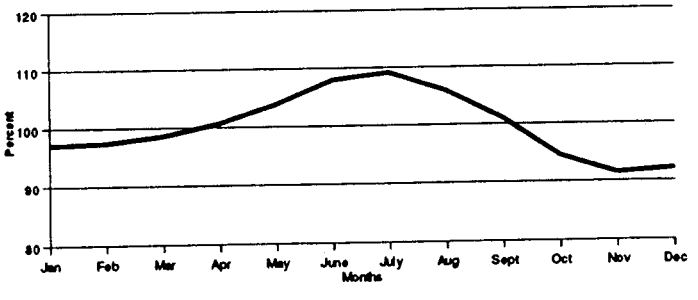


Figure 2.7. Seasonal Variation in End-of-Month Commercial Stocks of All Cheese, 1988-1993



to bulk cheese usage for all purposes. For 1988-1993, *daily* commercial disappearance peaked in October at about 4 percent above average, and hit lows in January and July at 8 percent and 4 percent below average, respectively.

Commercial disappearance in August, September and October increases for two reasons: (a) wholesale level demand increases in anticipation of increased retail sales when school begins and (b) companies build finished good inventories for peak retail sales in November and December. Cheese cut and wrap operations begin building finished product inventories in September; inventories peak in mid-November prior to the surge in retail sales in December.

Monthly commercial stocks (Figure 2.7) reflect the combined effects of Figures 2.4-2.6. On average, inventories of bulk cheese, referred to as commercial stocks, grow during April through July and decline thereafter as inventories are used to compensate for low cheese production and to allow the building of finished good inventory. Commercial stocks typically reach a low in November, the same month in which finished good inventories peak.

E. Pricing of Milk at Farm Level

The pricing of milk and dairy products in the U.S. is quite complex. However, the main features of the pricing system are relatively simple.[6]

1. Two grades of milk: Grade A milk can be used for fluid as well as manufactured products, while Grade B milk is referred to as "manufacturing grade" and can be used

---

[6] Two regional extension leaflets by Jesse and Cropp provide somewhat expanded but very understandable discussions of milk pricing. Ed Jesse and Bob Cropp, "What Determines Your Milk Check? Part 1: Manufacturing Grade Milk," N.C. Regional Extension Pub. 217-16, University of Wisconsin-Madison, March 1993; "What Determines Your Milk Check? Part II: Grade A Milk," N.C. Regional Extension Pub. 217-17, University of Wisconsin-Madison, August 1993.

only for nonperishable manufactured dairy products. Grade A milk producers are subject to more stringent sanitation and quality regulations than Grade B producers.

Much Grade A milk, however, is used for manufactured products. In 1994, only 7 percent of U.S. milk was Grade B; however, 63 percent of all milk (Grades A and B) was used for manufactured products.

2. Federal price support system: The Federal government sets a floor under manufacturing grade milk prices by offering to buy three manufactured dairy products--cheddar cheese, butter and non-fat dry milk--at "support" prices, which vary over time. Restrictions on imports of manufactured dairy products allow the U.S. price support system to function quite independently of global supply and demand.

3. Federal Marketing Orders: Seventy percent of U.S. milk was sold under the 38 Federal milk marketing orders in 1994; about 20 percent was sold under state orders. Federal orders determine the minimum prices paid for Grade A milk, depending on its use. A central feature of milk marketing orders is classified pricing, whereby Class I milk, that used for fluid products, is priced at a premium (Class I differential) over Class III milk, which is used for manufactured products.[7] The base Class I differential at Eau Claire, Wisconsin is $1.04 per hundredweight.

Milk marketing orders also establish distance differentials for Class I milk. The base Class I differential increases by approximately 21 cents per hundredweight for each 100 miles distance from Eau Claire, Wisconsin, to markets east of the Rocky Mountains.

---

[7] Class I prices are calculated as the Class III price two months earlier plus the Class I differential. Changes in Class I prices therefore lag by 2 months changes in Class III prices.

For example, Class I milk prices in southern Florida are approximately $3.00 per hundredweight higher than in Minneapolis-St. Paul.

Cooperatives often are able to negotiate an "over order premium" for Class I milk. These premiums averaged $0.81 per hundredweight for 1994. Minimum federal order prices for Class III milk are the same in all markets (BFP for current month). However, Class III pay prices may also exceed the order minimum in markets where cheese manufacturing is important. In Minnesota and Wisconsin, for example, cheese plants competing with one another for milk may pay $.50-1.00 per hundredweight more than the established Class III price.[8]

4. Basic Formula Price (previously the M-W price): As of May 1, 1995, the Minnesota-Wisconsin (M-W) price was replaced by the Basic Formula Price (BFP). The BFP and M-W price are slightly different ways of estimating the average price for manufacturing grade (B) milk that was paid by cheese and butter-powder plants in Minnesota and Wisconsin. The BFP is even more directly linked to National Cheese Exchange prices than was the M-W price. For example, the February BFP equals the average actual pay price for milk by cheese and butter-powder plants in January, plus the change in the *value* of manufactured milk in February based upon changes in cheese, butter and non-fat dry milk prices. In this calculation, NCE prices receive about 90 percent weight while butter-powder prices receive 10 percent.

---

[8] Actual Class III prices can also be less than the order minimums because cooperatives are exempt from the minimum price requirements of marketing orders. This mainly affects those orders in which cooperatives are major converters of Grade A milk into cheese and butter/powder (i.e., Class III uses). Proprietary cheese plants, unlike cooperative cheese plants, must pay the minimum Class III price.

Changes in the BFP largely drive farm prices throughout the U.S. Minimum Class II and III milk prices are tied directly to the BFP: market order Class III prices are identical to the current month's BFP and Class II prices are the BFP two months earlier plus 30 cents per hundredweight. Class I minimum prices are generally equal to the BFP two months earlier plus a Class I differential. Since Class I differentials change little over time in particular orders, price movements for much of the milk in the U.S. are based on BFP changes.

As this indicates, there is a close linkage between NCE prices and the Basic Formula Price for manufacturing grade milk, and also a tight linkage between BFP and the price received for milk by farmers in Wisconsin and throughout the U.S.

5. Blend Price: Farmers covered by marketing orders receive a "blend price" for their milk that represents the class prices in their marketing order times the proportion of milk used for each class. For example, the blend price received by dairy farmers in South Florida was 15.85 per hundredweight in 1994 (83 percent of milk in the order was used for Class I). By comparison, the blend price in the Upper Midwest order for 1994 was 12.15 per hundredweight (17 percent was used for Class I).

F. Cheese Pricing

Since 1981, the U.S. Congress has established the support price for manufacturing grade milk. The U.S. Department of Agriculture determines the price the Commodity Credit Corporation (CCC) will pay for bulk cheddar cheese, butter and nonfat dry milk in order to achieve the support price for milk. Thus, the CCC price for cheddar blocks and barrels provides a floor for cheese prices. However, since 1987, cheese prices have rarely dropped to the support

level. Whereas the CCC was an active buyer of cheese and was a major influence on prices during 1980-87, this was not true during 1988-94. In the latter period, with the CCC price at a relatively low level, the market price for cheese generally was well above the support price (Figure 2.8).

During 1980-1987, the CCC program also had a tendency to set a ceiling on cheese prices by selling government stocks of cheese back to the commercial market. Since 1981, the minimum CCC sales price has been set at 110 percent of the CCC purchase price for cheese at the time of the sale. As Figure 2.9 indicates, CCC stocks rose sharply in the early 1980s and peaked in 1983-84 at nearly 800 million pounds. This massive inventory was liquidated during the following four years, in part by cheese give-away programs and in part by sales back to the commercial market. Whenever market prices rose to 10 percent above the support price, cheese sales by the government tended to slow further price increases. By the end of 1988, however, CCC stocks were largely eliminated. Since then, the CCC program has no longer been an important constraint on the upward movement of cheese prices.

When the CCC price is not operative, the price "opinion" of the National Cheese Exchange (NCE) in Green Bay, Wisconsin, is the major basis for bulk cheese prices in the U.S. The NCE and CCC prices for cheddar blocks from 1978 to 1994 are shown in Figure 2.8. As cheese prices became more market-driven in the late 1980s, the volatility of cheese prices increased sharply. Hence, since mid-1988, the NCE has become more important in the price discovery process. Prior to that time, NCE prices were largely constrained by CCC support prices and sell-back provisions.

As Figure 2.8 indicates, the seasonality of cheese prices increased greatly during 1988-

Figure 2.8: NCE and CCC Block Cheese Prices
Weekly: 1978-94

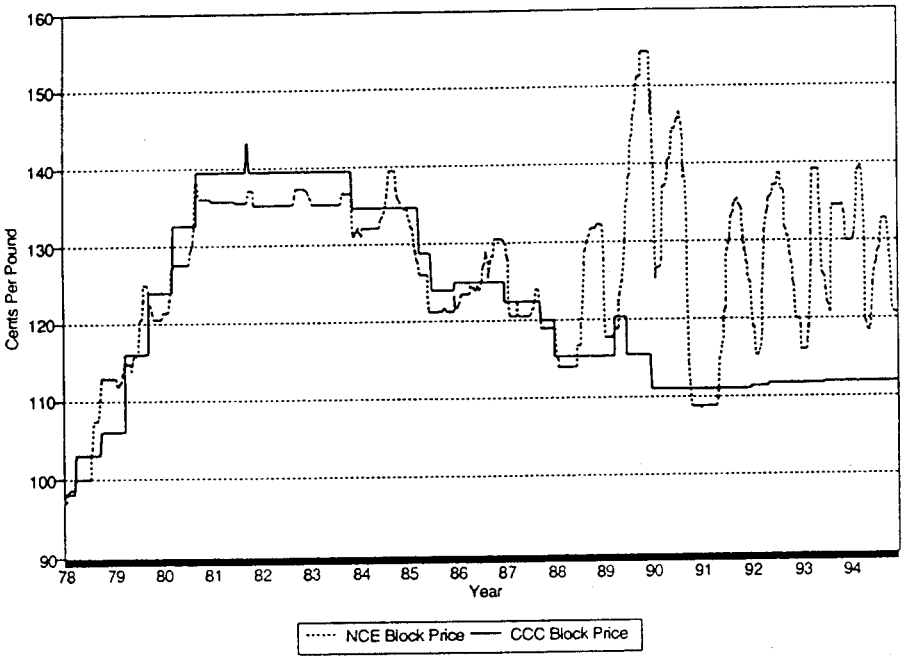
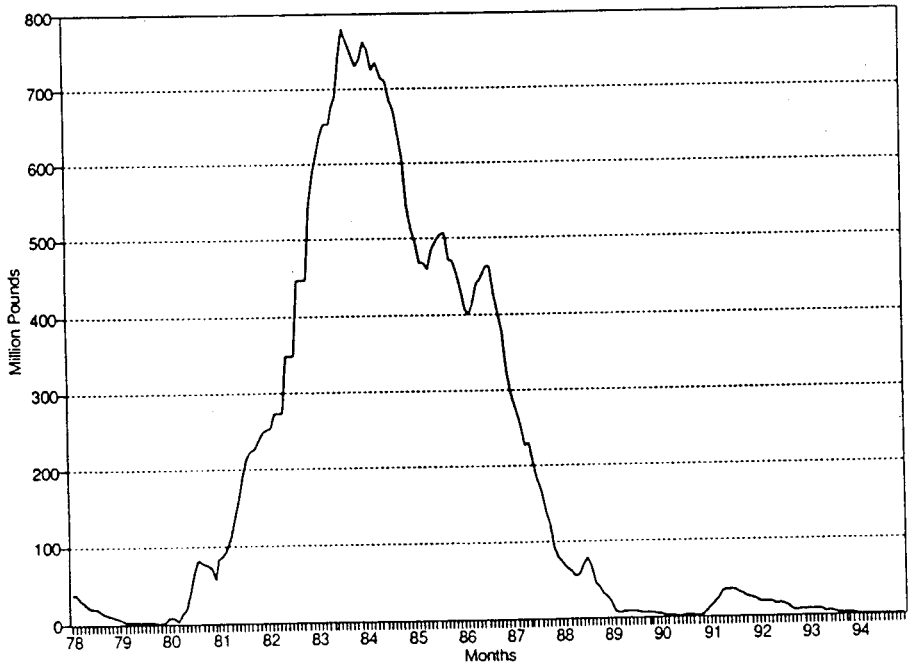


Figure 2.9: CCC Stocks of Natural Cheese
Monthly, 1978-94

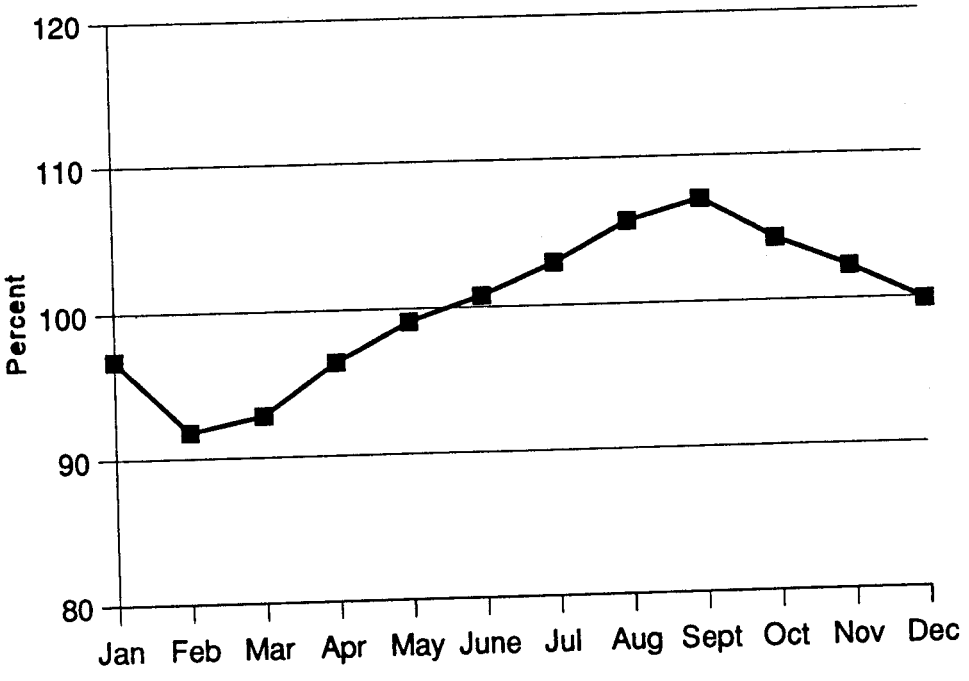


Source: Dairy Market Statistics, Annual Summaries, AMS, USDA

1994. With low support levels, cheese prices were allowed to move in response to supply-demand conditions and other factors. Figure 2.10 indicates that prices during 1988-1993, on average, bottomed in February and peaked in September. On average, prices had a 15 percent swing from low to high.

By comparison, during 1980-1987, the seasonality in cheese prices was largely eliminated by the influence of the CCC support price, which generally held constant throughout the year. During this 8 year period, there was only a 3 or 4 percent seasonal swing in cheese prices.

Figure 2.10. Seasonal Variation in NCE Block Prices, 1988-93 Average



The NCE "opinion price" is widely used by the industry as a national index of the value of bulk cheese.[9] The prices set by NCE activity each Friday provide the basis for most of the transactions in bulk cheese during the following week. Since less than 1 percent of total cheese production is usually sold on the NCE, the Exchange has a disproportionate amount of leverage in its effects.

The prices established on the NCE not only largely determine the prices cheese manufacturers receive for raw material or bulk cheese, but also greatly influence prices of other dairy products. Dairy marketing economists often characterize NCE prices as *driving* manufactured milk prices which, in turn, importantly determine fluid milk prices. A leading cheese marketer characterized the importance of cheese prices as follows:

> Cheese is the most important manufacturing product in the dairy industry in terms of value and influence. *Cheese* heavily influences manufacturing milk prices (known as the M/W) which largely determines fluid milk prices.[10]

G. Organization of Cheese Subsector

In this section the terminology used to describe the cheese subsector is generally consistent with that of the FDA (Food and Drug Administration), the NASS (National Agricultural Statistics Service of USDA), and the industry. Even within the cheese industry, however, there are some conflicting uses of these terms. We use these terms as follows:

Cheese Manufacturing refers to the making of natural cheese from fluid milk. Since milk

---

[9] The NCE does not issue an "opinion" at the end of each trading day. Rather, a trade publication, The Cheese Reporter, interprets the activity of the NCE and reports its market opinion for cheddar blocks and barrels. We will often refer to this reported "opinion" as the "opinion price," or the NCE price.

[10] Kraft General Foods, *Cheese Procurement Strategy*, Operations, December 6, 1989, KGF 2948, 2959. Emphasis added.

is the major input, it accounts for roughly 80 to 85 percent of the cost of cheese. On average, 10 pounds of milk produce 1 pound of cheese. Natural cheese includes American style cheeses (cheddar, colby, monterey, jack), Italian cheeses (mozzarella, provolone, parmesan, Romano, ricotta), Swiss, brick, Muenster, blue, cream and various specialty varieties. Cottage cheese is not considered a natural cheese.

Cheese Processing refers to the conversion of natural cheeses to processed cheese products. Processed cheeses are made by grinding, emulsifying and blending natural cheese and other ingredients (usually with the aid of heat). The natural varieties most often used in processed cheese are cheddar, colby and Swiss. The FDA and NASS recognize three main types of processed cheese products.

1) *Processed cheese*: Up to 5 percent of the butterfat weight may come from non-cheese inputs such as cream. Processed cheese accounts for 55 percent of the tonnage of processed cheese products.

2) *Processed cheese foods and spreads*: Cheese ingredients must account for not less than 51 percent of the weight of the final product. Other dairy ingredients that can be combined with cheese include cream, milk, skim milk, buttermilk, and cheese whey. Processed cheese foods and spreads account for 40 percent of the tonnage of all processed cheese products.

3) *Cold pack cheese and cheese foods*: Differ from the above two groups of products in that heat is not involved in the emulsifying process. "Cold pack cheese" is analogous to processed cheese but is made without heat. Cold pack products account for 5 percent of the tonnage of all processed cheese products.

Cheese Converters refers to those companies and plants that convert bulk natural cheese (often in 40-pound blocks or 500-pound barrels) into either processed cheese products or into finished natural cheeses. The conversion of natural cheese into finished natural cheeses occurs in "cut-wrap" plants or operations. Bulk natural cheese is cut, sliced, shredded, grated and packaged into a variety of package types and sizes.

Cheeese Manufacturing

Figure 2.11 portrays the overall organization of the cheese subsector. Natural cheese manufacturing is the first stage of the cheese subsector after milk supply. In 1994, there were 449 cheese manufacturing plants in the U.S. each producing, on average, 15 million pounds of cheese per year. This compares with 737 cheese plants in 1980, each with an average production of 5.4 million pounds.[11]

Wisconsin accounted for 34 percent of all cheese plants in the U.S. and 30 percent of cheese produced in 1994. One-third of Wisconsin's cheese plants produced over 10 million pounds of cheese annually (average production of these plants was 34.8 million pounds). These plants accounted for 86 percent of Wisconsin production in 1994. By comparison, only 11 percent of Wisconsin plants produced over 10 million pounds per year in 1980, and accounted for 54 percent of Wisconsin cheese production.[12]

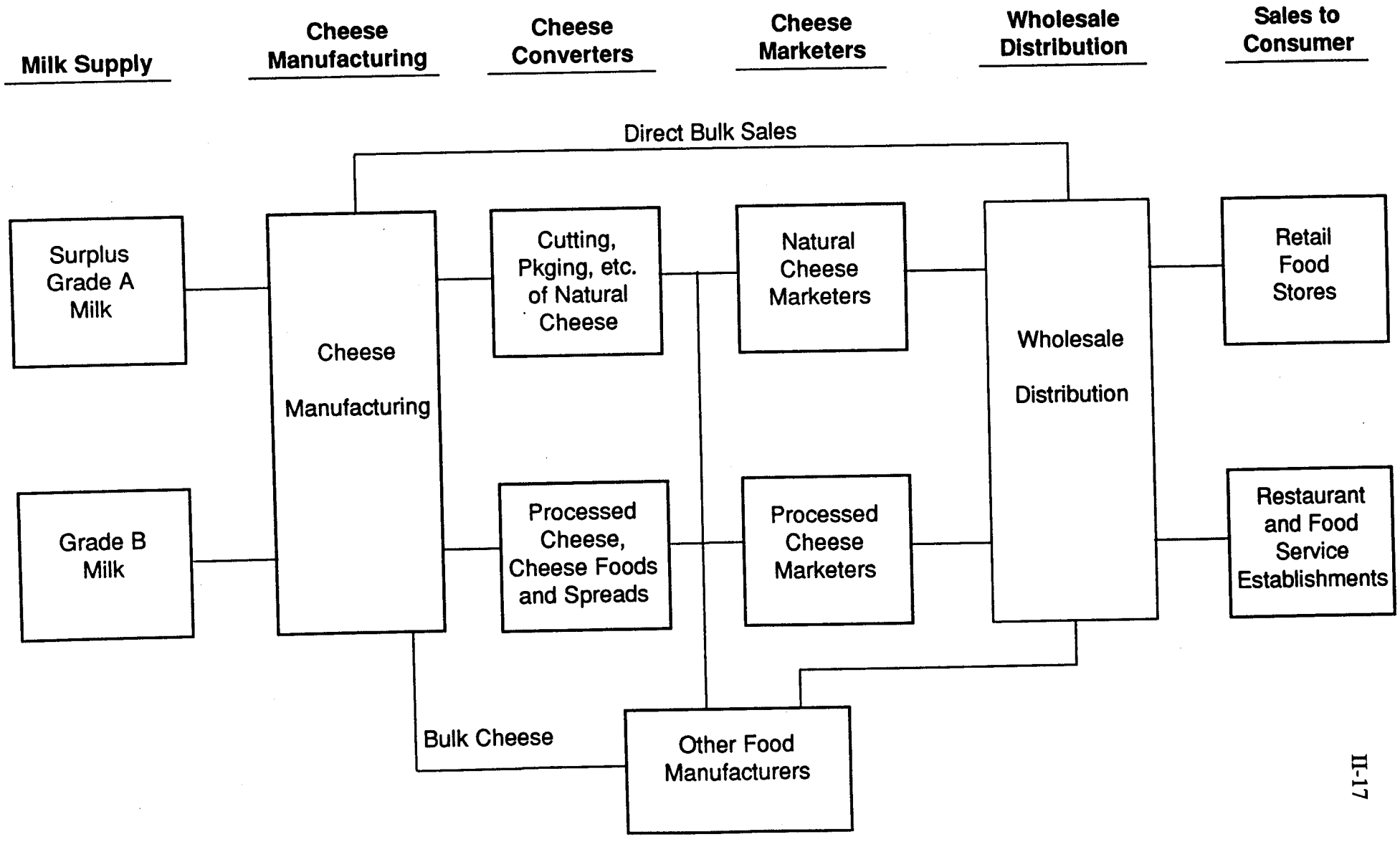
The number of Wisconsin plants making less than 5 million pounds of cheese per year has dropped sharply: 423 in 1971, 269 in 1980 and 85 in 1994. Over this 23-year period, the

---

11 National Agricultural Statistics Service (NASS), USDA, "Dairy Products, 1994 Summary," Washington, D.C., May 1995.

12 Wisconsin Department of Agriculture, Trade & Consumer Protection, "1995 Wisconsin Dairy Facts," Madison, Aug 1995.

Figure 2.11. Organization of Cheese Subsector



percent of Wisconsin cheese produced by these small plants plummeted from 59 percent in 1971 to 31 percent (1980) to 8 percent (1994).[13] Some small plants have found niches in the market; however, the trend, both in Wisconsin and the U.S., is towards large cheese plants that draw milk from relatively large geographic areas.

Economies of scale in cheese manufacturing plants have increased in the last 20 years. A 1987 Cornell study estimated that economies in cheddar cheese manufacturing continued out to 2.4 million pounds of milk per day.[14] This translates to about 80 million pounds of cheese per year, which is slightly more than one percent of total U.S. production of all cheese. Using these estimates, Wisconsin could accommodate about 25 minimum-efficient size plants.

The Cornell study found that plant size had a much greater effect on costs than did cheese making technology. Indeed, different cheese making technologies (standard cheddaring, automatic cheddaring, stirred curd, etc.) were found to have a relatively small impact on production costs.

Not considered in the Cornell study is the cost of procuring and assembling the needed volume of milk. Cook et al[15] estimated that entry barriers into cheese manufacturing are low--with raw milk supply being the most important barrier. In Wisconsin, raw milk supply

---

[13] *Ibid.*

[14] J.K. Mesa-Dishington, D.M. Barbano, and R. D. Aplin. "Cheddar Cheese Manufacturing Costs, Economies of Size, and Effects of Different Current Technologies," A.E. Res. No. 87-3, Department of Agricultural Economics, Cornell University, Ithaca, NY. 1987a. "Economic Performance of 11 Cheddar Cheese Manufacturing Plants in the Northeast and North Central Region," A.E. Res. No. 87-2, Department of Agricultural Economics, Cornell University, Ithaca, NY. 1987b.

[15] H.L. Cook, L. Blakley, R. Jacobson, R. Knutson, R. Milligan, and R. Strain, *The Dairy Subsector of American Agriculture: Organization and Vertical Coordination*, NC117 Monograph #5, Madison, Wisconsin, 1978.

continues to be the greatest barrier to entry for a large, efficient cheese plant. The larger the plant, the farther that plant will have to reach to obtain a sufficient supply of milk.

Natural cheese is made in a variety of flavors, shapes and sizes. American style cheese, which accounts for nearly half of all natural cheeses, is made in 40 lb. blocks, 640 lb. blocks and 500 lb. barrels. The 40 lb. blocks are used primarily for "cutting" cheese; barrel cheese is used primarily for processed cheese; and 640 lb. blocks may be used for either purpose. Italian and Swiss cheeses are usually made in slightly different sizes.

Of the 449 cheese manufacturing plants in the U.S. in 1994, 54 percent made at least some American style cheese, and 35 percent made at least some Italian cheese. A relatively small proportion of plants were able to make either American or Italian cheeses. Such plants are referred to as "balancing" plants, as are plants that can pack either barrel or block cheese. Plants that make either or both American and Italian type cheeses probably account for nearly 90 percent of cheese plants. The remaining plants make other cheese varieties such as Swiss, Muenster, Brick and Cream.

Table 2.1 provides a summary of cheese produced and sold in 1987 and 1992. In 1992, 6,488 million pounds of natural cheese were manufactured in the U.S. Of this, about 1,652 million pounds were converted into 2,203 million pounds of processed cheese products (e.g., cheese slices or loafs) and 4,923 million pounds were marketed in the U.S. as natural cheese (e.g., cheddar, colby, Swiss, mozzarella, parmesan, cream, blue, etc.). We estimate that, on average, 0.75 pounds of natural cheese is used to make 1 pound of processed cheese products. After adjusting for changes in cold storage stocks, imports and exports, and government

Table 2.1. Natural and Processed Cheese Produced and Marketed in the U.S., 1987 and 1992

Type of Cheese	1987	1992
	(Millions of Pounds)	
Natural Cheese Manufactured:		
American style	2716.7	2936.6
Italian	1799.8	2508.6
Cream	330.1	447.0
Swiss	227.2	237.0
All other	270.6	359.1
Total Natural Cheese Mft	5344.4	6488.3
Increase (+) or Decrease (-) in Stocks	+329	-45.0
Imports Less Exports	+177	+199
Less Government Removals	-304.2	-67.0
Total Commercial Usage in U.S.	5546.2	6575.3
Marketed as Natural Cheese	4074.9[a]	4923.3[a]
Processed Cheese Products		
Processed cheese	1188.5	1347.7
Processed cheese foods, spreads & cold pack	773.2	855.0
Total Processed Cheese Products	1961.7	2202.7
Total Natural and Processed Cheese Sold	6036.6	7126.0

[a] Assumes 0.75 pound of natural cheese in 1 pound of processed cheese products, on average.
Source: NASS, USDA, Dairy Products, 1987 and 1992 Summaries, May 1988 and 1993.

removals, total commercial usage of natural cheese in the U.S. increased from 5.5 billion pounds in 1987 to 6.5 billion pounds in 1992.

Economic Markets for Cheese Manufacturers

Different types of natural cheese are often poor substitutes for each other from the standpoint of the buyer/user. However, when determining economic product markets, one must consider the substitutability on the supply side as well as the demand side. On the supply side, there is a reasonable degree of substitution across cheese types. A significant minority of plants have the ability to produce several types of natural cheese, particularly cheddar and mozzarella.[16] This has the effect of placing most natural cheese within the same product market at the manufacturing stage. Because shipping costs are low relative to value, the geographic market for manufactured cheese is national. Thus, market share and concentration figures for all natural cheese manufacturing for the U.S. would be a useful measure of the structure of this market. The six leading natural cheese manufacturers, four of them cooperatives, are shown in Table 2.2.

Cheese Converters: Processed Cheese

From the cheese manufacturing plant, roughly three-fourths of the cheese is marketed through various channels as natural cheese. The remaining one-fourth goes to processing plants where it is converted to one of the three types of processed cheese. In a few instances cheese manufacturing plants also process cheese, but for the most part, processing plants are separate.

---

[16] The flexibility of cheese manufacturing to produce different types of cheese has limits. Occasionally the rapid growth in demand of certain cheeses, such as mozzarella, has exceeded the growth in manufacturing capacity and has resulted in inflated prices for that variety of cheese in the short-to-intermediate term.

In 1994, there were only 55 processing plants which produced 2295 million pounds of processed cheese products.[17]

There are at least two major submarkets for processed cheese: 1) food retailing firms, and 2) food service and industrial firms. Some cheese processors have a strong position in one of these submarkets but are little involved in the other. Table 2.3 identifies the leading processors/marketers of processed cheese products and the submarkets which they serve. Comparing Tables 2.2 and 2.3, Schreiber and Borden are leading cheese processors that buy nearly all of their natural cheese needs. Kraft, Land O' Lakes, AMPI and Beatrice are leaders in both cheese manufacturing and processed cheese production. Although Kraft is a large manufacturer, it buys much more American cheese than it manufactures. Indeed, cheese used for Kraft's processed cheese business accounted for over three-fourths of the cheese purchased by Kraft in 1991. Beatrice also buys much more American cheese than it makes, whereas Land O' Lakes and AMPI manufacture nearly all of the American cheese they use.

Converters and Marketers of Natural Cheese

Bulk natural cheese, as produced in cheese manufacturing plants, must be converted into the form, size and package desired by the end-user. For example, forty pound blocks of sharp cheddar may be cut into consumer-size chunks and packaged for sale in supermarkets, or shredded and packed in 5-pound bags for use in Mexican restaurants. Mozzarella may be cut

---

[17] National Agricultural Statistical Service (NASS), USDA, "Dairy Products, 1994 Summary," Washington, D.C. May 1995.

Table 2.2. Leading Manufacturers of Natural Cheese

	Amer	Mozz	Other	Self-Mft as percent of: All Cheese Sold	Self-Mft as percent of: American Cheese Used*
Kraft General Foods, Inc.	x		x	25-50%	< 25%
Beatrice Cheese, Inc.		x	x	50-75	< 25
American Milk Producers, Inc. (c)	x			75-100	75-100
Land O' Lakes, Inc. (c)	x			75-100	75-100
Mid-America Dairymen, Inc. (c)	x	x		75-100	75-100
Wisconsin Dairies (c)	x	x		75-100	75-100

*American Cheese used to make processed cheese products or cut and wrapped into finished natural cheese.

Table 2.3. Leading Processors/Marketers of Processed Cheese Products

	Retail	Food Service/Industrial
Kraft General Foods, Inc.	x	x
Schreiber Foods, Inc.	✓	x
Land O' Lakes, Inc.	x	x
American Milk Producers, Inc.		x
Borden, Inc.	x	
Beatrice Cheese, Inc.	✓	x

Table 2.4. Leading Marketers of Natural Cheese

	Amer	Mozz	Other	Retail	Fd Serv/Indust.
Kraft General Foods, Inc.	x	✓	x	x	✓
Beatrice Cheese, Inc.	✓	x	x	✓	x
Schreiber Foods, Inc.	x			x	✓
Sargento Foods, Inc.	x	x		x	
Land O' Lakes	x			x	✓
American Milk Producers, Inc.	x			x	
Mid-America Dairymen, Inc.	x	x			x

x = Major emphasis
✓ = Significant presence
c = cooperative

Source for Tables 2.2, 2.3, and 2.4: December 1993 survey of companies by the Wisconsin Department of Agriculture, Trade and Consumer Protection.

into chunks or shredded and packed in a variety of bag sizes for sale to supermarkets, pizza chains, or frozen pizza manufacturers. Parmesan cheese is usually grated and packed in a variety of containers. In the main, natural cheese cut and wrap operations are in separate plants from either cheese manufacturing or cheese processing.

With one exception (Marathon Cheese Co.),[18] the leading converters of natural cheese are also the leading marketers of natural cheese to retail, food service and industrial customers. The leading marketers of natural cheese are shown in Table 2.4. Here we find Sargento, a company not listed on Tables 2.2 and 2.3, which has become the second most important advertised brand of cheese sold through retailers. It has been especially successful in developing consumer demand for shredded and grated cheese in closable bags. Sargento buys virtually all of its bulk cheese from other cheese manufacturers.

Some cheese marketers emphasize sales to the retail grocery industry, while others sell mostly to food service or industrial customers. And, this emphasis may vary by type of cheese. For example, Schreiber's sales of processed cheese products are particularly strong in its food service/industrial business. However, its sales of natural cheese are stronger to the retail channel.

Kraft's sales of both processed and natural cheeses are heavily weighted toward the retail channel. Beatrice, by comparison, sells a high proportion of both processed and natural cheeses to the food service channel.

---

[18] Marathon is a large company that co-packs natural cheese for other cheese companies only. Although it cuts, shreds, grates, slices and packages about 5 percent of the natural cheese that is sold as natural cheese, Marathon does not sell to retail or food service end users. Thus, it is a converter, but not a marketer of natural cheese. Marathon manufactures a tiny portion of the cheese it packs.

Importance of Different Channels

There are three major channels through which cheese is marketed:

- Retail food stores
- Food service outlets
- Industrial users

Retail food stores include supermarkets and other retail outlets at which cheese is purchased mainly for at-home consumption. Food service outlets include restaurants, institutional feeding facilities (e.g., hospitals, schools, prisons), airlines and other places that provide food for consumption away-from-home. Industrial users are mainly food manufacturers that use cheese as an ingredient in products like frozen pizza, macaroni and cheese dinners, salad dressings, frozen entrees, snack foods and other products.

Most cheese companies distinguish the retail channel from the other two and often lump the food service and industrial business together. It may not make much difference whether a company is selling 5 pound bags of shredded mozzarella to Pizza Hut (food service channel) or to Tombstone (industrial channel).

The National Dairy Board (NDB) and the Wisconsin Milk Marketing Board (WMMB) have made estimates of the percentage of cheese sold through the different channels. Because they employ different methodologies, the two organizations arrive at different figures.[19] We

---

[19] The NDB relies on MRCA panel data for information on consumer purchases of cheese for at-home consumption. The NDB does a survey of food service establishments to estimate cheese usage in that channel. The industrial channel is then estimated as the residual: commercial disappearance minus retail sales and food service usage. For 1992, the NDB estimated 34 percent of all cheese was sold retail, 38 percent was used in food service, and 28 percent went to industrial users.

WMMB recently updated their estimates of cheese usage by channel. WMMB

believe the WMMB figures are more carefully developed than NDB figures. Using natural cheese equivalent pounds, WMMB estimates that in 1993, 40 percent of cheese pounds were sold retail, 44 percent were used in food service firms and 16 percent were used by other food manufacturing companies (Table 2.5).

The Group A cheeses in Table 2.5 are those cheese varieties for which production is tracked by NASS. Group B cheeses include 16 additional varieties, the most important of which are colby, monterey jack and cojack. These three American style cheeses account for about 70 percent of the Group B tonnage.[20]

The natural cheese poundage in Table 2.5 may be sold as natural cheese or be converted into processed cheese products. We estimate that in 1993, 1682 million pounds of natural cheese (mostly American) were converted into 2243 million pounds of processed cheese products. If the pounds of processed cheese are included in Table 2.5, the total pounds of cheese sold increases from 6800 to 7361 million pounds. These calculations assume that on average 0.75 lbs. of natural cheese are used to make one pound of processed cheese products. Approximately 55 percent of processed cheese products are sold through the retail channel, 36 percent to foodservice outlets and 9 percent to industrial users.[21]

---

estimates NDB figures for food service are 18 percent low. WMMB adjusts NDB data on retail sales using current estimates of cheese sales in convenience stores and club stores, and random weight cheese sales in supermarkets. Finally, WMMB has developed independent estimates of industrial cheese usage.

20 Group B also includes Asiago, Brie/Camembert, Edam/Gouda, feta, Fontina, fresh mozzarella, goat, Havarti, Hispanic, Limburger, Manchego, Mascarpone, and Pecorino.

21 Wisconsin Milk Marketing Board, "WMMB Cheese Channel Volume Segmentation Study," Madison, WI, November 1995.

Table 2.5. Estimate of Cheese Usage by Channel, 1993 (in millions of pounds, natural equivalents)

	1993 Estimated Usage (MM lbs)	Share of Total Cheese	% Share by Channel		
			Retail	Foodservice	Food Processing
Group A	5,945	87%	36-40%	42-47%	16-18%
Cheddar	2,363	35%	42-50%	32-38%	17-19%
Mozzarella	1,983	29%	14-16%	66-70%	16-18%
Cream	540	8%	50-58%	16-18%	28-30%
Swiss	309	5%	42-52%	38-46%	10-12%
Ricotta	234	3%	49-55%	22-30%	21-23%
Provolone	177	3%	36-42%	56-62%	1-3%
Parmesan	130	2%	54-58%	20-27%	19-22%
Muenster	123	2%	57-61%	36-46%	Min
Blue	39	11%	15-25%	52-62%	20-26%
Romano	34	1%	24-36%	35-47%	26-32%
Brick	13	0%	77-92%	8-23%	Min
Group B	810-830	12%	61-65%	34-38%	1-2%
Group C	30-40	1%	91-94%	3-12%	Min
TOTAL	6,800	100%	40%	44%	16%

Note: Bakers cheese is included with cream cheese.
Sources: Wisconsin Milk Marketing Board estimate based upon *Dairy Products Annual*, USDA and Technomic, Inc.; percent share by channel based upon manufacturer input and secondary data sources.

Market Share and Concentration Figures

The Bureau of Census is the most widely used source of industry concentration figures for U.S. food manufacturing industries. However, these figures are available only every five years with substantial delays, and frequently have other limitations for studying competition. Census figures do have the advantage of providing a time series estimated with a fairly consistent methodology over time. Census defines the following four cheese product classes:

Census cheese product classes:	Value of Shipments	
SIC	1987	1992
20223 Natural cheese, except cottage cheese	$6,414.5	$9906.9
20224 Process cheese and related product	3,502.0	5016.1
20225 Cheese substitutes	294.9	313.9
20220 Cheese, natural and processed, n.s.k. (not specified by kind)	564.3	438.8

For our purposes, SIC 20223 and 20224 are of primary interest. The product class four-firm concentration ratios for 1972-1987 were as follows:

	Natural Cheese (SIC 20223)	Processed Cheese (SIC 20224)	Natural & Processed (4 Prod. Classes Comb.)
1972	36%	60%	40%
1977	32	59	38
1982	32	64	35
1987	35	71	41

Concentration figures from the 1992 Census of Manufactures are available at the 4 digit level only (SIC 2022). The four largest cheese manufacturers and processors accounted for 42 percent of industry value of shipments. By comparison, the 4 digit four-firm concentration figure in 1987 was 43 and in 1982 was 34.

Based upon the above figures, concentration in natural cheese manufacturing is low and shows no clear trend; concentration in cheese processing is high and increasing. The most relevant concentration measure is for all natural and processed cheese combined; here concentration declined from 1972 to 1982, increased sharply between 1982 and 1987, and reached a plateau from 1987 to 1992.

An alternative source of data is NASS, the National Agricultural Statistics Service of the USDA. NASS routinely collects data from cheese manufacturing and cheese processing plants on the *pounds* of various types of cheese produced. NASS does not collect value of shipment data, however. Nor does it estimate market shares based upon tonnage data. Census data on value of shipments are more reliable than its data on tonnage, part of which is imputed. When NASS and Census tonnage figures are compared, there are significant differences (see Appendix 2a). We believe NASS tonnage figures are more accurate than those from Census and rely on NASS figures in our estimates of quantity market shares.

As part of this study, we obtained data from 16 of the leading cheese companies on the pounds of cheese manufactured, purchased, processed and sold. The most complete data set is for 1992. Using NASS data as the denominator, we estimate the following *tonnage* share of the market for the four leading firms:

	1992 CR4
Natural Cheese Manufacturing	29%
Processed Cheese Production/Marketing	69
Natural Cheese Marketers	25
Marketers of Processed & Natural Cheese	38

These figures understate the concentration of sales as measured by value since leading cheese marketers with strong brands like Kraft, Sargento and Borden receive higher prices per

pound than firms selling primarily private label brands and cheese for foodservice. It is no surprise that Census concentration figures based on value of shipments are somewhat higher than our figures based on tonnage. Concentration of sales measured in value terms is usually a better indicator of market power than concentration of tonnage.

It would be helpful to have similar market share estimates for the major channels, especially retail and food service/industrial. Unfortunately, no market share data are available for the latter. Market share information for retail cheese sales are available from sources such as SAMI and Info Scan. These data are summarized in the following section.

Retail Cheese Sales

Approximately 40 percent of U.S. cheese is sold through retail outlets, mostly grocery supermarkets. For cheese sales through supermarkets, relatively detailed information on market shares is available from private market research companies. I.R.I. (Information Resources, Inc.) collects scanner data from a sample of supermarkets and projects national market shares (sales and volume shares) based upon their sample. In this section, we provide I.R.I. Infoscan data on retail cheese sales for 1992.[22]

Table 2.6 provides a breakdown of supermarket cheese sales by nine categories. Nearly three-fourths of supermarket cheese sales falls into three categories: American Processed Slices and Loafs, Natural (not shredded) and Natural Shredded.

Table 2.7 provides market share figures for several of the leading cheese companies for

---

[22] These data are from Andrew W. Franklin and Ronald W. Cotterill, Pricing and Market Strategies in the National Branded Cheese Industry, Food Marketing Policy Center, Research Report No. 26, September 1994, University of Connecticut, Department of Agricultural and Resource Economics.

Table 2.6 Supermarket Sales by Type of Cheese, U.S., 1992

	Dollar Sales (Million $)	$ Share (Percent)	Volume (Million lbs.)	Volume Share (Percent)
Processed Cheese & Cheese Food:				
American Processed Slices & Loafs	$1563.1	29.1%	568.40	31.7%
Spreads and Balls	415.2	7.7	125.35	7.0
Natural Cheese:				
Natural (not shredded)	1497.0	27.9	431.24	24.1
Natural Shredded	829.1	15.5	227.41	12.7
Cream Cheese	598.0	11.1	254.17	14.2
Ricotta	161.0	3.0	93.65	5.2
All Other:	300.1	5.6	90.87	5.1
TOTAL	$5363.5	99.9%	1791.09	100.0%

Source: I.R.I. Infoscan data, Franklin and Cotterill, *op. cit.*, Food Marketing Policy Center, University of Connecticut.

Table 2.7. Dollar Market Shares of Leading Cheese Brands and Companies, U.S. Supermarket Cheese Sales, 1992

Type of Cheese	Kraft	ConAgra (Beatrice)	Sargento	Sorrento	Borden	RJR	Land O' Lakes	Fromageries	Other Brands	Private Label
Amer. Proc. Slices/Loafs	59.4%				8.0%		1.1%		8.1%	23.4%
Spreads/Balls	45.2					12.9%		10.8	17.8	13.3
Natural (not shredded)	30.7	2.5%		4.2%			2.0		31.1	29.5
Natural Shredded	25.4	2.2	26.0%	3.6			0.9		7.0	34.9
Cream Cheese	68.0								9.7	22.3

Source: I.R.I. Infoscan data, Franklin and Cotterill, *op. cit.*, Food Marketing Policy Center, University of Connecticut.

five categories of cheese. Companies are credited only with brand sales that can be traced to that company. Thus, sales of the County Line brand are credited to ConAgra, which owns Beatrice Cheese, Inc. Private label cheese supplied by ConAgra is not identified by these data, however. Thus, the market shares in this table understate these companies' actual shares.

Kraft is the leading brand marketer in four of the five categories--usually by a wide margin. Only in Natural Shredded cheese does Kraft yield first place to Sargento. Otherwise, Kraft is clearly the dominant brand.

Private label cheese sales account for shares ranging from 13 percent of Spreads and Balls to 35 percent of Natural Shredded. Since private label brands are undifferentiated products and several companies compete to supply private label cheese to supermarkets, we expect private label cheese to be priced more competitively than branded cheeses, which often carry a substantial price premium. For example, in 1992 the average retail price for Kraft's Philadelphia Cream Cheese brand was $2.46 per pound, while that of private label cream cheese was $1.73 per pound, a 42 percent difference. In natural shredded cheese, the retail price of Sargento brand averaged $4.40 per pound, compared to $3.07 per pound for private label, constituting a 43 percent premium for Sargento. It is important to recognize that some difference in quality and packaging may account for at least some of these price differences. In addition, these are retail price differences, not the prices realized by cheese converters/marketers. However, other data obtained from the leading cheese marketers indicates that most of the retail price differences reflect disparities in the prices and margins realized by cheese marketers. Leading brands do realize huge premiums over similar private labels.

Vertical Linkages in Cheese Subsector

As shown in previous sections, there is considerable vertical integration of the stages shown in Figure 2.11. Most of the leading manufacturers of natural cheese are also large converters and marketers of cheese. A few of the leading converters-marketers do little if any cheese manufacturing (Schreiber, Borden, Sargento). Among firms smaller than those listed in Tables 2.2, 2.3, and 2.4, there is less vertical integration and more specialization, except for small specialty cheese companies that are totally integrated from manufacturing to distribution.

Although Associated Milk Producers, Inc. (AMPI), Land O' Lakes (LOL) and Mid-America Dairymen, Inc. (Mid-Am)--the three largest dairy cooperatives--perform some conversion and marketing of cheese, they are all major sellers of bulk cheese. Sales of bulk cheese are almost always formula-priced off the NCE. Based upon what we learned in our interviews with cheese companies, roughly 5 to 10 percent of bulk cheese is sold on an uncommitted, negotiated price basis; 90 to 95 percent is sold on a committed basis (oral or written contract) in which the cheese is formula-priced. In some instances, cheese prices are formula-priced based upon the M-W or BFP milk price. These arrangements tend to be with large retail, foodservice or industrial customers and reflect cost-based rather than value-based formulas. Cost-based formulas, however, represent only a small portion of the 90 to 95 percent of bulk cheese sold on a committed basis. The vast majority of the formulas are tied to prices established on the National Cheese Exchange, where less than 0.5 percent of total cheese manufactured was sold during 1988-1993.

Some types of cheese have not historically been formula-priced. This is true for cream, Romano and Parmesan, all of which are sold on list prices. This may be because the Kraft brand

dominates these cheese products and likely provides a price umbrella for private label and lesser known brands.

Most cheese marketers do most of the cheese conversion themselves and sell finished products to retail, food service or industrial accounts. Branded processed and natural cheese sold to retail accounts is generally sold on a list-price basis. Private label cheeses sold to retail accounts and all cheese sold to food service and industrial accounts tend to be "priced off" the NCE.

H. Characteristics of Major Firms in Cheese Subsector

Of the major firms listed on Tables 2.2, 2.3, and 2.4, all handled at least 100 million pounds of cheese in 1992. Some of these firms are primarily manufacturers of cheese, others are primarily converters/marketers, and a few are integrated manufacturers-converters-marketers. We classify the firms as follows:

1) Primarily Manufacturers of Cheese: Sell mostly bulk cheese; manufacture nearly all cheese sold.
   - Associated Milk Producers, Inc. (AMPI)
   - Wisconsin Dairies (now Foremost Dairies)

2) Primarily Converters-Marketers: Buy nearly all bulk cheese used
   - Borden, Inc.
   - Sargento Foods, Inc.
   - Schreiber Foods, Inc.

3) Integrated Manufacturer-Converter-Marketer: Manufacture at least one-third of cheese marketed; convert and market a significant portion of all cheese sold.

- Beatrice Cheese, Inc. (owned by ConAgra, Inc.)
- Kraft General Foods, Inc. (owned by Philip Morris Companies, Inc.)
- Land O' Lakes, Inc.
- Mid-America Dairymen, Inc.

The economic fortunes of all these companies are significantly influenced by NCE prices. Just how that influence occurs depends upon the company's business, and particularly on the extent to which their buying prices and their selling prices are tied to the NCE price. We will examine this in more depth in Chapter 4.

Role of Cooperatives

Agricultural cooperatives have been important factors in dairy marketing for decades. In 1992, cooperatives handled over 80 percent of all milk produced by farmers in the U.S. The Agricultural Cooperative Service (ACS) estimates that in 1992, cooperatives held the following shares of dairy product manufacturing:[23]

Butter production--65 percent

Dry milk products--81 percent

Natural cheese production--43 percent

Pkg fluid milk products--16 percent

Ice cream--10 percent

Cottage cheese--13 percent

Data submitted by 10 large cooperatives as part of this study indicates that 10

---

[23] Charles K. Ling and Carolyn B. Liebrand, "Marketing Operations of Dairy Cooperatives," USDA, ACS Res. Rept. 133, April 1994.

cooperatives accounted for about 33 percent of natural cheese manufactured in 1992. ACS estimated the top 11 cooperatives accounted for 38 percent of cheese sales in 1992; however, 3 percent of this was processed cheese sales.

Whereas ACS estimated that cooperatives accounted for 43 percent of all natural cheese production in 1992, Kraft estimated that cooperatives manufactured 65 percent of all cheese in 1988. [24] We do not know the reason for this large difference.

Cooperatives are more important at the manufacturing stage than at the converting stage. Associated Milk Producers, Inc. (AMPI), Mid-America Dairymen, Inc. (Mid-Am), Land O' Lakes (LOL), Wisconsin Dairies, Alto Creamery and several smaller cooperatives are major suppliers of bulk cheese to cheese converters/marketers.

---

[24] Kraft General Foods, Inc., *Cheese Procurement Strategy*, Operations, December 6, 1989, KGF 2948, 2975.

Appendix 2.A.
Comparison of NASS and Census Data on Tonnage of Cheese Produced

Cheese quantity figures from Census and NASS are as follows for 1982, 1987 and 1992:

	1982		1987		1992	
	(Millions of Pounds)					
	Census	NASS	Census	NASS	Census	NASS
Natural Cheese Production	3685.2	4541.7 (+857)	4801.6	5344.4 (+542.)	6830.9	6488.3 (-342.6)
Processed Cheese	2030.0	1723.6 (-306)	2563.7	1961.7 (-602)	3364.5	2202.7 (-1161.8)
Natural and Proc. Cheese, n.s.k.	274.6	---	418.0	---	272.3	---
TOTAL	5989.8	6265.3 (+275.5)	7783.3	7306.1 (-477.2)	10467.7	8691.0 -1776.7

In both 1982 and 1987, Census figures for pounds of natural cheese produced were considerably under NASS. For 1992, however, Census pounds of natural cheese produced were 343 million greater than NASS. Census poundage for processed cheese products was greater than NASS in all three years. Since Census has an n.s.k. (not specified by kind) product class and NASS does not, one might expect Census figures for natural and processed cheese production to be somewhat lower than NASS.

Several factors lead us to believe NASS figures are more accurate. Whereas Census relies on a mail questionnaire every five years to collect data, NASS collects data from each plant every month. It would be easy for some natural cheese to be misclassified by Census as processed cheese; some cheese manufacturers refer to barrel cheese headed for processing as "process cheese." This may partly explain the 30 percent increase in processed cheese tonnage

from 1987 to 1992 shown by Census compared to a more plausible 12 percent increase shown by NASS.

Another source of error is the way natural cheese "cut and wrap" operations are handled. NASS collects no data from these operations. Census includes the data from these operations as part of 20223--natural cheese manufacturing. In the rare case in which cut and wrap operations are in the same plant that manufactures bulk cheese, there would be no double counting. In the typical case in which cut and wrap operations are in separate plants, Census procedures would result in double counting of natural cheese tonnage. This may explain, at least for 1992, the substantially higher tonnage reported by Census for all categories. For natural and processed cheese combined, Census quantity figures are 20 percent greater than NASS in 1992. We believe the NASS figures are much more reasonable than Census.

Appendix Table 2.1. Cheese Imports and Exports as Percent of Total Cheese Production, 1980-1995

Year	Imports			Exports			Total U.S. Production	Percent of Total U.S. Production	
	American	Other	Total	American	Other	Total		Imports	Exports
	(Million Pounds)							Percent	
1980	18	213	231	5	8	13	3984.266	5.80	0.33
1981	20	228	248	19	8	27	4277.561	5.80	0.63
1982	18	251	269	37	26	63	4541.669	5.92	1.39
1983	22	265	287	42	10	52	4819.471	5.96	1.08
1984	24	282	306	59	8	67	4673.993	6.55	1.43
1985	20	283	303	70	16	86	5080.942	5.96	1.69
1986	23	272	295	49	8	57	5209.252	5.66	1.09
1987	15	250	265	35	8	43	5344.364	4.96	0.80
1988	18	234	252	25	9	34	5571.973	4.52	0.61
1989	20	256	276	6	15	21	5615.372	4.92	0.37
1990	21	277	298	6	20	26	6059.436	4.91	0.45
1991	21	276	297	10	17	27	6054.855	4.91	0.43
1992	18	267	285	16	24	40	6488.291	4.39	0.49
1993	20	300	320	8	33	41	6528.172	4.92	0.63
1994	17	315	332	11	44	55	6730.000	4.93	0.82
1995[1]	20	317	337	26	46	72	6914.000	4.87	1.04

Source: Dairy Situation and Outlook Yearbooks, ERS, USDA
[1]1995 figures are preliminary.

Appendix Table 2.2. Total Cheese Production by State: 1940, 1950, 1960, 1980 and 1994

(Thousand pounds)

State	1940	1950	1960	1970	1980	1994
CA	16019	10136	18259	17460	181463	926283
ID	13256	20895	36733	58141	109351	264602
IL	47805	80556	78505	86186	98500	102246
IA	4024	11312	42885	103516	204577	268828
MN	16272	52329	72569	161539	512361	658036
MO	19677	63767	93591	98562	100796	198540
NY	59918	87582	118541	158317	319579	559636
OH	21425	45773	37183	43525	95166	102655
OR	21488	24890	20612	NA	34683	45978
PA	11072	12437	11165	24515	101262	348285
SD	982	1664	10748	NA	78836	148484
VT	1945	5109	9770	32730	79836	122872
WI	406903	557951	641119	947591	1484251	2017946
Sub-total	640786	974401	1191680	1732082	3400661	5764391
Total U.S.	785737	1192557	1477920	2203756	3983129	6730067

Percent of Total U.S. Production

CA	2.04%	0.85%	1.24%	0.79%	4.56%	13.76%
ID	1.69%	1.75%	2.49%	2.64%	2.75%	3.93%
IL	6.08%	6.75%	5.31%	3.91%	2.47%	1.52%
IA	0.51%	0.95%	2.90%	4.70%	5.14%	3.99%
MN	2.07%	4.39%	4.91%	7.33%	12.86%	9.78%
MO	2.50%	5.35%	6.33%	4.47%	2.53%	2.95%
NY	7.63%	7.34%	8.02%	7.18%	8.02%	8.32%
OH	2.73%	3.84%	2.52%	1.98%	2.39%	1.53%
OR	2.73%	2.09%	1.39%	NA	0.87%	0.68%
PA	1.41%	1.04%	0.76%	1.11%	2.54%	5.18%
SD	0.12%	0.14%	0.73%	NA	1.98%	2.21%
VT	0.25%	0.43%	0.66%	1.49%	2.00%	1.83%
WI	51.79%	46.79%	43.38%	43.00%	37.26%	29.98%
Sub-total	81.55%	81.71%	80.63%	78.60%	85.38%	85.65%
Total U.S.	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Source: National Agricultural Statistical Service, *Dairy Products Annual*, various years.
Note: NA indicates no figure was reported for that state by NASS.

Chapter 3--Origins and Nature of the National Cheese Exchange

This chapter provides a brief history of the Exchange, describes salient features of its current organization, identifies the regulatory authorities with jurisdiction over the Exchange, reviews the potential problems of thinly traded markets, and examines certain unique characteristics of the Exchange, especially the small volume of cheese traded and the concentration of trading activity among a few traders.

A. History of NCE

The nation's first cheese factory was started by five Wisconsin farmers in 1841.[1] In succeeding decades numerous cheese factories were established, especially in New York and Wisconsin. The Census Bureau reported that in 1870 there were 1,313 cheese factories in the United States. Only 54 (4.1 percent) of these were located in Wisconsin (Appendix Table 3.2). Fully 62 percent of all U.S. cheese plants were located in New York and another 15 percent in Ohio. The number of cheese factories grew in succeeding decades, reaching a peak around the turn of the century. In 1920 the Census Bureau reported 3,530 factories in the U.S. with 2,323 (64 percent) located in Wisconsin; these plants made 65 percent of all cheese in the U.S. In contrast, New York and Ohio had only 17 percent of all cheese plants and 19 percent of all cheese production. Thereafter the number of plants in the U.S. declined steadily until there were only 418 cheese companies in the nation by 1992, and only 216 companies had annual sales over $100,000 in 1987 (Appendix Table 3.1).

---

1 For the number of cheese factories and companies over time, see Appendix Tables 3.1 and 3.2.

Initially, cheese was bought directly from factories by dealers who assembled cheese from several factories. Subsequently, cheese factories established dairy boards that served as meeting places for factory representatives and cheese buyers. By 1879 there were seven dairy boards in Wisconsin.[2] Dairy boards also operated in New York and other states.

To encourage competitive bidding among dealers a Call Board system developed whereby offers from cheese factories and bids from interested buyers were recorded on a blackboard, with sales going to the highest bidder. By 1890 there were 18 Call Boards in Wisconsin.[3]

The Boards typically served quite small regions, often individual counties. In 1909 the Dairy Board located in Plymouth, Wisconsin, changed its rules to permit any factory in Wisconsin to sell on the board, an important step in making it the largest board in the state. In 1913 it was renamed the Plymouth Central Call Board of Trade. At the time there were six other call boards in the state. In 1918 the Central Call Board of Trade was reorganized to give full membership only to dealers and was incorporated as the Wisconsin Cheese Exchange.[4]

In response to producer dissatisfaction with the Exchange, the Farmer's Call Board was established in Plymouth in 1921. Cheese factories and cheese producer associations could become members, but only dealers were given buying privileges. The Farmer's Call Board,

---

2 Henry C. Taylor, W.A. Schoenfeld, and G.S. Wehrwein, *The Marketing of Wisconsin Cheese*, Bulletin No. 231, 1913, p. 12.

3 *Ibid.*

4 Arthur H. Miller, *Pricing American Cheese at Wisconsin Factories*, University of Wisconsin-Madison, Res. Bul. 163, August 1949, p. 10.

which met shortly after the weekly sessions of the Wisconsin Cheese Exchange, came under increasing criticism (see below) and discontinued operations in 1941. That left only the Wisconsin Cheese Exchange, which in 1956 was moved to Green Bay, Wisconsin, where it remains at present. In 1974 its name was changed to the National Cheese Exchange (NCE).

Periodic criticisms of the pricing practices of the dairy boards and their successors have resulted in a number of investigations by state and federal authorities. In 1911 dealers allegedly fixed prices and allocated customers among themselves at secret meetings held prior to call board sessions.[5] Cheese producers responded to the situation in 1913 by organizing the Sheboygan County Cheese Producers' Federation. Farmers hoped that by cooperative action they could develop their own marketing system and ultimately eliminate the Board.[6]

An investigation by the State of Wisconsin during 1931-32 concluded that the Farmers Call Board was a sham designed to placate farmers' dissatisfaction, but changed nothing. The Deputy Attorney General of Wisconsin, in summarizing evidence taken before the Wisconsin Commissioner of Agriculture, drew the following conclusion:

> The dealers and not the farmers conceived the idea of the organization of the board in the first place, and certain farmers lent their names then and since. In fact, the Farmers Call Board was organized to meet the growing dissatisfaction by producers with prices fixed by the dealers between themselves in their own organization, the Plymouth Cheese Exchange, and to make it appear that the farmers have set up their own market to which the dealers had to go to get cheese. The fraud of the name of the board is aggravated by its pretended farmer operation and control and by the insistence of the dealers that it is in fact a farmers' organization, and the persistent representation and advertisement of it as such.[7]

---

5 Federal Trade Commission, *Cooperative Marketing*, May 2, 1928, p. 10.

6 *Id.*, pp. 10-11.

7 *Report of the Federal Trade Commission on the Sale and Distribution of Milk and Milk Products*, Chicago Sales Area, 1936, p. 97.

The Deputy Attorney General went on to say that

> Whether competition really exists in the buying on the board is better judged by the results than the assertions of interested parties. The prices follow quite faithfully the base price fixed between the dealers on their own exchange each week, just an hour earlier.[8]

The fact that the Farmers Call Board followed "faithfully" the prices set by the Wisconsin Cheese Exchange was important because of the way in which Exchange prices were set at the time. The pricing process was explained as follows by Mr. J.L. Kraft, President of the Kraft-Phoenix Cheese Corporation:

> For the past few years a fair price has been established on the Plymouth Call Board in Wisconsin, which, to a very large extent, has been the ruling price throughout the country, or, in other words, the basic price from which to figure. This price has not been established by agreement but rather by sort of a tacit or mutual understanding as to what a fair relationship or fair value for the product should be, based upon statistical information at hand and the law of supply and demand.[9]

These comments reflect a mind set that believed "fair" prices could best be set by "a sort of tacit or mutual understanding" among industry leaders.

Based on its study of cheese pricing on the Wisconsin Cheese Exchange and Farmers' Call Board, the Federal Trade Commission concluded, in part:

> ...[T]he transactions on these boards are relatively small and seemingly without any real competition....[T]he real purpose of these boards appears to be to establish the price to be paid by dealers during the ensuing week, such action being taken under a prearranged program....[T]he absence of competition upon [the Wisconsin Cheese Exchange] has a significant influence upon the prices received by milk producers.[10]

---

8 *Id.*

9 *Id.*, pp. 98-99.

10 *Report of the Federal Trade Commission on Agricultural Income Inquiry, Part 1, Principal Farm Products*, 1938, p. 46.

In 1939, Professor William H. Nicholls, the leading economic authority of that day on competitive conduct in agricultural markets, including the cheese market, observed:

> The real point at hand is the fact that only the buyer of cheese--the large-scale distributor--is party to the decision as to what the "fair" price should be. The "law of supply and demand" is doubtless important in the decision of the large cheese distributors as to the "fair" price of cheese, but there seems to be *prima facia* reason to raise the question whether that famous economic law as interpreted by those distributors is the most desirable from the social viewpoint, either for the milk producer or the consumer.[11]

Nicholls concluded as follows concerning the state of competition in cheese pricing as of 1939:

> Bulk cheese prices continue to be established on the two Plymouth exchanges, in spite of repeated recognition of the obvious lack of competition on the boards....
>
> The chief competition the cheese industry has to meet is not within the industry itself. This competition is with the butter and condensed milk industries for the use of the milk supply. This competition still leaves a significant range within which monopolistic elements in the cheese industry can work against the farmer who sells his milk to the cross-roads cheese factory.[12]

Following its extensive investigations of cheese pricing during the 1930s, the Wisconsin Department of Agriculture brought these matters to the attention of the federal Antitrust Division and assisted it during 1940-1942 in the investigation and prosecution of alleged price fixing of cheese prices paid to producers.[13] These cases charged price fixing of Swiss, American, and brick cheese.[14] The actions culminated in a consent decree and $30,000 fine in the Swiss case

---

[11] William H. Nicholls, *Post-War Developments in the Marketing of Cheese*, Iowa State College, Research Bulletin 261, June 1939, p. 106.

[12] Nicholls, *op. cit.*, pp. 118-119.

[13] Ralph J. Geffen, "Antitrust Law in Wisconsin," *Wisconsin Law Review*, July 1951, p. 681.

[14] *United States v. Kraft Cheese Co.*, Criminal Indictment No. 11814, Fed. D.C. of W. Wis. (1940); *United States v. Wis. Cheese Exchange*, Criminal Indictment No. 33198, Fed.

and acquittal in the brick case.[15] After long delays, the American indictment was dismissed in 1950.[16]

On November 20, 1987, the Assembly of the State of Wisconsin enacted a Resolution requesting an investigation of recent price declines on the National Cheese Exchange and a prosecution if any violation of law were found to have occurred.[17] In response to this resolution, the Wisconsin Attorney General initiated a "preliminary investigation to determine whether there was any evidence of price-fixing or collusion or other violations of law on the NCE."[18] The "preliminary investigation," conducted by one attorney and one investigator over a four-month period, involved interviews with the president of the NCE, examination of NCE trading minutes of the board and other NCE documents, and interviews with personnel of 21 companies represented on the NCE, as well as interviews with other interested parties. No internal documents were subpoenaed.

The investigation yielded no evidence of price fixing. A number of parties interviewed indicated that the price declines in 1987 reflected general conditions of supply and demand. The attorney-investigator concluded:

D.C. of N. Ill. (1942); *United States v. Nat'l Cheese Institute*, Criminal Indictment No. 33197, Fed. D.C. of N. Ill. (1942).

15 *United States v. Wisconsin Cheese Exchange*, reported in The Federal Anti-trust Laws with Summary of Cases Instituted by the United States No. 694 (CCH-1947).

16 Geffen, *op. cit.*, p. 681

17 The State of Wisconsin, 1987 Assembly Resolution 6, "Relating to an Investigation of the National Cheese Exchange," November 20, 1987.

18 Matthew J. Frank, Assistant Attorney General to Kevin J. O'Connor, Assistant Attorney General, Unit Head, Consumer Protection and Antitrust Unit, Office of the Attorney General, April 11, 1988.

> In the absence of evidence of price-fixing agreements, and in the presence of reasonable explanations for the price declines because of general market conditions in the industry, the Department of Justice can take no further action at this time.[19]

B. Current Organization of NCE

The National Cheese Exchange articles of incorporation state that the purpose of the Exchange

> ...shall be to provide and maintain an exchange for the purchase and sale of cheese by its members and generally to do any lawful act which may be incident to the promotion of said purpose.

The affairs of the Exchange are managed by a Board of Directors, consisting of six members elected by NCE members, and the President, who is appointed by the Board.[20]

The By-Laws of the NCE provide that anyone may become a member by satisfying "the members that he or it is suitable to assume responsibilities and privileges of membership." In recent years, there have been 35-40 members, all of whom were cheese manufacturers, converters, marketers, brokers or customers. Members represent about 90 percent of the cheese industry. Each member may designate up to five persons as traders who can negotiate on the Exchange. The Board may suspend a member from the privilege of trading on the Exchange for up to six months for any conduct considered detrimental to the interests or welfare of the Exchange.[21]

---

[19] *Ibid.*

[20] This and the following are based on the National Cheese Exchange, Inc., Articles of Incorporation, By-Laws, and Rules Regulating Trading, April 6, 1990.

[21] See Chapter 4, text at notes 96-109, for an example of suspension for alleged misconduct in trading.

The NCE typically trades each Friday from 10:00 a.m. to 10:30 a.m., but the trading time may be extended if the presiding officer (the president or his designee) observes a continuing interest in trading. Only cheddar cheese in 40-pound blocks and 500-pound barrels in 38,000-42,000 pound carlots was traded until 1994, when 640-pound blocks were added for trade. All bids and offers for these types of cheese are subject to price adjustments for moisture content as provided by the rules. Unless a bid or offer specifies otherwise, the styles traded shall not be less than four days or more than one month of age on the date of sale. Traders may specify older cheese by stating the actual age in terms of months.

Barrel cheese shall meet the requirements of Wisconsin State Brand or USDA Extra Grade or better, and 40-pound block cheese shall meet the requirements of Wisconsin State Brand, USDA Grade A or better, except that moisture content shall be no less than 36.5 percent. Barrel cheese shall be white and block cheese shall be colored. Block style cheese shall be wrapped in a sealed film and packed in corrugated or solid fiberboard containers. Barrels shall be in airtight, 55-gallon steel containers or barrels which meet specifications.

No bids or offers shall disclose the state of origin, but the identity of traders making bids and offers is known. Parties represented by brokers are not disclosed. Bids and offers are stated in multiples of one-fourth of a cent per pound. When a member has an offer on the board, he cannot bid for the same kind of cheese at the same price; while he has an unsatisfied bid on board, he cannot offer the same kind of cheese at the same price.

Transactions on the NCE are FOB Green Bay, but no freight charge is made on cheese within 200 miles of Green Bay. Cheese that is located more than 200 miles from Green Bay has the freight cost to Green Bay (as specified by Exchange rules) deducted from the selling price.

Thus, all cheese is priced as though it is physically shipped to Green Bay. In reality, cheese sold on the NCE can be shipped anywhere within the continental U.S. On those transactions in which the actual freight from seller to buyer is less than the freight from seller's dock to Green Bay, buyers on the Exchange can benefit from the phantom freight charged to sellers.

C. Regulation of the NCE

Several government agencies have authority over trading activity on the National Cheese Exchange. The United States Department of Justice enforces the Sherman Act, which prohibits price fixing agreements and monopolizing conduct. The Federal Trade Commission, which enforces the Federal Trade Commission Act, can act in cases dealing with unfair methods of competition, which include price fixing agreements and monopolizing conduct. The Wisconsin Department of Justice can challenge price fixing agreements and monopolizing conduct under state or federal laws. The Wisconsin Department of Agriculture, Trade and Consumer Protection has jurisdiction over unfair competition and trade practices. Private parties may also initiate actions under the Sherman Act. The law allows a party injured by a violation of the Sherman Act to sue in Federal Court and recover treble damages plus the costs of the suit, including reasonable attorney's fees.

The NCE also became subject to the regulatory authority of the Commodity Futures Trading Commission (CFTC) in 1994 when the Commission designated the Coffee, Sugar, and Cocoa Exchange as a contract market for futures trading on cheddar cheese. The Commodity Exchange Act (CEA) gives the CFTC jurisdiction over commodity futures and options transactions. The CEA also gives the CFTC jurisdiction over the cash markets with futures contract markets. Section 6(c) of the CEA authorizes the CFTC to bring administrative action

against persons believed to be manipulating or attempting to manipulate the price of any commodity or for future delivery. Section 8 of the CEA gives the CFTC broad power to investigate the cash market in implementing and enforcing its authority. In *The Matter of Hunt et al*[22] the CFTC charged persons with manipulating cash prices in addition to futures prices.

D. The NCE is a Thin Market

The term *thin market* as used herein, refers to a market with a small volume of trading relative to the total transactions that are priced off the market.[23] As such, the term is purely descriptive, implying nothing regarding a market's pricing or operational efficiency.

Economic examination of thin markets raises two questions: (1) Why is the market thin? and (2) How well does the market perform? Causes of thin trading are easier to identify than the results. Thin centralized cash markets in many food industries have common economic roots: Industry members bypass centralized cash markets because trading there is more costly than trading directly via either spot purchases or long-term contractual arrangements. This situation has been true in cheese procurement for over 100 years. The "dairy boards" set up in the 1870s provided places for buyers and sellers to meet. But apparently after sellers and buyers had met

---

[22] *In the Matter of Hunt, et al.*, [1987-1990 Transfer Binder] Comm. Fut. L. Rep. (CCH ¶ 24.569 (CFTC Dec. 20, 1989)).

[23] This is the definition used by Raikes: "A market is thin if the reservation supply and demand values of only a small proportion of all traders are represented in the market." Ronald Raikes, "Thin Markets: Some Causes, Consequences, and Remedies," in Marvin L. Hayenga (ed.), *Pricing Problems in the Food Industry (With Emphasis on Thin Markets).*" NC Project 117, Monograph 7, Research Division, College of Agriculture and Life Sciences, University of Wisconsin, February 1979, p. 132. Dunn also uses this definition. Read J. Dunn, Jr., "Pricing Problems in the Food Industry: Research Needs," in Hayenga, *op. cit.*, p. 149. Others have defined a thin market as a market "with few transactions negotiated per time period." Hayenga, et. al., in Hayenga, (ed.), *op. cit.*, p. 11.

and developed mutually agreeable arrangements, both parties often preferred trading directly with one another using longer-term formal or informal arrangements. From the outset very little cheese was actually traded on any of the various centralized exchanges that predated the NCE.

Based on industry interviews, we believe that in recent years 90-95 percent of all bulk cheese transactions involve direct procurement using written or verbal committed supply arrangements, often one year in duration; another 5-10 percent involve direct spot transactions; and less than 0.5 percent of all transactions take place on the NCE. But despite the minuscule volume traded on the NCE, virtually all "committed" or contract transactions of bulk cheese use formula agreements that tie the price directly to prices developed on the NCE. Spot transactions also use the NCE as a reference price but have much greater flexibility to change the differential. For example, when NCE prices are declining, buyers may be unwilling to pay any premium over the NCE. Indeed, a negative differential does occasionally occur. The opposite is true when NCE prices are rising.

Formula pricing is heavily used in the cheese subsector, as it is in many other agricultural commodities. Formula pricing is trading on someone else's price; the price for a transaction is determined by an agreed upon formula tied to one or more indicators of value. Formula pricing arrangements that use a thin market price as the indicator of value are of particular interest since the combination gives enormous leverage to the thin market. In the case of cheese, if a firm can influence the price in a market (i.e., the NCE) that operates 30 minutes per week and trades less than one-half of 1 percent of all cheese, that firm has influenced the price of nearly all bulk cheese sold in the U.S. the following week.

Formula pricing and thin markets often go together. As firms adopt formula pricing to reduce transaction costs and price risks, the residual spot market declines in volume. Schrader and colleagues note the consequences:[24]

> The market, thinned by formula-priced transactions that are not immediately responsive to spot market prices, may be less likely to arrive at a price that approximates a competitive equilibrium. Furthermore, firms with formula-priced contracts based on a thin market price may have an incentive to attempt manipulation of the reference price quotation.[25]
>
> The combination of a thin market and very few participants on one side of the market may accent price volatility and inequity.[26]

Whenever so much business is transacted with reference to prices established by so few, questions persist concerning the quality of the price discovery process. Economists have identified various dimensions of performance deserving attention in examining thin markets, including the following:

> (1) the possible manipulation of thinly-traded markets by dominant firms or concentrated oligopolies, resulting in short or long term monopoly profits and discovered prices that do not accurately reflect industry supply and demand.
>
> (2) possible nonrepresentative or biased price signals, not because of intentional manipulation by participants, but because the buyer demand and seller supply represented in thinly-traded markets does not accurately reflect industry supply and demand. The results are prices that provide inaccurate resource allocation signals to the vertically linked markets in an industry or subsector.
>
> (3) the possible perception of increased risk due to more volatile prices, illiquid markets, and less secure input supply and output markets. Thinly traded markets may be less

---

[24] Lee Schrader, et al., "Pricing and Vertical Coordination in the Food System," Chapter 2 in Bruce W. Marion (ed.), *The Organization and Performance of the U.S. Food System*, Lexington Books, 1986.

[25] *Id.*, p. 74.

[26] *Id.*, p. 101.

> predictable and may be less able to deal with unexpected shifts in supply or demand than "fat" markets.[27]

Thinly traded markets are thought to be particularly vulnerable to the third problem when most of the supply in the industry moves between firms via contracts or committed arrangements. The logic here is that buyers and sellers are locked into committed supply arrangements in which quantities and prices are largely specified. Shifts in supply or demand, therefore, have an inordinate impact on the residual market. Thinly traded markets are often part of the residual market, which is the case in the cheese industry. The uncommitted supply represents 5-10 percent of total cheese produced; the NCE represents less than one-tenth of that residual market.

Thin trading volume does not necessarily imply poor performance if there is sufficient volume "waiting in the wings" and if no firm is large enough to influence or manipulate price to the firm's advantage.[28] As some analysts have observed, a "thin" market need not perform poorly:

> There may be sufficient volume "waiting in the wings" that could be quickly triggered into the price determination process, suppressing price gyrations or price inequities that otherwise might be "too large." Or, no firm may be large enough in absolute size that relatively small shifts in its inventory or its buy and sell policy could strongly influence or "manipulate" negotiated price levels and the returns from related formula price contracts to the firm's advantage.[29]

---

[27] Marvin L. Hayenga, "Summary" in Hayenga (ed.) *op. cit.*, p. 12.

[28] *Id.*, pp. 11-12.

[29] Hayenga, et. al., *op. cit.*, pp. 11-12.

The critical factual question is whether there exists a sufficient supply of potential traders "waiting in the wings" that will be "triggered into the price determination process" to prevent price departures from competitive levels. As Raikes explains,

> [T]here may be no reason to expect that, in general, the reservation values on the demand and supply sides in the central market will be representative of aggregate market demand and supply schedules, or to expect that the price distribution from the residual central market would be the same as the price distribution that would result if suppliers and demanders participated in price determination.[30]

The central market may not be representative of aggregate market conditions for various reasons. Few firms trade in the central market, but virtually all firms use the prices generated there in formula pricing their spot or contract transactions. Even if a non-trading user believes that the central market price is inaccurate, he may continue to use it because the existing alternatives are more costly. As Raikes explains, "Firms legitimately pursue their self interest...by using prices made by other firms to reduce spot transaction costs."[31]

Another reason central markets may not yield competitive results is that some traders enjoy strategic advantages over other traders. For example, if the largest trader(s) is perceived to have superior knowledge of overall supply and demand conditions, other traders and non-traders may be disinclined to challenge its judgment. If these advantages apply to potential as well as actual traders, they prevent the potential traders from contesting price decisions made in the central market.[32]

---

[30] Raikes, *op. cit.*, p. 132.

[31] *Id.*

[32] William Baumol, John Panzar and R. Willig, *Contestable Markets and the Theory of Industry Structure*, Harcourt Brace Jovanovich, 1982.

The above conditions imply that there are differences in the competitive market structure of a thin central market and the aggregate market of a product. These differences have special relevance for the NCE where trading is far more concentrated than in other markets or stages of the cheese industry.

The preceding explains why prices in a thin market like the NCE *may* not accurately reflect aggregate market conditions. A related question is whether the price established on the NCE is constrained by the alternative uses for the milk used in making cheese, especially non-fat dry milk and butter. If the milk supply curve facing the bulk cheese manufacturing industry were perfectly elastic and bulk cheese manufacturing were perfectly competitive, the prices for milk and bulk cheese, including the NCE price, would equal competitive levels. In fact, however, bulk cheese producers compete with the manufacturers of butter and non-fat dry milk powder. The upward sloping supply curve for farm-level milk plus the downward sloping derived demand for milk for products other than cheese imply an upward sloping market-equilibrium supply curve for milk to the bulk cheese industry. This, in turn, may provide the opportunity for the exercise of market power in the purchase of bulk cheese. As a result there is a range within which market power may be exercised in setting NCE prices.[33]

---

[33] In his study of cheese pricing, William H. Nicholls concluded that cheese prices could depart from competitive levels:

> The chief competition the cheese industry has to meet is not within the industry itself. This competition is with the butter and condensed milk industries for the use of the milk supply. *This competition still leaves a significant range within which monopolistic elements in the cheese industry can work against the farmer who sells his milk to the cross-roads cheese factory.*

William H. Nicholls, *Post-War Developments in the Marketing of Cheese*, Iowa State College, Research Bulletin 261, June 1939, p. 106. (Emphasis added.)

Those holding a sanguine view of thin markets believe they do not pose significant manipulation problems. Most economists, however, seem to agree with Caves who urges caution in summarily dismissing the likelihood of market manipulation. Market regulators agree. They are interested in thin cash and futures markets "because they are believed to be easily manipulated and susceptible to abusive treatment of customers."[34] Therefore, the Commodity Futures Trading Commission (CFTC) has been assigned authority to prevent manipulation in the cash markets of the commodities which have futures markets regulated by the CFTC.[35]

Although those studying thin markets hold various opinions regarding the quality of their performance, all agree it is not possible to judge performance of particular markets based on economic theory alone. Such a determination requires detailed analysis of the organization and conduct of particular thin markets.[36]

Previous Empirical Studies of Thin Markets

While the consequences of thin markets is largely an empirical question, there are few studies that provide useful insights, partly because of the difficulty of evaluating thin markets. Determining whether price discovery is efficient, whether prices have been manipulated or whether prices are unnecessarily volatile is very difficult. In addition, thin markets often are also concentrated markets in which one or a few buyers or sellers account for most of the trades.

---

[34] Mark J. Powers, former chief economist of the CFTC, "Thin Markets--A Regulatory Perspective," in Hayenga (ed.), *op. cit.*, p. 35.

[35] Read P. Dunn, Jr., former Commissioner, CFTC, "Pricing Problems in the Food Industry: Research Needs," in Hayenga (ed.), *op. cit.*, p. 149.

[36] R.E. Caves, "Industrial Organization and the Problem of Thin Markets," in Hayenga (ed.), *op. cit.*, p. 27.

In this situation, it is difficult to separate the effect of market thinness from the effect of market concentration.[37]

Tomek's study of the Denver terminal market for fed cattle is one of the best known studies of thin markets. Tomek found that Denver price movements were increasingly disassociated with price movements in other terminal markets (Omaha and Sioux City) as the volume of cattle on the Denver market declined in the late 1960s.[38] By 1967-68, Denver prices relative to Omaha prices had declined by about 50 cents per cwt. Unfortunately, Tomek never examined whether market power had increased in the Denver market. But, by 1967, only 27,000 head of steers were sold at the Denver market (vs. 165,000 in 1964). The Omaha terminal sold 700,000 head in 1967. As volume declines, the number of buyers also tends to fall. We suspect that the Denver example involved both market thinness (small volume) and buyer market power. The decline in steer prices was likely a consequence of both factors.

Many U.S. agricultural commodities have thin spot or negotiated markets, or have thinly reported markets. This is particularly true in commodities in which formula pricing and/or contracting is widespread. Organized markets, like the NCE, have tended to decline in importance as contracting/formula pricing has increased. Indeed, the NCE is unique as a centralized cash auction market of a manufactured food product. The only similar market with

---

[37] A review of empirical studies of auction markets as diverse as bonds, timber, oil drilling rights and construction has found a positive relationship between their performance and the number of effective competitors. R. Preston McAffee and John McMillan, "Auctions and Bidding," 25 *Journal of Economic Literature* (June 1989), 729-731. Lance Brannman, J. Douglas Klein, and Leonard W. Weiss, "The Price Effects of Increased Competition in Auction Markets," *Review of Economics and Statistics*, 1987.

[38] William Tomek, "Price Behavior on a Declining Terminal Market," *Amer. J. of Agric. Econ.*, Aug 1980, p. 434-444.

which we are familiar is the cash butter market located at the Chicago Mercantile Exchange. This market has even less trading than the NCE.[39]

Centralized markets have the virtue of providing low-cost price and quantity information that others can use to reduce their transaction costs. Developing accurate price information from decentralized direct transactions is more costly but may be less vulnerable to the price discovery and manipulation problems of thin central markets. The presence of an effective futures market may improve the price discovery process in thinly traded commodity markets.

The remainder of this chapter examines two features of the NCE that give rise to its characterization as a thin market: the volume of trading and the number and relative size of traders.

Trading Volume on NCE

In all years during 1974-1993, less than 1 percent of total cheese production was sold on the Exchange (Table 3.1). During 1988-1993, cheese traded on the Exchange never exceeded 0.4 percent and averaged 0.2 percent of total cheese manufactured in the U.S. The NCE played an especially important role in cheese pricing during the latter period because government price support programs had less influence on NCE price levels than in many earlier years.

Figure 3.1 depicts barrel prices and total barrel and block sales on the NCE over the course of each year during 1989-1993.[40] Each bar identifies the price at the end of a trading day. When trades occur the number of loads traded are shown near a bar. The wider solid bars

---

[39] See Chapter 4, note 63.

[40] For clarity of presentation no price line is shown for blocks, which generally move in unison with barrels at a few cents above barrels.

Table 3.1. Volume of Cheese Traded on the NCE, 1974-1993

Year	Carloads Sold on NCE[1]	Total Carloads Manufactured[2] American[3] Cheese	Total Carloads Manufactured[2] All[4] Cheese	NCE as a Percent of: American Cheese	NCE as a Percent of: All Cheese
1974	43	46,558	73,434	0.09%	0.06%
1975	167	41,499	70,285	0.40	0.24
1976	490	51,345	83,006	0.95	0.59
1977	553	51,179	83,963	1.08	0.66
1978	325	51,977	87,992	0.63	0.37
1979	440	54,857	92,931	0.80	0.47
1980	264	59,528	99,607	0.44	0.27
1981	39	66,203	106,939	0.06	0.04
1982	40	68,980	113,542	0.06	0.04
1983	34	73,296	120,487	0.05	0.03
1984	307	66,279	116,850	0.46	0.26
1985	144	71,381	127,024	0.20	0.11
1986	752	69,954	130,231	1.07	0.58
1987	707	67,916	133,609	1.04	0.53
1988	361	68,914	139,299	0.52	0.26
1989	118	66,814	140,384	0.18	0.08
1990	342	72,269	151,486	0.47	0.23
1991	399	69,228	151,371	0.58	0.26
1992	380	73,412	162,207	0.52	0.23
1993	596	73,120	163,204	0.82	0.37

Sources: National Cheese Exchange, Trading Activity Minutes, AMS, USDA, 1974-1993.
Dairy Products Summary, NASS, USDA 1974-1993

[1]NCE trades include carloads of barrels and blocks sold on National Cheese Exchange.
[2]American and total cheese manufactured were converted to carloads using 40,000 lbs. per carload.
[3]American includes Cheddar, Colby, granular, stirred curd, washed curd, and Monterey Jack.
[4]All cheese includes all types of cheese including cream cheese but excluding cottage cheese.

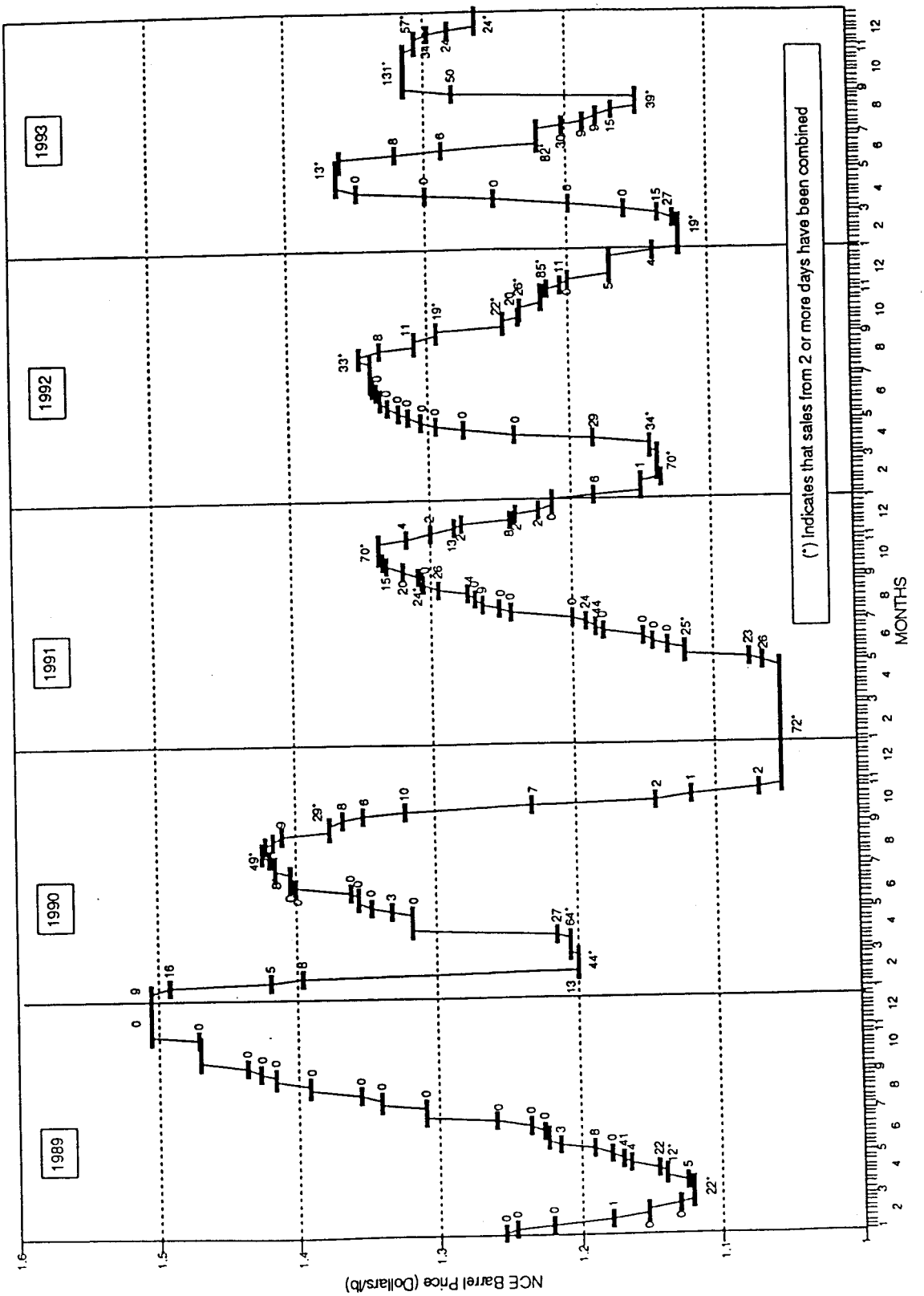


Figure 3.1
Barrel and Block Sales on NCE, 1989-93

indicate that the price remained unchanged for a number of weeks. The longest such period was November 11, 1990, to May 26, 1991, when NCE prices were below the price support level.

Most changes in price, often including very large ones, resulted from bids to buy or offers to sell that did not result in actual transactions. Frequently prices rose or fell by substantial amounts over a number of trading days without any cheese actually traded. For example, from May 12, 1989, through November 3, 1989, the price per pound for barrels rose from $1.19 to $1.505 on bids and increased bids without a single consummated transaction. Each year the largest daily price increases most often occurred with no transactions.

Table 3.2 summarizes the frequency of price changes within trading sessions (usually in 0.25 cent increments) that occurred with and without transactions. For total barrel and block activity combined, prices changed without transactions about nine times as frequently as with transactions.[41] Overall trading activity patterns are quite similar for barrels and blocks.

The following statement of a sometime buyer on the NCE illustrates the potential impact of buying even a few loads of cheese on the thinly traded NCE.

> If we had competed with [Company X] for the bid lead for barrels, (1) we may have secured 5-8 loads, but (2) the barrel market would have closed at a significantly higher level (4-6 cents).[42]

On the day referred to above, this company did make one bid and an increased bid for three loads of barrels. These bids, though not filled, increased the NCE barrel price 0.25 cents. On the other hand, the company "had secured 8-10 loads (barrels and 640's) of cheese for

---

41 The pattern was about the same for price increases and price decreases.

42 [[Source deleted in public report as not essential.]]

Table 3.2. Frequency of Price Changes Associated with Various Types of Trading Activity, 1988-1993

Number of Actions[1]

Type of Activity	1988		1989		1990		1991		1992		1993		Total 1988-1993	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Barrels and Blocks														
Price Changed with a Trade	37	6	9	1	54	4	53	7	51	6	83	7	287	5
Price Changed without a Trade	207	35	410	59	748	53	318	40	366	46	532	42	2581	46
Price Unchanged with a Trade	70	12	20	3	115	8	99	12	89	11	145	11	538	10
Price Unchanged without a Trade	281	47	260	37	490	35	334	42	288	36	509	40	2162	39
Total Actions	595	100	699	100	1407	100	804	100	794	100	1269	100	5568	100
Barrels														
Price Changed with a Trade	33	8	4	1	18	3	29	7	26	7	38	6	148	5
Price Changed without a Trade	109	27	209	49	337	64	159	36	175	45	277	41	1266	44
Price Unchanged with a Trade	69	17	19	4	45	9	62	14	37	10	78	11	310	11
Price Unchanged without a Trade	189	47	197	46	123	24	191	43	151	39	290	42	1141	40
Total Actions	400	100	429	100	523	100	441	100	389	100	683	100	2865	100
Blocks														
Price Changed with a Trade	4	2	5	2	36	4	24	7	25	6	45	8	139	5
Price Changed without a Trade	98	50	201	74	411	46	159	44	191	47	255	44	1315	49
Price Unchanged with a Trade	1	1	1	0	70	8	37	10	52	13	67	11	228	8
Price Unchanged without a Trade	92	47	63	23	367	42	143	39	137	34	219	37	1021	38
Total Actions	195	100	270	100	884	100	363	100	405	100	586	100	2703	100

Source: National Cheese Exchange, Trading Activity Minutes, AMS, USDA, 1988-1993.

[1] An action refers to bids and offers whether or not they result in a transaction.

processing...just prior to today's market."[43] Since these loads were purchased in the spot market, they did not exert an upward pressure on the market.

An even more dramatic illustration of the thinness of trading occurred when Pizza Hut attempted to sell three loads of blocks on the Exchange May 13, 1994. The block price dropped 10.5 cents per pound during the session without Pizza Hut selling a single load.[44]

An indication of the thinness of NCE trading is that even small companies may avoid selling for fear of lowering prices. The president of Edelweiss Cheese Company said he did not offer cheese on occasion because he did not want to lower the Exchange price. When he did not sell on the NCE, he sold the cheese in the spot market the following week.[45]

The preceding facts illustrate three frequent characteristics of so-called "thin" markets: (a) the small percentage of total cheese production actually traded on the Exchange, (b) price changes on the NCE most often resulting from bids to buy or offers to sell rather than from consummated transactions, and (c) the extreme sensitivity of the Exchange price to relatively small purchases or sales. We turn next to a fourth factor relevant to the competitive performance of thin markets, the concentration of transactions among relatively few traders.

Number and Relative Size of Traders

In perfectly competitive cash auction markets there are sufficient traders so that (a) each buyer and each seller has a relatively small influence, such that none, acting alone, can affect price or output; (b) buyers and sellers are well informed; and (c) there are no barriers to entry

---

43 [[Source deleted in public report as not essential]]

44 See Chapter 4, pp. 35-36.

45 Interview of Edelweiss Cheese Company by Matthew J. Frank, Assistant Attorney General, State of Wisconsin, February 9, 1988, p. 1.

facing new traders. In such a market, price is determined by impersonal market forces, not by the interests, desires or whims of individual traders. Such conditions, according to economic theory, maximize social welfare.

The competitive ideals of economic theory are seldom realized in real world markets. Close approximations exist in heavily traded securities markets and many agricultural futures markets. On the other hand, markets for most manufactured products do not meet the conditions of perfectly competitive markets. Economic theory predicts and empirical studies verify that a market's structural characteristics and the conduct of various market participants determine how well it performs.[46]

Important structural characteristics include the concentration of purchases among leading buyers and the concentration of sales among leading sellers. Also important are whether any market participants enjoy competitive strategic advantages over other traders, whether traders have equal access to market information, and whether they make price and output decisions independently of one another. As a result, it is necessary to examine the actual market conduct of leading market participants as well as the market's structure.[47] Much of the remainder of this study examines market conduct. But first we examine the concentration of trading on the NCE.

In theory, other things being the same, the intensity of competition diminishes as the concentration of trading increases. Many empirical studies have verified this theory for both

---

[46] F.M. Scherer and David Ross, *Industrial Market Structure and Economic Performance*, 1990.

[47] *Id.*

industrial and auction markets.[48] One measure of market concentration is the number of traders. Other measures are designed to capture the size distribution of traders. The most commonly used such measure is the *concentration ratio*, which measures the share of sales and purchases held by the largest participants in a market. In recent years, economists and public regulatory bodies have made increased use of the Herfindahl-Hirschman Index (HHI), which is the sum of the squares of the market participants' individual market shares.[49] The virtue of this measure is that squaring market shares gives greater weight to the market shares of the leading firms.[50]

The United States Department of Justice and the Federal Trade Commission have classified markets based on HHIs as follows:[51]

HHI below 1000:	Unconcentrated market
HHI 1000 to 1800:	Moderately concentrated market
HHI over 1800:	Highly concentrated market

---

48 Leonard Weiss (ed.), *Concentration and Price*, MIT Press,1989. This comprehensive review of the literature covers 121 studies, including such diverse American industries as airlines, beef packing, cement, banking and supermarkets, as well as several auction markets. Based on his review of these studies, Weiss concludes that the evidence "seems to give overwhelming support to the concentration-price hypothesis." *Id*, p. 268. For auction markets see McAffee and McMillan, *op. cit.*

49 For example, if a market had 10 sellers, each with a share of 10%, the HHI would equal 1000, i.e., 10 x 10 = 100 x 10 sellers = 1000.

50 George Stigler, *The Organization of Industry*, Richard Irwin Co., 1968, pp. 261-267.

51 Department of Justice and Federal Trade Commission, *Horizontal Merger Guidelines*, April 2, 1992, Section 1.51.

In the context of horizontal merger analysis, the antitrust agencies presume that increases of 100 points or more in markets with HHIs of 1800 and over "are likely to create or enhance market power or facilitate its exercise."[52]

Trading on the NCE has always been concentrated among a relatively few traders.[53] Table 3.3 displays for each year during 1974-1993 the total number of traders selling blocks and barrels on the NCE; the concentration ratios, CR1 to CR5, which refer to the combined market shares of the top one to five firms; and the HHIs. In only one year during this period were there more than nine sellers. In all years, the five largest sellers accounted for over 87 percent of total carloads of barrels and blocks sold on the NCE. Seller HHI values ranged from a low of 1759 in 1986 to a high of 8251 in 1989 (Table 3.3).

Table 3.4 displays for each year during 1974-1993 the degree of concentration among buyers on the NCE. The number of buyers ranged from three in 1982 to 14 in 1979. In all but two years, the five largest buyers accounted for over 90 percent of barrel and block sales. The HHI values ranged from a low of 1675 in 1980 to a high of 7324 in 1986.

Although both NCE sales and purchases of total barrels and blocks were very highly concentrated in virtually all years, seller concentration was generally higher than buyer concentration. This was particularly true during 1988-1993, when the seller HHI averaged 5990,

---

[52] *Id.*, Section 1.51. "The presumption may be overcome by a showing that [other] factors...make it unlikely that the merger will create or enhance market power or facilitate its excise [despite the presence of high market concentration]." *Id.*

[53] For a description of concentration in earlier years see Arthur Miller, *op. cit.*

Table 3.3. Seller Concentration on the National Cheese Exchange, 1974-1993
Barrel and Block Sales

Year	Carloads Traded	No. of Sellers	CR1	CR2	CR3	CR4	CR5	HHI
1974	43	9	39.5 (L)	58.1 (K)	69.8 (DP)	79.1 (BF)	88.4 (MA)	2255
1975	167	8	47.6 (K)	60.2 (BA)	72.9 (B)	84.9 (L)	91.6 (BF)	2806
1976	490	6	64.7 (L)	83.3 (K)	93.1 (BF)	96.5 (B)	99.4 (KP)	4647
1977	553	8	74.9 (L)	84.6 (KP)	91.1 (K)	95.3 (BF)	99.1 (B)	5774
1978	325	9	78.8 (L)	86.8 (K)	90.8 (S)	93.2 (B)	95.4 (BN)	6302
1979	440	4	63.0 (K)	82.3 (L)	98.9 (B)	100.0 (S)	---	4613
1980	264	6	65.2 (L)	86.0 (K)	92.4 (B)	96.6 (BF)	99.2 (TD)	4745
1981	39	4	41.0 (B)	82.1 (L)	97.4 (K)	100.0 (MA)	---	3609
1982	40	3	55.0 (L)	80.0 (MA)	100.0 (K)	---	---	4050
1983	34	6	58.8 (L)	76.5 (BF)	88.2 (K)	94.1 (B)	97.1 (MG)	3962
1984	307	8	44.3 (BN)	78.8 (L)	94.1 (DS)	95.8 (K)	97.4 (B)	3397
1985	144	6	54.2 (BN)	78.5 (L)	96.5 (B)	98.6 (K)	99.3 (MG)	3856
1986	752	12	29.3 (BN)	46.4 (MI)	61.7 (L)	75.3 (DS)	87.8 (K)	1759
1987	707	9	47.0 (K)	71.3 (L)	83.2 (DS)	89.5 (MI)	95.0 (BN)	3018
1988	361	6	76.7 (K)	89.5 (L)	98.3 (BN)	99.7 (DS)	98.9 (B)	6130
1989	118	5	90.7 (K)	94.9 (MG)	97.5 (MI)	99.2 (L)	100.0 (DS)	8251
1990	342	9	56.4 (K)	74.6 (AP)	84.8 (MA)	93.9 (DS)	96.2 (N)	3710
1991	399	8	85.0 (K)	89.5 (B)	92.0 (L)	96.0 (AP)	97.5 (MK)	7266
1992	380	8	67.9 (K)	76.3 (BN)	84.2 (AP)	89.7 (B)	92.9 (L)	4800
1993	596	9	74.3 (K)	89.6 (DS)	93.3 (AP)	96.1 (B)	97.7 (BN)	5784

Source: National Cheese Exchange, Trading Activity Minutes, AMS, USDA, 1974-93.

Notes: (1) CR refers to the concentration ratio measure of market concentration. CR1 refers to the percent of sales on the NCE by the largest seller. CR5 refers to the percent of sales made by the five largest sellers. The codes in column CR1 identify the largest seller. The codes in columns CR2 to CR5 represent the second to fifth largest sellers in each year. HHI refers to the Herfindahl-Hirschman Index of Market Concentration; it is calculated by summing the squares of the individual market shares of all firms selling on the NCE.

(2) Letters in parentheses are trader codes. AP=Alpine Lace; B=Borden; BF=Beatrice Food (Includes trades of Pauly, acquired in 1984); BN=Bongards; DS=Dairystate; K=Kraft; L=Land O' Lakes; MA=Marathon; MG=Masters Gallery; MI=Mid Am; MK=Marketing Association; N=Northern Wisconsin; S=Schreiber; TD=Twin Dakota. BA, DP, and KP are unidentified.

Chapter 4--Motives of NCE Traders

As discussed in Chapter 3, the NCE has the classic characteristics of a thin market: During 1988-1993, less than 0.3 percent of all cheese manufactured was sold on the Exchange, and trading was concentrated among a few traders.[1] Although thin markets may arise for a variety of reasons, they inevitably raise questions of their effectiveness in generating competitively determined prices, including whether they are susceptible to, or facilitate, market dominance or manipulation.

In this chapter we shall (a) review alternative beliefs or hypotheses regarding the function of the Exchange; (b) test the conflicting hypotheses of trader motivation by examining overall trading patterns; (c) examine the business characteristics of leading traders to determine whether they benefit financially from higher or lower NCE prices; (d) analyze why traders may prefer to sell in the spot market as an alternative to the NCE; and (e) examine documentary evidence of trader motives.

A. Functions of the NCE

The National Cheese Exchange serves two functions: (a) it provides a centralized cash market at which members may buy or sell cheese each Friday morning for about 30 minutes beginning at 10:00 a.m.; and (b) it establishes a block and barrel price or "market opinion" based on the last sale, highest bid or lowest offer. The "market opinion"[2] or settlement price is used as

---

1 Although there are about 40 members of the Exchange representing over 90 percent of the cheese manufactured in the United States, only a few members actually trade on the Exchange.

2 The NCE does not issue the barrel/block "market opinion" at the end of each trading day. Rather, *The Cheese Reporter*, a trade publication not affiliated with the NCE, reports a "Market Opinion" as to the price level at the end of each trading day. It began doing so

the basis or reference price in formula pricing 90-95 percent of all cheese transactions made off the NCE.[3] Many marketers also use NCE prices to establish the wholesale selling price of cheese, both for private label brands sold to grocery retailers and food service cheese customers and, to some degree, for weaker company brands.

There are conflicting views as to the primary function of the NCE and the motives of leading traders on the Exchange. One view holds that traders use the NCE primarily because it provides a cash auction market for the sale or purchase of cheddar cheese. An alternative view is that traders use the Exchange in order to influence the price.

Among those holding the first view is the long-time president of the NCE, Richard J. Gould. As he sees it,

> [T]he primary purpose of the Exchange is to furnish facilities for those who want the Exchange as an alternative source of supply and as a place to dispose of a surplus. It is an alternate market but it cannot be used for distressed or otherwise unmarketable cheese. The Exchange can and does furnish a comfortable market alternative in a highly competitive business. Most trading in cheese, however, is done in regular commercial channels--retail and wholesale outlets. The primary value of the NCE lies in its availability.[4]

---

all transactions on the Exchange. Subsequently, the USDA assumed responsibility to act as the market reporter and to report Exchange prices in its *Market News Reports*. "All About the National Cheese Exchange," *The Cheese Reporter*, Madison, Wisconsin, October 21, 1988, pp. 47-48. Thereafter, the *Cheese Reporter* has continued to publish a market opinion based on the "last significant transaction" on the Exchange as reported in USDA *Market News* reports.

3 Kraft General Foods, Inc., *National Cheese Exchange*, May 10, 1990, KGF 16971, 16978.

4 Richard J.Gould, "The National Cheese Exchange," in M.L. Hayenga (ed.), *Pricing Problems in the Food Industry (with Emphasis on Thin Markets)*, Northwest Regional Research Bulletin 261, College of Agriculture and Life Sciences, University of Wisconsin-Madison, February 1979, p. 80.

Although NCE prices are used as a basis for pricing 90-95 percent of manufactured cheese transactions made off the Exchange, Mr. Gould explains that setting cheese prices is not the "real function" of the NCE:

> [T]he emphasis placed on the meaning of Exchange transactions (Exchange prices) often overshadows the real function of the Exchange. Perhaps this is a result of the transactions being of such great interest to so many people other than the members of the Exchange. However, the Exchange does not exist to furnish an index as to the value of cheese. It serves as an index because it more openly and actively reflects supply and demand conditions than other sources of information.[5]

Some dairy marketing economists have accepted this view of the Exchange. As Harold W. Lough has put it:

> The primary purpose of the Exchange is as a source of supply and a place to dispose of surplus. It is an alternative market since most trading in cheese is done through regular commercial channels.[6]

Many leading industry members also characterize the NCE solely as a place to sell and buy cheese.[7] Two prominent cheese executives described the National Cheese Exchange as

---

5 Richard J. Gould., "History and Function of the National Cheese Exchange, Inc." (mimeograph), p. 11, attached to letter from R.J. Gould to Wesley Ringo, Securities Commissioner, State of Wisconsin, May 17, 1991.

6 Harold W. Lough, *Cheese Pricing*, Agricultural Economic Report No. 462, USDA, Economics and Statistical Service, December 1980, p. 7.

7 In the course of our interviews of leading traders on the NCE, practically all company officials interviewed characterized the NCE as an alternative outlet or source of supply and stated that they believed it accurately reflected overall market conditions. In follow-up questions some officials acknowledged it also served purposes other than an alternative outlet for, or source of, bulk cheese. Some persons interviewed questioned the effectiveness of the NCE as an efficient price discovery mechanism and believe it is susceptible to price manipulation.

The unanimity of responses by some leading companies suggests that they may have discussed with the Exchange president and others the "strategy" to follow in response to the investigation of the Department of Agriculture, Trade and Consumer Protection. This inference is supported by an internal memorandum of one leading company, which stated, in part:

> ...a facility for trading by members who have extra cheese inventory on hand to dispose of or who have need for supplies over and above what they have on hand or can assemble before needed.[8]

The publicly stated position of Kraft General Foods, Inc., is that it buys or sells on the NCE in order to balance inventories with demand. Kraft expressed this view in a 1991 "position paper"[9] as follows:

> Kraft manufactures approximately 30 percent of the natural cheese it uses in and sells as natural and process cheese products. Nonetheless, Kraft maintains substantial inventories of cheese and attempts to match its inventories with expected sales to the retail grocery trade and, ultimately, to the consumer. When the demand for Kraft cheese products is less than anticipated, as it has been in the past year, Kraft sometimes finds itself in a position of having excess inventory. Consequently, although Kraft is a net buyer of cheese, the company sometimes has excess inventories.

> The National Cheese Exchange (NCE) is under investigation by the Wisconsin Department of Agriculture....There are also rumours that Congress, the House Subcommittee on Livestock, Dairy and Poultry, may hold a hearing on the NCE. *We have met with the NCE to discuss a strategy and we plan to meet with other members when appropriate.* Emphasis added. [[Source deleted in public report as not essential.]]

8 Vincent L. Zehren and D.D. (Dave) Nusbaum, *Process Cheese*, Schreiber Foods, Inc., Cheese Reporter Publishing Co. 1992, p. 92. This source was summarizing the views of D.D. Nusbaum and H.A. Palmiter, expressed in an article in *The Cheese Reporter*, June 1983, p. 8.

9 The position paper was prepared in opposition to a proposed stockholder resolution which, among other things, would have prevented Kraft from selling on the NCE. Donald Fried, Vice President of Philip Morris, to Reverend Seamus Finn, O.M.I., Re: Stockholder Resolution, November 15, 1991. An internal Kraft Position memorandum, evidently prepared for the purpose of rebutting a stockholder resolution, explained in more detail than did its public "Position Paper" why Kraft traded on the NCE. Kraft General Foods, Inc., *National Cheese Exchange (NCE)* KGF 16913-16917. Although the document is undated, it discusses the manner in which Kraft disposed of surplus cheese in 1991.

> Cheese is sold both on the National Cheese Exchange in Green Bay Wisconsin and in private transactions. *Kraft uses both methods for buying or selling cheese in order to balance its inventories with demand for its products.*[10]

In this view, the NCE is no different than other cash commodity auction markets, such as livestock or tobacco leaf auctions, where each participant's position in the market is predictable: (a) producers of the commodity are sellers; (b) processor-marketers of the commodity are buyers; and (c) brokers are buyers or sellers depending on whom they represent. In competitive commodity markets prices are set by the impersonal interaction of many buyers and sellers. Hence, prices are the end *result* not the *object* of trading.

Others, however, accept the alternative view of the NCE--that leading participants trade for the explicit purpose of influencing prices. For example, three prominent dairy marketing economists observed that at the NCE

> [T]rades are not normally made for merchandising, but instead are made primarily when product traders feel price adjustments are needed to reflect supply-demand conditions.[11]

Some traders also explicitly reject the notion that the NCE is simply a place to buy and sell cheese. As one trader interviewed in the course of this study stated,

> The Exchange is not a place where you go with a load of cheese with expectations to sell it.[12]

Another cheese industry executive interviewed stated that the NCE served two functions:

---

10 Fried, *op. cit.*, p. 4; emphasis added.

11 Robert E. Jacobson, Jerome W. Hammond, and Truman G. Graf, *Pricing Grade A Milk Used in Manufactured Dairy Products*, Research Bulletin 1105, Ohio Agricultural Research and Development Center, Wooster, Ohio, December 1978, p. 36.

12 Wayne Hoecker, General Counsel, Mid-America Dairymen, Inc., typed transcript of recorded interview, August 2, 1993, p. 59.

> My opinion is that it serves both functions [trading to satisfy one's commercial needs and to influence price discovery]. At times...people are selling cheese on the Exchange because they have no other place to go.... But it also serves...the price discovery thing. I think there are times when people offer to buy or sell, not because they really want to change their supply, but because they have some strong opinion about the long-term supply and demand that they don't think is being registered properly in the price.[13]

Some industry members interviewed believe that buyers and sellers of cheese have had a specific interest in influencing the direction of NCE prices. As one company executive put it:

> AMPI and Mid-Am have generally been buyers and Kraft has more often than not been selling. And, you know, I don't think there's anything abnormal about that. If Kraft had any bias toward an overall price, I should think it would be a bias toward wanting to buy as efficiently as they can buy--at as low a cost as they can. That's their business. That doesn't mean that they want low prices, because they need to maintain enough of a price to maintain a supply. You know, but it would be logical that they would want to buy at the best price that they could and still accomplish their objectives of buying enough good quality cheese to fulfill their business purpose. AMPI and Mid-Am, on the other hand, if we have any bias, it would be toward wanting higher prices. We certainly want higher prices, but we must accomplish this within the constraints of the marketplace....[14]

In addition to the above motives for trading on the NCE, some trading may occur solely to influence the spread between block and barrel prices. One executive said that while his company's principal reason for trading on the NCE was to buy or sell cheese, "the other thing that would be important to us is the value between blocks and barrels."[15]

---

[13] Interview of Mark Firth, Regional Manager AMPI North Central, typed transcript of recorded interview, July 29, 1993, pp. 34-35.

[14] Mark Firth, AMPI North Central Regional Manager, typed transcript of recorded interview, July 29, 1993, p. 39.

[15] Douglas Johnson, Vice-President of Dairy Food Operations, typed transcript of recorded interview of Land O' Lakes, April 29, 1993, p. 28. See Chapter 5, Section E, for more on pricing to influence the block-barrel spread.

An internal memorandum of another company explicitly included such trading as part of its *current strategy*: "Bid barrels if necessary to prevent block/barrel spread increase."[16]

In summary, some dairy marketing specialists and some leading traders acknowledge that participants on the NCE trade not merely to obtain or dispose of cheese but to register their view as to the most appropriate price, given market supply and demand conditions. Thus, participants may often trade for the explicit purpose of influencing prices. In this situation, leading traders enjoy some discretion in influencing or managing prices, at least in the short run. The extent of discretion depends on the relative market power of participants and on whether they act independently or cooperatively, either by tacit or overt agreement.[17] If there are numerous buyers and sellers, each with a small share of the market, it is not possible for individuals to influence price. In that case, a trader's only motive for trading would be to use the market as an alternative cash market. However, in highly concentrated markets like the NCE, individual traders have the potential and incentive to influence the market price. Determining whether such traders use this potential requires examination of their actual trading conduct.

B. Purchases and Sales Patterns

Here we examine facts helpful in testing the conflicting hypotheses of trader motives. If those trading on the Exchange use it primarily as an outlet for or source of cheese, one can predict whether particular participants will be primarily buyers or sellers: (a) firms that are primarily cheese manufacturers that sell more bulk cheese than they buy off the NCE will use

---

16 Schreiber Foods, Inc., Vice President-Purchasing to top corporate managers, "SFI Market Position and Current Strategy," July 24, 1989, Bates 4724.

17 F.M. Scherer and David Ross, *Industrial Market Structure and Economic Performance*, 1990, pp. 235-274.

the NCE mainly as an alternative outlet for surplus cheese; (b) firms that are primarily marketers of cheese and that buy most of their manufactured cheese requirements from other companies off the NCE will be primarily buyers on the NCE; and (c) brokers will either buy or sell on the NCE, depending on whom they represent.

Not all NCE traders fit neatly into these categories. At times companies buying most of their cheese requirements from manufacturers may commit for cheese exceeding their needs. If such firms have inflexible supply agreements, they may be forced to dispose of the excess supply, though typically they do not do so on the NCE. Likewise, a cheese manufacturer selling more cheese than it buys may at times find itself short of cheese to fill its commitments to cheese converters/marketers, food retailers or finished product customers, forcing it to look elsewhere for supplies. But in general one would expect that a participant's trading activity on the Exchange would follow the overall pattern outlined above. Hence, one test of the hypothesis that the NCE is used mainly as an outlet for or source of cheese is whether the participants' trading conduct follows a pattern consistent with whether they are primarily buyers or sellers of bulk cheese off the NCE.

Tables 4.1 and 4.2 display the total cheese purchases and sales of companies on the NCE during 1980-1993. (The companies are grouped by the categories described above.)[18] Since some leading participants abruptly changed their trading conduct about 1987-1988, we divided trading activity after 1980 into two periods: 1980-1987 and 1988-1993. (Only companies accounting for more than 1 percent of all transactions are shown in the body of the tables; others appear in footnotes.)

---

[18] See Chapter 2 for the basis of this characterization.

Table 4.1. Trades on NCE by Primary Type of Business, 1980 TO 1987

---BARRELS & BLOCKS---

Type of Primary Business	Loads Sold									Loads Bought								
	1980	1981	1982	1983	1984	1985	1986	1987	Total	1980	1981	1982	1983	1984	1985	1986	1987	Total
Manufacturer of Cheese[1]																		
Land O' Lakes	172	16	22	20	106	35	115	172	658	16	12	0	1	0	0	0	39	68
Bongards'	0	0	0	0	136	78	220	39	473	0	0	0	0	0	34	0	0	34
Mid-America	0	0	0	0	0	0	129	45	174	0	0	0	11	13	5	1	0	30
Woldt's Cheese	0	0	0	0	0	0	0	0	0	36	7	0	0	0	0	0	0	43
Clearfield	0	0	0	0	0	0	0	0	0	11	0	16	0	9	0	0	0	36
Sub-Total	172	16	22	20	242	113	464	256	1305	63	19	16	12	22	39	1	39	211
Marketers of Cheese[2]																		
Kraft	55	6	8	4	5	3	94	332	507	16	2	0	8	183	98	104	0	411
Borden	17	16	0	2	5	26	20	0	86	61	9	10	0	23	0	0	16	119
Beatrice	11	0	0	6	0	0	2	0	19	20	0	0	8	56	2	635	540	1261
Schreiber	2	0	0	0	0	0	17	0	19	72	6	14	6	21	5	0	75	199
Masters Gallery	0	0	0	1	3	1	33	16	54	0	0	0	0	2	0	12	0	14
Marathon[3]	0	1	10	1	0	0	0	0	12	0	0	0	0	0	0	0	31	31
Sub-Total	85	23	18	14	13	30	166	348	697	169	17	24	22	285	105	751	662	2035
Brokers																		
Dairystate	0	0	0	0	47	0	102	84	233	0	0	0	0	0	0	0	0	0
Sub-Total	0	0	0	0	47	0	102	84	233	0	0	0	0	0	0	0	0	0
All Others[4]	7	0	0	0	5	1	20	19	52	32	3	0	0	0	0	0	6	41
Total	264	39	40	34	307	144	752	707	2287	264	39	40	34	307	144	752	707	2287

Source: National Cheese Exchange, Trading Activity Minutes, AMS, USDA, 1980-87.

[1]These are cheese manufacturers that sell significantly more bulk cheese than they buy.

[2]These are cheese marketers that buy significantly more bulk cheese than they sell. Beatrice manufactures more of its total cheese requirements than it buys from other cheese manufacturers. However, off the Exchange it sells very little bulk cheese and buys virtually all of its cheddar cheese, which is the only cheese traded on the NCE (see Chapter 2). Because of this, Beatrice is included among the "primarily cheese marketers group" of traders. Totals for Beatrice include those for Pauly cheese acquired in 1984.

[3]Marathon is a converter that cuts and packages cheese only for marketers like Kraft, Schreiber and others.

[4]Includes those companies that made less than 1 percent of all carloads traded on NCE during this period. These are Marketing Association (sold 17 carloads), Edelweiss (sold 13 carloads), Swiss Valley (sold 9 carloads), Twin Dakota (sold 7 carloads), AMPI (bought 2 carloads), Anderson Clayton (sold 4 and bought 15 carloads), Northern (sold 2 and bought 7 carloads), and N. Dorman (bought 17 carloads).

Table 4.2. Trades on NCE by Primary Type of Business, 1988 TO 1993

---BARRELS & BLOCKS---

Type of Primary Business	Loads Sold							Loads Bought						
	1988	1989	1990	1991	1992	1993	Total	1988	1989	1990	1991	1992	1993	Total
Manufacturer of Cheese[1]														
Mid-America	1	3	0	0	0	0	4	6	3	48	137	132	165	491
Land O' Lakes	46	2	0	10	12	2	72	57	9	21	0	4	98	189
AMPI	0	0	0[6]	0	0	0	0[6]	30	56	7	20	29	30	172
Bongards'	32	0	0	0	34	9	75	0	0	0	0	0	0	0
Sub-Total	79	5	0	10	46	11	151	93	68	76	157	165	293	852
Marketer of Cheese[2]														
Kraft	277	107	193	339	258	443	1617	0	0	22	0	0	0	22
Alpine Lace	0	0	62	16	30	22	130	0	0	0	0	0	3	3
Borden	2	0	3	18	19	17	59	28	0	0	4	0	0	32
Beatrice	0	0	0	0	0	0	0	118	13	172	85	165	220	773
Schreiber	0	0	6	0	0	1	7	78	28	13	123	34	46	322
Masters Gallery	0	5	2	0	0	0	7	0	0	46	16	0	0	62
Marathon[3]	0	0	35	0	0	0	35	0	0	0	0	0	0	0
Sub-Total	279	112	301	373	307	483	1855	224	41	253	228	199	269	1214
Brokers[4]														
Dairystate	3	1	31	3	0	91	129	8	0	1	7	0	13	29
Northern Wisconsin Produce	0	0	8	2	8	0	18	6	4	10	7	6	0	33
Schurman	0	0	0	0	0	7	7	0	0	0	0	2	18	20
Sub-Total	3	1	39	5	8	98	154	14	4	11	14	8	31	82
All Others[5]	0	0	2	11	19	4	36	30	5	2	0	8	3	48
Total	361	118	342	399	380	596	2196	361	118	342	399	380	596	2196

Source: National Cheese Exchange, Trading Activity Minutes, AMS, USDA, 1988-1993.

[1]These are cheese manufacturers that sell significantly more bulk cheese than they buy.

[2]These are cheese marketers that buy significantly more bulk cheese than they sell. Beatrice manufactures more of its total cheese requirements than it buys from other cheese manufacturers. However, off the Exchange it sells very little bulk cheese and buys virtually all of its cheddar cheese, which is the only cheese traded on the NCE (see Chapter 2). Because of this, Beatrice is included among the "primarily cheese marketers group" of traders. Totals for Beatrice include those for Pauly cheese acquired in 1984.

[3]Marathon is a converter that primarily cuts and packages for marketers like Kraft.

[4]Market Cheese Traders, which is owned by Alpine Lace Brands, is also a broker. NCE market activity reports do not distinguish between trades made by Alpine Lace for its own behalf or for others.

[5]Include those companies that made less than 1 percent of all carloads traded on NCE during this period. These are Dairygold (sold 14 carloads), Edelweiss Cheese (bought 19 carloads), Golden Cheese (sold 10 carloads), Marketing Association (sold 6 carloads), Northwood Dairy (sold 6 and bought 5 carloads), Hermke Cheese (bought 13 carloads), Empire Cheese (bought 5 carloads), and Alto Cooperative(bought 6 carloads).

[6]AMPI sold 10 loads through a broker in 1990.

During 1980-1987, firms that engaged primarily in cheese manufacturing and that sold more bulk cheese than they bought off the NCE, also were primarily sellers on the NCE, *selling* 6.2 loads for every load they *bought* (Table 4.1). Firms that are primarily marketers of cheese and that bought more bulk cheese than they sold off the NCE, also were primarily buyers on the NCE, *buying* 2.9 loads for every load they *sold*. These trading patterns are consistent with the hypothesis that during this period the NCE was used as another cash market to dispose of or obtain cheese.

When viewed aggregately, the facts displayed in Tables 4.1 and 4.2 indicate that in 1988 a reversal occurred in the trading patterns of leading market participants. During 1980-1987 the firms that *sold* more bulk cheese than they *bought* off the NCE were primarily *sellers* on the NCE. But during 1988-1993, they became primarily *buyers* on the NCE. The opposite is true for the firms that bought more bulk cheese than they sold off the NCE. Whereas during 1980-1987 they were primarily buyers on the NCE, during 1988-1993 they became primarily sellers.

However, the overall patterns conceal important shifts within the groups of traders. In the marketing group, for example, two leading participants did *not* change their buying patterns: Beatrice and Schreiber *bought* much more during 1988-1993 than they *sold*, just as they had during 1980-1987. Kraft alone accounts for practically all of the reversal in aggregate trading by cheese marketers: whereas during 1980-1987 Kraft *sold* 1.2 loads for each one it *bought*, during 1988-1993 Kraft *sold 73.5* loads for each *one* it *bought*. Two other leading cheese marketers, Borden and Alpine Lace, also *sold* more than they *bought* during 1988-1993. Some differences in business characteristics between firms within the marketing group appear to account for differences in trading conduct. Kraft, Borden and Alpine Lace market predominantly branded

cheese products, whereas Beatrice and Schreiber market mainly private label or weaker company brands to food retailers and to food service and other non-retail outlets where brand preferences are unimportant. The significance of these differences among marketers is discussed below.

A similar shift occurred in the manufacturing group: during 1980-1987 this group *sold* 6.2 loads for each one they *bought*, but during 1988-1993 they *bought* 5.6 loads for each one *sold*. As in the marketing group, only a few traders are responsible for the reversal. Mid-Am, Land O' Lakes and AMPI, three large agricultural cooperatives and the largest manufacturer-traders of 1988-1993, *bought* 11.2 loads for each load they *sold*, thus making 39 percent of all barrel and block purchases on the NCE. During 1980-1987, these three traders *bought* only one load for each 8.5 loads they *sold*, amounting to only 4.3 percent of all NCE purchases.[19] As with the marketing group, some traders did not change their behavior from one period to the next: Bongards', a smaller cooperative, remained a seller-trader throughout.

Kraft's transition to exclusively seller-trading actually began in August 1986 and continued thereafter.[20] The fact that the cooperatives did not become primarily buyer-traders until 1988 suggests they were responding to Kraft's change to a seller-trader more than one year earlier.

---

19 AMPI made no trades on the NCE during 1980-1987 (Table 4.1).

20 From January through July 1986, Kraft bought 94 loads and sold no loads of barrels and blocks. Beginning August 29, 1986, through December 1986, Kraft sold 104 loads and bought none. Thereafter it was exclusively a seller-trader on the NCE. It bought 22 loads of blocks in 1990, but these purchases evidently were made to affect the block-barrel spread, not to buy blocks, since Kraft had a surplus at the time. See Chapter 5, Section E.

Thus the facts indicate that during 1980-1987 various firms conducted their trading in a way one would anticipate, given their primary functions, and in consistency with the first view of the NCE discussed earlier: cheese manufacturers used the NCE as an alternative outlet for surplus cheese and cheese marketers used it as a supplemental source of supply. Conversely, during 1988-1993 trading conduct assumes a pattern one would expect to see if traders were interested primarily in using the NCE to influence prices. Among cheese marketers, Kraft's reversal of role from a buyer to a seller is particularly significant. If the NCE were being used as a supplemental cash market, one would expect marketers (like Kraft) that buy all or most of their bulk cheese to be on both sides of the market. Although we expect such firms to be mainly buyers, from time to time they are also likely to have surpluses, some of which they may dispose of on the NCE. It is, therefore, difficult to reconcile Kraft's change in trading behavior with the contention that traders use the market mainly to dispose of surpluses or to remedy shortages.

Trading Activity in Barrels and Blocks

There are significant differences in the trading patterns of barrels versus blocks sold on the NCE. More carloads of barrels than of blocks are sold on the NCE: barrels accounted for 67 percent of all sales during 1980-1987 and 68 percent during 1988-1993. During 1988-1993, Kraft had a larger share of barrel than block sales, 83 percent versus 53 percent (Appendix Tables 4.2a and 4.2b).

The reversal of trading roles of some leading NCE participants was great in both barrels and blocks. Kraft's share of total NCE barrel sales rose from 25 percent during 1980-1987 to 83 percent during 1988-1993. Kraft's share of total block sales rose from 16 percent during 1980-1987 to 53 percent during 1988-1993.

Trading Activity of Brokers

Brokers may trade for either buyers or sellers of cheese on the Exchange. In fact, however, during both the 1980-1987 and 1988-1993 periods leading brokers were predominantly seller-traders. Brokers' share of NCE sales were 10.2 percent in 1980-1987 and 7.0 percent during 1988-1993 (Tables 4-1 and 4-2). Their shares of purchases in these two periods were 0.0 percent and 2.8 percent, respectively. In both periods, Dairystate was the leading broker.

Because a broker may represent a number of different companies, its total Exchange transactions do not reflect the importance of the individual companies it represents. Although brokers generally represent mainly small cheese makers on the NCE, as is shown in Chapter 6, they may, at times, represent large cheese manufacturers.

Alpine Lace, which is included in the cheese marketers group above, also has operated a brokerage business, Market Cheese Traders. We have not included Alpine Lace among the brokers because it is predominantly a marketer of specialty cheeses. Moreover, the NCE activity reports do not identify whether Alpine Lace trades are made for Market Cheese Traders or made in its own behalf.[21]

Conclusions

The above facts indicate the following:

1. The overall trading pattern of major cheese manufacturers and marketers during 1980-1987 was that expected in a cash commodity auction market. Thus their conduct was consistent with the hypothesis that they were using the NCE as an alternative cash outlet or source of supply.

---

[21] See the following section for a discussion of the business characteristics of Alpine Lace.

2. The overall trading conduct of cheese manufacturers and marketer-traders during 1988-1993 was *not* consistent with that expected in a commodity auction market serving solely as an outlet or source of supply. Rather, their trading behavior was consistent with the hypothesis that the ***leading traders on the NCE were motivated primarily by a desire to influence price.***

The difference in trading patterns during the two periods coincides with the change in the role of cheese price supports. During 1980-1987, cheese prices were determined primarily by the government price support program; the NCE played a minor role in prices (Fig. 2.8). However, during 1988-1993, cheese prices were largely above the support price and market-driven; consequently, there was a sharp increase in the volatility and range of cheese prices.

A major cheese marketer commented on this change in a 1988 letter to its customers:

> For more than ten years, you had to pay little attention to the cheese market. Prices rarely moved more than a fraction of a cent. The only major changes were when governmental price supports took effect and these were generally signaled well in advance of the effective dates. As we all know, this pattern of predictability has changed radically....What once was a docile market for cheese has now taken on a completely different character.[22]

In this environment cheese companies have both greater opportunity and greater incentive to influence NCE prices.

C. Business Characteristics of Leading Traders

The preceding section documents that in recent years overall trading patterns on the NCE are consistent with the hypothesis that most trading on the NCE occurs to influence price. Here we examine the leading traders' business characteristics that may motivate them to engage

---

[22] Schreiber Foods, Inc., Senior Vice-President and General Manager, letter to retail customers, Sept. 30, 1988, Bates 109.

primarily in either buying or selling on the NCE. This analysis involves determining how changes in the level of NCE prices may affect each trader's profitability and, therefore, its motive for attempting to influence NCE prices in one direction or the other. We also need to understand both the nature of their business and the extent to which their input costs (of milk or bulk cheese) and selling prices (of bulk or finished cheese) are related to the NCE. We examine the business characteristics of the nine leading traders that accounted for 93 percent of all purchases and 92 percent of all sales during 1988-1993.

Kraft General Foods, Inc.

In December 1988 Kraft, Inc. (established in 1903), was acquired by the Philip Morris Companies Inc., who merged Kraft with General Foods, Inc. (acquired by Philip Morris in 1985) to form Kraft General Foods, Inc., a division of Philip Morris. In 1989 Kraft General Foods, Inc., reportedly had sales of $23.3 billion and made about 10 percent of all retail food sales.[23] Kraft U.S.A. (a division of Kraft General Foods, Inc.) which conducts Kraft's cheese business, had estimated sales of $4.5 billion in 1989.[24]

Kraft buys about 60 percent of its bulk cheese (70 percent excluding cream cheese), nearly all from committed suppliers at NCE-based formula prices. The cost of cheese manufactured in Kraft plants is also influenced heavily by NCE prices since pay prices for milk used in making cheese are largely driven by NCE prices.[25]

---

[23] A.M. Freedman, "Corporate Focus: Miles will Lead Kraft General Foods, Marketing Whiz Must Smooth Merger at Philip Morris," *The Wall Street Journal*, September 28, 1989.

[24] *Id.*

[25] See Chapter 2, Section E for a discussion of milk pricing.

In 1990, Kraft reportedly sold through retailers 852 million pounds of finished cheese products with a retail value of about $3 billion under Kraft consumer brands.[26] In 1990 Kraft brands, which command significant price premiums, reportedly accounted for the following shares of retail cheese sales: cream cheese, 70 percent; processed cheese, 58 percent; natural cheese, 30 percent; combined share, about 44 percent of total retail cheese sales.[27]

Before 1985, Kraft's cheese prices charged to retailers were apparently tied to NCE prices. In January 1985 Kraft informed its retail trade customers that,

> Effective January 31, 1985, Kraft will no longer automatically link its cheese prices to the National Cheese Exchange's weekly opinion. Rather Kraft will change prices as business conditions, costs and competitive situations dictate. This is consistent with the pricing practice on other Kraft products, such as salad dressings, margarine and pasta products.[28]

The decoupling of Kraft's wholesale prices from the NCE also changed the impact of the NCE price on Kraft's margins. Before 1985, both Kraft's purchases and sales were priced off the NCE. After Kraft decoupled wholesale prices from NCE prices, changes in wholesale list prices were made much less frequently than changes in NCE prices. Although Kraft cannot price entirely independently of other company brands or of the private label brands of retailers, during

---

[26] SAMI 1990 Million Dollar Brands. Another source estimated Kraft retail sales as 2,647 million in 1990. Appendix Table 6.4d.

[27] SAMI 1990 Million Dollar Brands.

[28] Kraft, Inc., "To Our Customers," KGF 20822-20823. Kraft gave several reasons for the change in pricing policy including the need to "protect our customers and ourselves from wide cheese price fluctuations...."; response to customer "complaints about the many price changes that take place as a result of the weekly transactions on the National Cheese Exchange." The NCE "does not consider changes in the costs of packaging, labor, distribution, administration and the cost of aging cheese." Kraft said that reducing the frequency of price changes would "lower administrative cost for both you and Kraft." *Id.* KGF 20823.

1981-1990 it apparently commanded substantial and increasing premiums over other leading company and private label brands.[29] Until 1988 it did so without losing market share.[30]

In the short run Kraft's profit margins for cheese are determined largely by the spread between the cost of cheese it buys or makes and the wholesale price of cheese it sells. Since the cost of cheese purchased by Kraft is tied directly to the NCE, whereas its selling prices are not, Kraft has a financial interest in the level of prices established on the NCE.[31] Leading Kraft competitors generally acknowledge that Kraft, like other sellers of strong brands, benefits from lower NCE prices.[32] This price relationship is documented in Section F, Chapter 6.

---

29 Appendix Tables 6.10 and 6.11; Chapter 6, Section E.

30 Kraft's dollar share of all processed natural and cream cheese was about 46 percent in 1981 and in 1988. *SAMI Million Dollar Brands.*

31 Chapter 6, Section E, includes a statistical analysis of the relationship between NCE prices and Kraft's gross margins. It documents that Kraft's gross margins increase as NCE prices decrease.

An additional analysis of the relationship between NCE prices and Kraft's gross margin used data supplied by Kraft and revealed a statistically significant negative relationship between NCE prices and gross margins. Although this is as expected, the data submitted by Kraft were for list prices and were aggregated across all types of Kraft cheeses. Because of this limitation in the data, we consider the results only a rough estimate of NCE-gross margin relationships for Kraft.. The analysis was based on data provided by Kraft in response to a Demand for Document Production by the Wisconsin Department of Agriculture, Trade and Consumer Protection.

32 During an interview by an investigator of the Wisconsin Justice Department, Mr. Jerome Folz, Beatrice's trader on the Exchange since 1984, expressed his belief that Kraft has a financial interest in lower NCE prices. The investigator's report stated, in part:

> ...Mr. Folz explained that Kraft has a fixed price on all of its retail products that it sells. However, the purchase price on all of the cheese products that Kraft purchases is variable. Therefore, Mr. Folz related that Kraft would have a good reason to want to lower the purchase price in order to provide a greater margin of profit on the retail end. Rosemary Perrizo, Investigator to Matt Frank, Assistant Attorney General, Wisconsin Department of Justice, February 3, 1988, p. 5.

Another large cheese company executive interviewed for this study gave a similar

Borden, Inc.

Borden, Inc., incorporated in 1899, had annual sales of $5.5 billion in 1993. Its cheese business is conducted by its Refrigerated Products Division. Borden brand cheese sales had a reported retail value of $232 million in 1990. Borden is predominantly a marketer of processed cheese that buys all its raw material cheese from manufacturers. Practically all these purchases are cheddar barrels and blocks purchased at NCE-based formula prices. Borden procures most of its bulk cheese requirements under committed supply agreements, purchasing the remainder in the spot market and on the NCE.[33]

The great majority of Borden's cheese is sold to retail outlets under the Borden brand, which in 1990 reportedly accounted for 8.1 percent of all grocery store sales of processed cheese and 0.5 percent of natural cheese.[34] Although its brand share is a distant second to that of Kraft,

---

explanation of how Kraft's selling on the NCE could enhance its margins:

> They [Kraft] buy a lot of their product based on the barrel market [NCE opinion]...Kraft doesn't always sell their finished product based on the market at all; they have a fixed price. So as they are a bigger offerer on the Exchange and they drive...the cost lower for them, they've enhanced their margins because they sell at a fixed price. James Lauderdale, Vice-President Sales and Marketing, Mid-America Dairymen, Inc., typed transcript of recorded interview, August 2, 1993, p. 43.

[33] Borden, Inc., Han Kim, Vice President-General Manager, Refrigerated Products, typed transcript of recorded interview, August 31, 1993, p. 23. Data submitted by Borden revealed that it bought over one-third of its bulk cheese from spot suppliers during 1989-1991. Borden, Inc., "Refrigerated Comparative Analysis Summary of Receipts by Vendor for Bulk Cheese." It bought only four loads on the NCE during these years (Table 4.2).

[34] *SAMI 1990 Million Dollar Brands. I.R.I. Infoscan* data as reported by Cotterill and Franklin, *op. cit.*, state that in 1992 Borden accounted for 9.1 percent of American processed slices and loafs sold in grocery stores.

Borden brands command a substantial premium over private label and lesser processed cheese brands (Appendix Figure 6.2).

Until 1985, Borden's wholesale prices to retailers were formula-priced off NCE prices. When Kraft discontinued formula-pricing in 1985, Borden did likewise and sold at list prices that generally followed Kraft's, though at a somewhat lower level.

Since Borden formula prices the cheese it purchases while selling its branded cheese to retailers at list prices that since 1985 change infrequently, it has the same financial interest as Kraft in lower NCE prices; i.e., Borden cheese profit margins are determined largely by the spread between its wholesale prices and NCE prices. Because Borden's private label business to retailers is relatively more important than Kraft's, NCE price changes may affect Borden's margins less than Kraft's. On balance, however, its financial interest in the level of NCE prices

is the same as Kraft's.[35] Since Borden is a much smaller factor in the market than Kraft, Borden tends mostly to follow Kraft's moves in wholesale pricing and on the NCE.[36]

---

[35] Borden Inc., Han Kim, Vice President-General Manager, Refrigerated Products, acknowledged that although Borden has some private label and food service business, "Borden...and most branded people...would like to see a lower cheese market. That will give us the best...profit opportunities. [Such opportunities occur because] they have list prices, and therefore, they like to see, you know, not the lowest...but they like to see...certain low points in the cheese market...." Typed transcript of recorded interview, August 31, 1993, typed transcript, pp. 68-69.

An analysis of the relationship between NCE prices and Borden's average gross margins did not yield conclusive results. Gross margins were negatively associated with NCE prices as expected, but were not statistically significant. The analysis was based on data for 1989-1992 submitted by Borden in response to a Demand for the Production of Documents by the Wisconsin Department of Agriculture, Trade and Consumer Protection.

This was an atypical period in which to examine the relationship between NCE prices and Borden's gross margins. Kraft increased its gross margins by unprecedented amounts during 1990-1991, following a large price increase in late 1989. When this move resulted in a substantial widening of the price gap between the retail price of Kraft brands and private-label brands, Kraft lost market share (Appendix Table 6.4a). Since Borden brand retail prices followed Kraft brand prices upward (Appendix Figure 6.2), Borden also lost market share. Kraft responded to its lost share with a large trade allowance program and several deep price cuts. As Borden responded to Kraft's conduct, the result was a substantial variation in Borden's list prices, which probably explains our findings of no significant statistical relationship between NCE prices and Borden's gross margins.

> A trade source reported that,
> Kraft's offensive has hurt rival Borden, Inc. Although Borden's cheese sales began to pick up in the 12 weeks ended Dec. 27, dollar volume for cheese still fell 3.5% for the period and 9.7% for the year....Borden's promotional spending increased 20% to 30% last year, according to Mitch Wienick, senior vice president for dairy products.... S.L. Hwang, "Kraft Puts Cheese Market in Ferment," *Wall Street Journal*, March 18, 1993, p. B3.

[36] Han Kim, Vice President-General Manager, Refrigerated Products, Borden Inc., stated that: "We are not really the pace setters; rather we are more followers,...you know, we are trying to survive in the market place maintaining what share we can get." Typed transcript of recorded interview, August 31, 1993, pp. 53-54.

Alpine Lace Brands, Inc.

Alpine Lace Brands, Inc., (First World Cheese until June 1991) has two principal businesses, a branded cheese business that develops, markets and distributes specialty cheeses under its own brand, and a cheese commodity business operating as Market Cheese Traders. In 1993, Alpine Lace had total sales of $180 million, a relatively small percentage of which came from Market Cheese Traders.[37]

Alpine Lace sells primarily nutritional cheese that is low in cholesterol and sodium, including non-fat cheese. Market Cheese Traders serves as a broker for buyers and sellers, trading primarily in the spot market but sometimes on the NCE.

Alpine Lace relies predominantly on bulk cheese bought from others and makes some cheese under co-pack arrangements. While it buys bulk cheese using NCE-based formula prices, Alpine Lace cheese brands are sold to retailers at list prices not coupled to the NCE. These pricing practices give Alpine Lace the same financial interest in lower NCE prices as that of Kraft and Borden. Although Market Cheese Traders' business as a broker does not give it an interest in the direction or level of NCE prices, business logic suggests that, when trading on the NCE, it will act in a manner consistent with the overall financial interest of Alpine Lace.[38]

---

[37] *Moody's OTC Industrial Manual*, 1994, 1061.

[38] The trader on the NCE is an employee of Alpine Lace, not of Market Cheese Traders. [[Source deleted in public report as not essential]]

Beatrice Cheese, Inc.

Beatrice Cheese, Inc., is an independent operating company of ConAgra, Inc., with sales of $23.5 billion in 1993. ConAgra acquired Beatrice in 1986 after Beatrice had expanded its cheese business in 1984 by acquiring Esmark, Inc., owner of the Pauly Cheese business.

Beatrice manufactures 50-75 percent of the cheese that it sells. In recent years it has become a large manufacturer of mozzarella cheese, which it sells to pizza companies. It also has a sizable processed cheese operation where it mainly uses purchased cheddar barrels. Beatrice does not have a strong consumer franchise for its finished cheese products, which are sold predominantly as private label brands to food service outlets, retailers, and industrial users.[39] The wholesale prices charged customers in these various market segments are either formula priced off the NCE or else they are competitive with other formula priced products.

Beatrice's pay prices for raw material cheese are formula priced off NCE prices, and its pay prices for milk used in its own manufacturing plants are also driven by changes in NCE prices. Although both Beatrice's buy and sell prices are coupled to Exchange prices, it may benefit from higher NCE prices because of its processed cheese business. Consider the following hypothetical example provided by a marketer of processed cheese: (a) Assume a company formula prices its processed cheese products to retailers based on the NCE barrel price plus an "overage" to cover processing and distribution costs including a profit margin; and (b) assume that raw material cheddar cheese represents 70 percent of the cost of making one pound

---

[39] In 1990, Beatrice *brands* reportedly accounted for 0.7 percent of total retail processed cheese sales and 3.0 percent of total retail natural cheese sales. *SAMI 1990 Million Dollar Brands*. Beatrice's brands had much smaller price increases between 1981 and 1990 than did Kraft brands (Appendix Table 6.11).

of finished product. In this example, holding other things constant, a 10 cent per pound increase in the NCE barrel price increases the wholesale price of the finished product by 10 cents per pound and increases the cheese manufacturing cost by 7 cents per pound, thereby adding 3 cents per pound to the price-cost margin.[40] The effect of changes in NCE prices on a seller's price-cost margin varies with the type of processed cheese sold. The effect is largest in "cheese food and spreads," where non-cheese ingredients may account for as much as 49 percent of the weight of the finished product. The effect of NCE prices on Beatrice also depends on the importance of processed cheese products in its sales mix. Since we estimate processed cheese products account for only about one-fifth of Beatrice cheese sales, the source of potential profit enhancement described above is probably quite modest.[41]

Beatrice has another financial incentive to buy on the NCE. It manufactures only a small part of its bulk cheddar cheese requirements, procuring the rest from committed suppliers and the spot market. Insofar as Beatrice raw material cheese needs exceed the volume available from committed suppliers, it has an incentive to buy cheddar barrels on the NCE when the NCE price is below that in the spot market, as has normally been true in recent years. In short, the NCE often is a cheaper, though less dependable, source of supply than the spot market. This may have been an important consideration in Beatrice's large purchases on the NCE at market

---

[40] [[Source deleted in public report as not essential.]] This assumes that other costs remain unchanged.

[41] An analysis of NCE prices and Beatrice's average gross margins during 1989-1992 indicates that gross margins were positively and significantly related statistically to NCE prices one month earlier. However, Beatrice's margins were only modestly enhanced by higher NCE prices. The analysis was based on price-margin data supplied by Beatrice Cheese, Inc., in response to a Demand for Production of Documents by the Wisconsin Department of Agriculture, Trade and Consumer Protection.

bottoms. If so, this buying may not have been an attempt to raise prices but to exploit a buying opportunity.[42]

Schreiber Foods, Inc.

Schreiber Foods, Inc., is a private corporation founded in 1945 and headquartered in Green Bay, Wisconsin. It reportedly had 2,300 employees and total sales of about $900 million in 1994.[43]

During 1988-1993, Schreiber bought the bulk of its raw cheese requirements (from committed suppliers, from the spot market, and on the NCE). Schreiber's purchases were formula-priced off NCE prices. Schreiber's primary business is marketing processed cheese products; whereas Beatrice is the major supplier of pizza chains, Schreiber is a leading supplier of fast food hamburger chains.[44] Less than 50 percent of its sales are to retail supermarkets, where it primarily supplies private label products.[45] Schreiber's wholesale prices are either formula priced off the NCE or are competitive with prices of other products formula priced off the NCE. Insofar as changes in both raw material costs and processed cheese prices are coupled to NCE prices, Schreiber benefits from increases in NCE prices and loses from decreases in NCE prices.[46] In this respect, its financial interest is similar to that of Beatrice and others sellers

---

[42] [[Source deleted in public report as not essential.]]

[43] *Million Dollar Directory, Leading Public and Private Corporations*, 1994, p. 4564.

[44] [[Source deleted in public report as not essential.]]

[45] In 1990, Schreiber brands reportedly represented only 0.8 percent of total branded cheese sold to retailers. *SAMI, 1990 Million Dollar Brands*. This source does not report individual sales of private label cheese by the name of individual supplier.

[46] For explanation of the reasons for this, see discussion of Beatrice above.

of NCE formula-priced processed cheese.[47] Like Beatrice, Schreiber may look to the NCE as a cheaper source of cheese than its committed suppliers or the spot market, depending on its flexibility in adjusting the amount taken from committed suppliers. In practice, Schreiber buys a small percent of its total needs on the NCE.[48]

Agricultural Cooperatives

Three of the leading traders in 1988-1993 were agricultural cooperatives: Associated Milk Producers, Inc. (AMPI), San Antonio, Texas; Mid-America Dairymen, Inc. (Mid-Am), Springfield, Missouri; and Land O' Lakes, Inc., (LOL), Minneapolis, Minnesota. In 1992 AMPI had 14,729 members with a total milk volume of 16.5 million pounds; Mid-Am had 13,108 members with a total milk volume of 16.5 million pounds; and LOL had 5580 members with a total milk volume of 4.2 million pounds.[49] These cooperatives have an economic interest in NCE prices from at least two standpoints. First, the farmer-members of cooperatives benefit directly from higher NCE prices because of the linkage to farm milk prices. Indeed, cooperatives that have sold on the NCE have at times been criticized by their farmer members because such sales are perceived as potentially lowering cheese and milk prices. Some cooperatives have become very hesitant to sell cheese directly on the NCE. Thus, cooperatives

---

[47] Analysis of margin data supplied by Schreiber for 1989-1992 reveals a statistically close but lagged linkage to NCE prices. The gross margins were positively related, with a several-week lag, to changes in NCE prices. An increase in NCE prices yielded only a modest increase in gross margins. Based on data supplied by Schreiber in response to a Demand for Production of Documents by the Wisconsin Department of Agriculture, Trade and Consumer Protection.

[48] During 1988-1993, Schreiber's average annual NCE purchases of 54 loads per year were an insignificant percent of its total annual purchases (Table 4.2).

[49] "Milk Up 2 Billion Pounds in Top 50 Co-ops," *Hoard's Dairyman*, October 10, 1993, p. 720.

have a public relations incentive for not selling on the NCE. During 1988-1993, Land O' Lakes sold more loads on the NCE (74) than Mid-Am (4 loads) and AMPI (18 loads).[50]

Each of these cooperatives converts and markets some cheese to supermarkets, food service accounts and industrial users. The linkage of NCE prices to the profitability of this part of their business is difficult to sort out. Mid-Am has no processed cheese operation. Its sales of natural cheese to food service and retail customers are directly or indirectly linked to the NCE, but this may not affect Mid-Am's margins in the same way they do those of Beatrice and Schreiber (through increased margins on processed cheese).

AMPI processes roughly 10 percent of the cheese it sells. Since AMPI does not have a strong brand, all of its finished product is formula-priced off the NCE or is sold in competition with other NCE formula priced products. AMPI's short-term profits from its cheese manufacturing business are probably positively linked to price increases on the NCE; its profits from their conversion-marketing business may also be slightly higher with higher NCE prices, all else remaining the same.

The Land O' Lakes processed cheese accounts for a substantial part of its total cheese business. In addition, Land O' Lakes is the only cooperative with moderately strong consumer brands for cheese (Land O' Lakes and Lake to Lake).[51] Insofar as these Land O' Lakes brands

---

50 AMPI sold 10 of these loads through a broker, as discussed in Chapter 6, Section A.

51 Land O' Lakes has the strongest consumer brands among these cooperatives. A public source reports that in 1992, Land O' Lakes retail brands accounted for 1.7 percent of all processed cheese, 3.7 percent of natural cheese, and 2.1 percent of natural shredded cheese. *I.R.I. Infoscan* data, Andrew W. Franklin and Ronald W. Cotterill, *Pricing and Marketing Strategies in the National Branded Cheese Industry*, Food Policy Center Research Report No. 26, Department of Agricultural and Resource Economics, University of Connecticut, September 24, 1994. In 1990, Land O' Lakes reportedly sold 53 million pounds to supermarkets. *SAMI 1990 Million Dollar Brands*. Neither of the

are sufficiently strong to price somewhat independently of NCE prices, Land O' Lakes gross margins for these sales may be negatively related to NCE prices. Since we do not know the extent to which their converted products are formula priced off the NCE and the extent to which they are list priced, we cannot estimate the effect of changes in NCE prices on the profits of Land O' Lakes' conversion/marketing business. The evidence indicates that Land O' Lakes brands are not nearly as strong as Kraft brands (Appendix Tables 6.9a and 6.11).

A farmer-owned cooperative interested in maximizing the joint profits of farmer-members and the cooperatively owned cheese operation is affected adversely when NCE prices decline and favorably when they rise. Insofar as the above three cooperatives engage in joint-profit maximizing, they have a financial interest in higher NCE prices, although they cannot be indifferent to the effect higher prices have on milk consumption and production. Unless they act in concert and control the supply of milk for manufactured products, in the long run the highest price they may achieve is the competitive equilibrium price, absent government support programs. They do, of course, have a strong incentive to prevent NCE prices from going below this price, which may occur if NCE prices are manipulated downward.

Brokers: Dairystate Brands, Inc.

Since Dairystate Brands differs from the traders discussed above, we are unable, *a priori*, to predict whether it has a financial interest in higher or lower NCE prices. The financial interests of brokers, *qua* brokers, are neutral with respect to the level of prices since brokers receive the same fee regardless of price. However, the party a broker represents may have an

---

other two cooperatives had sufficient retail brand sales to be reported by *SAMI* or *I.R.I Infoscan.*

interest in the level of prices. Small cheese companies that have cheese to sell presumably expect their brokers to obtain the highest available price, whether on the spot market or on the NCE. But some parties using a broker may have a different objective. As discussed in Chapter 6, on at least one occasion Dairystate represented a large company apparently interested in lowering the market. Finally, a broker may trade for speculative purposes, either acting in its own behalf or for others.

Because of the disparate interests of a broker or of its customers, we are unable to hypothesize whether Dairystate has an interest in higher or lower NCE prices. In Chapter 5 we seek insights into Dairystate's motives by examining its overall trading pattern on the Exchange.

Other Traders

Thirteen other concerns traded at least once on the Exchange during 1988-1993. Together they accounted for 7 percent of all purchases and 8 percent of all sales.

Bongards' Creameries, Bongards, Minnesota, was the largest of these, selling 75 loads on the NCE in three different years and buying none. Bongards' is an agricultural cooperative, primarily a cheese manufacturer, and was primarily a seller both in 1980-1987 and in 1988-1993 (Tables 4.1 and 4.2).

Masters Gallery Foods, Inc., which began operating in Plymouth, Wisconsin, in 1974, sold seven loads and bought 62 loads on the NCE during 1988-1993. Masters Gallery, a seller in two years and a buyer in two years, is a cheese marketer that manufactures no cheese; i.e., it purchases all the cheese it converts and markets. Its trading pattern on the Exchange is consistent with that expected of a cheese marketer that does not have a strong consumer brand.

Northern Wisconsin Produce Company, a cheese broker in Manitowoc, Wisconsin, sold 18 loads and bought 33 loads during 1988-1993. It was a seller in three years and a buyer in five years.

Marathon Cheese Corporation, Marathon, Wisconsin, sold 35 loads--all in 1990--and bought none. Marathon is a specialized cheese converter that engages primarily in the business of converting cheese into finished products for other companies, especially Kraft with whom it has had a co-pack arrangement for several decades.[52] It manufactures very little cheese. About 40 percent of the cheese it co-packs for other companies is supplied by those companies. Since Marathon is a co-pack converter, its financial interests appear to be unaffected by the level of cheese prices.

Schurman's Wisconsin Cheese Country, Inc., a cheese broker in Beetown, Wisconsin, sold seven loads and bought 20 loads on the NCE during 1988-1993. It was a seller in one year and a buyer in two years.

The remaining eight concerns each accounted for less than 1 percent of all NCE transactions during 1988-1993, most trading during only one or two years. All but three of these are located in Wisconsin. The three out-of-state concerns were Dairygold, Inc., Seattle, Washington, an agricultural cooperative (sold 14 loads); Golden Cheese of California, Corona, California, a cheese manufacturer and marketer (sold 10 loads of blocks); and Empire Cheese, Inc., Cuba, New York, a cheese manufacturer and marketer (bought 5 carloads). These concerns each traded during a single year and during relatively few sessions.

---

[52] Interview of Wayne Hangartner, former Director of Cheese Procurement and Inventories for Kraft, typed transcript of recorded interview, December 8-9, 1992, pp. 134-135.

Summary

The business characteristics of cheese companies determine whether, other things remaining the same, they benefit from lower NCE prices or higher NCE prices. We hypothesize that the *leading* traders on the NCE benefit as shown below.

Company	Benefit Financially if NCE Price is:	Total Loads Traded on NCE 1988-1993 Sales	Purchase
Kraft	Lower	1617	22[53]
Borden	Lower	59	32
Alpine Lace	Lower	130	3
Beatrice	Somewhat higher	0	773
Mid-Am	Higher	4	491
Schreiber	Neutral to Higher	7	322
AMPI	Higher	0	172
Land O' Lakes	Higher	72	189
Dairystate	Unclear	129	29

Source: Sales and purchases, Table 4.2.

The remainder of this chapter examines (a) the nature and purpose of trading in the spot market versus the NCE and (b) documentary evidence relating to trader motives.

D. Spot Trading as Alternative to the NCE

Whereas the NCE centralizes spot trading at one location for 30 minutes each Friday, there is a much larger spot market involving direct transactions at negotiated prices among cheese companies with short-term shortages or surpluses.[54] In recent years about 5 to 10 percent

---

53 Kraft's purchase of 22 loads of blocks in 1990 apparently was motivated by a desire to influence the block-barrel price spread, not because it needed blocks. See Chapter 5, Section E.

54 NCE sales are also spot sales, but herein the term *spot sales* shall refer only to those spot sales made off the NCE.

of all manufactured cheese has been sold in the spot market, whereas 0.2 percent has been sold on the NCE.[55] The fact that spot sales are more than ten times greater than NCE sales raises further questions as to whether the primary purpose of the NCE is to provide an "alternative source of supply and a place to dispose of surplus."[56] Some of those believing this function to be the primary purpose of the NCE view it as a *market of last resort*,[57] a place buyers or sellers turn to because other alternatives are unavailable.

The *market of last resort* rationale for Exchange trading is most plausible for small cheese manufacturers with limited knowledge of market alternatives; such companies might logically employ brokers to dispose of surplus cheese. This explanation does not imply, however, that they must sell on the NCE. Indeed, virtually all smaller cheese companies rely entirely on the spot market in disposing of their surplus cheese. And even those using brokers to

---

[55] Chapter 2, Section G. Company estimates of the size of the spot market vary. The 5 to 10 percent estimate is based on industry interviews.

All but two companies were unable to break out their spot sales or purchases. As shown in Appendix Table 4.3, during 1987-1992, Kraft, the largest seller on the NCE, reported sales of 61.3 million pounds of cheese on the NCE and 87.8 million pounds in the spot market. It also sold 23 million pounds of Swiss cheese in the spot market during 1989-1992. Kraft General Foods, Inc., *Raw Material Cheese Sales*, KGF 23755-23766.

Another large cheese marketer that bought virtually no cheese on the NCE during 1989-1991 made spot bulk cheese purchases representing over one-third of its total purchases. Borden, Inc. "Refrigerated Comparative Analysis Summary of Receipts by Vendor for Bulk Cheese."

Kraft responded on this point: "Overtime, approximately [...]% of the cheese Kraft purchases is cheese Kraft had previously committed to buy." Letter from Roibin Ryan, Kirkland and Ellis, to Reid Klopp and Bruce Marion, February 21, 1994. Information has been temporarily redacted pending judicial resolution of trade secret issues. See statement in Appendix Table 4.3.

[56] See notes 4-8 above.

[57] Kraft General Foods, Inc., Wayne Hangartner, former Director of Cheese Procurement and Inventories, said that the NCE may be viewed as a market of last resort. Typed transcript of recorded interview, December 8-9, 1992, p. 103.

dispose of surplus cheese on the NCE typically sell more in the spot market than on the Exchange.

Possession of limited market knowledge is an implausible reason for large companies to trade on the Exchange. Such companies have extensive knowledge of market conditions and communicate frequently with prospective buyers and sellers.[58] Those exploring spot market opportunities need expend little effort to learn whether any of the few companies trading on the Exchange are interested in buying or selling cheese. According to Kraft's former purchasing director, there are no special costs incurred in selling on the spot market rather than on the NCE, which has a charge of 0.25 cents per pound for both the buyer and the seller.[59] In fact, even the leading traders on the NCE typically do much more business in the spot market than on the Exchange. Many sizable proprietary and farmer-owned cooperative cheese companies *never* use the NCE, preferring to rely entirely on the spot market in dealing with short-term surpluses or shortages.

Spot market volume greatly exceeds NCE volume because spot trading has substantial advantages over NCE trading.

a. Spot traders are able to establish more precise delivery, age and quality specifications than are NCE traders. NCE trade specifications allow elements of uncertainty not present in spot trades. This problem is much less serious for barrels than for blocks.

b. Spot transactions may occur during all hours of each business day rather than during the typical NCE trading period of 30 minutes each Friday. In addition,

---

[58] In response to a legal demand by DATCP for this study, most large companies reported having regular communications with many other companies in the normal course of business.

[59] Kraft General Foods, Inc., Wayne Hangartner, former Director of Cheese Procurement and Inventories, typed transcript of recorded interview, December 8-9, 1992, pp. 96-97.

spot trades can be made by telephone from any location, whereas NCE trading requires physical presence or representation in Green Bay, Wisconsin.

c. NCE sales are F.O.B. Green Bay, Wisconsin or within 200 miles of Green Bay. Plants located some distance from Green Bay may avoid the freight charges associated with NCE transactions by trading in the spot market.

d. Spot traders need not pay the 0.25 cent per pound charge assessed on both the buyer and the seller on the NCE transactions. (Those using brokers typically pay 1 cent per pound for this service on both spot and NCE sales.)

e. Spot market trading provides an opportunity to trade at prices not immediately known to competitors. In competitive oligopolistic industries firms departing from the prevailing price generally do not wish to communicate this information to all competitors.

f. Spot sales give a seller control over who buys its product. For example, a distress sale made on the NCE may end up in the hands of a direct competitor that may use it to undercut the seller in its "natural market."[60]

g. The thinness of the NCE market and its widespread use in formula pricing discourage large cheese manufacturers and marketers from using the Exchange as an alternative outlet or source of supply. Cheese manufacturers are unwilling to sell on the NCE if doing so reduces NCE prices that are the basis for their *sales* under committed supply agreements. Cheese marketers with strong brands sold at list prices are reluctant to buy on the NCE if doing so increases NCE prices that serve as the basis for all their bulk *purchases* under committed supply agreements. Hence, the logical buyers and sellers in competitive cash auction markets are discouraged from using the NCE for these purposes. Spot trades do not create this conflict because the prices of committed supply agreements are not linked directly to spot prices.[61]

---

[60] For example, an internal company memorandum explains an incident occurring in September 1990 when NCE prices were falling:

> Golden MUST move 40 to 50 loads of blocks in September that they have not sold and they will send them to the market and lower [the price] till sold. They don't like [this] method of disposal because they may be purchased by a cutter and come back to California to dampen their own natural market. Consequently they have offered them to us in white form for processing at $0.1500 under block f.o.b factory with two weeks market protection after shipment. [[Source deleted in public report as not essential.]]

[61] The prices negotiated by spot traders may vary greatly, even in a single day, and may be above or below NCE prices, although the average spot price is usually some premium over the NCE price. When supplies are short, spot price premiums over the NCE increase and sometimes remain at that level for several weeks. When this happens, it suggests that the NCE price is not fully reflecting changes in supply and demand.

It is difficult to identify reasons why large companies would rather sell on the NCE than in the spot market, other than to influence the market price. In recent years, cheese sold on the NCE generally has commanded a lower price than cheese sold in the spot market. The lower prices can make the NCE an attractive, though less reliable, source of supply for buyers that need cheese beyond what they get from committed suppliers.

The thinness of NCE trading prevents the Exchange from serving as a reliable outlet for surplus cheese. A recent incident involving Pizza Hut illustrates this point. Pizza Hut reportedly accepted delivery of a futures contract of block cheddar cheese and attempted to dispose of it on the NCE. On May 13, 1994, Pizza Hut offered three loads of blocks on the NCE, initially at $1.2925 per pound. By the end of trading, Pizza Hut had reduced its offer 18 times but had never sold a load. As a result of the actions of Pizza Hut and other seller-traders, block prices dropped 10½ cents on that day with only one sale of 4 loads. Pizza Hut is no longer a member of the NCE, apparently concluding that it is an unreliable outlet for surplus cheese.

In sum, "the market of last resort" justification for the NCE appears specious, particularly for those few large companies that account for virtually all barrel trading. It is reasonable to assume that a seller could just as readily, and perhaps more readily, find a buyer by persistently

---

Sometimes the NCE price will rise sufficiently to eliminate the premium. Often, however, during periods of rising prices the premiums on spot sales may persist, and they do not disappear until NCE prices begin to fall (Appendix Table 4-4). The Federal and State Market News Service collects information on spot prices, which it calls "Wisconsin Assembly Point prices (WAP) and publishes a WAP price range each week. Industry representatives interviewed during the course of this study had mixed views concerning the accuracy and value of this price information. Some were not even familiar with it and others were very critical.

lowering the offer price in the spot market as by lowering the price on the NCE. At times such spot sales might require deeper price cuts than the seller wishes to accept. But selling at a less than desirable price also frequently happens on the NCE; indeed, at times NCE prices drop precipitously without any takers.[62] Often large buyer-traders appear to cover offers by a small company selling a few loads to "protect" the price the buyers receive for their committed supply sales. In such cases, of course, the purchases are made as a by-product of trader activity designed to influence NCE prices, not because the buyer needs the cheese.

If the NCE is indeed the market of last resort, as some traders claim, then can it be an appropriate basis for formula pricing virtually all other bulk cheese? Certainly, prices based on "distress" sales in a market as thin as the NCE are not an economically rational basis for formula pricing.

The economic conditions giving birth to the NCE and its predecessors are rooted in the fragmented cheese industry extant in the 1870s through the early decades of the 20th Century. Since then there has been a continuing consolidation of manufacturing operations among fewer and fewer cheese factories. Whereas in 1910 there were over 3560 cheese factories, by 1987 there were only 508 cheese firms, of which only 216 had sales of $100,000 or more. By 1987, the 20 largest manufacturers made 68 percent and the 50 largest made 82 percent of all natural and processed cheese sales (Appendix Tables 3.1 and 3.2).

Cheese manufacturing has also become geographically more disperse. Western and northeastern states have grown in cheese manufacturing while the north central states have declined. These changes and the great improvements in communication have decreased the need

---

[62] See Chapter 6.

for a central auction market at which buyers and sellers are physically present. Experience in other food and non-food manufacturing industries demonstrates that spot markets function effectively without centralized trading. Food manufacturers, such as fruit/vegetable processors and meat-packers, frequently have surplus or deficit problems, which they solve largely by dealing directly with one another in spot markets.[63] Viewing the NCE in the context of organizational changes within cheese and other food and non-food manufacturing industries raises the question, has the NCE become an anachronism?

NCE vs. Spot Sales of Kraft

As explained above, many factors make the NCE an unattractive outlet for sellers of cheese, particularly large sellers. Why then has Kraft, the leading buyer of cheese off the NCE,

---

[63] For example, each year vegetable canners attempt to "book" (commit) their entire expected pack from their own acreage and contracted acreage. After canners have processed their crop they frequently end up with a surplus or shortage, especially of some can sizes. They solve this problem in several ways: (1) they buy from or sell to other canners; (2) they sell surplus product to a food wholesaler or retailer with whom the canner had not previously booked any product; (3) they bid on government contracts; and (4) they place the remaining surpluses in inventory. The industry refers to the first kind of transactions as "inter-company" sales and the second as "spot" sales. Intercompany sales most closely resemble the definition used to describe spot sales in the cheese industry. Canners sometimes use brokers to make inter-company and spot sales, as well as to get bookings. As canners have become fewer and larger they have relied increasingly upon their own sales departments or their own "in-house" brokers in making spot sales. Whereas there were many canner brokers four or five decades ago, today there may be no more than a dozen nationally.

There is still a cash auction market for butter located at the Chicago Mercantile Exchange. Although we have not studied this market in any detail, it has virtually no trading volume: During 1989-1993, actual transactions on the butter exchange averaged 0.16% of total butter manufactured annually. Dairy Market Statistics, Annual Summary, AMS, USDA, 1989-1993. This extremely thin market apparently has survived solely because industry members wish to use it as a basis for establishing a public price for butter, not because it represents a meaningful alternative market outlet or source of supply.

often sold heavily on the NCE rather than in the spot market? Kraft's public position is that it trades on the NCE to buy and sell cheese in order "to balance its inventories with demand for its products."[64] Kraft's former Director of Cheese Procurement and Inventories, Wayne Hangartner, gave a similar explanation in interviews. He said Kraft sells more than it buys on the Exchange because of the way it manages its inventories:

> ...with the exception of going into a surplus cycle late in the year, our tendency is to insure that we have just a little bit more cheese than what we think we're going to need, so we don't run that risk of being off the shelf; the other primary reason is our relationship with our suppliers that we take their entire production irrespective of what develops throughout the year, and that more often than not has put us on the long side rather than the short side.[65]

But Hangartner's contention that Kraft always plans to carry a surplus does not explain its relatively large sales on the Exchange. Nor does it explain the sharp change in Kraft's trading activity on the NCE beginning in August 1986.[66] Hangartner's rationale implies that the NCE has been an important outlet for its surplus. However, our analysis demonstrates that Kraft usually handles planned or unplanned surplus in other ways and that much, if not all, surplus cheese sold on the NCE could have been sold elsewhere.[67]

As one method of handling surplus, Kraft does not always take the "entire production" of committed suppliers, as Hangartner implies above. For example, in 1991 Kraft faced the largest

---

[64] See at note 10 above.

[65] Typed transcript of recorded interview, December 8-9, 1992, pp. 63-64.

[66] For a discussion of Kraft's explanation as to why it apparently became a seller in 1986-1987, see Chapter 5, Appendix A.

[67] See Chapter 6.

unplanned surplus in recent years. During the first eight months of the year alone, Kraft reduced procurement receipts by 35 million pounds and reduced production by 12 million pounds.[68] During the entire year Kraft disposed of surplus by selling [...] million pounds in the spot market and [...] million to the CCC. On the other hand, Kraft's reported total sales on the NCE in 1991 were 13.8 million pounds. Examination of Kraft's 1991 NCE sales suggests that they could have been disposed of more profitably elsewhere (ignoring the cost effect if the NCE sales reduced the price Kraft paid for raw material purchases).[69] Whereas in 1991 Kraft calculated that it incurred losses of $240,468 on NCE sales, it enjoyed a gain of $1,041,225 on spot market sales of barrels and blocks ($1,984,297 including spot sales of 640-pound squares) and $89,824 on CCC sales (Appendix Table 4.3).[70]

---

[68] See Chapter 6, note 51.

[69] See Chapter 6, Section C. Some of the above information has been redacted from the report at this time pursuant to an agreement with Kraft General Foods, Inc., that there will be a subsequent judicial resolution of a good-faith dispute over the trade secret status of the information.

[70] Wayne Hangartner, former Director of Cheese Procurement and Inventories, stated that he had directed that the losses and gains for spot, CCC and NCE sales as summarized in Appendix Table 4.3, be calculated to show the actual gains or losses on each transaction:

> ...I initiated this report some years ago; it's to include all costs of that specific cheese as opposed to the way...we use inventory averages as far as accounting for the volume of cheese. I wanted to know specifically on the exact cheese that I would sell, either to the government, to the trade or on the Exchange, whether I was making a profit or making a loss; so I would include what we pay for the cheese, if it was in storage, what it cost to ship it to that storage, the storage and handling cost, any cost associated with that specific lot of cheese that I sold. Kraft General Foods, Inc., typed transcript of recorded interview, December 8-9, 1992, p. 97.
>
> The spot sales may include some Colby and an occasional load of Monterey Jack but no hard styles. *Id.* 107.

Kraft also experienced losses on its total NCE sales during 1987-1992 while experiencing gains on spot and government sales. For all years combined, Kraft calculated that it fared as follows on barrel and block cheese sales to the various outlets: it *lost* an average of 2.4 cents per pound on NCE sales, and *gained* an average of 3.3 cents per pound on outside spot sales and 0.2 cents per pound on government sales. If 640-pound squares (which are close substitutes for 40-pound blocks) are included, the gains on spot sales were 4.1 cents per pound (Table 4.3).[71]

To determine the extent to which differences in price affect the relative profitability of spot and NCE sales, we compared cheddar cheese of comparable age (4 weeks or less) sold in carlots at approximately the same time in the spot market and on the NCE. Table 4.4 shows Kraft spot sales of 500-pound barrels and 40-pound blocks and 640-pound squares made within three days of comparable sales on the NCE.[72] The table makes two comparisons: (a) For each day Kraft sold on the NCE, the price it received on the Exchange is compared with the price received for any spot sales made within 3 days of the NCE sale; and (b) for weeks in which Kraft did not sell on the NCE, the price Kraft received for each spot sale is compared with the NCE price within three days of the spot sale.

---

71 These values are based on Kraft's own method of calculating gains and losses. See note 70.

72 Although only loads of 40-pound blocks were sold on the NCE during 1988-1993, we have included spot sales of 640-pound blocks in the comparisons because there appears to be no significant difference in the average price Kraft received for spot sales of 40-pound and 640-pound blocks of cheddar cheese sold in carlots. See note in Table 4.4.

Table 4.3. Kraft Gains or Losses on Raw Material Cheese Sales: NCE, Outside Sales, and Government, 1987-1992

	NCE		Outside Sales		Government	
	Total Volume (thousands of pounds)					
	Loads	Pounds	Loads	Pounds	Loads	Pounds
Blocks	297	11,969	514	20,684	484	20,231
Barrels	1,214	49,322	717	30,787	1,509	61,666
Squares[1]	--	--	984	36,290	--	--
TOTAL	1,511	61,297	2,265	87,762	1,993	81,897
	Gains or Losses in Cents per Pound					
Blocks	(6.16)		0.80¢		0.62¢	
Barrels	(1.49)		3.89		0.05	
Squares[1]	--		6.15		--	
TOTAL	(2.40)¢		4.09¢		0.187¢	
	Total Gain or Loss					
Blocks	($737,797)		$165,634		$125,128	
Barrels	(733,335)		1,196,795		27,596	
Squares[1]	--		2,230,437		--	
TOTAL	($1,471,132)		$3,592,866		$152,724	

Source: Kraft General Foods, Inc., Appendix Table 4.3

[1]Squares are 640-pound blocks.

Table 4.4. Comparison of Prices Kraft Received for Spot Sales with NCE Prices, 1989-1992

Year	Price Comparison for Weeks Kraft Made Both Spot & NCE Sales					Price Comparison for Weeks Kraft Made Only Spot Sales			
	Spot Loads[5] (1)	Average Spot Price (2)	NCE Loads (3)	Average NCE Price[1] (4)	Spot Less NCE[2] (5)	Spot Loads (6)	Average Spot Price (7)	Average NCE Price[3] (8)	Spot Less NCE[4] (9)
500-Pound Barrel Cheese									
1989	13	$1.1592	48	$1.1396	$0.0196	6	$1.1250	$1.1225	$0.0025
1990	5	1.3825	3	1.3275	0.0550	70	1.4021	1.3580	0.0441
1991	260	1.2930	146	1.2631	0.0299	221	1.2022	1.1859	0.0163
1992	9	1.1953	23	1.1935	0.0018	9	1.2250	1.2219	0.0031
TOTAL	287	--	220	--	--	306	--	--	--
Average[5]	--	1.2854	--	1.2564	0.0290	--	1.2471	1.2251	0.0220
40-Pound and 640-Pound Block Cheese									
1989	--	--	--	--	--	2	1.2125	1.1775	0.0350
1990	8	1.1559	12	1.1068	0.0491	20	1.2520	1.1981	0.0539
1991	220	1.3048	67	1.2617	0.0431	248	1.2412	1.1999	0.0413
1992	159	1.2990	82	1.2454	0.0536	286	1.3390	1.2914	0.0476
TOTAL	387	--	161	--	--	556	--	--	--
Average[5]	--	1.2993	--	1.2518	0.0475	--	1.2918	1.2469	0.0450

Source: Kraft Sales Confirmation letters (see next page) and National Cheese Exchange, Trading Activity Minutes, AMS, USDA.
Note: For 354 loads of Kraft's spot barrel sales, Kraft sales confirmation letters identified the age of cheese as 4 weeks or less; for 239 loads, the age was not identified. We assume the "no information" cheese is 4 weeks old or less. The average price difference between Kraft spot sales of cheese 4 weeks old or less and NCE price is $0.0279/lb. For spot sales with no age information, this difference is $0.0291/lb. All of the spot block (40 & 640 lb.) cheese sales were 4 weeks old or less. The average price difference between Kraft spot sales of 40 lb. blocks and NCE price is $0.0464/lb. For spot sales of 640 lb. blocks, this difference is 0.0478/lb.

[1]Average price Kraft received for sales on NCE within 3 days of a Kraft spot sale.
[2]Column 2 less Column 4.
[3]Average NCE price calculated as the average of the previous week final price and the NCE final price on a day within 3 days of a Kraft spot sale.
[4]Column 7 less Column 8.
[5]All prices are weighted averages based on quantity sold in the spot market.

Table 4.4 (cont.) Bates Numbers for Kraft Sales Confirmation Letters Showing Information on Spot Sales of Cheese Used in Table

14866	15083	22387	22607
14868	15086	22388	22608
14869	15087	22391	22609
14870	15089	22392	22610
14871	20143	22393	22611
14872	20151	22394	22612
14873	20163	22395	22614
14875	20164	22396	22615
14876	20166	22397	22616
14877	20169	22400	22618
14878	20170	22401	22619
14883	20172	22402	22620
14885	21844	22403	22621
14886	21846	22404	22622
14887	21847	22406	22623
14889	21848	22409	22624
14891	21854	22410	22626
14892	21856	22411	22627
14893	21857	22412	22628
14894	21858	22414	22630
14896	21861	22417	22632
14897	21863	22418	22634
14899	21865	22419	22635
14900	21867	22420	22636
14902	21869	22421	22638
14903	21870	22422	22639
14904	21875	22423	22640
14908	21876	22424	22641
14909	21877	22425	22642
15004	21878	22428	22643
15034	21879	22429	22644
15055	21909	22430	22645
15056	21931	22431	22646
15057	21939	22436	22649
15058	21960	22444	22650
15060	21961	22445	22651
15064	21976	22447	22653
15066	22002	22451	22654
15067	22046	22453	22661
15068	22047	22454	22662
15069	22376	22457	22663
15070	22377	22464	22666
15071	22379	22472	22667
15072	22380	22479	22671
15073	22381	22595	22678
15076	22382	22599	22734
15077	22383	22602	
15078	22384	22603	
15080	22385	22604	
15081	22386	22606	

These comparisons document that for the four-year period 1989-1992 Kraft received an average of 2.9 cents per pound more for comparable age 500-pound barrel cheese sold in the spot market than for such sales made on the Exchange. During weeks when Kraft did not sell on the NCE, its price for barrel cheese sold in the spot market averaged 2.2 cents per pound more than the average NCE price at the time.

For 40- and 640-pound block cheese, Kraft received an average of 4.75 cents per pound more for cheese sold in spot sales than for comparable age cheese sold on the NCE. In weeks when Kraft did not sell on the NCE, its price for block cheese sold in the spot market averaged 4.5 cents more per pound than the average NCE price at the time (Table 4.4).

In order to compare the above price difference with the profit differences calculated by Kraft for NCE and outside spot sales, we examined the figures for 1991, the year of Kraft's greatest spot and NCE trade volume. In 1991 the price per pound differences between spot and NCE barrel sales using the two comparisons reported in Table 4.4 were 3.0 cents per pound and 1.6 cents per pound; for blocks the two comparisons yield price differences of 4.3 cents and 4.1 cents. These differences were smaller than the differences in profitability between NCE sales and outside spot sales that Kraft calculated for 1991: 5.1 cents for barrels and 6.7 cents for blocks (Appendix Table 4.3). Apparently, not only did Kraft receive lower prices for NCE sales than for spot sales, but also the costs associated with Kraft's NCE sales were higher than the costs associated with spot sales. Several factors may explain this difference. First, Kraft sometimes sells cheese on the NCE from plants as distant as Stephenville, Texas, and Tulare,

California.[73] Whereas transportation costs on spot sales can be minimized by shipping directly between plants, all NCE sales are priced FOB within 200 miles of Green Bay. Also, the NCE charges 0.25 cent per pound for the seller and 0.25 cent per pound for the buyer. Kraft also incurs extra storage costs if it temporarily places cheese in Green Bay warehouses to have available for trading purposes.

There is also documented evidence that Kraft sold on the NCE at times when it could have sold in the spot market. A Kraft memorandum dated April 6, 1992, from Jeffrey C. Voermans, Regional Procurement Manager, to Wayne Hangartner, Director of Procurement, included a list of requests for cheese made to Voermans on or after the Exchange.[74] On March 30 one company requested 4-5 loads of barrels aged 2-4 weeks. Rather than sell these loads to the company in the spot market, Kraft sold two truck loads to it on the NCE the following Friday, April 3, 1992. On March 30 and 31 three other companies also expressed a desire to buy barrel or block cheese aged 30 days or less (the age of cheese sold on the NCE). The memorandum reports that no action was taken in one case involving a request for 4-5 loads of barrels; a second party requesting 2 loads of barrels was told that Kraft sold its excess cheese directly to customers; a third party requesting 4 loads of blocks was told none was available. In fact, however, the following Friday, April 3, 1992, Kraft sold 27 loads of barrels and two loads of blocks on the NCE. Thus, Kraft had cheese available for sale when the requests were made but chose to sell on the NCE rather than the spot market, despite the fact that Kraft generally received higher prices in the spot market than on the Exchange (Tables 4.3 and 4.4). Evidence

---

[73] Stephenville is over 1,000 miles from Green Bay and Tulare is about 2000 miles from Green Bay. This involves a freight differential of almost 2.5 cents per pound.

[74] Kraft General Foods, Inc., Jeff Voermans to Wayne Hangartner, Director of Cheese Procurement and Inventories, "Requests for Cheese," April 6, 1992, KGF 16023-16024.

clearly indicates that spot prices in early April were higher than NCE prices: the average WAP premium was 2.5 cents above the NCE price for barrels and 5.0 cents for blocks (Appendix Table 4.4).

Other evidence shows that Kraft retained surplus cheese for NCE trading purposes even when it could have sold more profitably in a "tight" spot market.[75] An internal memorandum of a large cheese marketer stated:

> Barrels continue to be in tight balance. Kraft has agreed to sell [us] 10 loads of barrels to be delivered next week. Wayne [Kraft Director of Purchasing] said that Kraft's usage is up for a couple weeks due to buying as a result of price increases. Wayne believed that they don't want to carry more than they need for their own requirements; however, *he wanted to have some trading inventory* (emphasis added).[76]

Kraft generally had "trading inventory" available since its policy was always to carry some surplus cheese.[77] Because Kraft had first call on the cheese from committed suppliers, Kraft could prevent such suppliers from selling surplus cheese in the spot market if Kraft wished to sell it on the NCE. A July 13, 1990, memorandum of a Kraft competitor explained such a situation.

> Stephenville [an AMPI cheese plant in Stephenville, Texas] cut us 1 load of blocks this week and I understand they cut Mid-Am more in favor of shipping Kraft more. However, the blocks that Mid-Am bought from Kraft last week [July 6] on the exchange was filled with Stephenville blocks.[78]

The timing of these events is significant. NCE barrel and block prices had risen about 20 cents per pound between the end of March and the end of June 1990. Beginning the week of

---

[75] The week of September 20, 1991, the average WAP spot market price for barrels was 3.5 cents per pound above the NCE barrel price (Appendix Table 4.4).

[76] [[Source deleted from public report as not essential.]]

[77] See at Chapter 6, note 95.

[78] [[Source deleted from public report as not essential.]]

July 6, Kraft began selling into the market until prices peaked July 17. The following weeks Kraft offered cheese and prices declined steadily. This illustrates the manner in which Kraft may use its control over committed suppliers to direct sales away from the spot market to the NCE.

The Assistant Manager of the North Central District of AMPI (a large Kraft supplier) informed an investigator of the Wisconsin Department of Justice that Kraft had carried excess supplies to "keep the market level."

> [D]uring the last couple years Kraft has had more cheese under contract than they need for their own production. Mr. Mammen explained that Kraft makes these purchases in anticipation of market trends as well as *to keep the market level.*[79]

These facts are consistent with the hypothesis that Kraft sells on the NCE, not to sell on the most profitable market alternative available, but rather to influence prices.

---

[79] Rosemary Perrizo, Investigator to Matt Frank, Assistant Attorney General, Wisconsin Department of Justice, Interview of Harlan Mammen, AMPI, March 31, 1988, p. 4. (Emphasis added.)

In an interview with Mark Firth, Manager of AMPI North Central, the latter said that Mammen's remarks "would have had to have been speculation. There's no logical way that Harlan could have any...first hand knowledge of exactly what Kraft's internal needs were, their decisions, you know." Typed transcript of recorded interview, July 29, 1993, p. 24.

We believe that, as Kraft's largest supplier, AMPI management personnel were in an especially advantageous position to interpret Kraft's conduct.

E. Evidence of Trader Motives

Here we discuss various documentary evidence relevant to the issue of trader motives. Because of its prominent role in NCE trading we begin with Kraft.

Evidence of Kraft's Motives

The following rationale for Kraft trading appears in a 1989 internal document under the section heading, "Kraft--National Cheese Exchange Strategy."

> -As one of many participants in the competitive cheese market, Kraft's primary objective at the NCE is to contribute to price discovery--i.e., by bidding and offering Kraft's view of industry supply and demand conditions are conveyed to the market place.
>
> -Kraft should be in a position to buy or sell cheese to reinforce the market fundamentals.
>
> -Tactical procurement decisions on whether to buy, hold, or sell, how much and what price are made weekly and reflect the most current information available about the industry.[80]

Various other references suggest that Kraft views its trading activity on the NCE as an important factor in managing cheese costs. Because Kraft planning documents usually consist of outline presentations with little or no text concerning the various subjects included in the outline, these references tend to be quite cryptic. As an example, Kraft's *Refrigerated Products Groups 1990 Strategic Plan* states that "Cheese commodity cost management must be a strategic

---

[80] Kraft, General Foods, Inc., *1990 Cheese Inventory and Procurement Strategy*, Operations, December 12, 1989, KGF 3002, 3011. Wayne Hangartner, former Director of Cheese Procurement and Inventories, said that he disagreed with the document. He said that the "[E]xchange is not there as a price discovery mechanism...it's there solely for the purpose of people selling cheese if they so desire, or to buy cheese if they so desire; as a result of that, the industry has chosen to use that activity to develop an opinion as to what supply and demand conditions that dictate the value of cheese shall be." Typed transcript of recorded interview, December 8, 1992, p. 61. Marcia Glenn, Director of Dairy Economics, Kraft General Foods, Inc., characterized the difference between her and Hangartner's view of the Exchange as: "An economist's view versus a businessman's view." *Id.*

priority." Among the "Key issues to consider" in achieving this objective the Plan lists four items including the "Role of the Green Bay Exchange."[81] A December 6, 1989, document, entitled "Cheese Procurement Strategy," lists various objectives, one of which is to *maximize profit.*[82] The first item listed under its "Plan" to achieve the profit maximization objective is, "-Utilize industry price discovery mechanism--NCE."[83] A somewhat similar cryptic statement appears in Kraft's *Refrigerated Products Group 1988 Strategic Plan,*[84] which discusses how "Kraft Can Realize 3 Key Advantages with an Effective Milk Procurement Strategy."[85] It lists several items under the topic heading: "Developing Analysis, Conclusions and Strategic Formulation to Guide Decisions," with one of the items being, "-What Basis/When Should Kraft Move Cheese Prices?"[86]

None of the above sources elaborates as to how Kraft could use the NCE to manage cheese costs. However, the planners' repeated allusions to the Exchange in the context of controlling costs and maximizing profits imply a belief that trading conduct on the NCE could play a strategic role in managing cheese procurement costs.

---

81 Kraft General Foods, Inc., *Refrigerated Products Group, 1990 Strategic Plan*, December, 1989, KGF 21183, 21192.

82 Kraft General Foods, Inc., *Cheese Procurement Strategy*, Operations, December 6, 1989. KGF 2948, 2992.

83 *Id.*, KGF 2996.

84 Kraft General Foods, Inc., *1988 Strategic Plan, Sources of Value Addition--Procurement/Manufacturing Strategy*, KGF 21112.

85 *Id.*, KGF 21114.

86 *Id.*, KGF 21115.

On April 12, 1990, a document entitled *Short-Term Cheese Options*[87] was prepared (with the assistance of Kraft personnel) by McKinsey Company consultants for purposes of discussion with senior Kraft management.[88] The document summarized the short-term problems facing Kraft, including the likelihood that, "If the current relationship between Kraft wholesale price and raw material costs does not improve, the result will be a [...] per month shortfall versus financial plan." The document then spells out several "options" open to Kraft, including trading on the NCE to influence barrel prices. This document is discussed in greater detail in Chapter 6, Section B, where we examine it within the context of market conditions before and during April 1990. Suffice it to say here that, in our opinion, this document implies that Kraft believed it could enhance profitability by influencing prices on the NCE.[89]

In sum, the various Kraft documents cited above provide further support for the hypothesis that Kraft participated in NCE trading for the explicit purpose of influencing price. These various references to the NCE imply that Kraft decision-makers believed that trading on the NCE could play a strategic role in maximizing profits by managing cheese procurement costs.

---

87 Kraft General Foods, Inc., *Short Term Cheese Options*, Kraft, USA, Discussion Outline, April 12, 1990, KGF 3026, 3027.

88 Typed transcript of recorded interview, December 8, 1992, pp. 66-69. Senior management who met with McKinsey included Jim Kilts, president, and Dick Baily, Vice-President of Operations, Kraft USA. Wayne Hangartner, Director of Cheese Procurement and Inventories, said that senior management hired the McKinsey company personnel. Typed transcript of recorded interview, December 8, 1992, p. 67-68.

89 Kraft personnel interviewed in the course of this study said that the McKinsey document does not reflect Kraft policy and was not acted upon. See Chapter 6, note 28, for the reasons we believe this document does indicate that Kraft believes it can influence NCE prices to its benefit.

Evidence of Other Leading Traders' Motives

In both public statements and interviews, most leading traders repeatedly said they bought or sold cheese on the NCE primarily because they had shortages or surpluses of cheese.[90] However, a variety of documentary evidence supports the hypothesis that leading cheese companies had a financial motive for attempting to influence NCE prices. An executive of a leading cheese marketer explicitly stated that the interest in NCE prices of companies selling strong brands conflicts with the interest of those selling primarily private label brands to retailers or to food service customers. He explained that most companies selling branded products at list prices,

> ...would like to see a lower cheese market. That will give [them] the best...profit opportunities. [Such opportunities occur because] they have list prices, and therefore, they like to see, you know, not the lowest...but they like to see...certain low points in the cheese market....[91]

On the other hand, companies like Beatrice and Schreiber that sell substantial amounts of private label brand processed cheese or cheese food to retailers and food service customers have an interest in higher NCE prices. As explained above, if companies formula-price their selling price for processed cheese and cheese food products off the NCE, their price-cost margins rise

---

[90] Some buyer-traders have said they buy primarily on the NCE because they need cheese and that NCE prices are lower than the spot market. While this may explain some of the buying activity of Beatrice, Mid-Am and Schreiber, it does not explain why these buyer-traders bid up prices repeatedly in a rising market, sometimes for weeks, without getting any cheese on the NCE. The only rationale for such bidding is to raise prices, either to raise their cheese margins or as a signal that the traders believe higher prices are needed to assure an adequate supply of bulk cheese.

[91] Borden, Inc., Han Kim, Vice President-General Manager Refrigerated Products, typed transcript of recorded interview, August 31, 1993, pp. 68-69.

with increases in NCE prices, other things remaining the same.[92] The executive of a leading company stated that because of their conflicting interests, "Beatrice and Schreiber will be at one side of the camp, whereas Kraft will be at the other side of the camp as to how they perceive the prices."[93]

One trader identified Kraft and Beatrice as market leaders, saying he deferred to their judgment. As he put it,

> [E]arlier this year Beatrice was bidding--we didn't feel that the market would be going up, but...we don't have the clout or the backing of a big inventory to offer a counter opinion. We just kinda sit there and scratch our heads and say, you know, we don't understand why the market's going up. And we can only assume that Kraft and the other people who do have these big inventories,...share the same opinion as Beatrice.[94]

One cooperative executive acknowledged that agricultural cooperatives have an inherent interest in higher NCE prices:

> AMPI and Mid-Am,...if [they] have any bias, it would be toward wanting higher prices. [They] certainly want higher prices, but [they] must accomplish that within the constraints of the marketplace....[95]

In 1988, the CEO of Mid-America, Gary Hanman, stated explicitly in a memorandum to Mid-Am members that the cooperative had successfully taken three steps to increase milk prices of farmer members.

---

92 See text at notes 40 and 41 this chapter.

93 [[Source deleted from public report as not essential.]]

94 [[Source deleted from public report as not essential.]]

95 Interview of Mark Firth, North Central Regional Manager, AMPI, typed transcript of recorded interview, July 29, 1993, p. 39.

With your help, we've convinced Congress to increase price supports, we've increased over order premiums; and *we've raised the Green Bay Cheese Market.*[96]

He elaborated on the last point as follows:

...Mid-America Farms...bid the Green Bay 40-lb. block cheese market up 4¢ per pound. Mid-America Farms needed some cheese--and went to the market to buy. On Friday, July 29, we moved the market up 2.5¢ per pound and bought two carloads of cheese (80,000 lbs.). The following Friday, on August 5, we again bid for 40 lb. blocks of cheese--moved the market up another 1.5¢--and never bought a pound of cheese. These two cheese market movements will be the equivalent of 40 cents per cwt. in your future milk checks.[97]

According to a press report, Mr. Hanman again referred to Mid-Am's activity on the NCE at subsequent Mid-Am informational meetings:

According to Mr. Hanman, the way to get a better price for all farmers is to boost the Minnesota-Wisconsin price series. He said Mid-America had started to bid at the Green Bay Cheese Exchange and has been able to help boost that price although it had to purchase very little cheese on the open market because of the tight supply.

"We had decided to get into the market. The only way to move the Minnesota-Wisconsin price is to try to buy cheese on that market," he said.[98]

Mid-Am's action caused NCE president Richard J. Gould to call a special meeting of the Board of Directors of the NCE.[99] Because Mid-Am's action had allegedly damaged the

---

[96] Mid-Am Member Memos, Vol. 15, August 1988, p. 1. (Emphasis added.)

[97] Mid-Am Member Memos, Vol. XVI, August 1988, pp. 1,2.

[98] *The Country Today*, September 7, 1988, p. A8. Although the date on which Mr. Hanman made the above statement was not given by this source, *Agri-View*, September 9, 1988, Section 2, reported that Hanman had made a similar remark at a September 1, 1988, meeting at Eau Claire and at other meetings in Mid-Am's territory. Hanman reportedly said that co-op managers were "disturbed that the M-W didn't move in June...the way to move the M-W was to buy at Green Bay." Joel McNair, "Mid-America Temporarily Off Exchange," *Agri-View*, Section B, September 15, 1988.

[99] The minutes of that meeting state, in part:

A special meeting of the Board of Directors of the National Cheese Exchange was held on September 2, 1988, ...to consider action against Mid-America Dairymen, Inc...in communicating to its members that through its activities at the Trading

"integrity of the Exchange and the validity of its transactions," the Board adopted the motion of Exchange president Richard J. Gould that Mid-Am be "suspended from the privilege of trading on the Exchange for a period of two months," the maximum permissible suspension.

In a letter to Mid-Am's general counsel explaining the NCE's action, President Gould said:

> First of all, you should understand that the Board of Directors of the Exchange does not believe any action of Mid-America Dairymen, Inc., manipulated the Cheese Market on July 29, 1988, or August 5, 1988. *It is generally known that the recent price increases have been a result of general market condition and that no one individual member can manipulate prices* on the National Cheese Exchange, Inc. Prices move as a result of interactions between buyers and sellers and general market conditions (emphasis added).[100]

> Sessions of July 29, 1988, and August 5, 1988, it had increased the price of cheese and thereby the price paid its members for milk....While the Board was satisfied that Mid-America Dairymen, Inc. had not by its bidding on the two dates mentioned increased the price of cheese, the letter represented and boasted to its recipients that the price of cheese had been *unilaterally manipulated* through the bidding activities of Mid-Am for the benefit of its members.
>
> The assertion that Mid-Am manipulated the upward movement of cheese prices was obviously damaging to the reputation of the Exchange in that it implied that its members can use the facilities of the Exchange for illegal price fixing purposes. The letter was felt particularly detrimental to the Exchange in view of the fact that the Exchange and its members had within the past year been publicly accused by members of the Wisconsin Legislature of illegal price fixing and had been the subject of an investigation by the State of Wisconsin Attorney General. Minutes of the Directors, National Cheese Exchange, September 2, 1988. (Emphasis added.)

[100] R.J. Gould, President of NCE, to Wayne H. Hoecker, Gage & Tucker, "Re: Mid-America, Inc., September 6, 1988." Mid-Am counsel had previously written R.J. Gould that "Mid-America Dairymen vigorously denies that its actions on the Exchange on July 29 and August 5 constituted any sort of market manipulation. These actions were taken for the legitimate purpose of buying cheese to fill market demand." Wayne H. Hoecker to Richard J. Gould, September 2, 1988.

At a special NCE Board of Directors meeting September 23, 1988, Dr. Lonnie Spurgeon of Mid-Am was given an opportunity to explain Mr. Hanman's memo dated August 1988.[101] Following a discussion of the matter, no motion was made to lift the suspension.[102]

One significant aspect of the Mid-Am affair is that the Board of Directors seemed preoccupied with protecting the integrity and reputation of the Exchange as a highly competitive market rather than with considering seriously whether Mid-Am's action may have raised prices or may have been taken in concert with others. The Board summarily dismissed the possibility that market manipulation had occurred, because, as Mr. Gould asserted, "It is generally known that...no one individual can manipulate prices on the National Cheese Exchange, Inc. Prices move as a result of interaction between buyers and sellers and general market conditions."[103]

The Board's deliberation and action focused solely on Mid-Am's NCE bidding in blocks only on July 9 and August 5, the days mentioned in the Mid-Am memorandum, even though

---

[101] The Board minutes report that

> Mr. Spurgeon...stated, among other things, that he considered that the words used by Mr. Hanman in the memo were not the best but that this was Mr. Hanman's way of "completely communicating" with Mid-America's members. Mr. Spurgeon apologized for the words that were used and admitted that the memo cast the Exchange in a bad light, regretted that Mr. Hanman had used the words that he did use in the memo and acknowledged that the activities of Mid-America could not have resulted in an increase in cheese prices. Mr. Spurgeon concluded by asking the Directors to consider lifting the suspension. Minutes of the Board of Directors, National Cheese Exchange, September 23, 1988.

[102] *Id.* In another action, the Board amended Section 4 (a) of Article III of the Exchange Bylaws to read, in part, that a member can be suspended from trading "for any conduct considered detrimental to the interests or welfare of the Corporation. Suspension in each case shall be for such period of time as may be designated by the Board of Directors not exceeding six months." This action increased the permissable period of suspension from two months to six months. *Id.*

[103] R.J. Gould, President of NCE, to Wayne H. Hoecker, General Counsel, Mid-America Dairymen, Inc., September 6, 1988.

Mid-Am also led bidding for blocks in the following two weeks, when block prices rose 2.75 cents per pound and 4.75 cents per pound, respectively. On neither day were Mid-Am's nor any other traders' bids filled.

While analyzing the situation, it is useful to place Mid-Am's activity in a broader context, as well as Mr. Hanman's comments regarding this activity. In prior years Mid-Am had made very few purchases on the NCE. In fact, it had bought no loads in 1987, the first full year Kraft was exclusively a seller-trader on the Exchange, accounting for 70 percent of barrel sales and 47 percent of total sales.[104] In a September 1987 memo to members, Mid-Am CEO Hanman accused Kraft's large sales on the NCE of both holding down the cheese market and manipulating the price of cheese.[105] NCE president Gould, in commenting on that episode in 1988, wrote, in part:

> It was obvious then and it is obvious now that Gary [Hanman] does not understand the function of the Exchange and does not seem to care about learning.[106]

Perhaps Mr. Hanman had inferred that since Mr. Gould apparently believed Kraft's extensive *selling* activity on the NCE posed no threat of market manipulation, neither would he consider Mid-Am's *buying* to be problematic. If the activities themselves were not against regulations, then Mr. Hanman violated NCE rules only because he told his members why he was buying. In 1988, Mid-Am bought only six loads on the NCE (1.7 percent of total purchases on the NCE), whereas Kraft made 77 percent of all sales on the NCE in that year.

---

[104] Table 4.1 and Appendix Table 4.1a.

[105] National Cheese Exchange, "Mid-America Farms Suspension," September 6, 1988. This is a file memorandum written by Mr. Gould.

[106] *Id.*, p. 2.

Following its two month suspension, Mid-Am virtually ceased trading on the NCE for over one year. It bought only three loads in the last two months of 1988 and sold three loads in 1989. Mid-Am resumed buying on a modest scale (48 loads) in 1990. It then became the largest buyer on the NCE in 1991 and was second only to Beatrice in 1992 and 1993 (Table 4.2). The NCE president and Board apparently have not objected to this activity.

Mr Gould was correct when he concluded that Mid-Am had not *unilaterally* increased NCE prices in July and August 1988. Although Mid-Am led the bidding on each of four weeks in July and August, it was joined by other buyers, particularly Beatrice. Indeed, Mr. Hanman told his members that Mid-Am had not done it "by ourselves."[107] Moreover, seasonal market conditions doubtless warranted some price increases in this period.

The NCE Board was correct in concluding that Mid-Am had not "unilaterally" manipulated prices. But given the thinness of trading on the NCE, one cannot infer categorically that a much larger trader could not unilaterally influence NCE prices or that two or more leading traders acting in concert, either by explicit or implicit agreement, could not manipulate the thin NCE market. As discussed in chapter 3, empirical studies of auction markets indicate that their competitive performance is significantly influenced by the number and size distribution of participants.[108]

Another alleged attempt to manipulate the NCE occurred August 24, 1990. On that day, according to NCE activity minutes, after prices of blocks had fallen 2.5 cents on a series of

---

[107] Indeed Mid-Am's CEO, Gary Hanman, acknowledged as much when he reportedly told his members on September 1, 1988, that "Mid-Am did it. Not by ourselves, but we led the way." *Agri-View*, September 9, 1988, p. 16.

[108] See Chapter 3, note 37.

offers and reduced offers, Kraft (K) covered three offers of Alpine Lace (AP) at $1.4225 (Figure 4.1). Then, on the last trade of the day, Beatrice (BF) covered an outstanding offer by Dairystate (DS) on two loads of blocks at $1.4325, one cent above the immediate prior offer just covered by Kraft at $1.4225.

According to NCE president Gould, Beatrice's trader on the Exchange, Jerome Folz, admitted to Gould following the trading session that the purpose of the trade was

> ...to establish a higher market for 40 pound block. This appeared to be a deliberate attempt of Beatrice to manipulate the market and I so advised Mr. Folz. His response was that if this was "illegal" we should change the rules.[109]

The NCE Board of Directors held a special meeting on this matter August 31, 1990, at which Mr. Folz denied admitting that his trading on August 24, 1990, was to manipulate the market. Beatrice president Robert Burns stated that NCE rules for trading contained "gray areas" and needed improvement.[110]

The majority of the Board believed that a letter of reprimand should be prepared and sent to Beatrice advising that because such trading activity

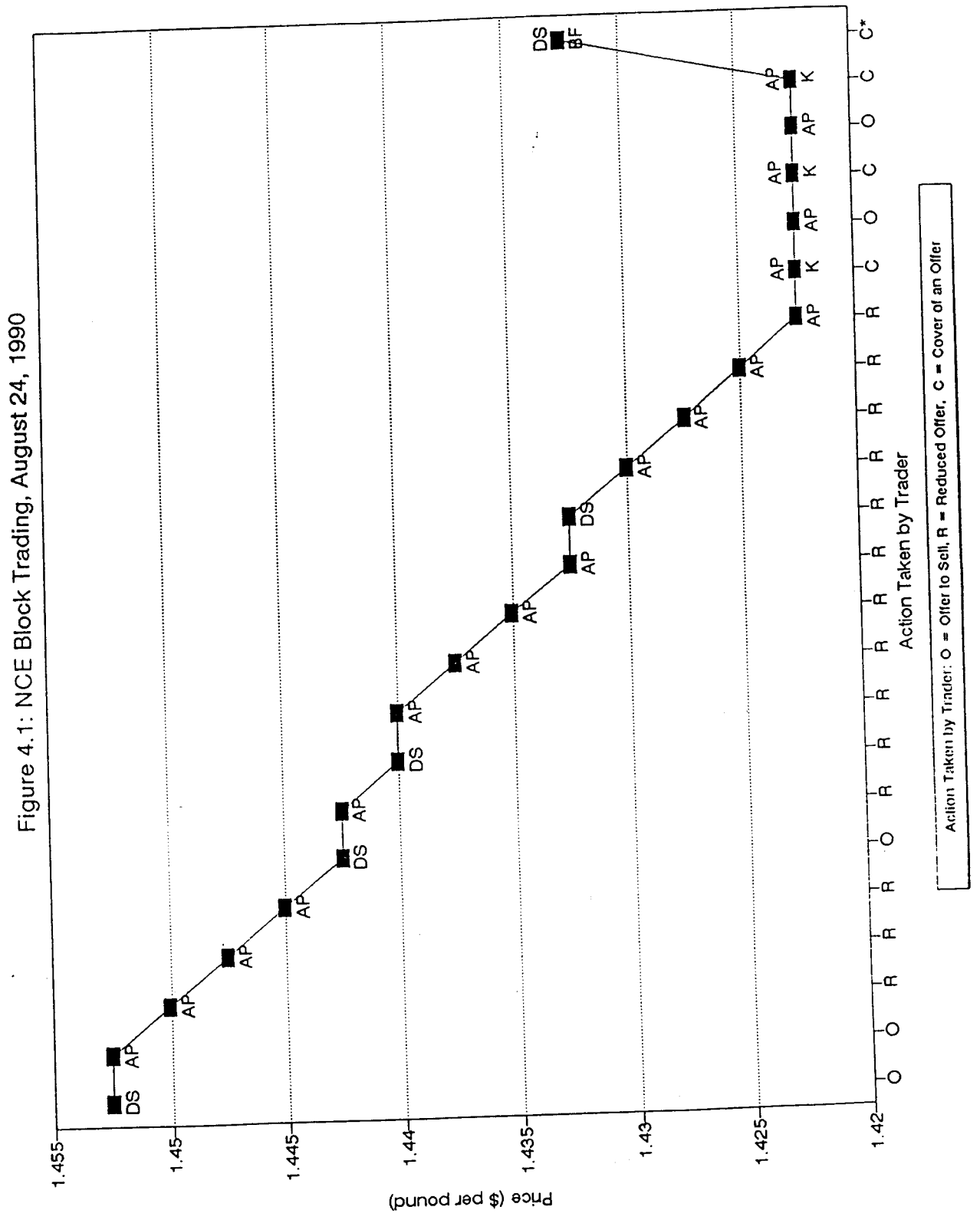
> ...could be interpreted as an attempt by Beatrice to manipulate the market and...could result in severe criticism of Exchange activities...any further activity by Beatrice of a

---

[109] R.J. Gould, President, to Board of Directors, National Cheese Exchange, August 27, 1990.

[110] Minutes of a Special Meeting of the Board of Directors of the National Cheese Exchange, August 31, 1990. Bernard Golbach of Masters Gallery stated that Richard Reski of Beatrice had asked him earlier in the week of August 24 whether NCE rules for trading covered all posted offers regardless of prices. Golback told Reski that while there were no rules to prevent such trading it would be extremely unlikely anyone would do so because the buyer would likely be paying more than was necessary.

Figure 4.1: NCE Block Trading, August 24, 1990



similar nature could result in suspension from the privilege of trading on the Exchange or expulsion therefrom.[111]

Another apparent instance of trading against self-interest came to the attention of the Exchange president March 16, 1990. On March 13, 1990, Dairystate opened block bidding at $1.25 cents a pound, 3.75 cents a pound below the closing price during the two preceding sessions. Kraft immediately filled the bid. After Kraft filled the initial bid, Mid-Am and Beatrice made successive bids. Kraft filled three of these bids until the price returned to $1.2675 a pound, the previous week's closing price.[112] The customary trading practice is for opening bids or offers to be made at the previous week's close. When a trader departs from this pattern, the general practice is for another trader to bid or make an offer at the previous week's close. (For example, August 21, 1992, Alpine Lace opened barrel bidding at $1.235, 10 cents below the previous week's close. Kraft then made an offer to sell at $1.335, the previous week's close.)

---

[111] *Id.* President Gould believed that in view of Mr. Folz's admission to him that Beatrice's intent was to raise the price of block, "a more severe sanction should be imposed upon Beatrice." In his letter to Beatrice, Gould said, in part, "[Y]our company's trading activity was clearly against its economic best interests and could easily be interpreted as an intentional attempt to manipulate the market price of 40 pound block. Such trading was extremely inept, could result in severe criticism of the Exchange and deterioration of its integrity." R.J. Gould to Robert Burns, President, Beatrice Cheese, Inc., September 21, 1990. Earlier President Gould said "Beatrice's trading was not consistent with the natural self interest of buyers to attempt to purchase at the exisitng or a lower price." Minutes of the Board of Directors of the National Cheese Exchange, August 31, 1990, 3.

[112] Kraft counsel stated that this "*singular* irregular trade identified to have occurred in many years covered by Kraft production was self-policed by Kraft....That one instance, involving a mistake by an inexperienced, stand-in trader, on a single transaction, has not re-occurred." Tefft W. Smith, Kirkland & Ellis, to Reid Klopp, Assistant Counsel, Department of Agriculture, Trade and Consumer Protection, "Re: Wisconsin DATCP Investigation Regarding the National Cheese Exchange," January 19, 1995. Actually, Kraft made four trades on March 13, 1990.

Other traders complained to President Gould that it appeared Kraft was trying to lower the market since normally a seller would seek a higher price before accepting such a low bid. President Gould asked Kraft's trader, Jeff Voermans, Procurement Manager Green Bay, whether this trade had been a mistake or oversight. Voermans reported his conversation with Gould to Kraft purchasing director Wayne Hangartner, in part: "His [Gould's] interpretation is that it was an oversight." Voermans told Gould that "in retrospect we probably should have responded differently and that his interpretation that it was an oversight was correct."[113] Mr. Hangartner said this matter was not brought to the attention of the Board of Directors.[114]

There is evidence suggesting that large traders have acted to increase prices either unilaterally or jointly. For example, executives of a large trader on the NCE were asked in an interview whether they agreed that had they not participated in trading on a particular day prices would have fallen without a single purchase. They replied as follows:

> First Executive: "We take all the credit we can."
>
> Second Executive: "There's no question; we support sometimes."
>
> First Executive: "Yeah. And we've got ulterior motives for that, there's no question about it. We've got a [--] million pound inventory running around. At one time a lot higher."[115]

Traders have many opportunities to exchange market information in the normal course of business. Cheese marketers necessarily communicate on a regular basis with their committed

---

[113] Kraft General Foods, Inc., Jeff Voermans to Wayne Hangartner, Director of Cheese Procurement and Inventories, "NCE 3/16," March 16, 1990, KGF 17104.

[114] Typed transcript of recorded interview of Kraft personnel, December 8-9, 1992, p. 116. Hangartner said that had he been trading that day he would have responded to the Dairystate bid by making an offer at the previous session's close. *Id.*

[115] [[Source deleted in public report as not essential.]]

suppliers, and all large companies have frequent contact in the spot market. As discussed in Chapter 6, in November 1989 one cheese marketer conducted a "poll" of nine companies with which it did business.[116] It concluded, in part, that "The lowest block market anticipated by major companies polled is $1.28. Most companies estimate the range will be $1.30-$1.32."[117] Although traders on the NCE avoid the appearance of communicating with one another regarding prices prior to and during NCE trading sessions, ample opportunities exist for communication in the normal course of business off the Exchange.[118]

One example is discussed in an interview summary of an assistant Attorney General of Wisconsin. Mr. Joseph Peterson, the bulk procurement and bulk sales manager of Land O' Lakes explained in some detail the nature of his contacts with other cheese companies. He said he never had discussions with other companies regarding their inventory and similar information that is considered very secret within the industry.[119]

He commented as follows regarding his contacts with other cheese companies:

> Mr. Peterson related that in addition to...trade association meetings he also has contacts with other cheese companies as customers and as suppliers of cheese to Land O' Lakes for purchases outside of the exchange....He added that during 1987 the majority of Land

---

[116] [[Source deleted in public report as not essential.]]

[117] The information companies supply one another may not necessarily reflect their actual views. See Chapter 6, Section A.

[118] Parties interviewed during 1987-1988 in the course of an investigation of cheese prices by the staff of the Wisconsin Attorney General repeatedly stated that they never spoke to one another about prices before the opening of trading at the NCE. The investigators' reports of these interviews are available in the offices of the Wisconsin Department of Justice.

[119] Interview of Joseph Peterson, Bulk Procurement and Bulk Sales Manager, Land O' Lakes, Inc., by Matt Frank, Assistant Attorney General, State of Wisconsin, January 1988, p. 3.

> O' Lakes' bulk cheese sales were to Kraft. Mr. Peterson informed that these cheese transactions were negotiated either by telephone or over dinner on a Thursday night [prior to NCE Friday trading sessions] in Green Bay, Wisconsin. Mr. Peterson clarified that the majority of the negotiations were handled by telephone and that the negotiations over dinner occurred only three or four times during the last year.
>
> Mr. Peterson informed that the price arrived at during these negotiations was tied to the market opinion of the National Cheese Exchange. He explained that these contracts to sell cheese to Kraft varied from a short term contract of two weeks to a one year contract....Mr. Peterson further related that the majority of cheese sold to Kraft by Land O' Lakes was sold outside of the National Cheese Exchange.[120]

There is also evidence that a broker may influence NCE prices to achieve the objective of its customer. As discussed in Chapter 6, Dairystate played the leading role in taking down the barrel market on February 2, 1990, apparently selling on the instructions of a large cheese manufacturer.[121]

F. Summary and Conclusions

There is considerable evidence supporting the hypothesis that during 1988-1993 most leading NCE traders often were motivated by the desire to influence prices rather than merely to buy or sell on the Exchange. The business characteristics of each firm determine whether it benefits from higher or lower NCE prices.

Firms whose raw material cheese costs are coupled directly or indirectly to NCE prices and who sell most of their finished cheese as strong consumer brands at wholesale list prices not coupled to NCE prices have a financial interest in *lower* NCE prices, other things being the

---

[120] *Id.*, p. 4. Other persons interviewed by Wisconsin Justice Department investigators also reported that they had many contacts with competitors in the normal course of their business, especially in negotiating supply arrangements and spot sales. For example, see Wisconsin Justice Department interview of Borden Foods, February 4, 1988, pp. 3-4.

[121] See Chapter 6, Section A.

same.[122] Kraft, Borden, and Alpine Lace are the most prominent traders in this category. Not only does Kraft have a financial interest in the level of NCE prices, but documentary evidence also implies that Kraft believed it could influence NCE prices.

Firms whose raw material cheese costs are coupled directly or indirectly to NCE prices and whose processed cheese prices are coupled directly or indirectly to NCE formula-based prices have a modest financial interest in *higher* NCE prices, other things being the same. The leading proprietary traders in this category are Beatrice and Schreiber.[123] However, at times these companies may also benefit financially because they can buy more cheaply on the NCE than from a committed supplier or in the spot market. However, examinations of leading buyer-trader activity on the NCE strongly suggests that often they trade without expecting their bids to be filled, sometimes bidding up the price for weeks at a time in a rising market without any bids being covered. Such activity supports the hypothesis that bidding is occurring to influence prices rather than to actually procure cheese. The motive for such trading may be either to raise prices and thereby increase such traders' cheese margins or to signal suppliers that prices need to be higher in order to insure adequate bulk cheese production.

Finally, agricultural cooperatives that seek to maximize the joint profits of their farmer members and their cooperatively owned cheese enterprises have a direct interest in higher NCE prices because this means increased milk prices to farmers. The three leading cooperative

---

[122] Virtually all raw material cheese is purchased from contract or committed suppliers at NCE-based formula prices. The cost of cheese which these companies manufacture for themselves is also coupled to NCE prices because the price of the milk used in making cheese is driven by NCE prices.

[123] Masters Gallery Food, Inc., a similarly situated but much smaller company, apparently has the same motives as Beatrice. During 1988-1993, Masters Gallery was primarily a buyer on the NCE (Table 4.2).

traders, Mid-Am, AMPI and Land O' Lakes, are all major sellers of bulk cheddar cheese, though all sell some finished cheese products. The cooperative with the greatest *potential* interest in lower NCE prices is Land O' Lakes, since it sells a substantial volume of finished product under its own brand. However, benefits from this source may, at best, be modest since its brands are not as strong as those of the market leaders. Finally, though farmers benefit from higher NCE prices in the short run, cooperative managers cannot be indifferent to the effect higher prices may have on long-run milk output. In the absence of control over the supply of milk for manufacturing and without government support programs, the highest price cooperatives may achieve for bulk cheese is the competitive equilibrium price. They do, of course, have a strong incentive to prevent NCE prices from going below this price, which may occur if NCE prices are manipulated downward.

Undoubtedly the NCE has a substantial impact on the financial interests of cheese manufacturers and marketers. But do these companies attempt to influence the NCE in the direction consistent with their interests and, if so, have they been successful? This chapter has not examined in detail the actual trading conduct of traders and the extent, if any, to which their trading conduct is consistent with their financial interests in the level of NCE prices. These subjects are examined in the following chapters.

Appendix Table 4.1a

TRADES ON NCE BY PRIMARY TYPE OF BUSINESS, 1980 TO 1987

---BARRELS--

Type of Primary Business	Carloads Sold									Carloads Bought								
Manufacturer of Cheese	1980	1981	1982	1983	1984	1985	1986	1987	**Total**	1980	1981	1982	1983	1984	1985	1986	1987	**Total**
Land O' Lakes	172	10	22	20	106	35	77	82	524	16	12	0	0	0	0	0	39	67
Bongards'	0	0	0	0	116	78	174	31	399	0	0	0	0	0	34	0	0	34
Mid America	0	0	0	0	0	0	10	0	10	0	0	0	11	11	2	0	0	24
Anderson Clayton	0	0	0	0	4	0	0	0	4	12	3	0	0	0	0	0	0	15
Woldt's Cheese	0	0	0	0	0	0	0	0	0	36	7	0	0	0	0	0	0	43
Clearfield	0	0	0	0	0	0	0	0	0	11	0	16	0	9	0	0	0	36
N. Dorman	0	0	0	0	0	0	0	0	0	17	0	0	0	0	0	0	0	17
Sub-Total	172	10	22	20	226	113	261	113	937	92	22	16	11	20	36	0	39	236
Marketer s of Cheese																		
Kraft	55	6	8	4	3	0	10	298	384	16	2	0	8	183	98	104	0	411
Borden	17	16	0	2	5	26	20	0	86	56	2	0	0	23	0	0	16	97
Schrieber	2	0	0	0	0	0	12	0	14	70	6	14	5	9	5	0	75	184
Beatrice[1]	6	0	0	6	0	0	2	0	14	20	0	0	8	45	0	222	288	583
Sub-Total	80	22	8	12	8	26	44	298	498	162	10	14	21	260	103	326	379	1275
Brokers																		
Dairystate	0	0	0	0	47	0	0	11	58	0	0	0	0	0	0	0	0	0
Sub-Total	0	0	0	0	47	0	0	11	58	0	0	0	0	0	0	0	0	0
All Others[2]	5	0	0	0	1	0	21	2	29	3	0	0	0	2	0	0	6	11
Total	257	32	30	32	282	139	326	424	1522	257	32	30	32	282	139	326	424	1522

Source: National Cheese Exchange, Trading Activity Minutes, AMS, USDA, 1980-87.

[1]Includes trades of Pauly Cheese which was acquired by Beatrice Cheese, Inc., in 1984.
[2]Includes those companies that made less than 1% of all carloads traded on NCE during this period. These are Marketing Association (sold 10 carloads), Twin Dakota (sold 5 carloads), Edelweiss (sold 1 carload), Swiss Valley (sold 8 carloads), Masters Gallery (sold 5 and bought 2 carloads), Northern (bought 7 carloads), and AMPI (bought 2 carloads).

Appendix Table 4.1b

TRADES ON NCE BY PRIMARY TYPE OF BUSINESS, 1980 TO 1987

---BLOCKS--

Type of Primary Business	Carloads Sold									Carloads Bought								
	1980	1981	1982	1983	1984	1985	1986	1987	Total	1980	1981	1982	1983	1984	1985	1986	1987	Total
Manufacturer of Cheese																		
Mid America	0	0	0	0	0	0	119	45	164	0	0	0	0	2	3	1	0	6
Land O' Lakes	0	6	0	0	0	0	38	90	134	0	0	0	1	0	0	0	0	1
Bongards'	0	0	0	0	20	0	46	8	74	0	0	0	0	0	0	0	0	0
Twin Dakota	2	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
Edelweiss	0	0	0	0	0	0	0	12	12	0	0	0	0	0	0	0	0	0
Sub-Total	2	6	0	0	20	0	203	155	386	0	0	0	1	2	3	1	0	7
Marketers of Cheese																		
Kraft	0	0	0	0	2	3	84	34	123	0	0	0	0	0	0	0	0	0
Masters Gallery	0	0	0	1	2	1	29	16	49	0	0	0	0	0	0	12	0	12
Marathon	0	1	10	1	0	0	0	0	12	0	0	0	0	0	0	0	31	31
Schrieber	0	0	0	0	0	0	5	0	5	2	0	0	1	12	0	0	0	15
Beatrice[1]	5	0	0	0	0	0	0	0	5	0	0	0	0	11	2	413	252	678
Borden	0	0	0	0	0	0	0	0	0	5	7	10	0	0	0	0	0	22
Sub-Total	5	1	10	2	4	4	118	50	194	7	7	10	1	23	2	425	283	758
Brokers																		
Dairystate	0	0	0	0	0	0	102	73	175	0	0	0	0	0	0	0	0	0
Sub-Total	0	0	0	0	0	0	102	73	175	0	0	0	0	0	0	0	0	0
All Others[2]	0	0	0	0	1	1	3	5	10	0	0	0	0	0	0	0	0	0
Total	7	7	10	2	25	5	426	283	765	7	7	10	2	25	5	426	283	765

Source: National Cheese Exchange, Trading Activity Minutes, AMS, USDA, 1980-87.

[1]Includes trades of Pauly Cheese which was acquired by Beatrice Cheese, Inc., in 1984.
[2]Includes those companies that made less than 1% of all carloads traded on NCE during the period. These are Marketing Association (sold 7 carloads) Northern Produce (sold 2 carloads) and Swiss Valley (sold 1 carload).

Appendix Table 4.2a

TRADES ON NCE BY PRIMARY TYPE OF BUSINESS, 1988 TO 1993

---BARRELS--

Type of Primary Business	Carloads Sold							Carloads Bought						
Manufacturer of Cheese	1988	1989	1990	1991	1992	1993	**Total**	1988	1989	1990	1991	1992	1993	**Total**
Land O' Lakes	39	0	0	10	10	2	61	57	9	18	0	4	98	186
AMPI	0	0	0	0	0	0	0	30	56	2	15	17	12	132
Mid America	0	0	0	0	0	0	0	4	0	2	78	29	18	131
Bongards'	32	0	0	0	32	7	71	0	0	0	0	0	0	0
Edelweiss Cheese	0	0	0	0	0	0	0	19	0	0	0	0	0	19
Sub-Total	71	0	0	10	42	9	132	110	65	22	93	50	128	468
Marketers of Cheese														
Kraft	277	107	131	260	138	336	1249	0	0	0	0	0	0	0
Borden	2	0	3	18	19	17	59	28	0	0	4	0	0	32
Alpine Lace	0	0	0	0	10	4	14	0	0	0	0	0	1	1
Beatrice	0	0	0	0	0	0	0	109	10	64	59	117	211	570
Schrieber	0	0	0	0	0	0	0	78	28	12	118	34	46	316
Masters Gallery	0	0	0	0	0	0	0	0	0	36	1	0	0	37
Sub-Total	279	107	134	278	167	357	1322	215	38	112	182	151	258	956
Brokers														
Dairystate	0	0	10	0	0	30	40	8	0	0	6	0	10	24
Northern Wis.	0	0	0	0	0	0	0	6	4	8	7	6	0	31
Sub-Total	0	0	10	0	0	30	40	14	4	8	13	6	10	55
All Others[1]	0	0	0	0	0	5	5	11	0	2	0	2	5	20
Total	350	107	144	288	209	401	1499	350	107	144	288	209	401	1499

Source: National Cheese Exchange, Trading Activity Minutes, AMS, USDA, 1988-1993.

[1]Includes those companies that made less than 1% of all carloads traded on NCE during this period. These are Schurman (sold 5 and bought 5 carloads), Hemke Cheese (bought 13 carloads) and Northwood (bought 2 carloads).

Appendix Table 4.2b
TRADES ON NCE BY PRIMARY TYPE OF BUSINESS, 1988 TO 1993

---BLOCKS--

Type of Primary Business	Carloads Sold							Carloads Bought						
	1988	1989	1990	1991	1992	1993	Total	1988	1989	1990	1991	1992	1993	Total
Manufacturer of Cheese														
Mid America	1	3	0	0	0	0	4	2	3	46	59	103	147	360
AMPI	0	0	0	0	0	0	0	0	0	5	5	12	18	40
Land O' Lakes	7	2	0	0	2	0	11	0	0	3	0	0	0	3
Dairy Gold	0	0	0	5	9	0	14	0	0	0	0	0	0	0
Golden Cheese	0	0	0	0	10	0	10	0	0	0	0	0	0	0
Sub-Total	8	5	0	5	21	0	39	2	3	54	64	118	165	403
Marketers of Cheese														
Kraft	0	0	62	79	120	107	368	0	0	22	0	0	0	22
Alpine Lace	0	0	62	16	20	18	116	0	0	0	0	0	2	2
Beatrice	0	0	0	0	0	0	0	9	3	108	26	48	9	203
Marathon	0	0	35	0	0	0	35	0	0	0	0	0	0	0
Masters Gallery	0	5	2	0	0	0	7	0	0	10	15	0	0	25
Schrieber	0	0	6	0	0	1	7	0	0	1	5	0	0	6
Sub-Total	0	5	167	95	140	126	533	9	3	141	46	48	11	258
Brokers														
Dairystate	3	1	21	3	0	61	89	0	0	1	1	0	3	5
Northern	0	0	8	2	8	0	18	0	0	2	0	0	0	2
Schurman	0	0	0	0	0	2	2	0	0	0	0	2	13	15
Northwood	0	0	2	0	0	4	6	0	0	0	0	3	0	3
Sub-Total	3	1	31	5	8	67	115	0	0	3	1	5	16	25
All Others[1]	0	0	0	6	2	2	10	0	5	0	0	3	3	11
Total	11	11	198	111	171	195	697	11	11	198	111	171	195	697

Source: National Cheese Exchange, Trading Activity Minutes, AMS, USDA, 1988-93.
[1]Include those companies that made less than 1% of all carloads traded on NCE during this period. These are Alto (bought 6 carloads), Bongards' (sold 4 carloads), Empire Cheese (bought 5 carloads), and Marketing Association (sold 6 carloads).

Appendix Table 4.3
Gains or Losses Incurred by Kraft for Raw Material Cheese Sales
NCE, Outside Sales, and Government, 1987 - 1992

	National Cheese Exchange				Outside Sales				Government Sales			
	No. Loads	Pounds	Gain/Loss in Dollars	Gain/Loss Cents Per Pound	No. Loads	Pounds	Gain/Loss in Dollars	Gain/Loss Cents Per Pound	No. Loads	Pounds	Gain/Loss in Dollars	Gain/Loss Cents Per Pound
1987												
Blocks	THIS INFORMATION HAS BEEN REDACTED FROM THE REPORT AT THIS TIME PURSUANT TO AN AGREEMENT WITH KRAFT GENERAL FOODS, INC., THAT THERE WILL BE A SUBSEQUENT JUDICIAL RESOLUTION OF A GOOD-FAITH DISPUTE OVER THE TRADE SECRET STATUS OF THE INFORMATION.											
Barrels												
Squares												
TOTAL												
1988												
Blocks												
Barrels												
Squares												
TOTAL												
1989												
Blocks												
Barrels												
Squares												
TOTAL												
1990												
Blocks												
Barrels												
Squares												
TOTAL												

Appendix Table 4.3 (cont.)

	National Cheese Exchange				Outside Sales				Government Sales			
	No. Loads	Pounds	Gain/Loss in Dollars	Gain/Loss Cents Per Pound	No. Loads	Pounds	Gain/Loss in Dollars	Gain/Loss Cents Per Pound	No. Loads	Pounds	Gain/Loss in Dollars	Gain/Loss Cents Per Pound
1991												
Blocks												
Barrels												
Squares												
TOTAL												
1992												
Blocks												
Barrels												
Squares												
TOTAL												
Total: 1987 - 1992												
Blocks												
Barrels												
Squares												
TOTAL												

Source: Kraft General Foods, Inc. "Raw Material Cheese Sales, 1987-1992", KGF 23755, 23757, 23759, 23763, 23765, 23766.
[1]The number of outside sales of barrels in 1991 was increased by 50 to correct an error in the original source for September 1991.

Appendix Table 4.4
NCE Opinion Prices, Average Wisconsin Assembly Point (WAP) Prices and Premiums, Weekly, 1986-1993

NCE Date	NCE Barrel Price	NCE Block Price	WAP Date	Average WAP Barrel Price 1/	Average WAP Block Price 1	WAP Barrel Premium 2/	WAP Block Premium 2/
				----cents per pound----			
860103	117.75	121.75	860109	118.75	123.75	1.00	2.00
860110	117.75	121.75	860116	118.75	123.75	1.00	2.00
860117	117.75	121.75	860123	118.75	123.38	1.00	1.63
860124	118.25	122.25	860130	119.00	124.00	0.75	1.75
860131	118.25	122.25	860206	118.75	124.00	0.50	1.75
860207	118.25	123.25	860213	118.75	124.50	0.50	1.25
860214	118.25	123.50	860220	118.75	125.00	0.50	1.50
860221	118.25	123.50	860227	118.75	124.50	0.50	1.00
860228	118.25	123.50	860306	116.75	122.00	-1.50	-1.50
860307	118.25	123.50	860313	118.00	123.50	-0.25	-0.00
860314	118.25	123.50	860320	118.00	123.00	-0.25	-0.50
860321	118.50	123.50	860326	118.88	124.00	0.38	0.50
860327	118.50	123.50	860403	118.88	124.50	0.38	1.00
860404	118.50	123.50	860410	118.88	124.50	0.38	1.00
860411	118.50	123.50	860417	118.63	124.50	0.13	1.00
860418	118.50	124.50	860424	118.63	125.50	0.13	1.00
860425	118.50	124.50	860501	118.63	126.25	0.13	1.75
860502	118.25	124.25	860508	118.50	126.13	0.25	1.88
860509	117.25	124.25	860515	118.00	126.00	0.75	1.75
860516	117.25	124.25	860522	118.00	126.00	0.75	1.75
860523	117.25	124.25	860529	118.00	125.50	0.75	1.25
860530	118.50	123.75	860605	118.63	124.50	0.13	0.75
860606	118.50	124.50	860612	119.13	126.00	0.63	1.50
860613	118.50	124.50	860619	119.13	125.75	0.63	1.25
860620	118.50	124.00	860626	119.13	125.25	0.63	1.25
860627	118.50	124.00	860702	119.13	125.25	0.63	1.25
860703	118.50	124.00	860710	119.13	126.00	0.63	2.00
860711	119.25	125.00	860717	119.50	126.50	0.25	1.50
860718	119.25	125.25	860724	119.00	127.25	-0.25	2.00
860725	121.00	127.00	860800	121.00	128.00	0.00	1.00
860801	122.25	127.25	860807	122.00	128.13	-0.25	0.88
860808	123.25	128.50	860814	122.50	129.25	-0.75	0.75
860815	123.25	129.00	860821	122.50	129.50	-0.75	0.50
860822	124.50	128.50	860828	124.25	131.50	-0.25	3.00
860829	123.50	127.50	860904	123.25	130.50	-0.25	3.00
860905	121.50	125.50	860911	121.50	128.50	0.00	3.00
860912	123.50	126.50	860918	122.63	129.50	-0.88	3.00
860919	124.00	127.50	860925	122.88	130.00	-1.13	2.50

NCE Date	NCE Barrel Price	NCE Block Price	WAP Date	Average WAP Barrel Price 1/	Average WAP Block Price 1	WAP Barrel Premium 2/	WAP Block Premium 2/
				----cents per pound----			
860926	124.00	128.25	861002	122.88	131.00	-1.18	2.75
861003	124.00	128.25	861009	122.88	128.75	-1.13	0.50
861010	123.75	128.25	861016	122.75	128.87	-1.00	0.62
861017	123.75	128.25	861023	122.75	128.87	-1.00	0.62
861024	123.75	130.50	861030	122.75	133.75	-1.00	3.25
861031	123.75	130.50	861106	122.75	133.75	-1.00	3.25
861107	123.75	130.50	861113	122.75	133.50	-1.00	3.00
861114	123.75	130.50	861120	122.75	133.50	-1.00	3.00
861121	123.75	130.50	861127	122.75	132.50	-1.00	2.00
861128	123.75	130.50	861204	122.75	132.50	-1.00	2.00
861205	122.17	130.50	861211	122.00	129.75	-0.17	-0.75
861212	121.75	130.50	861218	121.50	129.75	-0.25	-0.75
861219	121.50	130.50	861225	121.38	129.75	-0.13	-0.75
861226	120.75	130.25	870101	120.00	129.63	-0.75	-0.63
870102	120.00	130.00	870108	119.38	129.00	-0.62	-1.00
870109	119.00	130.00	870115	118.88	129.00	-0.13	-1.00
870116	119.00	128.25	870122	118.25	126.88	-0.75	-1.38
870123	119.00	128.00	870129	118.25	126.75	-0.75	-1.25
870130	117.50	122.50	870205	117.38	124.00	-0.13	1.50
870206	116.75	120.50	870212	117.50	122.00	0.75	1.50
870213	116.75	120.50	870219	117.25	122.00	0.50	1.50
870220	116.75	120.50	870226	117.00	122.00	0.25	1.50
870227	116.75	120.50	870305	117.00	122.25	0.25	1.75
870306	116.75	120.50	870312	117.25	122.25	0.50	1.75
870313	116.75	120.50	870319	117.25	122.25	0.50	1.75
870320	116.75	120.50	870326	117.25	122.25	0.50	1.75
870327	116.75	120.50	870402	117.25	122.25	0.50	1.75
870403	116.75	120.50	870409	117.25	122.00	0.50	1.50
870410	116.75	122.25	870415	117.25	123.75	0.50	1.50
870416	116.75	120.50	870423	117.25	122.00	0.50	1.50
870424	116.75	120.50	870500	117.00	122.00	0.25	1.50
870501	116.75	120.50	870507	117.00	122.00	0.25	1.50
870508	116.75	120.50	870514	117.00	122.00	0.25	1.50
870515	116.75	120.50	870521	117.00	122.00	0.25	1.50
870522	116.75	120.50	870528	116.50	122.00	-0.25	1.50
870529	116.75	120.50	870604	115.50	122.00	-1.25	1.50
870605	116.75	120.50	870611	116.00	122.00	-0.75	1.50
870612	116.75	120.50	870618	116.75	122.00	0.00	1.50
870619	116.75	120.50	870625	117.50	122.00	0.75	1.50
870626	116.75	120.50	870701	117.50	122.00	0.75	1.50
870702	116.75	120.50	870708	117.50	122.50	0.75	2.00
870709	116.75	120.75	870716	117.50	122.75	0.75	2.00
870717	117.50	120.75	870723	118.25	123.75	0.75	3.00

Public Report

NCE Date	NCE Barrel Price	NCE Block Price	WAP Date	Average WAP Barrel Price 1/	Average WAP Block Price 1	WAP Barrel Premium 2/	WAP Block Premium 2/
			----cents per pound----				
890316	112.00	117.75	890322	113.13	118.00	1.13	0.25
890323	112.50	118.00	890330	113.63	118.12	1.13	0.12
890331	114.00	118.75	890406	115.00	119.00	1.00	0.25
890407	114.00	118.75	890413	115.13	119.00	1.13	0.25
890414	114.50	118.75	890420	115.75	121.75	1.25	3.00
890421	116.50	118.75	890427	117.38	121.75	0.88	3.00
890428	117.00	118.75	890504	118.25	121.75	1.25	3.00
890505	117.75	119.00	890511	118.75	121.88	1.00	2.88
890512	119.00	122.25	890518	120.25	123.50	1.25	1.25
890519	121.50	123.25	890525	122.50	126.75	1.00	3.50
890526	122.25	124.75	890601	123.25	128.50	1.00	3.75
890602	122.25	124.75	890608	123.50	128.75	1.25	4.00
890609	122.50	125.50	890615	122.50	129.50	0.00	4.00
890616	123.50	127.50	890622	124.75	131.50	1.25	4.00
890623	125.75	130.25	890629	127.25	134.50	1.50	4.25
890630	131.00	135.25	890706	132.75	139.50	1.75	4.25
890707	131.00	135.25	890713	134.25	139.50	3.25	4.25
890714	131.00	135.25	890720	134.88	139.75	3.88	4.50
890721	134.25	138.50	890727	137.63	143.00	3.38	4.50
890728	134.25	138.50	890803	138.63	143.13	4.38	4.63
890804	135.75	140.00	890810	140.13	145.75	4.38	5.75
890811	139.25	143.50	890817	144.13	149.25	4.88	5.75
890818	139.25	143.50	890824	145.75	149.25	6.50	5.75
890825	141.75	146.00	890900	148.75	151.75	7.00	5.75
890901	141.75	146.00	890907	148.75	152.00	7.00	6.00
890908	142.75	147.00	890914	149.75	155.00	7.00	8.00
890915	143.75	148.00	890921	150.75	156.50	7.00	8.50
890922	147.00	151.25	890928	154.00	159.75	7.00	8.50
890929	147.00	151.25	891005	154.50	159.75	7.50	8.50
891006	147.00	151.25	891012	154.50	159.75	7.50	8.50
891013	147.00	151.25	891019	155.00	159.75	8.00	8.50
891020	147.00	151.25	891026	157.00	161.25	10.00	10.00
891027	147.25	151.25	891102	157.25	161.75	10.00	10.50
891103	150.50	154.50	891109	160.00	164.50	9.50	10.00
891110	150.50	154.50	891116	160.00	164.00	9.50	9.50
891117	150.50	154.50	891121	160.00	164.00	9.50	9.50
891122	150.50	154.50	891200	158.25	163.00	7.75	8.50
891201	150.50	154.50	891207	158.25	163.00	7.75	8.50
891208	150.50	154.50	891214	157.75	162.50	7.25	8.00
891215	150.50	154.50	891221	156.00	161.50	5.50	7.00
891222	150.50	154.50	891228	156.00	161.50	5.50	7.00
891229	150.50	154.50	900104	154.50	160.50	4.00	6.00
900105	150.50	146.25	900111	148.88	151.75	-1.63	5.50

Public Report

NCE Date	NCE Barrel Price	NCE Block Price	WAP Date	Average WAP Barrel Price 1/	Average WAP Block Price 1	WAP Barrel Premium 2/	WAP Block Premium 2/
			----cents per pound----				
880520	109.00	114.00	880526	110.13	114.75	1.12	0.75
880527	109.50	114.00	880602	110.38	115.50	0.88	1.50
880603	109.50	114.00	880609	110.38	115.50	0.88	1.50
880610	109.50	114.00	880616	110.50	115.50	1.00	1.50
880617	110.00	114.00	880623	111.00	116.38	1.00	2.38
880624	113.00	116.75	880700	114.00	118.00	1.00	1.25
880701	114.00	116.75	880707	115.13	118.00	1.13	1.25
880708	115.50	116.75	880714	116.38	118.00	0.88	1.25
880715	115.75	116.75	880721	116.75	118.25	1.00	1.50
880722	116.00	116.75	880728	116.88	119.00	0.88	2.25
880729	116.00	119.25	880804	117.38	122.75	1.38	3.50
880805	116.25	120.75	880811	117.75	125.00	1.50	4.25
880812	119.50	123.50	880818	121.00	128.00	1.50	4.50
880819	124.25	127.25	880825	125.75	131.50	1.50	4.25
880826	125.75	128.75	880901	127.25	133.00	1.50	4.25
880902	126.25	129.00	880908	128.25	133.25	2.00	4.25
880909	126.75	130.00	880915	130.00	134.25	3.25	4.25
880916	127.75	130.75	880922	130.25	135.50	2.50	4.75
880923	127.75	130.75	880929	130.75	135.75	3.00	5.00
880930	128.00	130.75	881006	131.00	135.50	3.00	4.75
881007	128.00	131.75	881013	131.00	136.50	3.00	4.75
881014	128.00	131.75	881020	131.25	136.63	3.25	4.88
881021	128.00	131.75	881027	130.50	136.75	2.50	5.00
881028	128.00	131.75	881103	130.50	136.75	2.50	5.00
881104	128.75	131.75	881110	131.25	136.25	2.50	4.50
881111	128.75	131.75	881117	130.75	136.00	2.00	4.25
881118	128.75	132.25	881122	130.75	136.50	2.00	4.25
881123	128.50	132.25	881201	130.25	136.25	1.75	4.00
881202	127.75	132.25	881208	129.50	136.25	1.75	4.00
881209	127.75	132.25	881215	128.75	136.00	1.00	3.75
881216	127.50	132.25	881222	128.50	135.75	1.00	3.50
881223	127.25	132.25	881229	128.25	135.75	1.00	3.50
881230	126.25	132.25	890105	127.25	134.75	1.00	2.50
890106	125.25	132.25	890112	125.75	134.75	0.50	2.50
890113	124.50	127.75	890119	125.38	129.25	0.88	1.50
890120	122.00	123.50	890126	122.62	121.00	0.62	-2.50
890127	117.75	117.75	890202	116.75	117.50	-1.00	-0.25
890203	115.25	117.75	890209	115.88	117.50	0.62	-0.25
890210	115.25	117.75	890216	115.50	118.00	0.25	0.25
890217	113.00	117.75	890223	113.75	117.25	0.75	-0.50
890224	112.00	117.75	890302	112.63	117.50	0.63	-0.25
890303	112.00	117.75	890309	112.88	117.50	0.88	-0.25
890310	112.00	117.75	890315	113.13	118.00	1.13	0.25

Public Report

NCE Date	NCE Barrel Price	NCE Block Price	WAP Date	Average WAP Barrel Price 1/	Average WAP Block Price 1	WAP Barrel Premium 2/	WAP Block Premium 2/
			----cents per pound----				
890316	112.00	117.75	890322	113.13	118.00	1.13	0.25
890323	112.50	118.00	890330	113.63	118.12	1.13	0.12
890331	114.00	118.75	890406	115.00	119.00	1.00	0.25
890407	114.00	118.75	890413	115.13	119.00	1.13	0.25
890414	114.50	118.75	890420	115.75	121.75	1.25	3.00
890421	116.50	118.75	890427	117.38	121.75	0.88	3.00
890428	117.00	118.75	890504	118.25	121.75	1.25	3.00
890505	117.75	119.00	890511	118.75	121.88	1.00	2.88
890512	119.00	122.25	890518	120.25	123.50	1.25	1.25
890519	121.50	123.25	890525	122.50	126.75	1.00	3.50
890526	122.25	124.75	890601	123.25	128.50	1.00	3.75
890602	122.25	124.75	890608	123.50	128.75	1.25	4.00
890609	122.50	125.50	890615	122.50	129.50	0.00	4.00
890616	123.50	127.50	890622	124.75	131.50	1.25	4.00
890623	125.75	130.25	890629	127.25	134.50	1.50	4.25
890630	131.00	135.25	890706	132.75	139.50	1.75	4.25
890707	131.00	135.25	890713	134.25	139.50	3.25	4.25
890714	131.00	135.25	890720	134.88	139.75	3.88	4.50
890721	134.25	138.50	890727	137.63	143.00	3.38	4.50
890728	134.25	138.50	890803	138.63	143.13	4.38	4.63
890804	135.75	140.00	890810	140.13	145.75	4.38	5.75
890811	139.25	143.50	890817	144.13	149.25	4.88	5.75
890818	139.25	143.50	890824	145.75	149.25	6.50	5.75
890825	141.75	146.00	890900	148.75	151.75	7.00	5.75
890901	141.75	146.00	890907	148.75	152.00	7.00	6.00
890908	142.75	147.00	890914	149.75	155.00	7.00	8.00
890915	143.75	148.00	890921	150.75	156.50	7.00	8.50
890922	147.00	151.25	890928	154.00	159.75	7.00	8.50
890929	147.00	151.25	891005	154.50	159.75	7.50	8.50
891006	147.00	151.25	891012	154.50	159.75	7.50	8.50
891013	147.00	151.25	891019	155.00	159.75	8.00	8.50
891020	147.00	151.25	891026	157.00	161.25	10.00	10.00
891027	147.25	151.25	891102	157.25	161.75	10.00	10.50
891103	150.50	154.50	891109	160.00	164.50	9.50	10.00
891110	150.50	154.50	891116	160.00	164.00	9.50	9.50
891117	150.50	154.50	891121	160.00	164.00	9.50	9.50
891122	150.50	154.50	891200	158.25	163.00	7.75	8.50
891201	150.50	154.50	891207	158.25	163.00	7.75	8.50
891208	150.50	154.50	891214	157.75	162.50	7.25	8.00
891215	150.50	154.50	891221	156.00	161.50	5.50	7.00
891222	150.50	154.50	891228	156.00	161.50	5.50	7.00
891229	150.50	154.50	900104	154.50	160.50	4.00	6.00
900105	150.50	146.25	900111	148.88	151.75	-1.63	5.50

Public Report

NCE Date	NCE Barrel Price	NCE Block Price	WAP Date	Average WAP Barrel Price 1/	Average WAP Block Price 1	WAP Barrel Premium 2/	WAP Block Premium 2/
			----cents per pound----				
900112	149.25	149.25	900118	149.25	154.75	0.00	5.50
900119	142.00	143.00	900125	142.00	148.50	0.00	5.50
900126	139.75	139.75	900201	139.75	145.25	0.00	5.50
900202	120.00	125.25	900208	120.50	128.75	0.50	3.50
900209	120.00	126.75	900215	121.00	130.75	1.00	4.00
900216	120.00	126.75	900222	121.00	130.25	1.00	3.50
900223	120.00	126.50	900301	121.00	130.25	1.00	3.75
900302	120.50	126.75	900308	121.50	130.75	1.00	4.00
900309	120.50	126.75	900315	121.50	130.75	1.00	4.00
900316	120.50	126.75	900322	122.50	130.75	2.00	4.00
900323	120.50	126.75	900329	123.00	130.75	2.50	4.00
900330	121.50	127.75	900405	122.50	132.00	1.00	4.25
900406	131.75	137.00	900411	137.25	143.00	5.50	6.00
900412	131.75	137.00	900419	137.25	143.00	5.50	6.00
900420	131.75	137.00	900426	137.75	143.50	6.00	6.50
900427	131.75	137.00	900503	137.75	143.50	6.00	6.50
900504	133.25	137.75	900510	138.75	143.50	5.50	5.75
900511	134.75	139.50	900517	140.75	147.00	6.00	7.50
900518	135.75	140.50	900524	141.75	147.50	6.00	7.00
900525	135.75	140.50	900600	141.75	147.50	6.00	7.00
900601	136.25	141.00	900607	142.25	147.00	6.00	6.00
900608	140.00	144.50	900614	146.00	151.00	6.00	6.50
900615	140.50	144.50	900621	146.38	150.50	5.88	6.00
900622	140.50	144.50	900628	146.50	150.00	6.00	5.50
900629	140.50	144.50	900705	146.50	150.00	6.00	5.50
900706	141.50	145.50	900712	147.50	151.00	6.00	5.50
900713	141.50	145.50	900719	146.50	151.00	5.00	5.50
900720	142.00	145.75	900726	147.00	151.25	5.00	5.50
900727	142.50	146.75	900802	147.50	152.25	5.00	5.50
900803	142.50	146.50	900809	146.50	152.00	4.00	5.50
900810	142.25	146.00	900816	146.25	151.50	4.00	5.50
900817	141.75	145.25	900823	144.13	149.25	2.38	4.00
900824	141.00	143.25	900830	142.88	147.25	1.88	4.00
900831	137.75	138.25	900906	138.25	142.25	0.50	4.00
900907	137.75	140.25	900913	138.25	144.25	0.50	4.00
900914	136.75	139.25	900920	137.75	142.75	1.00	3.50
900921	135.25	137.75	900927	133.75	141.25	-1.50	3.50
900928	132.25	132.75	901004	129.75	136.25	-2.50	3.50
901005	123.00	124.50	901011	122.50	126.00	-0.50	1.50
901012	114.25	114.25	901018	113.63	115.75	-0.63	1.50
901019	111.75	111.75	901025	110.25	113.25	-1.50	1.50
901026	107.00	109.00	901101	108.50	112.25	1.50	3.25
901102	105.25	108.75	901108	106.75	112.00	1.50	3.25

Public Report

NCE Date	NCE Barrel Price	NCE Block Price	WAP Date	Average WAP Barrel Price 1/	Average WAP Block Price 1	WAP Barrel Premium 2/	WAP Block Premium 2/
			----cents per pound----				
901109	105.25	108.75	901115	106.75	112.00	1.50	3.25
901116	105.25	108.75	901120	106.75	112.00	1.50	3.25
901121	105.25	108.75	901129	106.75	112.00	1.50	3.25
901130	105.25	108.75	901206	106.25	113.00	1.00	4.25
901207	105.25	108.75	901213	106.25	112.75	1.00	4.00
901214	105.25	108.75	901220	105.75	112.75	0.50	4.00
901221	105.25	108.75	901227	106.13	112.38	0.88	3.63
901228	105.25	109.00	910103	105.88	112.25	0.63	3.25
910104	105.25	108.50	910110	105.88	111.00	0.63	2.50
910111	105.25	108.75	910117	105.88	111.25	0.63	2.50
910118	105.25	108.75	910124	105.88	111.25	0.63	2.50
910125	105.25	108.75	910200	105.88	111.75	0.63	3.00
910201	105.25	108.75	910207	105.88	111.50	0.63	2.75
910208	105.25	108.75	910214	105.88	111.50	0.63	2.75
910215	105.25	108.75	910221	105.88	111.50	0.63	2.75
910222	105.25	108.75	910300	105.88	111.50	0.63	2.75
910301	105.25	108.75	910307	105.88	111.50	0.63	2.75
910308	105.25	108.75	910314	105.88	111.50	0.63	2.75
910315	105.25	108.75	910321	105.88	111.50	0.63	2.75
910322	105.25	108.75	910327	105.88	111.50	0.63	2.75
910328	105.25	108.75	910404	106.13	111.75	0.88	3.00
910405	105.25	108.75	910411	106.13	111.75	0.88	3.00
910412	105.25	108.75	910418	106.13	111.75	0.88	3.00
910419	105.25	108.75	910425	106.13	111.75	0.88	3.00
910426	105.25	108.75	910502	106.13	111.75	0.88	3.00
910503	106.50	108.75	910509	108.50	112.38	2.00	3.63
910510	107.50	109.75	910516	109.00	112.88	1.50	3.13
910517	112.00	114.75	910523	114.00	118.75	2.00	4.00
910524	112.00	114.75	910530	114.00	118.75	2.00	4.00
910531	113.25	115.50	910606	116.50	119.50	3.25	4.00
910607	114.25	116.75	910613	117.75	120.75	3.50	4.00
910614	115.00	117.50	910620	118.00	121.50	3.00	4.00
910621	117.75	120.00	910627	120.25	124.00	2.50	4.00
910628	118.25	121.25	910704	121.25	125.25	3.00	4.00
910705	119.00	121.50	910711	122.00	125.50	3.00	4.00
910712	120.00	122.50	910718	123.25	126.50	3.25	4.00
910719	124.25	128.00	910725	127.50	132.50	3.25	4.50
910726	125.00	128.75	910801	128.50	133.75	3.50	5.00
910802	126.25	129.75	910808	129.50	134.75	3.25	5.00
910809	126.75	130.25	910815	130.00	135.75	3.25	5.50
910816	127.25	130.75	910822	130.50	136.25	3.25	5.50
910823	129.50	133.00	910829	132.75	138.50	3.25	5.50
910830	130.50	133.50	910905	133.75	139.00	3.25	5.50

Public Report

NCE Date	NCE Barrel Price	NCE Block Price	WAP Date	Average WAP Barrel Price 1/	Average WAP Block Price 1	WAP Barrel Premium 2/	WAP Block Premium 2/
				----cents per pound----			
910906	130.75	133.50	910912	136.25	139.00	5.50	5.50
910913	131.00	134.50	910919	134.25	140.00	3.25	5.50
910920	132.00	135.25	910926	135.50	140.50	3.50	5.25
910927	133.25	135.00	911003	136.25	140.25	3.00	5.25
911004	133.50	135.50	911010	136.50	140.75	3.00	5.25
911011	133.75	135.50	911017	136.75	140.75	3.00	5.25
911018	133.75	134.75	911024	136.75	139.75	3.00	5.00
911025	133.75	134.50	911100	136.75	139.25	3.00	4.75
911101	133.75	134.25	911107	136.50	139.00	2.75	4.75
911108	131.75	132.75	911114	133.75	136.75	2.00	4.00
911115	130.00	130.50	911121	131.00	134.00	1.00	3.50
911122	128.25	128.75	911128	129.25	132.25	1.00	3.50
911129	127.75	128.25	911205	128.75	131.75	1.00	3.50
911206	124.25	127.25	911212	124.75	130.75	0.50	3.50
911213	123.75	127.25	911219	124.75	130.25	1.00	3.00
911220	122.25	125.75	911226	123.25	128.75	1.00	3.00
911227	121.25	124.75	920102	122.25	127.75	1.00	3.00
920103	121.25	124.75	920109	120.25	127.75	-1.00	3.00
920110	118.25	124.75	920116	118.12	127.25	-0.13	2.50
920117	115.00	121.50	920123	115.00	124.50	0.00	3.00
920124	115.00	119.00	920130	114.75	120.75	-0.25	1.75
920131	115.00	119.00	920206	114.50	120.75	-0.50	1.75
920207	113.50	119.00	920213	113.00	120.50	-0.50	1.50
920214	113.75	115.50	920220	113.25	117.25	-0.50	1.75
920221	113.75	115.25	920227	113.25	117.00	-0.50	1.75
920228	113.75	115.25	920305	114.25	118.25	0.50	3.00
920306	113.75	115.25	920312	113.88	119.25	0.13	4.00
920313	113.75	115.75	920319	114.75	119.75	1.00	4.00
920320	114.25	116.25	920326	116.00	120.75	1.75	4.50
920327	114.25	118.25	920402	115.75	122.75	1.50	4.50
920403	118.25	123.50	920409	120.75	128.50	2.50	5.00
920410	123.75	126.75	920415	126.25	132.25	2.50	5.50
920416	127.50	130.25	920423	130.25	135.75	2.75	5.50
920424	129.50	131.25	920500	133.50	137.75	4.00	6.50
920501	130.50	132.50	920507	135.00	139.00	4.50	6.50
920508	131.50	133.50	920514	135.75	140.00	4.25	6.50
920515	132.25	134.25	920521	136.25	140.25	4.00	6.00
920522	133.00	135.00	920528	137.00	141.00	4.00	6.00
920529	133.50	135.50	920604	137.50	141.50	4.00	6.00
920605	133.50	135.50	920611	137.50	141.00	4.00	5.50
920612	133.75	135.75	920618	137.75	141.25	4.00	5.50
920619	134.00	136.25	920625	137.00	141.25	3.00	5.00
920626	134.25	137.00	920701	137.25	142.00	3.00	5.00

NCE Date	NCE Barrel Price	NCE Block Price	WAP Date	Average WAP Barrel Price 1/	Average WAP Block Price 1	WAP Barrel Premium 2/	WAP Block Premium 2/
			----cents per pound----				
920702	134.25	137.00	920709	135.75	142.00	1.50	5.00
920710	134.25	137.00	920716	135.75	142.00	1.50	5.00
920717	134.25	137.00	920723	135.75	142.00	1.50	5.00
920724	134.25	137.00	920730	133.25	141.00	-1.00	4.00
920731	135.00	138.75	920806	136.50	142.75	1.50	4.00
920807	135.00	138.75	920813	136.50	142.75	1.50	4.00
920814	133.50	138.75	920820	135.00	142.75	1.50	4.00
920821	131.00	136.50	920827	129.00	140.00	-2.00	3.50
920828	131.00	136.50	920903	129.00	140.00	-2.00	3.50
920904	129.25	136.50	920910	128.25	139.00	-1.00	2.50
920911	129.25	136.25	920917	127.75	138.25	-1.50	2.00
920918	124.50	131.50	920924	123.50	133.50	-1.00	2.00
920925	124.50	131.50	921001	123.50	133.50	-1.00	2.00
921002	123.50	130.50	921008	123.00	132.50	-0.50	2.00
921009	123.25	130.50	921015	123.25	133.00	0.00	2.50
921016	123.25	130.75	921022	123.25	133.25	0.00	2.50
921023	121.75	128.25	921029	121.25	130.75	-0.50	2.50
921030	121.75	127.50	921105	121.25	130.50	-0.50	3.00
921106	121.75	127.25	921112	121.25	130.25	-0.50	3.00
921113	121.50	126.50	921119	121.00	129.50	-0.50	3.00
921120	120.50	124.75	921124	120.00	127.50	-0.50	2.75
921125	120.00	124.25	921203	119.50	127.50	-0.50	3.25
921204	117.00	120.00	921210	116.50	123.13	-0.50	3.13
921211	117.00	120.00	921217	116.50	122.00	-0.50	2.00
921218	117.00	120.00	921222	116.50	122.00	-0.50	2.00
921223	117.00	120.00	921229	116.50	121.75	-0.50	1.75
921230	117.00	120.00	930107	116.50	121.75	-0.50	1.75
930108	114.00	119.00	930114	114.00	120.25	0.00	1.25
930115	112.00	116.00	930121	112.00	117.50	0.00	1.50
930122	112.00	116.00	930128	112.25	117.25	0.25	1.25
930129	112.00	116.00	930204	112.00	117.75	0.00	1.75
930205	112.00	116.00	930211	112.25	118.25	0.25	2.25
930212	112.00	116.00	930218	112.25	118.75	0.25	2.75
930219	112.00	116.00	930225	113.00	119.50	1.00	3.50
930226	112.50	116.00	930304	114.50	120.25	2.00	4.25
930305	113.50	117.25	930311	115.50	121.50	2.00	4.25
930312	116.00	119.00	930318	118.00	123.38	2.00	4.38
930319	119.75	122.50	930325	122.75	127.25	3.00	4.75
930326	125.00	127.00	930401	128.00	132.00	3.00	5.00
930402	130.00	131.00	930407	133.00	136.00	3.00	5.00
930408	135.00	138.00	930415	138.00	143.00	3.00	5.00
930416	136.50	139.25	930422	138.50	144.25	2.00	5.00
930423	136.50	139.25	930429	138.50	143.50	2.00	4.25

NCE Date	NCE Barrel Price	NCE Block Price	WAP Date	Average WAP Barrel Price 1/	Average WAP Block Price 1	WAP Barrel Premium 2/	WAP Block Premium 2/
			----cents per pound----				
930430	136.50	139.25	930506	138.50	142.75	2.00	3.50
930507	136.50	139.25	930513	138.38	142.75	1.88	3.50
930514	136.50	139.25	930520	138.38	140.75	1.88	1.50
930521	136.25	139.25	930527	136.25	140.75	0.00	1.50
930528	136.25	139.25	930603	136.25	140.75	0.00	1.50
930604	132.25	136.75	930610	136.25	140.75	4.00	4.00
930611	128.75	133.50	930617	128.75	133.50	0.00	0.00
930618	122.00	126.00	930624	122.75	127.50	0.75	1.50
930625	122.00	125.75	930700	123.00	127.25	1.00	1.50
930701	122.00	125.75	930708	123.25	127.50	1.25	1.75
930709	122.00	125.50	930715	122.75	127.50	0.75	2.00
930716	120.25	123.75	930722	121.25	125.75	1.00	2.00
930723	118.75	122.25	930729	119.50	124.25	0.75	2.00
930730	117.75	122.00	930805	119.25	124.50	1.50	2.50
930806	116.75	122.00	930812	118.25	124.50	1.50	2.50
930813	115.00	121.00	930819	116.50	123.50	1.50	2.50
930820	115.00	121.00	930826	116.50	124.50	1.50	3.50
930827	115.00	126.25	930902	117.25	130.25	2.25	4.00
930903	128.00	134.50	930909	130.50	138.75	2.50	4.25
930910	131.50	134.50	930916	133.75	138.50	2.25	4.00
930917	131.50	134.50	930923	134.25	138.50	2.75	4.00
930924	131.50	134.50	931000	134.25	138.50	2.75	4.00
931001	131.50	134.50	931007	134.00	138.75	2.50	4.25
931008	131.50	134.50	931014	133.50	139.00	2.00	4.50
931015	131.50	134.50	931021	133.50	139.13	2.00	4.63
931022	131.50	134.50	931028	133.50	139.00	2.00	4.50
931029	131.50	134.50	931104	133.50	139.00	2.00	4.50
931105	131.50	134.50	931111	133.38	138.63	1.88	4.13
931112	130.75	134.50	931118	131.75	138.50	1.00	4.00
931119	130.75	134.75	931123	131.75	138.75	1.00	4.00
931124	130.75	134.75	931202	131.75	138.75	1.00	4.00
931203	129.75	133.50	931209	130.25	134.50	0.50	1.00
931210	128.25	132.00	931216	128.75	133.50	0.50	1.50
931217	126.25	130.00	931222	126.75	131.50	0.50	1.50
931223	126.25	130.00	931230	126.75	131.50	0.50	1.50
931230	126.25	130.00	940106	126.75	131.38	0.50	1.38

Source: Dairy Market News, AMS, USDA.

1/ USDA reports a minimum and maximum WAP price each week. The WAP price reported here is the simple average of the minimum and maximum price reported by USDA.

2/ WAP Premiums are measured as the difference between the average WAP price as reported on Thursday of each week and the NCE Price as reported on Friday of the previous week.

Chapter 5--Trader Activity-Price Relationships

A. Introduction

During 1988-1993 there was a cyclical pattern to cheese prices each year caused by seasonal variation in overall supply and demand conditions. Prices typically were lowest at the beginning of the flush production months--February-March--rising thereafter until they peaked in late summer or fall. There were departures from the general pattern in some years due to unique supply and demand factors.

Overall supply and demand conditions determine the broad contour of prices over each price cycle. But given the high price inelasticity of short-run supply, there often is a range of prices that will clear the market at each point on the cycle, which gives traders with market power a range within which they may influence the price established each week on the NCE.

In the preceding chapters we demonstrated that leading traders often have a financial interest in the level of NCE prices; this interest provides a motive for traders to use the NCE to influence prices, not merely to buy or sell cheese. Based on an examination of their business characteristics, we hypothesized the following motives for trader activity on the NCE: Because Kraft, Borden and Alpine Lace may at times benefit from lower NCE prices, they are predominantly seller-traders on the NCE despite the fact that they buy virtually all their bulk cheese requirements (not made in their own plants) directly from cheese manufacturers. Because Beatrice, Schreiber, Mid-Am, Land O' Lakes and AMPI may at times benefit from higher NCE prices, they are primarily buyer-traders on the NCE. We cannot hypothesize the motives of another leading trader, Dairystate, since its status as a broker makes its trading activity dependent on the nature and motives of its clients.

In this chapter we examine the above traders' conduct on the NCE to determine whether it is consistent with their hypothesized conduct. We begin with an overview of trader activity during 1988-1993 and then examine the relationship between the activity of individual leading traders and NCE prices. We examine the 1988-1993 period because, as discussed in Chapter 4, a significant change in the trading conduct of several leading traders occurred between 1980-1987 and 1988-1993. Several concerns that had been primarily seller-traders on the NCE became primarily buyer-traders, and vice versa. The transition in trading roles took place within the span of a couple of years, beginning with Kraft's switch in August 1986. Whereas Kraft bought more than it sold on the NCE during 1980 through July 1986, beginning in August 1986 it became exclusively a seller-trader and continued thus through 1993. Leading agricultural cooperative cheese manufacturers began the transition from seller-traders to buyer-traders a little later, in 1988. Since the changes in roles had taken place by 1988 or soon thereafter, we shall limit our analysis of trading activity to the period 1988-1993. For a brief discussion of Kraft's trading activity during 1986 and 1987, see Appendix 5.A. Finally, we make an econometric analysis of the relationship between trader activity and the level of NCE prices.

B. Overview of Trader Activities

Table 5-1 summarizes total seller and buyer trading activity of nine leading traders for the period 1988-1993. The upper half of the table contains three classifications of seller activity: (a) offers or reduced offers to sell; (b) actual sale from having an offer "covered"; and (c) actual sale by filling a bid. Total sales for each trader are the sum of its offers that are covered and bids that it fills. The buyer counterparts to seller activity are summarized on the bottom half of the table: (a) bids or increased bids to buy; (b) actual purchase by having a bid filled; and (c)

Table 5.1. Types of Trading Activity by Leading Traders of Barrel and Block Cheese on the NCE, 1988-1993

Type of Trader Activity	Leading Traders										
	Kraft	Borden	Alpine	DS[1]	Beatrice	Mid-Am	Schreiber	LOL	AMPI	All Others[2]	TOTAL
						Seller Activity of Traders					
Offers and Reduced Offers											
Number	879	250	485	501	0	0	26	59	3	389	2592
%	34	10	19	19			1	2	*	15	100
Sale: Offer Covered											
Carloads	633	45	118	110	0	0	4	2	0	101	1013
%	62	4	12	11			*	*		10	100
Sale: Filled Bid											
Carloads	984	14	12	19	0	4	3	70	0	77	1183
%	83	1	1	2		*	*	6		7	100
TOTAL SALES											
Carloads	1617	59	130	129	0	4	7	72	0[3]	178	2196
%	74	3	6	6		*	*	3		8	100
						Buyer Activity of Traders					
Bids and Increased Bids											
Number	3	29	15	160	968	573	357	220	196	650	3171
%	*	1	*	5	31	18	11	7	6	22	100
Purchase: Bid Filled											
Carloads	0	32	1	29	391	205	197	103	105	120	1183
%		3	*	2	33	17	17	9	9	10	100
Purchase: Covered Offer											
Carloads	22	0	2	0	382	286	125	86	67	43	1013
%	2		*		38	28	12	8	7	4	100
TOTAL PURCHASES											
Carloads	22	32	3	29	773	491	322	189	172	163	2196
%	1	1	*	1	35	22	15	9	8	7	100

Source: National Cheese Exchange, Trading Activity Minutes, AMS, USDA, 1988-93.

Note: Total percentage figure may not add, due to rounding.

*Less than 1 percent.

[1]Dairystate Brands

[2]These are Alto (bought 6 carloads): Bongards' (sold 75 loads); Dairygold (sold 14 carloads); Edelweiss (bought 19 carloads); Empire Cheese (bought 5 carloads); Golden Cheese (sold 10 carloads); Hermke Cheese (bought 13 carloads); Marathon (sold 35 loads); Marketing Association (sold 6 carloads); Masters Gallery (sold 7 loads and bought 62); Northern (sold 18 loads, bought 33 loads); Northwood (sold 6 and bought 5 carloads); Schurman (sold 7 and bought 20 carloads). Green Bay Cheese, Fromageries, Frigo and Tolibia (made offers and bids but no sales or purchases).

[3]AMPI sold 10 loads through Dairystate, a broker. These loads are included in Dairystate's total sales.

actual purchase by covering an offer. Total purchases for each trader are the sum of its bids that are filled and offers that it covers.

We divide leading traders into two groups: seller-traders and buyer-traders. Three leading seller-traders, Kraft, Borden, and Alpine Lace, made 82 percent of all barrel and block sales on the NCE during 1988-1993. Kraft, alone, made 74 percent of all NCE sales and 83 percent of barrel sales, which accounted for 68 percent of all NCE sales. This large sales share made Kraft the dominant seller on the Exchange during this period. However, the other leading seller-traders, Borden and Alpine Lace, were significantly more active on the NCE than implied by their share of actual sales. Whereas they made only 9 percent of all NCE sales, they made 28 percent of all offers and reduced offers to sell, indicating that they were very often active in making offers during periods when few or no actual sales were made. They filled very few bids. Kraft was much more active in periods of heavy selling.

The leading buyer-trader, Beatrice, made 35 percent of all purchases, which was less than one-half the sales share of the leading seller-trader, Kraft. However, buyer concentration was also high, with five buyers accounting for 89 percent of all purchases on the Exchange (Table 5.1).

Some companies were more important in barrel than in block sales. For example, although Kraft was the leading trader in both barrels and blocks, Borden traded only barrels, Beatrice traded more barrels than blocks, and Mid-Am traded more blocks than barrels (Appendix Tables 5.1a and 5.1b).

C. Trading Patterns of Various Traders

In this section we examine the NCE trading activity patterns over each price cycle during 1988-1993. We begin with Kraft, the leading trader on the NCE, and then examine the activity of other leading traders.

Trading Activity of Kraft

Figures 5.1a through 5.1c display Kraft's trading activity in barrels and blocks on the NCE from July 1988 through June 1993. The solid bars show the NCE opinion or settlement price for barrels[1] at the end of a day's trading, and the space between bars identifies the extent of trading activity during the day. The "K" notation below the price line identifies each time Kraft acted on the NCE. The notations above the price line identify the types of activity involved as follows:

F, Kraft *filled* another trader's bid to buy
O, Kraft *offered* to sell
R, Kraft *reduced* the price of its previous offer
C, another trader *covered* a Kraft offer to sell
B, Kraft *bid* to buy
I, Kraft *increased* its previous bid.

The numbers below the line indicate the number of loads Kraft sold. Below the bottom axis of each figure is shown the trading date with year, month, and day; e.g., 88.0701 is July 1, 1988. Not all trading dates are reported because of space limitations.

Kraft trading activity during July 1988 through June 1993 followed the same general pattern over each price cycle. Around price peaks, Kraft usually initially filled bids, then offered to sell, and then reduced its offers. Once prices began to fall, Kraft usually continued making

---

1 To simplify the presentation, no price line is shown for blocks, which generally move in unison with barrels at a few cents above barrels.

Figure 5.1a: Kraft Activity on NCE

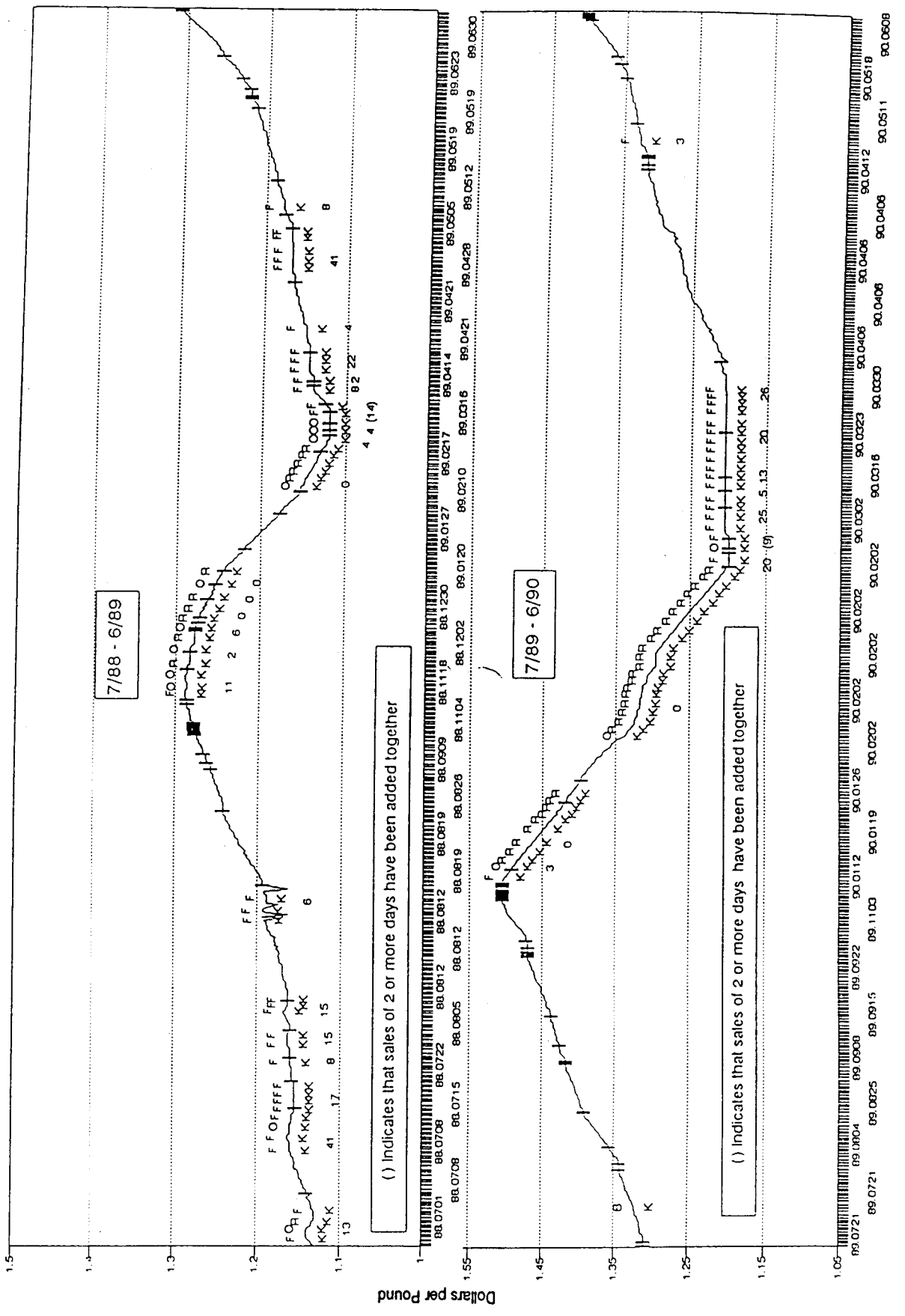
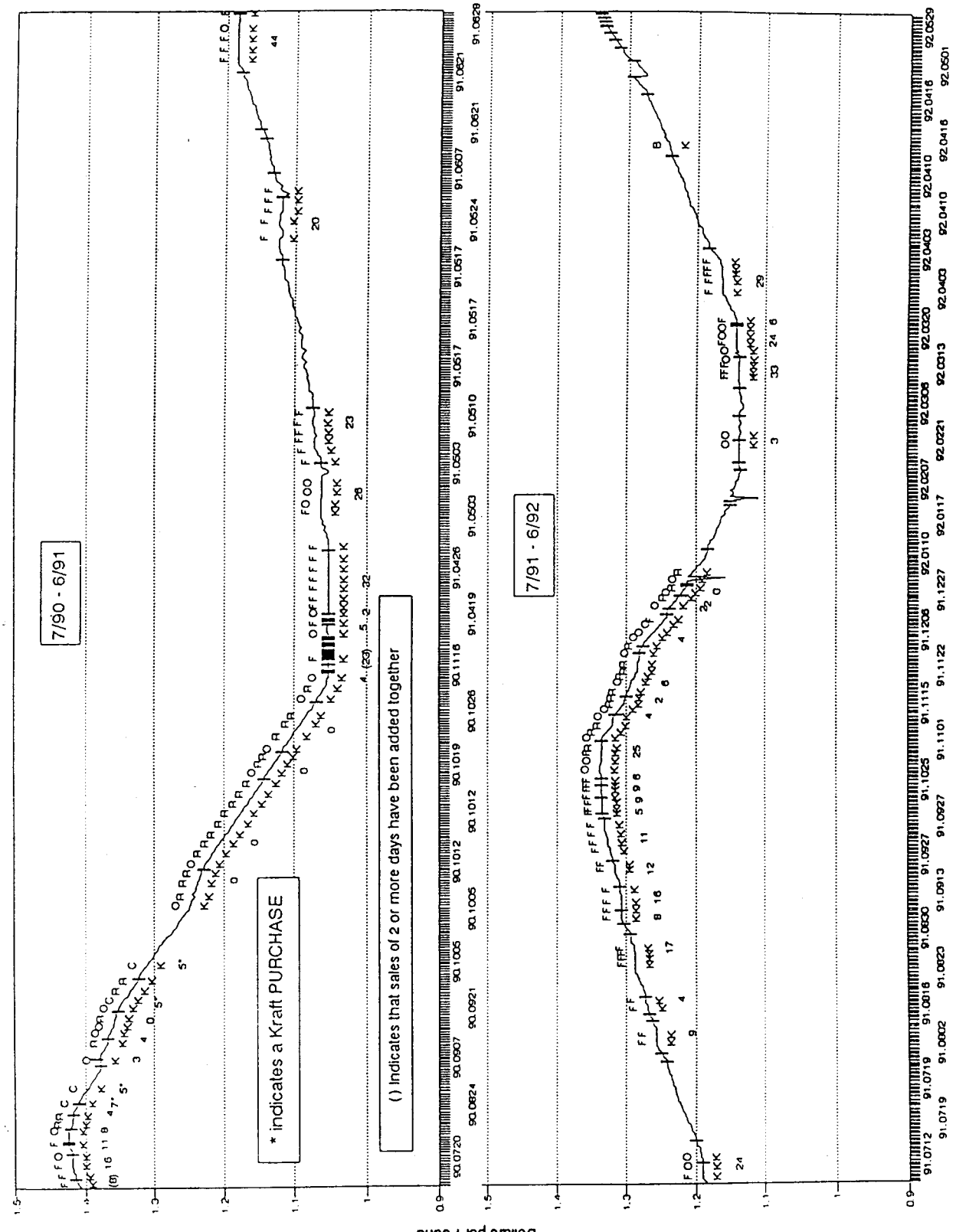


Figure 5.1b: Kraft Activity on NCE



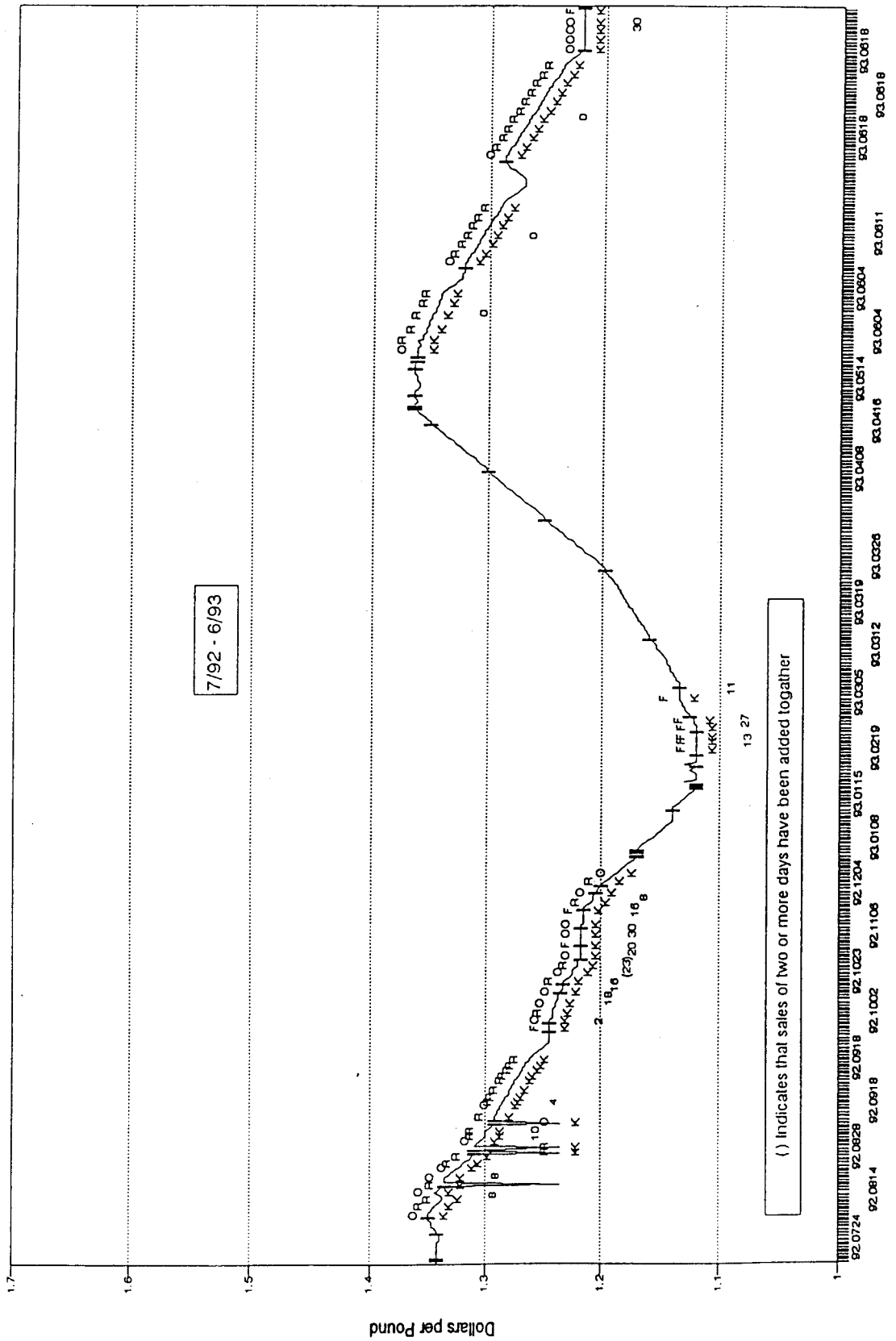


Figure 5.1c: Kraft Activity on NCE

offers, although it sometimes ceased doing so as other seller-traders maintained the trend. Often prices declined with few or no actual transactions during most sessions; but if Kraft's offers were covered, it continued making offers until prices resumed their decline. At the price bottom Kraft filled bids or made offers, often selling quite heavily. In the subsequent price upturn, Kraft remained relatively inactive, except for periodic selling, which seemed to have the purpose and effect of moderating the momentum of the rising price trend (see Section E this chapter).

There are a few seemingly notable exceptions to Kraft's activity as a *seller-trader*, when Kraft *appeared* to behave as a *buyer-trader* during several trading sessions. During two of these sessions, July 21, 1989 and April 16, 1992, Kraft made a single bid to buy on the Exchange. Neither bid was filled.[2] In addition, during four sessions in August-October 1990, Kraft bought 22 loads of blocks on the Exchange. These exceptions do not represent *bona fide* buyer-trader activity, as explained in Section E of this chapter, and in all other trading sessions during 1988-1993, Kraft acted as a seller-trader. Thus we frequently refer to Kraft as an *exclusive seller-trader.*

Trading Patterns of Other Leading Traders

The barrel trading activity of Kraft and other leading traders is displayed in Appendix Figures 5-1a to 5-1e, with each graph showing one year's activity. The bold line traces changes in price, while the solid bars on the bold price line depict the opinion or settlement price at the end of a trading day. Wider bars indicate that no trading activity occurred for two or more

---

[2] We have omitted several actions in this graph where a trader made an opening bid far below the closing opinion of the prior session. These bids were ignored by other traders because the accepted procedure is for the opening bid or offer to be at the prior week's close. We have included one such opening bid made April 21, 1992, because the bid was filled. This was considered an improper action. See Chapter 4, text at note 112.

consecutive trading days. The shadow lines above and below the bold price line are included to show the activity of individual leading traders. The leading seller-traders appear above the bold line and the leading buyer-traders below the bold line. The nature of each activity is identified using the following letter codes:

F: fill another trader's bid to buy
O: offer to sell
R: reduce price of previous offer
C: cover another trader's offer
B: bid to buy
I: increase price of previous bid

Seller-Trader Activity in Barrels--Beginning in 1990, Borden and Alpine Lace frequently joined Kraft in selling activity on the NCE, with Borden selling only barrels and Alpine Lace mainly blocks.[3] However, their activity differed from Kraft's in an important respect. Although these traders and Kraft were often active during the same periods, Kraft usually took the lead. And when buyer-traders began buying heavily, Borden and Alpine Lace typically became inactive, leaving the heavy selling to Kraft. As a consequence, Kraft made far more actual sales than either Borden or Alpine Lace, who made 26 percent of all offers and reduced offers for barrels, but only 5 percent of all sales. Kraft, on the other hand, made 48 percent of all offers and reduced offers to sell barrels, but 83 percent of all actual barrel sales during 1988-1993 (Appendix Table 5.1a).

---

[3] Borden bought 28 loads during 1988 and none in 1989; during these years it sold only two loads. During 1990-1993, Borden was predominantly a seller-trader, buying only four loads, while selling 57 loads. During 1988 and 1989, Alpine Lace neither sold nor bought on the NCE; thereafter it became predominantly a seller-trader, selling 130 loads while buying only three loads. (Table 4.2).

Although Dairystate was an active barrel seller-trader at times,[4] making 17 percent of all offers to sell, it made only 3 percent of all barrel sales. Also, Dairystate made more bids and increased bids to buy than did the other leading seller-traders: 114 (6 percent) versus 35 (2 percent) for Kraft, Borden and Alpine Lace combined. However, Dairystate made only 2 percent of all barrel purchases (Appendix Table 5.1a). It appears, therefore, that much of Dairystate's buying and selling activity was not made in expectation of consummated transactions. This activity suggests that Dairystate at times had an interest in influencing prices, whether acting for others or in its own behalf, not merely in buying or selling cheese on the Exchange.

Buyer-Trader Activity in Barrels--The leading buyer-traders in barrels were Beatrice, Mid-Am, Schreiber, Land O' Lakes and AMPI, some of whom did not trade actively in all years. Combined, these traders purchased 89 percent of all barrels traded on the Exchange during 1988-1993. Each buyer-trader's total activity in barrels, as measured by its share of total bids, corresponded roughly with its share of total purchases (Appendix Table 5-1a). This pattern differed substantially from that of the seller-traders.

Typically, around price tops and price bottoms one or more buyer-traders made substantial purchases by accepting Kraft's offers to sell or by Kraft's filling of their bids to buy (Appendix Figures 5.1a to 5.1e). On the other hand, the leading buyer-traders initiated and maintained upward price trends, an action often accomplished with relatively few actual

---

[4] We do not include Dairystate among the leading seller-traders because, as discussed above, we cannot hypothesize the motive for its trading conduct.

purchases, except when Kraft periodically filled bids with the apparent effect of moderating the price rise.

Trader Activity in Blocks--Kraft also was the leading seller-trader in blocks, accounting for 53 percent of all block sales in 1989-1993. Alpine Lace was the second largest at 17 percent, with Dairystate, a broker, taking third place at 13 percent. Borden, the second most active barrel trader, engaged in no block trading activity (Appendix Table 5.1b).

One difficulty with interpreting block trading patterns is that often such activity appears to be aimed at maintaining "appropriate" block-barrel price spreads. Indeed, even Kraft evidently bought 22 loads of blocks for this purpose in 1990.[5] Often block prices merely followed barrel prices without actual transactions. This may also explain, in part, why far fewer blocks than barrels are traded on the NCE. For example, only 11 carloads of blocks were traded each year during 1988 and 1989, and in no year during 1988-1993 did block sales reach 200 loads (Appendix Table 4.2b). But whereas blocks account for just below one-third of all NCE sales, more blocks than barrels are sold in the spot market off the NCE, as well as under contract sales. Indeed, cheese processing plants, the destination of nearly all barrels, utilize only about one-fourth of all cheese manufactured. The other three-fourths is marketed predominantly as natural cheese and is cut and wrapped from 40- and 640-pound blocks.

Kraft began selling blocks during the historic price drop of February 2, 1990, and remained quite active thereafter, especially at price tops and bottoms, where Kraft filled bids and made offers that were covered. Kraft also was quite active during price declines, especially in the early stages after a market had topped (Appendix Figures 5.2a-5.2e).

---

[5] See Section E, this chapter.

Alpine Lace and Dairystate combined made more offers to sell blocks than did Kraft, 51 percent versus 23 percent. But Kraft made more sales than they did, 53 percent versus 30 percent (Appendix Table 5.1b). Like the pattern we saw in barrel trading, when buyer-traders began covering many offers, Alpine Lace and Dairystate let Kraft carry the burden of selling, which it generally did at a loss.[6] Leading buyer-traders were active at price bottoms and around price tops when Kraft was engaged in heavy selling. The buyers were especially active between price bottoms and price tops, when they often bid up prices with very few takers.

Thus, the pattern of block trading generally paralleled that in barrels, although the trading patterns were less clear than in barrels, perhaps because some block trading apparently occurred to maintain the proper block-barrel price spread.

D. Trader Activity-Price Relationships

Kraft Activity-Price Relationships

The relationships between trading activity and NCE prices, displayed graphically in the above figures, are summarized in the tables below. Table 5.2 summarizes the behavior of barrel prices on days in which Kraft was active on the Exchange during 1988-1993 and on days in which Kraft was not active but other traders (excluding Borden and Alpine Lace)[7] were active. Kraft activity is divided among those days in which it (a) made sales; (b) made purchases; (c) made an offer to sell but the offer was not covered; and (d) made a bid to buy but the bid was not filled.

---

[6] See Chapter 4, Table 4.3 and Chapter 6, Sections A-D.

[7] The activity of Borden and Alpine Lace is excluded because they, like Kraft, were active seller-traders.

Of the 135 trading sessions in which Kraft was active as a seller-trader on the Exchange during 1988-1993, prices increased during only 5 percent,[8] decreased 36 percent, and remained unchanged during 27 percent of the sessions. During the remaining 30 percent of the sessions, Kraft's selling activity appears to have had the effect of *moderating an upward price trend* (Table 5.2).[9]

During the 82 days that Kraft was not active in barrel trading on the Exchange but others were active (excluding Borden and Alpine Lace), barrel prices increased 63 percent of the days and decreased only 6 percent of the days. In the remaining 30 percent of the days, prices were unchanged. Few actual transactions occurred on days when other traders were active but Kraft, Borden and Alpine Lace were not. Trades occurred during only 10 of the 82 days that Kraft, Borden and Alpine Lace were inactive; these trades involved only 58 carloads (4 percent of total barrel sales during 1988-1993). In contrast, in the 135 days Kraft was active on the NCE it made sales during 104 (77 percent) of the days, involving sales of 1249 carloads (83 percent of all barrel sales during 1988-1993). These facts reflect that when Kraft was not active in selling

---

[8] This excludes the two days Kraft apparently made bids designed to signal competitors that it approved an upward price trend. This activity is excluded because Kraft was not acting as a bona fide buyer-trader. See Section E, this chapter.

[9] See Chapter 6, text at notes 55-58. Prices frequently increased some on these days.

Table 5.2. Price Behavior During Trading Days Kraft was Active and not Active on NCE, 1988-1993

BARRELS

Number of Trading Days:

	Price Increased	Price Decreased	Price Remained Unchanged	Price Increase Stopped, Slowed or Reversed[a]		
	No. of Days (1)	No. of Days (2)	No. of Days (3)	No. of Days (4)	Total Days (5)	Total Loads Traded (6)
1. Kraft Active on NCE						
Kraft made sale	7	24	33	40	104	1249
Kraft made purchase	0	0	0	0	0	0
Kraft offered, made no sales	0	24	4	1	29	0
Kraft bid, made no purchases	2[b]	0	0	0	2	0
Total trading days	9	48	37	41	135	1249
Percent of trading days	7 (5)%[c]	36%	27%	30%	100%	
2. Kraft Not Active but Others Active (excluding Borden and Alpine Lace)						
Trades took place	3	1	6	--	10	58
No trades took place	49	4	19	--	72	0
Total trading days	52	5	25	--	82	58
Percent of trading days	63%	6%	30%	--	100%	
3. No Activity on NCE					62	
TOTAL DAYS OF TRADING					279	

Source: National Cheese Exchange, Trading Activity Minutes, AMS, USDA, 1988-1993.

[a]This refers to a day in which prices were increasing as a result of other trader activity until Kraft began selling activity, at which time the upward price trend was stopped, reversed, or slowed appreciably.

[b]These bids were apparently designed to signal competitors that Kraft agreed that prices should continue to increase. See Section E, this chapter.

[c]Excluding two weeks in which Kraft made bids for signaling purposes only. See note b above.

Table 5.3. Price Behavior During Trading Days Kraft was Active and not Active on NCE, 1988-1993

BLOCKS

	Number of Trading Days:					
	Price Increased	Price Decreased	Price Remained Unchanged	Price Increase Stopped, Slowed or Reversed[a]		
	No. of Days (1)	No. of Days (2)	No. of Days (3)	No. of Days (4)	Total Days (5)	Total Loads Traded (6)
1. Kraft Active on NCE						
Kraft made sale	7	23	23	22	75	368
Kraft made purchase	0	4[b]	0	0	4	22[b]
Kraft offered, made no sales	0	15	1	0	16	0
Kraft bid, made no purchases	1[c]	0	0	0	1	0
Total trading days	8	42	24	22	96	390
Percent of trading days	8 (7)%[d]	44%	25%	23%	100%	
2. Kraft Not Active but Others Active (excluding Borden and Alpine Lace)						
Trades took place	5	3	6	--	14	60
No trades took place	57	7	28	--	92	0
Total trading days	62	10	34	--	106	60
Percent of trading days	58%	9%	32%	--	100%	
3. No Activity on NCE					90	
TOTAL DAYS OF TRADING					292	

Source: National Cheese Exchange, Trading Activity Minutes, AMS, USDA, 1988-1993.

[a]This refers to a day in which prices were increasing as a result of other trader activity until Kraft began selling activity, at which time the upward price trend was stopped, reversed, or slowed appreciably.

[b]These purchases appear to have been made to align block prices with barrel prices, not to buy blocks since at the time Kraft was leading NCE prices down. See Section E, Chapter 5.

[c]This bid evidently was made to signal competitors that Kraft believed prices should continue to rise. See Section E, this chapter.

[d]Excluding week in which Kraft made a bid for signaling purposes only. See note c above.

barrels, other traders' activity involved primarily bids and increased bids or offers and reduced offers, with very few consummated sales. During another 62 days no trader activity occurred.

The overall pattern of block trading activity parallels that of barrel trading (Table 5.3). Indeed, during the days Kraft was active in blocks, prices decreased somewhat more frequently (44 percent) than in barrels (36 percent).

Activity-Price Relationships of Leading Seller- and Buyer-Traders

As hypothesized above, leading traders may be divided into two groups: *seller-traders* and *buyer-traders*. We therefore examine the relationship between NCE prices and the trading activity of leading seller-traders and buyer-traders during 1988-1993. The leading seller-trader group consists of Kraft, Borden and Alpine Lace;[10] and the leading buyer-trader group consists of Beatrice, Mid-Am, Schreiber, Land O' Lakes and AMPI. Table 5.4 shows the behavior of NCE prices on days when these leading seller-traders and buyer-traders were active on the NCE during 1988-1993.

There is a distinct difference in the activity-price relationships of the two groups. During the days the leading seller-traders were active on the Exchange, prices increased 8 percent of the time, decreased 43 percent of the time, and remained unchanged 22 percent of the time. During the remaining 27 percent of the days seller-trader activity had the apparent effect of moderating an upward price trend.[11] In contrast, during the days buyer-traders were active, prices increased 45 percent of the time, decreased 30 percent of the time, and remained

---

[10] Dairystate, a broker, is not included among the leading seller-traders because, unlike the other leading seller-traders, we cannot infer a motive for its conduct on the NCE. See third paragraph of this Chapter and Chapter 4, Section C.

[11] Prices often increased some during these trading sessions.

unchanged 25 percent of the time.[12] Thus, the activity of the seller group is negatively related to price changes, which is hardly surprising since it is dominated by Kraft's activity as displayed in Tables 5.2 and 5.3. On the other hand, the activity of the buyer group is somewhat more often related to price increases than to price decreases (Table 5.4).

Leading buyer-traders were active during more days of trading than were the leading seller-traders: 239 versus 183. During 164 of the total 313 trading days, members of both groups were active, and during 55 days members of neither group were active. Thus, buyer-traders were inactive for only 19 of the days in which seller-traders were active, whereas seller-traders were inactive for 75 of the days in which buyer-traders were active. This difference reflects the fact that while both seller-traders and buyer-traders were active during price bottoms and price tops, seller-traders remained relatively inactive when buyer-traders were bidding up prices. (Appendix Table 5.2 shows the activity patterns of the seller- and buyer-trader groups separately for barrels and blocks.)

The activity-price relationships of individual leading seller- and buyer-traders are shown in Appendix Tables 5.3 and 5.4. The seller-trader group sold 1806 loads and bought 57 loads. The 22 loads Kraft bought were apparently for the purpose of influencing the price spread between blocks and barrels, not to obtain needed cheese.[13] Alpine Lace bought only three loads during 1988-1993. Borden bought all but four of its 32 loads during 1988 (Table 4.2).

---

[12] The comparisons are influenced by the addition of a separate category for seller-traders: days when their activity appeared to have had the effect of stopping, slowing or reversing an upward price trend. This activity also has a negative impact on price changes although occurring during an upward trend in prices. There is no clear counterpart of this category for buyer-traders. However, at times buyer activity appeared to slow price declines.

[13] See Section E, this chapter.

Table 5.4. Price Behavior on Days in Which at Least One of the Leading Traders in Each Group was Active, 1988-1993

Trader Active on NCE	Number of Days NCE Prices:				Trading Days		Loads Traded	
	Increased	Decreased	Remained Unchanged	Price Increase Stopped, Slowed, or Reversed[a]	Total Trading Days	Percent of Total Days	Loads Sold	Loads Bought
				BARRELS and/or BLOCKS[b]				
Seller-traders[c]	14	79	41	49	183[e]	58%	1806	35[h]
Percent	8%	43%	22%	27%	100%	--	--	--
Buyer-traders[d]	107	72	60	N/A	239	76%	89[g]	1947
Percent	45%	30%	25%	N/A	100%	--	--	--
Both Seller and Buyer Traders Active					164	52%		
Other Traders Active					10	3%	301	236
No Activity Days					45	14%	0	0
Total Days of Trading					313	100%[f]	2,196	2,196

Source: National Cheese Exchange, Trading Activity Minutes, AMS, USDA, 1988-1993.

[a]This refers to a day in which prices were increasing due to other trader activity until Kraft began selling activity, with the apparent effect of stopping, slowing or reversing an upward price trend.
[b]This reflects trading days in which the leading sellers or buyers were involved in either barrel and/or block trading on the NCE. The number of days price increased (decreased) includes days in which both barrel and block prices increased (decreased) or days in which barrel prices increased (decreased) while block prices were unchanged and vice versa. The number of days prices remained unchanged refers to the days in which both barrel and block prices remain unchanged. Finally, the price increase stopped, slowed or reversed refers to the days in which the leading sellers' activity stopped, slowed or reversed an upward price trend in barrel while block prices increased or remained unchanged, and vice versa.

On three trading days, barrel and block prices moved in opposite directions, thus not falling in any of the above categories. These days were classified as a price increase, decrease or unchanged, depending upon the net difference between barrel and block price changes. For leading seller-traders, two of these three days are included in the price increase-stopped-slowed-or-reversed category.
[c]Kraft, Borden and Alpine Lace
[d]Beatrice, Mid-Am, Schreiber, Land O' Lakes and AMPI
[e]Excludes four days when Kraft and/or Borden submitted bids for the apparent purpose of signalling their approval to buyer-traders of an upward price trend. See Section E, this chapter.
[f]Percents do not add to 100 because of the 164 days in which both seller and buyer traders were active.
[g]Includes 10 loads AMPI sold through a broker.
[h]Excludes 22 loads of blocks Kraft purchased for the apparent purpose of influencing the block-barrel price spread. See Section E, this chapter.

Hence, during 1989-1993, the three leading seller-traders were virtually always sellers.

The buyer-traders appear to be a less cohesive group than the seller-traders. Whereas the three largest buyer-traders *sold no* loads of barrels and very few loads of blocks, the sales of the fourth largest buyer-trader, Land O' Lakes, were 38 percent as great as its purchases. And the largest cheese manufacturing cooperative, AMPI, was a relatively inactive buyer-trader, buying less than any of the other leading buyer-traders. Moreover, on one occasion AMPI sold heavily while the two leading buyer-traders were purchasing.[14]

E. Trading to Signal Competitors and to Influence the Block-Barrel Spread

The most notable feature of Kraft's activity on the NCE during 1988-1993 is that it virtually always acted as a seller-trader: it bought no barrels and only 22 loads of blocks during these six years. Examination of these exceptions to Kraft's conduct as a seller-trader reveals that Kraft was not motivated by a desire to purchase cheese. Rather, it appears that the activity occurred to influence the *price spread* between blocks and barrels. On two other occasions Kraft apparently made bids for the purpose of *signaling* competitors that Kraft approved of a rising price trend.

Trading to Signal Competitors

Kraft bid to buy when NCE prices were rising during two of the six price cycles in 1988-1993. On July 21, 1989, Kraft made one bid to buy barrels, and on April 16, 1992, it made one bid to buy barrels and one bid to buy blocks. None of the bids was filled.

---

[14] See Chapter 6, Section A.

A leading *buyer-trader* interpreted Kraft's barrel and block bids on April 16, 1992, as sending a "message" to other traders that Kraft did not object to an upward price trend then underway. An internal company memorandum summarizing activity stated in part:

> A significant event occurred today. When the block market was bid to $1.27, Kraft entered a bid for four cars of blocks at $1.27 and 5 cars of barrels at $1.24/pound...*Kraft's message to the industry was that they were not going to sell any blocks or barrels at this point in time.* (Emphasis added).[15]

This expectation was confirmed by subsequent events: Kraft did not offer to sell on the NCE for the next 16 weeks, during which prices continued to rise.

We have no industry commentary concerning Kraft's price bid of July 21, 1989, but this bid occurred under circumstances similar to those of April 16, 1992. Prices rose from May 5 through June 30, 1989, after which the price of barrels remained unchanged for two weeks. After prices began rising again on July 21, Kraft made one bid to buy barrels, which was not filled. Kraft's bid likely was interpreted by the buyer-traders as *signaling* Kraft's approval of further price increases. If so, their expectation was confirmed by subsequent events: Kraft made no offers to sell during the following 14 weeks, as prices continued to rise.

Another type of trading activity by Kraft was apparently interpreted by an official of a leading *buyer-trader* as signaling that Kraft approved of an "orderly" price rise. The trader also observed that Kraft was engaged in "selective selling" to "moderate" a rising market. This buyer-trader made the following observations, in internal company memoranda, concerning Kraft's trading activity during a period of rising prices:[16]

---

[15] [[Source deleted in public report as not essential.]]

[16] For a discussion of this period see Chapter 6, Section C.

June 14, 1991 Trading Session
...Kraft seems to be taking the position that they will sell to prevent a panic market run up but will not stop an orderly market rise.[17]

June 28, 1991 Trading Session
It appears that Kraft is *continuing to over commit* for both blocks and barrels so that they are in a position to cover their commercial orders *as well as influence and trade at the Exchange.*[18]

July 19, 1991 Trading Session
The cheese available, especially barrels, continues light--with Kraft's selective selling moderating the rise in markets.[19]

September 19, 1991
Wayne [Hangartner, Kraft's purchasing director] believed that they will have more available in future weeks and that they don't want to carry more than they need for their own requirements[;] however, *he wanted to have some trading inventory.*[20]

October 8, 1991
Kraft selective selling continues to moderate the upward movement.[21]

Trading to Influence the Block-Barrel Price Spread

Because barrel trading often drives NCE price levels, some trading activity occurs to achieve what traders regard as the appropriate block-to-barrel price spread.[22] The size of the spread is important because it affects the relative profitability of manufacturing blocks and barrels. Kraft's *purchases* during four sessions in August-October 1990 apparently were motivated by this objective. During this period Kraft purchased 22 loads of blocks, its only

---

17 [[Source deleted in public report as not essential.]]

18 Emphasis added. [[Source deleted in public report as not essential.]]

19 [[Source deleted in public report as not essential.]]

20 Emphasis added. [[Source deleted in public report as not essential.]]

21 [[Source deleted in public report as not essential.]]

22 See Chapter 4, text at notes 15 and 16.

purchases on the NCE during 1988-1993.[23] The evident purpose and effect of Kraft's conduct was to prevent what it believed was an inappropriate narrowing of the block-barrel spread. Kraft clearly did not buy because it needed more blocks. As explained below,[24] during this period Kraft appeared to be leading the market down so that it could dispose of a large surplus of blocks and barrels once NCE prices were driven below the support level.

F. Econometric Examination of Trader-Price Relationships

The preceding demonstrates that during 1988-1993 the conduct of leading traders was consistent with the motives hypothesized: Kraft, Borden, and Alpine Lace were primarily seller-traders that exerted a downward pressure on prices, whereas Beatrice, Schreiber, Mid-Am, Land O' Lakes, and AMPI were primarily buyer-traders that exerted an upward pressure on prices, although the relationship appears weaker than for the seller-traders.

Kraft appeared to lead the seller-traders, joined by others with common interests, especially Borden and Alpine Lace. Over a price cycle Kraft appeared to shape the pattern of the cycle by setting price tops, by participating in initiating and sustaining price declines, and by establishing and maintaining price bottoms. Between a price bottom and the succeeding price top, leading buyer-traders were active in raising prices. During the latter period Kraft appeared

---

[23] On August 24, 1990, Kraft bought 7 loads of blocks. During the prior three weeks the spread between blocks and barrels had narrowed from 4.25 cents to 3.5 cents. When the spread continued to narrow to 1.25 cents on August 24, Kraft began bidding for blocks. The spread at the close of trading was 2.25 cents. When the spread continued to narrow the next week, August 31, 1990, Kraft again bought blocks. At the close the spread was 1.0 cent. At the opening of trading September 28, 1990, the spread was 2 cents. When the spread narrowed, Kraft began buying blocks; nonetheless, at the close the spread was 0.5 cents. The following trading session, October 5, 1990, trading was very active, with barrels dropping 9.25 cents on offers by Kraft and Borden. Kraft again bought blocks. At the close, the spread had widened to 1.5 cents.

[24] See Chapter 6, Section B.

to *signal* implicit approval of rising prices by not participating in trading, *signal* explicit approval of rising prices by submitting a bid, and *signal* explicit disapproval of rising prices by selling into a rising market, thereby moderating upward price trends.

Although Kraft was the dominant seller-trader, it was confronted by a small group of buyer-traders. In this setting, Kraft's view of the appropriate price apparently did not always go unchallenged. The buyer-traders appeared to challenge Kraft's conduct at price bottoms and, to a lesser degree, at price tops. When they persisted in bidding and/or covering Kraft offers, Kraft had to sell large amounts to prevent a price rise. If Kraft yielded to the buying pressure by not filling bids, prices rose immediately and often continuously for some weeks, often with few or no actual consummated transactions.

The apparently conflicting motives and conduct of these leading traders implied that NCE trading occurred within the context of bilateral oligopoly, where a small group of seller-traders confronted a small group of buyer-traders. This conclusion raises the question, what was the relative impact on prices of these countervailing traders? We have, therefore, performed an econometric test of the following hypotheses: (a) the trading activity of the leading seller-traders had a negative influence on NCE prices and (b) the trading activity of the leading buyer-traders had a positive influence on NCE prices.

The Economic Model

A simple competitive partial equilibrium model of the monthly pricing of cheese at the manufacturing level may be written as a function of dynamic adjustments, predetermined supply and demand shifters as follows:

$$P_t = f\,(p_t^{\ell},\ S_t,\ x_t) \qquad t = 1,2....T, \qquad (1)$$

where P_t denotes the monthly average price of cheese; vector $\underline{p}_t'$ denotes lagged cheese prices; S_t denotes predetermined total supply (beginning stocks plus production); and $\underline{x}_t$ is a vector of exogenous variables that are important shifters of the demand for cheese (e.g., disposable income, population and seasonality). The subscript t indicates month t. Under the competitive model given by equation 1, lagged cheese prices are included to reflect the possibility that supply and demand conditions prior to any given month influence cheese prices for that month. Total supply in a given month is considered as predetermined because of short-run inelastic cheese supply response.

A quantitative analysis of cheese pricing would be relatively straightforward if the observed prices were determined in a purely competitive market. In reality, however, observed prices are affected by a complex interaction of market forces, government price support policies, and the conduct of leading traders on the NCE. The federal government directly influences cheese prices through the CCC purchases of cheese for school lunch and other purposes and, importantly, through price supports for milk used in manufacturing cheese. Under the price support program, the federal government buys cheese, butter, and dried skim milk to assure that the price paid to farmers does not fall below support levels. The government's offer to buy cheese in unlimited quantities at announced prices often tends to put a floor on the price received by manufacturers. Moreover, as explained in earlier sections of this chapter, the trading patterns of leading sellers and leading buyers on the NCE imply that these traders play an important part in setting the level of observed NCE cheese prices. Thus, a competitive econometric model of cheese pricing must be modified to account for both government intervention and the potential effect of leading NCE traders.

The next section presents two alternative econometric models that allow us to control for government intervention and to test the hypotheses that leading NCE sellers have a negative effect and leading NCE buyers a positive effect on monthly cheese prices.

The Econometric Model

Let P_t equal the price of cheese at time t. A dynamic econometric equation that draws on the competitive economic model given by equation 1 can be specified as a function of market forces, seasonality, and stochastic error at time t as follows:

$$P_t = \alpha_0 + \underline{\beta}_1' \underline{p}_t^{\ell} + \beta_2 S_t + \underline{\beta}_3' \underline{x}_t + e_t \qquad t = 1,2...T, \qquad (2)$$

where $\underline{p}_t^{\ell}$ is a vector of lagged prices, S_t is the predetermined total cheese supply (beginning stocks plus production), and $\underline{x}_t$ is a vector of demand shifters (i.e. disposable income, population and seasonality) with $\underline{\beta}_1$, β_2 and $\underline{\beta}_3$ being the corresponding parameters at time t. The term α_0 denotes a constant term while e_t denotes disturbance at time t. It is assumed that $E(e_t) = 0$, $var(e_t) = \sigma$ and $cov(e_t, e_{t+1}) \neq 0$.

The lagged prices $\underline{p}_t^{\ell}$ are included to control for the dynamic adjustment process of monthly cheese prices. The full price effects of changes in $\underline{x}_t$ and S_t are felt not only in the same month during which these changes occur, but also over several months. Inserting lagged independent variables is a standard way of taking into account such changes that take place over time.

An econometric estimation of equation 2 would provide a consistent estimation of the parameters α_0, $\underline{\beta}_1$, β_2 and $\underline{\beta}_3$ if NCE prices were determined solely by the interaction of market forces without the influence on cheese prices of a) the behavior of leading NCE traders, as hypothesized above, and b) government purchases, particularly under its milk price support

program. The effect of leading NCE traders' conduct on the level of observed prices can be accounted for by incorporating in equation 2 variables representing leading sellers' and buyers' trading on the NCE. The estimation problem caused by government intervention in the cheese market, however, may be dealt with by two alternative methods as detailed below.

Government intervention through CCC purchase prices has at times played a dominant role in determining prices, since the CCC purchase price tends to set a lower bound on NCE prices. Thus when the NCE price drops to the CCC support level, market factors are relegated to a role of marginal importance. For example, an examination of monthly NCE and CCC prices for 40-pound block cheese reveals that during the period from 1988-1993, 17 percent of the monthly NCE prices were at or slightly below the CCC price support level. These observations pose a problem in specifying a model to explain cheese prices since NCE prices significantly below CCC price levels never occur. The role of government in cheese pricing suggests a need for modification of the econometric model given by equation 2.

One way to resolve the estimation problem created by the limited dependency of NCE prices on competitive factors is to employ a censor regression model (or Tobit Model).[25] Let P_t^g be the CCC purchase price for cheese in month t. In the Tobit Model a switching regression equation may be specified as follows:

$$P_t = \begin{cases} \alpha_0 + \underline{\beta}_1' \underline{p}_t^{\ell} + \beta_2 S_t^c + \underline{\beta}_3' \underline{x}_t + \beta_4 K_t + \beta_5 BF_t + u_t & \text{if } P_t > P_t^g \\ P_t^g & \text{otherwise,} \end{cases} \qquad t = 1,2....T \qquad (3)$$

---

[25] G.S. Maddala 1983. *Limited Dependent and Qualitative Variables in Econometrics.* Cambridge, England: Econometric Society Monograph.

As specified in equation 3 the Tobit Model allows for switching between two regimes, namely the market regime when $P_t > P_t^g$ and the government regime otherwise. The switching is conditional on the level of P_t relative to P_t^g. If the observed cheese price is greater than the CCC purchase price, observation P_t is treated as the market-determined price of cheese at time t; otherwise, it is equal to the CCC purchase price, P_t^g. Note that in equation 3, we have replaced total supply S_t with commercial supply S_t^c,which equals total supply minus net government purchases.[26] Moreover, to account for leading traders' conduct on the NCE, equation 3 includes two additional variables, namely K_t and BF_t, representing leading sellers' and buyers' participation indices with corresponding parameters β_4 and β_5, respectively. (A detailed description of these and other variables along with data sources is given in the next section.) We assume the residuals, u_t, are independently and normally distributed with mean zero and common variance σ^2. A maximum likelihood estimation of the Tobit model (equation 3) would render consistent estimates of the parameters α_0, $\underline{\beta}_1$, β_2, $\underline{\beta}_3$, β_4, and β_5.

Another way to overcome the estimation problem caused by government intervention is to control for CCC net removal of cheese in each month, since it is through purchasing of cheese at CCC prices that the federal government implements its price policy. Thus if we employ the commercial supply of cheese, S_t^c, for each month in the following equation, we have insulated cheese prices from the distortion caused by CCC purchase prices.

$$P_t = \alpha_0 + \underline{\beta}_1' \underline{p}_t^{\ell} + \beta_2 S_t^c + \underline{\beta}_3' \underline{x}_t + \beta_4 K_t + \beta_5 BF_t + e_t \qquad t = 1,2....T \quad (4)$$

---

[26] This variable replacement allows for government intervention in cases where market price is above the CCC price, but where government cheese purchases under programs other than the price support program may still affect cheese prices.

A maximum likelihood estimation of equation 4 (referred to here as Full Sample Model) would allow us to use the full sample of observations without censoring any observations.

In the analysis that follows, we employ both the Tobit Model (equation 3) and the Full Sample Model (equation 4) to explain monthly NCE and WAP barrel and block prices during the period 1988-1993.

Variables, Data and Hypotheses

Dependent Variables

The following monthly real NCE and WAP prices of cheddar cheese are employed as alternative dependent variables in the estimation of both the Tobit Model and the Full Sample Model.

NCE Prices. Monthly NCE barrel and block prices are calculated as the simple averages of weekly NCE barrel and block prices as reported in *Dairy Market News*, USDA. The producer price index (PPI) for processed food and feed (1982=100) is used to deflate nominal monthly prices.

WAP Prices. Monthly Wisconsin Assembly Point (WAP) prices for barrels and blocks are the simple averages of the minimum and maximum WAP barrel and block prices as reported in *Dairy Market News* on Thursday of each week. The PPI for processed food and feed (1982=100) is used to deflate nominal monthly prices.

Independent Variables

The following independent variables are used in the above models to explain monthly NCE and WAP prices.

Lag Prices (Lag 1 and Lag 2). For each dependent variable, we use monthly prices lagged by one and two months, respectively, as independent variables. Lagged prices are

introduced to account for the lagged or dynamic adjustment mechanism of monthly cheese prices. The coefficients for these variables reflect the speed of adjustment or delayed effect of other independent variables on the current monthly price. In other words the effect of other independent variables is the sum of the short-run or simultaneous effect and the delayed effect. We also examined three and four month lagged prices and found no significant effect on current prices. We conclude that one and two month lags are the most appropriate lags for prices to adjust to the changes in independent factors.

Supply (S^c). Supply is measured by per capita monthly commercial supply of American cheese in pounds. Commercial supply is equal to total supply minus CCC purchases during the month. Total supply is defined as the monthly production of American style cheese, plus beginning-of-month commercial stocks, plus CCC sales for unrestricted use in commercial channels. The CCC sales in commercial channels are included because they affect market price by adding to the existing market supply. Monthly population estimates were used to arrive at the per capita commercial supply of cheese.

Per capita monthly commercial supply figures in each year were standardized into 12 equal periods to adjust for differences in the number of days in each calendar month. Such standardization controls for the spurious variation in monthly supply due to the difference in the length of a month rather than to production seasonality or other economic conditions.

We expect the per capita commercial supply of cheese to be negatively related to NCE and WAP prices.

Demand Shifter (D). Monthly real per capita disposable personal income in thousands of 1982 dollars, D, is employed to account for one source of shifts in demand. Nominal

disposable personal income (as reported in *Survey of Current Business*, Economic and Statistics Administration, Bureau of Economic Analysis, US Department of Commerce) was deflated using an implicit price deflator for personal consumption expenditure to arrive at real disposable income. Monthly population estimates were used to get per capita income figures. We expect D to be positively related to NCE and WAP prices.

Seasonality (M2,...M12): Eleven monthly dummies, one for each month from February (M2) to December (M12) are employed to control for the effect of demand seasonality on NCE and WAP prices. Demand seasonality results from changes in consumer demand and the building up and the drawing down of inventory. January is excluded for dummy variable purposes.

Trader Activity Categories. Leading traders on the NCE are classified as follows: K--Kraft; the K-Group, which identifies the leading seller-traders (Kraft, Borden and Alpine Lace) and the BF-Group, which identifies the leading buyer-traders (Beatrice, Mid-Am, Schreiber, Land O'Lakes, and AMPI). A group's degree of participation in trading activity during a month is measured by the percent of trading sessions each month in which at least one member of the group is active on the Exchange. Because the number of trading sessions in a month is either 4 or 5, this variable may take on the following values for each group: 0, 20%, 25%, 40%, 50%, 60%, 75%, 80%, or 100%.

K and the K-Group variable are expected to be negatively related to NCE and WAP prices, and the BF-Group variable is expected to be positively related to NCE and WAP prices.

Estimation and Results

NCE Prices

Appendix Tables 5.5 and 5.6 present the maximum likelihood estimates of monthly NCE barrel and block prices for the Tobit and Full Sample Models for 1988-1993. The two models yield very similar results, perhaps reflecting the fact that only 17 percent of the price observations were at or below the CCC support level.

Estimated coefficients for Lag1 and Lag2 are positive and negative, respectively, in each of the four equations; they are significant at the 1 percent level. Lagged prices allow for controlling the dynamic adjustments of monthly cheese prices. Overall, the significant coefficients for Lag1 and Lag2 suggest that it takes three months for NCE prices to adjust or to reflect fully changes in market conditions.

As expected, the coefficients for S^c (per capita commercial supply) and D (per capita disposable personal income) are negative and positive, respectively, in each of the estimated equations for both the Tobit and Full Sample Models. Both of these variables are statistically significant at the 1 percent level in all of the price equations.

The effect of seasonality as depicted by the coefficients for $M_2, M_3 ... M_{12}$ in the four equations implies that on average, prices bottom in February and peak during July, August and September. These estimated coefficients reflect the seasonality of prices as shown in Figure 2.11. Low prices in February seem to reflect low demand for commercial stocks in addition to low demand for consumption after the holiday season of December and January; high prices during July through September, in contrast, seem to reflect high demand for commercial inventories (Figures 2.5 and 2.7) and high demand for consumption with the start of school.

Table 5.5. Estimated Relationship Between Trader Activity Variables and NCE Prices

	Tobit Model			Full Sample Model		
			BARRELS			
Equation	1a	1b	1c	2a	2b	2c
K	-0.026[b] (2.17)	--	--	-0.025[b] (1.96)	--	--
K-Group	--	-0.026[b] (2.06)	-0.032[b] (2.13)	--	-0.028[b] (2.14)	-0.036[b] (2.40)
BF-Group	--	--	0.013 (0.73)	--	--	0.018 (1.08)
			BLOCKS			
Equation	3a	3b	3c	4a	4b	4c
K	-0.021[b] (2.03)	--		-0.026[b] (2.37)	--	--
K-Group	--	-0.029[a] (2.68)	-0.033[a] (2.54)	--	-0.031[a] (2.79)	-0.035[a] (2.54)
BF-Group	--	--	0.008 (0.51)	--	--	0.007 (0.46)

Source: The value of other variables used in these equations appear in Appendix Tables 5.5 and 5.6.

Note: A one-tail t-test is used to determine statistical significance. An *a* denotes 1% level of significance and a *b* denotes 5% level of significance.

To facilitate presentation, the coefficients and t-values of the trader activity variables as reported are summarized in Table 5.5. When the Kraft trader activity variable, K, is included in the Tobit Model, the estimated coefficients on K are -0.026 for barrels and -0.021 for blocks (Equations 1a and 3a, Table 5.5). In the Full Sample Model, these coefficients on K are -0.025 for barrels and -0.026 for blocks (Equations 2a and 4a, Table 5.5). All coefficients are statistically significant at the 5 percent level or higher.

When the K-Group trader activity variable is included in the Tobit Model, the coefficients are -0.026 for barrels and -0.029 for blocks (Equations 1b and 3b). In the Full Sample Model, the coefficients on the K-Group are -0.028 for barrels and -0.031 for blocks (Equations 2b and 4b, Table 5.5). All coefficients are statistically significant at the 5 percent level or higher. In the Tobit Model, the coefficients on both K and K-Group are -0.026 in the barrel equations 1a and 1b. In contrast, the coefficient on the K-Group is somewhat greater than that on K in the block equations 3a and 3b. In the Full Sample Model, the coefficient on the K-Group is slightly greater than on K for both barrels and blocks. All coefficients are statistically significant at the 5 percent level or higher.

These findings suggest that while Kraft was predominantly responsible for the size of the coefficient on K-group, the participation of the other two leading seller-traders contributed modestly to Kraft's impact on prices. But while K-Group has a slightly larger coefficient in three equations than does K alone, this does not necessarily imply that their trading activity was essential to the result. For had they not joined Kraft in selling, Kraft may have achieved this result by making these sales itself.

When both the K-Group and BF-Group are included in the equations, the estimated coefficients for the K-Group in the Tobit Model are -0.032 for barrels and -0.033 for blocks (Equations 1c and 2c). In the Full Sample Model, these coefficients are -0.036 for barrels and -0.035 for blocks (Equations 3c and 4c). All coefficients are statistically significant at the 5 percent level or higher.

Though positive as hypothesized, the estimated coefficients for the BF-Group (leading buyer-traders) are very small and are not statistically significant in any of the equations.

These findings support the hypothesis that the trading activity of the leading seller-traders, dominated by Kraft, had a statistically significant negative impact on NCE cheese prices. On the other hand, the group of leading buyers had no statistically significant impact on prices.

Holding other variables constant, the findings imply that when at least one of the leading seller-traders was active in each trading session during a month, NCE prices were lower by 3.2-3.6 cents per pound for barrel cheese and 3.3-3.5 cents per pound for block cheese, respectively, than when none of the leading sellers was active. These coefficients are expressed in 1982 dollars. Expressed in 1993 dollars, these values are 4.0- 4.5 cents for barrels and 4.1-4.3 cents for blocks.

WAP Prices:

The above analysis estimates the effect of various factors on monthly NCE prices. These prices, of course, originate in a central, organized auction market, the National Cheese Exchange. And, as we have noted, NCE prices are used as the basis for formula pricing bulk cheese purchased under committed supply agreements, which account for 90-95 percent of all cheese sales. These formulas typically include a premium over the relevant NCE price, with the

premiums varying somewhat according to changes in overall market conditions. Hence, NCE prices may not be identical to actual transaction prices paid under committed supply agreements.

To determine whether this potential shortcoming of NCE prices significantly affected the relevance of our results, we substituted WAP prices, which are those paid on spot sales at Wisconsin assembly points. WAP spot transactions occur directly between buyers and sellers at negotiated prices expressed as a premium (or discount) in relation to NCE prices. WAP prices are generally higher than NCE prices, but the premium may change weekly to reflect changing market conditions. Since WAP premiums over NCE vary more frequently and by larger amounts than do the premiums of committed supply agreements, the use of WAP prices in our equation may provide a conservative test of whether our models accurately reflect changes in actual transaction prices of committed supply agreements.

The results using WAP prices as dependent variables are reported in Appendix Tables 5.7 and 5.8. The estimated coefficients are quite similar to those reported when NCE prices are used. Given the very high correlation of NCE and WAP prices ($r = 0.993$ for block prices and 0.992 for barrel prices), the similarity of results is not surprising. However, the consistency of the results using the two different market prices provides some encouragement concerning the validity of our model in explaining prices paid for bulk cheese purchased under committed supply agreements as well as NCE prices.

Appendix 5.A.
Kraft's Trading Activity During 1986 and 1987

Kraft's former Director of Purchasing explained why Kraft became a seller-trader beginning in 1986 as follows:

> ...the major, very significant change that you're talking about between those two periods, until about '85, '86, versus beyond that is the government support program and the supply/demand positions in the industry....[T]his industry had a gross surplus of cheese...beginning in 1980 throughout, until 1987, and while I was not making the decisions as to whether we sell cheese...on the board [or] off the board at that point in time, I was involved in inventory management....[Y]ou did not have to carry the kind of safety stocks you do in a volatile...market because you knew that cheese was always out there. You could buy any cheese any time you wanted to at basically support prices that first half of the 1980s. The people that were responsible at that time knew that [if] they didn't have any inventories, they could buy cheese as needed. So, in that particular case, I suspect that we played our inventories a little bit different. If I knew today that there was going to be that kind of surplus situation...we would change our management philosophy on raw material cheese....[27]

Examination of market conditions and Kraft's trading activity on the NCE, as well as examination of Kraft's actual inventory experience, does not support Mr. Hangartner's explanation as to why Kraft became exclusively a seller-trader beginning in 1986. Appendix Figure 5.3 shows the pattern of Kraft's overall trading activity from July 1986 through June 1988.[28] In the months prior to August 1986, when there was an industry surplus and NCE prices were *below* support levels, Kraft bought 104 loads on the NCE. It made its last purchase July 3, 1986. By the end of July market conditions had tightened and prices rose above the support level.

---

[27] Wayne Hangartner, Kraft's former Director of Cheese Procurement and Inventories, typed transcript of recorded interview, December 8-9, 1992, pp. 119-120.

[28] This figure shows Kraft's activity in barrel and blocks although the price line shown is for barrels for presentation purposes. Block and barrel prices generally move together with block prices somewhat above barrel prices. See text at note 1, this chapter, for a description of the method used to construct Appendix Figure 5.3.

Barrel prices continued rising until August 29, when they reached $1.245, six cents above the barrel price on July 27. At this point Kraft began offering barrels, leading to a 1 cent per pound drop in barrel prices. A similar rise in block prices was reversed on August 22, when Kraft began offering blocks. During the next two sessions, Kraft continued to exert downward pressure on prices. It also appears that Kraft participated in topping the block market during September and October 1986.

We do not know Kraft's inventory situation in 1986. However, Kraft's abrupt change from a buyer to a seller on the Exchange occurred when market conditions strengthened and prices rose *above* the support level. Kraft's abrupt change in trading conduct in August 1986 and its subsequent conduct are consistent with the hypothesis that it was motivated by a desire to influence prices.

Kraft remained exclusively a seller-trader after 1986. Insofar as Kraft had a surplus in 1987, this does not in itself explain why it became the largest seller on the Exchange in that year. Examination of trading patterns suggests that Kraft's NCE sales were designed to maintain NCE prices at or below the CCC support level by what it believed to be an appropriate margin. During August 7 through September 9, 1987, Kraft offered to sell barrels whenever the price rose above the support level, with the result that prices at the close of each trading session were the same as at the opening. Kraft also appeared to play the leading role in the November and December 1987 market decline to below the support level in the weeks preceding the reduction in the level of support prices effective January 1, 1988.

Kraft apparently did not make these large sales on the NCE in order to maximize return in disposing of the surplus, since it would have fared better selling to the CCC rather than on the

NCE. During 1987, Kraft lost an average of 1.9 cents per pound on NCE sales, whereas its losses on CCC sales averaged only 0.6 cents per pound (Appendix Table 4.3).

Finally, recall that Mr. Hangartner said that the reason Kraft became a seller-trader after the mid-1980s was related to a change in inventory policy, implying that when CCC stocks were no longer available, Kraft had to carry larger inventories. Consider these facts. During 1988-1992, when NCE prices were primarily market driven, Kraft's raw material cheese inventories were below the average for 1981-1987, when NCE prices were largely determined by price support levels. Indeed, during 1988-1989, the first two years that NCE prices were market driven, Kraft's inventories were lower than Kraft's inventories in each year 1981-1987.[29]

In sum, the facts do not support Mr. Hangartner's rationale for Kraft's becoming a seller-trader in 1986. Rather, they are consistent with the hypothesis that Kraft began selling on the NCE in August 1986 to exert an influence on the level of NCE prices.

---

[29] Appendix Table 6.1 and Kraft General Foods, Inc., *Cheese Procurement Strategy*, Operations, December 6, 1989, KGF 2948, 2982, 2983. During 1981-1987, Kraft's raw material cheese inventories averaged [...] million pounds per year, ranging from [...] million pounds to [...] million pounds. During 1988-1992, when cheese prices were predominantly above price support levels, Kraft's actual average inventories were less than [...] million pounds (1981-1987 average) in all years but 1990.

During 1981-1989, Kraft decreased its inventories expressed as average day's supply from [...] days to [...] days. Importantly, the decline continued during the first two years that price supports were not operative, 1988 and 1989. Kraft's planned average day's supply was [...] days in 1990 and in 1986, although that was higher than in 1988 or 1989. *Id.* 2983. 1990 was the only year during 1988-1993 in which Kraft's inventories exceeded the 1981-1987 average. However, Kraft's larger inventory in 1990 was unplanned. Its *planned* inventory for 1990 was well below its *actual* inventory. *Id.*, KGF 2982. Information has been redacted from the report at this time. See statement in Appendix Table 6.1.

Appendix Table 5.1a. Types of Trading Activity by Leading Traders of Barrel Cheese on the NCE, 1988-1993

Type of Trader Activity	Leading Traders										
	Kraft	Borden	Alpine	DS[1]	Beatrice	Mid-Am	Schreiber	LOL	AMPI	All Others[2]	TOTAL
					Seller Activity of Traders						
Offers and Reduced Offers											
Number	546	250	50	198	0	0	0	33	0	61	1138
%	48	22	4	17				3		5	100
Sale: Offer Covered											
Carloads	436	45	13	34	0	0	0	2	0	29	559
%	78	8	2	6				*		5	100
Sale: Filled Bid											
Carloads	813	14	1	6	0	0	0	59	0	47	940
%	86	1	*	1				6		5	100
TOTAL SALES											
Carloads	1249	59	14	40	0	0	0	61	0	76	1499
%	83	4	1	3				4		5	100
					Buyer Activity of Traders						
Bids and Increased Bids											
Number	2	29	4	114	498	184	352	220	188	231	1822
%	*	2	*	6	27	10	19	12	10	13	100
Purchase: Bid Filled											
Carloads	0	32	0	24	317	83	195	103	101	85	940
%		3		3	34	9	21	11	11	9	100
Purchase: Covered Offer											
Carloads	0	0	1	0	253	48	121	83	31	22	559
%			*		45	9	22	15	6	4	100
TOTAL PURCHASES											
Carloads	0	32	1	24	570	131	316	186	132	107	1499
%		2	*	2	38	9	21	12	9	7	100

Source: National Cheese Exchange, Trading Activity Minutes, AMS, USDA, 1988-93.

Note: Total percentage figure may not add, due to rounding.

*Less than 1 percent.

[1]Dairystate Brands, Inc.

[2]These are Bongards (sold 71 carloads); Edelweiss (bought 19 carloads); Hermke Cheese (bought 13 carloads); Masters Gallery (bought 37 carloads); Northern (bought 31 carloads); Northwood (bought 2 carloads); Schurman (sold 5 and bought 5 carloads). Alto, Fromageries and Frigo Cheese made offers and bids but no sales or purchases.

Appendix Table 5.1b. Types of Trading Activity by Leading Traders of Block Cheese on the NCE, 1988-1993

Type of Trader Activity	Leading Traders										
	Kraft	Borden	Alpine	DS[1]	Beatrice	Mid-Am	Schreiber	LOL	AMPI	All Others[2]	TOTAL
						Seller Activity of Traders					
Offers and Reduced Offers											
Number	333	0	435	303	0	0	26	26	3	328	1454
%	23		30	21			2	2	*	23	100
Sale: Offer Covered											
Carloads	197	0	105	76	0	0	4	0	0	72	454
%	43		23	17			1			16	100
Sale: Filled Bid											
Carloads	171	0	11	13	0	4	3	11	0	30	243
%	70		5	5		2	1	5		12	100
TOTAL SALES											
Carloads	368	0	116	89	0	4	7	11	0	102	697
%	53		17	13		1	1	2		15	100
						Buyer Activity of Traders					
Bids and Increased Bids											
Number	1	0	11	46	470	389	5	0	8	419	1349
%	*		1	3	35	29	*		1	31	100
Purchase: Bid Filled											
Carloads	0	0	1	5	74	122	2	0	4	35	243
%			*	2	30	50	1		2	14	100
Purchase: Covered Offer											
Carloads	22	0	1	0	129	238	4	3	36	21	454
%	5		*		28	52	1	1	8	5	100
TOTAL PURCHASES											
Carloads	22	0	2	5	203	360	6	3	40	56	697
%	3		*	1	29	52	1	*	6	9	100

Source: National Cheese Exchange, Trading Activity Minutes, AMS, USDA, 1988-93.

Note: Total percentage figure may not add, due to rounding.

*Less than 1 percent.

[1]Dairystate Brands, Inc.

[2]These are Alto (bought 6 carloads): Bongards (sold 4 carloads); Dairygold (sold 14 carloads); Empire Cheese (bought 5 carloads); Golden Cheese (sold 10 carloads); Marathon (sold 35 loads); Marketing Association (sold 6 carloads); Masters Gallery (sold 7 loads and bought 25); Northern (sold 18 loads and bought 2); Northwood (sold 6 and bought 3 carloads); Schurman (sold 2 and bought 15 carloads). Edelweiss, Green Bay Cheese, and Fromageries (made offers and bids but no sales or purchases).

Appendix Table 5.2. Price Behavior on Days in Which at Least One of the Leading Traders in Each Group was Active, 1988-1993

Trader Active on NCE	Number of Days NCE Prices:				Total Days Active
	Increased	Decreased	Remained Unchanged	Price Increase Stopped, Slowed, or Reversed[a]	
			BARRELS		
Seller-traders[b]	12	62	49	41	164[c]
Percent	7%	38%	30%	25%	100%
Buyer-traders[d]	96	41	67	N/A	204
Percent	47%	20%	33%	N/A	100%
			BLOCKS		
Seller-traders[b]	10	53	31	22	116[e]
Percent	9%	46%	27%	19%	100%
Buyer-traders[d]	67	51	47	N/A	165
Percent	41%	31%	28%	N/A	100%

Source: National Cheese Exchange, Trading Activity Minutes, AMS, USDA, 1988-1993.

[a]This refers to a day in which prices were increasing as a result of other trader activity until Kraft began selling activity with the apparent effect of stopping, slowing or reversing a price increase.

[b]Kraft, Borden and Alpine Lace

[c]Excludes 4 days when Kraft and/or Borden submitted bids for the apparent purpose of signalling their approval to buyer-traders of an upward price trend. See Section E, this chapter.

[d]Beatrice, Mid-Am, Schreiber, Land O' Lakes and AMPI

[e]Excludes one day when Kraft submitted bids for the apparent purpose of signaling its approval of an upward price trend to buyer-traders. See Section E, this chapter.

Appendix Table 5.3. Price Behavior in Days Kraft, Borden and Alpine Lace Were Active in NCE Trading, 1988-1993

Trader	Carloads Traded		Number of Days NCE Prices:				Total Days Active
	Sold	Bought	Increased	Decreased	Remained Unchanged	Price Increase Stopped, Slowed or Reversed	
BARRELS							
Kraft	1249	0	7[a]	48	37	41	133
Borden	59	32	10[c]	24	19	0	53
Alpine Lace	14	1	0	5	4	0	9
Total (Net)[b]	1322	33	10	62	50	41	163
Percent			6%	38%	31%	25%	100%
BLOCKS							
Kraft	368	22[d]	6[e]	42	24	22	94
Borden	0	0	0	0	0	0	0
Alpine Lace	116	2	11	33	11	0	55
Total (Net)[b]	484	24	11	53	31	22	115
Percent			9%	46%	27%	19%	100%

Source: National Cheese Exchange, Trading Activity Minutes, AMS, USDA, 1988-1993.

[a]Excludes two days when Kraft submitted bids for the apparent purpose of signalling that it approved of an upward price trend. See Section E, this chapter.

[b]This is the number of days in which at least one of the traders was active.

[c]Excludes four days when Borden submitted bids for the apparent purpose of signalling its approval of a rising price trend. See Section E, this chapter.

[d]Kraft purchased 22 loads of block apparently for the purpose of influencing the block-barrel price spread. See Section E, this chapter.

[e]Excludes two days when Kraft submitted bids for the apparent purpose of signalling its approval of a rising price trend. See Section E, this chapter.

Appendix Table 5.4. Price Behavior in Days Beatrice, Mid-Am, Schreiber and AMPI were Active in NCE Trading, 1988-1993

Trader	Carloads Traded		Number of Days NCE Prices:			Total Days Active
	Sold (1)	Bought (2)	Increased (3)	Decreased (4)	Remained Unchanged (5)	(6)
			BARRELS			
Beatrice	0	570	51	19	35	105
Mid-Am	0	131	27	4	8	39
Schreiber	0	316	52	14	23	89
Land O' Lakes	61	186	28	14	19	61
AMPI	10[b]	132	23	4	19	46
Total (Net)[a]	71	1325	96	41	67	204
Percent			47%	20%	33%	100%
			BLOCKS			
Beatrice	0	203	46	22	21	89
Mid-Am	4	360	43	42	29	114
Schreiber	7	6	4	4	1	9
Land O' Lakes	11	3	4	4	5	13
AMPI	0	40	4	11	6	21
Total (Net)[a]	22	612	67	51	47	165
Percent			41%	21%	28%	100%

Source: National Cheese Exchange, Trading Activity Minutes, AMS, USDA, 1988-1993.
[a]This is the number of days in which at least one of the traders was active.
[b]These are sales AMPI made through a broker, Dairystate.

Appendix Table 5.5. Estimates of Factors Affecting Monthly NCE Barrel Prices, 1988-1993

n=72

	Tobit Equations			Full Sample Equations		
	1a	1b	1c	2a	2b	2c
Variables	Coefficients					
Constant	-63.355[b]	-57.499[c]	-56.661[c]	-19.410	-17.682	-12.054
	(2.15)	(1.95)	(1.91)	(0.76)	(0.75)	(0.51)
Lag1	0.942[a]	0.942[a]	0.930[a]	0.985[a]	1.024[a]	1.031[a]
	(8.77)	(8.77)	(8.57)	(8.91)	(9.59)	(9.76)
Lag2	-0.385[a]	-0.392[a]	-0.376[a]	-0.416[a]	-0.440[a]	-0.433[a]
	(3.86)	(3.95)	(3.71)	(4.04)	(4.43)	(4.34)
S^c	-25.816[a]	-26.124[a]	-25.761[a]	-22.243[a]	-21.654[a]	-20.345[a]
	(5.50)	(5.60)	(5.44)	(4.44)	(4.61)	(4.36)
D	13.630[a]	13.366[a]	13.169[a]	9.241[a]	8.968[a]	8.092[a]
	(4.38)	(4.28)	(4.15)	(3.29)	(3.40)	(3.05)
M2	-2.058	-2.769	-3.124	-1.092	-1.363	-1.583
	(0.99)	(1.37)	(1.50)	(0.55)	(0.67)	(0.76)
M3	4.435[b]	3.190	2.673	3.514[c]	2.798	2.404
	(2.09)	(1.55)	(1.23)	(1.74)	(1.40)	(1.18)
M4	8.781[a]	7.491[a]	7.053[a]	6.823[a]	5.961[a]	5.578[b]
	(4.15)	(3.57)	(3.22)	(3.34)	(2.92)	(2.69)
M5	6.319[a]	5.127[b]	4.497[c]	4.503[b]	3.393	2.552
	(2.80)	(2.29)	(1.87)	(2.03)	(1.54)	(1.11)
M6	9.007[a]	7.831[a]	7.249[a]	6.983[a]	5.908[b]	5.005[b]
	(4.05)	(3.47)	(3.03)	(3.12)	(2.65)	(2.14)
M7	11.243[a]	10.042[a]	9.367[a]	9.110[a]	8.105[a]	7.120[a]
	(5.21)	(4.75)	(4.11)	(4.08)	(3.69)	(3.05)
M8	10.986[a]	10.161[a]	9.638[a]	8.939[a]	8.301[a]	7.493[a]
	(5.10)	(4.87)	(4.39)	(4.00)	(3.79)	(3.29)
M9	11.656[a]	10.559[a]	9.987[a]	9.677[a]	8.769[a]	7.902[a]
	(5.49)	(5.17)	(4.59)	(4.40)	(4.09)	(3.51)
M10	5.545[b]	4.173[b]	3.863[c]	3.834[c]	2.599	2.119
	(2.65)	(2.08)	(1.89)	(1.76)	(1.23)	(0.99)
M11	5.934[a]	4.650[b]	4.263[b]	4.761[b]	3.829[c]	3.391[c]
	(3.02)	(2.47)	(2.19)	(2.37)	(1.94)	(1.69)
M12	2.267	0.993	0.962	1.403	0.434	0.537
	(1.15)	(0.53)	(0.51)	(0.69)	(0.21)	(0.26)
K	-0.026[b]	–	–	-0.025[b]	–	–
	(2.17)			(1.96)		
K-group	–	-0.026[b]	-0.032[b]	–	-0.028[b]	-0.036[b]
		(2.06)	(2.13)		(2.14)	(2.40)
BF-group	–	–	0.013	–	–	0.018
			(0.73)			(1.08)
R^2	0.924	0.924	0.924	0.907	0.907	0.908

Note: Maximum Likelihood methods are used to estimate both the Tobit and Full Sample models. A one tail test is applied to determine statistical significance on S^c, D, K, K-group and BF-group coefficients while a two tail test is applied for the rest of the coefficients. T-statistics are in parentheses: a/ denotes 1% level of significance; b/ denotes 5% level of significance; and c/ denotes 10% level of significance. R^2 statistics are the squares of correlation coefficients between actual and predicted values.

Appendix Table 5.6. Estimates of Factors Affecting Monthly NCE Block Prices, 1988-1993

n=72

	Tobit Equations			Full Sample Equations		
	1a	1b	1c	2a	2b	2c
Variables	Coefficients					
Constant	-41.298[c] (1.76)	-38.403[c] (1.68)	-39.053[c] (1.68)	-18.797 (0.84)	-17.496 (0.82)	-15.526 (0.73)
Lag1	1.036[a] (9.46)	1.007[a] (9.49)	0.997[a] (9.23)	1.048[a] (9.88)	1.054[a] (10.23)	1.056[a] (10.10)
Lag2	-0.447[a] (4.41)	-0.421[a] (4.33)	-0.408[a] (4.07)	-0.426[a] (4.38)	-0.424[a] (4.48)	-0.420[a] (4.29)
S^c	-23.981[a] (5.80)	-23.585[a] (5.95)	-23.421[a] (5.83)	-19.948[a] (4.48)	-19.632[a] (4.65)	-19.117[a] (4.48)
D	11.261[a] (4.38)	11.096[a] (4.46)	11.081[a] (4.38)	8.353[a] (3.43)	8.229[a] (3.54)	7.904[a] (3.32)
M2	-0.912 (0.52)	-1.369 (0.81)	-1.530 (0.88)	0.525 (0.31)	0.223 (0.13)	0.136 (0.08)
M3	4.543[b] (2.54)	3.561[b] (2.08)	3.322[c] (1.86)	4.817[a] (2.75)	3.929[b] (2.27)	3.776[b] (2.11)
M4	8.448[a] (4.87)	7.389[a] (4.36)	7.222[a] (4.15)	7.625[a] (4.54)	6.713[a] (3.86)	6.570[a] (3.70)
M5	5.025[b] (2.66)	4.080[b] (2.23)	3.811[c] (2.00)	4.755[b] (2.50)	8.746[b] (1.99)	3.431[c] (1.74)
M6	8.523[a] (4.68)	7.486[a] (4.14)	7.235[a] (3.85)	7.718[a] (4.04)	6.725[a] (3.54)	6.383[a] (3.17)
M7	9.847[a] (5.57	8.987[a] (5.29)	8.709[a] (4.87)	9.126[a] (4.74)	8.232[a] (4.39)	7.860[a] (3.91)
M8	10.766[a] (6.14)	10.357[a] (6.19)	10.145[a] (4.87)	10.136[a] (5.30)	9.694[a] (5.22)	9.391[a] (4.83)
M9	9.960[a] (5.64)	9.330[a] (5.59)	9.100[a] (5.26)	9.422[a] (4.92)	8.672[a] (4.70)	8.345[a] (4.29)
M10	4.354[b] (2.55)	3.403[b] (2.11)	3.305[b] (2.03)	4.006[b] (2.15)	2.902 (1.62)	2.719 (1.49)
M11	5.229[a] (3.19)	4.358[a] (2.83)	4.204[b] (2.68)	5.471[a] (3.17)	4.507[b] (2.68)	4.338[b] (2.50)
M12	2.337 (1.43)	1.422 (0.92)	1.463 (0.95)	2.525 (1.46)	1.540 (0.91)	1.571 (0.91)
K	-0.021[b] (2.03)	–	–	-0.026[b] (2.37)	–	–
K-group	–	-0.029[a] (2.68)	-0.033[a] (2.54)	–	-0.031[a] (2.79)	-0.035[a] (2.54)
BF-group	–	–	0.008 (0.51)	–	–	0.007 (0.46)
R^2	0.941	0.943	0.943	0.93	0.943	0.933

Note: Maximum Likelihood methods are used to estimate both the Tobit and Full Sample models. A one tail test is applied to determine statistical significance on S^c, D, K, K-group and BF-group coefficients while a two tail test is applied for the rest of the coefficients. T-statistics are in parentheses: a/ denotes 1% level of significance; b/ denotes 5% level of significance; and c/ denotes 10% level of significance. R^2 statistics are the squares of correlation coefficients between actual and predicted values.

Appendix Table 5.7. Estimates of Factors Affecting Monthly WAP Barrel Prices, 1988-1993

n=72

	Tobit Equations			Full Sample Equations		
	1a	1b	1c	2a	2b	2c
Variables	Coefficients					
Constant	-59.790[b] (2.29)	-53.318[b] (2.09)	-52.010[b] (2.02)	-26.956 (1.02)	-25.551 (1.05)	-20.374 (0.86)
Lag1	1.153[a] (11.98)	1.135[a] (11.84)	1.124[a] (11.70)	1.102[a] (10.55)	1.123[a] (11.02)	1.129[a] (11.24)
Lag2	-0.511[a] (5.63)	-0.498[a] (5.57)	-0.482[a] (5.32)	-0.480[a] (4.87)	-0.488[a] (5.07)	-0.481[a] (5.01)
S^c	-22.922[a] (5.64)	-22.833[a] (5.77)	-22.286[a] (5.54)	-21.188[a] (4.32)	-20.640[a] (4.52)	-19.352[a] (4.30)
D	12.124[a] (4.48)	11.737[a] (4.43)	11.446[a] (4.24)	9.280[a] (3.26)	9.057[a] (3.43)	8.230[a] (3.14)
M2	-1.592 (0.85)	-2.275 (1.26)	-2.670 (1.46)	-0.704 (0.43)	-0.971 (0.58)	-1.171 (0.68)
M3	4.753[b] (2.51)	3.497[c] (1.93)	2.922 (1.54)	3.617[c] (1.97)	2.846 (1.58)	2.475 (1.35)
M4	8.938[a] (4.71)	7.625[a] (4.11)	7.125[a] (3.72)	7.125[a] (3.82)	6.282[a] (3.41)	5.920[a] (3.19)
M5	5.902[a] (2.85)	4.725[b] (2.37)	3.958[c] (1.87)	4.885[b] (2.39)	3.860[c] (1.93)	3.058 (1.47)
M6	7.937[a] (3.86)	6.730[a] (3.34)	6.038[a] (2.87)	6.749[a] (3.22)	5.714[a] (2.79)	4.852[b] (2.28)
M7	9.752[a] (4.91)	8.601[a] (4.56)	7.828[a] (3.89)	8.515[a] (4.09)	7.570[a] (3.77)	6.630[a] (3.13)
M8	10.028[a] (5.12)	9.301[a] (5.03)	8.665[a] (4.49)	8.896[a] (4.34)	8.373[a] (4.22)	7.611[a] (3.71)
M9	10.275[a] (5.29)	9.285[a] (5.12)	8.596[a] (4.50)	9.226[a] (4.57)	8.415[a] (4.35)	7.595[a] (3.76)
M10	5.625[a] (2.95)	4.355[b] (2.46)	3.986[b] (2.22)	4.829[b] (2.43)	3.682[c] (1.94)	3.229[c] (1.69)
M11	4.879[b] (2.68)	3.691[b] (2.20)	3.267[c] (1.91)	4.156[b] (2.27)	3.184[c] (1.80)	2.764 (1.54)
M12	1.744 (0.96)	0.566 (0.33)	0.563 (0.33)	1.559 (0.91)	0.580 (0.34)	0.649 (0.37)
K	-0.024[b] (2.15)	–	–	-0.025[b] (2.06)	–	–
K-group	–	-0.028[b] (2.40)	-0.036[a] (2.60)	–	-0.029[b] (2.33)	-0.039[a] (2.60)
BF-group	–	–	0.016 (1.02)	–	–	0.018 (1.11)
R^2	0.949	0.951	0.951	0.939	0.941	0.943

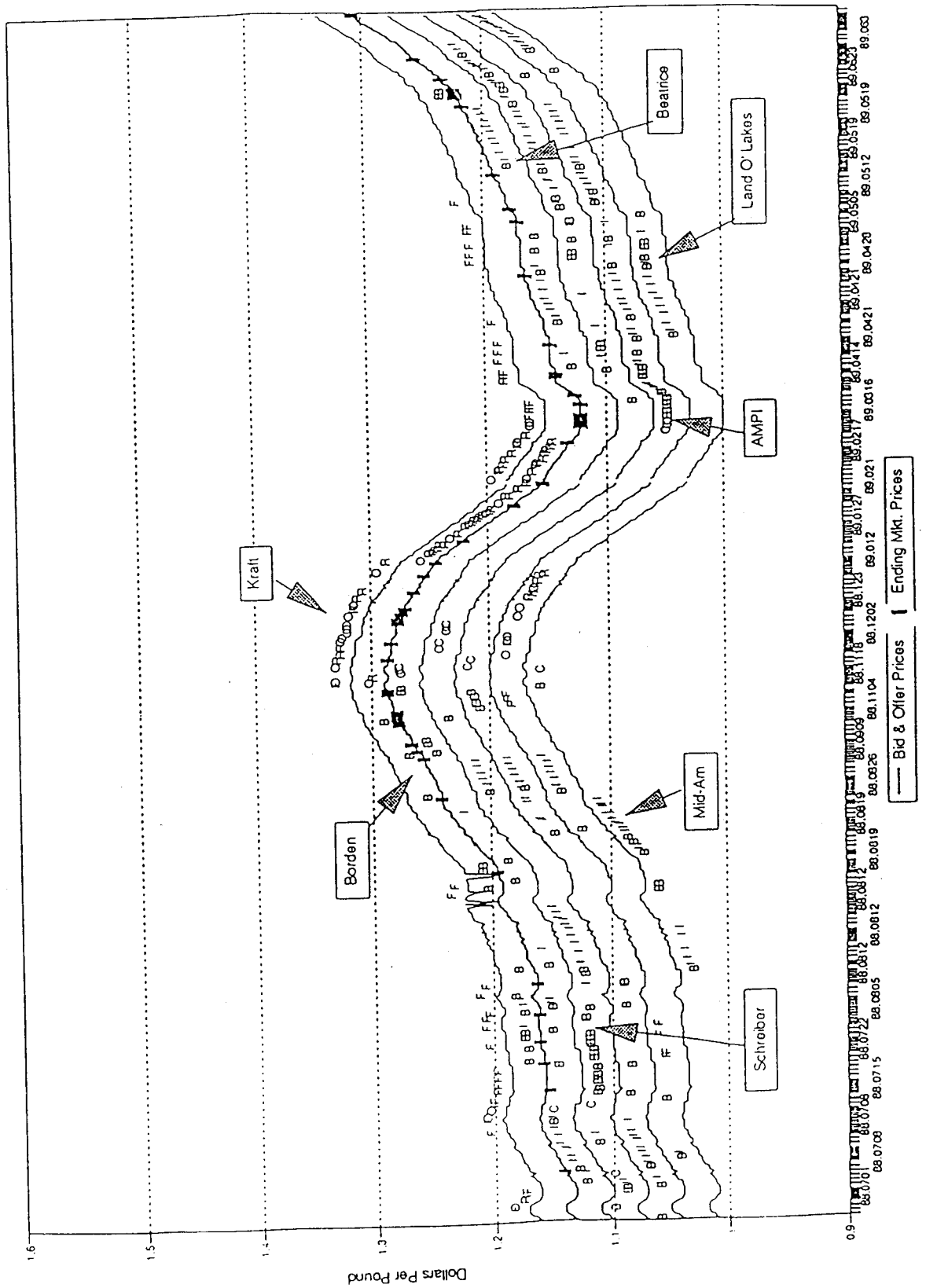
Note: Maximum Likelihood methods are used to estimate both the Tobit and Full Sample models. A one tail test is applied to determine statistical significance on S^c, D, K, K-group and BF-group coefficients while a two tail test is applied for the rest of the coefficients. T-statistics are in parentheses: a/ denotes 1% level of significance; b/ denotes 5% level of significance; and c/ denotes 10% level of significance.
R^2 statistics are the squares of correlation coefficients between actual and predicted values.

Appendix Table 5.8. Estimates of Factors Affecting Monthly WAP Block Prices, 1988-1993
n=72

	Tobit Equations			Full Sample Equations		
	1a	1b	1c	2a	2b	2c
Variables	Coefficients					
Constant	-56.036[b]	-52.966[c]	-53.460[c]	-25.155	-23.110	-18.389
	(2.03)	(1.97)	(1.95)	(0.97)	(0.94)	(0.76)
Lag1	1.101[a]	1.066[a]	1.052[a]	1.051[a]	1.058[a]	1.068[a]
	(8.98)	(8.81)	(8.58)	(9.63)	(9.98)	(10.13)
Lag2	-0.480[a]	-0.447[a]	-0.428[a]	0.414[a]	-0.413[a]	-0.410[a]
	(4.17)	(3.98)	(3.70)	(4.08)	(4.18)	(4.10)
S^c	-25.326[a]	-24.879[a]	-24.451[a]	-20.611[a]	-20.240[a]	-19.026[a]
	(5.46)	(5.57)	(5.36)	(4.11)	(4.29)	(4.05)
D	12.567[a]	12.381[a]	12.260[a]	8.971[a]	8.789[a]	8.019[a]
	(4.28)	(4.34)	(4.20)	(3.17)	(3.28)	(2.96)
M2	-1.805	-2.265	-2.525	0.247	-0.110	-0.282
	(0.87)	(1.13)	(1.24)	(0.12)	(0.05)	(0.13)
M3	4.819[b]	3.752[c]	3.351	4.818[b]	3.765[c]	3.474
	(2.31)	(1.84)	(1.58)	(2.30)	(1.83)	(1.64)
M4	8.308[a]	7.205[a]	6.910[a]	7.630[a]	6.546[a]	6.241[a]
	(4.04)	(3.55)	(3.31)	(3.63)	(3.14)	(2.94)
M5	5.808[b]	4.851[b]	4.372[c]	5.622[b]	4.420[c]	3.728
	(2.61)	(2.26)	(1.94)	(2.51)	(2.00)	(1.61)
M6	8.547[a]	7.519[a]	7.076[a]	7.968[a]	6.786[a]	6.040[b]
	(3.92)	(3.49)	(3.16)	(3.50)	(3.02)	(2.55)
M7	9.710[a]	8.859[a]	8.360[a]	9.162[a]	8.095[a]	7.280[a]
	(4.60)	(4.39)	(3.92)	(4.01)	(3.65)	(3.07)
M8	10.935[a]	10.550[a]	10.156[a]	10.509[a]	9.983[a]	9.315[a]
	(5.28)	(5.33)	(4.95)	(4.67)	(4.57)	(4.07)
M9	11.116[a]	10.503[a]	10.080[a]	10.918[a]	10.026[a]	9.308[a]
	(5.31)	(5.33)	(4.91)	(4.85)	(4.62)	(4.07)
M10	3.793[c]	2.875	2.704	3.910[c]	2.591	2.172
	(1.81)	(1.47)	(1.37)	(1.74)	(1.21)	(0.99)
M11	5.368[b]	4.536[b]	4.281[b]	6.485[a]	5.341[b]	4.986[b]
	(2.66)	(2.41)	(2.24)	(3.15)	(2.66)	(2.42)
M12	1.795	0.872	0.954	2.322	1.163	1.246
	(0.92)	(0.47)	(0.52)	(1.11)	(0.56)	(0.59)
K	-0.023[b]	–	–	-0.031[b]	–	–
	(1.75)			(2.37)		
K-group	–	-0.032[b]	-0.038[b]	–	-0.038[a]	-0.045[a]
		(2.31)	(2.37)		(2.79)	(2.78)
BF-group	–	–	0.013	–	–	0.015
			(0.75)			(0.82)
R^2	0.933	0.935	0.935	0.92	0.922	0.923

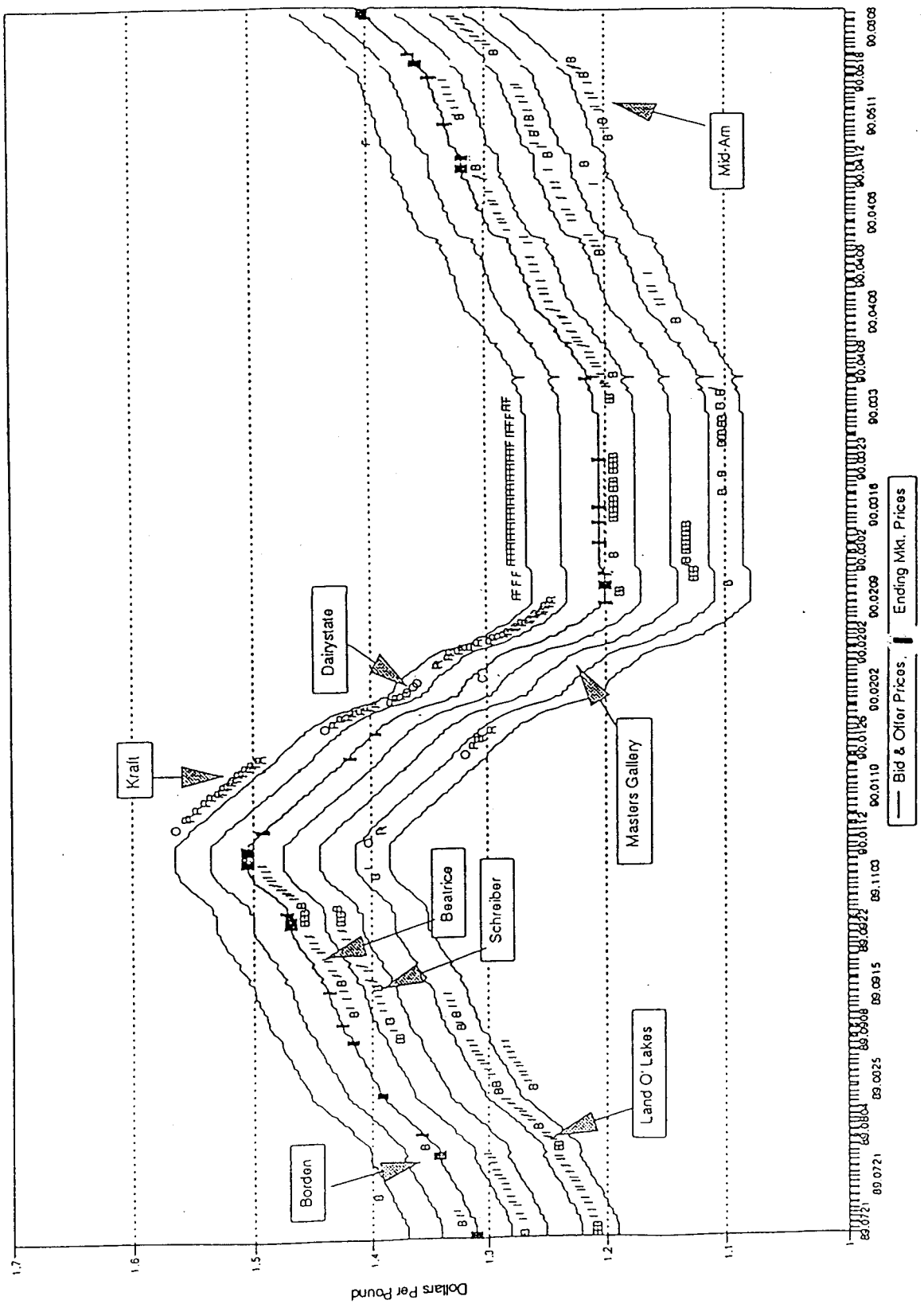
Note: Maximum Likelihood methods are used to estimate both the Tobit and Full Sample models. A one tail test is applied to determine statistical significance on S^c, D, K, K-group and BF-group coefficients while a two tail test is applied for the rest of the coefficients. T-statistics are in parentheses: a/ denotes 1% level of significance; b/ denotes 5% level of significance; and c/ denotes 10% level of significance.
R^2 statistics are the squares of correlation coefficients between actual and predicted values.

Appendix Figure 5.1a
NCE Barrel Activity of Leading Traders,
July 1988 - June 1989

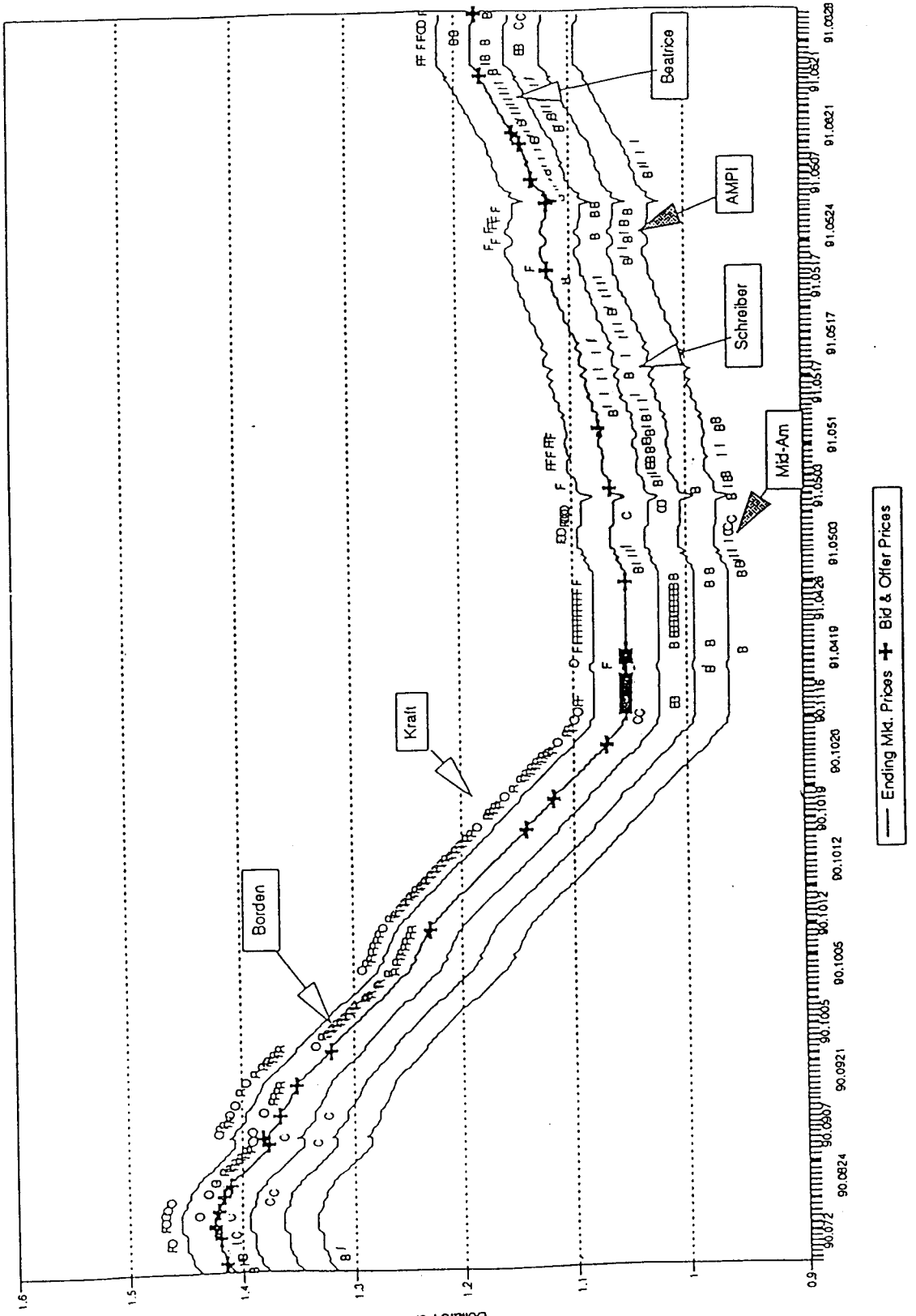


Appendix Figure 5.1b

NCE Barrel Activity of Leading Traders,
July 1989 - June 1990

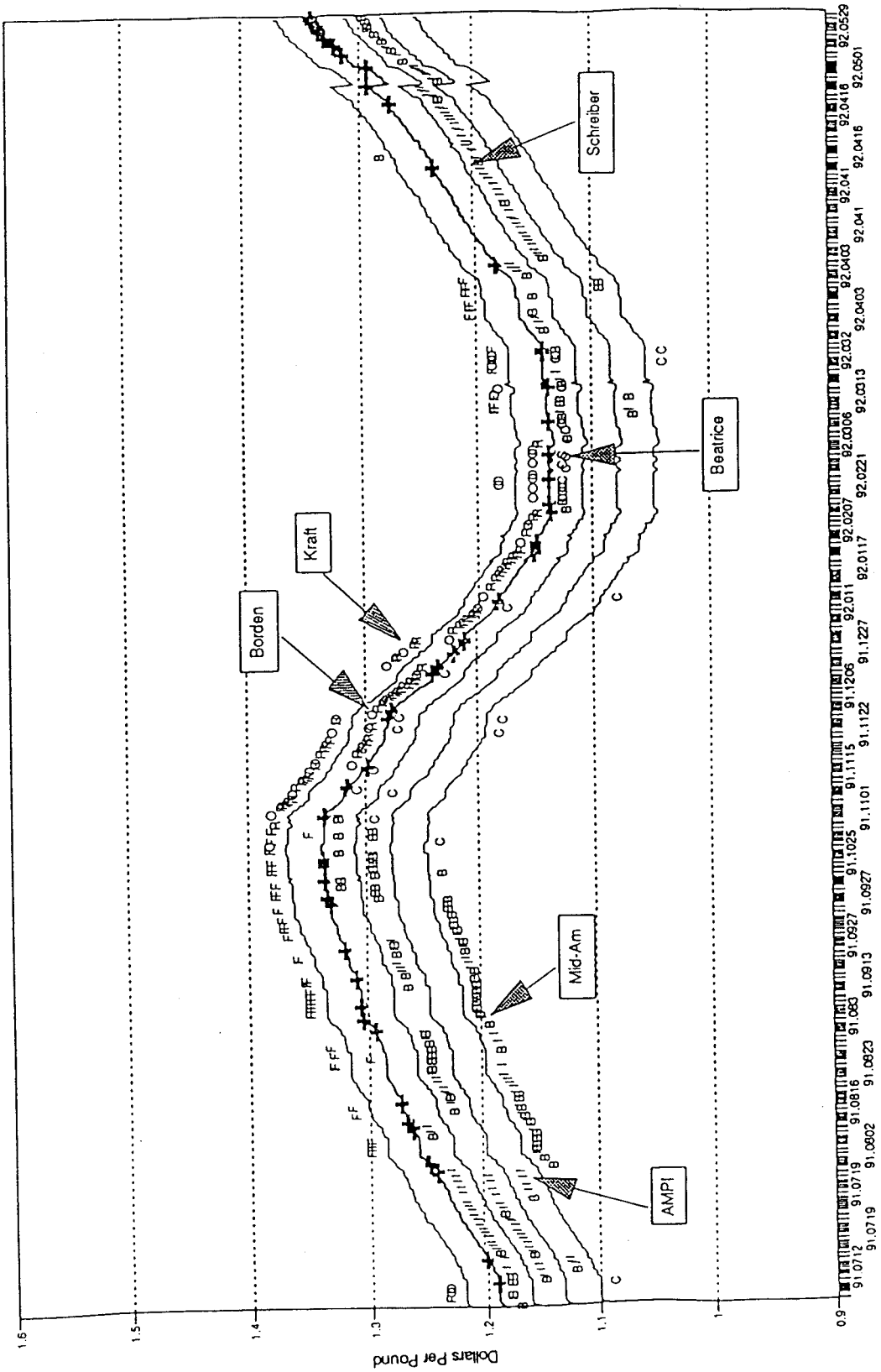


Appendix Figure 5.1c
NCE Barrel Activity of Leading Traders,
July 1990 - June 1991



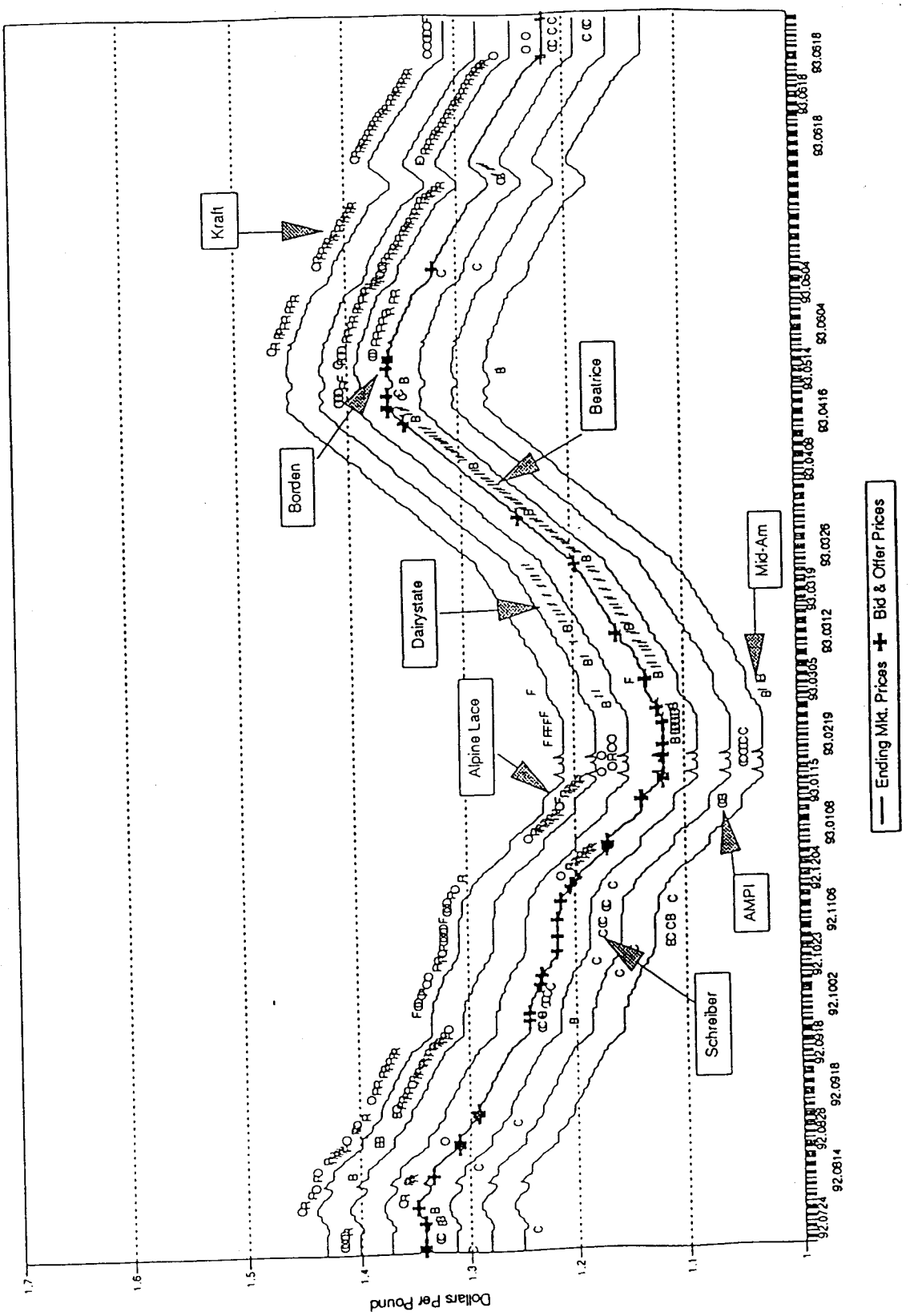
Appendix Figure 5.1d

NCE Barrel Activity of Leading Traders,
July 1991 - June 1992



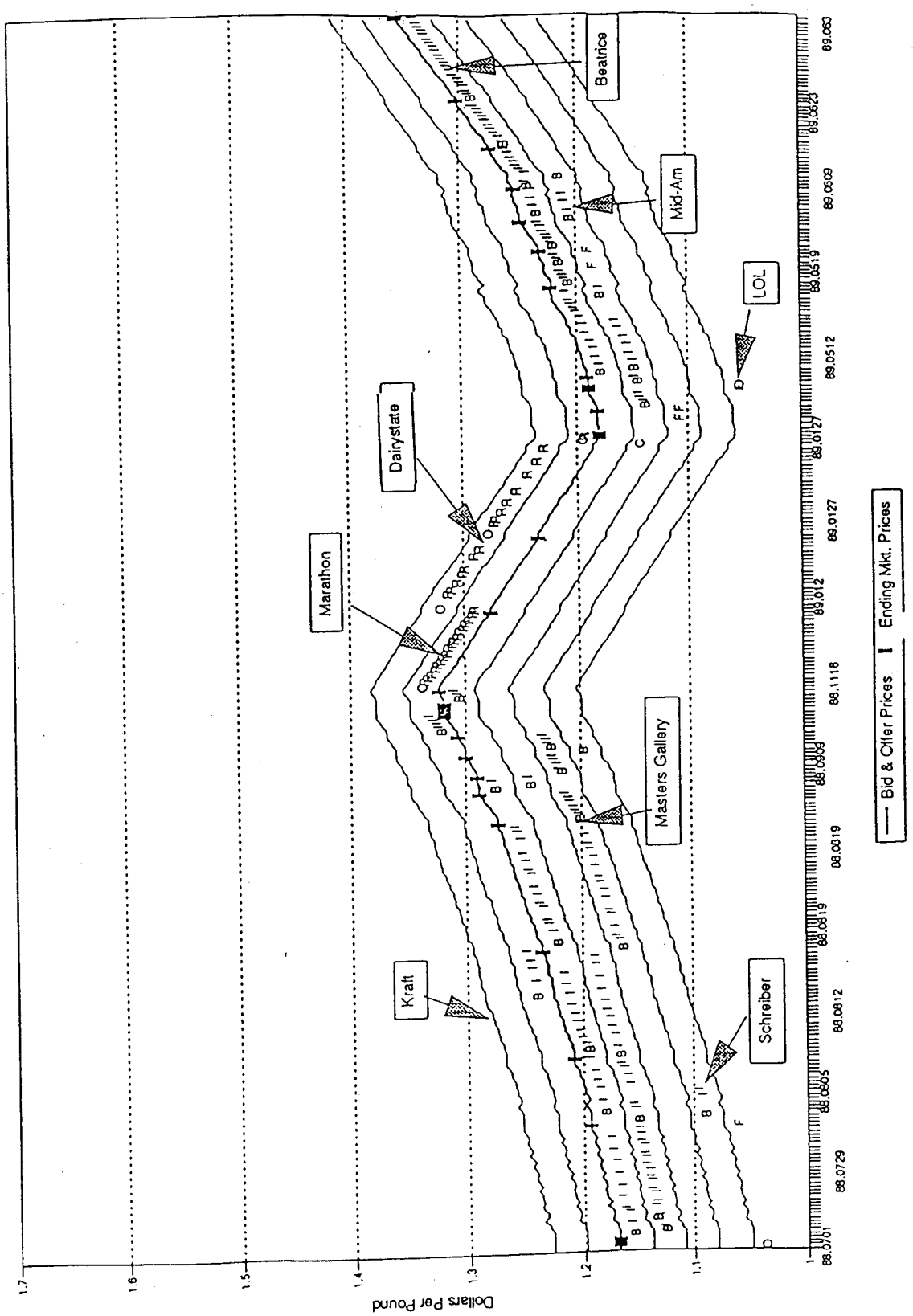
Appendix Figure 5.1e

NCE Barrel Activity of Leading Traders,
July 1992 - June 1993



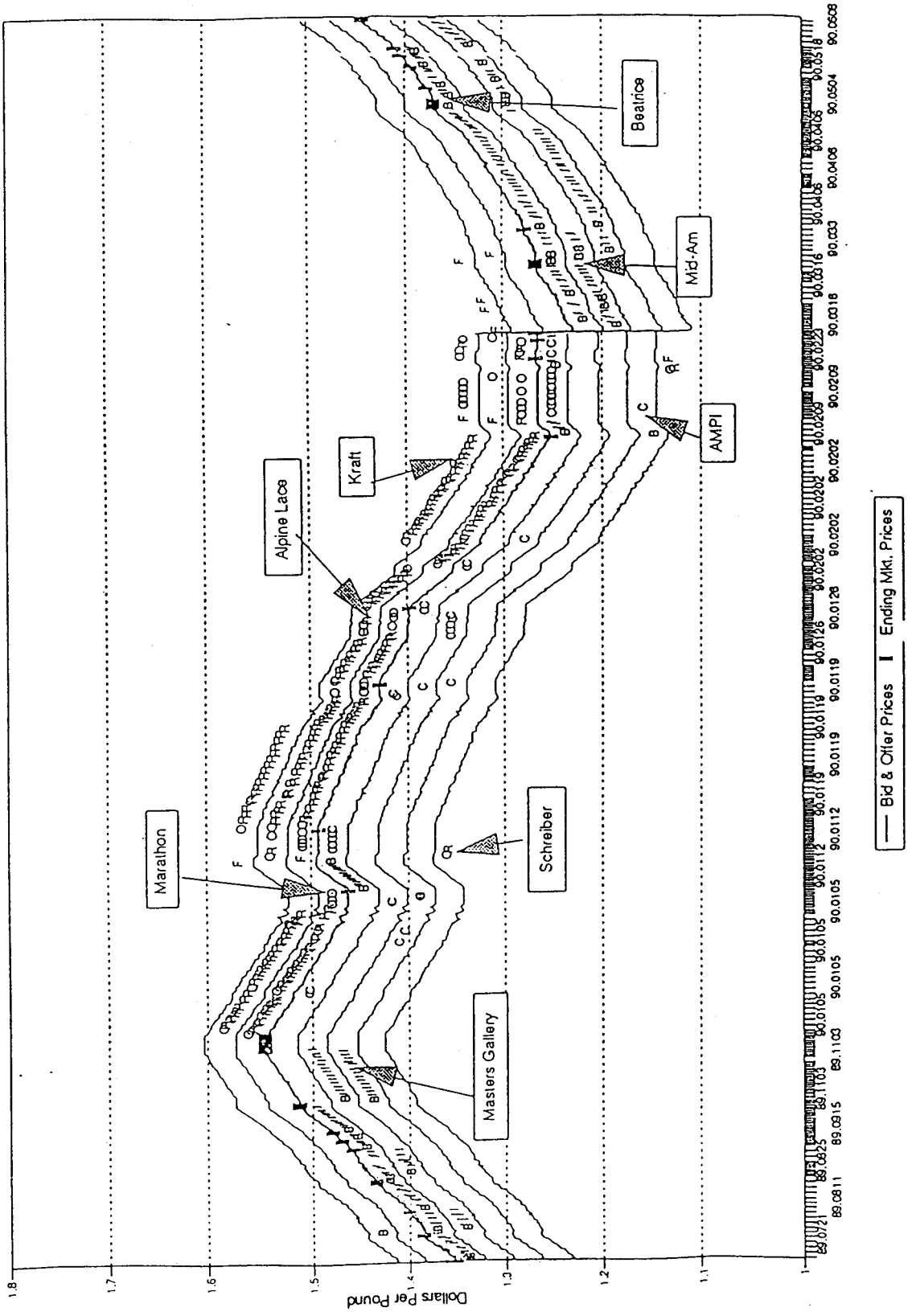
Appendix Figure 5.2a

NCE Block Activity of Leading Traders,
July 1988 - June 1989



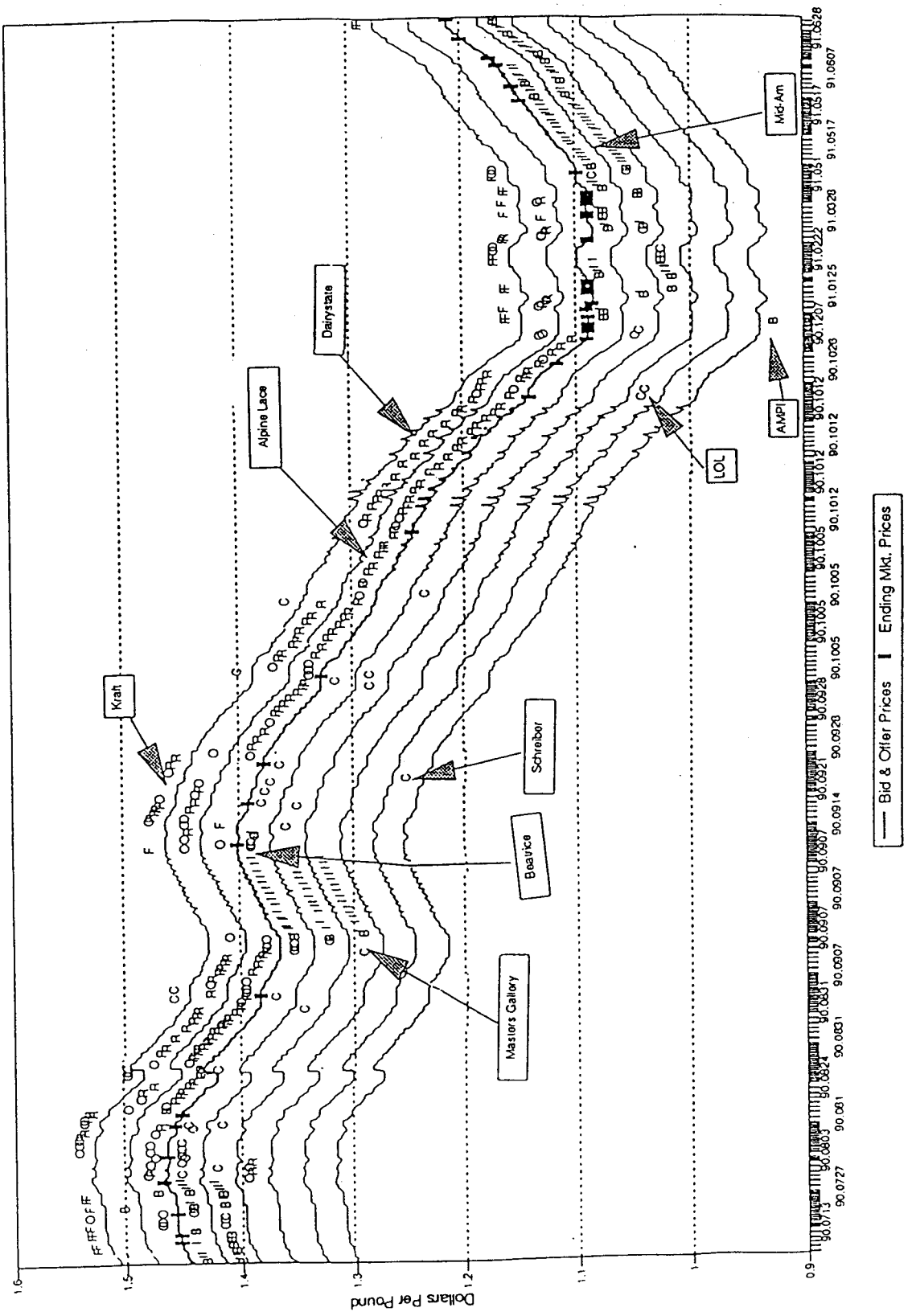
Appendix Figure 5.2b

NCE Block Activity of Leading Traders,
July 1989 - June 1990



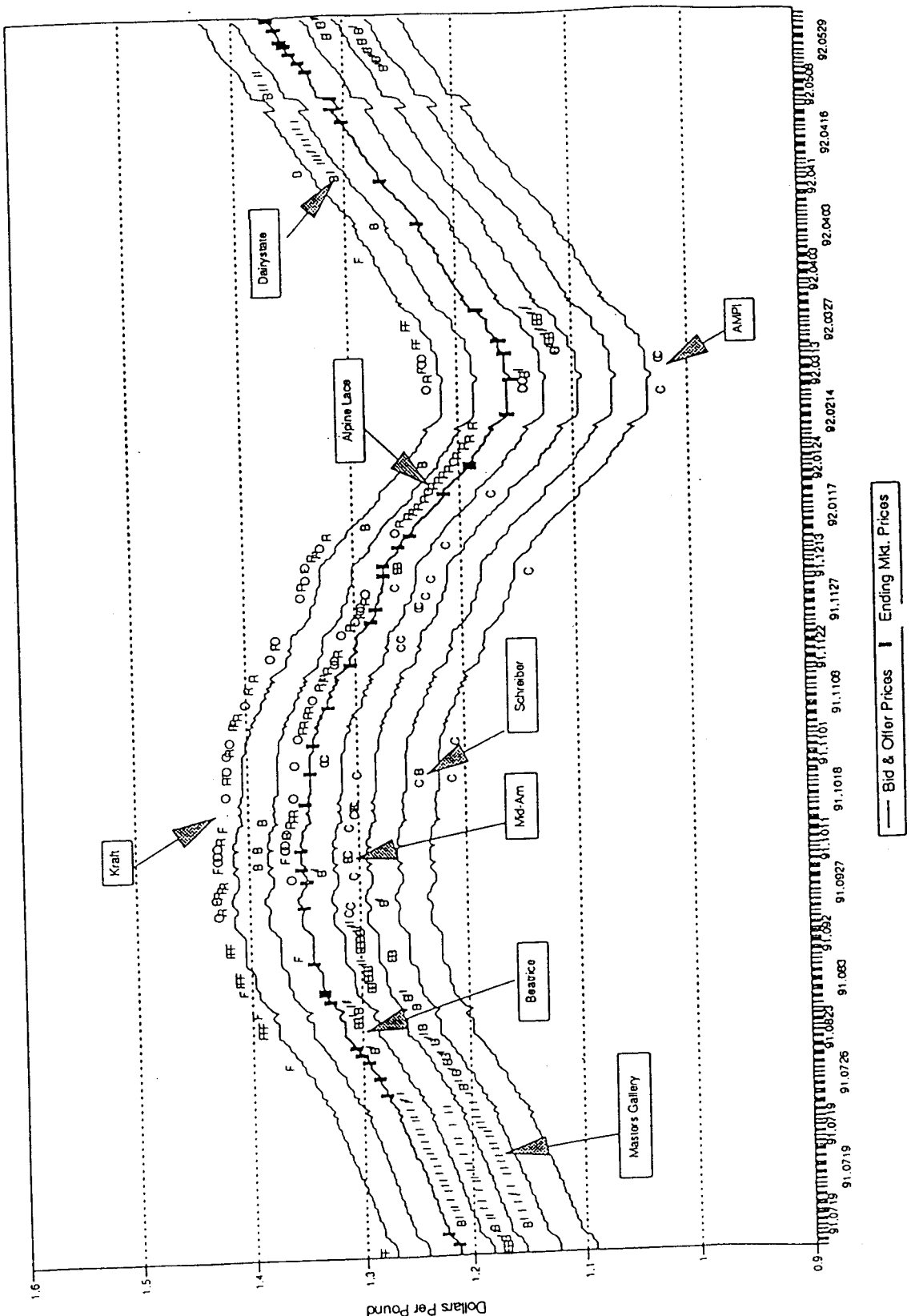
Appendix Figure 5.2c

NCE Block Activity of Leading Traders,
July 1990 - June 1991

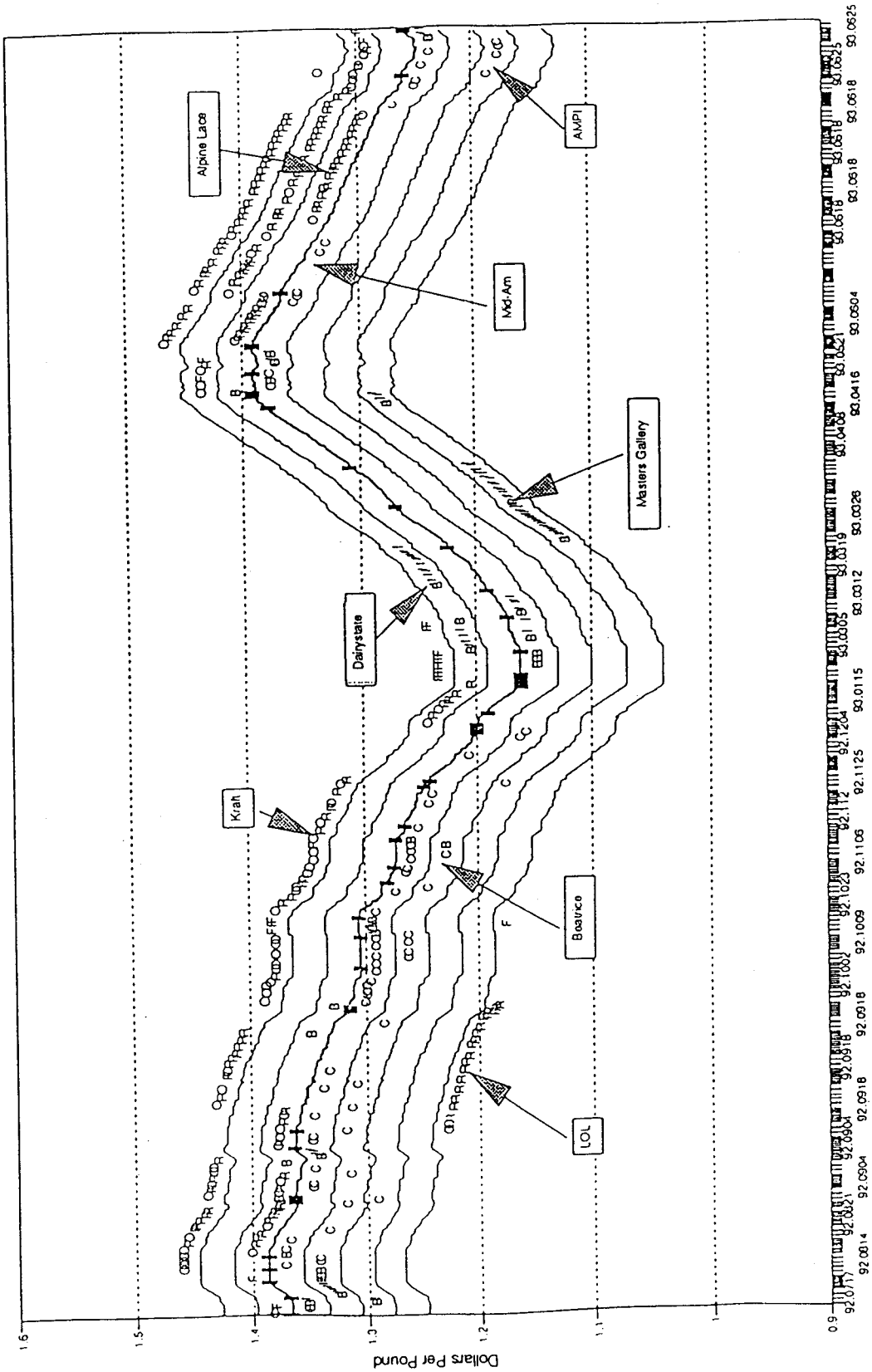


Appendix Figure 5.2d

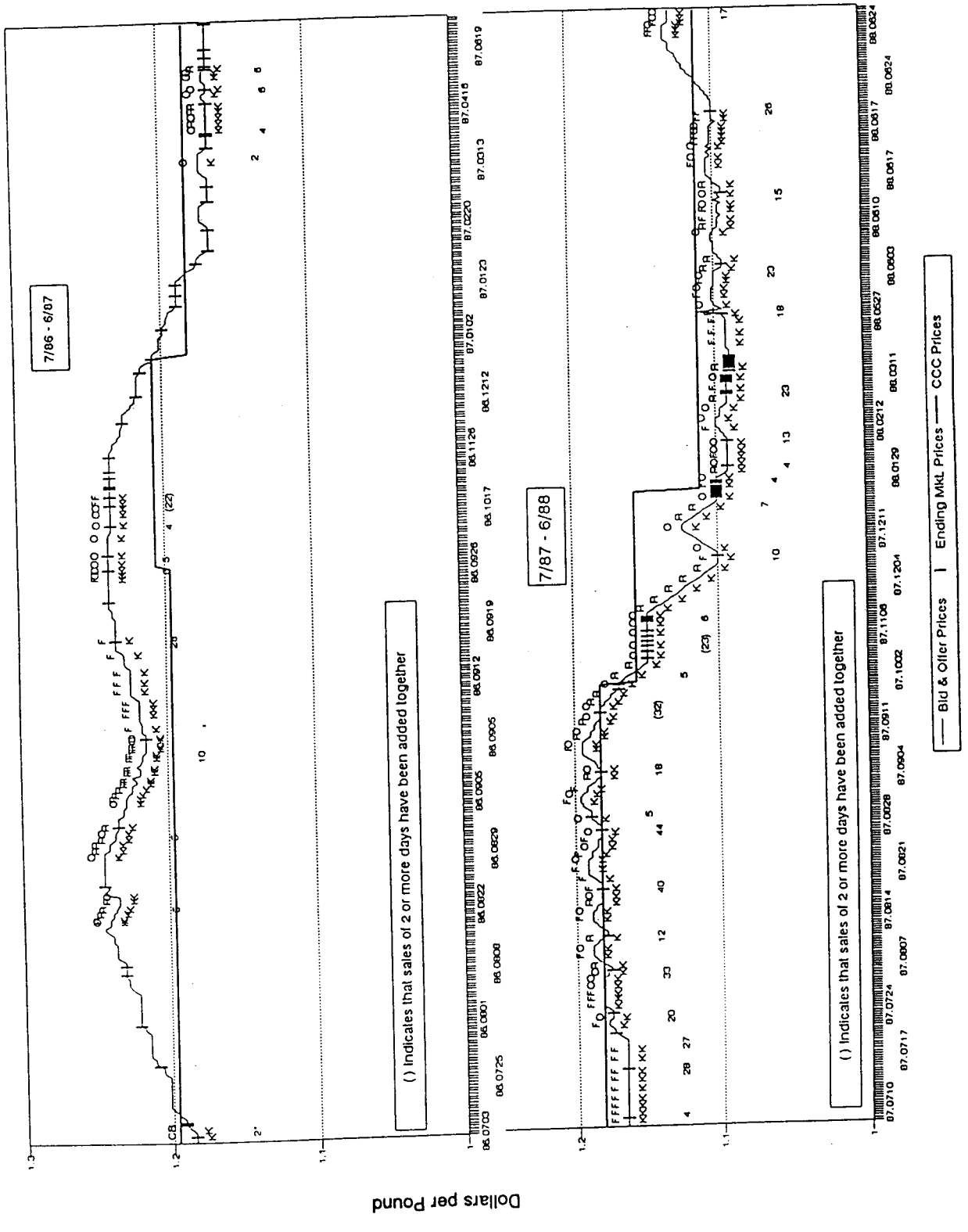
NCE Block Activity of Leading Traders,
July 1991 - June 1992



Appendix Figure 5.2e
NCE Block Activity of Leading Traders,
July 1992 - June 1993



Appendix Figure 5.3: Kraft Activity on NCE



Chapter 6--Kraft Trading Activity During 1990-1992

The preceding chapter examines the overall trading activity of leading seller-traders and buyer-traders during 1988-1993. Since Kraft was the preeminent trader on the NCE during 1988-1993, this chapter examines in more detail its trading activity from January 1990 through December 1992. We chose this period because we have the most documentary evidence for it, in addition to the trading activity reports for the NCE.[1] We focus on the nature and apparent impact on NCE prices of Kraft's trading during each price cycle, including the price decline, bottom, rise, and top. We also examine the roles played by other leading traders during these periods. Finally, we examine the relationship between NCE prices and Kraft's wholesale prices during 1990-1992.

To facilitate following the events discussed herein, readers should refer to Figure 5.1 and Appendix Figures 5.1-5.2, which display the weekly NCE trading activity of leading traders during this period. See also Figure 6.1.

A. Price Decline and Price Bottom, January-March 1990

In 1989 a reduction in herd numbers and milk production caused a large rise in cheese prices. NCE prices peaked in November 1989 and remained unchanged during the last eight weeks of the year. The industry anticipated that the return of flush milk supplies in 1990 would cause cheese prices to decline. After one company "polled" nine "major" cheese companies regarding expected price and other market conditions for the year, a November 17, 1989, internal memorandum reported, in part, that the lowest projected price for block was $1.28, with

---

[1] The Department of Agriculture, Trade and Consumer Protection Demand for Production of Documents was served to companies in early 1992. A limited amount of information was obtained for periods before or after this date.

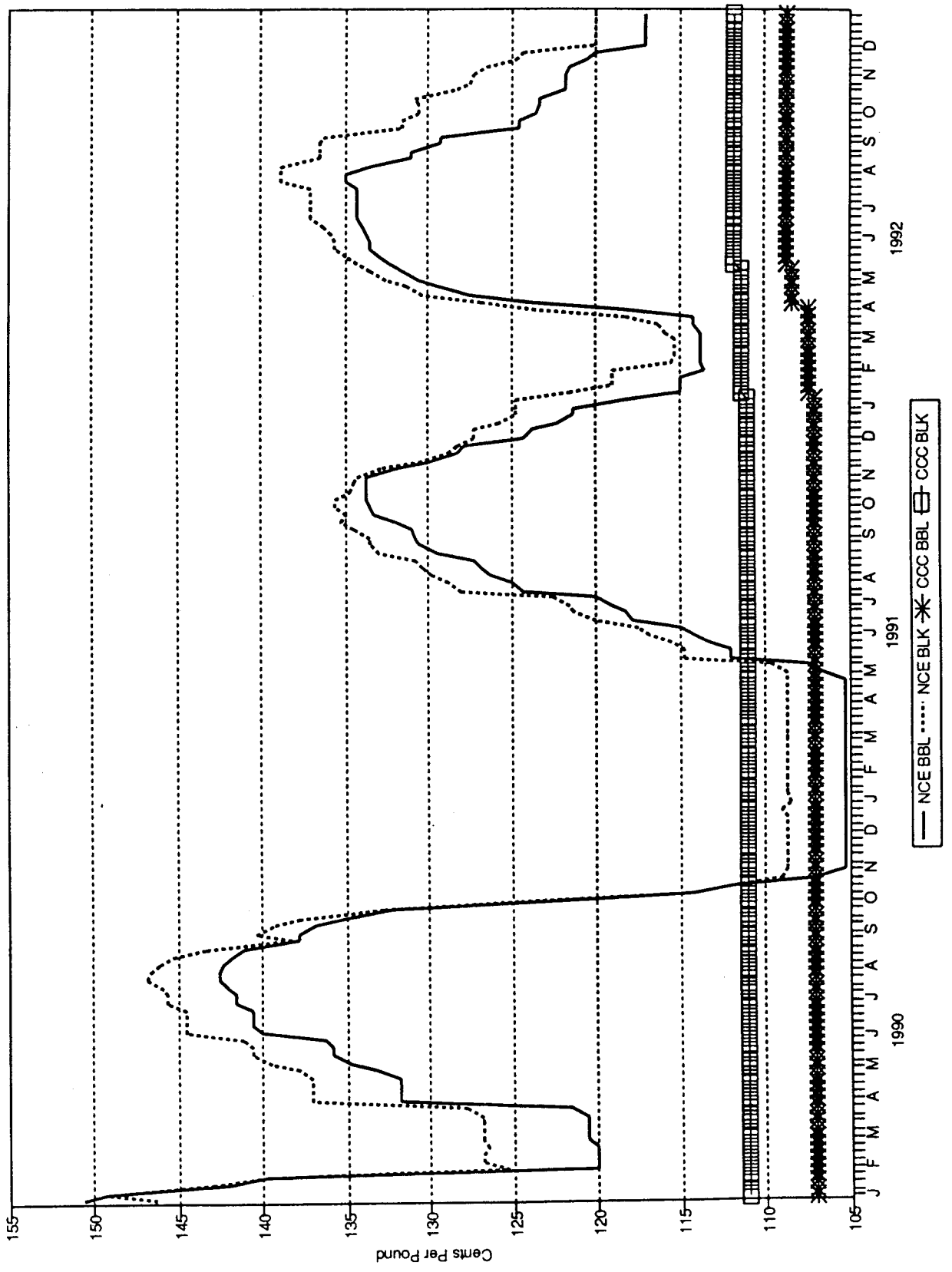


Figure 6.1: NCE and CCC Barrel and Block Cheese Prices, Weekly, 1990-1992

most company estimates in the range of $1.30-$1.32. At the time this document was written, block prices were $1.545.[2] Based on the poll, the company prepared two Industry Forecasts (showing expected monthly prices) that projected block prices would bottom at $1.28-$1.32 and barrel prices at $1.24-$1.28, with the expected low to occur in April-May.[3]

The Price Decline

There was an industry consensus that cheese prices would fall substantially in 1990. The main questions were how much prices would fall, when the price decline would begin, and who would lead the market down. One leading competitor apparently expected Kraft to lead off the price decline, since "One source reported that Kraft might try to work on the barrel market today [January 5]."[4] In fact, neither Kraft nor anyone else sold barrels on January 5. Two other traders, Alpine Lace and Marathon, sold 9 loads of blocks, causing block prices to fall 8.25 cents per pound while barrel prices remained unchanged. This development caused block prices to be 4.25 cents per pound *below* barrel prices, creating an atypical relationship since blocks usually

---

2 All of the major companies polled were suppliers or customers of the company. [[Source deleted in public report as not essential.]]

When questioned about the November 17, 1989, memorandum, a purchasing official of the company explained how he generally developed such information: "Getting an understanding of what others are thinking, for some companies, the way I would determine what their thinking was, I would give Mid Am a call and say, How is your milk supply at this point? How do the solids look? What do you expect for the next three or six months and what do you expect to happen in the markets? and see what they say. So there would be typically companies like Mid-Am or AMPI that we are doing business with on a committed supply basis. [[Source deleted in public report as not essential.]]

3 [[Source deleted in public report as not essential]]

4 Schreiber Foods, Inc., Purchasing Director-Western Region, to Vice-President-Purchasing, "Pre-Market Update," E-mail transmission, January 5, 1990, 8:27 a.m., Bates 5059.

sell at 2 cents to 4 cents per pound *above* barrels.[5] This relationship was corrected the following week when block prices rose while barrel prices fell.

(All references below to trading volume and prices on the NCE are based on the trading activity reports prepared weekly by the Agricultural Marketing Service (AMS), USDA, unless another source is cited.)

During the next three weeks--January 12, January 19, and January 26--NCE barrel prices dropped a total of 10.75 cents. Most of the decline occurred January 19, when Kraft led the trading in barrels; it made 30 offers and reduced offers to sell barrels, causing prices to drop 7.25 cents for the day, but no sales were consummated. No other trader offered barrels during the session. Kraft, joined by Alpine Lace and Marathon, also led off the decline in block prices on January 19. Block prices dropped until Beatrice began buying near the end of the session.

Dairystate, a broker, was the only trader to offer barrels on the NCE on February 2, 1990.[6] It opened trading for the day by offering 5 loads of barrels at $1.3975, the previous week's close. During the first 18 minutes of trading, Dairystate reduced its offer 24 times, dropping the price 7.25 cents. Between 10:18 a.m. and 10:31 a.m., Beatrice Foods and Masters Gallery covered all offers, purchasing 10 loads. Although 10:30 a.m. is the customary closing time of the NCE, trading rules provide that activity continues until one minute elapses after the last action. On this day, trading in barrels continued to 10:53 a.m., by which time Dairystate had

---

5 One industry source observed: "This is only the second time in recollectable history that the cost of Barrels is greater than Blocks...." Schreiber Foods, Inc., Director of Copack Services to Senior Vice-President and General Manager-Retail Division, "Schreiber Report-Rough Draft No. 4," E-mail transmission, January 10, 1990, Bates 2298.

6 Dairystate is generally viewed by industry participants as a broker on the NCE, although it describes itself as a cheese trader or reseller. It sometimes takes title to the cheese it sells, although it typically sells the cheese of others for a fixed fee and does not take the price risk of an owner. Typed transcript of recorded interview of Dennis Wyssbrod, Dairystate Brands, August 11, 1993, pp. 2 and 24.

reduced its offer 50 more times without any takers, and NCE barrel prices had dropped a total of 19.75 cents. One minute later, block trading also ceased (see below).

Dairystate was offering cheese for AMPI, which apparently did not wish to sell in its own name.[7] Two weeks before February 2, 1990, AMPI had offered another cheese company cheddar barrels to sell on the NCE. An internal document of that company dated January 19, 1990, stated:

> AMPI has offered barrels to us in steel based on today's market down to $1.2500. In other words, if we want to offer barrels they would provide the cheese and absorb any risk of market decline.[8]

An internal memorandum of this company written before the opening of trading the morning of February 2, 1990, stated:

---

[7] Immediately after Black Friday, an industry trade paper stated that Dairystate was a broker that represented, "among other firms,...Associated Milk Producers Inc.," *The Milkweed*, "`Black Friday' at Green Bay," December 1989, p. 4. (The February 1990 issue of *The Milkweed* was dated December 1989.) This source did not specifically state that Dairystate had sold for AMPI on February 2. During the course of this study we learned that it is common industry knowledge that Dairystate had been selling for AMPI. We were not able to determine whether any companies, in addition to the one cited below, knew on February 2, 1990, that Dairystate was selling for AMPI.

We have found no evidence that AMPI has sold on the NCE on any other occasion between February 2, 1990, and the end of 1993. AMPI *purchased* 172 carlots on the NCE during 1988-1993 (Table 5.1).

An executive of a leading cheese company said that "...after the market on February 2, Beatrice field men were out telling farmers that AMPI was responsible for the market drop in areas where they compete for milk." [[Source deleted in public report as not essential.]]

[8] Schreiber Foods, Inc., Purchasing Director-Western Region, to Vice-President-Purchasing, "Pre-Market Update," E-mail transmission, January 19, 1990, 8:10:56, Bates 5055. When the vice president-purchasing was asked why Schreiber did not accept the AMPI proposition, he replied: "...we simply don't participate in that kind of thing." Typed transcript of recorded interview, May 26, 1993, *Id.*, p. 16.

> AMPI, North Central, are still offering us 10 loads of barrels to go to the exchange with and they would absorb market decline. They are very perturbed at Mid-Am's activity on the exchange.[9]

While this company declined the AMPI proposition, Dairystate did offer barrels on the NCE for AMPI. We have been unable to determine how much cheese Dairystate was prepared to sell, but after it had sold 10 loads, it offered five more, none of which was covered; by the close of trading it had reduced the offer to one load.

Although Kraft did not offer barrels during the February 2 price decline, it did participate in NCE block trading. As its only trade for the day, Alpine Lace first offered two loads of blocks, an offer that Beatrice covered after the price of barrels had dropped by 4.5 cents per pound. At that time, Marathon and Kraft began offering blocks and continued until the price had declined another 10 cents, although only one of these loads was sold. In total, Beatrice bought two loads and Mid-America one load of blocks. Clearly, Beatrice Foods, Mid-Am and Masters Gallery, the only buyers on February 2, held a different view of the appropriate price than did the other traders.

AMPI's motive for taking down the barrel market price remains unclear,[10] but in light of the memorandum cited above it appears that AMPI expected its actions to drop the market. Nor

---

[9] Schreiber Foods, Inc., Purchasing Director-Western Region to Vice-President-Purchasing, "Pre-Market Update," Interoffice Memorandum, February 2, 1990, Bates 5052. The reference to being "very perturbed at Mid-Am's activity on the exchange" may have referred to Mid-Am's participation in bidding activity during the long run-up in NCE prices in 1989 (Appendix Figures 5.2a-5.2b). AMPI made no bids after May 1989, whereas Mid-Am bid through November 3, 1989, at which time prices peaked for the year.

[10] During the course of an interview of AMPI officials, an official stated that it was not AMPI's purpose to lower the price on the NCE February 2, 1990. Mark Firth, North Central Regional Manager, typed transcript of recorded interview of AMPI officials, July 29, 1993, p. 41.

is it plausible that AMPI was selling on the NCE merely to reduce excess inventory. The Exchange clearly is not a viable outlet for surpluses of the size Dairystate was prepared to sell on February 2, particularly during a period of declining prices. Indeed, most companies, both large and small, look to better means for solving excess inventory problems (See Section D, Chapter 4). AMPI's motives for selling on February 2 are puzzling, especially considering subsequent events. First, on the following Friday it led off bidding for both barrels and blocks and ended up purchasing two loads of barrels and one load of blocks. Second, AMPI made no further bids for blocks or barrels during the rest of 1990 although it did buy in the spot market.[11] Finally, as discussed below in the internal memoranda of other companies, in the weeks following February 2 many companies, apparently including AMPI, had no extra cheese available for spot buyers.[12]

The Price Bottom

Once the market hit bottom on February 2, 1990, barrel prices remained at a low of $1.20-$1.205 for the next seven weeks as Kraft filled all but one bid for barrels. When Kraft failed to fill one bid immediately on March 2, 1990, the bid was increased twice, resulting in a 0.50 cent price increase, whereupon Kraft filled that bid and all others for the day. During February-March 1990, Kraft sold a total of 100 loads of barrels. Dairystate was the only other trader selling barrels during the period.

Kraft also was active in block trading during the February-March price bottom, selling 18 loads in all. Closing block prices ranged between $1.2525 and $1.2675.

---

[11] On March 12, 1990, AMPI purchased three loads of barrels in the spot market from Dairystate, which was selling for Borden. Records of Dairystate Brands, Inc.

[12] See notes 16-17.

When Kraft stopped filling barrel bids at 10:23 a.m. on March 30, buyer-traders immediately began bidding up prices, which went up 1.5 cents per pound for the day. Block prices also rose 1 cent for the day.

Summary of Kraft Conduct at Price Bottom

Although Kraft's role in the market decline before and on February 2 is ambiguous, Kraft appears to have played a less ambiguous role in keeping prices virtually unchanged over the next seven weeks. Kraft's persistent and largely solitary selling over this period raises the question, did its trading keep prices below those warranted by competitive supply and demand conditions? Below is summarized evidence relevant in answering this question.

1. During January-March 1990, industry commercial stocks and CCC stocks were lower than in any other like months during 1980-1993.[13].

2. Kraft did not have a surplus at the end of 1989. On the contrary, Kraft's 1990 procurement plan, prepared in November 1989, projected a 35 million pound shortage for 1990.[14] Nor did Kraft believe it had an inventory problem in early 1990.[15]

---

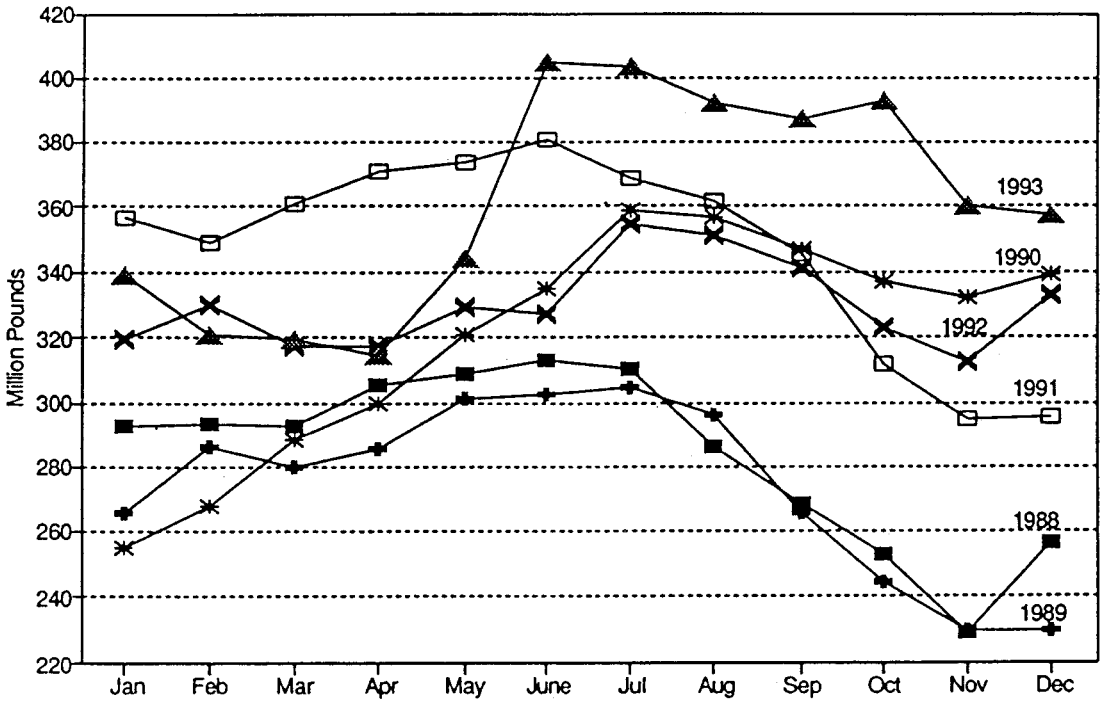
[13] Figure 6.2, Appendix Table 6.3.

[14] Kraft-General Foods, Inc., *1990 Cheese Inventory and Procurement Strategy*, Operations, December 12, 1989, KGF 3002, 3005.

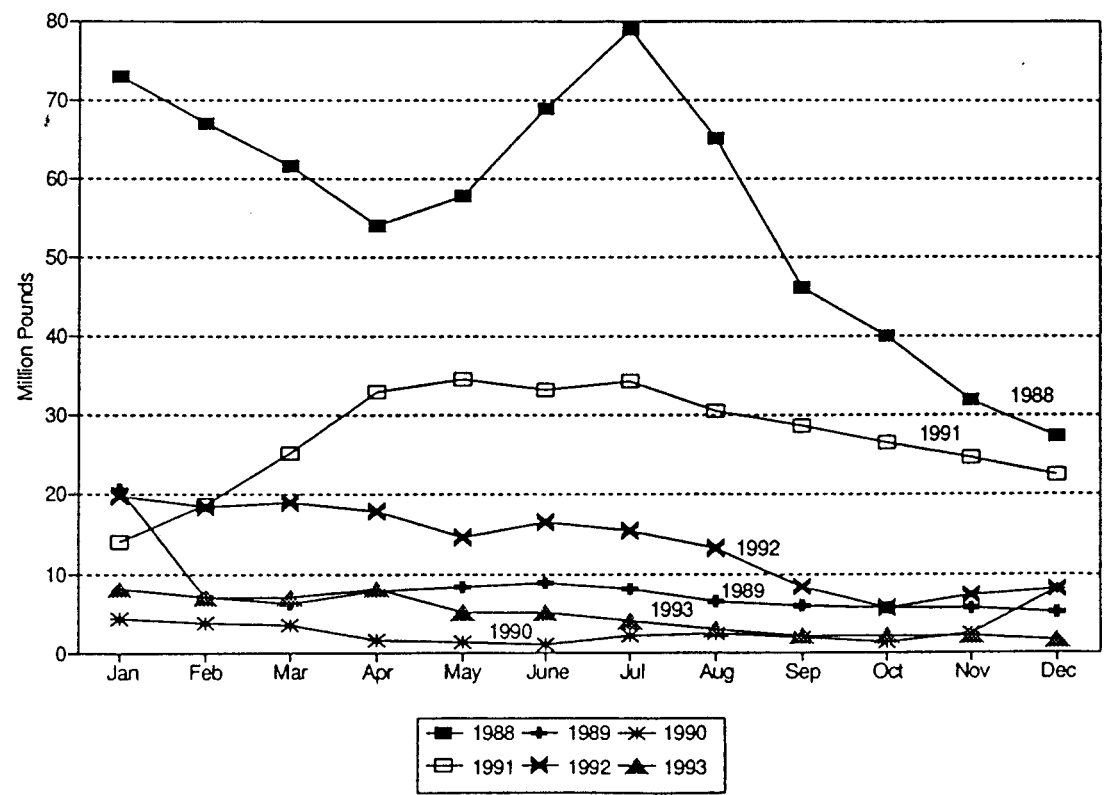
[15] On February 28, 1990, Kraft's director of cheese procurement and inventories stated that, although usage and receipts were not on Plan, in his view this did not pose a problem. As he saw it:

> This over Plan condition is a result of usage being under Plan by 11 million pounds and receipts over by 3 million during the November-January period. *Based on our latest forecast for the balance of 1990, this 14 million pounds will be required to cover heavy Fall demand.* Kraft General Foods, Inc., Wayne Hangartner, Director of Cheese Procurement and Inventories to Don Butte, Vice-President and Director-Refrigerated Operations, "Letter of Comment-February 1990," February 28, 1990, KGF 3168-3169, emphasis added.

Figure 6.2
Commercial Stocks of American Cheese, 1988-1993



CCC Stocks of Natural Cheese, 1988-1993



3. Whereas industry cheese supplies appeared adequate in February, by March they appeared to have tightened (especially for barrels) more than implied by NCE prices.[16] Two

---

[16] A March 1, 1990, internal memorandum of one company stated, in part:

> Inventories gradually continue to drift downward as a result of the restrictions we have on receipts. Production schedules continue to run light also.
>
> Reports and rumors are taking a little different light this week, especially in the natural block trade. AMPI, North Central, reports they are having trouble filling all block orders. Mid-Am reports the same....
>
> Market Cheese Traders is reportedly looking for blocks. This seems a little unusual in as much as First World [name subsequently changed to Alpine Lace], their parent company, sold blocks recently on the Exchange.
>
> Rumor has it that Kraft is storing all the barrels they can get their hands on.
>
> Pacific Cheese advises that bulk sales in CA are terrific and they could market more blocks than Hilmar, their supplier, can make. They were also having some problems in locating 3 cars of current Wisconsin State Brand and needed references. [[Source deleted in public report as not essential.]]

A March 7, 1990, internal company memorandum stated, in part:

> Kraft has contacted some of our suppliers and offered to buy all the barrel cheese that SFI does not take. They have also instituted premiums for barrels to 2 cents over market (we had just dropped to flat market). Schreiber Foods, Inc., Vice President Purchasing to President and CEO, and seven other executives, "SFI Market Position and Current Strategy," March 7, 1990, Bates 4659, 4660.

A March 7 memorandum of a Kraft competitor expressed the view that Kraft appeared to be buying to keep prices down while building inventories:

> It looks like Kraft covered bids at the NCE on Friday [March 2] to moderate short term market pressures, while building their inventories for the fall. [[Source deleted in public report as not essential.]]

A March 9, 1990, internal company memorandum stated, in part: "Most major suppliers suggested that they were basically sold out for the month of March." Schreiber Foods, Inc., Purchasing Director-Eastern Region, to Vice President-Purchasing, "Premarket Update," Interoffice Memorandum, March 9, 1990, Bates 5045.

An internal memorandum of another company, March 30, 1990, expressed a similar sentiment:

> Barrels are exceptionally short. Smaller companies such as NU-TEK, Dairyland, Sargento and Northfield are experiencing shortages of barrels. Block is also

cheese companies looking for extra cheese in March said that AMPI reported having none available for them,[17] perhaps because Kraft was selling on the NCE cheese acquired from AMPI, a leading Kraft supplier. [18] Some AMPI cheese was shipped all the way from AMPI's Stephenville, Texas, plant located over 1,200 miles from Green Bay.

The market might have been even tighter had not Kraft's heavy selling on the Exchange apparently discouraged some buying for inventory. For example, one large cheese company

---

> moving very well and premiums are rising on both barrels and block. Borden Company, Intercompany memorandum, March 30, 1990.

Also see references in note 17.

[17] A March 15, 1990, internal company memorandum said that its co-packer had reported that:

> They have contacted all major dairies/co-ops and their regular suppliers and no one is willing to sell them more than their commitment levels. AMPI told them short term they could not assist with additional load requirements, and WI Dairies has refused to lower the balance of the incremental premium of $.0150. WI Dairies continues to state they can sell the product elsewhere. Schreiber Foods, Inc., Director of Copack Services to President and CEO, Senior Vice-President and General Manager-Retail Division, and four others, "Co-Pack Bulk Cheese Tightness," E-mail transmission, March 15, 1990, Bates 5042.

An internal company memorandum of March 15, 1990, of a leading cheese company stated:

> AMPI, Sanborn, is running about two loads per week shy of their projections of 10/week....we have been soliciting some extra blocks without success. So far we have checked for extra cheese at other AMPI North Central areas; AMPI, Southern; Wisconsin Dairies; and Swiss Valley. No one has any uncommitted production available at this time. [[Source deleted in public report as not essential.]]

[18] Later, on March 29, 1990, an internal company memorandum of a large cheese company stated, in part:

> Two different suppliers are getting an influx of phone calls from buyers wanting to buy blocks and [are] willing to make commitment thru the year. Sounds like October 1989[.] Mid-Am and AMPI continue to state that they are short of needed production. [[Source deleted in public report as not essential.]] Reference to October 1989 is to a period of considerable shortages.

had limited such purchases because it feared prices might decline further. Only when NCE prices rose April 8 did the company authorize making additional purchases.[19]

4. During February and March 1990, Kraft sold 100 loads of barrels and 18 loads of blocks on the NCE.[20] During the same period, however, Kraft reported selling no loads of barrels and only one load of 40-pound blocks in the spot market, despite a quite strong demand (see 3 above).[21] Kraft calculated that on NCE sales of 92 loads it incurred average losses of 17.5 cents per pound in February and 4.9 cents per pound in March.[22] The much larger losses in February probably occurred because Kraft had purchased some of the cheese at the higher January prices, whereas all March sales involved cheese purchased in February or March.[23]

---

[19] On April 9, 1990, the company's purchasing director stated:

> For some time now, we have capped receipts from some committed suppliers to control the young cheese for process inventory growth in anticipation of further market declines....At yesterday's President's Staff Meeting, approval was given to purchase barrel cheese from committed suppliers for Missouri and Wisconsin; i.e., the cheese that we had not been accepting. Schreiber Foods, Inc., Vice-President Purchasing to Business Requirements Planning CAT Members, April 9, 1990, Bates 1475.

[20] National Cheese Exchange, Trading Activity Minutes, AMS. USDA, reported these sales for February-March 1990. Only 92 of these 118 loads were reported in Kraft's "Raw Material Cheese Sales" report for February-March 1990. The remaining 26 loads were reported in April. See note 45 below which explains the reason and significance of these differences.

[21] Kraft General Foods, Inc., *Raw Material Cheese Sales, 1990, December 1990*, KGF 23760.

[22] Kraft General Foods, Inc., *Raw Material Cheese Sales, December 1990*, KGF 23760. This source calculates losses for 92 loads for February and March. Twenty-six loads sold in March are included with the April sales, on which Kraft lost an average of 4.9 cents per pound. *Id.*

[23] The March losses apparently reflected in part the relatively high transportation costs between Green Bay and some of Kraft's supplier plants.

If Kraft's only motive for selling on the NCE during February and March had been to dispose of excess inventories and maximize returns on such sales, it would have preferred to sell in the spot market, as it often did on other occasions. Typically, Kraft's sales in the spot market were more profitable than its sales on the NCE (Appendix Table 4.3), especially when supplies were tight, as they evidently were during this period. Indeed, Kraft itself appeared short at times since in March, at least, it reportedly was looking for more cheese.[24] These actions are inconsistent with the notion that Kraft was selling barrels on the NCE to reduce inventories.

Note: Below and elsewhere in this Report, all references to specific prices shown in Figures 6.4 and 6.5 (see page 44 below) have been temporarily redacted pursuant to an agreement with Kraft General Foods, Inc., pending judicial resolution of trade secret issues. Pending judicial resolution, the authors have agreed to express in percentage terms all references to these prices in this Report.

5. Kraft had a strong financial interest in lower NCE prices in February and March 1990. It had raised the average price of Kraft processed cheese to the trade by about 15 percent between January 1989 and January 1990 (Figure 6.4). Because NCE barrel prices had risen sharply in the fall of 1989, the spread between Kraft's net prices to the trade less NCE barrel prices (hereafter Kraft's price-cost margin) had risen only about 10 percent over the period. When NCE barrel prices dropped sharply February 2, 1990, Kraft's processed cheese price-cost margins widened by about 35 percent between January and February 1990, because Kraft did not lower net prices to the trade. Kraft's price-cost margin for natural cheese also rose by a small amount between January and February--about 15 percent (Figure 6.5). These margins apparently represented historic highs[25] and gave Kraft a strong financial incentive to prevent

---

[24] See note 16 above.

[25] As shown in Appendix Tables 6.10 and 6.11, retail prices of Kraft brands rose steadily and substantially between 1981 and 1990. In contrast, average NCE block and barrel

NCE prices from rising.[26] We estimate that during February and March 1990, Kraft cheese profits rose by over $1.0 million for each 1 cent per pound decrease in raw material cheese costs due to lower NCE prices.[27]

In sum, the available evidence does not support the hypothesis that Kraft's heavy selling on the NCE during February-March 1990 was dictated by excess Kraft or industry inventories. Rather, the evidence supports the hypothesis that Kraft's heavy selling on the NCE during the period was designed to keep the NCE price from rising, thereby widening its profit margins on cheese.

---

prices dropped about four cents per pound between 1981 and 1990. Hence, Kraft's gross profit margins measured by retail prices less NCE block and barrel prices, rose substantially. For example, the gross margin of Kraft's Velveeta brand rose from 43 cents per pound in 1981 to $1.96 per pound in 1990 (see Appendix Table 6.11).

[26] Kraft's reported losses on NCE sales during February and March were $336,971. Kraft General Foods, Inc., *Raw Material Cheese Sales, December 1990*, KGF 23760. Kraft actually sold 118 loads on the NCE during February and March. The results of these sales are reported during February-April in KGF 23760. These losses were small compared to the increase in Kraft's gross profit margins during these months. See Figures 6.4 and 6.5 in Section E.

[27] This estimate is based on the following assumptions:

1. Each 1 cent per pound decrease in NCE prices resulted in a 1 cent per pound decrease in the cost of purchased bulk cheese, as well as cheese made in Kraft-owned plants because the lower NCE prices lowered manufacturing milk prices.
2. In 1990, Kraft sold about 800 million pounds of finished cheese products to retail outlets (Appendix Table 6.4c) and about 265 million pounds to other outlets (25% of Kraft's total sales are non-retail sales. Chapter 7, p. 8).
3. About 0.85 pounds of bulk cheese is required for each one pound of finished cheese product.
4. About one-sixth of all cheese utilized by Kraft in 1990 was made or procured in February-March 1990.

B. Price Rise, Top and Decline, April 6-November 2, 1990

As noted above, after remaining virtually unchanged from February 2, 1990, until March 30, 1990, when Kraft stopped filling bids, NCE prices rose 10.25 cents the following session, April 6, 1990. Just six days later, April 12, 1990, McKinsey & Co. consultants prepared a

document entitled *Short-Term Cheese Options*,[28] for discussion purposes with senior Kraft

---

[28] Kraft General Foods, Inc., *Short Term Cheese Options*, Kraft, USA, Discussion Outline, April 12, 1990, KGF 3026-3033.

Kraft employees interviewed in the course of this study said the McKinsey document did not reflect Kraft policy because it was prepared by outside consultants and was not acted upon by those interviewed, all of whom were involved in cheese procurement.

Wayne Hangartner, former Director of Cheese Procurement and Inventories, denied much familiarity with the document. Hangartner said the options "were not presented to me. They weren't prepared to be presented to me. I did not hire McKinsey to do this." He added, "I know that this was a period where the senior management hired McKinsey financial people, strategy people [who] were looking at our cheese business...." Kraft interview, *op. cit.*, p. 67.

When asked if McKinsey would provide strategy information to him, Hangartner replied:

> No, I think I'd characterize it this way. With all the volatility and what was happening to Kraft's cheese business, senior management was concerned and wanted an outside viewpoint--that's the reason for consultants...we hired them to look at the total Kraft cheese business.... *Id.*, 68.

Kraft legal counsel asked Wayne Hangartner, "...just so there's no mistake about it. These supposed options that this consultant presented, were those options adopted by you in your performance of your job responsibilities in charge of procuring cheese?" Hangartner replied: "They definitely were not adopted, and I can't recall any Kraft management above my level suggesting that." *Id.*, 69.

Marcia Glenn, Director of Dairy Economics, stated the following as to her understanding of the genesis of the document:

> This is a document that was prepared by an external consulting firm...during the spring of 1990 when prices were really quite [hectic]....We contributed parts, a couple pages to it, some information...and they had outlined some options that we could or could not take as they're outlined there. *Id.* 66.
>
> ...there were some new people that had joined the organization and were not familiar with the market; we were in a period of rapidly moving prices and asked McKinsey to have a look at the situation. *Id.*, 67.

It is our view that the McKinsey "Options" document is a legitimate representation of Kraft's view concerning the way in which it could use the NCE to influence bulk cheese procurement costs. This is apparent when this document is read in the context of prevailing market conditions (see below) and in the context of other Kraft documents that imply using the NCE to control raw material costs (see Chapter 4,

management.[29] It summarized the short-term problems facing Kraft as follows:[30]

- Changes in the nature of the cheese market have led to unprecedented raw material cost volatility.
- If the current relationship between Kraft wholesale price and raw material costs does not improve, the result will be a [...] [profit] shortfall versus financial plan.
- Our current understanding of overall cheese supply and demand indicates that raw materials costs should fall in four to six weeks.
- Between now and that time, Kraft has several options on the National Cheese Exchange and in the wholesale market.

The memorandum summarized "Kraft's Options" as follows:[31]

- National Cheese Exchange

Sections D and E). Moreover, McKinsey consultants were familiar with Kraft's operations. Kraft personnel had contributed parts to the options document. Glenn, *op. cit.*, 66. Moreover, Kraft had employed McKinsey consultants both before and after the April 1990 document was prepared. For example, the Kraft General Foods, Inc., Refrigerated Products Group, *1989 Strategic Plan* cited McKinsey as a source. KGF 27977, 28026. Marcia Glenn said that McKinsey also had looked at specific Kraft activities six months after the April 1990 report. Kraft Interview, *op. cit.*, 68. Marcia Glenn and other Kraft employees also consulted with McKinsey personnel regarding issues relating to futures trading in cheese. Kraft General Foods, Inc., Lance Friedman to David Brown, Conference Call, May 31, 1990, with c.c. to Matt Christoff (McKinsey) and Marcia Glenn (KUSA Operations), KGF 16966. Also, Marcia Glenn to D. Baily, October 6, 1992, stated that they were working with McKinsey. KGF 26984, 26986. Kraft General Foods, Inc., *1993 KUSA Operations Strategic Plan*, November 23, 1992, KGF 28053, 28114, refers to McKinsey as the source of a Retail Cheese Consumption by Channel study.

[29] Interview with Kraft personnel, December 8, 1992, typed transcript of recorded interview, *op. cit.*, p. 67. Senior management who met with McKinsey included Jim Kilts, president, and Dick Baily, Vice-President of Operations. Marcie Glenn, *Id.*, p. 68.

[30] *Short Term Cheese Options, op. cit.*, KGF 3027.

[31] *Id.*, KGF 3031.

-Commit to sell an agreed upon volume in an attempt to prevent the barrel opinion from rising. Increased cheese supplies from the flush milk period should then decrease price in May/June time frame.

-Sell no cheese on the exchange, allowing prices to increase further, followed by a May/June decrease.

-Actively sell into the market to reduce price.

- Wholesale market

-Maintain current prices.

-Increase prices immediately, with an understanding that they may have to be decreased in two or three months.

This document can best be interpreted within the context of NCE activity during March and early April 1990. As noted above, Kraft had enjoyed unprecedented large gross profit margins during February and March 1990, when it sold heavily on the NCE. The McKinsey memorandum of April 12, 1990, appears to have been prepared in response to the 7.25 cent rise in barrel price on April 6 after Kraft stopped selling on the NCE. It discussed alternative price strategies that Kraft might pursue in response to the expected further price increases if it remained inactive on the NCE.

Kraft did not immediately adopt either the memorandum's first option of selling on the NCE to prevent barrel prices from rising nor the third option to actively sell into the market to reduce price. Rather, Kraft remained inactive on the NCE from April 12 through July 13, 1990, during which period NCE barrel prices rose by another 9.75 cents, with only one bid filled during the period. However, Kraft did increase net wholesale prices of processed and natural cheese sufficiently to increase margins in April through October (Figures 6.4 and 6.5). This action was consistent with the McKinsey memorandum wholesale market "option" of

"increasing prices." Kraft did not follow this option in its entirety; i.e., it did not subsequently reduce wholesale prices "in two or three months."

On July 20 Kraft began selling into the barrel market.[32] During the five trading sessions July 20-August 17, Kraft sold 17 loads of barrels as the barrel market peaked (during the sessions of July 27 and August 3) and then declined gradually for four sessions and remained unchanged September 7. Thereafter barrel prices fell a total of 32.5 cents per pound on offers and reduced offers by Kraft and Borden in eight sessions, with only two offers covered. Barrel prices hit bottom November 2, 1990, at 1.75 cents per pound below the price support level.

The virtual free fall in barrel prices was quite typical of trading patterns once price began falling off a high. As one large trader put it:

> Experience tells us that as markets start to soften, everyone in the use chain holds back purchasing (to get the best price or minimize inventory devaluation), thereby exacerbating the backup and forcing a market drop.[33]

The overall pattern in blocks was similar to that in barrels, though more and different actors were involved. Kraft appeared to begin topping the block market July 6 and July 13, 1990. On July 20, Kraft was joined in selling by Alpine Lace, and prices peaked July 27. During the following weeks prices began their descent, as Kraft and Alpine Lace continued

---

[32] On July 13, 1990, a competitor of Kraft reported that,

> Stephenville [an AMPI plant in Texas that supplied Kraft] cut us 1 load of blocks this week and I understand they have cut Mid-Am more in favor of shipping Kraft more. However, the blocks that Mid-Am bought from Kraft last week on the exchange was filled with Stephenville [AMPI] blocks. [[Source deleted in public report as not essential.]]

This illustrates how Kraft exercised control over its committed suppliers to determine whether their surplus was disposed of on the NCE or in the spot market.

[33] Schreiber Foods, Inc., Vice-President-Purchasing to five top corporate officials, "Market Conditions and Inventory Position," June 27, 1990, Bates 5130, 5131.

selling. Thereafter, prices declined irregularly until November 2, 1990, when blocks were 2.25 cents per pound below the price support level. Although other block traders, particularly Dairystate and Alpine Lace, joined in offering the block market down, Kraft was the principal player, selling 35 loads of blocks during the 18 sessions July 6 through November 2, 1990.

These events suggest that in April 1990 Kraft decided to let the NCE price rise initially and then, beginning in July, to "actively sell into the market" until prices topped and then declined again. These events also imply that, as the McKinsey document suggests, Kraft does at times have the ability to influence NCE prices and its net wholesale selling prices should it decide to do so.

Summary of Kraft Conduct

Kraft did not have a surplus problem when it topped the market in July 1990,[34] nor did it believe there was a surplus problem when it began taking the market down in August.[35] On

---

[34] Kraft's Director of Cheese Procurement and Inventories made monthly status reports on cheese receipts and usage to the Vice President of the Refrigerated Products Division. On July 6, 1990, Kraft's purchasing director reported, in part:

> We have sold no raw material cheese into the industry since mid-June. Based on latest projections, Kraft's estimated cheese supply over the balance of 1990 will cover demand and desired safety stock levels. These projections indicate no surplus. Kraft General Foods, Inc., Wayne Hangartner, Director of Cheese Procurement and Inventories, to Don Butte, Vice President and Director-Refrigerated Operations, "Letter of Comment-June," July 6, 1990, KGF 3179.

[35] On August 24 Chris Emerson, Manager-Raw Material Cheese Planning, gave an optimistic report on expected usage and receipts for the remainder of calendar year 1990 and 1991:

> Projected usage, for the balance of 1990 is 5.2 million pounds over the previous projection....Also, 1991 growth has been increased by Marketing. This increased usage has resulted in a projected shortage of 10.6 million [pounds], by year's end. The projected shortage should not be a problem, because receipts have been exceeding estimate and safety stock reductions could cover the shortfall. Kraft General Foods, Inc., Chris Emerson, Manager-Raw Material Cheese Planning to Wayne Hangartner, Director of Cheese Procurement and Inventories, "Letter of

September 24, 1990, Kraft purchasing planners warned that events were not unfolding according to plan because receipts were higher and usage was lower than expected.[36]

On October 8, 1990, Emerson reported:

> September year-to-date actual commercial usage is...2.4% over plan and...2.8% over prior year....While this performance is impressive, demand for the balance of 1990 is down from previous estimates and is projected to be under plan. In addition, finished product inventories are significantly over plan.[37]

Comment-August 1990," August 24, 1990, KGF 3184. Hangartner forwarded Emerson's memorandum to Butte. Wayne Hangartner, Director of Cheese Procurement and Inventories, to Don Butte, Vice President and Director-Refrigerated Operations, "Letter of Comment, August 1990," August 24, 1990, KGF 3184.

[36] Kraft General Foods, Inc., Chris Emerson, Manager-Raw Material Cheese Planning to Wayne Hangartner, Director of Cheese Procurement and Inventories, "Letter of Comment-September 1990," September 24, 1990, KGF 26606.

[37] Kraft General Foods, Inc., Chris Emerson, Manager-Raw Material Cheese Planning to Wayne Hangartner, Director-Cheese Procurement and Inventories, "Letter of Comment-September 1990," October 8, 1990, KGF 26620; underlining in original.

Hangartner raised the specter of a potentially serious surplus problem November 1, 1990, when he reported:

> Tentative figures indicate that Kraft will close October with a total raw material of cheese inventory of 214 million pounds, 25 million over Plan, and 6 million over our latest estimate. Our latest projections indicate a December 1990 ending inventory of...26 million pounds over Plan. Due to our present inventory mix and demand for current cheese over the remaining two months, it will not be possible to bring our inventory down to a totally desirable year end level.
>
> We are developing plans to *reduce this surplus through reduced receipts and government sale.* Due to firm supplier commitments, the government sale program will result in some level of loss and also have the impact of increasing Kraft's receivables. As soon as we finalize this program, it will be shared with Operations financial to determine the exact financial impact. Kraft General Foods, Inc., Wayne Hangartner, Director-Cheese Procurement and Inventories to Don Butte, Vice President and Director-Refrigerated Operations, "Letter of Comment-October 1990," November 1, 1990, KGF 3213; emphasis added.

By November 19, 1990, Kraft's purchasing director estimated the surplus would be 40-50 million pounds during November 1990 through 1991.[38] As shown in Figure 6.3 and Appendix Table 6.1, Kraft's actual inventory exceeded the 1990 Plan each month during September through the end of December. From the outset Kraft's 1991 Plan had anticipated solving the surplus problem by reducing the amount of cheese procured and by selling to the CCC.[39]

Once the purchasing executives discovered in September 1990 that Kraft had a serious and growing surplus problem, they had a strong incentive to quickly take prices to the support level so Kraft (and the industry) could dispose of the surplus to the CCC.[40] In eight trading sessions beginning September 14, Kraft--often joined by Borden--led barrel prices down 32.25 cents. At this point the NCE barrel price was 1.75 cents below the support level for barrels and 2.25 cents for blocks. During the eight-week price plunge from September 14 to November 2, only two of Kraft's offers to sell barrels and none of Borden's were covered before prices had

---

38 Kraft General Foods, Inc., Wayne Hangartner, Director of Cheese Procurement and Inventories, to Kathy Williams, "Surplus Inventory," November 19, 1990, KGF 3232.

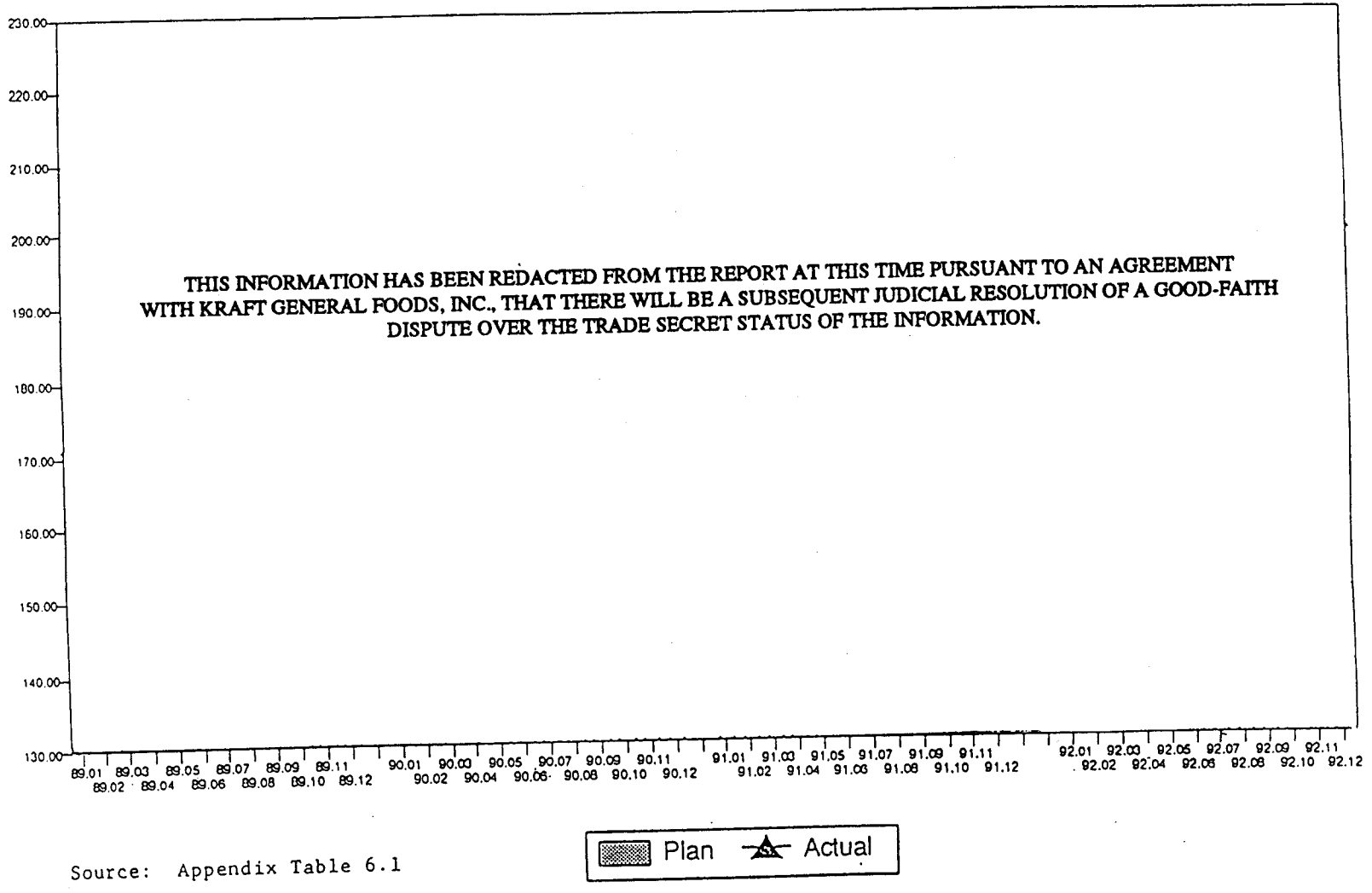
39 Kraft's 1991 Raw Material Operating Plan, prepared in November 1990, stated:

> The 1991 surplus supply will not be procured and inventory reductions will be made based on the seasonal supply curve. Sales to the government have already been initiated.

Kraft General Foods, Inc., *1991 Raw Material Operating Plan*, KGF 3236. Also see text at note 42 below regarding Kraft's planned method of disposing of the surplus.

40 By this time there was an industry-wide surplus problem, which had developed because of an increased supply of milk and a decline in retail sales. As early as August 8, one leading cheese marketer noted that milk production was higher than anticipated, attributable, in part, to very mild and cool weather in the Midwest and South. California cheese production also was up. Schreiber Foods, Inc., Purchasing Director-Western Region to Vice President-Purchasing, "Pre-Market Update," August 9, 1990, Bates 5000.

Figure 6-3
Kraft Planned and Actual Raw Material Cheese Inventory, 1989-1992



Source: Appendix Table 6.1

fallen below the support level.[41] Thus, it appears that during the price drop Kraft was not active on the NCE to dispose of surplus, but to use it as an instrument for taking the NCE price below the support level in order to dispose of surplus to the CCC. As Kraft's purchasing director Hangartner stated November 19, 1990:

> Now that the cheese market has settled out at support level, we are in a position to deal with our surplus inventory position and also our surplus commitments through 1991. Our latest planning indicates a surplus in the 40-50 million pound range November 1990 through 1991. *This situation will be dealt with through a combination of commitment reductions and sale to the Commodity Credit Corporation, with the majority handled through the government sales program.*[42]

Significantly, Hangartner made no mention of sales on the NCE in the surplus disposal plan.

In summary, these events suggest that Kraft was the primary actor in topping the market in July and initiating the decline in August.[43] When the surplus dictated a further price decline in September, Kraft again led prices down until they were below support levels.

What, then, is the significance of these events? First, they document Kraft's leadership role in placing the upper limit on prices in this price cycle and in leading the market down. Second, they document that during the price decline, Kraft used the NCE to lead prices below the support level in order to sell its surplus to the CCC rather than using the NCE merely to

---

[41] During this period when Kraft and Borden were taking down NCE prices, Kraft bought 10 loads of blocks. As discussed in Chapter 5, Section E, Kraft bid blocks at times during this period for the apparent purpose of influencing the spread between NCE barrels and block prices, not because it needed blocks. Kraft also bought 12 loads of blocks August 4 and 31, 1990.

[42] Wayne Hangartner, Director of Cheese Procurement and Inventories, to Kathy Williams, "Surplus Inventory," November 19, 1990, KGF 3232. Emphasis added.

[43] After Kraft had initiated the decline August 17, Alpine Lace and Dairystate became the most active seller-traders in taking down the block market.

dispose of surplus. And because Kraft did not lower its wholesale prices correspondingly, it enlarged its gross profit margins.

When barrel prices fell below the support level November 2, 1990, Kraft lowered its wholesale price (Figure 6.4 and 6.5). Nonetheless, the spread between the NCE barrel price and Kraft's average net price to the trade for processed cheese widened by about 35 percent between July and December 1990. Thereafter Kraft's average processed cheese margins widened. During November 1990 through April 1991, Kraft net wholesale prices remained well above earlier levels even though NCE barrel prices remained below support levels through April 1991 (Figures 6.1 and 6.4).

C. Price Cycle November 1990-February 1992

The Price Bottom, November 1990-May 10, 1991

After NCE prices fell below the CCC support level November 2, 1990, Kraft and other companies immediately began contracting to sell to the CCC. From the week ending November 19, 1990, through the week ending May 24, 1991, the industry sold 39.5 million pounds of blocks and barrels to the CCC (Appendix Table 6.2).

Kraft played the leading role in trading NCE barrel and block prices during the 29 weeks they remained below the support level. Except for one sale of two loads made by Borden, Kraft was the only seller-trader in barrels, selling 84 loads during November 2, 1990, through May 10, 1991. In blocks, Kraft sold 31 loads and Dairystate sold 4 loads. In total, Kraft sold 115 of the 121 loads sold on the NCE during the period. During this period, Kraft made 95 percent of all

sales on the NCE. In contrast, Kraft accounted for about 40 percent of all cheese sales to the CCC during November 1990-May 1991.[44]

Barrels were in shorter supply than blocks during this period. Indeed, there were no *net* barrel sales to the CCC after February 8, 1991. A Kraft document shows that it sold only five loads of barrels to the CCC in April and none thereafter.[45] On the other hand, Kraft sold heavily on the NCE, selling 75 loads of barrels during April through May 10, when barrel prices rose to the support level.[46] For the period, Kraft reported sales of only five loads of barrels to the CCC

---

[44] Kraft sold 6,716,948 pounds of block cheese and 9,015,330 pounds of barrel cheese to the CCC in 1991. Kraft General Foods, Inc., "Raw Material Cheese Sales, December 1991," KGF 23757. This represented 40 percent of CCC sales in 1991 (Appendix Table 6.2.)

[45] Kraft General Foods, Inc., "Raw Material Cheese Sales," December 1991, KGF 23757. Some or all of the five loads may actually have been contracted for sale to CCC earlier, since this source often reported the month in which transactions were consummated, not always the month in which Kraft made a trade on the NCE. This source frequently reports an NCE sale made at the end of one month among the sales reported in the gain/loss report the following month. Although the number of loads reported in Kraft's gain/loss reports for a month may not correspond precisely with the number of loads traded in a month, loads sold on the NCE and loads reported in the gain/loss report are virtually the same over the course of a year. Nor does this reporting practice result in a consistent bias when comparing Kraft's losses or gains of NCE, spot and CCC sales for particular months or groups of months.

[46] By this time barrels were in especially short supply. A month before barrel prices rose to the support level, one leading company internal memorandum commented, in part:

> --There is a significant interest in barrel cheese.
> --Outside of Kraft no one has surplus barrels
> --Barrels will drive the cheese market increases.

Schreiber Foods, Inc., Purchasing Director-Western Region to Vice President-Purchasing, "Pre-Market Update," April 12, 1991, Bates 4916.

and 10 loads in the spot market.[47] For April and May, Kraft reported sales of 63 loads of blocks in the spot market and 56 loads to the CCC.[48]

Kraft reported losses of 1.7 cents per pound on barrel and block sales on the NCE for April and May, whereas it had gains of 1.9 cents per pound on barrel and block spot sales and 1.1 cents per pound on CCC sales.[49] The pattern of Kraft's sales conduct on the NCE, especially in barrels, implies that it was motivated by a desire to keep NCE prices below support levels. Had Kraft's motive for selling barrel and blocks during April and May been solely to maximize profit on these sales, it would have sold them in the spot market or to the CCC rather than on the NCE.

The above facts demonstrate that Kraft played the leading role in maintaining prices below support levels during November 1990-May 1991, especially for barrels. Even without Kraft's actions prices would have dropped to support levels in the fall of 1990 since there was clearly an industry-wide surplus problem. But Kraft appeared to determine the timing and swiftness of the price drop. This may have reflected that Kraft had a larger surplus problem than most, much of it self-imposed, and had somewhat exacerbated the industry-wide problem because of its wholesale pricing conduct.[50] But NCE prices, especially for barrels, might well have risen above the support level somewhat earlier had Kraft sold more to the CCC rather than on the NCE.

---

47 Kraft General Foods, Inc., *Raw Material Cheese Sales, December 1991*, KGF 23757.

48 Kraft General Foods, Inc., *Raw Material Cheese Sales, December 1991*, KGF 23757.

49 *Id.*

50 See Section E below, this chapter.

During the period that NCE prices were below support levels, Kraft took important steps in dealing with its surplus problem as had been planned in November 1990.[51] By the end of May 1991, Kraft's inventory was below planned levels for the first month since August 1990 (Figure 6.3 and Appendix Table 6.1).

The Price Rise May 17, 1991-September 26, 1991

When Kraft did not participate in the May 17, 1991, trading session, NCE prices immediately began rising. The upward trend continued, with block prices peaking September 27 and barrel prices October 18. Throughout the rise, supplies were quite tight. As early as May 21, 1991, the purchasing official of a leading cheese company reported:

> Along with the price rise, we will experience cost over market pressure--especially for barrel cheese for processing. Many of our suppliers of barrel cheese are reporting that our competitors are willing to pay $0.020/pound higher cost over market premiums for incremental volume.[52]

On June 7, 1991, another company reported that:

---

[51] By the end of August 1991, Kraft's purchasing director was able to report that Kraft had essentially solved its surplus problem.

> During the first 8 months of 1991, we have sold approximately 60 million pounds of raw material cheese, reduced Kraft production approximately 12 million pounds, and reduced Procurement receipts by over 35 million pounds. Our latest estimates indicate an additional surplus of approximately 7 million pounds for the period of September through November, but it is questionable if this surplus will actually develop. Currently, receipts are coming in under estimate and usage is running slightly over estimate. Actual surplus and the decision to sell additional quantities into the industry is being addressed on a weekly basis. Wayne Hangartner, Director of Cheese Procurement and Inventories, to Don Butte, Vice President and Director-Refrigerated Operations, "Monthly Letter of Comment-August 1991," August 28, 1991, KGF 14675.

Kraft sold "into the industry" during the fall of 1991 for the apparent purpose of moderating the rising price trend in the fall of 1991 even though doing so reduced its safety stocks, as discussed below.

[52] Schreiber Foods, Inc., Vice President-Purchasing, "Market Projections-Revised," May 21, 1991, Bates 1883.

American cheese production showed a drop in April of 6%. This drop in production plus the government contracts are tightening the supply further.[53]

Government contracts refers to the USDA's so-called secondary support program announced in early May. For this program, the USDA temporarily suspended the resale of CCC cheese and NFDM inventories and instead bought cheese for the 1992 school lunch and other domestic feeding programs. This action reduced the supply of cheese available to the commercial market and eliminated the tendency for CCC resales to place a cap on cheese prices.

During the following weeks internal company reports made frequent reference to tight bulk cheese supplies, especially barrels, but noted the availability of such cheese from Kraft in the spot market.[54] As tightening market conditions caused prices to rise, Kraft periodically sold

---

53 Borden, Inc., F.C. Davis to Han Kim, General Manager-Refrigerated Products, "Market Report," June 7, 1991.

54 On May 24, 1991, a memorandum of one large company stated: "Kraft still has plenty of excess inventory to fill requirements." [[Source deleted in public report as not essential.]] On June 21, 1991, Borden stated, "Barrels are still very tight." Borden, Inc., F.C. Davis to Han Kim, General Manager-Refrigerated Products, "Market Report," June 21, 1991.

On June 27, 1991, Schreiber reported: "Barrels continue to be in tight supply[;] however, we were successful in purchasing 20 loads from Kraft...." Schreiber Foods, Inc., Purchasing Director-Eastern Region to Vice President-Purchasing, "Pre-Market Report Review, 6/27," June 27, 1991, Bates 4880. On July 29, 1991, Schreiber reported that, "Things appear to be getting tighter by the day." From Vice President Refrigerated Products to Vice President-Purchasing, "No Govt Volume in September," July 29, 1991, Bates 5099.

On September 6, 1991, another company reported: "Barrels continue in tight supply. However this is not a repeat of 1989 as Kraft continues to have extra barrels." [[Source deleted in public report as not essential.]].

On September 5, 1991, Schreiber reported: "Kraft has agreed to sell us 15 loads of barrels for shipment wk of 9/9." Schreiber Foods, Inc., Purchasing Director-Eastern Region to Vice President-Purchasing"Pre-Market Review 9/5," September 5, 1991, Bates 4851. Schreiber also reported on September 19, 1991 that, "Kraft agreed to sell [us] 10 loads of barrels for delivery next week." Schreiber Foods, Inc., Purchasing Director-Eastern Region to Vice President-Purchasing, "Pre-Market Update, 9/19," September 19, 1991, Bates 4846.

on the NCE for the apparent purpose of "moderating" the price rise. During the weeks of rising prices beginning May 17 through October 11, 1991, Kraft's periodic selling appeared to slow, or temporarily stop the upward trend. During these weeks, Kraft sold a total of 146 loads of barrels and 33 loads of blocks on the NCE. The only other Exchange sellers during these weeks were Borden, which sold 8 loads of barrels, and Land O' Lakes, which sold 10 loads of barrels.

The inference that the motive for Kraft's periodic selling during this period was to stop or slow the price rise is not ours alone; various personnel of a large cheese company arrived at the same conclusion:

> June 14, 1991 Trading Session
> ...Kraft seems to be taking the position that they will sell to prevent a panic market run up but will not stop an orderly market rise.[55]
>
> June 28, 1991 Trading Session
> It appears that Kraft is *continuing to over commit* for both blocks and barrels so that they are in a position to cover their commercial orders *as well as influence and trade at the Exchange.*[56]
>
> July 19, 1991 Trading Session
> The cheese available, especially barrels, continues light--with Kraft's selective selling moderating the rise in markets.[57]
>
> September 19, 1991
> Wayne [Hangartner, Kraft's purchasing director] believed that they will have more available in future weeks and that they don't want to carry more than they need for their own requirements[;] however, *he wanted to have some trading inventory.*[58]

---

55 [[Source deleted in public report as not essential.]]

56 Emphasis added. [[Source deleted in public report as not essential.]]

57 [[Source deleted in public report as not essential.]]

58 Emphasis added. [[Source deleted in public report as not essential.]]

October 8, 1991
Kraft selective selling continues to moderate the upward movement.[59]

In order to continue selling "into the industry,"[60] for the apparent purpose of moderating the price rise, Kraft drew down its inventory to below plan, thereby reducing safety stocks below normal levels. On October 3, 1991, Kraft purchasing director Hangartner explained the rationale for doing so:

> Our window of opportunity to sell surplus cheese into the industry will close as soon as market values start their decline. For this reason, as well as financial considerations, we are currently *reducing safety stocks below normal levels* to ensure that we are at absolute minimum inventories when the markets start to head south.[61]

Left unsaid was the fact that, as Hangartner certainly knew, Kraft had already begun to top the market on September 27, 1991, and in a few weeks would trigger a steep price decline (see below). Kraft's strategy succeeded: prices declined and when they bottomed out in early 1992, Kraft rebuilt inventory so that it was right on Plan by April 1992 (Figure 6.3 and Appendix Table 6.1).

---

59 [[Source deleted in public report as not essential.]]

60 Indeed, Kraft's purchasing director stated explicitly August 28, 1991, that decisions to sell "into the industry" were being addressed on a "weekly basis." See note 51 above.

61 Kraft General Foods, Wayne Hangartner, Director of Cheese Procurement and Inventories, to Kathy Romine, "Monthly Letter of Comment--September 1991," October 3, 1991, KGF 14673. Emphasis added.

During 1991, Kraft reported sales of 720 loads of cheddar barrels and 40-pound blocks in the spot market, 375 loads to government, and 343 loads on the NCE. It also reported sales of 457 loads of 640-pound blocks in the spot market. Appendix Table 4-3. Kraft General Foods, *Raw Material Cheese Sales, December 1991*, KGF, 23757. Kraft reported average gains of 0.6 cents per pound on government sales, average gains of 4.2 cents per pound on spot sales, and average losses of 1.7 cents per pound on NCE sales. *Id.*

The Price Top and Subsequent Decline, September 1991-February 1992

During September 6 through October 10, 1991, Kraft sold into a rising market. Prices for barrels peaked October 18, remained unchanged through November 1, and began falling November 8, 1991, as Kraft continued heavy selling. Thereafter, Kraft, joined primarily by Borden and Alpine Lace, offered the barrel market down until it bottomed on February 7, 1992; the block market bottomed February 21, 1992.

Summary of Kraft Conduct

Kraft played the leading role in maintaining NCE prices below the support level during November 1990-May 1991. Although an industry-wide surplus problem dictated that prices drop to the support price, Kraft's active selling determined the timing and swiftness of the price decline. Once NCE prices were below the support level, they might well have risen to, or above, the support price somewhat earlier had Kraft sold more to the CCC rather than on the NCE. The fact that Kraft incurred losses on its NCE sales during April and May 1991, whereas it enjoyed gains on its spot and CCC sales, implies that it was selling on the NCE to influence prices, not to maximize profits on these sales.

Between mid-May and October 1991, Kraft played the central role in shaping price movements as NCE prices rose from below support levels to their seasonal highs, after which they declined steadily until February 1992 (Figure 6.1). Kraft slowed the price rise by periodic selling into the market. Between the sessions in which Kraft sold on the NCE, prices rose in active bidding with virtually no consummated sales. Kraft effectively topped the market by selling heavily in successive sessions, and continued to sell as prices began a long decline on November 8, 1991.

Kraft apparently was able to influence NCE prices because it had access to large amounts of cheese, much of which it chose to sell selectively on the NCE, even though demand in the spot market was strong and sales there more profitable than sales on the NCE. For June through December, 1991, Kraft reported average losses of 2.4 cents per pound for 237 loads of barrels and blocks it sold on the NCE, whereas it enjoyed an average gain of 3.8 cents per pound on [...] loads of barrels and blocks sold in the spot market. These facts imply that Kraft was acting against its own interest had its objective been solely to maximize profits on sales.

Kraft had more than met its goal of reducing inventory substantially during 1991.[62] Indeed, in each month from May through December 1991, Kraft's actual inventories were below Plan. By the end of December 1991, Kraft's inventory was [...], 6 percent below its 1991 Plan (Figure 6.3 and Appendix Table 6.1). As noted above, Kraft accomplished this, in part, by reducing its "safety stocks" below normal, anticipating their replenishment after prices had declined.

D. Price Cycle February 1992-December 1992

Overview of 1992

Kraft began 1992 with a modest surplus problem. At the end of January cheese inventories were 2.8 percent over the 1992 Plan (Figure 6.3 and Appendix Table 6.1). Commercial usage was 12.6 percent under 1992 Plan.[63] Kraft initiated actions to remedy the

---

62 Chris Emerson, Manager-Raw Material Cheese Planning, to Wayne Hangartner, Director of Cheese Procurement and Inventories, "Letter of Comment-December 1991 Results," January 7, 1992, KGF 26423. Some references to specific information for 1991 is temporarily redacted pursuant to an agreement with Kraft General Foods, Inc., pending judicial resolution of trade secret issues.

63 Kraft General Foods, Inc., Chris Emerson, Manager-Raw Material Cheese Planning, to Wayne Hangartner, Director of Cheese Procurement and Inventories, "Letter of

situation.[64] By April 1, 1992, Kraft's purchasing director was able to report that they had negotiated further cutbacks with committed suppliers, thereby reducing the projected surplus to only [...] million pounds through November 1992, which he believed could be easily disposed of by spot sales to industry or the NCE, if and when necessary.[65] At the end of April Kraft's Director of Purchasing reported that the projected surpluses had been eliminated through reduced commitments and increased demand.[66]

During July-December 1992, Kraft's actual inventories closely followed planned inventories (Figure 6.3 and Appendix Table 6.1). Indeed, Kraft began 1993 under the 1993 Plan.[67]

Comment-January 1992 Results," January 31, 1992, KGF 26441.

64 Dwight Krampien to Wayne Hangartner, Director of Cheese Procurement and Inventories, "January 1992 Monthly Letter of Comment," January 24, 1992, KGF 26943, 26944.

65 Kraft General Foods, Inc., Wayne Hangartner, Director of Cheese Procurement and Inventories, to Larry Gundrum, "Monthly Letter of Comment--March 1992," April 1, 1992, KGF 16889. Although Kraft had a small surplus in early 1992, Kraft purchasing personnel believed that in February overall industry supply and demand could be close to balance. Kraft General Foods, Inc., Wayne Hangartner, Director of Cheese Procurement and Inventories, to Larry Gundrum, "Monthly Letter of Comment--February 1992," February 27, 1992, KGF 16891. Information has been temporarily redacted in this report pursuant to an agreement with Kraft General Foods, Inc., pending judicial resolution of trade secrets.

66 Kraft General Foods, Inc., Wayne Hangartner, Director of Cheese Procurement and Inventories, to Larry Gundrum, "Monthly letter of Comment--April 1992," April 29, 1992, KGF 26858.

An executive of another company reported a similar tightening of supply conditions. Borden Co., F.C. Davis to Han Kim, General Manager-Refrigerated Products, "Market Reports," March 13, 1992, through May 15, 1992.

67 Kraft General Foods, Inc., Chris Emerson, Manager-Raw Material Cheese Planning, to Bob Praus, "Letter of Comment, December, 1992 Results," January 6, 1993, KGF 26221.

Kraft's efforts to regain market share by reducing wholesale prices and income began paying off during 1992 (see below).[68] Although commercial usage did not increase immediately, by the fourth quarter total retail sales exceeded those in the fourth quarter of 1991.[69]

Pricing Conduct Over Price Cycle

The price cycle of 1992 was similar to those during 1990 and 1991 (Figure 6.1). Barrel prices bottomed February 7 at $1.135 per pound. During February 14 through March 27, barrels traded in a $1.1350 to $1.1425 range until prices began rising during the April 3 trading session, with Kraft intermittently selling into the rise. The most active barrel sellers during February 7 through April 3 were Kraft (71 loads), Borden (13 loads) and Bongards' (16 loads). The most active buyers were Beatrice (74 loads) and AMPI (10 loads).

---

[68] For a discussion of Kraft's wholesale price conduct see Section E below. In November 1991 Chris Emerson had anticipated that Kraft's price reductions in 1991 would not immediately impact demand: "At present, the [...] per pound price rollback is not expected to impact short range demand. Philip Morris had agreed to reduce income in order to regain share. This support has given renewed impetus to the Sales/Marketing effort." Kraft General Foods, Inc., Chris Emerson, Manager-Raw Material Cheese Planning, to Wayne Hangartner, Director of Cheese Procurement and Inventories, Monthly Letter of Comment--November 1991," November 22, 1991, KGF 26482. Information has been temporarily redacted in this report pursuant to an agreement with Kraft General Foods, Inc., pending judicial resolution of trade secret issues.

Public sources, however, place Kraft's price decrease at about 22 cents per pound and discuss the reasons for the decrease. On March 28, 1992, a Kraft official informed the editor of *The Milkweed*, a Wisconsin farm magazine, that Kraft had lowered its cheese prices 22 cents per pound in December 1991. *The Milkweed*, April 1992, p. 5. Other public services also discuss Kraft's December 1991 price cut averaging 8 percent or "slightly more than 20 cents" for Kraft natural cheese and processed cheese slices in order to "regain" market share losses during 1990-1991. See *Advertising Age*, January 27, 1992, p. 16; *Wall Street Journal*, March 18, 1993; *Milkweed*, January 1992, p. 4.

Philip Morris Companies Inc. CEO reportedly told marketing analysts that Kraft's loss in supermarket cheese sales had reduced Kraft's net profits by $125 million in 1991. *The Milkweed*, February 1992.

[69] Appendix Table 6.4c.

The price pattern in blocks generally followed that in barrels. The block market bottomed February 14 and remained in a $1.1525 to $1.1625 range through March 20. Prices began rising March 27. The leading block seller-trader was Kraft (22 loads); and the leading buyer-traders were Mid-Am (12 loads), Beatrice (8 loads) and AMPI (8 loads).

Illustrative of Kraft's preference for selling on the Exchange rather than the spot market are the following events. On March 30 and 31, 1992, Kraft received requests from four companies to buy 10 to 12 loads of barrels and four loads of blocks aged 30 days or less, i.e., the age qualifying for sale on the NCE.[70] Kraft sold two loads of barrels to one of these parties on the NCE April 3, 1992. One of the other parties was told that Kraft's excess was sold to their direct customers. Kraft informed another party that they had no available cheese. No response was apparently given to the fourth prospective buyer. Although Kraft apparently could have sold another 12-14 loads in the spot market, it evidently chose to sell on the NCE instead, where on April 3, 1992, it sold 27 loads of barrels and two loads of blocks.

From April 10 through July 31, barrel prices rose by 16.75 cents per pound on bids by several buyer-traders, especially Schreiber, Beatrice and Dairystate, with no actual sales until the last few weeks of the rise. Kraft evidently approved of the price rise since on April 16 it made one bid for barrels and one bid for blocks. Kraft's actions were interpreted as sending a "message to the industry" that Kraft approved of the rising price trend. One of the traders bidding up the market during these weeks observed:

> A significant event occurred today. When the block was bid to $1.27 Kraft entered a bid for four cars of blocks at $1.27 and for five cars of barrels at $1.24/pound--*Kraft's*

---

[70] Kraft General Foods, Inc., Jeff Voermans to Wayne Hangartner, Director of Cheese Procurement and Inventories, "Requests for Cheese" April 6, 1992, KGF 16023.

message to the industry was that they were not going to sell any blocks or barrels at this point in time.[71]

Kraft's approval of the rising price trend evidently reflected its view that economic fundaments dictated an increase in prices. In Kraft's view, weak milk production and government procurement activity was causing a counterseasonal rise in price.[72]

The barrel price remained at the seasonal high of $1.35 for only two weeks. Then on August 14, 1992, Kraft, which had remained inactive since sending its April 16 "message" approving the rising price trend, began offering the barrel market down. It was joined by Borden and Alpine Lace. The barrel price continued to decline for 22 weeks, dropping a total of 23 cents a pound and reaching bottom January 15, 1993.

The downward pattern in blocks generally followed that in barrels. Prices began falling August 21 on offers by Kraft and Alpine Lace. Block prices also hit bottom on January 15, 1993. Although several traders joined in offering the block market down, Kraft (90 loads), Alpine Lace (14 loads) and Golden Cheese (10 loads)[73] accounted for over 90 percent of all loads traded.

Summary of Kraft Conduct

Kraft's trading patterns during the 1992 price cycle were generally the same as in previous cycles. Kraft sold heavily on the NCE during the price bottom of March and April

---

71 [[Source deleted in public report as not essential.]] Emphasis added.

72 Kraft General Foods, Inc., Wayne Hangartner, Director of Cheese Procurement and Inventories, to Larry Gundrum, "Monthly Letter of Comment--April 1992," April 29, 1992, KGF 26858.

73 These were the only loads sold by Golden Cheese of California during 1988-1993. See Table 4.2, note 5.

1992 and during the price decline of August through December 1992. For the year, Kraft reported incurring losses averaging 5.2 cents per pound on NCE sales of barrels and blocks versus average losses of 2.4 cents per pound on its spot barrel and block sales. If 640-pound squares (which are close substitutes for 40-pound blocks) are included among spot sales, Kraft enjoyed gains of 3.8 cents per pound on its total spot sales (Appendix Table 4.3).

For the three years 1990-1992, Kraft reported *losses* of 3.9 cents per pound on NCE sales, *gains* of 2.9 cents per pound on spot sales of blocks and barrels, and *gains* of 0.57 cents per pound on CCC sales (Appendix Table 4.3).

Kraft's NCE sales during March 1992, appeared to be designed to maintain the price bottom and the sales during April appeared to slow the subsequent price rise, not designed to dispose of surplus. NCE sales during the August-December price decline appear to have been directed at reducing NCE prices, since during August-December 1992, Kraft's commercial usage exceeded cheese receipts, causing actual inventory to fall short of planned inventory (Figure 6.3 and Appendix Table 4.3). Thus, although Kraft no longer had a surplus problem, it had access to sufficient cheese for trading purposes to influence prices on the NCE.

E. Relationship between NCE Prices and Kraft's Wholesale Prices

Cheese marketers, like Kraft, that do not couple their wholesale prices to NCE prices benefit financially from lower NCE prices, other things being the same (see Section C, Chapter 4). Here we examine the relationship between Kraft's wholesale pricing conduct and NCE prices during 1990-1992 and the consequences of this conduct.

This analysis focuses on Kraft's cheese sales to food retailers, which account for about 75 percent of Kraft's total commercial cheese sales.[74] In 1990, Kraft brands reportedly had the following retail sales and market shares (measured in dollars) for various styles of cheese:[75]

Cheese Styles	Value of Retail Sales (Millions)	Market Share
Processed cheeses	$1,554	58%
Natural cheeses	1,059	30
Cream cheese	381	75
Total	$2,994	44%

Kraft retail brands compete in two market segments, branded cheeses and *private label* cheese sold by food retailers. Kraft dominates the branded market segment. The private label market segment is larger than the combined shares of all cheese brands other than Kraft brands (Appendix Tables 6.9a-9c).

Kraft brands and private-label brands of food retailers (also called store brands) are in separate strategic groups or submarkets. Whereas Kraft brands are highly differentiated products, private-label brands are undifferentiated products. The purpose of product differentiation is to create a gap in buyers' perceived value of a brand relative to other brands.[76] The greater the difference in perceived value, the larger premium buyers will pay for the brand. Differentiation is achieved by strategies that increase perceived value, e.g., creating new products, establishing a reputation for product quality, and designing attractive packaging. The

---

74 February 21, 1994 letter from Roibin Ryan, Kirkland and Ellis, to Reid Klopp, DATCP, providing data on Kraft's volume of cheese manufactured, purchased and sold in 1992 in response to DATCP survey of December 1993.

75 SAMI Million Dollar Brand Directory. Another source, which does not report Kraft's processed and natural cheese sales separately, estimated Kraft's brands had a retail value of $2,647 million in 1990. Appendix Table 6.4d.

76 Michael E. Porter, *Competitive Advantage* (1985), 153.

perceived value of the product is enhanced by extensive advertising and promotion efforts. Successful product differentiation creates consumer loyalty for the brand, which reduces buyers' propensity to switch brands as price gaps widen.

Kraft has succeeded in differentiating its brands by using the above and other strategies that enhance the perceived value of brands. This has given it a significant degree of independence in pricing relative to private-label brands. Between 1981 and 1988 Kraft increased substantially the retail price gap between its brands and private-label brands without losing share to these brands. During the period, this price gap increased as follows: processed cheeses--15.2 percent to 25.7 percent; natural cheeses--15.7 percent to 23.1 percent; and cream cheese 21.0 percent to 27.1 percent (Appendix Table 6.10). This was accomplished without loss of share to private-label brands (Appendix Tables 6.9a-6.9c). Rather, private-label brands lost share over the period. Although Kraft lost some share in natural cheeses, this loss was to two aggressive new cheese marketer brands, Sargento and Sorrento.

Kraft's product differentiation advantage permitted a gradual widening of the Kraft-private label price gap between 1981 and 1988 by an annual average of 2.4 percentage points for processed cheese, 1.6 percentage points for natural cheeses, and 1.5 percentage points for cream cheese (Appendix Table 6.10). Kraft's success in widening the price gap without losing market share apparently was due in part to its strategy of gradualism, which gave consumers less incentive to switch brands than a strategy that would have increased the price gap in a few large steps. A single large increase in a price gap causes consumers to immediately reevaluate their perception of the relative value of the premium brand. Also, such increases encourage retailers

to promote their own lower price private brands, emphasizing the size of the new price gap. Private label suppliers may also give promotion incentives to retailers in these circumstances.

The success of Kraft's strategies apparently increased its gross profit margins to record levels by 1988.[77] At the end of 1989, the Kraft strategic planners reported that Kraft had enjoyed exceptional earnings growth driven by increasing prices in an environment of declining commodity costs and increasing productivity.[78] The planners cautioned that recent increases in the Kraft-private label price gap were causing Kraft to lose market share.[79] Their strategic plan for 1990 therefore called for a return to more normal earnings growth, and an acceleration of volume and market share growth.[80] During 1990 and 1991 Kraft did not follow the planners' advice. Instead they pursued a strategy of rapid earnings growth and substantial widening of the Kraft-private label price gap, causing large losses in market share.

Note: Below and elsewhere in this Report, all references to specific prices shown in Figures 6.4 and 6.5 have been temporarily redacted pursuant to an agreement with Kraft General Foods, Inc., pending judicial resolution of trade secret issues. Pending judicial resolution, the authors have agreed to express in percentage terms all references to these prices in this Report.

---

77 Kraft General Foods, Inc., *Refrigerated Products Group, 1990 Strategic Plan*, December 1989, KGF 21183, 21190. The Plan was forwarded December 6, 1989 by Mitch Wienick to Jim Kilts, Doug Conant, Pat O'Neil and Dave Rickard, KGF 21182. Kraft's gross profit margins are determined by the spread between the average net wholesale price charged retailers and other customers and the average cost of making finished cheese products (raw material costs, mainly cheese and other forms of milk, average about 75 to 85 percent of the cost of making finished cheese products in the U.S. cheese industry).

Also see note 25 above.

78 *1990 Strategic Plan, op cit.*, KGF 21185, 21190, and 21203.

79 *Id.* KGF 21185, 21194, 21203. This reference evidently referred to the decline in share during 1989 relative to 1988 (Appendix Table 6.4a).

80 *Id.* KGF 21185 and 21190.

Figure 6.4 compares the average NCE barrel price with the average *net* wholesale price to the trade of Kraft processed cheese from January 1989 through December 1991, as reported in a Kraft document.[81] In January 1989, the spread between the NCE barrel price and Kraft's

---

[81] Kraft changed list prices and trade allowances several times during 1989-1991. These changes were not uniform across all lines, often affecting only certain brands. This explains in part why the average *net* wholesale prices shown in Figures 6.4 and 6.5 vary from month to month and do not always correspond to the price changes reported below.

A large price increase occurred during September-October 1989, increasing average net prices of processed cheese by about 35 cents per pound and average net prices of natural cheese by about 60 cents per pound (Figure 5.4).

Kraft reported to the editor of *The Milkweed* the following price changes for "Kraft Natural Chunk" cheese: A trade allowance of 17 cents per pound was given during the period October 1990-July 1991; list prices were reduced 18 cents per pound in April 1991; and list prices were reduced 22 cents per pound in December 1991. This represented a net decrease of 40 cents over the period. Pete Hardin, "Kraft Natural Chunk Pricing," *The Milkweed*, April 4, 1992. These dates identify periods in which significant reductions were made in Kraft's net prices to the trade during this period and are reflected in Kraft's net prices to the trade as reported in Figures 6.4 and 6.5. However, similar cuts were not made for all products; prices were raised for some products during the period.

The 18 cent price cut in April 1991 covered only Kraft's most popular products. "Kraft Reduces List Prices for Cheese Products," *The Cheese Reporter*, April 5, 1991, p. 1.

The December 1991 price cut covered nearly half of Kraft's cheese line. K. Deveny, "Philip Morris to Restructure Kraft Unit," *Wall Street Week*, November 29, 1991, Sec: A, p. 3.

In August 1991, Kraft confirmed that it raised prices an average of 6 cents per pound on 70 percent of the Kraft line of cheeses. R. Gibson and S. Kilman, "Marketing: Cost of Cheese May Turn Pizza into Pricey Pie," *Wall Street Journal*, August 26, 1991, Sec B: p. 1.

In addition to making several reductions in the wholesale price for processed and natural cheese, in September 1990 Kraft announced a large promotion effort involving reported expenditures of $75-$100 million including trade promotion allowances and consumer coupon redemption programs. George Lazarus, "KGF to Deck Halls with Mega Promo," *Chicago Tribune*, September 7, 1990, p. 2. (This program apparently included the trade allowances reported above for the period October 1990-July 1991.) The promotion program was aimed not only at cheese but also at 34 Kraft General Food brands, including Miracle Whip salad dressing, Maxwell House coffee, and Jell-O pudding. Kraft reported that the promotion program made available $500 million in cents-off coupons. It is not possible to estimate the effect of these coupons on retail

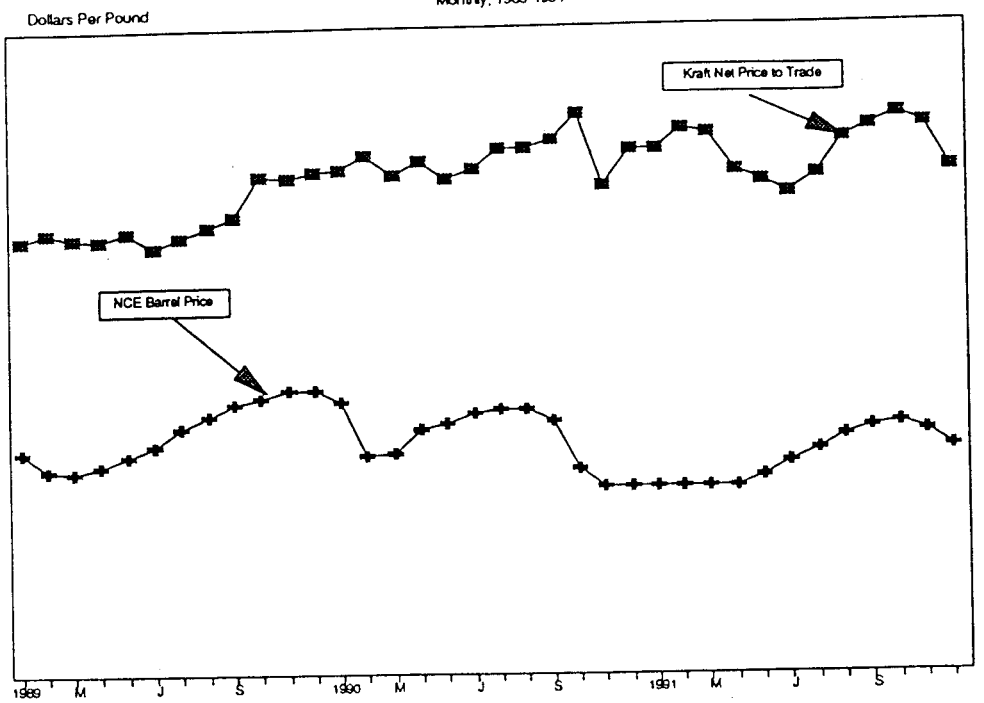
average net price to the trade (hereafter Kraft's price-cost margin) averaged about [...] cents per pound. Thereafter the margin narrowed as NCE barrel prices rose. Between January 1989 and December 1989, Kraft increased by about 15 percent the average net price to the trade of its processed cheese. This increase restored Kraft's price-cost margin in December to about that of January 1989. But as NCE barrel prices dropped beginning in January 1990, Kraft's price-cost margin for processed cheese widened, so that during February and March 1990 the margin averaged about 40 percent above that of January 1989. In the following months the margin always remained well above those in 1989. At its high point, in October 1990, the margin was about 80 percent greater than in January 1989. For the six months November 1990-April 1991, when NCE prices were below support levels, the margins averaged almost 70 percent above those in January 1989. Thereafter, the margins narrowed. But even after a sharp cut in net prices to the trade between November and December 1991, the price-cost margin for processed cheese was about 35 percent above that in January 1989.

Figure 6.5 reports the same information for Kraft natural cheese as Figure 6.4 reports for processed cheese. Changes in Kraft's margin for natural cheese differed somewhat from those for processed cheese. However, during the entire period January 1990-November 1991, Kraft's price-cost margins for natural cheese were well above those in January 1989. During the six months NCE prices were below the support level, November 1990-April 1991, these margins for

---

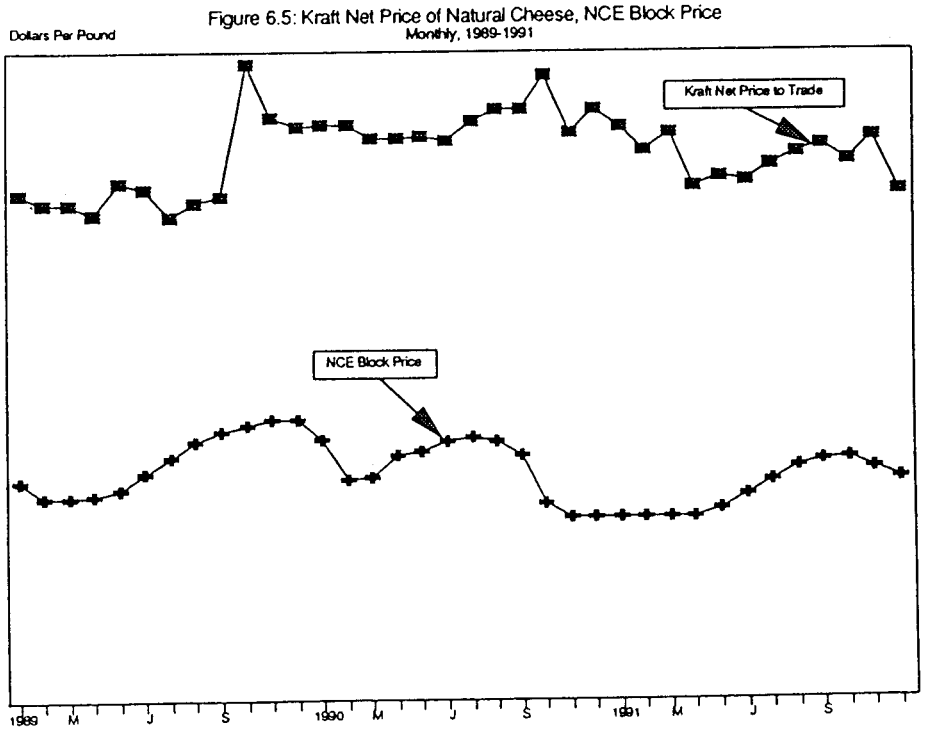
cheese prices since this figure applies to 34 Kraft General Foods brands. Moreover, few coupons issued are redeemed. A Congressional Research Service report states that less than 2 percent of all coupons issued during cereal promotions were redeemed. Givenell Bass, "Cereal Pricing," Economics Division, Congressional Research Service, December 23, 1994, p. 8.

Figure 6.4: Kraft Net Price of Processed Cheese, NCE Barrel Price
Monthly, 1989-1991



Source: Derived from "Kraft Retail Price, Kraft Net Price & NCE, Processed Cheese," Kraft General Foods, Inc., KGF 16912

Figure 6.5: Kraft Net Price of Natural Cheese, NCE Block Price
Monthly, 1989-1991



Source: Derived from "Kraft Retail Price, Kraft Net Price & NCE, Natural Cheese," Kraft General Foods, Inc., KGF 16911

Note: The values on the Y axis have been deleted and the scales of the net price to trade and NCE prices are altered to avoid disclosure. This information has been redacted from the report at this time pursuant to an agreement with Kraft General Foods, Inc., that there will be a subsequent judicial resolution of a good-faith dispute over the trade secret status of the information.

natural cheese averaged about 35 percent above those of early 1989. After a price cut in December 1991, Kraft's average price-cost margins for natural cheese were about where they were in early 1989. This contrasted with Kraft's processed cheese margins which in December 1991 remained well above those in early 1989. This difference reflected Kraft's greater success in differentiating its processed cheeses than its natural cheeses.

A statistical analysis was made of the price and gross margin information shown in Figures 6.4 and 6.5. A regression of Kraft's net *prices* to the trade for processed and natural cheese as a function of NCE barrel and block prices found no statistically significant relationship between these prices. This was as expected since Kraft sells its branded products using list prices that are not coupled to NCE prices. Regressing Kraft's *gross margin* for processed cheese (as measured by Kraft's net price to the trade less NCE price) on NCE barrel prices yielded a coefficient on the gross margin of -0.988 with a t-value of -4.73. This indicates that as NCE barrel prices *decreased* by 10 cents per pound, Kraft's gross margin on processed cheese *increased* by about the same amount. The same analysis for Kraft's natural cheese products yielded a coefficient on the gross margin of -0.730 with a t-value of -3.51. This implies that when NCE block prices *decreased* by 10 cents per pound, Kraft's gross margins for natural cheese *increased* by 7.3 cents per pound.

Table 6.1 reports our estimates of Kraft's gross profit margins for processed and natural cheese in 1989-1991.[82]

---

[82] The annual gross profits reported in Table 6.1 were calculated as follows. Kraft's annual processed and natural cheese volume for 1989 are from the *SAMI Million Dollar Brands* report. IRI Infoscan (Franklin and Cotterill, *op. cit.*) does not divide Kraft's total sales into these two categories. However, IRI data were used to estimate Kraft's quarterly volume of processed and natural cheese during 1989-1991. The SAMI report does not report quarterly data nor Kraft annual volume data for 1991. Kraft's quarterly processed cheese volume in 1990 and 1991 was estimated using changes in the quarterly

Note: We do not report in Table 6.1 our estimates of Kraft's gross profits. An agreement with Kraft General Foods, Inc., provides that the price data in Figures 6.4 and 6.5 are temporarily redacted pending a subsequent judicial resolution of a good-faith dispute over the trade secret status of the information.

Table 6.1. Estimated Gross Profits for Kraft's Processed and Natural Cheese (Excluding Cream Cheese), 1989-1991[a]

	Kraft Processed Cheese	Kraft Natural Cheese	Kraft Total
	---millions of dollars---		
1989	*This information is based in part on numbers in Figures 6.4 and 6.5 which are temporarily redacted from the report at this time. See statement, Figures 6.4 and 6.5.*		
1990			
1991			
Change			
1989-1990			
1989-1991			

[a]See note 82 for method used to make these calculations.

By our estimate, Kraft's gross profits for processed and natural cheese sold to retailers were 31% higher in 1990 than in 1989, and 26% higher in 1991 than in 1989. We cannot make similar calculations for Kraft cream cheese sales and non-retail cheese sales. Such sales are

---

volume of Kraft American cheese between 1989 and 1990-1991, as reported by IRI. Kraft's quarterly natural cheese volume in 1990 and 1991 was similarly calculated using changes in "all other" Kraft cheese volume as reported by IRI.

The gross profits reported in Table 6.1 were calculated by multiplying the Kraft quarterly estimated volume data by Kraft's quarterly price-cost margins (Kraft's net prices less NCE prices) shown in Figures 6.4 and 6.5.

We believe the estimates in Table 6.1 understate Kraft's gross profits for processed cheese and overstate the volume of Kraft's natural cheese, the net effect of which is to understate somewhat the estimates of Kraft's gross profits. Our estimate for 1991 of Kraft's processed cheese (440 million pounds) shown in Table 6.1 is substantially less than the 556 million pounds reported by Kraft for 1992 in response to our investigative survey (Exhibit D of Kraft's submission of February 21, 1994, by its counsel Roibin J. Ryan, Kirkland and Ellis, to Reid Klopp, Counsel, DATCP). Our estimate of natural cheese sales (225 million pounds) used in Table 6.1 was only slightly less than figures reported by Kraft for 1992 (232 million pounds).

about 15 percent and 33 percent, respectively, as large as Kraft's processed and natural sales to retailers.[83] Hence, Kraft's estimated gross profits for all cheese sold increased by more than the amounts reported above.

Gross profits measured by net wholesale prices to the trade less raw material costs do not translate directly into greater net profits. During these years, Kraft's manufacturing costs, excluding raw material cheese, very likely changed little, whereas its advertising and non-price promotion costs probably increased. In sum, we believe the above calculations approximate the increase in Kraft's gross profits between 1989 and 1990 and between 1989 and 1991 for processed and natural cheese sold to retailers, but that they may overstate the relative change in net profits between 1990 and 1991.[84]

The large increases in Kraft's price-cost margins adversely affected its share of retail food store cheese sales. Between 1988 and 1992, Kraft's share of total retail cheese sales, excluding cream cheese, fell 8.4 percentage points, and its reported total retail cheese sales, excluding cream cheese, declined by 78 million pounds (Appendix Tables 6.4a and 6.4c).

Kraft's share decline occurred primarily because of the widening gap between its prices and private label brand prices. As noted above, in 1989 Kraft planners had urged caution in making future increases in this price gap. This gap began widening in early 1990 and peaked in the first two quarters of 1991 (Appendix Figure 6.1). The continued widening occurred primarily because private label retail prices rose less and began to decline sooner than those of

---

[83] Appendix Table 6.6a and text at note 75 above.

[84] Michael Miles, chairman and CEO of Philip Morris reportedly told marketing analysts that Kraft's cheese business profits declined by $125 million in 1991. "Kraft Gripes Publicly about Lost Cheese Profits," *The Milkweed*, February 1992.

Kraft brands (Appendix Table 6.7). The retail price gap also widened somewhat between Kraft and Borden, Kraft's leading branded cheese competitor in processed cheese (Appendix Figure 6.2 and Appendix Table 6.8).

Kraft's price gap strategy beginning in 1990 marked a drastic departure from that pursued earlier. Between 1981 and 1988 the Kraft-private label retail price gap increased much more gradually than thereafter. The gap for processed cheese grew by 16.7 percentage points for the entire 1981-1988 period (Appendix Table 6.10). In contrast, the gap for American cheese widened by 24.6 percentage points between 1988 and the first half of 1991 when the size of the gap peaked (Appendix Table 6.7).[85] The size of the gap for all natural cheeses rose by 11.4 percentage points for the entire 1981-1988 period; in contrast, between 1988 and the first half of 1991 the gap for natural cheeses, excluding shredded, widened by 23.6 percentage points and the gap for shredded natural cheese by 21.7 percentage points. Thus, Kraft decision-makers chose to ignore the planners' advice in 1989 not to substantially widen the Kraft-private label price gap (Appendix Table 6.7).

The impact of Kraft's declining market shares on retail sales (measured in pounds) is estimated in Table 6.2. Had Kraft's market share remained constant, its estimated total retail sales would have increased by 10.6 percent between 1988 and 1992, and its retail cheese sales in 1992 would have been greater by 135.8 million pounds.

---

[85] We compared all American cheese in the latter period with all processed cheese in the former period because the data source used for the 1988-1991 comparison does not combine all processed cheese. The American cheese category used by I.R.I. Infoscan most closely approximates the total processed cheese category used by SAMI. The I.R.I. Infoscan data are reported in Appendix Table 6.7.

Kraft's pricing conduct may also have had an adverse affect on total industry retail cheese sales. Retail-NCE margins were significantly higher 1990-1992 than either before or after these years (Figure 6.6). Without this increase, retail prices would have been correspondingly lower. Retail natural cheese prices were about 6 percent higher during

Table. 6.2. Kraft Reported Retail Cheese Sales and Estimated Lost Retail Sales of Kraft, 1989-1992

(Millions of Pounds)

	Kraft's Reported Total Sales[1]		Estimated Kraft Total Sales at 1988 Market Share[2]		Estimated Lost Retail Sales of Kraft[3]	
	all cheese	w/o cream cheese	all cheese	w/o cream cheese	all cheese	w/o cream cheese
1988	793.3	655.1	793.4	655.1	--	--
1989	800.1	660.2	818.6	676.7	18.5	16.5
1990	799.7	640.8	878.3	720.0	78.6	79.2
1991	756.4	597.8	884.9	722.5	128.5	124.7
1992	738.8	577.0	877.6	712.8	138.8	135.8
Percent Change 1988-1992	-6.8	-8.8	+10.6	+8.8		

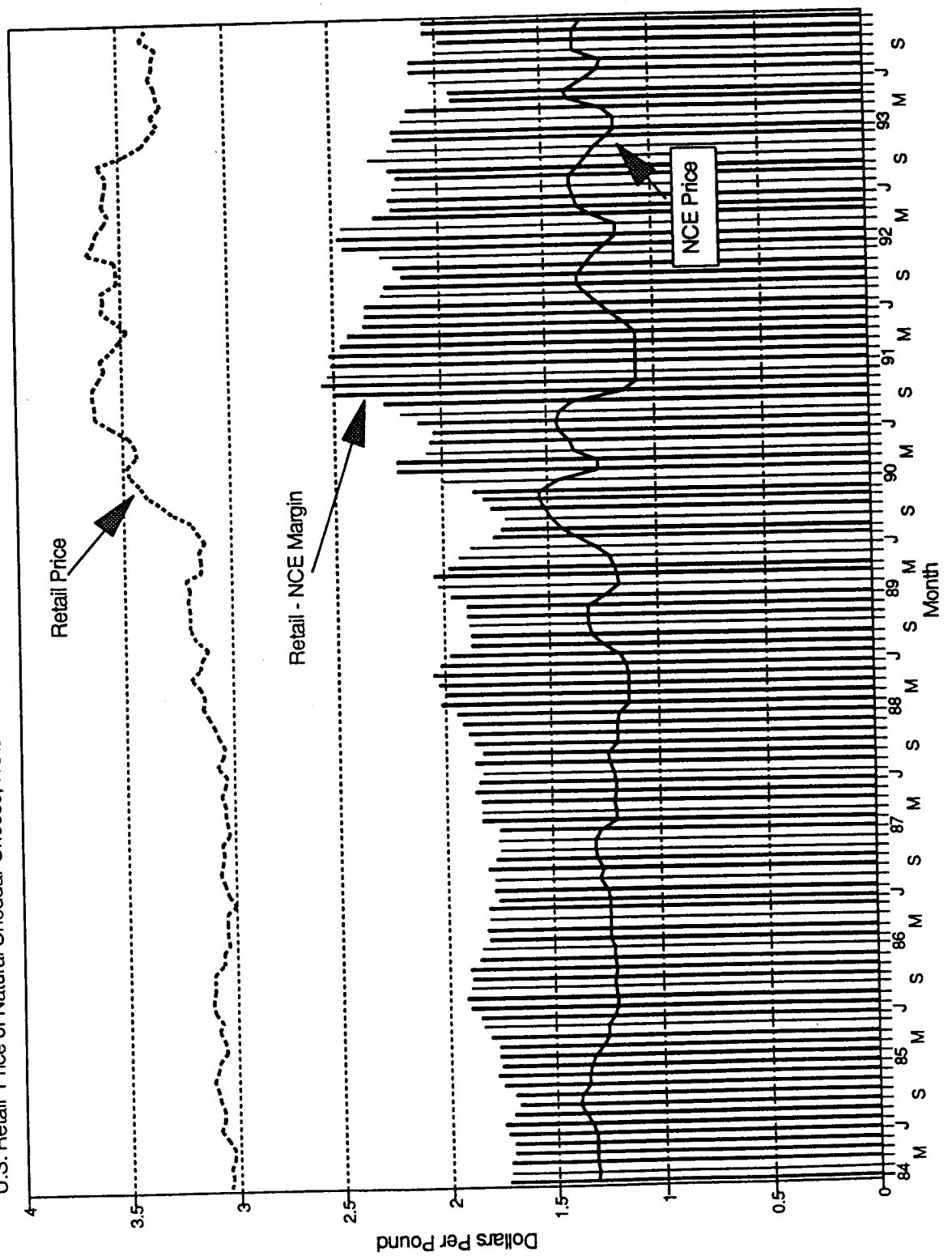
[1]Appendix Table 6-4c.

[2]Estimate based on Kraft's 1988 market share of 46.38% without cream cheese and 49.0% including cream cheese (Appendix Table 6.4a) and total retail cheese sales (Appendix Table 6.6a).

[3]Estimated sales less total reported sales.

Figure 6-6

U.S. Retail Price of Natural Cheddar Cheese, NCE Block Price and Retail Price-NCE Price Margin, Monthly, 1984-1993



Sources: CPI Detailed Report, Bureau of Labor Statistics, U.S. Department of Commerce; and Dairy Market News, USDA.

1990-1992 than during 1993. (The 1990-1992 prices were about 17 percent higher than during 1988.) Assuming a price elasticity of demand of -0.5, prices that were 6 percent higher would have reduced retail cheese consumption during 1990-1992 by about 3 percent.[86] We cannot estimate the effect on total cheese consumption because we do not know what happened to wholesale cheese prices to the food service and industrial cheese customers. However, it appears that Kraft's wholesale price policy had an adverse impact on total cheese industry sales as well as on its own sales during 1990-1992. Since Kraft has the dominant retail brand for most types of cheese, it is not surprising that their pricing behavior affected the pricing of competing brands sold to retailers.

Why did Kraft's top management disregard the planners' 1989 warning that the company should not accelerate earnings growth by widening substantially the Kraft-private label price gap? Some commentators have attributed the change in Kraft's pricing strategy after 1988 to the Philip Morris takeover of Kraft effective December 1988. Shortly after the takeover was consummated, the newly appointed president of Kraft General Foods, Inc., reportedly stated that what Philip Morris wanted was "further and faster growth" from all of the Kraft General Foods food units.[87] He reportedly told financial analysts that Kraft U.S.A. was expected to post an operating profit of $1.3 billion for 1989, an increase of 30 percent over its 1988 operating profits.[88]

---

[86] See Chapter 2 for price elasticity estimates. This implies that the estimates in Table 6.2 understate the decline in Kraft's retail sales.

[87] Janet Kay, "Philip Morris 'Getting Aggressive' in Food, Exec Says," *Chicago Tribune*, February 23, 1990, p. 3.

[88] Alex M. Freedman and Richard Gibson, "Philip Morris's Kraft General Foods Expects Sharp '89 Earnings Increase," *Wall Street Journal*, February 24, 1989, p. 1.

Kraft apparently responded to the higher profit objective by increasing cheese gross profit margins. Initially, Kraft's pricing strategy seemed to work, as profits surged. The *Wall Street Journal* reported: "After Philip Morris Co. bought Kraft in 1988 and merged it with General Foods Corp. in '89, profit growth at Kraft General Foods averaged more than 20% the first two years [1989 and 1990]."[89]

But while Kraft's pricing policy increased profits in the short term, a Prudential Securities, Inc., financial analyst was quoted as saying he believed "50 % of [Kraft's] problems [loss of market share] were caused by aggressive efforts to maximize profits. They pushed too hard, and now they're paying the price for it."[90] On another occasion this analyst reportedly said: "Kraft had taken five years' worth of price hikes [in cheese] in two years."[91]

In 1993, a *Wall Street Journal* article summarized Kraft's post-acquisition pricing conduct and its consequences as follows:

> Soon after Kraft was acquired, Kraft General Foods began to steadily increase the prices of such stalwart brands as Kraft Singles and Velveeta. At first the concept worked: the cheese business reported results in both 1989 and 1990.
>
> In late 1990, however, the market for some cheese ingredients plunged, allowing private-label manufacturers to lower their prices. This price gap between packages of Kraft cheese slices and private-label versions, typically 30 cents, more than doubled. The Philip Morris unit was slow to make the adjustments, and its share of the $5.2 billion

---

89 Julie Liesse and Judanna Dagnoli, "Goliath KGF Loses Steam After Merger," *Advertising Age*, January 27, 1992, p. 1b.

90 K. Deveney, "Marketing, After Some Key Sales Strategies Go Sour, Kraft General Foods Gets Back on Track," *Wall Street Journal*, March 18, 1992, Sec:B, p. 1.

91 Suein L. Hwang, "Kraft Puts the Cheese Market in Ferment," *Wall Street Journal*, March 16, 1993, Sec:B, p. 1.

retail market slid three or four percentage points, to 42%. Last year alone, that lost share cost the company $125 million in profits.[92]

Philip Morris efforts to accelerate Kraft earnings growth after the 1988 takeover may well have placed added pressure on Kraft to lower cheese procurement costs. Kraft enjoyed some of its largest margins during periods when it sold actively on the NCE with the apparent effect of depressing bulk cheese prices, without the corresponding decreases in prices for finished cheese products.

F. Summary and Conclusions

During January 1990 through December 1992, Kraft made 83 percent of all barrel sales and 54 percent of all block sales on the NCE. During the same time, the three leading seller-traders, Kraft, Borden and Alpine Lace, made 90 percent of all barrel sales and 75 percent of all block sales.

During these years, Kraft apparently followed the same general trading pattern over each price cycle, trading most persistently at price tops and price bottoms, and intermittently when prices were rising. At price bottoms, Kraft appeared to fill as many bids as required to keep prices at or near the seasonal low. Between a price bottom and the next price top, buyer-traders bid up the market, often with few consummated trades, except when Kraft engaged in "selective selling," having the effect of "moderating" an upward price trend. At price tops, Kraft initially filled bids with the apparent purpose and effect of slowing or stopping the upward trend. Thereafter, Kraft filled bids or it offered to sell as the market topped and began to subside. Once

---

92 *Id.* Another source reported that Michael Miles, CEO and Chairman of Philip Morris, had reported that Kraft had netted $125 million in reduced profits in 1991. "Kraft Gripes Publicly About Lost Cheese Profits," *The Milkweed*, February 1992, p. 3.

a downward price trend was established Kraft frequently continued offering to sell, often joined by Borden and Alpine Lace--and sometimes by other traders. However, in periods when buyer-traders bought heavily in an apparent effort to counteract seller-trader activity, the other leading seller-traders usually left Kraft to carry the burden of selling, which it generally did at a loss. The apparent effect of Kraft's selling conduct was to shape the pattern of NCE prices over each price cycle.

Both buyer-traders and other seller-traders often seemed to defer to Kraft's actions, perhaps because they feared the consequences of not doing so, if Kraft's view of the most appropriate price level was proven correct. This fear may have stemmed from several sources. First, experience had shown that Kraft's view generally prevailed. Second, Kraft's large size gave it superior knowledge of overall industry conditions.[93] Other traders acknowledged this fact and were therefore reluctant, especially during turning points in a price cycle, to oppose Kraft's view of market conditions as implied by its trading activity.[94] Finally, Kraft typically

---

[93] Kraft included among the implications of being the largest cheese buyer the "Potential for better information about the industry as a whole." Kraft General Foods, Inc., *Cheese Procurement Strategy,* Operations, December 6, 1989, KGF 2948, 2990. It therefore included among its profit maximizing strategies the development of superior market information of industry conditions and demand for Kraft products. *Id.* 2992, 2993-2994.

[94] For example, an official of a large Kraft competitor stated:

> ...[W]hen Kraft starts selling, people start looking at their inventories real carefully. I mean, they have a lot of respect [for Kraft]. You think supplies are tightening, and Kraft's on that market selling. I assure you the CEO's are going to their economists and saying, are you damn sure things are tightening? Wayne Hoecker, general counsel of Mid-America Dairymen, Inc., typed transcript of recorded interview, August 2, 1993, p. 62.

This person subsequently added that,

> [The reason] people look [to Kraft] is the respect the industry has for their economists and their ability to forecast. Now they're the biggest company in the industry, very sophisticated in their forecasting, and they have a lot of human resources dedicated to it. *Id.*, p. 65.

built excess supplies, so-called safety stocks, into its annual plans. It also had alternative methods of reducing supplies should circumstances make this the preferred alternative. These and other factors generally gave Kraft access to ample supplies for sale on the NCE when it decided to sell there.[95]

Evidence presented in this chapter supports the hypothesis that Kraft's trading activity was motivated primarily by a desire to influence NCE prices, not to dispose of surplus cheese on the NCE. During 1990-1992, Kraft managed its surplus problem predominantly by reducing

---

[95] Very important is Kraft's agreement to take, with minor exceptions, the entire output of its committed suppliers. (Interview of Wayne Hangartner, former Director of Cheese Procurement and Inventories, Kraft General Foods, December 8-9, 1992, typed transcript of recorded interview, pp. 7,9, 55). This gives Kraft control over where these suppliers dispose of their surplus, enabling Kraft to divert a supplier's surplus cheese either to the NCE, the spot market or the CCC when this alternative is available. While a supplier may benefit from Kraft's agreement to accept the supplier's entire output, were the decision left to the supplier it most probably would prefer to sell in the spot market rather than the NCE, since lower NCE prices adversely affect the supplier. Kraft gains additional control over the amount of cheese available for sale on the NCE because some of its committed suppliers have "balancing" plants that can switch between block and barrel output. *Id*, p. 55. Kraft officials acknowledge that their Annual Plans cover projected demand plus safety stocks. Chris Emerson, *Id*, p. 2.
A Kraft employee explained its planned surplus policy as follows:

> Raw Material Cheese Inventories and Procurement always plans and operates with a projected...surplus of cheese availability. The surplus may range from [...to...] million pounds and is disposed of by trade sales, government sales and milk diversion to other commodities when Kraft doesn't need the cheese. This method reduces the chance of Kraft running out of raw material cheese on short-term situations.
>
> To be able to do this, certain supplier(s) must be able to produce 640s or Drums on short notice in order to balance raw material cheese requirements within the existing supplier base.

Kraft General Foods, Dwight Krampien to Ron Denken, "Resourcing HM for Springfield," November 18, 1991, KGF 3144. Information has been temporarily redacted pursuant to an agreement with Kraft General Foods, Inc., pending judicial resolution of trade secret issues.

procurement of bulk cheese, selling in the spot market, and periodically selling to the CCC. Kraft's total NCE sales were unprofitable, whereas its total spot and CCC sales were profitable. There is evidence that Kraft chose to sell cheese on the Exchange at a loss when it could have more profitably made the sale elsewhere. Such conduct constitutes *trading against interest*, the practice of purposely not selling at a profit-maximizing price. In the context of NCE trading, this implies that Kraft anticipated that unprofitable sales would enhance overall company profits by lowering the prices paid for bulk cheese purchased under NCE-based formula price contracts. Evidence in this and the preceding chapter indicates that, at times, Kraft successfully kept bulk cheese prices below those justified by industry-wide supply and demand conditions.

An analysis of Kraft's pricing of finished products documents how Kraft's profits are affected since its wholesale prices are not coupled to NCE prices. In the fall of 1989, Kraft raised the *net* wholesale price for most leading Kraft brands when NCE prices rose, but it did not lower them when NCE prices dropped sharply in February 1990. Between December 1989 and November 2, 1990, NCE barrel prices fell from $1.5050 per pound to $1.0525 per pound, where they remained through May 3, 1991. Yet, Kraft's average net wholesale price for processed cheese was higher in the latter months than in December 1989. This increased substantially the margin between NCE and Kraft's wholesale prices, and, therefore, Kraft's gross profits during 1990 and 1991. Because other marketers, especially those selling cheese for the private label brands of retailers, raised their wholesale prices less, and lowered them sooner, than did Kraft, the retail price gap between Kraft and private-label brands widened substantially, causing a large drop in Kraft's share of retail cheese sales. Kraft adopted a strategy of sacrificing income to regain market share by reducing wholesale prices in December 1991. This price reduction

caused an appreciable drop in profits in 1992, though they apparently remained above those in early 1989.

During 1990-1991, Kraft may have kept the spread between its net wholesale prices and NCE prices too large for too long, as it attempted to meet the aggressive profit goals set by Philip Morris. But this experience demonstrates how Kraft can benefit when NCE prices decline while Kraft leaves unchanged its net wholesale prices.

Kraft's conduct during 1990-1992 affected others besides itself. The decline in Kraft market share contributed to its surplus problem beginning in late 1990. This, in turn, adversely affected Kraft's suppliers as it reduced purchases from them. Kraft's higher wholesale prices appeared to also encourage higher cheese prices by competitors. The resulting higher retail prices very probably reduced, somewhat, overall cheese consumption, thereby reducing the total amount of milk used in manufacturing cheese.[96]

---

[96] One source reported that many dairy farmers "were angered by Kraft's decision to maintain high cheese prices despite falling milk prices, which curtailed cheese sales." William D. Dobson and Robert A. Cropp, "The Dairy Marketing Initiative of Upper Midwestern Cooperatives," in R.G. Cotterill (ed.) *Competitive Strategy Analysis for Agricultural Marketing Cooperatives*, 1994, p. 186.

Appendix Table 6.1 Kraft Bulk Cheese Inventory, Receipts, Usage, and Sales

Yr. & Mo. [1]	Planned Inventory [2]	Actual Inventory [3]	Surplus/ Deficit Inventory [3] - [2] [4]	Actual Receipts [5]	Actual Usage [6]	Non-Commercial Sales [7]	Commercial Usage [6] - [7] [8]
89.01							
89.02							
89.03							
89.04							
89.05							
89.06							
89.07							
89.08							
89.09							
89.10							
89.11							
89.12							
1989							
90.01	THIS INFORMATION HAS BEEN REDACTED FROM THE REPORT AT THIS TIME PURSUANT TO AN AGREEMENT WITH KRAFT GENERAL FOODS, INC., THAT THERE WILL BE A SUBSEQUENT JUDICIAL RESOLUTION OF A GOOD-FAITH DISPUTE OVER THE TRADE SECRET STATUS OF THE INFORMATION.						
90.02							
90.03							
90.04							
90.05							
90.06							
90.07							
90.08							
90.09							
90.10							
90.11							
90.12							
1990							
91.01							
91.02							
91.03							
91.04							
91.05							
91.06							
91.07							
91.08							
91.09							
91.10							
91.11							
91.12							
1991							
92.01							
92.02							
92.03							
92.04							
92.05							
92.06							
92.07							
92.08							
92.09							
92.10							
92.11							
92.12							
1992							

Sources: Kraft Documents: KGF 004118; 004089; 004071; 004054; 004033; 019740; 004303; 015453-015457; 015465; 015468-015478; 004507; 004226; 004249; 004176; 004153; 003651; 003728; 003680; 026622; 026575; 026593; 026562; 026517; 026531; 026549; 026490; 026467; 026425; 026442; 026414; 026403; 026392; 026366 026349; 026349; 026333; 026313; 026297; 026277; 026255; 026231; 026627-026628; 026429-026431; 026226-026227; 015469-015478; 015455-015457; 026629-026630; 026432-026434; 026228-026229; 018746-018743; 023755

Note: 1989 Actual Inventory includes Kraft and supplier owned inventories.

Appendix Table 6.2: Adjusted CCC Purchases (Contract Basis) by Regions, Weekly, October 12, 1990 - September 27, 1991 1/

	Block Cheese				Barrel Cheese				Barrels & Blocks
Date	Midwest	West	East	Total	Midwest	West	East	Total	Total
				1,000 lbs					
901012	0	0	0	0	0	0	0	0	0
901019	0	0	0	0	0	0	0	0	0
901026	0	0	0	0	0	0	0	0	0
901102	0	0	0	0	0	0	0	0	0
901109	495	0	0	495	0	0	0	0	495
901116	784	0	0	784	42	0	0	42	826
901121	303	129	0	432	46	0	0	46	478
901130	1837	43	0	1880	833	0	0	833	2713
901207	598	115	0	713	1122	0	0	1122	1835
901214	1158	515	0	1673	1602	0	0	1602	3275
901221	510	582	0	1092	1031	0	0	1031	2123
901228	706	41	0	747	912	0	0	912	1659
910104	0	0	0	0	854	0	0	854	854
910111	893	316	0	1209	1862	0	0	1862	3071
910118	969	263	0	1232	2003	0	0	2003	3235
910125	1279	576	0	1855	534	0	0	534	2389
910201	1236	526	0	1762	741	0	0	741	2503
910208	260	230	0	490	588	0	0	588	1078
910215	503	1029	0	1532	988	0	0	988	2520
910222	1095	1133	0	2228	811	0	0	811	3039
910301	552	641	0	1193	53	0	0	53	1246
910308	620	663	0	1283	476	0	0	476	1759
910315	577	239	237	1053	324	0	0	324	1377
910322	370	466	0	836	-1496	0	0	-1496	-660
910328	299	289	314	902	-1186	0	0	-1186	-284
910405	622	535	0	1157	268	0	0	268	1425
910412	218	652	0	870	679	0	0	679	1549
910419	923	175	62	1160	335	0	0	335	1495
910426	365	162	0	527	-58	0	0	-58	469
910503	216	426	0	642	-116	0	0	-116	526
910510	574	408	138	1120	-548	0	0	-548	572
910517	184	-82	240	342	-874	0	0	-874	-532
910524	146	58	0	204	0	0	0	0	204
910531	0	0	0	0	0	0	0	0	0
910607	0	0	0	0	0	0	0	0	0
910614	0	11	0	11	0	0	0	0	11
910621	-436	0	0	-436	-85	0	0	-85	-521
910628	0	0	0	0	0	0	0	0	0
910705	0	0	0	0	0	0	0	0	0
910712	-222	0	0	-222	0	0	0	0	-222
910719	-101	0	0	-101	0	0	0	0	-101
910726	0	0	0	0	0	0	0	0	0
910802	-219	0	0	-219	0	0	0	0	-219
910809	0	0	0	0	0	0	0	0	0
910816	0	0	0	0	0	0	0	0	0
910823	0	0	0	0	0	0	0	0	0
910830	0	0	0	0	0	0	0	0	0
910906	0	0	-700	-700	0	0	0	0	-700
910913	0	0	0	0	0	0	0	0	0
910920	0	0	0	0	0	0	0	0	0
910927	0	0	0	0	0	0	0	0	0
Total	17314	10141	291	27746	11741	0	0	11741	39487

Source: Dairy Market Statistics, AMS, USDA, Annual Summary, 1990 and 1991.

1/ Adjusted purchases are total purchases, contract basis,less cancellations. Negative numbers can result when previous week(s) cancellations exceed current week purchases (contract basis).

Appendix Table 6.3

End-of-Month Commercial Stocks of American Cheese and CCC Stocks of Natural (Blocks and Barrels) Cheese, 1980-1993

Commercial Stocks of American Cheese

Year	Jan	Feb	Mar	Apr	May	June	Jul	Aug	Sep	Oct	Nov	Dec	Average
						-------Million Pounds-------							
1980	393.1	392.5	384.6	393.0	419.5	433.3	443.4	418.1	422.7	409.5	391.5	422.8	410.3
1981	421.8	423.4	410.3	428.4	419.0	425.4	426.1	404.4	374.5	363.0	353.8	373.8	402.0
1982	374.8	370.1	367.8	367.8	367.8	365.6	365.6	365.6	318.1	318.1	318.1	334.7	352.8
1983	343.7	372.9	380.4	379.4	379.4	374.4	391.7	380.8	359.7	365.5	360.2	368.2	371.4
1984	357.1	353.1	364.6	354.4	365.7	374.2	365.9	360.4	346.3	340.5	339.6	339.7	355.1
1985	354.7	349.3	338.1	324.0	343.9	363.0	355.4	351.9	335.0	322.5	313.4	306.5	338.1
1986	312.0	315.5	324.7	327.4	340.2	348.8	351.9	353.3	333.9	310.3	287.3	277.0	323.5
1987	295.8	292.8	302.5	325.3	338.7	353.2	360.4	345.5	344.8	319.1	311.3	289.3	323.2
1988	292.2	293.0	292.5	305.3	309.1	313.2	309.7	285.9	268.9	253.3	229.2	256.3	284.0
1989	265.7	286.2	279.5	285.5	300.8	302.7	304.2	295.8	265.7	244.5	229.6	229.7	274.1
1990	254.8	267.5	288.4	299.4	320.9	335.1	358.7	356.4	347.0	337.1	332.0	339.2	319.7
1991	357.0	349.3	361.2	371.2	374.0	380.7	368.6	361.7	345.5	311.5	294.5	295.6	347.6
1992	319.2	329.8	316.8	317.1	328.9	327.0	354.8	351.1	341.5	322.4	312.1	333.1	329.5
1993	339.3	320.7	319.4	314.7	343.8	404.5	403.0	392.1	386.7	392.7	360.2	357.2	361.2
Average	334.4	336.9	337.9	342.3	353.7	364.4	368.5	358.8	342.2	329.3	316.6	323.1	342.3

CCC Stocks of Natural Cheese

1980	6.6	7.1	3.1	12.1	19.0	38.8	64.3	83.1	75.5	74.9	70.7	56.8	42.7
1981	82.9	85.2	93.7	111.5	136.6	159.5	189.6	213.3	224.1	228.3	236.7	249.3	167.6
1982	251.5	252.6	273.8	273.8	273.8	346.7	346.7	346.7	447.0	447.0	447.0	546.1	354.4
1983	586.6	612.2	637.6	652.4	653.6	674.5	691.3	743.2	781.2	765.5	750.4	731.5	690.0
1984	739.7	763.3	752.6	727.1	737.7	714.9	712.5	684.7	671.8	639.3	606.2	545.2	691.3
1985	511.0	494.6	468.2	467.9	459.1	483.9	498.1	504.9	506.5	472.1	469.1	452.3	482.3
1986	430.1	406.4	399.9	415.5	438.3	445.6	463.2	462.7	426.0	400.9	378.2	324.7	416.0
1987	294.6	271.5	254.6	228.0	230.8	211.5	186.7	164.2	140.5	122.0	92.0	78.1	189.5
1988	72.7	66.9	61.6	53.9	57.6	68.7	78.7	65.2	46.0	39.9	31.7	27.1	55.8
1989	20.4	6.8	6.2	7.7	8.3	8.8	7.8	6.4	5.8	5.6	5.6	5.1	7.9
1990	4.2	3.7	3.4	1.4	1.2	0.9	1.8	2.3	1.7	1.3	2.4	8.0	2.7
1991	13.9	18.3	25.0	32.7	34.5	33.1	34.3	30.4	28.5	26.4	24.6	22.2	27.0
1992	19.6	18.2	18.6	17.6	14.6	16.4	15.2	13.1	8.3	5.6	7.1	7.8	13.5
1993	8.0	7.0	7.0	8.0	5.0	5.0	4.0	3.0	2.0	2.0	2.0	1.6	4.5
Average	217.3	215.3	214.7	215.0	219.3	229.2	235.3	237.4	240.3	230.8	223.1	218.3	224.6

Source: Dairy Market Statistics, Annual Summary, USDA.

Appendix Table 6.4a: Kraft Market Share of Retail Quantity of Cheese Sold, by Type, 1988-92.

Year & Qtr	American Cheese	Natural Cheese (Excl Shred)	Natural Shredded Cheese	Spreads & Imitation Balls	Cheese	Ricotta Cheese	All Other Cheese	Sub-Total	Cream Cheese	Total
				----Percent Share of Total Pounds Sold----						
88.1	59.11	37.68	28.54	49.20	0.00	20.34	61.20	46.33	68.56	49.00
88.2	58.85	36.98	27.14	46.28	0.00	20.96	62.28	46.47	67.72	49.02
88.3	58.42	36.23	28.04	46.13	0.00	18.98	63.11	46.26	67.35	48.65
88.4	60.65	37.66	27.78	47.15	0.00	20.02	61.67	46.46	64.60	49.25
89.1	60.44	36.26	27.18	46.73	0.00	20.38	60.41	46.06	66.99	48.50
89.2	59.31	34.56	27.09	46.74	0.00	19.41	57.53	45.75	66.79	48.18
89.3	58.39	34.11	26.16	44.01	0.00	18.29	58.95	45.01	66.33	47.43
89.4	60.32	35.28	25.57	40.65	0.00	18.94	57.07	44.23	64.90	47.48
90.1	58.42	31.94	25.76	37.07	0.00	18.75	55.48	42.25	67.78	45.26
90.2	57.11	29.62	25.68	35.72	0.00	19.79	57.08	41.46	67.88	44.78
90.3	56.89	28.44	25.52	33.85	0.00	17.16	58.12	41.14	67.50	44.37
90.4	57.63	28.73	24.44	37.17	0.00	17.87	57.67	40.33	63.17	44.11
91.1	55.27	26.06	21.57	35.65	0.00	17.06	56.19	38.21	65.15	41.60
91.2	53.84	27.55	23.74	34.00	0.00	19.38	56.93	39.25	64.84	42.44
91.3	52.88	26.38	24.24	38.88	0.01	17.50	58.72	39.07	64.75	42.29
91.4	52.82	27.87	22.03	40.04	0.52	20.24	44.24	37.05	61.82	41.28
92.1	51.75	25.55	20.54	40.55	1.76	17.05	50.40	36.22	63.89	39.74
92.2	52.09	26.22	21.36	43.42	3.23	20.58	49.40	37.38	64.20	40.95
92.3	52.48	25.01	24.35	46.83	3.24	17.53	48.24	38.01	63.52	41.29
92.4	54.93	28.12	24.13	45.68	3.23	23.01	40.63	38.52	63.24	42.84
1988	59.26	37.15	27.89	47.22	0.00	20.10	62.06	46.38	66.80	48.99
1989	59.61	35.08	26.48	44.25	0.00	19.33	61.83	45.25	66.10	47.89
1990	57.51	29.68	25.32	36.05	0.00	18.42	60.67	41.28	66.18	44.62
1991	53.73	26.96	22.84	37.30	0.13	18.60	59.65	38.38	63.91	41.88
1992	52.81	26.27	22.61	44.25	2.80	19.82	58.50	37.54	63.66	41.25

Source: I.R.I. Infoscan data as reported by Andrew W. Franklin and Ronald W. Cotterill, "Pricing and Marketing Strategies in the National Brand Cheese Industry", Food Marketing Policy Research Report No. 26, September 1994.

Appendix Table 6.4b: Kraft Market Share of Retail Dollar Sales of Cheese, by Type, 1988-92.

Year & Qtr	American Cheese	Natural Cheese (Excl Shred)	Natural Shredded Cheese	Spreads & Balls	Imitation Cheese	Ricotta Cheese	All Other Cheese	Sub-Total	Cream Cheese	Total
				----Percent Share of Total Dollar Sales----						
88.1	62.56	41.47	31.67	47.03	0.00	23.37	63.29	48.91	72.02	51.30
88.2	62.55	40.94	30.28	44.61	0.00	24.16	63.84	48.95	71.00	51.28
88.3	62.55	40.45	31.40	43.99	0.00	22.77	64.41	49.02	70.62	51.19
88.4	64.03	41.90	31.07	45.27	0.00	23.34	63.52	49.10	68.60	51.52
89.1	63.76	40.43	30.34	46.50	0.00	23.48	62.01	48.70	70.40	50.83
89.2	62.82	38.96	30.08	46.76	0.00	23.00	59.70	48.26	69.83	50.39
89.3	62.10	38.30	29.57	43.42	0.00	21.48	60.67	47.55	69.41	49.65
89.4	63.80	40.11	29.27	40.83	0.00	22.33	60.51	47.36	68.75	49.89
90.1	62.27	36.74	29.03	37.56	0.00	21.20	59.15	45.46	70.85	47.79
90.2	61.62	34.64	29.15	36.13	0.00	22.41	59.84	44.94	71.07	47.50
90.3	62.00	33.76	29.52	34.77	0.00	20.55	61.61	45.06	70.07	47.41
90.4	63.14	34.08	28.64	38.10	0.00	20.45	60.72	44.60	66.52	47.22
91.1	62.29	32.36	26.23	38.41	0.00	19.56	59.70	43.60	68.41	46.00
91.2	61.36	33.63	28.48	36.88	0.00	22.10	60.03	44.62	68.29	46.95
91.3	60.02	31.95	28.98	40.35	0.01	20.32	60.84	43.90	67.89	46.27
91.4	59.56	32.90	26.18	41.16	0.50	20.89	38.02	40.70	66.08	43.94
92.1	58.61	30.43	23.61	43.63	1.54	18.68	41.79	39.55	68.01	42.44
92.2	59.14	30.89	24.17	44.59	2.72	20.82	44.11	40.77	68.11	43.69
92.3	58.98	29.54	27.02	46.62	2.98	19.90	43.72	40.95	67.67	43.73
92.4	61.04	31.75	26.58	45.83	2.93	22.45	41.98	41.29	68.13	44.83
1988	62.94	41.21	31.12	45.25	0.00	23.40	63.76	49.00	70.38	51.33
1989	63.12	39.49	29.79	44.00	0.00	22.62	63.40	47.94	69.52	50.18
1990	62.26	34.80	29.07	36.76	0.00	21.12	62.41	45.01	69.33	47.47
1991	60.84	32.70	27.39	39.33	0.12	20.65	61.51	43.19	67.55	45.77
1992	59.43	30.67	25.35	45.23	2.48	20.55	60.74	40.64	67.99	43.69

Source: Franklin and Cotterill, op.cit.

Appendix Table 6.4c: Kraft Brand Retail Cheese Sales, by Type, 1988-92.

Year & Qtr	American Cheese	Natural Cheese (Excl Shred)	Natural Shredded Cheese	Spreads & Imitation Balls	Cheese	Ricotta Cheese	All Other Cheese	Sub-Total	Cream Cheese	Total	Percent Change
				----Sales in Millions of Pounds----							
88.1	85.09	38.16	10.46	14.01	0.00	4.47	11.76	163.96	33.07	197.02	
88.2	85.01	35.92	9.03	12.38	0.00	3.40	11.24	156.98	31.18	188.16	-4.50%
88.3	86.52	35.74	9.57	12.33	0.00	2.94	12.23	159.32	29.65	188.97	0.43
88.4	88.96	40.54	10.92	17.30	0.00	4.78	12.36	174.86	44.26	219.12	15.96
89.1	90.58	37.20	11.07	14.35	0.00	4.66	12.56	170.41	32.73	203.14	-7.29
89.2	89.85	33.49	10.06	14.77	0.00	3.20	11.28	162.67	31.01	193.68	-4.66
89.3	87.82	32.67	9.74	13.28	0.00	2.83	11.88	158.23	29.86	188.09	-2.89
89.4	87.38	37.81	10.90	16.67	0.00	4.38	11.76	168.90	46.28	215.18	14.41
90.1	87.45	36.36	11.51	11.47	0.00	3.96	12.36	163.11	34.91	198.03	-7.97
90.2	87.04	32.83	10.65	10.59	0.00	4.11	12.03	157.25	37.04	194.29	-1.88
90.3	88.03	30.98	10.94	9.72	0.00	2.94	12.55	155.16	35.59	190.75	-1.83
90.4	87.40	34.53	12.01	13.95	0.00	4.62	12.77	165.28	51.34	216.62	13.56
91.1	84.97	30.50	11.18	11.89	0.00	4.37	13.39	156.30	38.46	194.75	-10.09
91.2	81.68	29.50	11.02	9.73	0.00	3.59	12.62	148.12	34.94	183.06	-6.00
91.3	78.50	27.67	11.74	11.78	0.00	3.10	15.14	147.94	35.11	183.05	-0.01
91.4	73.53	31.70	12.11	14.84	0.02	5.46	7.82	145.48	50.01	195.48	6.79
92.1	71.88	27.21	11.99	11.93	0.06	4.03	12.04	139.14	35.77	174.91	-10.53
92.2	74.80	27.66	11.38	12.24	0.09	4.73	9.32	140.21	37.03	177.24	1.33
92.3	76.02	25.98	13.19	14.31	0.09	3.27	9.75	142.60	35.10	177.70	0.26
92.4	77.48	32.44	14.87	16.99	0.08	6.53	6.63	155.02	53.91	208.93	17.57
1988	345.58	150.35	39.98	56.03	0.00	15.60	47.58	655.12	138.16	793.27	
1989	355.63	141.17	41.77	59.08	0.00	15.08	48.38	660.20	139.88	800.09	0.86
1990	349.92	134.70	45.10	45.73	0.00	15.63	48.42	640.80	158.89	799.69	-0.05
1991	318.66	119.37	46.05	48.24	0.02	16.53	48.08	597.84	158.51	756.35	-5.42
1992	300.18	113.29	51.42	55.47	0.32	18.56	47.48	576.98	161.81	738.79	-2.32

Source: Franklin and Cotterill, op.cit.

Appendix Table 6.4d: Kraft Brand Retail Cheese Sales, by Type, 1988-92.

Year & Qtr	American Cheese	Natural Cheese (Excl Shred)	Natural Shredded Cheese	Spreads & Balls	Imitation Cheese	Ricotta Cheese	All Other Cheese	Sub-Total	Cream Cheese	Total	Percent Change
				----Sales in Millions of Dollars----							
88.1	193.01	128.06	34.86	36.96	0.00	7.76	53.16	453.81	77.06	530.87	
88.2	193.72	120.76	30.02	32.77	0.00	6.07	48.93	432.27	74.31	506.58	-4.58%
88.3	202.61	122.61	32.45	33.43	0.00	5.58	53.29	449.97	72.34	522.30	3.10
88.4	213.75	142.60	38.81	49.28	0.00	8.32	56.70	509.46	101.21	610.67	16.92
89.1	222.06	132.12	39.63	41.04	0.00	8.16	56.57	499.57	78.64	578.21	-5.32
89.2	222.06	121.28	35.42	42.41	0.00	6.10	50.26	477.53	75.70	553.22	-4.32
89.3	225.02	120.80	36.06	39.32	0.00	5.45	53.10	479.75	74.23	553.98	0.14
89.4	243.89	150.02	44.39	53.86	0.00	8.44	58.99	559.59	109.13	668.72	20.71
90.1	255.37	149.04	47.93	37.62	0.00	8.00	64.36	562.31	88.51	650.83	-2.68
90.2	256.71	134.39	44.58	34.82	0.00	7.80	59.33	537.63	92.23	629.86	-3.22
90.3	270.26	133.44	47.95	33.33	0.00	6.48	65.13	556.60	89.98	646.58	2.65
90.4	273.99	146.58	53.78	48.78	0.00	9.02	66.47	598.61	121.12	719.73	11.31
91.1	268.88	132.96	50.29	41.38	0.00	8.60	70.51	572.62	96.20	668.82	-7.07
91.2	254.44	125.07	48.25	33.72	0.00	7.22	64.15	532.85	89.40	622.25	-6.96
91.3	243.03	117.69	51.78	39.83	0.00	6.51	70.52	529.36	90.04	619.40	-0.46
91.4	233.41	131.23	53.73	49.88	0.04	9.22	25.05	502.55	119.33	621.89	0.40
92.1	228.44	113.56	50.66	42.61	0.13	7.79	33.70	476.88	92.54	569.42	-8.44
92.2	232.14	111.57	46.48	41.47	0.18	7.92	27.61	467.37	93.47	560.85	-1.51
92.3	233.66	107.94	53.40	47.07	0.20	6.82	29.51	478.60	91.69	570.29	1.68
92.4	234.79	125.80	59.68	56.63	0.18	10.54	26.26	513.89	128.88	642.77	12.71
1988	803.08	514.03	136.14	152.44	0.00	27.73	212.09	1845.51	324.92	2170.43	
1989	913.03	524.22	155.50	176.63	0.00	28.15	215.49	2016.44	337.69	2354.13	8.46
1990	1056.33	563.46	194.24	154.54	0.00	31.30	216.82	2255.16	391.84	2646.99	12.44
1991	999.77	506.95	204.05	164.80	0.04	31.55	216.63	2137.38	394.97	2532.34	-4.33
1992	929.03	458.88	210.22	187.79	0.69	33.07	218.91	1936.75	406.58	2343.33	-7.46

Source: Franklin and Cotterill, op.cit.

Appendix Table 6.5a: Private Label Market Share of Retail Quantity of Cheese Sold, by Type, 1988-92

Year & Qtr	American Cheese	Natural Cheese (Excl Shred	Natural Shredded Cheese	Spreads & Balls	Imitation Cheese	Ricotta Cheese	All Other Cheese	Sub-Total	Cream Cheese	Total
				----Percent Share of Total Pounds Sold----						
88.1	23.23	27.85	38.46	18.98	20.89	8.17	20.24	24.68	26.10	24.85
88.2	23.13	27.42	40.11	20.43	19.66	16.12	19.28	25.26	26.67	25.43
88.3	24.02	28.24	39.90	19.09	19.46	18.16	19.12	25.85	26.90	25.97
88.4	21.98	28.04	38.92	18.04	19.62	17.46	20.11	24.70	30.05	25.52
89.1	22.12	29.13	40.47	22.50	19.35	16.46	20.15	25.64	27.55	25.86
89.2	23.54	29.24	41.10	22.79	17.19	15.93	20.50	26.30	27.70	26.46
89.3	23.54	29.15	41.94	21.69	15.45	17.01	20.65	26.35	28.05	26.55
89.4	22.57	28.50	41.15	18.64	16.32	18.11	22.12	25.55	30.57	26.34
90.1	23.90	29.84	41.89	20.63	23.55	18.15	22.54	27.08	27.16	27.09
90.2	25.19	30.81	41.30	21.39	25.92	19.48	21.20	27.77	27.21	27.70
90.3	26.01	31.16	42.99	22.92	28.86	20.10	22.25	28.73	26.78	28.49
90.4	25.29	33.15	41.81	20.84	29.84	23.57	23.41	28.99	30.69	29.27
91.1	27.71	34.42	43.64	27.06	28.10	21.24	23.85	30.97	27.83	30.57
91.2	28.60	34.44	42.81	28.87	30.48	20.41	22.22	31.26	28.54	30.92
91.3	29.42	34.76	42.62	24.69	32.16	21.36	23.56	31.45	28.16	31.04
91.4	29.26	34.58	41.64	22.78	32.29	21.54	33.30	31.60	32.11	31.68
92.1	30.22	36.11	41.32	25.57	30.01	20.01	29.63	32.52	29.53	32.14
92.2	30.06	35.54	41.91	23.70	33.40	21.18	28.03	32.18	29.70	31.85
92.3	29.84	35.79	42.11	21.22	33.46	21.48	28.34	32.09	30.11	31.83
92.4	27.41	34.31	40.44	21.18	34.60	20.50	31.07	30.51	31.33	30.66
1988	23.09	27.89	39.31	19.04	19.94	14.69	19.70	25.11	27.71	25.44
1989	22.95	28.99	41.15	21.20	17.09	16.95	21.63	25.95	28.71	26.30
1990	25.11	31.27	42.00	21.39	26.99	20.52	24.41	28.15	28.28	28.17
1991	28.73	34.55	42.66	25.68	30.62	21.18	28.01	31.32	29.45	31.06
1992	29.39	35.41	41.41	22.79	32.69	20.73	28.54	31.81	30.30	31.59

Source: Franklin and Cotterill, op.cit.

Appendix Table 6.5b: Private Label Market Share of Retail Dollar Sales of Cheese, by Type, 1988-92.

Year & Qtr	American Cheese	Natural Cheese (Excl Shred)	Natural Shredded Cheese	Spreads & Balls	Imitation Cheese	Ricotta Cheese	All Other Cheese	Sub-Total	Cream Cheese	Total
				----Percent Share of Total Dollar Sales----						
88.1	20.15	23.50	34.25	10.87	18.72	7.11	19.03	21.58	20.36	21.45
88.2	19.89	22.94	35.48	11.44	17.39	14.21	18.28	21.64	20.69	21.54
88.3	20.32	23.36	34.91	10.98	17.10	14.91	18.26	21.85	20.75	21.74
88.4	18.94	23.41	34.15	10.72	16.96	15.10	18.72	21.21	23.14	21.45
89.1	18.96	24.36	35.56	13.34	16.26	14.28	18.93	22.14	21.09	22.03
89.2	19.82	24.14	35.96	13.25	14.46	13.97	19.38	22.27	21.39	22.19
89.3	19.94	24.26	36.38	12.88	12.89	14.87	19.55	22.44	21.48	22.35
89.4	19.34	23.94	35.46	10.83	13.12	15.45	19.87	21.80	23.42	21.99
90.1	20.22	24.92	36.17	12.63	18.54	15.89	20.03	23.11	20.66	22.89
90.2	20.95	25.38	35.19	12.96	20.51	16.61	19.08	23.28	20.78	23.03
90.3	21.39	25.80	36.36	13.69	23.12	17.38	19.50	23.92	20.56	23.60
90.4	20.45	26.88	34.96	12.26	24.22	19.33	20.60	23.76	23.12	23.68
91.1	21.25	27.22	35.65	15.69	23.66	17.90	20.77	24.63	20.46	24.22
91.2	21.76	26.98	34.79	16.62	25.71	17.11	19.43	24.53	21.19	24.20
91.3	23.07	27.84	34.82	14.15	27.65	17.93	19.91	25.13	20.94	24.71
91.4	23.16	28.30	34.28	13.40	27.62	18.06	34.72	26.17	23.71	25.86
92.1	23.92	29.55	34.25	14.58	25.94	16.89	31.86	27.04	21.72	26.50
92.2	23.60	29.28	35.22	13.98	28.67	17.65	25.49	26.49	22.17	26.03
92.3	24.01	29.92	35.95	12.55	29.90	18.18	25.16	26.82	22.17	26.33
92.4	22.21	29.13	34.20	12.26	30.79	17.29	25.18	25.59	22.83	25.23
1988	19.81	23.31	34.66	10.97	17.55	12.63	18.58	21.56	21.41	21.54
1989	19.52	24.17	35.81	12.39	14.16	14.69	20.61	22.15	22.00	22.13
1990	20.76	25.77	35.65	12.83	21.54	17.40	24.14	23.52	21.46	23.32
1991	22.28	27.59	34.88	14.87	26.01	17.78	25.91	25.11	21.74	24.75
1992	23.44	29.46	34.87	13.26	28.62	17.46	20.64	26.48	22.28	26.01

Source: Franklin and Cotterill, op.cit.

Appendix Table 6.5c: Private Label Brand Retail Cheese Sales, by Type, 1988-92.

Year & Qtr	American Cheese	Natural Cheese (Excl Shred)	Natural Shredded Cheese	Spreads & Balls	Imitation Cheese	Ricotta Cheese	All Other Cheese	Sub-Total	Cream Cheese	Total	Percent Change
					----Sales in Millions of Pounds----						
88.1	33.44	28.21	14.10	5.40	0.48	1.80	3.89	87.32	12.59	99.91	
88.2	33.41	26.63	13.35	5.47	0.38	2.61	3.48	85.33	12.28	97.61	-2.30%
88.3	35.57	27.85	13.61	5.10	0.38	2.82	3.70	89.04	11.84	100.88	3.35
88.4	32.24	30.18	15.29	6.62	0.41	4.17	4.03	92.95	20.59	113.54	12.55
89.1	33.15	29.88	16.49	6.91	0.47	3.77	4.19	94.85	13.46	108.31	-4.60
89.2	35.66	28.34	15.27	7.20	0.40	2.62	4.02	93.52	12.86	106.38	-1.79
89.3	35.40	27.92	15.62	6.55	0.36	2.63	4.16	92.65	12.63	105.28	-1.03
89.4	32.69	30.55	17.54	7.65	0.40	4.19	4.56	97.57	21.80	119.37	13.39
90.1	35.78	33.96	18.72	6.38	0.82	3.83	5.02	104.52	13.99	118.51	-0.72
90.2	38.39	34.15	17.12	6.34	0.80	4.05	4.47	105.32	14.85	120.17	1.40
90.3	40.25	33.94	18.43	6.58	0.91	3.44	4.81	108.36	14.12	122.48	1.92
90.4	38.35	39.83	20.54	7.82	0.98	6.10	5.18	118.82	24.94	143.76	17.38
91.1	42.60	40.28	22.62	9.02	1.04	5.45	5.68	126.69	16.43	143.12	-0.45
91.2	43.39	36.87	19.86	8.26	0.90	3.78	4.92	117.99	15.38	133.37	-6.82
91.3	43.67	36.47	20.65	7.48	0.96	3.79	6.08	119.09	15.27	134.36	0.75
91.4	40.73	39.34	22.89	8.44	0.98	5.81	5.89	124.08	25.97	150.05	11.67
92.1	41.98	38.46	24.13	7.52	1.02	4.73	7.08	124.91	16.53	141.44	-5.74
92.2	43.17	37.49	22.32	6.68	0.92	4.86	5.29	120.72	17.13	137.85	-2.54
92.3	43.22	37.18	22.80	6.48	0.96	4.00	5.73	120.38	16.64	137.02	-0.60
92.4	38.66	39.58	24.91	7.88	0.89	5.82	5.07	122.81	26.71	149.52	9.12
1988	134.66	112.87	56.35	ERR	24.25	11.40	15.10	354.64	57.30	411.94	
1989	136.91	116.69	64.91	28.31	1.63	13.22	16.93	378.59	60.75	439.34	6.65
1990	152.77	141.89	74.81	27.13	3.52	17.42	19.48	437.02	67.90	504.92	14.93
1991	170.39	152.96	86.02	33.21	3.87	18.83	22.57	487.85	73.05	560.90	11.09
1992	167.03	152.71	94.16	28.56	3.79	19.42	23.16	488.83	77.01	565.84	0.88

Source: Franklin and Cotterill, op.cit.

Appendix Table 6.5d: Private Label Brand Retail Cheese Sales, by Type, 1988-92.

Year & Qtr	American Cheese	Natural Cheese (Excl Shred)	Natural Shredded Cheese	Spreads & Balls	Imitation Cheese	Ricotta Cheese	All Other Cheese	Sub-Total	Cream Cheese	Total	Percent Change
					----Sales in Millions of Dollars----						
88.1	62.17	72.59	37.70	8.54	0.88	2.36	15.99	200.23	21.78	222.01	
88.2	61.61	67.66	35.17	8.41	0.71	3.57	14.01	191.15	21.65	212.80	-4.15%
88.3	65.81	70.80	36.07	8.35	0.73	3.65	15.11	200.52	21.25	221.77	4.22
88.4	63.22	79.66	42.66	11.67	0.83	5.38	16.71	220.13	34.14	254.27	14.65
89.1	66.04	79.61	46.45	11.78	0.95	4.96	17.27	227.07	23.56	250.62	-1.43
89.2	70.08	75.15	42.34	12.02	0.80	3.70	16.31	220.41	23.19	243.59	-2.81
89.3	72.26	76.53	44.36	11.67	0.74	3.77	17.11	226.45	22.97	249.42	2.39
89.4	73.92	89.56	53.78	14.28	0.85	5.84	19.37	257.60	37.17	294.77	18.18
90.1	82.93	101.08	59.71	12.65	1.74	6.00	21.79	285.90	25.81	311.71	5.75
90.2	87.26	98.48	53.83	12.49	1.74	5.78	18.92	278.48	26.97	305.45	-2.01
90.3	93.25	101.99	59.06	13.12	1.98	5.48	20.61	295.50	26.40	321.90	5.39
90.4	88.75	115.60	65.64	15.69	2.13	8.53	22.55	318.89	42.10	360.99	12.14
91.1	91.71	111.86	68.35	16.90	2.19	7.87	24.53	323.42	28.77	352.19	-2.44
91.2	90.24	100.36	58.93	15.19	1.89	5.59	20.77	292.98	27.75	320.72	-8.93
91.3	93.41	102.55	62.22	13.97	2.02	5.74	23.08	303.00	27.78	330.77	3.13
91.4	90.75	112.91	70.37	16.24	2.06	7.97	22.87	323.17	42.82	365.99	10.65
92.1	93.23	110.25	73.50	14.24	2.15	7.04	25.69	326.10	29.56	355.65	-2.83
92.2	92.63	105.76	67.73	13.01	1.92	6.72	15.95	303.71	30.42	334.14	-6.05
92.3	95.13	109.32	71.06	12.67	2.00	6.23	16.98	313.40	30.04	343.43	2.78
92.4	85.44	115.42	76.80	15.14	1.89	8.12	15.75	318.57	43.19	361.76	5.34
1988	252.81	290.70	151.61	36.96	3.15	14.97	61.82	812.02	98.82	910.84	
1989	282.30	320.86	186.94	49.74	3.35	18.28	70.06	931.52	106.88	1038.41	14.01
1990	352.19	417.15	238.23	53.95	7.60	25.79	83.87	1178.78	121.28	1300.06	25.20
1991	366.12	427.69	259.87	62.30	8.16	27.18	91.25	1242.56	127.12	1369.68	5.36
1992	366.44	440.75	289.09	55.07	7.96	28.10	74.38	1261.78	133.20	1394.98	1.85

Source: Franklin and Cotterill, op.cit.

Appendix Table 6.6a: Total Retail Cheese Sales, by Type, 1988-92.

Year & Qtr	American Cheese	Natural Cheese (Excl Shred)	Natural Shredded Cheese	Spreads & Imitation Balls	Ricotta Cheese	All Other Cheese	Sub-Total	Cream Cheese	Total	Percent Change
				----Sales in Millions of Pounds----						
88.1	143.96	101.29	36.66	28.47	2.28	21.99	19.21	353.86	48.23	402.09	
88.2	144.45	97.11	33.28	26.76	1.95	16.20	18.05	337.80	46.04	383.84	-4.54%
88.3	148.10	98.63	34.11	26.73	1.95	15.51	19.38	344.41	44.02	388.43	1.19
88.4	146.67	107.66	39.29	36.70	2.11	23.90	20.04	376.37	68.52	444.89	14.54
89.1	149.87	102.58	40.73	30.70	2.43	22.87	20.79	369.97	48.86	418.83	-5.86
89.2	151.50	96.91	37.15	31.61	2.31	16.48	19.61	355.57	46.43	402.00	-4.02
89.3	150.40	95.79	37.24	30.18	2.32	15.48	20.16	351.57	45.02	396.59	-1.35
89.4	144.86	107.18	42.61	41.02	2.46	23.15	20.60	381.88	71.31	453.19	14.27
90.1	149.70	113.83	44.69	30.93	3.50	21.12	22.28	386.05	51.51	437.56	-3.45
90.2	152.40	110.84	41.46	29.65	3.10	20.78	21.08	379.31	54.57	433.88	-0.84
90.3	154.73	108.93	42.86	28.72	3.16	17.13	21.60	377.13	52.73	429.86	-0.93
90.4	151.66	120.18	49.14	37.54	3.30	25.86	22.14	409.82	81.27	491.09	14.24
91.1	153.73	117.03	51.82	33.35	3.69	25.64	23.84	409.10	59.03	468.13	-4.68
91.2	151.70	107.07	46.40	28.61	2.95	18.53	22.16	377.42	53.89	431.31	-7.86
91.3	148.44	104.91	48.44	30.31	2.99	17.74	25.79	378.62	54.22	432.84	0.35
91.4	139.20	113.77	54.98	37.06	3.02	26.97	17.69	392.69	80.89	473.58	9.41
92.1	138.90	106.50	58.40	29.41	3.41	23.65	23.89	384.16	55.98	440.14	-7.06
92.2	143.60	105.50	53.25	28.18	2.75	22.97	18.87	375.12	57.68	432.80	-1.67
92.3	144.85	103.89	54.15	30.56	2.86	18.64	20.21	375.16	55.26	430.42	-0.55
92.4	141.05	115.35	61.61	37.20	2.58	28.39	16.31	402.49	85.25	487.74	13.32
1988	583.18	404.69	143.34	118.66	8.29	77.60	76.68	1412.44	206.81	1619.25	
1989	596.63	402.46	157.73	133.51	9.52	77.98	78.25	1458.99	211.62	1670.61	3.17
1990	608.49	453.78	178.15	126.84	13.06	84.89	79.81	1552.31	240.08	1792.39	7.29
1991	593.07	442.78	201.64	129.33	12.65	88.88	80.59	1557.82	248.03	1805.85	0.75
1992	568.40	431.24	227.41	125.35	11.60	93.65	81.16	1536.92	254.17	1791.09	-0.82

Source: Franklin and Cotterill, op.cit.

Appendix Table 6.6b: Total Retail Cheese Sales, by Type, 1988-92.

Year & Qtr	American Cheese	Natural Cheese (Excl Shred)	Natural Shredded Cheese	Spreads & Balls	Imitation Cheese	Ricotta Cheese	All Other Cheese	Sub-Total	Cream Cheese	Total	Percent Change
					----Sales in Millions of Dollars----						
88.1	308.52	308.85	110.08	78.58	4.72	33.19	83.99	927.93	107.00	1034.93	
88.2	309.70	294.95	99.15	73.47	4.10	25.14	76.64	883.15	104.66	987.81	-4.55%
88.3	323.91	303.10	103.33	76.00	4.26	24.50	82.74	917.84	102.43	1020.27	3.29
88.4	333.83	340.31	124.91	108.85	4.88	35.63	89.27	1037.68	147.54	1185.22	16.17
89.1	348.27	326.82	130.63	88.26	5.85	34.75	91.22	1025.80	111.70	1137.50	-4.03
89.2	353.49	311.31	117.76	90.70	5.55	26.52	84.18	989.51	108.40	1097.91	-3.48
89.3	362.35	315.41	121.93	90.55	5.75	25.38	87.53	1008.90	106.94	1115.84	1.63
89.4	382.27	374.04	151.67	131.92	6.51	37.79	97.48	1181.68	158.74	1340.42	20.13
90.1	410.10	405.63	165.08	100.15	9.41	37.74	108.80	1236.91	124.93	1361.84	1.60
90.2	416.60	388.02	152.97	96.37	8.47	34.79	99.16	1196.38	129.77	1326.15	-2.62
90.3	435.90	395.31	162.43	95.86	8.58	31.55	105.72	1235.35	128.41	1363.76	2.84
90.4	433.94	430.06	187.74	128.02	8.80	44.11	109.46	1342.13	182.08	1524.21	11.77
91.1	431.66	410.91	191.71	107.72	9.27	43.98	118.10	1313.35	140.62	1453.97	-4.61
91.2	414.67	371.94	169.39	91.42	7.34	32.69	106.86	1194.31	130.91	1325.22	-8.86
91.3	404.92	368.33	178.70	98.72	7.31	32.03	115.91	1205.92	132.62	1338.54	1.01
91.4	391.89	398.94	205.26	121.18	7.45	44.13	65.88	1234.73	180.59	1415.32	5.74
92.1	389.76	373.16	214.60	97.67	8.27	41.69	80.64	1205.79	136.07	1341.86	-5.19
92.2	392.53	361.22	192.29	93.00	6.69	38.05	62.58	1146.36	137.24	1283.60	-4.34
92.3	396.17	365.40	197.66	100.97	6.69	34.27	67.50	1168.66	135.49	1304.15	1.60
92.4	384.65	396.27	224.57	123.57	6.15	46.95	62.55	1244.71	189.17	1433.88	9.95
1988	1275.96	1247.21	437.47	336.90	17.96	118.46	332.65	3766.61	461.63	4228.24	
1989	1446.38	1327.58	521.99	401.43	23.66	124.44	339.87	4205.89	485.78	4691.67	10.96
1990	1696.54	1619.02	668.22	420.40	35.26	148.19	347.41	5010.77	565.19	5575.96	18.85
1991	1643.14	1550.12	745.06	419.04	31.37	152.83	352.20	4948.31	584.74	5533.05	-0.77
1992	1563.11	1496.05	829.12	415.21	27.80	160.96	360.41	4765.52	597.97	5363.49	-3.06

Source: Franklin and Cotterill, op.cit.

ppendix Table 6.7. Kraft and Private Label Retail Cheese Prices and Price Gaps, by Types, 1988-1992.

	-- Price Per Pound --							
Yr & Qtr	Kraft American Price	PL American Price	Kraft Pvt Label American Price Gap	Percent Kraft Pvt Label American Price Gap	Kraft Spreads & Balls Price	PL Spreads & Balls Price	Kraft Pvt Label Spreads & Balls Price Gap	Percent Kraft Pvt Label Spreads & Balls Price Gap
88.1	$2.27	$1.86	$0.41	22.01%	$2.64	$1.58	$1.06	66.98%
88.2	2.28	1.84	0.43	23.58	2.65	1.54	1.11	72.07
88.3	2.34	1.85	0.49	26.58	2.71	1.64	1.08	65.73
88.4	2.40	1.96	0.44	22.53	2.85	1.76	1.08	61.52
89.1	2.45	1.99	0.46	23.07	2.86	1.71	1.16	67.79
89.2	2.47	1.97	0.51	25.77	2.87	1.67	1.20	72.10
89.3	2.56	2.04	0.52	25.54	2.96	1.78	1.18	66.11
89.4	2.79	2.26	0.53	23.45	3.23	1.87	1.36	72.92
90.1	2.92	2.32	0.60	25.97	3.28	1.98	1.30	65.53
90.2	2.95	2.27	0.68	29.76	3.29	1.97	1.32	66.97
90.3	3.07	2.32	0.75	32.51	3.43	1.99	1.44	72.03
90.4	3.13	2.31	0.82	35.47	3.50	2.01	1.49	74.25
91.1	3.16	2.15	1.01	46.98	3.48	1.87	1.61	85.80
91.2	3.12	2.08	1.04	49.77	3.47	1.84	1.63	88.47
91.3	3.10	2.14	0.96	44.75	3.38	1.87	1.51	81.14
91.4	3.17	2.23	0.95	42.48	3.36	1.92	1.44	74.70
92.1	3.18	2.22	0.96	43.09	3.57	1.89	1.68	88.66
92.2	3.10	2.15	0.96	44.62	3.39	1.95	1.44	74.07
92.3	3.07	2.20	0.87	39.65	3.29	1.96	1.33	68.24
92.4	3.03	2.21	0.82	37.12	3.33	1.92	1.41	73.40
1988	$2.32	$1.88	$0.45	23.79%	$2.72	$1.64	$1.08	66.30%
1989	2.57	2.06	0.51	24.51	2.99	1.76	1.23	70.13
1990	3.02	2.31	0.71	30.94	3.38	1.99	1.39	69.94
1991	3.14	2.15	0.99	46.01	3.42	1.88	1.54	82.11
1992	3.09	2.19	0.90	41.07	3.39	1.93	1.46	75.61

Appendix Table 6.7 (cont.) Kraft and Private Label Retail Cheese Prices and Price Gaps, by Types, 1988-1992.

	-- Price Per Pound --							
Yr & Qtr	Kraft Natural (exc Shred) Price	PL Natural (exc Shred) Price	Kraft Pvt Label Natural (exc Shred) Price Gap	Percent Kraft Pvt Label Natural (exc Shred) Price Gap	Kraft Natural Shred Price	PL Natural Shred Price	Kraft Pvt Label Natural Shred Price Gap	Percent Kraft Pvt Label Natural Shred Price Gap
88.1	$3.36	$2.57	$0.78	30.42%	$3.33	$2.67	$0.66	24.63%
88.2	3.36	2.54	0.82	32.32	3.32	2.63	0.69	26.12
88.3	3.43	2.54	0.89	34.97	3.39	2.65	0.74	28.00
88.4	3.52	2.64	0.88	33.29	3.56	2.79	0.77	27.44
89.1	3.55	2.66	0.89	33.33	3.58	2.82	0.76	27.07
89.2	3.62	2.65	0.97	36.53	3.52	2.77	0.75	26.93
89.3	3.70	2.74	0.96	34.90	3.70	2.84	0.86	30.33
89.4	3.97	2.93	1.04	35.33	4.07	3.07	1.01	32.83
90.1	4.10	2.98	1.12	37.74	4.16	3.19	0.98	30.57
90.2	4.09	2.88	1.21	41.93	4.19	3.14	1.04	33.20
90.3	4.31	3.01	1.30	43.36	4.38	3.21	1.18	36.77
90.4	4.25	2.90	1.34	46.28	4.48	3.20	1.28	40.17
91.1	4.36	2.78	1.58	57.00	4.50	3.02	1.48	48.89
91.2	4.24	2.72	1.52	55.77	4.38	2.97	1.41	47.61
91.3	4.25	2.81	1.44	51.24	4.41	3.01	1.40	46.35
91.4	4.14	2.87	1.27	44.23	4.44	3.07	1.36	44.29
92.1	4.17	2.87	1.31	45.57	4.22	3.05	1.18	38.67
92.2	4.03	2.82	1.21	42.97	4.09	3.04	1.05	34.63
92.3	4.16	2.94	1.22	41.33	4.05	3.12	0.93	29.96
92.4	3.88	2.92	0.96	32.99	4.01	3.08	0.93	30.23
1988	$3.42	$2.58	$0.84	32.75%	$3.41	$2.69	$0.72	26.58%
1989	3.71	2.75	0.96	35.05	3.72	2.88	0.84	29.27
1990	4.18	2.94	1.24	42.28	4.31	3.18	1.12	35.24
1991	4.25	2.80	1.45	51.89	4.43	3.02	1.41	46.68
1992	4.05	2.89	1.16	40.34	4.09	3.07	1.02	33.16

Appendix Table 6.8 Average Retail Price Per Pound of Kraft, Borden, and Private Label Brand American Cheese.

Yr & Qtr	Kraft Brand	Borden Brand	Private Label Brand	Kraft Less Borden	Kraft Less PL
88.1	$2.488	$2.198	$1.859	$0.290	$0.629
88.2	2.461	2.261	1.844	0.200	0.617
88.3	2.535	2.294	1.850	0.241	0.685
88.4	2.659	2.333	1.961	0.326	0.698
89.1	2.687	2.387	1.992	0.300	0.695
89.2	2.641	2.426	1.965	0.215	0.676
89.3	2.745	2.446	2.041	0.299	0.704
89.4	3.049	2.686	2.261	0.363	0.788
90.1	3.205	2.852	2.318	0.353	0.887
90.2	3.188	2.815	2.273	0.373	0.915
90.3	3.304	2.909	2.317	0.395	0.987
90.4	3.395	2.956	2.314	0.439	1.081
91.1	3.407	2.935	2.153	0.472	1.254
91.2	3.308	2.779	2.080	0.529	1.228
91.3	3.328	2.794	2.139	0.534	1.189
91.4	3.411	2.925	2.228	0.486	1.183
92.1	3.290	2.961	2.221	0.329	1.069
92.2	3.225	2.852	2.146	0.373	1.079
92.3	3.211	2.760	2.201	0.451	1.010
92.4	3.238	2.646	2.210	0.592	1.028

Source: Franklin and Cotterill, op.cit.

Appendix Table 6.9a. Market Shares of Company Brand Sales of Processed Cheeses

----Percent Share of Retail Sales in Dollars----

Company	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Kraft	56.0	57.0	57.0	57.8	59.3	59.4	59.6	60.2	59.8	58.3
Borden	8.1	7.5	8.1	8.5	8.1	8.3	8.4	8.0	8.5	8.1
Land O' Lakes	2.2	2.5	3.0	2.9	3.5	4.1	3.9	3.7	4.4	4.4
Fromageries	1.2	1.2	1.2	1.3	1.2	1.2	1.2	1.3	1.3	1.3
Weight Watchers	.5	.4	.5	.6	.7	.8	.9	1.1	1.1	.9
Top Five Cos.	68.0	68.7	69.8	71.0	72.8	73.8	74.0	74.2	75.2	73.1
All Other Cos.	4.3	4.6	5.1	4.8	4.9	3.9	4.4	5.8	6.9	6.8
Generic & Private Label	27.7	28.1	26.9	25.5	23.3	23.3	21.5	20.1	19.7	20.0
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: SAMI Million Dollar Brands
Note: Individual market shares do not always add to 100%.

Appendix Table 6.9b. Market Shares of Company Brand Sales of Natural Cheeses

----Percent Share of Retail Sales in Dollars----

Company	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Kraft	33.2	33.1	32.4	32.5	30.5	29.5	29.3	29.3	30.9	29.7
Sargento	2.3	2.5	2.9	3.2	3.9	4.0	4.6	5.6	6.0	6.5
Sorrento	1.1	1.2	1.4	1.7	2.7	3.2	3.3	3.5	3.3	3.5
Beatrice	3.7	3.5	3.4	3.6	3.9	4.0	3.9	3.8	3.3	3.0
Frigo Cheese Corp	.8	.8	.8	1.0	1.4	1.4	1.6	1.7	2.0	2.1
Top Five Cos.	42.8	43.4	42.8	43.5	43.3	42.5	43.6	44.5	45.5	44.8
All Other Cos.	11.3	9.2	9.1	9.5	10.2	11.6	11.5	11.8	12.1	12.4
Generic & Private Label	45.9	47.4	48.1	47.0	46.5	45.9	44.9	43.7	42.4	42.8
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: SAMI, Million Dollar Brands.
Note: Individual market shares do not always add to 100%.

Appendix Table 6.9c. Market Shares of Company Brand Sales of Cream Cheese

----Percent Share of Retail Sales in Dollars----

Company	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Kraft	69.9	69.3	69.3	69.7	69.3	69.2	70.4	69.6	69.0	69.0
Breakstone	3.6	3.3	3.4	3.6	3.8	3.7	3.6	3.7	3.2	3.0
Bongrain	--	--	--	--	--	.8	.7	.8	1.6	1.6
Anco Intl. Corp.	--	--	--	--	--	1.2	.9	.9	.9	.8
Zausner Food	--	--	--	--	--	--	--	--	--	.3
Top Five Cos.	73.5	73.0	73.1	73.7	73.4	75.2	75.9	75.2	74.9	74.7
All Others (2)	0.3	0.4	0.4	0.4	0.3	0.4	0.5	0.6	0.4	0.4
Generic & Private Label	26.0	27.4	26.9	26.9	27.1	25.0	24.1	24.3	23.9	23.5
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: SAMI, Million Dollar Brands.
Note: Individual market shares do not always add to 100%.

Appendix Table 6.10. Average Retail Prices of Kraft and Private Label Brands

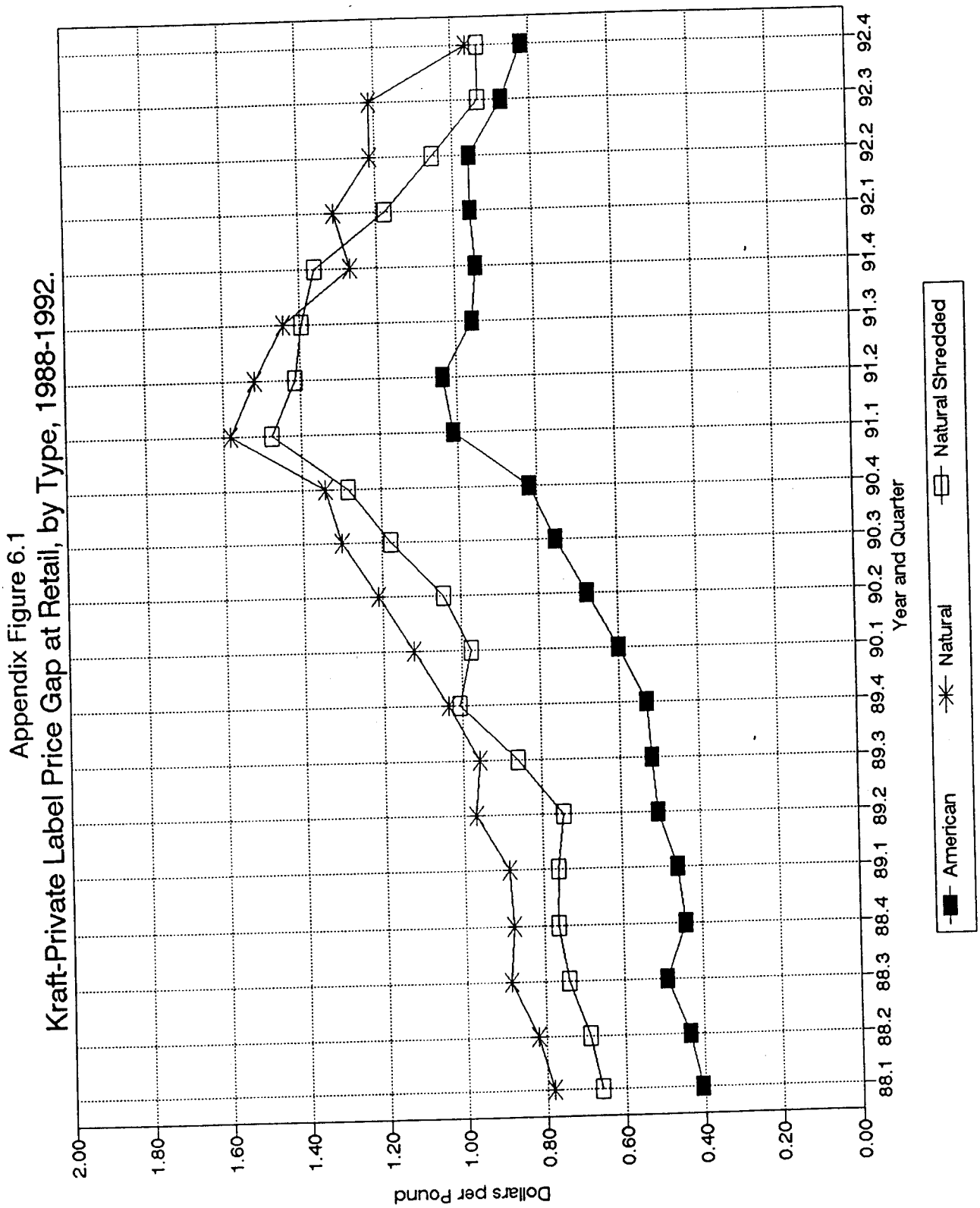
	All Processed Cheese			All Natural Cheeses			Cream Cheese		
	Kraft	PL	% Gap	Kraft	PL	% Gap	Kraft	PL	% Gap
1981	$2.37	$2.01	17.9%	$2.99	$2.52	18.7%	$1.95	$1.54	26.6%
1982	2.50	2.02	23.7	3.08	2.70	14.1	2.03	1.61	26.1
1983	2.55	2.02	26.2	3.16	2.70	17.0	2.09	1.65	26.7
1984	2.60	2.00	30.0	3.25	2.70	20.3	2.18	1.69	29.0
1985	2.63	2.00	31.5	3.30	2.65	24.5	2.25	1.72	30.8
1986	2.63	1.99	32.2	3.33	2.64	26.1	2.30	1.74	32.2
1987	2.68	1.99	34.7	3.37	2.64	27.7	2.39	1.78	34.3
1988	2.76	2.05	34.6	3.45	2.65	30.1	2.47	1.80	37.2
1989	2.87	2.12	35.4	4.03	2.90	39.0	2.53	1.86	36.0
1990	3.31	2.35	40.9	4.55	3.13	45.4	2.56	1.89	35.4
Percentage Point Change 1981-1988			16.7			11.4			10.6

Source: SAMI Million Dollar Brands

Appendix Table 6.11. Retail Prices of Natural and Processed Cheese, Leading Brands, 1981-1990

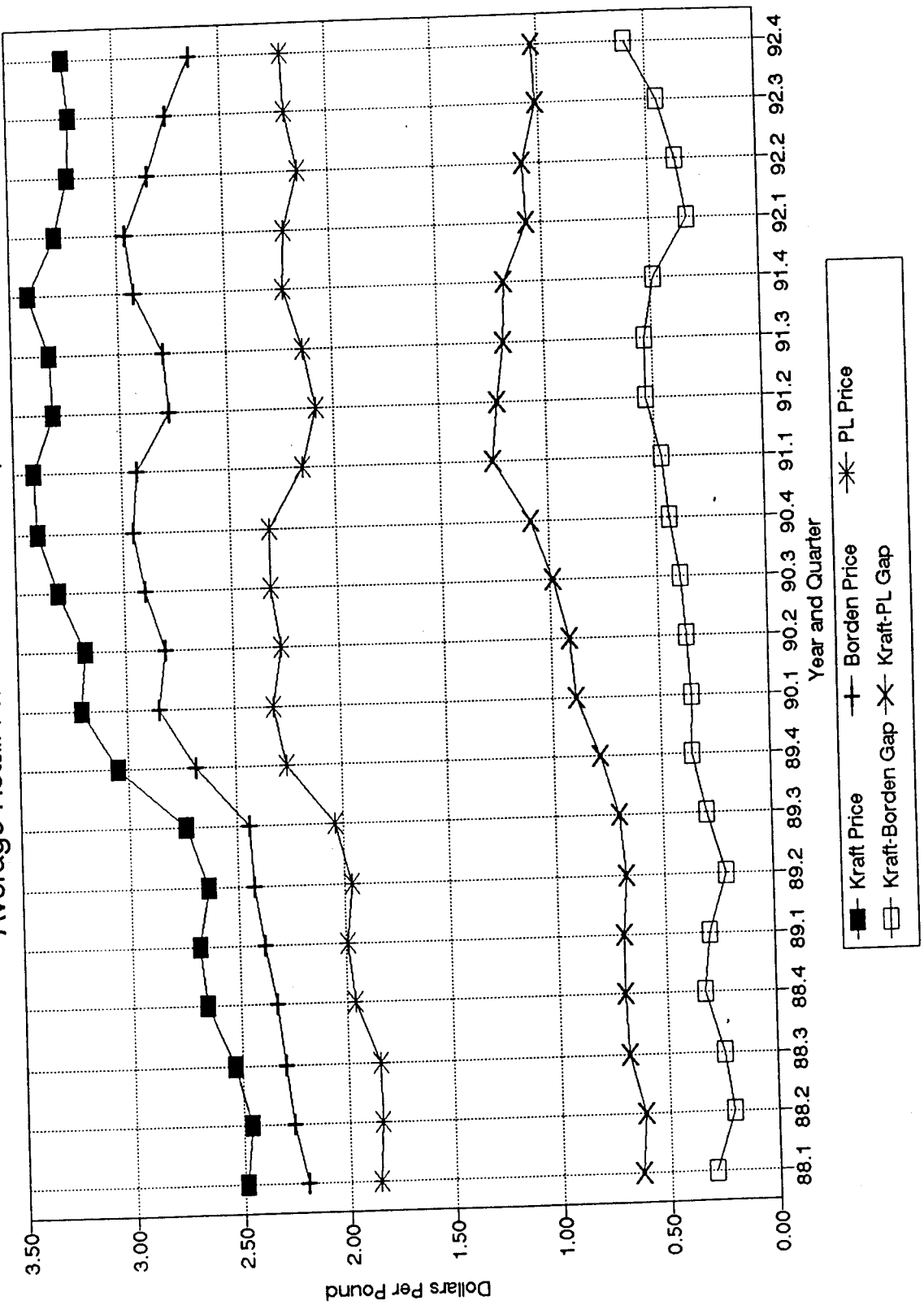
	Price Per Pound			Percent Change		
	1981	1985	1990	1981-1985	1985-1990	1981-1990
NATURAL CHEESE						
Private Label	$2.53	$2.67	$2.91	5.5%	9.0%	15.9%
Kraft						
Cracker Barrel	3.30	3.58	4.50	8.5	25.7	36.4
Harvest Moon	2.67	2.91	3.80	9.0	30.6	42.3
Kraft Brand	3.02	3.38	4.80	11.9	42.0	58.9
Land O' Lakes						
Lake to Lake	2.75	3.11	3.46	13.1	11.3	25.8
Beatrice						
County Line	3.06	3.30	3.92	7.8	18.8	28.1
Pauly	2.45	2.29	2.49	-6.5	7.0	1.6
NCE Blocks	1.358	1.248	1.315	-8.1	5.4	-3.2
PROCESSED CHEESE						
Private Label	2.05	2.08	2.37	1.5	13.9	15.6
Kraft						
Velveeta	1.74	2.09	2.89	20.1	38.3	66.1
Cheez Whiz	2.35	2.59	3.53	10.2	36.3	50.2
Kraft Brand	1.91	2.41	3.26	26.1	35.3	70.7
Borden	2.45	2.48	3.09	1.2	24.5	26.1
NCE Barrels	1.308	1.211	1.279	-7.4	5.6	-2.2

Source: SAMI Million Dollar Brands.



Source : Appendix Table 6.7

Appendix Figure 6.2: Kraft, Borden & Private Label Brands of American Cheese, Average Retail Price and Price Gaps, 1988-1992



Source: Franklin and Cotterill, op.cit.

Chapter 7--Summary, Conclusions, and Policy Initiatives

A. Introduction

Cheese is the most important manufactured dairy product in the U.S. commanding 85 percent of the milk from Wisconsin and 33 percent of all milk in the U.S. However, the price of cheese has even more effect on the nation's dairy farmers than these figures suggest. Cheese prices largely determine the manufactured grade milk price (previously the M-W price but now the Basic Formula Price), which is the main driver of farm milk prices throughout the country.

In 1992 sales of cheese manufacturers and marketers were about $16 billion. Bulk natural cheese generally goes from the cheese manufacturing plants to one of two types of converting operations: about three-fourths of natural cheese goes to cut and wrap operations which convert bulk cheese into the form, size and package desired by end-users; the remaining one-fourth goes to processing plants which grind, emulsify and blend natural cheese (usually with the aid of heat) to make processed cheese, cheese foods and cheese spreads.

Most cheese converters market finished natural or processed cheese products to one or more of three main types of customers: roughly 40 percent of all cheese is sold to retail food stores, 44 percent to food service, and the remaining 16 percent is sold to other food manufacturers (industrial accounts). Brands such as Kraft, Sargento and Borden are primarily important in cheese sold through food stores. Leading brands of cheese are sold at substantial premiums over private label or store brand cheese. Margins on cheese sold to food service and industrial accounts are similar to those on private label cheese.

We estimate that the largest four manufacturers of natural cheese accounted for about 29 percent of total pounds made in 1992. Most of the leading manufacturers are also involved in

either cheese processing or the marketing of natural cheese. However, some of the leading processors/marketers make little or no natural cheese (i.e., Schreiber, Borden, Sargento). The largest four marketers of processed and natural cheese account for about 38 percent of the total *pounds* sold. The Census Bureau reported that in 1992 the four largest cheese companies made 42 percent of the *value* of all natural and processed cheese shipments. Thus, overall both cheese manufacturing and cheese marketing are only moderately concentrated.

B. Cheese Pricing and the NCE

The commercial cheese industry in the United States began in the 1840s and by 1870 boasted over 1300 cheese factories, located predominantly in Wisconsin and New York State. Initially cheese factories conducted business individually with dealers. But by the 1870s so-called "dairy boards" were established, where factory representatives and cheese dealers met and engaged in organized trading. These dairy boards and their successors evolved into the current National Cheese Exchange located in Green Bay, Wisconsin.

The National Cheese Exchange, often referred to herein as the NCE or the Exchange, is a centralized cash auction market trading 40-pound blocks (640-pound blocks were added in 1994) or 500-pound barrels of cheddar cheese in carlots of 40,000 pounds. In recent years the NCE has had 30 to 40 members consisting of cheese manufacturers, marketers, brokers and customers. Trading typically occurs from 10:00 a.m. to 10:30 a.m. each Friday.

During 1988 to 1993 just 0.2 percent of all bulk cheese was traded on the NCE. About 90-95 percent of bulk cheese sales involved direct supply arrangements using written or verbal "committed supply" agreements, often one year in duration. Another 5 to 10 percent involved spot market transactions.

Although only a tiny share of all bulk cheese transactions occurs on the NCE, it serves as the primary price discovery mechanism for bulk cheese transactions.. Virtually all long-term bulk cheese contracts (not merely cheddar cheese) use so-called *formula price contracts,* which spell out various terms of trade as well as an agreed upon price premium over the closing weekly NCE opinion or price. Spot sales also are priced "off the NCE"; however, premiums are negotiated for each transaction and may vary somewhat from week to week. On committed supply agreements, prenegotiated premiums often apply for extended periods so that transaction prices move in lock-step with NCE prices.

NCE prices are also used in formula pricing some cheese sold wholesale to retailers and food service companies, especially private label and weak cheese brands. Historically, this practice tended to "couple" the wholesale price of cheese with the NCE price. Since about 1985 the extent and closeness of such coupling has declined, as some companies adopt wholesale list prices that change infrequently or modify the terms of formula price contracts.

C. Potential Problems of Thin Markets

Because such a small share of total bulk cheese transactions occur on the NCE, it is what market analysts call a "thin" market. Formula pricing and thin markets often go together. As firms adopt formula pricing--i.e., trading off a price established by someone else--the residual market declines in volume. Thin markets like the NCE are primarily a potential problem where they serve as a widely used reference price and hence become highly leveraged. The incentive to influence the NCE would be very different if it were used to price 5 percent of bulk cheese sales rather than the estimated 90 to 95 percent. As it is, during 1988-1993, the price on 0.2

percent of all cheese produced was used in setting the price on 90 to 95 percent. That simple fact creates a great incentive for attempting to influence the NCE.

Economists have identified several possible adverse consequences of thin markets including manipulation of price, incorrect price signals causing misallocation of resources, and increased price volatility due to market illiquidity. Thinly traded markets do not necessarily perform poorly if there is sufficient volume "waiting in the wings" and if no single firm (or group of cooperating firms) is large enough to influence price to its (their) advantage. The critical issue lies in having a sufficient volume of potential traders who will participate in price determination should price depart from the competitive level. Supply and demand in the thin central market may not accurately represent aggregate supply and demand conditions, especially if only a few firms trade in the central market, but virtually all firms use prices generated there in formula price arrangements. Even if a non-trader believes that the central market price is inaccurate, he may continue to use formula pricing since doing so reduces his transaction costs. Thus, for a given product the competitive structure of a thin central market may differ significantly from that of the aggregate market. The cheese industry illustrates this principle since the NCE is far more concentrated than either the buying or selling side of the aggregate market. The nature of competition in a central market is affected when some of its traders enjoy *strategic competitive advantages* over other actual and potential traders. As shown below, such advantages may cause the thinly traded central market to become a submarket within the larger aggregate market, with prices for both set in the central market.

The various stages of the cheese subsector fit the economic definition of moderately concentrated oligopolies. In sharp contrast, NCE trading is highly concentrated in both buying

and selling, and it has a dominant seller-trader--Kraft General Foods, Inc., owned by Philip Morris Companies Inc. During 1988-1993, Kraft made 74 percent of all NCE sales and the next largest seller a mere 6 percent, with the top four seller-traders together accounting for 88 percent. During this period, the leading buyer-trader made 35 percent of all NCE purchases while the top four buyer-traders together came in at 81 percent. The degree of concentration was even greater in barrel trading, which accounted for 68 percent of all NCE sales and often appeared to drive block prices. During 1988-1993, Kraft made 83 percent of all barrel sales, a substantial percentage increase over the 1980-1987 period, when Kraft made only 25 percent of all barrel sales.

D. NCE Functions and Trader Motivations

Essential to understanding the trading conduct on the NCE is the proper identification of its functions: (a) to provide a cash market where members may buy and sell cheese and (b) to establish a "market opinion" price for bulk cheese, based on the day's last sale, highest bid, or lowest offer. There are, however, conflicting beliefs as to the primary reason traders use the Exchange. One view is that leading traders use the Exchange primarily as an alternative outlet or source of cheese; the second view is that they trade primarily to influence NCE prices, which are used in formula pricing bulk cheese bought and sold elsewhere.

If traders use the NCE primarily as an alternative outlet or source of supply, their trading patterns on the Exchange should be similar to those in any *bona fide* cash agricultural auction market: (a) traders that manufacture and sell most of their bulk cheese off the NCE should be mainly sellers on the NCE and (b) traders that normally buy most of their bulk cheese from others off the NCE for processing and marketing purposes should be mainly buyers on the NCE.

On the other hand, if firms trade primarily to influence NCE prices, their trading conduct may often be the reverse of that expected in *bona fide* cash agricultural auction markets.

We tested these conflicting hypotheses by examining trading patterns over the 1980-1993 period. During 1980-1987, cheese companies that sold bulk cheese off the NCE were predominantly sellers on the NCE, while cheese marketers that bought bulk cheese off the NCE were predominantly buyers on the NCE--as expected in a bona fide cash auction market. This trading pattern was reversed during 1988-1993, when some leading marketers became predominantly sellers and several leading manufacturers became predominantly buyers.

The most significant reversal was that of Kraft, the largest buyer of bulk cheese off the NCE. During the seven years, 1980-1986, Kraft bought 411 loads on the NCE while selling only 175 loads. However, beginning in August 1986, Kraft became *exclusively a seller-trader* on the NCE.[1] Also, beginning in 1988, three leading agricultural cooperative cheese manufacturers reversed their role, from being mainly sellers to being mainly buyers on the NCE. The cooperatives reversed their trading conduct more than one year after Kraft had become the leading seller-trader, suggesting that their reversals were a response to that of Kraft.

The shift in trading patterns occurred at the same time that the NCE became more important in the cheese price discovery process. During 1980-1987, cheese prices were strongly

---

[1] From August 1986 through 1993, Kraft sold 2,043 loads and bought 22 loads. The 22 loads of blocks were evidently purchased for the purpose of influencing the price spread between blocks and barrels on the NCE, not because Kraft needed blocks at the time. Also, on two occasions Kraft bid to buy barrels; neither bid was filled. However, these bids evidently were made to *signal* its approval of an increasing price trend, not because Kraft needed more barrels. See Chapter 5, Section E. Thus, the above buyer-type actions were actually ancillary to Kraft's seller-trading activity, not the actions of a bona-fide buyer-trader.

influenced by the government price support program. There was little opportunity for firms trading on the NCE to have much influence. As support prices declined, cheese prices became more market driven. The volatility and range of cheese prices increased sharply during 1988-1993. In this environment, cheese companies had both greater opportunity and greater incentive to influence prices.

In sum, the trading patterns of leading cheese manufacturers and marketers during 1980-1987 is consistent with the hypothesis that leading traders use the NCE as an alternative outlet or source of cheese. Trading conduct during 1988-1993, however, is consistent with the hypothesis that some leading traders are motivated primarily by a desire to influence NCE prices.

E. Business Characteristics of Leading Traders

Differences in the business characteristics of leading traders help explain why some were primarily buyers and others primarily sellers on the NCE during 1988-1993. Essentially some traders benefit from higher NCE prices and some from lower NCE prices, other things being the same. To understand this concept, one must determine how an individual company's input costs and selling prices are related to NCE prices.

We examined the business characteristics of the nine leading traders on the NCE, who together accounted for 94 percent of all purchases and 94 percent of all sales during 1988-1993. Five of these traders--Kraft, Borden, Alpine Lace, Beatrice, and Schreiber--are primarily cheese marketers; three are agricultural cooperatives and major manufacturers of cheese: Mid-America, Land O' Lakes, and AMPI; and one is a broker: Dairystate Brands.

As cheese marketers, Kraft, Borden, Alpine Lace, Beatrice and Schreiber have certain characteristics in common. They all buy bulk cheese from manufacturers at NCE-based formula

prices. NCE prices also largely determine the cost of milk used in making cheese and thus are the dominant influence over the cost of cheese-making in supplier plants.

There are, however, significant differences among these five cheese marketers. Kraft, Borden, and Alpine Lace all sell cheese under their own brand names. Kraft sells about 75 percent of its finished cheese products to retailers under highly differentiated Kraft brands that command significant price premiums over lesser brands. Borden, the second largest marketer of branded processed cheese to retailers, sells nearly all of its cheese under the Borden brand, which also commands a substantial price premium over private label and weaker brands but a lower premium than Kraft brands.

Beginning in 1985, Kraft quit linking wholesale cheese prices to NCE prices and instead sold its brands at wholesale list prices, which frequently remain unchanged for many months. Since then there has been little correlation between NCE prices and the wholesale prices of either Kraft brands or those brands that often follow Kraft's prices. Although Kraft cannot set list prices entirely independently of other cheese brands, the relative strength of its brands gives it a significant degree of discretion in pricing. Like Kraft, Borden and Alpine Lace also sell finished product to retailers at list prices not coupled to NCE price.

Raw material inputs for processed cheese and finished natural cheese are predominantly bulk natural cheese and other dairy products. These inputs account for roughly 75 to 85 percent of the cost of finished cheese products. Profit margins for these three companies come mostly from the difference between the cost of cheese they buy or make and the wholesale price of finished product they sell. Since the bulk cheese they buy is priced off the NCE, and since the cost of bulk cheese constitutes such a large part of total manufacturing costs, Kraft, Borden and

Alpine Lace all have a strong financial interest in lower NCE prices, all else remaining the same. There is also documentary evidence that implies Kraft believed it could influence NCE prices.

Beatrice and Schreiber differ somewhat from the other three marketers in that neither has strong consumer brands for its finished cheese products. Beatrice sells its products predominantly as private label brands and weak company brands to food service companies, food retailers and industrial users. Schreiber, which is predominantly a processor and marketer of processed cheese products, makes a substantial majority of its sales to food service customers, particularly fast food chains. Most of its remaining sales are to food retailers, largely as private label or store brands and weak Schreiber brands. Therefore, both Beatrice and Schreiber sell to their customers at wholesale prices that are either formula-priced off the NCE or else which compete with products of other sellers that formula-price.

Since Beatrice and Schreiber apparently sell their products at essentially NCE-based formula prices rather than for a list price, both their buying and selling prices are expected to generally follow the NCE. Thus, their ultimate interest in the level of NCE prices is likely to differ from that of Kraft, Borden, and Alpine Lace. Even though a marketer may buy a good share of its bulk cheese,[2] the fact that it buys bulk cheese and sells processed cheese and cheese foods at NCE-based formula prices means it may profit from higher NCE prices. Since bulk cheese costs may represent 70 percent or less of the total cost for making *processed* cheese products, an increase in NCE price will increase the wholesale price of the finished products by more than the cost of making these cheeses, all else being the same.

---

[2] Beatrice makes between 50 and 75 percent of its total cheese sales needs, although it buys practically all of the barrel cheddar used in making processed cheese. During 1988-1993, Schreiber bought the bulk of its cheese requirements (from committed suppliers, from the spot market, and the NCE).

Beatrice and Schreiber also may have other motives for NCE trading. Both were primarily buyers on the Exchange during both 1980-1987 and 1988-1993. Thus, their trading pattern has been consistent with that expected of a cheese marketer who looks to the Exchange as a supplemental source of supply. The NCE is often the lowest cost source of bulk cheese. Thus, both Beatrice and Schreiber have an incentive to buy when NCE prices are below those in the spot market. But the amount they can purchase is limited by how much their bulk cheese needs exceed the amount they get from committed suppliers. Both may also have purchased on the NCE in an effort to prevent decreases in the value of their inventories. However, both also appear to sometimes participate in bidding up prices in rising markets for the apparent purpose of raising NCE prices rather than expecting to buy since none of their bids are filled. On balance, however, the potential benefit of higher NCE prices to either company seems modest compared to the potential benefits marketers with strong brands may derive from lower NCE prices.

The three leading agricultural cooperative buyer-traders have two reasons for preferring higher NCE prices. First, the farmer-members of cooperatives benefit directly from higher prices for milk used in making cheese. Second, insofar as cooperatives sell some cheese under private label or weak brands of processed cheese, they have the same interests as Beatrice and Schreiber in higher NCE prices, although the potential benefits from this source are modest.

Since Dairystate is a broker, its interest in NCE prices presumably reflects those of its customers. Insofar as its customers are mostly small cheese manufacturers, it should be primarily a seller on the NCE, as it was during both 1980-1987 and 1988-1993. We are not satisfied, however, that we understand the motivation for much of Dairystate's NCE trading,

particularly its activity in prolonged rising or declining price trends when there is little or no real prospect of consummating a transaction.

In sum, the business characteristics of traders determine whether, other things being the same, they benefit from lower NCE prices or higher NCE prices. Based on our analysis of the business characteristics of leading traders, we hypothesize that the leading cheese traders fall into three categories: (a) traders benefitting from lower prices: Kraft, Borden and Alpine Lace; (b) traders benefitting somewhat from higher prices: Beatrice, Mid-Am, Schreiber, Land O' Lakes, and AMPI; (c) a trader with a neutral interest: Dairystate Brands. Thus, if traders use the NCE primarily to influence prices, their interests in the level of NCE prices explain why traders in category (a) are predominantly seller-traders and those in category (b) are predominantly buyer-traders.

F. Spot Trading as an Alternative to the NCE

Analysis of the "spot market" provides further evidence concerning the motives of leading traders on the NCE. Whereas the NCE centralizes trading at one location for about 30 minutes each Friday, the spot market is comprised of direct transactions at negotiated prices among cheese companies for the purpose of handling short-term shortages or surpluses. (As used here, the term "spot market" refers only to those spot sales made off the NCE, although the NCE is also a spot market.) During 1988-1993, 5 to 10 percent of *all* manufactured cheese (all types and ages) was sold in the spot market, whereas about 0.2 percent was sold on the NCE. The fact that spot sales substantially exceed NCE sales (even for the types sold on the NCE) raises a question as to whether the NCE is needed as an alternative source of supply and a place to dispose of surplus. Some of those believing this function of the NCE to be essential

evidently view it as a market of last resort, a place to which buyers or sellers turn because other alternatives are unavailable. This rationale for Exchange trading is most plausible for small cheese manufacturers with limited knowledge of market alternatives. However, even small cheese companies rely predominantly on the spot market in disposing of surplus cheese. And brokers selling for small companies use the spot market far more than the Exchange.

Limited knowledge of market alternatives is an implausible reason for large companies to trade on the Exchange. Such companies have quite extensive knowledge of market alternatives and frequent communication with prospective buyers and sellers.

Most cheese companies prefer the spot market because it has substantial advantages over NCE trading, including the following:

-- Spot traders are able to establish more precise delivery, age and quality specifications than are NCE traders.
-- Spot transactions may occur any time during the business week rather than during the typical NCE trading period of about 30 minutes each Friday.
-- NCE sales are F.O.B. within 200 miles of Green Bay. Plants located some distance from Green Bay may often avoid the freight charges associated with NCE transactions by trading in the spot market.
-- Spot traders need not pay the 0.25 cent per pound charge assessed to both the buyer and seller on NCE trades.
-- Spot market trading provides an opportunity to trade at prices not immediately known to competitors. In competitive markets, firms departing from the prevailing price generally do not wish to communicate this information to others.
-- The thinness of the market and its widespread use in formula pricing discourage large cheese manufacturers and marketers from using the Exchange *as an alternative outlet or source of supply* because doing so may adversely affect the price they pay or receive for contract purchases. Hence, the logical buyers and sellers in competitive cash auction markets are discouraged from using the NCE as bona fide buyers or sellers. Spot trades do not create this conflict because the prices of committed supply agreements are not linked directly to spot prices.

Given this list of spot market advantages, it is not surprising that NCE prices generally have been lower than spot market prices for comparable cheese. The lower prices can make the NCE an attractive, though less reliable, source of supply for buyers who need more cheese than they receive from committed suppliers. Of course, lower prices on the NCE do not explain why a large company would prefer to sell there. Indeed, it is difficult to identify any reasons why a large company would prefer to sell on the NCE rather than in the spot market, other than to influence the market price.

Kraft's publicly stated reasons for selling on the NCE are that (a) it always builds a surplus into its annual plan, and (b) it must take the entire output of its committed suppliers. But while Kraft always plans for some surplus--and occasionally has unplanned surpluses or shortages--these reasons explain neither its large sales on the NCE nor its exclusive seller-trader status from August 1986 through 1993. Analysis of Kraft's operations reveals that it can--and usually does--manage surpluses in one of three other ways: by reducing the amounts taken from committed suppliers (so-called "deprocurement"), by selling in the spot market, and by selling to the CCC when the option is available. For example, when in 1990-1991 Kraft faced the largest unplanned surplus in recent years, it sold a relatively minor part of the total surplus on the NCE. Most, if not all, cheese sold on the NCE could have been placed in inventory or sold more profitably to the CCC and in the spot market. Instead, Kraft chose to sell on the NCE at prices below the CCC support level. After prices rose above the support level in 1991, Kraft sold on the NCE for the apparent purpose of moderating an upward price trend.

On barrel and block sales for the entire 1987-1992 period, Kraft calculated that it *lost* an average of 2.40 cents per pound on NCE sales, *gained* an average 2.65 cents per pound on spot

sales, and *gained* an average of 0.19 cents per pound on CCC sales. Thus, there was a net differential of about 5 cents per pound between the loss from NCE sales and the gains from spot sales. (The comparisons include only sales of 40-pound cheddar blocks and 500-pound cheddar barrels, the cheese types sold on the NCE in 1988-1993.) To sell on the Exchange at a loss when other more profitable outlets are available constitutes trading against interest; i.e., it is irrational business conduct unless Kraft expected to influence NCE prices to its benefit. The profit-loss calculus to justify selling at such a loss is straightforward. Although Kraft lost about $1.5 million on NCE sales during 1987-1992, every 1 cent per pound reduction in NCE prices lowered Kraft's raw material procurement costs by over $10 million *annually*.

When considering whether or not the NCE as presently functioning is necessary as an alternative outlet, it is important to recall that a fragmented but geographically centralized cheese industry gave birth to the NCE and its predecessors in 1918. Since then manufacturing has become increasingly consolidated, with the number of cheese plants falling from about 4,000 in the early 1900s to 508 by 1987. Only 216 companies had annual sales over $100,000, the 50 largest of which made 82 percent of all natural and processed cheese shipments. Moreover, in 1920, two years after the predecessor of the NCE was established, Wisconsin accounted for 64 percent of the value of all cheese shipments; by 1994 Wisconsin's share of U.S. cheese production (in pounds) had declined to 30 percent. Over the period cheese production in the Western Region grew from about 6 percent to nearly 25 percent.

This geographic decentralization of manufacturing and decline in firm numbers, together with improved communications and transportation, has made obsolete a central cash auction market where buyers and sellers physically meet. Other food and nonfood manufacturing

industries have demonstrated that they can effectively manage unexpected shortages and surpluses without central cash markets, depending instead entirely on adjustments in supply, trades in spot markets, and inventory adjustments. Viewing the NCE in the context of the evolving cheese industry raises questions as to whether the NCE, as it currently functions, has become an anachronism.

G. Trading Activity of Leading Traders, 1988-1993

During 1988-1993 there was a cyclical pattern to cheese prices each year caused by seasonal variation in overall supply and demand conditions. Prices typically were lowest in February and March, the beginning of the flush production; prices typically rose thereafter until they peaked in late summer or fall.

Overall supply and demand conditions determine the broad contour of prices over each price cycle. But given the high inelasticity of short-run supply and demand, there often is a range of prices that will clear the market at each point on the cycle. This gives traders with market power a range within which they may influence the price established each week on the NCE. Such traders might not always seek the *lowest or the highest* price possible each trading session; rather, they might choose to periodically influence prices over a price cycle when they believed doing so would aid in achieving their profit goals.

Leading traders on the NCE may be divided into two groups based on their differing financial interests in the level of NCE prices, other things being the same. Kraft, Borden and Alpine Lace apparently benefit from lower NCE prices, whereas Beatrice, Mid-Am, Schreiber, Land O' Lakes and AMPI apparently benefit from higher NCE prices, other things remaining the same. During 1988-1993, leading traders in the first group were predominantly seller-traders

on the NCE, selling 1806 loads and buying 57 loads. Those in the second group were predominantly buyer-traders, buying 1947 loads and selling 93 loads. The two groups made 91 percent of all purchases and 86 percent of all sales. The leading seller-trader was Kraft, which made 74 percent of all sales, and the leading buyer-trader was Beatrice, which made 35 percent of all purchases.

Over each price cycle, the seller-traders, led by Kraft, usually traded most actively at price tops, price bottoms, and intermittently when prices were rising. At price bottoms, Kraft sometimes appeared to fill as many bids as required to keep prices at or near the seasonal low. Between a price bottom and the next price top, buyer-traders appeared to bid up the market, often with few consummated sales. During periods of rising prices, the seller-traders, led by Kraft, appeared to signal implicit approval of rising prices by not participating in trading, occasionally signaling explicit approval of rising prices by joining buyers in submitting bids, and signaling disapproval of rising prices by actively selling into a rising market, thereby moderating upward price trends. When seller-traders ceased selling, the upward price trend usually continued. At price tops Kraft often initially filled bids with the effect of slowing or stopping the upward trend. Thereafter, Kraft led in filling bids and in offering to sell as the market topped and began to subside. Once a downward price trend was established, Kraft frequently continued making offers to sell--often joined by Borden and Alpine Lace and sometimes by other traders. Generally, little actual selling was required to maintain a downward price trend, since with prices falling everyone in the marketing chain generally withheld purchasing, thereby delaying inventory accumulation until prices hit bottom. The apparent effect of seller-trader activity, led by Kraft, often was to shape the pattern of NCE prices over a price cycle.

The trading conduct of the two smaller seller-traders, Borden and Alpine Lace, differed from Kraft's in an important respect: whereas Borden made 30 percent of all offers to sell barrels during 1988-1993, it made only 4 percent of all barrel sales. Likewise, Alpine Lace made 30 percent of all offers to sell blocks but made only 5 percent of all block sales. The apparent explanation for these disparities in the pattern of offers and sales is that when buyer-traders began buying heavily, Borden and Alpine Lace generally became inactive, leaving Kraft to assume the losses that usually accompanied heavy selling. Thus, Kraft clearly dominated selling activity on the NCE.

Leading seller-traders were confronted by a small group of buyer-traders, led by Beatrice in barrels and Mid-Am in blocks. The buyer-traders were most active at price bottoms and during upward price trends. At price bottoms they exerted upward pressure on the market by covering offers (usually Kraft's) or making bids (usually filled by Kraft). Whenever Kraft stopped filling bids at a price bottom, buyer-traders actively bid up prices, usually with few or no sales, sometimes for many successive weeks. The buyer-traders appeared to be a less cohesive group than the seller-traders, since at times some buyer-traders sold when others were buying.

Overall trading patterns imply that the seller-trader activity exerted a downward influence on price, and the buyer-trader activity exerted an upward influence on price. For example, during the days Kraft and the other leading seller-traders were active on the NCE, prices *increased* during only 8 percent of the sessions, whereas they *decreased* during 43 percent of the sessions and *remained unchanged* during 22 percent of the sessions. And in 27 percent of

the sessions their selling activity *moderated upward price trends*. The same general pattern existed in block trading as in barrels.

The apparent influence of buyer-trader activity was the mirror image of leading seller-trader influence, but less pronounced in its effect. During the days leading buyer-traders were active, barrel prices *increased* on 45 percent of the days, *decreased* during 30 percent of the days, and *remained unchanged* on 25 percent of the days.

H. Kraft Trading Activity 1990-1992

An in-depth analysis of Kraft's trading activity during 1990-1992 provides insights into the apparent motives and consequences of Kraft's conduct, especially during cyclical price bottoms. For example, after a large price decline during January and the first week of February 1990, prices remained virtually unchanged for two months. The low prices apparently did not fully reflect market fundamentals but rather Kraft's persistent heavy selling on the NCE. Neither Kraft nor the industry had excess inventory at the time. Indeed, the market was quite tight with many cheese companies seeking supplemental supplies in the spot market. Market supplies would have been even tighter had not some companies apparently delayed building inventories because they feared prices might fall even lower. Whereas Kraft incurred losses on its NCE sales during this period, the evidence indicates that it often could have made profitable sales in the spot market.

The evidence does not support the idea that Kraft's large NCE sales during February-March 1990 were motivated primarily by a need to dispose of surplus cheese on the NCE. Kraft documents reveal that its top purchasing officials did not believe a surplus existed or loomed on the horizon. Insofar as Kraft had any short-term supply imbalances, these could have been

managed by increasing inventory modestly or by making more spot sales, the predominant methods used by Kraft and other large firms in handling surpluses in periods when price supports were not operative.

Although NCE barrel prices fell 30.5 cents per pound between the January high and the February and March lows, Kraft lowered its average net wholesale processed cheese prices by only 5 cents per pound during the same period. As a result, Kraft's gross profit margins on cheese reached record highs during February and March 1990.

This and other evidence presented in this analysis support the hypothesis that Kraft's trading activity was motivated primarily by a desire to influence NCE prices, not to dispose of surplus cheese. During 1990-1992, Kraft managed its surplus problem predominantly by reducing procurement of bulk cheese, selling in the spot market, and selling to the CCC when available. Kraft's overall NCE sales were *unprofitable*, whereas its spot and CCC sales were *profitable*. There is evidence that Kraft chose to sell cheese on the Exchange at a loss when it could have more profitably made the sales elsewhere. Such conduct constitutes *trading against interest*, the practice of purposely not selling at the profit-maximizing price. In the context of NCE trading, this implies the seller anticipates the unprofitable NCE sales will enhance company profits by lowering prices paid for bulk cheese purchased under NCE-based formula price contracts.

I. Econometric Analysis

In addition to the analyses of trader motives, overall trading patterns and the in-depth analysis of Kraft's conduct, we made several econometric analyses of NCE prices. The analyses sought to estimate quantitatively the relationship between NCE prices and various independent

variables. Two alternative estimating techniques were used in examining the relevant relationships.

The analyses tested the hypothesis that during 1988 through 1993, trading by Kraft and the other leading seller-traders had a negative influence on NCE prices, and that trading by leading buyer-traders had a positive influence on prices. The first analysis found a statistically significant *negative* relationship between NCE prices and leading seller-trader activity. The analysis found a very modest *positive*, but *not statistically significant*, relationship between NCE prices and the activity of leading buyer-traders.

The analysis implies that when at least one of the three leading seller-traders, dominated by Kraft, was active each week of a month, the average block and barrel price for the month was 4 to 5 cents per pound lower than if none of these traders had been active during the month. (These estimates are expressed in 1993 dollars.) So, if these traders were active during half of the weeks in a year, block prices would have averaged 2 to 2½ cents less for the entire year.

A separate analysis was made estimating Wisconsin Assembly Point (WAP) prices rather than NCE prices. This was done to determine whether the findings regarding NCE prices were representative of the actual transaction prices for the 90-95 percent of bulk cheese sold under committed supply agreements using NCE-based formula prices. These formulas typically include a premium over the relevant NCE price, with the size of the premium varying somewhat with changes in overall market conditions. Hence, NCE prices do not reflect precisely the actual transaction prices paid under committed supply agreements.

To determine whether this potential shortcoming of NCE prices significantly affected the relevance of our results, we substituted in our estimating equations average WAP prices, which

are the prices paid on spot transactions at Wisconsin assembly points. WAP prices generally are higher than NCE prices with the size of the premium influenced by market conditions. Our results using WAP prices are very similar to those using NCE prices. These results indicate that NCE prices are representative of the NCE-based formula prices for bulk cheese sold under committed supply agreements.

In sum, these analyses provide quantitative support for the hypothesis that the leading seller-traders--dominated by Kraft--were successful in reducing NCE prices when they participated in trading. In doing so they lowered the price of bulk cheese sold by cheese manufacturers at NCE-based formula prices. The trading activity of leading buyer-traders, however, had no statistically significant influence on prices.

J. Conclusions

The National Cheese Exchange and its predecessors have been subject to periodic criticisms and questions since their inception. It is easy to understand why. This tiny market in Green Bay, Wisconsin, operates for about 30 minutes each week with trades averaging 0.2 percent of total cheese volume during 1988-1993, yet the NCE price is used to formula-price virtually all bulk cheese transactions. This enormous leverage and the concentrated nature of trading raises questions of whether the NCE may be subject to manipulation for the benefit of some traders.

During the 1970s and through the mid-1980s, cheese prices were determined largely by government price supports for cheese; prices on the NCE seldom moved far from the CCC price. Thus, there was less opportunity and incentive for firms to manipulate the NCE. As price supports and CCC stocks declined, the role of the NCE in cheese pricing changed. Cheese prices

became increasingly market driven, price volatility increased sharply, and in this environment the potential pay-off from "managing" NCE prices increased.

During 1988-1993, the NCE apparently did not perform the functions expected of a *bona fide* cash auction market serving primarily as a supplemental outlet or supply. In *bona fide* cash agricultural auction markets, price determination is the *result* of trading, not the *purpose* of it. However, the evidence presented in this report provides considerable support for the hypothesis that during 1988 to 1993, leading seller-traders and, to a lesser extent, buyer-traders, engaged in trading primarily to influence NCE prices.

There is evidence that in recent years Kraft has been the market leader on the NCE. Whereas Kraft is the leading *buyer* of bulk cheese off the NCE, beginning in August 1986 Kraft became exclusively a *seller-trader* on the NCE. During 1988-1993 it made 74 percent of all barrel and block *sales* on the Exchange. In the important barrel market segment, which accounted for 68 percent of NCE sales, Kraft made 83 percent of all sales. Together with two other leading seller-traders, Kraft accounted for 88 percent of all barrel sales and 70 percent of all block sales.

Analysis of trading conduct during 1988-1993 indicates that Kraft's trading activity appeared to fashion the pattern of NCE prices *over each price cycle.* Kraft's sales on the Exchange were usually at a loss, whereas when it sold either in the spot market or to the CCC it generally made a profit (or incurred a smaller loss than on the NCE).

While Kraft was the dominant seller-trader on the NCE, it frequently was joined by Borden and Alpine Lace. These three seller-traders were frequently confronted by five leading buyer-traders, Beatrice, Mid-Am, Schreiber, Land O' Lakes and AMPI. The buyer-traders--

especially Beatrice and Mid-Am--often appeared to challenge Kraft's conduct at cyclical price bottoms and price tops, and to take turns bidding up prices during rising price trends. Insofar as cooperation occurred among buyers or among sellers, this may merely have reflected a shared interest in the level of prices; we found no evidence of collusive conduct among traders. The buyer-traders were a less cohesive group than the seller-traders, with some buying while others were selling.

The above characterization of trading conduct on the NCE implies that prices were established within the context of bilateral oligopoly, with Kraft acting as the dominant price leader, with two followers, confronted by five leading buyer-traders. Economic theory teaches that what actually happens under bilateral oligopoly depends upon the relative market power of the conflicting parties, including which party exercises price leadership. When power is evenly divided, the resulting prices *may* approximate competitive ones. If one side enjoys greater power than the other, the resulting prices will benefit the holders of greatest power. The study examined this issue by analyzing the conduct and performance of leading traders.

The analysis indicates that there was an imbalance in market power between buyer-traders and seller-traders, with the balance favoring Kraft and its followers. Kraft is the largest cheese company, the largest buyer of cheese off the NCE, and the leading seller on the NCE, especially in barrel cheddar cheese. We estimate that Kraft used 35 to 40 percent of all barrel cheese made in the United States in 1992,[3] practically all of which was purchased under

---

[3] A 1989 Kraft document states that Kraft utilizes [... to ...] percent of the cheese produced in the U.S. Kraft General Foods, Inc., *Cheese Procurement Strategy*, Operations, December 6, 1989, KGF 2948, 2977. In November 1990, Kraft's cheese procurement director estimated that Kraft accounted for [...] percent of total U.S. cheese production. Kraft General Foods, Inc., Wayne Hangartner, "Jerome Cheese Company," November 8, 1990, KGF 3218, 3228. Information has been redacted from the report at this time pursuant to an agreement with Kraft General Foods, Inc., that there will be a subsequent

committed supply agreements at NCE-based formula prices. Kraft, in turn, uses this barrel cheese in processed cheese and cheese spreads, where Kraft accounts for about 60 percent of *retail* sales.

Kraft's large size in the cheese industry and dominance in NCE trading give it several *strategic competitive advantages* over traders and potential traders.[4] One competitive advantage derives directly from Kraft's position as the largest buyer of cheese off the NCE[5]. Each year Kraft builds some surplus into the amount of cheese it agrees to buy from committed suppliers.[6] In addition, it typically has first call on any excess cheese produced by committed suppliers, thereby controlling whether the cheese is sold in the spot market or on the NCE. Thus, Kraft has

---

judicial resolution of a good-faith dispute over the trade secret status of the information.

4 A firm enjoys a strategic competitive advantage if it can employ strategies not available to other actual and potential market participants. Alexis Jacquemin, *The New Industrial Organization*, The MIT Press, 1987, 107-129; Michael E. Porter, *Competitive Advantage*, The Free Press, New York, 1985; T. Schelling, *The Strategy of Conflict*, Harvard University Press, 1960.

5 In an interview, Richard B. Mayer, Chairman-CEO of Kraft General Foods, Inc., reportedly said size "yields a lot of areas of *competitive advantage*" including "*incredible purchasing power*. Those types of advantages are very, very real." Emphasis added. J. Liesse and J. Dagnoli, "Goliath KGF Loses Steam After Merger," *Advertising Age*, January 27, 1992, p. 17.

Kraft included among the implications of being the largest cheese buyer the ability to get better information than others about overall market conditions. Kraft General Foods, *Cheese Procurement Strategy*, Operations, December 6, 1989, KGF 2948, 2990. It included among the strategies to maximize profits: developing superior information systems; establishing inventory strategic reserves; and influencing industry conditions to support Kraft business strategy. *Id.* 2993.

6 Kraft buys virtually all its barrel cheese needs from committed or spot suppliers. Kraft also can obtain additional barrel or block cheese from some of its committed supplier plants that can convert from making block to barrels. Such plants are referred to as "balancing" plants. If need be, these plants can supply additional barrels or blocks for trading purposes, thus contributing to Kraft's supply flexibility.

various methods of managing its surplus, which gives it the option of selling as much of the surplus on the NCE as best serves its interest.

Buyer-traders apparently do not have similar flexibility. Cheese marketers like Beatrice and Schreiber may plan each year to buy some cheese in the spot market and on the NCE. But the amount they can buy on the NCE may vary greatly from week to week. It is therefore risky for such marketers to plan on the NCE as a significant supply source. Since most marketers obtain 90-95 percent of their cheese under committed supply arrangements, this limits the extent to which they can buy cheese on the NCE.[7] Likewise, when selling on the NCE, Kraft often deals directly with cooperative cheese manufacturers that sell much of their bulk cheese (as committed suppliers or in the spot market) to Kraft and other cheese marketers. Although cooperatives often plan to buy some cheese in the spot market, their needs at a specific time may be quite are limited. Since they must ultimately sell any cheese purchased that exceeds their needs, they face the same problem as the proverbial coal mines of Newcastle. Moreover during 1988-1993, the leading cooperatives did not appear to coordinate their buying efforts on the Exchange. Land O' Lakes was an active seller-trader on a number of occasions. AMPI, the largest cheese cooperative, was the least active of the five leading buyer-traders, and on one

---

[7] Of course, one option would be for a trader to buy at a low price on the NCE and sell at a higher price in the spot market. We have no evidence that this occurs frequently, although brokers may occasionally do so. Perhaps the reason for this is that buyer-traders believe the potential rewards are smaller than the potential risks. This is especially true at market tops and in declining markets, when a speculative buyer-trader may end up selling at a lower price in the spot market than he paid on the NCE.

At market bottoms, such speculative trading may be discouraged because continued heavy seller-trader activity may ultimately drive prices down even lower. Finally, other seller-traders that benefit from lower prices would not be inclined to *buy* on the NCE if doing so threatened to *increase* prices or slow decreases.

occasion sold heavily (while other buyer-traders were buying) on the Exchange, causing an historic drop in prices. Thus, the leading buyer-traders at times appeared to trade at cross purposes, an action which suggests that they constituted a less cohesive group than the seller-traders.

Kraft enjoys another strategic advantage over buyer-traders because of the asymmetry in market information among traders.[8] Kraft believes that its greater overall size and larger committed supplier base compared to other traders give it superior information regarding the size of industry inventories and overall supply/demand conditions. Other traders acknowledge that Kraft is the best informed trader, commanding the respect of both sellers and buyers. Because of Kraft's superior market knowledge, other traders hesitate to oppose Kraft's view of market conditions as implied by its trading conduct, especially during the turning points at the bottoms and tops of price cycles. When Kraft is active in a down market, traders with coincident interests often join in offering cheese; but traders with conflicting interests may remain on the sidelines because they suspect Kraft knows better than they such relevant facts as the size of industry inventories and shifts in aggregate supply and demand. A trader contemplating activity contrary to that of Kraft may believe such a strategy involves greater risk than going along with

---

[8] The literature of strategic behavior includes asymmetry of information among rivals as an important factor conferring strategic advantage to a firm. David Encaoua, Paul Geroski and Alexis Jacquemin, "Strategic Competition and the Persistence of Dominant Firms," in Joseph Stiglitz and G. Frank Matthewson (ed.), *New Development in the Analysis of Market Structure* (1986), p. 55. Economic theory also suggests that asymmetric information facilitates cartel behavior. J.S. Feinstein, M.F. Block, and F.C. Nold, "Asymmetric Information and Collusive Behavior in Auction Markets," 74 *American Economic Review* (June 1985), 441-460. In a recent decision, the British Office of Fair Trading concluded that "asymmetries in information" constituted a significant barrier to entry. M.A. Utton, *Market Dominance and Antitrust Policy*, 1995, p. 130. See note 5 above regarding Kraft's superior market information.

Kraft. Such conduct may also be encouraged by the fact that all leading seller-traders have much slimmer profit margins than Kraft. The deference shown Kraft because of its superior market knowledge is a classic example of strategic advantage conferred by asymmetrical market knowledge.

Finally, Kraft gains competitive advantage because it buys so much cheese off the Exchange directly from actual and potential Exchange traders, a fact which may explain why important suppliers of Kraft have elected not to participate in trading. Only one (AMPI) of Kraft's leading suppliers during 1991-1992 traded on the Exchange in those years. This suggests that Kraft's leading suppliers were reluctant or unable to challenge Kraft on the NCE even though their interest in NCE price levels differed from Kraft's. No such constraints are placed on buyer-traders for whom Kraft is not a large customer off the NCE. Beatrice, Schreiber, Mid-Am and Land O' Lakes, the leading buyer-traders on the NCE, are not committed suppliers of Kraft, and they sell relatively little of their total bulk cheese output to Kraft. On the other hand, AMPI, an agricultural cooperative, the country's largest cheese manufacturer and a large committed supplier of Kraft, made far fewer purchases on the NCE than did Mid-Am, the nation's second largest cheese cooperative. AMPI's behavior is consistent with the expectation that firms selling relatively large amounts of cheese to Kraft off the Exchange are not likely (or able) to challenge Kraft's conduct on the NCE. Likewise, any trader that has a continuing business relationship with Kraft may cooperate with it on the NCE despite the fact that NCE prices seemingly have a neutral impact on the trader's profitability.

These various strategic competitive advantages are the source of Kraft's ability to exercise price leadership on the NCE. As Michael E. Porter observed, "industry leadership is

not a cause but an effect of competitive advantage."[9] No other trader on or off the Exchange enjoys these advantages, all of which derive from Kraft's large overall size and unique organizational structure. In this context, Kraft holds the balance of power. Of course, there may be times when supplies are so tight that Kraft is unable to depress prices on the NCE. Indeed, it may not be in Kraft's interest to do so at times, lest price be inadequate to bring forth a sufficient supply. But this only indicates, of course, that there are constraints on Kraft's ability to influence prices, a condition true even for a monopolist.

Kraft's potential influence over industrywide prices would be greatly diminished if it only *bought* from committed and spot suppliers and *sold* any surpluses in the spot market, since then its influence over price would be limited primarily to its buying power in the aggregate cheese market. Since Kraft's cheese requirements account for a quite modest share of total cheese production (approximately 15 to 20 percent),[10] it would have little unilateral control over price.

---

[9] Michael Porter, *Competitive Advantage*, (The Free Press-Macmillan Inc.), 1985, p. 26. Emphasis in the original. David Encaoua, Paul Geroski, Alexis Jacquemin. "Strategic Competition and the Resistance of Dominant Firms: A Survey," in Joseph Stiglitz and G. Frank Mathewson, *New Development in the Analysis of Market Structure*, MIT Press, (1983) 79, 55-56. Steven C. Salop, "Strategic Entry Deterrence," *American Economic Review*, 69 (May 1979), 335-338. Michael E. Porter, *Competitive Advantage*, The Free Press, New York, 1985. Steven C. Salop (ed.), *Strategy, Predation and Antitrust Analysis*, Federal Trade Commission, Washington, D.C., September 1990.

[10] In a public document Kraft reports that in 1992 it accounted for about 20 percent of all cheese in the U.S., and 40-45 percent of all cheese sold through supermarkets. Dede Thompson Bartlett, Vice President and Secretary, Phillip Morris Companies Inc., to the Reverend Seamus P. Finn, O.M.I., February 24, 1992, enclosures, Kraft General Foods, Inc., "Share of the U.S. Dairy Industry," and "Facts about Kraft's Cheese Business."

Thus, the existence of the NCE and the industrywide practice of NCE-based formula pricing greatly enhances or facilitates the use of the power conferred by Kraft's various strategic advantages.[11] Since potential traders do not enjoy these advantages, they cannot *contest* the pricing decisions made on the NCE. This establishes the NCE as an incontestable submarket within the aggregate cheese market. And because cheese in the aggregate market is priced "off the NCE," the ability to influence NCE prices confers influence over industrywide prices.

The documentary evidence indicates that sellers with strong brands not coupled to NCE prices benefit from lower NCE prices, other things being equal. Kraft's conduct on the Exchange, as well as documentary evidence, implies that it believed it could influence NCE prices, and that at times it sold at a loss to accomplish this result. Selling on the NCE at a loss when it could have sold profitably (or at a smaller loss) elsewhere constitutes irrational business conduct unless Kraft expected to benefit from lower prices paid to committed suppliers. That is to say, rational businessmen would not needlessly squander resources in Exchange selling unless they believed doing so enhanced overall profits.

Kraft's former director of procurement rationalized Kraft's behavior on the NCE by explaining that when Kraft has a surplus it first offers cheese to potential spot buyers. When it

---

[11] The NCE, as presently structured, may be viewed as an institution that enhances or *facilitates* the use of unilateral or collective market power. The legal-economic literature on facilitating practices usually discusses them in the context of practices that promote cooperation among competitors and market dominance. The critical point is that the facilitating practice enhances the use of unilateral or collective market power. See Scherer and Ross, *op cit*, 235-274; Donald S. Clark, "Price Fixing Without Collusion," 1983, *Wisconsin Law Review*, 887; Kevin J. Arquit, "The Boundaries of Horizontal Restraints: Facilitating Practices and Invitations to Collude," Federal Trade Commission, Washington, D.C., August 11, 1992; Randall C. Marks, "Can Conspiracy Theory Solve the Oligopoly Problem?" 1986, *Maryland Law Review*, 387.

exhausts this demand, it sells the remainder on the NCE at a loss, if necessary. He acknowledged that in this scenario the NCE might be viewed as a *market of last resort.* If correct, this would be a serious indictment of the thin NCE market as an appropriate basis for formula pricing practically all sales of bulk cheese.

Kraft's use of the NCE as a market of last resort is also irrational conduct for a seller seeking to maximize profits on surplus sales. Economic theory teaches and business experience verifies that sellers in imperfectly competitive markets avoid publicizing prices of distress sales to avoid "spoiling" the market for other sales. This logic implies that a rational seller would make distress sales in the spot market, not the NCE where prices become public immediately. It is rational, however, to treat the NCE as a *market of last resort* if doing so reduces the price at which a *seller* on the Exchange *buys* large amounts of bulk cheese off the Exchange at NCE-based formula prices.

Finally, our econometric analysis provides further support for the hypothesis that during 1988-1993 Kraft and other seller-traders had a significant negative impact on NCE prices. The implication is that at times Kraft enjoyed significant savings in procuring bulk cheese because it bought the cheese at NCE-based formula prices. The econometric analysis found that leading buyer-traders had no statistically significant impact on prices. But based on our non-econometric analysis of buyer-trader motives and conduct, we are inclined to believe they did have a modest countervailing influence. At a minimum, had they made no effort to countervail Kraft's leadership, NCE prices might have been lower at times. Thus, we do not imply that there are no constraints on Kraft's influence, but rather that during 1988-1993 the balance of power tilted in Kraft's favor and that at times it benefitted from this advantage.

Farmers have an important financial interest in higher NCE prices, but their cooperatives cannot be indifferent to the effect higher prices may have on milk output. In the absence of control over the supply of milk for manufacturing and without government support programs, the highest price cooperatives may achieve is the competitive equilibrium price. They do, of course, have a strong incentive to prevent NCE prices from going below this price, which may occur if NCE prices are manipulated.

In sum, our analysis of business motives, trading conduct on the NCE, an in-depth analysis of Kraft's conduct on and off the NCE, and a quantitative analysis of NCE prices indicate that the National Cheese Exchange was not an effectively competitive price discovery mechanism during 1988-1993. As currently organized, the Exchange appears to facilitate market manipulation. The main beneficiaries of this situation appear to be Kraft General Foods, Inc. and other seller-traders with coincident interests. The evidence supports the hypothesis that during 1988-1993 Kraft (a) had a financial *motive* for influencing NCE prices, (b) had the *power* to influence prices, and (c) had at times exercised this power for its benefit. We emphasize, however, that we found no evidence of collusion among cheese companies.

This raises the question, did Kraft posses *unilateral* power over prices in NCE trading? To posses unilateral power a firm must hold a substantial market share in an economic market with significant entry barriers that protect the firm from potential competitors.

Kraft's average share of NCE sales during 1988-1993 was 74 percent, which is well above the range that economists generally consider sufficient to confer unilateral power in a market with high entry barriers.[12]

NCE trading constitutes a separate economic market shielded by substantial entry barriers. These barriers exist because practically all bulk cheese prices in the aggregate cheese market are priced off NCE prices and because actual and potential traders in the aggregate market cannot replicate, at the same cost, the strategic competitive advantages Kraft enjoys in NCE trading. Therefore, both the actual and potential traders on the NCE apparently cannot successfully *contest* the prices established there even when they depart significantly from competitive levels.[13]

Thus, during 1988-1993 Kraft enjoyed the two necessary conditions of unilateral power, a large market share in a market with significant entry barriers.

---

[12] Economists typically assume firms with market shares exceeding 40-50 percent may possess unilateral market power. George J. Stigler, *The Organization of Industry*, 1968, 228, uses 40 percent in identifying such firms. P.A. Geroski, "Do Dominant Firms Decline," in Donald Hand and John Vichers (eds.), *The Economics of Market Dominance*, 1987, states that "A market share of 40 percent is the conventionally accepted cut-off point" in identifying dominance.

During 1988-1993 Kraft's annual share of NCE sales ranged from 56 percent to 91 percent. Kraft's share apparently varied, in part, depending upon the volume of sales required to achieve its objectives. Each year it very probably could have sold larger amounts on the NCE had this been required to achieve its objectives.

[13] The theory of contestable markets holds that a firm with a large market share has power over price if entry and exit in a market are made difficult because of significant advantages enjoyed by the dominant incumbent firms. John C. Panzar and Robert D. Willig, *Contestable Markets and the Theory of Industry Structure*, 1982. Also, see text at notes 30-31, Chapter 3, for reasons NCE prices may not be representative of aggregate demand and supply conditions.

Because these conclusions are based on an analysis of the six-year period, 1988-1993, they may reflect factors *unique* to these years, and therefore may be an imperfect predictor of the future performance of NCE pricing. There is evidence that beginning in 1990 Kraft engaged in especially aggressive short-run profit maximization, as it increased substantially gross profits for cheese by widening the spread between wholesale net selling prices and bulk cheese procurement costs. During this period Kraft appears to have used the competitive advantages it enjoys in NCE trading to periodically depress bulk cheese prices, perhaps by a greater amount than is sustainable in the future. If so, this does not diminish the apparent consequences of Kraft's conduct during the years studied nor gainsay the need to enhance the NCE's competitive performance. Even short-run price manipulation subverts the market to the detriment of consumers and farmers as well as some industry participants.

K. Public and Private Initiatives to Improve Price Discovery

There are several possible solutions to the problems with price discovery on the NCE. Included in the following discussion are policies and procedures which could be implemented in conjunction with the NCE as well as suggestions for possible alternatives to the Exchange as a central cash auction market.

In considering alternatives to the Exchange, we are mindful that despite its deficiencies as a price discovery mechanism, the Exchange is widely used by industry participants as a reference price in formula pricing. This function is highly prized by many because it greatly reduces transaction costs. It is therefore imperative that any alternative to the Exchange continue to provide this function.

The Problem of Trading Against Interest

As discussed earlier an anomalous trading pattern has emerged on the NCE in which the leading *sellers* on the NCE are predominantly *buyers* of bulk cheese off the NCE; the leading *buyers* on the NCE are either large agricultural cooperative cheese manufacturers that *sell* bulk cheese off the NCE or large cheese marketers that sell private label brands or weak company brands. This trading pattern appears to be motivated by efforts to influence prices, not to use the Exchange as a residual market.

This behavior may involve what legal-economic analysts characterize as "trading against interest," a phenomenon in which big buyers (sellers) of a product may sell (buy) some of it in one market in a way that depresses (increases) the price in another market where the companies buy (sell) practically all their supplies. Such conduct always raises a question of potential market manipulation.

While both leading buyers and sellers on the NCE may have periodically attempted to trade against interest in recent years, leading seller-traders, dominated by Kraft, appear to have been the main beneficiaries of the practice. Indeed, the conduct of leading buyer-traders during 1988-1993 may have been largely a response to Kraft's seller-trader activity beginning in August 1986. The apparent purpose and effect of Kraft's conduct on the NCE have certain parallels to a classic market price manipulation case involving trading against interest. In *Socony*,the major oil companies used the spot market price of gasoline to formula-price gasoline they sold to jobbers. By purchasing a small amount of gasoline in the spot market, the major oil

companies were able to raise spot prices, thereby raising prices to jobbers and consumers throughout the Midwest.[14] The Supreme Court concluded in part:

> [T]he fact that sales on the spot markets were still governed by some competition is of no consequence. For it is indisputable that competition was restricted through the removal by respondents of a part of the supply which but for the buying programs would have been a factor in determining the going prices on those markets.[15]

Whereas the oil companies manipulated the spot market in order to benefit their selling prices, Kraft sold on the NCE with the apparent purpose and effect of lowering the price it paid for cheese purchased from committed suppliers under NCE-based formula prices..

Unlike the major oil companies, who achieved their purpose by *agreement* among oligopolists, Kraft's conduct seems to involve primarily a *unilateral* action, followed by some cooperating marketers with interests similar to Kraft's. *Unilateral* conduct involving selling against interest also *may* violate public policy when practiced by a dominant trader. For example, in a consent decree the National Cranberry Association, the dominant cranberry marketer, is among other things restrained from, "Purchasing cranberries from others and reselling or otherwise disposing of them to artificially raise, depress or stabilize market price levels of fresh or processed cranberries."[16]

Various public and private initiatives may aid in eliminating the market failure problems caused by trading against interest. To be effective, the policies must address the factors that make such trading possible and that give competitive advantage to some traders. Below we discuss possible approaches to the problem.

---

[14] *United States v. Socony*, 310 U.S. 150 (1940).

[15] *Ibid.*

[16] *United States v. Nat. Cranberry Ass'n*, 1957 TC par. 68, 850 (D. Mass 1957).

Prohibiting Trading Against Interest

The courts have approved decrees banning trading against interest where the purpose and effect have been to manipulate prices.[17] We do not presume here to determine whether the apparent trading against interest on the NCE meets the standards of legal proof required for a finding of price manipulation under the Federal or Wisconsin antitrust and unfair competition statutes.

The NCE By-Laws have been applied to prohibit trading against interest, although they have been applied only narrowly. In one instance a trader who covered an outstanding offer at a higher price than the last covered offer was reprimanded by the Directors of the Exchange because the trade "was not consistent with the *natural self interest* of buyers to attempt to purchase at the existing or a lower market price."[18] Yet, Exchange president Richard Gould and

---

[17] For example, *Socony* and *National Cranberry Assn.*

[18] Minutes for a Special Meeting of the Board of Directors of National Cheese Exchange held on August 31, 1990, 3. Emphasis added. Exchange President Gould wrote this trader that "your company's *trading activity was clearly against its economic best interests* and could easily be interpreted as an intentional attempt to manipulate the market price of 40 pound block." Emphasis added. R.J. Gould to Robert Burns, President, Beatrice Foods, September 21, 1990. For a discussion of this and a similar incident see text at notes 108-111, Chapter 4. The Board viewed this conduct as "detrimental to the interests and welfare of the Exchange." Minutes of a Special Meeting of the Board of Directors of the National Cheese Exchange, August 31, 1990, p. 4. The Board's authority for prohibiting such conduct is Article III Section 4(a) of the NCE By-Laws, which authorizes the Board to suspend a member for "any conduct considered detrimental to the interests or welfare of the Corporation. Suspension in each case shall be for such period of time as may be designated by the Board of Directors not exceeding six months." National Cheese Exchange By-Laws, Article III, Section 4(a), which was amended August 23, 1988, "increasing permissible suspension from two months to six months."

The Exchange president has responsibility for monitoring trading activity for collusion. "Interview of Richard J. Gould," Rosemary Derrio to Matt Frank, Assistant Attorney General of the Wisconsin Department of Justice, March 4, 1988, p. 3.

the NCE Board of Directors have expressed the view that the NCE cannot be manipulated by the "unilateral" action of an individual trader.[19]

Trading Limits

A cash auction market may adopt rules limiting the amount of purchases or sales made by a single party. For example, the United States Treasury Department has such a rule in the sale of United States securities: "The maximum award that will be made to any bidder is 35 percent of the public offering...."[20] This rule was deemed necessary despite the fact that there are about 35 "primary" treasury security dealers as well as other bidders for a particular security being sold. Moreover, the new security competes with similar securities already available in the market; for example, a new two-year treasury security has competition from already issued securities of similar duration.

This approach may not be practical on the NCE. It clearly could not be applied to trading for individual days. Nor may it be practical if applied to longer periods, since a trader would never know beforehand how much total trading would occur over the relevant period.

---

19 See Chapter 4, note 100 and text at note 103.

20 *Sale and Issue of Marketable Book-Entry Treasury Bills, Notes, and Bonds*, Department of the Treasury Circular, Public Debt Series No. 1-93, Section 35622.

May 20, 1992, Saloman, Inc. and Salomon Brothers, Inc., entered into a consent settlement agreement with the Securities and Exchange Commission for allegedly violating the Treasury Department 35 percent rule. Among other matters agreed to in the settlement, Saloman was required to pay $190 million to the United States and $100 million for compensatory damages to injured parties. *Securities and Exchange Commission v. Saloman Inc. And Saloman Brothers Inc.*, Complaint and Permanent Injunction and other Relief, May 20, 1992.

Alternative Basis for Formula Pricing Cheese

One alternative for preventing any trader from affecting price by trading against interest is to change the rules of the NCE, or enforce more aggressively the existing rules. Another alternative is to develop some price basis other than the NCE that can be used for formula pricing bulk cheese. From time to time, some members have advocated alternatives. Indeed, apparently some Kraft officials are not wedded to the NCE and have said that Kraft supports the review of alternatives to the NCE, and expects to participate in any alternative.[21] In our view, however, the required industry participation and assistance which would be required to make any fundamental changes may not be forthcoming until some State or Federal authority determines whether trading against interest has occurred and has adversely influenced prices on the Exchange.

In considering alternative bases for formula pricing, it is important to keep in mind that existing problems with the NCE are due to a combination of factors: the Exchange is a *highly concentrated, thin market*, that is highly leveraged in its effect through *formula pricing;* and Kraft enjoys a *strategic competitive advantage* over other actual and potential traders on the Exchange. So long as these conditions exist, the NCE serves to *facilitate* non-competitive

---

21 Kraft General Foods, Inc., *Milk Prices, Cheese Prices and the National Cheese Exchange*, author not identified, April 14, 1992, KGF 16948, 16956. A cover page to the document indicates it was forwarded from Wayne Hangartner, Kraft's Director of Cheese Procurement and Inventories, to others in his department, and is identified as "Copy of Presentation to the Dairy Farm Specialists" on 4/14/92. A similar sentiment is expressed in Kraft General Foods, Inc., *National Cheese Exchange (NCE)*, author not identified and undated, KGF 16913, 16917.

On another occasion Phillip Morris Vice President and Secretary stated that Kraft supports "the review of alternatives [to the NCE] and expects to participate in any alternative that may be developed." Dede Thompson Bartlett, *op. cit.*, p. 2. See note 10 above, this chapter.

behavior. Any alternative basis for formula pricing, to be an improvement, must eliminate or reduce the distorting influence of these problems.

Trading on the NCE is much more concentrated than is cheese manufacturing, cheese converting or cheese marketing. If the industry were to adopt a different price discovery mechanism that encouraged/allowed participation of more members representative of the aggregate market, a more competitive market would evolve. Such a market might be much less concentrated and might reduce the strategic competitive advantages Kraft enjoys in NCE trading, especially if the other initiatives discussed below were adopted.

Price Report for Direct Spot Transactions

Price reports of decentralized spot transactions are used in several commodities as a reference price for formula pricing (see Appendix 7.A, which reviews thin market/formula pricing problems in other agricultural commodities). This system is clearly feasible in the case of cheese. At the present time, Wisconsin Assembly Point prices are reported weekly. However, the accuracy of these reports is not highly regarded by industry members. To replace the NCE as a basis for formula pricing, the spot market price report would need to be substantially improved.[22]

Such a price report could still encounter thin market problems since the spot market for bulk cheese represents only 5 to 10 percent of total cheese volume, and during tight supply conditions perhaps much less than that. We have not been able to determine the size of the spot market for cheddar cheese which meets NCE standards. We do know, however, that it is

---

22 One cheese company has used the WAP price in setting the premiums paid one of its suppliers in Wisconsin.

significantly larger than the current volume sold on the NCE. Even the largest traders typically trade much more off the NCE than on it, and numerous cheese companies never trade on the Exchange. A report covering spot sales nationally would enlarge the total volume of direct transactions, greatly expand the reporting base and better reflect aggregate market conditions. (The current WAP price report covers only sales in Wisconsin.) Such an enlarged spot price reporting program would better reflect the overall structure of cheese manufacturing and cheese marketing, which is relatively unconcentrated and therefore less subject to manipulation. Thus, we believe that thin market problems would be fewer and less influential than those of the NCE.

In order to avoid a thin price reporting problem like those encountered in beef (see Appendix 7.A), it would be essential that the spot market price report be accurate and based on a significant portion of spot transactions. Thus, a mandatory reporting program similar to those used for some products in California may be required.[23]

While price reports of spot transactions of bulk cheese appear feasible at the present time, it is well to keep in mind that there are other ways of developing an acceptable reference price. Another alternative is for market news to "simulate or formulate prices for thin markets based upon prices of related products that are traded in less thin or more price-representative markets."[24] For example, live broiler prices can be formulated from ready-to-eat broiler prices. And, carcass beef prices can be formulated from boxed beef prices. Thus, if the spot market for bulk cheese should also become too thin over time for reliable price discovery, there may be other ways of developing an acceptable reference price.

---

[23] See text at note 31 this chapter.

[24] D.R. Henderson, "Price Reporting in Thin Markets," in Hayenga, p. 120.

Electronic Marketing Systems

Spot market trading might be facilitated by the adoption of an electronic market system. Electronic markets have been tried with mixed success in several agricultural commodities. Although several of the markets did not succeed, experience has shown that such markets generally reduced marketing costs, increased prices to sellers and lowered costs to buyers, improved pricing efficiency and increased competition.[25] The problems of adapting to an electronic market in cheese may be less difficult than in most other products where such markets are used or have been tried.

An electronic market system might increase spot trading in several ways. It could aid spot traders in identifying the nearest potential suppliers or buyers. Trading volume could also be increased if the electronic market permitted trading in cheeses not meeting the current NCE age and quality requirements; in addition, the frequency of trading could be increased to daily or three times a week.

To succeed, an electronic system must be cost effective. In the 1980s several electronic markets closed because of high fixed costs and low trading volume; however,enormous strides have been made in computer and communication technologies since then. With current technology, an electronic market for cheese might be less costly than the NCE, when all costs are considered. The market could be supported by all industry participants as is done in some California market reporting programs.

---

[25] Wayne D. Purcell and T. L. Sporleder, "Will Electronic Markets Continue to Develop?" *National Conference on Electronic Marketing of Livestock*, Chicago, October 4, 1990.

Higher prices to commodity sellers in electronic markets appear to stem in part from increased competition between buyers and in part from reduced transaction costs. Studies of computerized auctions of slaughter lambs, [26] feeder cattle,[27] and hogs[28] found they increased prices to producers.

Part of the benefit of electronic trading is its anonymity, according to empirical analyses of these markets.[29] In oligopolistic markets, traders are more likely to compete on price if their rivals do not know the parties involved and terms of each transaction. This is in sharp contrast to NCE conditions where each trader's action is immediately known to others. In markets of few sellers, such transparency of trading tends to *facilitate* market manipulation, not competition.

An efficient electronic spot market would not, alone, solve problems arising from persistent and systematic "trading against interest" by a firm with competitive strategic advantages over other actual and potential traders. But this practice would be more difficult if much of the current spot trading were shifted to an electronic market and if other steps were taken to reduce the competitive advantage of some traders, e.g., eliminating advantages deriving from the asymmetrical market knowledge of traders.

---

[26] James R. Russell and Wayne D. Purcell, "Costs of Operating a Computerized Trading System for Slaughter Lambs," *SJAE*, Vol. 15, No. 1, July 1983, pp. 123-127.

[27] Thomas L. Sporleder and Phil L. Colling, "Competition and Price Relationships for an Electronic Market," selected paper, 1986 annual meetings of the AAEA, Reno, Nevada, July 27-30, 1986.

[28] W. Timothy Rhodus, E. Dean Baldwin, and Dennis R. Henderson, "Pricing Accuracy and Efficiency in a Pilot Electronic Hog Market," *AJAE*, 71:4, November 1989, pp. 874-882.

[29] Shannon R. Hamm, Wayne D. Purcell, and Michael A. Hudson, "A Framework for Analyzing the Impact of Anonymous Bidding on Prices and Price Competition in Computerized Auction," *NCJAE*, 7:2, July 1985, pp. 109-117.

The above are merely suggested options in creating an electronic market system that may facilitate and enlarge spot trading. Industry users and others experienced in electronic markets can best determine the adjustments necessary for success in cheese.

Public and Private Actions to Improve Market Information

Accurate market information is an essential prerequisite of competitive markets. Asymmetry in market knowledge is one problem among traders on the NCE. Public information can be improved, however, particularly regarding inventory levels and prices off the NCE.

Many industry personnel interviewed in the course of this study expressed dissatisfaction with current information on commercial inventories, since they regard inventory information as critical in making price decisions. Although government data reflect trends, they do not accurately measure total inventory. Likewise, industry participants question the accuracy and usefulness of Wisconsin Assembly Point prices. This source of spot price information would be improved if it covered spot transactions in all major cheese manufacturing areas.

The Agricultural Marketing Service (AMS), USDA, should be encouraged to improve the quality of estimates and be provided the resources necessary to accomplish this. All the AMS dairy market news information programs rely on voluntary responses. We believe that it may be necessary to initiate mandatory reporting programs to obtain accurate information of inventories and prices. Such programs have been adopted for some commodities by the State of California and others.[30] For example, California's market reporting program in grapes is mandatory, its costs paid by grape processors and growers.[31] Similarly, the California State

---

30 See Henderson *op. cit.*, p. 122, regarding the legislative authority given the Secretary of Agriculture to mandate information on private trades for cotton.

31 State of California, 1992 Food and Agricultural Code, Article 8, section 55601.6.

Market News Service has a mandatory program for reporting the price of nonfat dry milk. To insure accuracy, the records of NFDM plants are audited every two months. It is generally acknowledged that the NFDM prices reported for California are much more reliable than those reported for other regions of the country, which are based on weekly phone calls to a relatively few plants by Market News personnel.

Agricultural cooperatives also provide a promising vehicle for obtaining more accurate market information for their members. For example, in 1992, agricultural cooperatives in California and Washington established the Western Cooperative Milk Marketing Association, a marketing agency in common as permitted by the Capper-Volstead Act. This association reports to its members in aggregate form (separately for spot and contract sales) the weekly production, inventory and average prices of nonfat-dry milk and butter. Since these cooperatives represent about two-thirds of NFDM output in the country, this market information is extremely important. The association also sets a minimum price at which members agree to sell their butter and cheese.

A 1992 survey of Upper Midwest Cooperatives indicated that they believed information-sharing on cheddar and mozzarella cheese would have potential for improving their marketing efforts.[32] No action has been taken to date.

Cooperative information-exchange efforts have the potential to improve the efficiency of cheese pricing. As noted in our study, the current asymmetry in market information among traders appears to be one source of Kraft's competitive advantage on the NCE. We recommend

---

[32] Robert Cropp, *The Feasibility of Joint Activities Among Dairy Cooperatives in the Processing and Marketing of Cheese*, University of Wisconsin Center for Cooperatives, UW-Madison, University of Wisconsin Extension-Cooperative Extension,

that cooperative information-exchange efforts have open membership to qualified cooperatives. Such a system creates the greatest likelihood that such efforts will improve competitive performance in a market.

Futures Trading in Cheese

A futures contract for cheddar cheese was initiated in June 1993. An analysis by Fortenbery and Zapata examined the trading volume of the contract and the degree to which futures prices and NCE prices are interdependent.[33] Co-integration analysis, the technique used by Fortenbery and Zapata, measures the extent to which two markets have achieved a long-run equilibrium. They ask "Have the cash and futures markets for cheddar cheese achieved the long-run equilibrium expected to exist between two markets pricing the same commodity and utilizing the same market information?"

Most studies of cash-futures relationships in agricultural markets have found that the two markets are closely related, with futures often leading cash markets in price discovery. In the case of cheddar cheese, Fortenbery and Zapata find no evidence that the futures market leads the cash market in price discovery, or vice versa. The two markets for cheddar cheese show substantial independence. And, for the two year period, June 1993-July 1995, the authors find that the cash (NCE) and futures markets for cheese still show no evidence of becoming co-integrated. Fortenbery and Zapata find these results unusual and raise the question of "whether

---

[33] T. Randall Fortenbery and Hector O. Zapata, "An Evaluation of Price Linkages Between Futures and Cash Markets for Cheddar Cheese," Working Paper 107, Food System Research Group, University of Wisconsin-Madison, March 1995. The authors have updated this analysis through July 1995.

there are institutional or market structure constraints which prohibit the cash and futures markets from behaving in an efficient pricing manner."

There is no indication as yet that the near-term futures contract price will be used instead of the NCE in formula pricing. Indeed, this could hardly be expected since the futures contract is still struggling to survive. Before the cheese futures contract will be considered as an alternative to the NCE for formula pricing, it must become a viable futures market. The dominant role played by the NCE may actually have hindered the early success of futures trading in cheese, as some traders felt "like observers of the few large players who have dictated recent price movement."[34] Also, the NCE is too thin a market to be used by futures traders that accept delivery on a contract. For example, when Pizza Hut accepted delivery of a futures contract, it offered three loads of blocks on the NCE. By the end of the trading session, Pizza Hut had reduced its offer 18 times without a sale. Block prices dropped 10.5 cents for the day.

If a viable futures market develops for cheese, it would provide opportunities to hedge risks of market participants, including farmers. It may also improve the price discovery process by increasing the number of market participants. But a futures market, alone, will not solve all market failure problems, particularly those which are structurally based. One need only recall that a thriving gasoline futures market has existed throughout the years since the creation of the OPEC oil cartel in 1973. Similarly, coffee and some other agricultural commodity futures

---

[34] CSCE Daily Dairy Market Report, September 9, 1993, Market commentary. This source reported, in part:

> Traders await with trepidation tomorrow's session at the NCE, as the last few weeks have produced large price increases...which resulted in major moves in the futures markets....the reality is that the NCE continues its hold on market participants. At least for the time being, this causes some traders to feel like observers of the few large players who have dictated recent price movement.

markets have operated successfully in industries with state-run cartels. While such futures markets are useful in hedging risks, they have not brought effective competition to these industries. We emphasize this point lest some mistakenly conclude that all competitive problems in the cheese industry will be solved by a viable futures market.

Appendix 7.A
Thin Market/Formula Pricing Problems in Other Agricultural Commodities

Thin markets and formula pricing are not uncommon problems in agricultural commodities. A conference sponsored by regional research project NC 117 and the University of Wisconsin in 1978 focused specifically on pricing problems in thin markets (Hayenga 1979). The potential solution to these problems depends on the underlying structure of the markets involved and the cause of the perceived thin trading problem.

A few examples may illustrate the point. In the late 1970s, the National Provisioner "Yellow Sheet" received considerable scrutiny as the dominant reference price for wholesale beef carcasses and primals. Investigations revealed that the Yellow Sheet prices were often based on 1 or 2 transactions; in some cases, market prices were estimated with no actual trades. The problem here was thin price reporting; negotiated transactions were estimated to account for about 30 percent of the beef volume. The Yellow Sheet was reporting on a tiny portion of this volume. Because of this, firms allegedly could manipulate the Yellow Sheet prices. Had a much larger sample of the negotiated transactions been used by the Yellow Sheet, the allegations of manipulated and unrepresentative prices might have been avoided. The Yellow Sheet also failed to keep pace with product changes in the industry. Boxed beef rapidly replaced carcasses as the dominant product form in the 1970s and 1980s. The Yellow Sheet was slow in adapting.

The solution in this case was for the industry to shift to an alternative reference price--the USDA Wholesale Meat Price Report. Called the "Blue Sheet," the USDA price report was expanded in the late 1970s and early 1980s in response to industry requests. Boxed beef composite values have been emphasized with daily quotes currently provided on 2 grades and 2 weights. A carcass cut-out value is also reported to provide feeders a way of converting boxed

beef prices to the value of their cattle. By the mid 1980s, the Blue Sheet had become the dominant reference price used by the beef industry. Formula pricing using the Blue Sheet is estimated to be used on about 80% of the wholesale beef sold in the U.S; negotiated trades account for roughly 20 percent.

Beef is similar to many agricultural commodities in the sense that a growing proportion of transactions are not standardized. Rather, transactions are increasingly specialized as to weight, trim, grade and cut. However, the industry still has a strong desire to use a formula price. And to formula price, an acceptable reference price is needed. The price of a standardized product is most useful for formula pricing purposes. The dilemma facing many commodities is that the trend toward specialized transactions is eroding the base for a standardized reference price. In the case of beef, the USDA has computed carcass values based upon boxed beef and wholesale cut prices.

Egg pricing has also been plagued by a thin market-formula pricing combination. Most transfer prices for eggs in the eastern two-thirds of the U.S. are based on the Urner Barry quotation for New York eggs. Urner Barry (UB) has published price quotations for eggs for over 100 years. For many years, the quote reflected the value of eggs at wholesale in New York City. Over time, it was redefined to reflect the price of cartoned eggs delivered to chain store warehouses in the New York area. The UB quote has tended to creep up so that today, it is 10 to 12 cents above the wholesale price to food retailers. The UB quote is not a report of actual transactions. The UB staff monitors going prices, the inventory situation, relative strength of demand, and availability of eggs. Based upon this information, they adjust their quote up or

down. Although there has been periodic criticism of the UB quote, it has been widely enough accepted by the industry as a third party objective indicator of value to continue in existence.

Schrader (1979) characterized the pricing problem in eggs as follows:

> The fundamental problem of pricing eggs is the almost universal desire to have a base or reference price combined with an even greater desire by firms not to participate in the open market....This leads to the tight circle of quoting prices which are based on the prior quote....[35]

Several other price discovery mechanisms have been tried for eggs (e.g., Egg Clearinghouse, Egg Market Evaluation Committee). However, none have displaced the UB quote as the dominant base for formula pricing. Because Urner Barry is an independent third party that is not reporting the prices of actual transactions, it is probably not as vulnerable to manipulation as the Yellow Sheet was. One of the things this example suggests is that spot market prices are not the only acceptable basis for formula pricing.

In studying the thin market-formula pricing problems of several agricultural commodities, several recommended solutions have been put forth. They include:

1. Prohibit formula priced transactions in a commodity. This not only "fattens" the negotiated part of the market, but eliminates the incentives to manipulate the reference price.
2. Subsidize (or reduce the cost of) negotiated spot transactions in order to encourage increased volume. Negotiated trades may be centralized as with the NCE, or decentralized via direct trades.

---

[35] Lee Schrader, "Pricing Problems in the Food Industry: Broiler Chickens and Eggs," in Hayenga (ed.) *op. cit.*, p. 43.

3. "Committee" pricing, or pricing by an objective third party (e.g., similar to Urner Barry in eggs).

4. Develop an electronic exchange system utilizing computers, teletypes or other advanced technology. Centralized pricing occurs without traders being physically centralized. Trading is usually anonymous.

5. Establish trading in a futures contract for a commodity. If suppliers and demanders of the cash commodity participate actively in the futures market to forward price or hedge cash positions, the futures market can become a broader and more reliable indicator of aggregate supply and demand conditions.

6. Develop improved private or public market information, including such things as quantity manufactured and sold, size of inventories and the prices of contract and spot transactions.

About the Authors

Willard F. Mueller is Vilas Research Professor of Agricultural Economics, Professor of Economics, Professor in Law School, emeritus, at the University of Wisconsin-Madison since 1969. He has also taught at the University of California-Davis; University of Maryland; Michigan State University; and American University. From 1961-68, he was Director of the Bureau of Economics, Federal Trade Commission; and from 1968-69, he served as Executive Director of the President's Cabinet Committee on Price Stability. From 1973-1986, he was chairman of a 15-state research consortium to study the Organization and Performance of the U.S. Food System. He served the Industrial Organization Society as Vice-President (1988-89) and as President (1989-90). Mueller has received many honors and awards, including election as a Fellow of the American Agricultural Economics Association in 1976; awards for Professional Excellence in Recognition of: Quality of Research Discovery (1988); Quality of Communication (1985); Quality of Policy Contribution (1980), American Agricultural Economics Association. He is a member of the Advisory or Editorial Boards of *The Antitrust Bulletin*, 1979-present; *Journal of Reprints for Antitrust Law and Economics*, 1979-present; *Review of Industrial Organization*, 1984-present; *Antitrust Law & Economics Review*, 1986-present. He is author or co-author of a dozen books and monographs and numerous professional articles dealing with issues of competitive behavior and public policy in a market economy.

Bruce W. Marion is a professor of agricultural economics at the University of Wisconsin-Madison. Since 1974, he has been Director of the Food System Research Group of the Department of Agricultural Economics, University of Wisconsin-Madison. He is co-author of *The Food Retailing Industry: Market Structure, Profits and Prices* (Praeger, 1979), *The Food Manufacturing Industries: Structure, Strategies, Performance and Policies* (Lexington Books, 1985) and *The Organization and Performance of the U.S. Food System* (Lexington Books, 1986). He has written numerous articles and monographs on the organization and performance of markets and industries in the U.S. food system and has received awards for outstanding research from the American Agricultural Economics Association and the American Council on Consumer Interests. As executive director of NC 117, a large multi-state project, he received the American Agricultural Economics Association award in 1980 for distinguished policy contribution.

Maqbool H. Sial is a Trade Practices Analyst at the Wisconsin Department of Agriculture, Trade and Consumer Protection since January 1996. He received his Ph.D. in Agricultural Economics from the University of Wisconsin-Madison in 1989. He worked as an Assistant Scientist with the Food System Research Group of the Department of Agricultural Economics, University of Wisconsin-Madison, from April 1991 to December 1995. He has written articles and staff papers on the organization and performance of the U.S. manufacturing sector and the efficiency of rural financial markets. He has also contributed to a paper on U.S. competitiveness in world markets and its relation to antitrust policies.

Frederick Geithman, Master of Science, Agricultural Economics, was Project Coordinator or Associate Research Scientist in the Food System Research Group of the Department of Agricultural Economics, University of Wisconsin-Madison from 1975 to 1995, except for three years at Wisconsin Power and Light Company. He left the University to accept a position with a software company in August 1995. He is co-author of *The Food Retailing Industry* (Praeger, 1979) and of several book chapters and journal articles on the organization and competitive performance of U.S. food manufacturing and retailing industries.