

THE NEW ZEALAND DAIRY INDUSTRY
INTERNATIONAL TRADE & INDUSTRY STRUCTURE

by

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Chapter 1.0: Introduction

The New Zealand dairy industry has a unique cost advantage in milk production and is seen as the low cost exporter in international markets. Unlike other OECD countries, the industry in New Zealand has limited government support and is almost totally reliant on exporting for sustained profitability.

Other major exporters, particularly the European Economic Community and the United States, use the relatively small international market to absorb excess domestic production. Their governments provide price support for the local industry and insulate the domestic market from international trade.

The EEC has become the dominant source of dairy products for international trade, however all of the EEC exports are made with export subsidies.

Demand and production trends in these countries have led to large and unpredictable excess domestic production which, when sold internationally, has destabilised the international markets.

Faced with turbulent markets, driven by the policies in major countries, the New Zealand industry has two basic options. The low cost advantage from milk production in New Zealand can be used to undercut the exports of other countries and pursue a low cost strategy with limited research and development or investment in distribution. Alternatively, the industry can withdraw from the exposed markets, plain commodities, and reposition New Zealand products as specialty products and branded commodities, and invest in distribution channels.

The New Zealand Dairy Board ("the Dairy Board"), the producer export marketing board, has adopted a strategy to move away from the least stable and most price sensitive markets, unbranded commodity products. The Dairy Board has increased investment in branding, and in research and development for specialty products. The Board has also integrated forward to develop final processing and distribution in less developed countries, increasing the penetration for New Zealand products. This represents a complete transformation from the strategy twenty years ago of simply producing commodity products for the market in the United Kingdom.

The strategy has increased the complexity of coordination between the Dairy Board and the milk processing cooperatives, and the entrenched vertical separation in the industry between marketing and processing has come under pressure. The fundamental objective of the New Zealand industry structure, the representation of farmer interests through the cooperatives and the Dairy Board, has also become less certain with the increased complexity of the industry, and this uncertainty has been compounded by the trend for consolidation of cooperatives into regional monopsonies.

This thesis has examined the trends in the international dairy markets and reviewed the strategic options available to the New Zealand industry. The ability of the current industry structure to maintain representation of farmers and to respond to a change in the strategy of the industry, has been assessed.

The conclusions of the thesis are that the chosen strategy of the Dairy Board is appropriate, however the current structure of the industry constrains the ability of the existing processing cooperatives and the marketing board to respond effectively. Cooperative bargaining organisations for the farmers are proposed to preserve farmer representation at the farm gate and allow the downstream processing cooperatives and marketing board greater freedom to pursue the new strategic direction.

Chapter Two: International Trade

2.1 Introduction

The strategy adopted by the New Zealand dairy industry is consistent with its factor advantages and the political environment of international dairy trade. New Zealand has a unique low cost position in the industry which is exposed to the policies of the major dairy producers, particularly the EEC and the United States. The strategy to increase product differentiation and develop distribution networks can limit the impact of commodity product disposals by these countries on New Zealand's profitability, without further increasing the political instability.

New Zealand has the only major dairy industry dependent on export receipts. In 1988, 84 per cent of production was exported and approximately twenty per cent of the country's export revenues came from trade in dairy products. Although New Zealand's total production is only 1.5 per cent of the entire world dairy market, the country's exports account for 25 per cent of total international trade.

New Zealand is prominent in the world market because of its relatively low cost production capabilities. Milk production costs are approximately 50 per cent of those in other countries (table 2.1). These advantages arise from the pastoral based farming, the favourable climate and the level of investment in the industry.

Table 2.1: Estimate of Comparative Costs for International Suppliers (1989)

	New Zealand	United States	The Netherlands	Japan
US\$/tonne				
Butter	1,239	2,148	2,829	4,949
Cheddar Cheese	1,687	2,762	3,568	6,077
Skim Milk Powder	1,283	2,074	2,668	4,515
Casein	3,359	5,666	7,397	12,782
Whole Milk Powder	1,579	2,473	3,203	5,474

Source: Upgrading New Zealand's Competitive Advantage¹

The traditional strategy of the New Zealand industry was focused on providing commodity products to the United Kingdom, and became redundant when the United Kingdom joined the EEC in 1973. From that time, the New Zealand industry has been increasingly forced to compete in the international markets.

The New Zealand industry faces an unfriendly trading environment which suffers from fragile dynamics. Countries restrict imports and intervene internally to maintain stable markets for domestic producers. Major trading nations dispose of frequent domestic surpluses on the relatively small international commodity markets and destabilise international prices. These events have become more prevalent with increases in milk yield and shifts in demand. The few significant open markets tend to demand commodity products and require investment in distribution and marketing, without promise of long term security.

¹ Crocombe, G.T., Enright, M.J. and Porter, M.E. "Upgrading New Zealand's Competitive Advantage", Oxford University Press, Auckland, 1991.

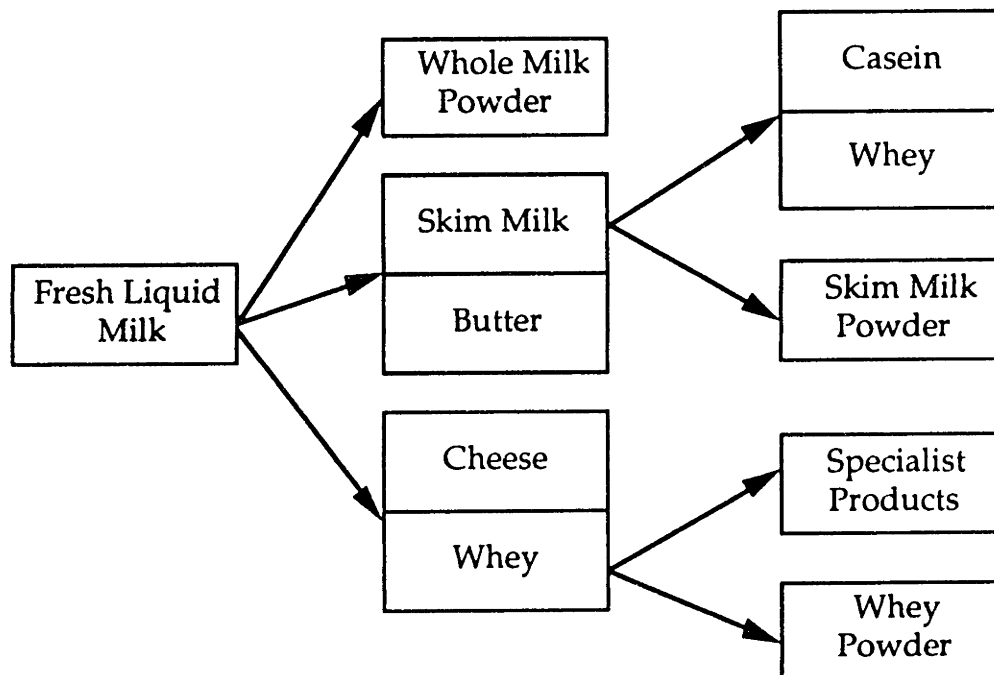
Two broad strategies are possible for the New Zealand industry to respond to the uncertain markets. A low cost strategy to maintain market share, relying on the cost advantage from the New Zealand farms, or in attempting to secure profitability, a dual strategy seeking product differentiation through branding and product development, and increased distribution through investment in international subsidiaries.

2.2 Export Supply Characteristics

International trade in dairy products is effected by the natural variability of milk production and more significantly, by the policies followed in major producing countries. These policies directly impact on prices and frequently result in supply shocks to the international markets.

Traded dairy products represent less than five per cent of total world milk production. Due to high transport costs, import barriers and its relatively short life, most milk is consumed in the region within which it is produced as either fluid milk (approximately 40 per cent) or as soft products (for example yoghurt and ice cream). Other milk is manufactured into commodity products, principally butter, cheese, and milk powder, or specialty products (figure 2.1). Production can swing between different groups of products and therefore the international prices are linked.

Figure 2.1: Milk Products



International trade statistics are dominated by the EEC which has over 50 per cent of the international market and the greatest single share of each commodity product segment (table 2.2). The next largest exporter, New Zealand, supplies approximately 25 per cent of the market. Total production in the EEC is some four times the size of total international trade.

Table 2.2: EEC and New Zealand Export Market Shares (1989)

	Butter	Cheese	Milk Powder
EEC	48.8%	48.0%	50.7%
New Zealand	21.4	10.2	14.5

Source: EEC Dairy Facts & Figures 1990, Milk Marketing Board²

Other countries with major domestic production and consumption also affect international trade. While the EEC has the continuing major presence, periodic surpluses arising in the United States and purchases by the USSR have previously depressed prices. The United States and USSR, along with the EEC, account for 60 per cent of total world milk production. The United States is the smallest of the three, however the next largest country, India, produces less than 50 per cent of the United States output. New Zealand produces approximately one tenth of the United States output (table 2.3).

Table 2.3: World Milk Production (1989)

	Milk Production	
	('000 tonnes)	per cent of total
EEC	109,900	23.3
USSR	107,600	22.8
United States	65,432	13.9
India	23,000	4.9
New Zealand	6,877	1.5
Total World	471,959	

Source: EEC Dairy Facts & Figures 1990, Milk Marketing Board³

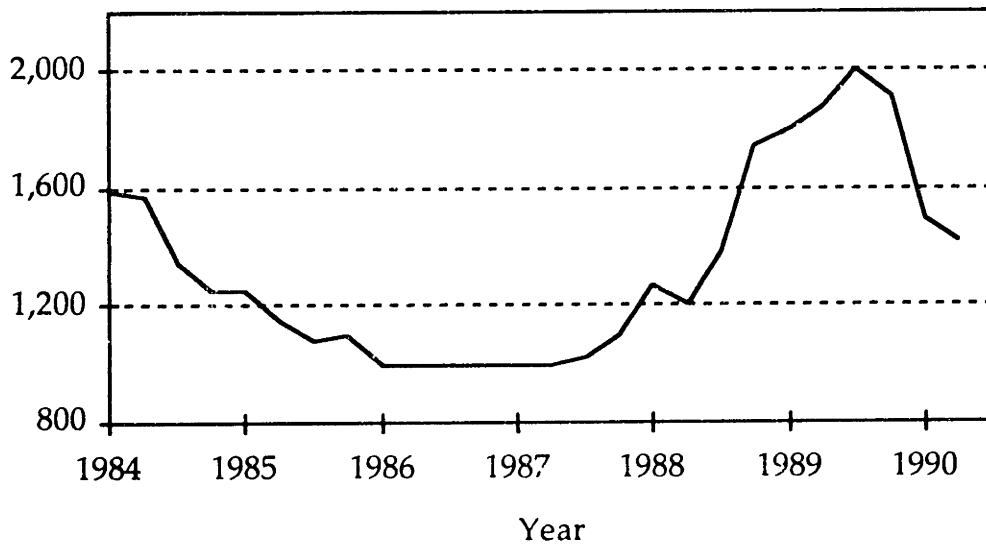
² "EEC Dairy Facts & Figures 1990", Economics Directorate, Milk Marketing Board, Surrey, United Kingdom, 1990.

³ *ibid.*

A minor increase in milk supply in the major producing regions has the potential to undermine prices in the international market. In 1988, milk production declined in the EEC by 2.6 per cent and international milk product prices approximately doubled to reach record levels as intervention stocks fell (figure 2.2 & 2.3). In 1989 the EEC experienced unanticipated production in excess of the internal production quotas of 1.8 million tonnes and prices fell with butter prices falling 40 per cent. The OECD had viewed the dairy market outlook as relatively stable in 1989 with the expectation that production controls, low stock levels, and demand from moderate world growth should prevent over-supply and price collapse in international markets.⁴ Although only equivalent to 1.7 per cent of total EEC production, the supply shock was equivalent to approximately eight per cent of total traded products.

Figure 2.2: World Price of Butter

US\$/tonne FOB

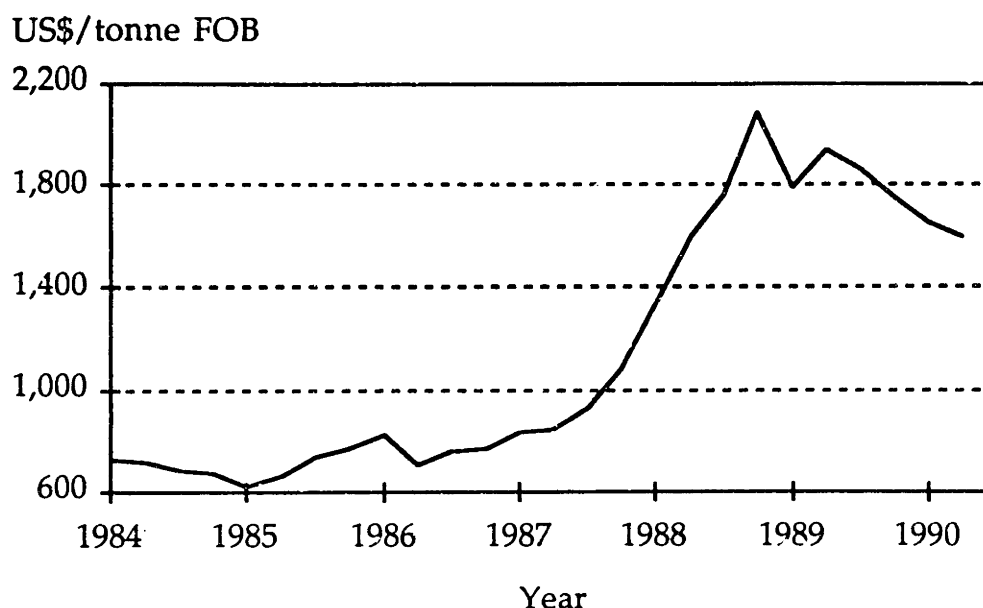


Source: EEC Dairy Facts & Figures 1990, Milk Marketing Board⁵

⁴ "Agricultural Policies Markets and Trade - Monitoring and Outlook, 1990", Organisation for Economic Co-operation and Development, Paris, 1990.

⁵ "EEC Dairy Facts & Figures 1990", Economics Directorate, Milk Marketing Board, Surrey, United Kingdom, 1990.

Figure 2.3: World Price of Skim Milk Powder



Source: EEC Dairy Facts & Figures 1990, Milk Marketing Board⁶

In addition to the natural supply variability, international trade is distorted by a relatively high degree of government intervention. Agriculture generally receives a significant level of support from national governments and the dairy industry attracts a high proportion of the total support. In 1980, the dairy industry attracted approximately 40 per cent of the total transfers while only representing 20 per cent of the total agricultural production.⁷ Within the OECD, the most industrialised countries provide the highest level of support and New Zealand the least (table 2.4). The highest level of intervention aligns with the most attractive markets for dairy products and the largest exporter, the EEC.

⁶ "EEC Dairy Facts & Figures 1990", Economics Directorate, Milk Marketing Board, Surrey, United Kingdom, 1990.

⁷ "National Policies and Agricultural Trade", Organisation for Economic Co-operation and Development, Paris, 1990.

Table 2.4: Total Transfers in OECD Countries Agricultural Policies (1988)

\$ billion	Transfer from tax payers	Transfer from consumers	Total transfers
United States	51.3	23.4	74.7
Canada	4.6	3.4	8.0
Australia	0.7	0.3	1.0
New Zealand	0.2	0.1	0.3
Japan	17.2	59.8	77.0
Austria	0.9	2.8	3.7
EEC	45.0	75.3	120.3
Total	119.9	165.1	285.0

Note: The actual transfers were about \$270 billion in 1988, because \$15 billion was collected by governments from import duties on agriculture products, including \$13.3 billion in Japan.

Source: OECD⁸

The distortions arising domestically flow into the international markets. For example, in 1988 the record international skim milk powder prices, combined with the returns from selling the associated product, butter, at the domestic floor price, encouraged United States domestic processors to switch production to butter and skim milk powder. The domestic floor price for butter effectively provided a cross subsidy for the skim milk exports which competed with the previous international suppliers. The domestic supply of cheese tightened as milk went to butter and skim milk powder production. The butter purchases were stockpiled and eventually partially cleared in a subsidised sale to the USSR in 1989. These sales contributed to the 40 per cent price fall in the international butter prices at that time.

⁸ "Agricultural Policies Markets and Trade - Monitoring and Outlook, 1990", Organisation for Economic Co-operation and Development, Paris, 1990.

International commodity prices are often established based on the EEC domestic price and the level of EEC export subsidies. Prices for butter and skim milk, the principal exports from the EEC, generally follow the European domestic prices, less the export subsidy set by the EEC. Whole milk powder prices are related to skim milk powder prices, as they are close substitutes for several uses. The EEC is both a major importer and exporter of cheese and as with other products, internal EEC policies also directly bear on international prices.

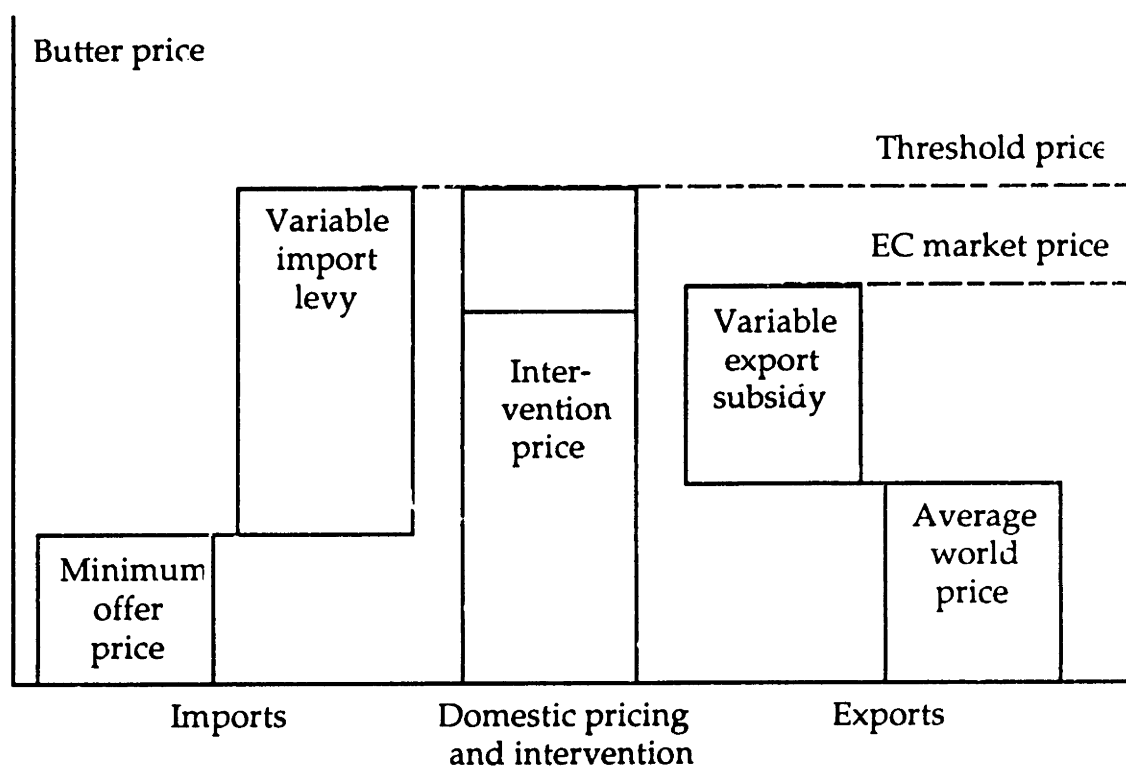
Among the OECD nations, the EEC nations collectively have the highest level of government intervention (table 2.4). The Common Agricultural Policy ("CAP") administered by the EC Agriculture Council aims to provide producers with a stable and protected market, while increasing incomes and encouraging rural development.⁹

The trade policy is designed to create a buffer for local stability and exports provide a mechanism for delivering income support. The EEC restricts imports of most products through a limited number of special import quotas, and uses intervention prices, balanced by domestic production quotas, to maintain returns to farmers (figure 2.4). The current production quotas aim to provide 85 million tonnes of milk for consumption in the European Community and allow for export of the equivalent of 12 million tonnes of milk.¹⁰

⁹ McCalla, A.F. & Josling, T.E. "Agricultural Policies and World Markets", MacMillan Publishing Company, New York, 1985.

¹⁰ "Situation and Outlook for New Zealand Agriculture", Ministry of Agriculture and Fisheries, New Zealand, 1990.

Figure 2.4: EEC Butter Market Support



The exports require significant subsidies to generate sufficient demand. Over the last four years, the subsidy applied to skim milk exports has ranged between 10 to 40 per cent of the world price, and that for butter between 90 to 200 per cent of the world price.¹¹ The dairy industry absorbs 50 per cent of the CAP budget, which is the largest budgetary programme in the EEC. In 1991 expenditure on price support is expected to increase by 30 per cent to £22.8bn.¹²

Development of a stable international market has been a secondary priority for the EEC. Production encouraged by the CAP in the early 1980's, and dairy

¹¹ "EEC Dairy Facts & Figures 1990", Economics Directorate, Milk Marketing Board, Surrey, United Kingdom, 1990.

¹² Financial Times, Friday, March 30, 1991.

cow yield improvements, exceeded the limited domestic demand growth. Between 1983 and 1987, the EEC resorted to heavily subsidised exports to clear the significant accumulation of products, referred to as the "butter mountain". The actions of the EEC resulted in depressed prices which only recovered when farm production quotas, backed with penalties for excess supply, were set to restrict output.

The political flexibility of the domestic production quota system, however, was demonstrated in 1989 when the unanticipated excess domestic production of 1.8 million tonnes of milk was retrospectively included in the production quotas, thus avoiding penalties for farmers under the EEC rules. This production will be disposed of through the export markets.

The United States also follows policies which disrupt the international market. The domestic market is insulated from the international market and milk is in fact the only major livestock product in the United States covered by administered prices. The domestic policies lead to alternatively opportunistic commercial activity in the international market and forms of subsidised international disposal of products. The Commodity Credit Corporation, an agency of the United States Department of Agriculture ("USDA"), purchases products to maintain floor prices and controls disposal of surplus products through domestic "donations", foreign food aid and subsidised export. Imports are controlled through transferable licenses. However, when world prices rise sufficiently, exports also occur directly from domestic producers.

The structure of intervention in the United States thus encourages a market response when international prices rise above the necessary threshold for

domestic suppliers, unlike the EEC where the level of export subsidy simply decreases and production remains unchanged. The United States system potentially has a greater impact on the world market because traded quantities change as production is switched. Over time capacity can increase, however, when prices fall the national industry requires a readjustment period and production capacity over shadows the market.

As with the EEC, the United States also pursued policies through the late 1980's to reduce milk production. The Dairy Termination Programme from April 1986 to October 1987 was followed with a reduction in the milk support price by 2.3 per cent in October 1987 and further cuts in the national support price in January 1988. A large sale of butter to the USSR in September 1989 reduced the support stocks and the Commodity Credit Corporation further lowered purchase prices. Supply control measures in the form of acreage reduction requirements also exist, however these have been relaxed in view of improved dairy prices.

While the EEC and the United States have large captive domestic markets and are able to treat international stability as secondary, New Zealand faces shrinking captive or long term markets. The country has a special butter tariff quota and a cheese quota for imports into the United Kingdom, and a cheese quota for access into the United States. These arise from historical trading patterns and international negotiations. Other contracts must be established on a commercial basis with, typically, government purchasing agents or multinational food companies.

However, in 1990, the levy associated with the United Kingdom butter quota was cut and a new schedule for reduction was agreed, terminating in 1992 at

55,000 tonnes. This represents the largest market for New Zealand butter (25 per cent) but has fallen to a third of the original size.

In contrast to the EEC and the United States, New Zealand had by 1990 removed most direct controls on the dairy market and now provides neither direct subsidies to the industry nor maintains a price support policy. This is consistent with the reliance on international markets. Relatively limited intervention occurs through a statutory export monopoly conferred upon a producer marketing board, the New Zealand Dairy Board, and through limits on imports of certain agricultural goods for animal health quarantine reasons.

The almost complete absence in New Zealand of direct government support exposes the industry to the international market in contrast to the other major trading nations.¹³ The philosophical difference in policies is captured in the tone of the description in a recent USDA publication: "...New Zealand does little to prevent international market forces from affecting its dairy industry."¹⁴

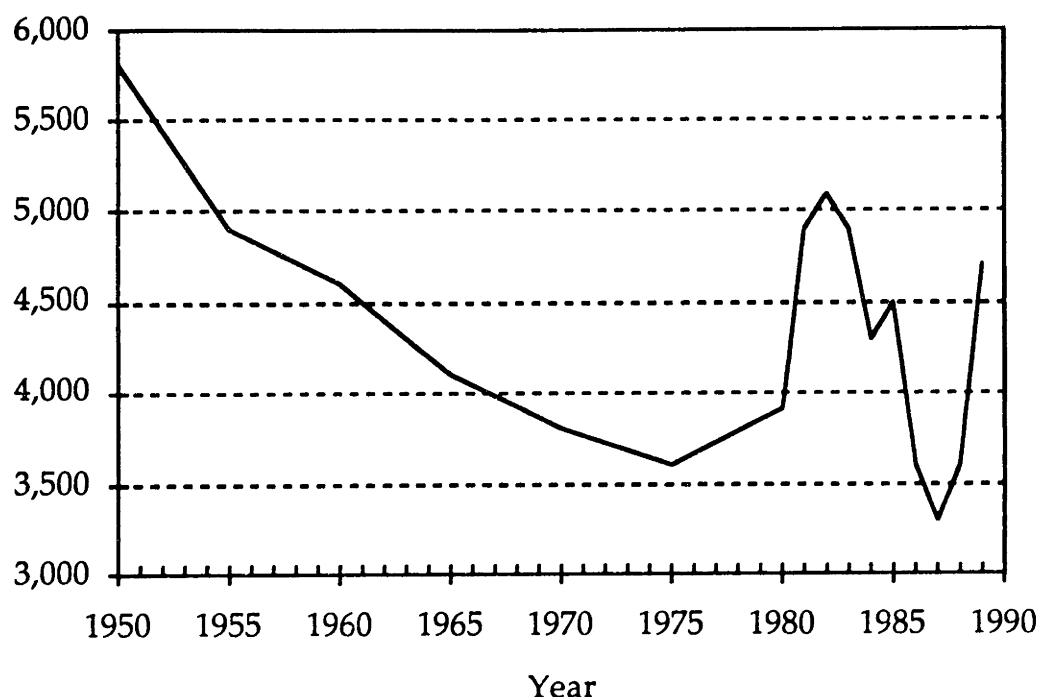
The prices received by New Zealand farmers thus mirror international prices and volatility (figure 2.5). Domestic prices in other countries, based on government policies, are typically two to three times higher than the New Zealand domestic price and the New Zealand producers face significantly greater volatility. The relative isolation of the United States and EEC farmers

¹³ "Agricultural Policies Markets and Trade - Monitoring and Outlook, 1990", Organisation for Economic Co-operation and Development, Paris, 1990.

¹⁴ Blayney, D.P. & Fallert, R., "The World Dairy Market - Government Intervention and Multilateral Policy Reform", U.S. Department of Agriculture, Staff Report No. AGES 9053, August 1990.

Figure 2.5: New Zealand Export Prices

Real NZ\$/tonne FOB



Note: Indexed CPI Base 100 = 1950

Source: Improving New Zealand's Competitive Advantage¹⁵

from the world market is shown in the comparison with prices received by New Zealand farmers (table 2.5). Producer prices in the EEC have moved within a narrow band and in the United States have tended downward with the lowering of price supports, except when the international price has sustained exports. The volatility experienced by the New Zealand producers had a variance of 34.8, in contrast with the United States at 0.22 and the EEC at 0.53.

¹⁵ Crocombe, G.T., Enright, M.J. and Porter, M.E. "Upgrading New Zealand's Competitive Advantage", Oxford University Press, Auckland, 1991.

Table 2.5: Milk Price Volatility

	Nominal prices (national/currency/100 Kg)					percentage change over previous year			
	1985	1986	1987	1988	1989	1986	1987	1988	1989
United States									
support price	25.8	24.9	24.3	23.4	23.6	-3.5	-2.4	-3.7	0.9
producer price	28.1	27.6	27.6	26.9	28.0	-2.0	0.3	-2.6	4.1
New Zealand									
producer price	18.6	15.5	16.7	23.4	29.9	-16.7	7.7	40.1	27.8
EC-12									
support price	27.8	27.8	27.8	27.8	27.8	0.0	0.0	0.0	-0.1
producer price	27.6	28.1	27.9	28.8	29.4	1.8	-0.7	3.2	2.1

Source: OECD¹⁶

World-wide production trends have also placed pressure on the market stability. Production has been increasing at a rate of approximately two per cent per annum, mainly through increased yields from cows through improvements in genetics, feed supply and management practices.¹⁷

Demand is relatively static in the EEC and the United States, thus increased production in these countries leads to increased subsidised exports.

The dynamics of production further add to market instability. While international prices have a short term effect on the mix of products produced from the available milk, total milk production is fixed by herd numbers. Herd expansion requires some two years for the number of cows to increase. New Zealand is one of the most responsive countries internationally and has invested in production capacity for switching the product mix. In

¹⁶ "Agricultural Policies Markets and Trade - Monitoring and Outlook, 1990", Organisation for Economic Co-operation and Development, Paris, 1990.

¹⁷ *ibid.*

comparison, the EEC tends to be largely unresponsive due to the domestic policy regime, as is the United States.

Table 2.6: Production of Dairy Products, 1988-89.

	thousand tonnes			Skim milk powder		
	1988	1989	% change	1988	1989	% change
United States	547.7	545.0	-0.5	443.8	390.0	-12.1
New Zealand	202.2	279.3	38.1	171.1	140.4	-17.9
EEC-12	1734.9	1731.6	-0.2	1295.6	1316.1	1.6
Total	3082.8	3165.3	2.7	2417.3	2373.9	-1.8

	thousand tonnes			Whole milk powder		
	1988	1989	% change	1988	1989	% change
United States	2527.2	2570.0	1.7	78.2	70.0	-10.5
New Zealand	128.4	121.3	-5.5	184.0	199.2	8.3
EEC-12	4349.1	4414.2	1.5	866.4	851.7	-1.7
Total	8205.8	8327.5	1.5	1271.0	1257.2	-1.1

Source: OECD¹⁸

Overall, international supply remains unpredictable. The dynamics of the markets while affected by changes in production mainly follow the policy decisions of the major trading countries. The inability of the EEC to impose control on their complex industry and the ready response of United States producers to international price increases, both suggest continuing volatility.

¹⁸ "Agricultural Policies Markets and Trade - Monitoring and Outlook, 1990", Organisation for Economic Co-operation and Development, Paris, 1990.

2.3 Import Demand Characteristics

Growth opportunities exist within the international markets, however these require marketing, distribution and product development investment.

While western countries have mature demand for commodity dairy products, growth is occurring in countries where consumer demand for dairy products is relatively undeveloped or where capital and technical constraints have limited the development of the domestic industry to satisfy the latent demand. In mature markets, technology has been applied to develop specialist products for niche markets, and competition requires continual investment in research and development.

Government agencies are frequently directly involved in markets and although most purchasers individually have limited market presence in each segment, one country tends to be prominent. The largest buyers in recent years have been the USSR (butter), Japan (cheese), Mexico (milk powder) and the EEC (cheese).

The USSR, by the scale and unpredictable nature of its purchases, has been a contributing factor to market instability. The USSR times purchases of butter to gain leverage from the magnitude of the tenders relative to the market and move the price. The largest occurrence took place in 1988 when the Soviets purchased over 400,000 tonnes, principally from the EEC, leading to record sales of over 600,000 tonnes. The EEC had to sell stockpiled butter which had neared the end of its storage life and this weakened international prices. The position of the USSR is unusual because of the apparent discretionary nature

of the purchases and its often important role of absorbing production surpluses.¹⁹

Countries with growing demand attempt to balance protecting the growth of the domestic industry, while allowing increased trade. Japan has been a major growth market for international trade and the previously under-developed consumer demand for milk products has increased significantly. Domestic supply has been growing (table 2.7), however milk available for processing into cheese and other products had an estimated shortfall of some 3.0 million tonnes in 1989. While protecting and encouraging domestic farmers, the Japanese government has liberalised the trade in some products, for example, in 1989 the import quotas on processed cheese were abolished.

Table 2.7: Japanese Production of Dairy Products, 1988-89.

thousand tonnes	1988	1989	% change
Butter	68.4	78.4	14.5
Skim milk powder	159.5	177.8	11.5
Cheese	82.0	84.6	3.2
Whole milk powder	32.2	32.9	2.1

Source: OECD²⁰

Demand in developing countries has recorded an average growth rate of three per cent per annum in recent years and steady growth is expected to be maintained, limited by investment in production and distribution. On a per capita basis, production of fluid milk for fresh consumption generally remains at low levels and imported milk powder is an important substitute.

¹⁹ McCalla, A.F. & Josling, T.E. "Agricultural Policies and World Markets", MacMillan Publishing Company, New York, 1985.

²⁰ "Agricultural Policies Markets and Trade - Monitoring and Outlook, 1990", Organisation for Economic Co-operation and Development, Paris, 1990.

Demand is particularly driven by the growing middle classes. A number of countries have embarked on development programmes, including India, China and Mexico.

Mexico has been a major market for whole milk powder and has also had a relatively successful policy to increase fresh milk self sufficiency. Mexican production had a four per cent growth rate in 1988 and production increased strongly from 1985 due to the introduction of high yielding breeding stock.²¹ As with other developing countries, Mexico is aiming to ultimately reduce or eliminate the import of dry milk powder as a substitute for fluid milk.

Whole milk powder has become increasingly important encouraged by strong demand from markets with under-developed industries, principally in Asia and South America. In 1988, 975,000 tonnes of whole milk powder were traded internationally and this increased to a record level of 1,000,000 tonnes in 1989.

The other commodity product segments, cheese and butter, have historically been the most important traded products. World cheese production has increased at an average rate of close to five per cent per annum since 1970²² and reached a record level in 1989, of 882,600 tonnes. International demand and production has been in reasonable balance each year with increased imports into the EEC, Japan and strong demand by OPEC and other developing countries.

²¹ "Agricultural Policies Markets and Trade - Monitoring and Outlook, 1990", Organisation for Economic Co-operation and Development, 1990.

²² Blayney, D.P. & Fallert, R., "The World Dairy Market - Government Intervention and Multilateral Policy Reform", U.S. Department of Agriculture, Staff Report No. AGES 9053, August 1990.

International demand for butter has declined to the levels of the early 1980's as consumer preferences in western countries are generally moving away from high fat foods, such as butter. Animal fats also face pressure from vegetable fat substitutes in, for example, imitation ice creams and cheese. Although animal fats, such as butter, are price competitive, dietary preferences favour vegetable fats.

In mature country markets, new products derived from milk components have found sophisticated market niches and non-traditional products are increasingly relevant to overall returns for the milk industry. Casein, milk protein, is the most significant non-traditional product traded and represents an attractive market as casein has both food applications and industrial uses. The major markets for casein are in the EEC and the United States. Milk proteins also have few close substitutes and are strongly competitive compared with, for example, vegetable proteins.

Specialty products also present growth opportunities. Investment in research and process technology has led to the development of the whey products market. Whey, although accounting for 50 per cent of milk solids in cheese manufacture, was traditionally considered as a waste by-product. There has been strong demand for whey products as food and animal feed additives, and in pharmaceutical applications. The market has grown rapidly however prices have fluctuated as new suppliers entered the market. Other specialty products are adapted to specific customer group requirements and include formula milk powder, specialty cheeses, concentrated milk lactose and specialty milk fat.

All of these opportunities require investment without assured return. The markets in developing countries provide a degree of first mover advantage from investments in distribution and marketing however the long term stability is uncertain for when the markets have matured and domestic production increased. The specialty product markets are relatively open to imitation and require continual investment in research and development to remain competitive. However, where a first mover advantage can be attained, an expectation of above average profits would be reasonable.

2.4 International Coordination

A significant degree of formal and informal coordination is attempted in the international markets to preserve stability and maintain prices. The EEC and the United States dominate in establishing the basis of international trade and New Zealand is weakly placed to negotiate liberalisation. The New Zealand quotas for access to the EEC and the United States also suggest a level of bilateral coordination in the dairy markets.

International price coordination has been attempted through the General Agreement on Trade and Tariffs. The International Dairy Arrangement ("IDA") was negotiated in the Tokyo GATT Round in 1978 and replaced a number of piecemeal agreements, including the 1970 OECD Arrangement Concerning Certain Dairy Products. International cooperation has a long tradition, dating from the formation in 1908 of the International Dairy Federation to exchange technical information.

The IDA's espoused goals are to expand and liberalise trade under stable market conditions to the mutual benefit of exporting and importing countries, and also further economic and social development in developing countries.²³ Several IDA institutions provide forums for discussions and coordination, and set formal minimum export prices for commodity items.

The signatories are representative of the dairy importing and exporting nations, but fail to include the USSR, the United States, Canada and Austria (table 2.8). Members include other major OECD countries, developing

²³ "The World Market for Dairy Products, 1989", International Dairy Arrangement, Tenth Annual Report, General Agreement on Tariffs and Trade, Geneva, November 1989.

countries and eastern European countries. The United States and Austria withdrew in 1985 during the period in which excess production drove prices down.

Table 2.8: Signatories to the International Dairy Arrangement (1989)

- Argentina
- Australia
- Bulgaria
- Egypt
- the EEC
- Finland
- Hungary
- Japan
- Poland
- New Zealand
- Norway
- Romania
- South Africa
- Sweden
- Switzerland
- Uruguay

Source: International Dairy Arrangement, Tenth Annual Report

It is unclear that the IDA meets its stated purpose. It appears to principally provide a forum for discussion and exchange of price information, and potentially increase the visibility of any product dumping. The minimum prices have been breached several times by signatories with the approval of GATT. The minimums are set well clear of the market prices and are frequently adjusted (table 2.9). The absence of several major dairy trading countries further lessens the credibility of the Agreement and the enactment of support for undeveloped countries receives scant record in the annual reports.

Table 2.9: International Commodity Prices

Product	Prices		IDA Minimum	
	1988	1989(1)	1989	Sept 1989
\$US per ton f.o.b.				
Anhydrous milk fat	1,325-2,100	1,900-2,500	1,500	1,625
Butter	1,100-1,880	1,750-2,100	1,250	1,350
Cheese	1,400-2,400	1,900-2,400	1,350	1,500
Skim milk powder	1,300-2,270	1,700-2,100	1,050	1,200
Whole milk powder	1,400-2,000	1,800-2,100	1,150	1,250

Notes: (1) First three quarters only
 Source: International Dairy Arrangement, Tenth Annual Report

Informal coordination appears to be more powerful in the market than the IDA. Price coordination occurs through intermediary agents and a number of commodity traders act in the market, including Louis Dreyfus, Cargill, Continental Grain, Mitsui and Mitsubishi.²⁴ These intermediaries are well placed to collect market information and pursue opportunities in commodity product segments.

The New Zealand tariff quotas providing access into the EEC and the United States, and associated above normal profits, also suggest incentives for maintaining coordination in the international market. The net price for butter sold under the unique butter quota for the United Kingdom is 80 per cent above the international market price, representing a clear subsidy from the EEC to New Zealand. The New Zealand Dairy Board has also publicly coordinated activities with other sellers. For example, in 1981 the Dairy Board purchased 100,000 tonnes of butter from the United States and coordinated the on-sale to the USSR.

The apparent lack of historical price competition and the willingness to hold stocks by the New Zealand Dairy Board represents a significant level of implicit collusion with the EEC and the United States. This was heightened in 1988 by domestic coordination to limit production while prices rose in a favourable market, and McCalla and Josling suggested that New Zealand actively colluded with the EEC, along with the connivance of the United States, to boost prices in the early 1980's.²⁵

²⁴ Dobson, W.D. "The Competitive Strategy of the New Zealand Dairy Industry", *Agribusiness*, Vol. 6, No. 6, 1990.

²⁵ McCalla, A.F. & Josling, T.E. "Agricultural Policies and World Markets", MacMillan Publishing Company, New York, 1985.

The existing framework of international agreements, including the IDA, is currently under revision in the Uruguay GATT round, and New Zealand would be a major beneficiary from any trade liberalisation. The OECD calculates that OECD household incomes could be one per cent higher as a result of trade liberalisation based on removal of the level of transfers existing in 1986-88. New Zealand would have the highest gain at 2.7 per cent.²⁶ In a recent article, the OECD claimed that if farm support was eliminated world trade in dairy products would increase by 240 per cent and world prices would rise by 14 per cent.²⁷

The New Zealand Government's policies are strongly in favour of increased trade liberalisation, consistent with the embracing of free market policies in the country, and New Zealand is a member of the Cairns Group seeking open trade in agricultural products in the Uruguay round. However, New Zealand has no basis for leverage in undertaking trade liberalisation negotiations.

The Uruguay round seeks to prohibit export subsidies which are the main policy instruments of the EEC, as applied to dairy product exports. The possibility for fundamental revision to the EEC's Common Agricultural Policy, which this would imply, appears slim and the continuing EEC debate surrounding budget cuts to the CAP has been clouded by the inclusion in the EEC of the previous East Germany.

Progress towards any liberalisation is dependent on the policies of the EEC. While the internal politics of the EEC can accept the cost of the CAP, it

²⁶ "Agricultural Policies Markets and Trade - Monitoring and Outlook, 1990", Organisation for Economic Co-operation and Development, Paris, 1990

²⁷ Financial Times, Friday, March 30, 1991.

appears unlikely that major changes in the international competitive framework will occur. The dominance of the EEC and the United States in trade negotiations suggest that weakly placed countries, such as New Zealand, have few options for improving their relative position. Further, any actions by New Zealand to disrupt the collusion in the dairy markets, would likely directly risk the existing bilateral agreements over quotas, and possibly threaten other exports to the EEC and the United States.

2.5 The Strategy of the New Zealand Industry

The strategy which the New Zealand Dairy Board has adopted on behalf of the industry, is consistent with the strengths of the New Zealand industry and also appears consistent with both the opportunities in the international environment and with the political context of trade in dairy products. The New Zealand dairy industry has had two basic strategic options for competing in the international markets: rely on its low cost production advantage to compete on price or seek to differentiate New Zealand exports through delivery and product attributes. The strategy to seek product differentiation and invest in distribution has the greatest potential for reducing the volatility of New Zealand's earnings and improve overall export profitability.

Under the low cost strategy, the New Zealand industry would rely on the low cost production advantage of the New Zealand farmer and the New Zealand industry would become an innovation follower in the market, competing firstly on price. Revenue stability could be enhanced by committing to long term contracts at the expense of accepting lower prices. Such a strategy would lower marketing costs and the lower prices may also stimulate growth in the total market available to New Zealand.

New Zealand is well placed economically to compete on price and attempt to undercut competitors, however international supply would be largely insensitive to a moderate decline in price. Exports from the EEC are already made with significant subsidies and political support is likely to maintain the level of exports. Even if production capacity were to decline, the response would be slow and the volatility in the international markets may well increase as adjustments in supply occurred.

The major source of volatility, supply shocks, would remain and New Zealand may only achieve an overall decrease in revenue, with increased risk to profitability from the supply shocks.

The low cost strategy may however generate increased demand and expand the market at a greater rate in the developing dairy consuming regions. This increased market size may lead to increased production in New Zealand, without increased production by uneconomic competitors, and overall lead to higher revenues for the New Zealand industry. The enlarged market may also be better able to absorb the supply shocks from the EEC and the United States. The delay in increasing capacity, however, suggests that the increase in demand may lead to increased market volatility in the short term.

The strategy also generates less profit for investment to develop these markets, and also pursue other potentially profitable innovations such as specialty products. However, the Dairy Board has the expertise and market intelligence to adopt a follower strategy in market innovations. Depending on the nature of the innovation, this may be a less expensive strategy to pursue.

Competing on cost breaks the international coordination between trading countries. The IDA agreement specifically creates international floor prices and while practically not binding, New Zealand's actions would break the collusion. The repercussions of this may well return through the bilateral agreements over quota access. In the case of the butter quota for the United Kingdom, this results in sales at 80 per cent over the international market and has an obvious element of subsidy. This would be threatened by New Zealand deciding to act independently and compete head on with the EEC.

The low cost strategy may result in a significantly less attractive market for the New Zealand industry, with low profitability and continued exposure to supply shocks.

The alternative strategy to invest in product differentiation and distribution, avoids introducing new sources of instability to the existing commodity markets and is consistent with the strategic direction already committed to by the Dairy Board, as the international marketer for the industry. A reversal to a low cost strategy would result in a significant withdrawal from investments already made.

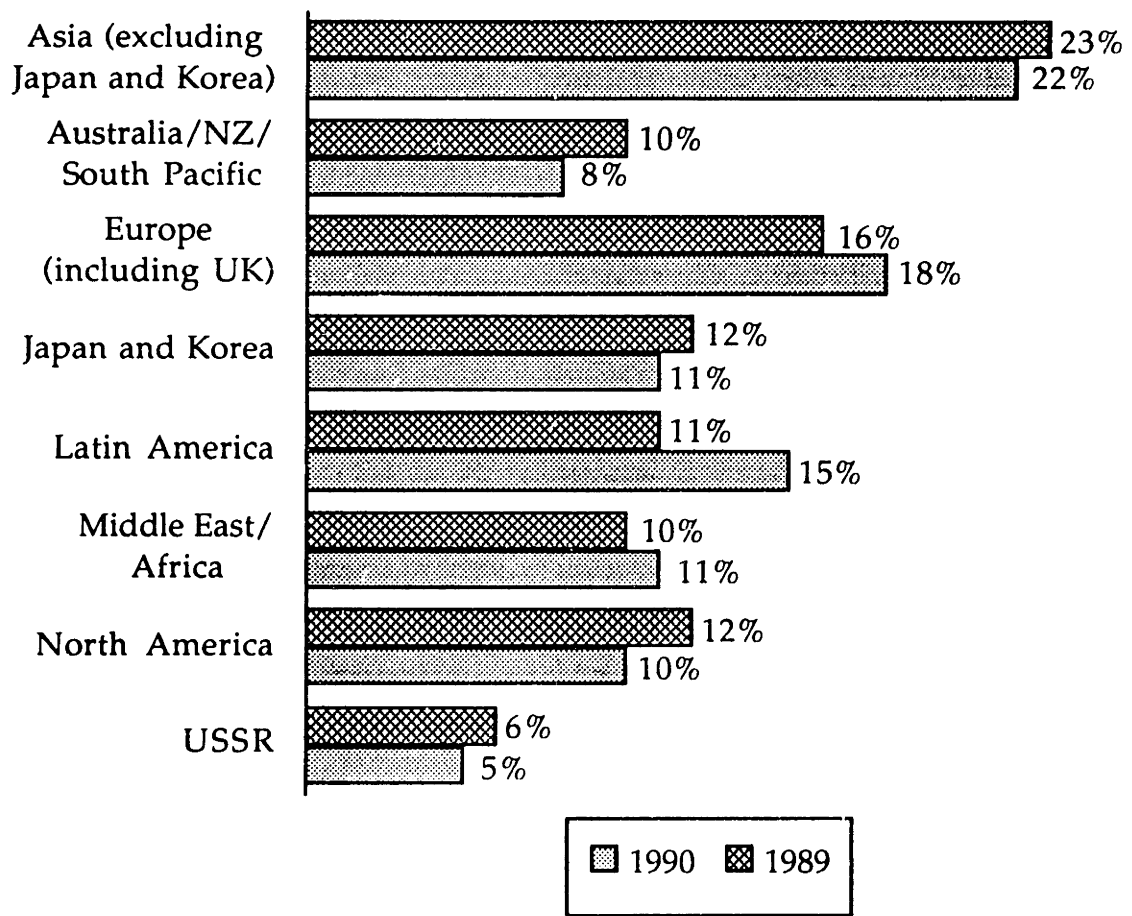
The chief executive officer states in the 1990 Dairy Board annual report that: "Central to the Board's strategic thinking is the need for an increasingly market driven industry." This strategy has been implemented through increased marketing intensity internationally through both sophisticated product attributes and consumer branded products. For example, the Board developed "butter sheets", an attractive product for bakeries, and has expanded the use of branded milk powder sales in Malaysia. Research and development activity has been focused on supporting new product development and has successfully led to a growing business in specialty products derived from whey.

The supply shocks from the United States and the EEC directly affect the commodity markets which the strategy seeks to reposition the New Zealand product mix away from. The remaining commodity products, marketed through captive distribution channels or having brand recognition in the final market, will be less exposed than undifferentiated products to the

shocks, if the marketing effort has successfully decreased the elasticity of demand for the products.

The strategy also aligns with the recognised market opportunities in developing dairy markets and the Dairy Board has invested in a considerable network of international sales offices to pursue these opportunities. It now has over 50 subsidiaries in some 25 countries and sales are spread around the world (figure 2.6). These subsidiaries are involved in market development as well as distribution. The commitment to new markets has continued with recent investments in subsidiaries in Korea, Egypt and Taiwan.

Figure 2.6: International Sales of the New Zealand Dairy Board



Source: New Zealand Dairy Board

Research centres have also been established in foreign markets to increase product development and the New Zealand industry has considerable technical expertise to focus on these opportunities. However, imitation of these products by competitors, particularly the European multinationals and cooperatives, has few barriers. The Dairy Board has an initial advantage through the coverage of the marketing network and the existing investment in market research, and could possibly sustain a first mover role.

This repositioning of the product mix is expected by the Dairy Board to both increase and stabilise revenue.

Moreover, this strategy would retain the apparent collusion among major exporters and avoid the risk of retaliation through lost quota access or other trade restrictions. Through competing in new markets, rather than the core commodity products, the New Zealand industry avoids direct confrontation with other major trading countries.

The strategy which the Dairy Board has adopted appears to be the most politically acceptable and as well as having the potential for generating increased returns to the industry. The low cost strategy has limited potential for minimising the impact of supply shocks and may attract political retaliation. The dual differentiation and investment in distribution strategy is consistent with the established direction of the Dairy Board, however it calls for increased coordination across the industry.

Chapter Three: Industry Structure

3.1 Introduction

The current structure of the New Zealand dairy industry evolved to serve a very different market from that which now exists. The structure appears too rigid to fully meet the demands of the new market but any rearrangement must also ensure representation of farmer interests.

The existing structure of cooperative processors and a marketing board has institutionalised a vertical separation between marketing and processing, detracting from the responsiveness of processors and the overall industry to the market. The statutory monopoly for export markets held by the Dairy Board appears inconsistent with the need for industry-wide responsiveness to the dynamic market place and with improved representation of farmers this institutional constraint can be removed.

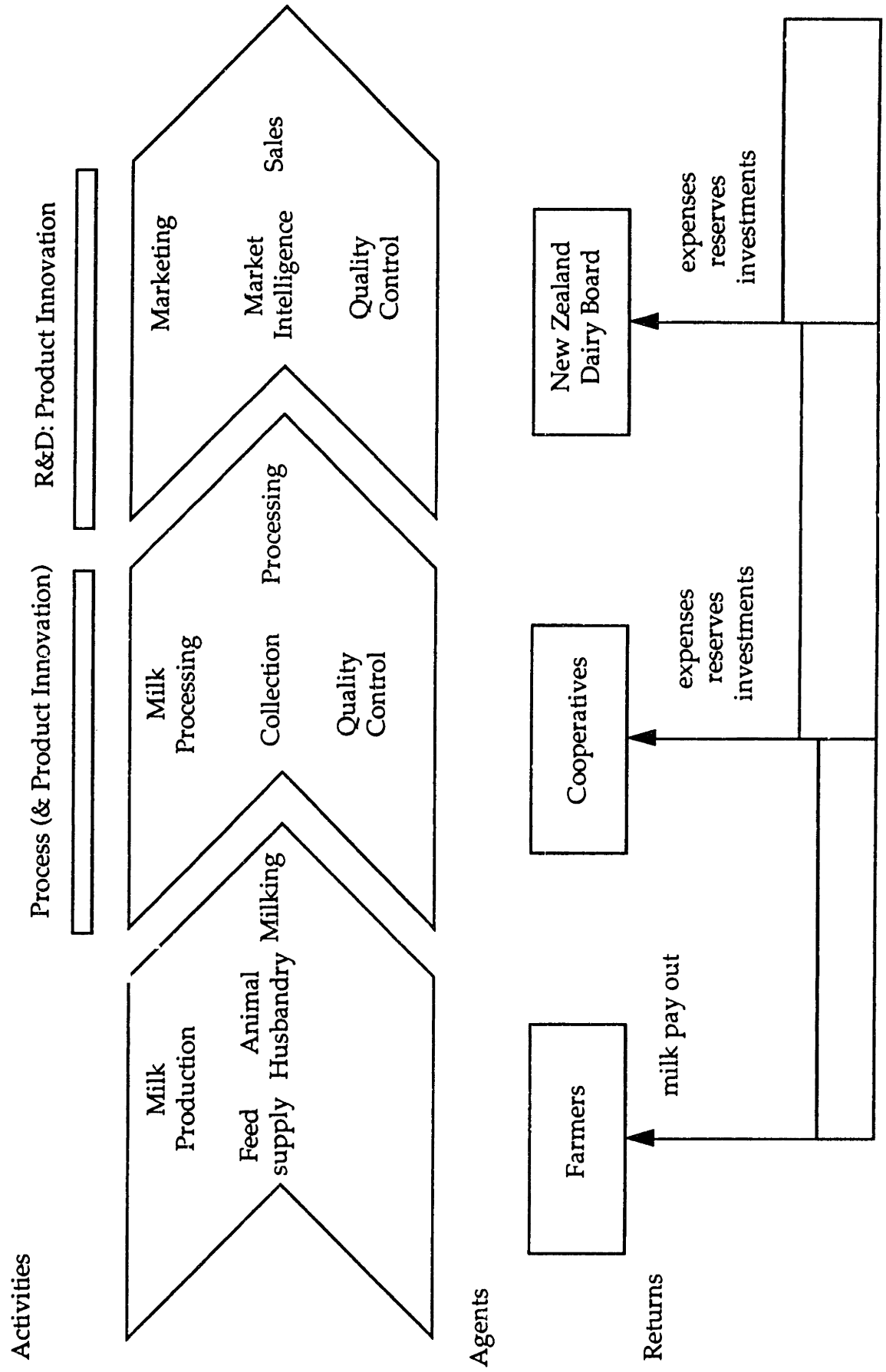
The various organisations in the industry must be released from the institutional constraints to pursue market opportunities and allow these organisations to concentrate on strategies to expand the total returns to the industry, while preserving representation of the farmers. Bargaining cooperatives between the farmers and processors would improve representation of farmers in the face of the developing regional monopsonies and return the benefits of the cost advantage of milk production in New Zealand, to the farmers. Representation at the producer level would remove the need for maintaining equality among processors, as currently attempted.

The existing organisations currently belong to the New Zealand farmers and this should be recognised through the distribution of property rights, that is,

shares, before any major changes to the industry structure. Shares will preserve the existing rights of the farmers and changing the organisations into public companies will expose the organisations to performance monitoring by external parties.

The New Zealand industry is organised in three tiers vertically separated between marketing, processing and production. The Dairy Board coordinates marketing activities for the eighteen cooperative processing companies supplied by shareholder farmers (figure 3.1). The farmers hold cooperative shares in the processing companies and recent legislation has recognised their rights to the assets of the marketing board. Several industry wide service organisations also exist, such as the Dairy Research Institute which undertakes basic research and is funded by the Dairy Board. The governance and management structures of the Dairy Board and the processing cooperatives resemble corporations.

Figure 3.1: New Zealand Dairy Industry Value Chain



There are no significant farming companies and three quarters of the farmers own their own farms. Other farmers partially lease their farms through "share-milking" arrangements.

The structure of the New Zealand dairy industry was originally based on pooling scarce capital, protecting farmer interests and preserving equality for farmers. At both the farmer and the cooperative processor level, there were many small players, each undertaking similar functions. The producer board acted as international bargaining agent for the whole industry and also achieved economies of scale by coordinating shipping. In this environment the cooperative form of organisation was very appropriate.

3.2 Dominance of Cooperatives

Cooperative forms of organisation have come to dominate the New Zealand industry. Although internationally cooperatives are prominent in the dairy industry, alternative forms of organisation also exist in most countries.

Unlike New Zealand, in other countries cooperatives may undertake collective bargaining and marketing as well as milk processing.

Internationally, the dairy industry has the highest proportion of cooperative organisations for agricultural industries. A 1985 study by the International Dairy Federation showed that among 20 countries, accounting for 60 per cent of the world production of milk, 86 per cent of the milk was marketed by producer cooperatives.²⁸

²⁸ Empson, J. "Large Dairy Cooperatives Dominate in Major Milk Producing Countries", *Farmer Cooperatives*, May 1985.

Eight farmers formed the first cooperative processor in New Zealand, the Otago Peninsula Cheese Factory, in 1871. At this stage of the industry's evolution, the cooperative structure provided a simple form of organisation for sharing scarce capital and providing equality for the farmers.

No significant examples of alternative forms of organisation now exist in the New Zealand industry, although proprietary companies existed early in the development of the industry. Proprietary companies became less competitive as farmers became tied to cooperatives and eventually farmers were legally required to join a cooperative.

The roles of cooperatives and the regulatory constraints differ markedly between countries. In the United States many cooperatives exist primarily to act as collective bargaining agents for the sale of milk to private milk processing plants and receive government support through tax incentives, subsidised loans and free services from the USDA.²⁹ AMPI, a United States cooperative and the largest dairy cooperative in the world, only processes a third of the milk collected from members, acting as a bargaining agent in the on-sale of the remaining two thirds.³⁰

In each of the major western milk producing countries, a significant number of alternative organisation forms exist in addition to cooperatives (table 3.1). The opportunity to succeed in pursuing different strategies in these countries, sustains a diversity of organisations.

²⁹ Porter, P.K. & Scully, G.W., "Economic Efficiency in Cooperatives", *The Journal of Law & Economics*, vol. XXX (October 1987).

³⁰ Empson, J. "Large Dairy Cooperatives Dominate in Major Milk Producing Countries", *Farmer Cooperatives*, May 1985.

Table 3.1: Importance of Dairy Producer Cooperatives in Selected Countries³¹

Country	Total milk supplies (million metric tons)	Producer cooperatives as percent of total			
		Milk supplies	Liquid milk	Butter production	Cheese production
USA	43.4	77	16	64	47
Germany	23.0	79	75	85	71
France	22.9	47	59	53	33
United Kingdom	15.5	100(24)	(5)	(60)	(35)
Netherlands	11.4	87	83	93	92
Canada	7.0	60	20	80	60
New Zealand	5.9	100	70	100	100
Australia	5.3	68	60	82	49
Denmark	4.9	87	81	93	78
Eire	4.5	100	30	100	66
Switzerland	3.7	100	75	100	90

Notes: Canada: Percentage of activities estimated, no statistics available.

United Kingdom: Figures refer to the five Milk Marketing Board's.

Percentage importance of MMB commercial businesses in brackets.

USA: USDA 1980 statistics.

Cooperatives appear to be less prevalent in product segments with a high degree of differentiation, such as cheese. Proprietary cheese making firms exist in New Zealand, however, the throughput of these organisations is too small to impact on the statistics. In contrast to other countries, New Zealand's cheese production is relatively focused on standard types, particularly cheddar, reflecting local demand and traditional export patterns.

The lack of alternative organisational forms in New Zealand has arisen from the evolution of the industry. From an early stage the industry focused on producing a limited range of commodity products for export sales, and strategies varied little across different processors. The range of activities of the cooperatives has also been limited by the export marketing monopoly awarded to the Dairy Board.

³¹ Empson, J. "Large Dairy Cooperatives Dominate in Major Milk Producing Countries", *Farmer Cooperatives*, May 1985.

3.3 Vertical Coordination

The existing structure of cooperative processors and an international marketing board is inappropriate for the strategy adopted by the Dairy Board and discussed in Chapter Two. The vertical separation of these activities creates informational barriers and limits the overall responsiveness of the industry. The statutory monopoly for export markets held by the Dairy Board appears inconsistent with the need for industry-wide responsiveness to the dynamic market place.

The dominant marketing role of the Dairy Board has distanced the processor cooperatives from the international market and the relative market stability until the 1980's provided little incentive for the cooperatives to disrupt this arrangement. Also, the regulation of the domestic fresh milk, butter, butter substitutes and cheese markets until 1990, and the involvement domestically of the Dairy Board, limited the need for responsiveness to the domestic market.

While the industry was driven by quantity into the mid 1970's, coordination was straight forward. The move from cream-only to whole-milk collection from farms in the 1960's and through to the mid 1970's resulted in increased supply, and the cooperatives readily focused on expanding processing for the increased volume and range of products. The Dairy Board moved in parallel to increase the markets available for sales of the additional product with, for example, the first sizable sale to Japan in 1967.

The nature of the vertical coordination problem has dramatically changed over the last decade, with a swing from focusing on increasing production

and sales, to managing increased volatility in the international markets. The Dairy Board has interpreted this as a need to increase marketing intensity and initiated a strategy to decrease the reliance on sales of undifferentiated commodity products, through marketing investment in brands and local final processing, and product development.

Vertical coordination within the industry is less responsive to a need for product development than to increases in supply because of the relatively poor distribution of information. Only the Dairy Board has previously focused on marketing and thus information about the nature of the opportunities is concentrated with the Board. Technical information and skills to meet those opportunities through product development, are concentrated with the cooperatives. As marketing has decentralised to the Dairy Board's off-shore subsidiaries this separation has increased.

The incentives created by institutional aspects of the vertical separation between cooperatives and the marketing board heighten the coordination problem for product development activities. The Dairy Board has first access to any funds generated from sales and maintains discretion in the distribution of profits. The cooperative must however invest in product development and new processing capabilities without being able to appropriate the returns from the investments.

The Dairy Board has previously established different contracts with cooperatives to address the coordination problem, both for product development and production. In both cases, the Dairy Board attempts to maintain the equality of the industry by inviting tenders before selecting the cooperative to undertake the special function. The contracts address the

required investment by the cooperatives in specific assets by providing a level of access to the returns from the activity.

Any contract will however be sub-optimal for the industry because of the uncertain nature of the returns from the activity and the tension caused by the asymmetrical distribution of information between the cooperative and the Dairy Board. The returns from product development are not assured and the fair distribution of returns difficult to assess because of the Dairy Board's information advantage relative to the cooperatives. The markets are also dynamic and the future returns from the activity will depend on the competitive response of the New Zealand industry in, for example, developing second generation products. The asymmetrical distribution of information will limit this response. Special contracts also fundamentally weaken the equality among all participants in the domestic industry.

The difficulties for industries with separated marketing and manufacturing organisation to successfully innovate have been well recognised. An illustration from the literature is provided by Teece:³²

"A more general impediment to innovation has been identified in the British distribution system. British industry in the nineteenth century displayed very little in the way of forward integration - there was a layer of merchants between the manufacturer and the final customer. While enabling specialization economics to be obtained in a static market, Kindleberger suggests that 'the separation of selling from production may have the drawback of slowing communication between the ultimate customer and the

³² Teece, D., "Technology Change and the Nature of the Firm." From Dosi, G. et al.: *Technical Change and Economic Theory*, (New York, NY: Columbia University Press, 1988).

producer' (1964, p. 148). Furthermore, 'it may be significant that the woollen industry, which did much better than cotton in maintaining its rate of technical change, moved to direct trading' (ibid.). His final conclusion is that: 'There is the distinct possibility, whose demonstration would require a separate book, that the merchant system bears a significant share of the responsibility for slowing down technical change because it renders a large proportion of the benefits of technical change external to the firms that must effect or sell it.' (p. 149)"

3.3.1 Forces for vertical integration

To implement the strategy the Dairy Board has forward integrated through investing in a network of international subsidiaries to increase the responsiveness to specific regional markets. These subsidiaries undertake a variety of activities, including local final processing, for example, repackaging for consumer distribution; brand management, for example, Fernleaf milk powder in Malaysia; and local market research. Coordination of this network has been relatively straight forward as all parties are internal to the Dairy Board.

The simplest organisational solution for the Dairy Board to develop new products is to also internalise these activities, effectively backward integrating into activities traditionally undertaken by the cooperatives in association with the Dairy Research Institute. This worked in the development of the whey industry, with the Whey Products Company established as a subsidiary of the Dairy Board to develop and produce whey products. This organisation interfaces with the Dairy Board's research facilities in North America and the marketing subsidiaries around the world, and with the processing

cooperatives in New Zealand. Various production facilities in New Zealand have been constructed for the Whey Company and these are managed by the local cooperative. The integration of the core activities in a single sub-organisation within the Dairy Board simplified the coordination and information flow required for the development.

Backward integration is also occurring with, for example, the establishment of skill centres, organisations within the Dairy Board to undertake product development.³³ If extended, this trend would ultimately result in the cooperatives becoming simply commodity producers with specialty products produced in parallel vertically integrated organisations.

The major cooperatives have been seeking increased access to marketing. Dobson writes in his review of the industry: "A few companies, particularly those that have some of the largest processing plants in the world and personnel with strong marketing skills, are demanding more autonomy."³⁴ This has occurred in specialty markets with, for example, the NZDC involvement in the export of soft service ice cream ingredients.

The cooperatives also seek forward integration to better evaluate investments in processing capabilities encouraged by the Dairy Board. In the past, there has been criticism of the investments encouraged by the Dairy Board, for example, in cheddar cheese production capacity.

³³ "New Zealand Dairy Board Annual Report 1990", New Zealand Dairy Board, Wellington, 1990.

³⁴ Dobson, W.D. "The Competitive Strategy of the New Zealand Dairy Industry", *Agribusiness*, Vol. 6, No. 6, 1990.

This forward integration encroaches on the statutory rights and obligations of the Dairy Board, although the Board has the ability to license other export marketers. The management of the Dairy Board would potentially be placed in competition with a supplying cooperative and the international markets would see a number of different New Zealand brands. Dobson observes that: "While the NZDB [Dairy Board] officials concede that such initiatives have merit, they exhibit mild unease about increased involvement by dairy companies with foreign customers. Some NZDB officials believe the companies might make agreements which the Dairy Board will find objectionable and problems with export coordination will increase if companies work independently with foreign customers."³⁵

Forward integration has also occurred following the deregulation of the domestic fresh milk market, as several cooperatives moved to undertake milk marketing in areas previously managed by the milk marketing boards. This will lead to the cooperatives increasing their experience with marketing and place more pressure on the relationship with the Dairy Board.

The key to the efficient implementation of the differentiation strategy is to allow the evolution of the appropriate industry structure as determined by successfully implemented strategies. This however places at risk the fundamental principal of the industry to serve farmer interests.

³⁵ Dobson, W.D. "The Competitive Strategy of the New Zealand Dairy Industry", *Agribusiness*, Vol. 6, No. 6, 1990.

3.4 Representation of the Farmers

A new form of vertical coordination is required between the farmers, and the processors and marketing board to allow these downstream organisations greater flexibility to pursue market opportunities, while strengthening the representation of farmer interests. The activities of the processors and the marketers have become too sophisticated and complex for the existing industry structure, attuned to commodity production and delivery, to meet both the demands of the market and provide equal returns for all farmers at each level.

A model for the type of organisation to enable this representation is provided by the cooperatives in the United States which primarily act as bargaining agents for the farmers.

Effective representation of the farmers, and associated performance monitoring of manager-agents, is critical because the farmers have last claim on the returns from their production and bear the greatest risk in the industry. Returns to the industry first pass through the Dairy Board and then the local cooperative, before the residual is returned to the farmer. Thus the farmers bear the risks of production, processing and marketing.

Although farmers nominally own the whole vertical chain, control resides with the managers and industry returns may only partially accrue to the farmers due to the principal-agent problem.^{36,37} The flow of returns through

³⁶ Fama, E.F. & Jensen, M.C., "Separation of Ownership and Control", *Journal of Law & Economics*, vol. XXVI June 1983.

the marketing board to the cooperatives, and finally to the farmers, establishes different levels of management discretion within the industry. Opportunities exist at each level for agents to affect the distribution of returns and associated discretion through bargaining, following local strategies, controlling agendas and other non-cooperative behaviour. For example, investment decisions made by the cooperative management, while economically or strategically justifiable within the cooperative organisation, may be inappropriately timed relative to the cash flow requirements of the individual farmers.

The most active level in the industry for farmer representation has been with the cooperatives and this relationship has changed markedly through the consolidation of these organisations (table 3.2). When several hundred cooperatives existed, each serving a relatively small community, representation would have been reasonably direct. With consolidation among cooperatives encouraged by the economies of scale in processing, the farmers tend to assume a weak position similar to that of a minority shareholder in a public corporation. Their individual potential returns from effectively monitoring the actions of managers, their monitoring incentives, are small relative to the personal cost and they are reliant on the board of directors.

³⁷ Jensen, M.C. & Meckling, "Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure", *Journal of Financial Economics*, vol. 3, 1976.

Table 3.2: Consolidation of Cooperative Processors

	Cooperatives	Farmers	Average Farmers per Cooperative
1960/61	180	33,400(1)	185
1970/71	95	21,900	231
1980/81	42	15,020	357
1989/90	18	13,590	755

Notes: (1) 1962/63

Source: New Zealand Dairy Board

As the cooperatives tend towards regional monopsonies, farmers lose the discretion to withdraw their supply and change cooperatives, placing the farmers in a weak bargaining position with respect to the management of the cooperative. The need to maintain representation has been recognised in the cooperatives and in the largest cooperative, the New Zealand Dairy Cooperative ("NZDC"), a system of wards was formed to improve the flow of information and representation.

The trend to regional monopsonies is continuing. A proposed merger between the NZDC and the Waikato Valley Dairy Company will result in a cooperative counting for 48 per cent of milk fat production and dominating the Waikato, the major dairying area. Other significant regional monopsonies already exist in Northland and the southern North Island, and a proposed merger in Taranaki would effectively result in most farmers in the country tied to a dominant regional cooperative.

In the established industry structure, individual farmers have weak incentives to monitor management as the cost of monitoring far exceeds the individual farm return from the potential gains. The farmers exercise control of the cooperatives primarily through the opportunity to vote at an annual

general meeting and other meetings, and the selection of a board of directors, in a similar pattern to public corporations. The shares which carry voting rights are allotted to farm owners in proportion to milk fat supplied to the cooperative. This leads to a large number of shareholders and a wide dispersion of both the voting rights and the potential economic rewards from improved management.

The board of directors is the principle channel for farmer representation. While boards of directors are the most common mechanism for representation in corporations, the ability of management in a typical corporation to influence the independence of a board of directors also compromises the effective representation of shareholder interests.

Mechanisms employed by management extend from control of the formal nomination of prospective board members to the control of recommendations presented to the board. Over time, boards have a tendency to follow senior management advice and support the consensus which develops around management recommendations. A publication on cooperatives from the Food and Agriculture Organisation, pre-dating more recent papers on manager and director incentives, addresses this directly: "Even producer-representatives on board directorates tend to identify themselves after a certain time with the board and defend decisions rather than the interests of the producers who support it."³⁸

For instance, the representation by directors has also been an issue in the recent takeover of the Waikato Valley Cooperative by the NZDC. The

³⁸ Abbott, J.C. & Creupelandt, H.C., "Agricultural Marketing Boards Their Establishment and Operation", FAO Marketing Guide No. 5, Food and Agriculture Organization of the United Nations, 1966.

directors had strenuously opposed the merger and then unexpectedly switched their support. One farmer was quoted as saying: "A lot of suppliers are now feeling very disillusioned with their directors. You kind of wonder what sort of say co-op farmers have in the running of the company."³⁹

Porter and Scully describe cooperatives as "voluntary, *closed* organizations in which the decision-control and risk-bearing functions repose in the membership, and the decision management reposes in the agent (manager), who represents the principal's interests."⁴⁰ The "closed" nature is reflected in, for example, the requirement that directors must themselves be farmer shareholders of the cooperatives. Coming from the industry, the directors are likely to reflect the same assumptions about the operating environment as the managers and fail to question the standard solutions as seen elsewhere in the industry, potentially weakening the performance of the board in comparison to a one with more open representation.

The closed institutional arrangements limit the role of potential external monitoring agents whereas these agents play a significant role in forming management incentives in modern corporations. The incentives involved with activity in the capital markets provide many of these agents.⁴¹ Porter and Scully observe: "The stock market offers clear signals on the implications of internal agent decisions on net cash flows. Holders of the rights to residual

³⁹ "Dairy Takeover Sours Waikato Farmers", *The Examiner*, New Zealand, 14 March, 1991.

⁴⁰ Porter, P.K. & Scully, G.W., "Economic Efficiency in Cooperatives", *The Journal of Law & Economics*, vol. XXX October 1987.

⁴¹ Jensen, M.C. and Warner, J.B. "Power and governance in corporations", *Journal of Financial Economics*, 20, 1988.

claims are free to dispose of their shares and, in the process, signal the decision agents about their perceived performance."⁴²

The representation of farmer interests and effective monitoring of management performance has been even more difficult at the level of the Dairy Board. The complexity of the Board's activities and the limited formal reporting mechanisms, places the farmers in an even weaker position for monitoring than with the cooperatives. The only formal mechanisms for monitoring the Dairy Board have been the board of directors and the legally required report to government. Uncertainty over ownership of the Dairy Board confused the incentives for monitoring the Board and the ownership of the Dairy Board by the farmers has only been recently clarified in an amendment to the empowering act.

Interested parties claim that farmer representation is in fact strong, for example, the Dairy Board describes its relationship with farmers as: "The New Zealand Dairy Board, which is also controlled by the elected representatives of the dairy farmers, buys and sells all the export production of these dairy co-operatives. The dairy manufacturing sector in New Zealand is thus tightly under the control of farmer suppliers of the milk."⁴³

In a study of the New Zealand producer boards, Woods states the alternative view: "In practice the boards report to the producers very much on their own terms. It is true that producer members of the statutory boards are required periodically to submit to the ballot box. However elections are rotational and

⁴² Porter, P.K. & Scully, G.W., "Economic Efficiency in Cooperatives", *The Journal of Law & Economics*, vol. XXX, October 1987.

⁴³ "A Survey of the New Zealand Dairy Industry", External Economics Division, New Zealand Dairy Board, Fifth Edition, October 1984.

election procedures are indirect. Consequently it is difficult for producers to express effectively any dissatisfaction with, or contest the performance of, their representatives."⁴⁴

The cooperatives are presently the best placed to monitor the Dairy Board, yet they are also dependent on the Dairy Board for their revenue within the current industry structure and the Dairy Board has grown into an organisation which is larger and more complex than any of the cooperatives. The selection of Directors on a regional basis has also given prominence to the large cooperatives.

However, relying solely on the cooperatives maintains the distance between the farmers and the activities of the Dairy Board. In a recent article, Richard Alsop, the Chairman of the New Zealand Federated Farmers Dairy Section was quoted as observing in reference to the Dairy Board's investment in processing companies in South East Asia that: "there needs to be goodwill between the Board and dairy farmers about the benefits of these investments...this depends on the Board communicating directly with farmers and not just passing the information to them through dairy companies."⁴⁵

The original incentives for forming cooperatives were to pool capital and, in the case of the Dairy Board, collude to exercise monopoly power over purchasers. These reasons have less validity given the increased sophistication and concentration of the industry. Capital sources are

⁴⁴ Woods, R. "The Role of Producer Boards", Economic Development Commission, Wellington, 1988.

⁴⁵ "Stabilisation not Answer for Dairy Farmers", The Examiner, New Zealand, 14 March, 1991.

generally open to the processors, as seen with large companies undertaking international debt raisings. The consolidated cooperatives are considerably more capable to effectively represent their interests with international buyers, and profitable collude with other New Zealand parties, than the much smaller cooperatives were 30 years ago, when the marketing monopoly was established.

The espoused culture of the industry, to value farmer interests foremost, has come under threat as the scale of processing and marketing organisations has grown, and the complexity of the market increased. Representation of farmer interests is a fundamental objective of the structure of the New Zealand industry and this need not obstruct the implementation of the strategy to increase marketing intensity. The existing structure has weaknesses even in the absence of the new strategy, and a new form of coordination to maintain farmer representation is required.

3.5 Alternative Structure

A new organisation form, essentially farmer bargaining cooperatives, would transparently represent farmer interests and remove the need for direct farmer involvement in the downstream industry. This unionisation of farmers would capture the profits from low cost milk production in New Zealand at the farm gate and allow the downstream industry to adapt to the appropriate form for undertaking the industry strategy. The existing cooperatives and the New Zealand Dairy Board would become public companies, initially owned by the farmers and required to perform to the norms of New Zealand corporate activity.

Bargaining cooperatives have become a realistic alternative form of organisation. Farmers are able to organise at relatively low cost and have access to relevant market and processing information. The farmers are also able to credibly negotiate with processors by threatening the partial withdrawal of supply, which would quickly decrease the efficiency of the processing factories. The need for access to information may lead to a limited amount of downstream integration by the bargaining cooperatives.

The capture of rents from low cost production at the farm gate, would allow increased flexibility in the organisation of the downstream processing and marketing. Previous issues concerning the representation of farmers in downstream organisations would lose relevance. The downstream organisations would have instead relationships with the bargaining cooperatives and equity investors. The discretion for industry participants to pursue alternative strategies to those currently implemented would be

enhanced and farmers would also be less exposed to the activities of particular downstream agents.

The statutory marketing monopoly would have greatly lessened significance and should be removed to allow the pursuit of alternative strategies by the previous processing cooperatives. The collective bargaining achieved through the marketing monopoly is maintained by the bargaining cooperatives. While the contracting costs in the industry will increase, the potential gains from refocused incentives throughout the industry are likely to overall improve returns.

The Dairy Board would become a fully commercial stand alone food company, initially owned by the farmers. Activities currently undertaken for national coordination, such as administering quotas and establishing industry standards, should be undertaken by government or industry wide agencies without potential commercial conflicts, in a purely administrative capacity. This may lead to transitional problems with a loss of international collusion with exporters from other countries. The established expertise and network of the Dairy Board may well ensure that its role, however, remains largely unchanged.

The current cooperatives would have greatly increased flexibility to pursue market opportunities and other activities by transforming into processing corporations rather than becoming bargaining cooperatives. This has the potential for a positive gain for the industry, as highlighted in a comparison of organisational forms in a study of cheese processors: "Noncooperative plants are more diversified in production and more directly involved in

marketing and merchandising. They appear to seek more rewards from marketing and had more diversified outlets."⁴⁶

The industry may lose the current level of coordination between cooperatives and interfirm spillovers as competition increases. Sharing of technical knowledge is particularly exposed to increased competition. This can be countered somewhat by ensuring the Dairy Research Institute maintains its position as an industry wide source of technical expertise. Coordination around other facets may also be necessary, for example, shipping, and may preserve the status of the Dairy Board.

Introducing transferable shares to the Dairy Board and the cooperatives is a fundamental step in facilitating the transition and recognises the existing investments of farmers. The ownership incentives in the current organisations would be clarified by the issue of transferable shares and the transparency surrounding the actions of agents would be required to become equivalent to the standard acceptable for other corporations.

Shares would also separate the value of milk supply from the return on investment in the organisations, and clarify the confused incentives of farmers as both shareholders and suppliers. The farmers' portfolio decision between investing in processing factories, in marketing organisations and in farming is separated, and farmers are able to choose their level of exposure in the vertical industry. Further, the market value of shares would provide a signal for shareholders of management performance.

⁴⁶ Babb, E.M. "Co-op Performance Compared With Other Cheese Plants", Farmer Cooperatives, April 1981.

Listed shares also provide an opportunity to align management incentives with those of the shareholders through management ownership. Jensen and Meckling argue that managers perform better the greater their ownership stake in the firm.⁴⁷

The distribution of shares in the Dairy Board may be critical in the early stages of the transition to ensure that the existing distribution channels remain open to all industry participants. The processing companies may decide to establish strategic stakes in the Dairy Board to protect their long term interests and this would further strengthen the position of the Dairy Board in its current role.

For change to occur, it must clearly preserve farmer interests. The general acceptance of institutional reform in New Zealand, in spite of an economic recession, and the severe fall in returns to farmers in the last season suggests that the climate may be relatively tolerant to change. As a Canadian study on cooperatives noted: "Clearly, the evolution of perceptions regarding problems and possibilities within co-operative organizations is closely related to the social and political context within which co-operative firms operate, as well as to the institutional dynamics evolving within these co-operatives. Co-operatives' life-cycles are intimately related to the patterns of change within the societies giving them birth."⁴⁸

⁴⁷ Jensen, M.C. & Meckling, "Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure", *Journal of Financial Economics*, vol. 3, 1976.

⁴⁸ "Co-operative Organizations and Canadian Society: Popular Institutions and the Dilemmas of Change", edited by M.E. Fulton, University of Toronto Press, 1990.

Change will also be a political process. The New Zealand Government has a role in facilitating structural change in the industry, particularly in terms of the legislative framework in which the Dairy Board exists and also in applying anti-trust legislation to protect farmer interests. The Government has recently been active in reforming legislation governing the industry, consistent with the general liberalisation of the economy. The domestic controls on marketing products have been removed and the relationship with the Dairy Board has been moved to a more commercial model through, for example, the removal of access to subsidised financing through the Reserve Bank, the New Zealand central bank. However, the political will follows the farmers' voice and as Zwart notes: "Given the fact that there have been few changes in the export marketing boards during the liberalisation period, and that a new board has been formed, there appears to be considerable political support for such institutions."⁴⁹

Through out the industry, managers are likely to oppose such a change due to the uncertainty in the transition to a new stable industry structure and any perceived threats to their discretion. The delinking of the farmers from the downstream organisations will also cause a cultural reorientation for the industry as well as greatly lessen the dependency of the farmers on the processing cooperatives. Managers in larger cooperatives particularly will prefer the increased freedom to develop opportunities and those in smaller cooperatives may be the strongest supporters of the Dairy Board.

⁴⁹ Zwart, T. & Moore, W., "Marketing and Processing" in "Farming Without Subsidies, New Zealand's Recent Experience", edited by Sandrey, R. & Reynolds, R., New Zealand Ministry of Agriculture and Fisheries, 1990.

The Dairy Board would object to any intrusion by the cooperatives into the international markets and resist the relinquishment of the marketing monopoly. This weakens the dependence of the cooperatives on the Dairy Board and increases the cooperatives ability to assess the performance of the Board through their own sales efforts. Significant justification remains, however, for the Dairy Board to continue acting in many of its current roles and depending on how the transition is managed, the loss of the marketing monopoly may have limited impact.

Few of the original constraints leading to the evolution of a structure incorporating cooperative processors and a marketing board remain valid in the now more sophisticated industry. The cooperatives have access to commercial sources of capital and undertake marketing domestically. The structure inhibits the full realisation of the New Zealand industry strategy. Strengthening farmer representation further back in the value chain through bargaining cooperatives is a necessary step before allowing the downstream organisations to adopt more appropriate organisational forms to pursue the strategy.

Chapter 4.0: Conclusions

The profitability of the New Zealand dairy industry has become dependent on the policy decisions of the European Economic Community and the United States. Although the New Zealand industry, through its low production costs, is commercially driven, the presence of the EEC and the United States in the international markets is driven by policies to ensure stability of their domestic markets.

From an economic point of view, the New Zealand industry may be able to profitably compete in a low cost strategy, however its major competitors are largely politically driven. The outcome of this strategy would be uncertain and high risk. The New Zealand Dairy Board has adopted the appropriate alternative strategy to reposition the industry away from mature markets in unbranded commodity products, the most volatile and disputed segment.

The strategy however changes the demands on the industry and places pressure on the entrenched structure to facilitate the coordination between the marketing board and the processor cooperatives, while also maintaining representation of the farmers. The consolidation of the cooperatives to form regional monopsonies, further threatens the representation of farmers.

Farmer bargaining cooperatives are recommended to ensure transparent representation of the farmers' interests and allow the imposed constraints on downstream organisations to be relaxed such that organisational innovations can evolve to increase the marketing focus of the industry. The increased returns to the industry from allowing unimpeded focus on the market by all participants, may more than balance any costs of strengthening farmer representation.