World Processed Food Trade: A Comparative Analysis of New Zealand and Selected Exporters

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Abstract

International trade in processed food products has been a dynamic component of world economic activity over the past twenty years, with the value of world processed food trade more than tripling between 1976 and 1996. Fueling this growth has been recent dietary trends towards higher-valued processed foods, which has been accelerated by rising incomes, urbanisation and demographic and socio-economic factors. In highly developed markets such as the European Union, North America and Japan, consumer ready processed goods make up a large and growing share of the food and agricultural imports. Consumer ready processed goods are also making inroads in developing countries as consumers demand convenience foods such as frozen 'ready-meals' and evening 'meal solutions.' Despite this, most agro-food trade research has been concentrated on the trade in bulk commodities (non-processed food products).

This research evaluates the performance of New Zealand's processed food exports, relative to the performance of five other leading processed food competitors. Combined with revealed comparative advantage indices, a constant market share model is applied to the data to determine factors responsible for enhancing or retarding the performance of a focus country's processed food exports.

An important empirical finding is that New Zealand's competitive position in international processed food markets deteriorated over the 1976-1996 period. A combination of declining competitiveness, reduced comparative advantage and a heavy reliance on traditional export markets has eroded New Zealand's share of world processed food trade. The failure to capitalise on the potential offered by Asian markets has also limited the growth of New Zealand's processed food trade. However evidence suggests that since the early 1990s New Zealand has been able to diversify into the fast growing Asian markets and is beginning to increase her competitiveness.

Acknowledgements

There have been several people who have contributed towards the development of this research. Firstly I would especially like to acknowledge and thank my supervisor, Professor Allan Rae for his efforts throughout the duration of this study. His invaluable assistance and guidance is very much appreciated. I would also like to thank Dr Shamim Shakur for his assistance with various aspects of this research and Professor Srikanta Chatterjee for his assistance with the methodology and results sections of this research. A special thanks must go to Mrs Julia Fisher for her enthusiasm and persistence in making me do work.

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Table of Contents

List of Tables

List of Figures

Chapter One
Introduction

Processed food[1] is a value-added industry, transforming raw agricultural commodities into value-added convenient processed food products. International trade in processed foods has been a dynamic component of world economic activity over the past two decades, due to both demand developments and advances in marketing and distribution techniques. Not only has the growth in the value of world processed food trade more than tripled between 1976 and 1996, but trade in processed foods has achieved the third fastest growth over the twenty year period,[2] behind the rapid expansion of total world trade and the well documented expansion of world trade in manufactured goods (Table 1.1).

In addition to the strong growth recorded by the processed food sector, Figure 1.1 illustrates that processed foods are a growing share of both total food exports and agricultural exports (although processed food products have historically contributed significantly to both total food and agricultural exports, as indicated by Figure 1.1). Athukorala and Sen (1998) point out that this feature of international processed food trade is likely to continue as world consumption behaviour becomes more globalised, and imported food products play an increasingly important role in the consumption patterns of consumers in developed countries and in many developing nations as diets shift towards high-valued and value-added foods.

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[1] The processed food aggregate used in this study includes both lowly (or crudely) processed foods such as frozen carcass meat and butter and highly processed foods such as chocolate. Also, no distinction is made between different stages of processing. For example, beef sold 'on-hoof' is listed as a raw commodity, but as beef moves further downstream towards the consumer, it is here defined in the processed food category whether it is sold as carcass beef (slaughter), as boxed beef (initial packaging), or as final cut beef (shrink wrapped in grocery display cases) (Henderson, Handy and Neff 1996, p.3). Refer to section 5.4 for a discussion on the processed food aggregate and Appendix A for a complete list of the Standard International Trade Classification (SITC) divisions incorporated in it.

[2] The reader should note that the time period of this research does not incorporate the events of the 'Asian Crisis.'

Table 1.1 Percentage Growth of World Exports [a]

	1976-86	1986-96	1976-96
Total World Exports	112.52	148.07	427.20
Agricultural	72.38	104.84	253.10
Manufactured	158.83	166.34	588.56
Total Food [b]	78.51	114.50	282.48
Processed Food [c]	89.28	117.62	311.92
Non-Processed Food [d]	64.33	109.91	244.93
Fuels, Metals, Minerals	27.60	98.94	153.85
Non-Manufactured [e]	46.48	101.79	195.57
Primary Products [f]	37.89	97.43	172.23

Notes: a. Growth rates are calculated as point growth rates between time period X_1 and X_2, using the formula $((X_2 - X_1) / X_1))*100$.

b. Total Food Exports is the sum of SITC divisions 0: Food and Live Animals; 1: Beverages and Tobacco; and 4: Animal, Vegetable Oil, Fat.

c. As defined by the NAPES database. Refer to Appendix A for a complete disaggregated of SITC divisions included.

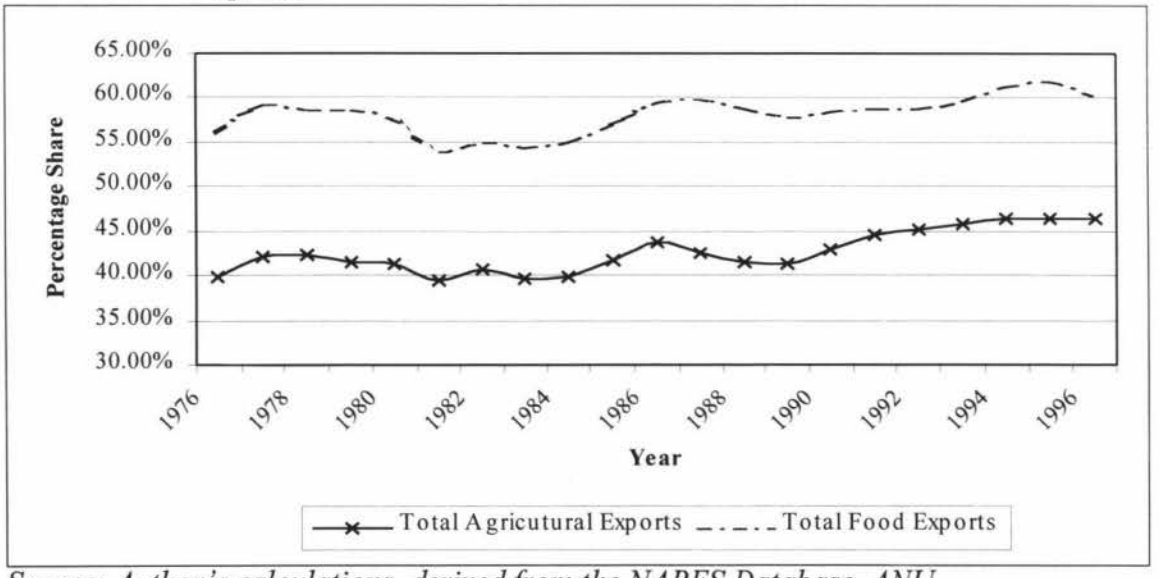
d. Total Food Exports less Processed Food Exports.

e. Total World Exports less Manufactured Exports.

f. Non-Manufactured Exports less Processed Food Exports.

Source: Author's calculations, derived from the National Asia Pacific Economic and Scientific (NAPES) Database, Australian National University (ANU).

Figure 1.1 Processed Food as a Percentage of Total World Food and Agricultural Exports



Source: Author's calculations, derived from the NAPES Database, ANU

Notwithstanding the importance of processed food trade and the high value returns that processed foods often provide exporters, research centred around argo-food trade has generally concentrated on the trade in bulk commodities or non-processed commodities. This point was noted by Dayton and Henderson (1992, p.1), who comment that compared to trade in commodities, "...agricultural economists have given relatively little attention to international trade flows in processed foods" (cited in Henderson, Handy and Neff 1996, p.6).

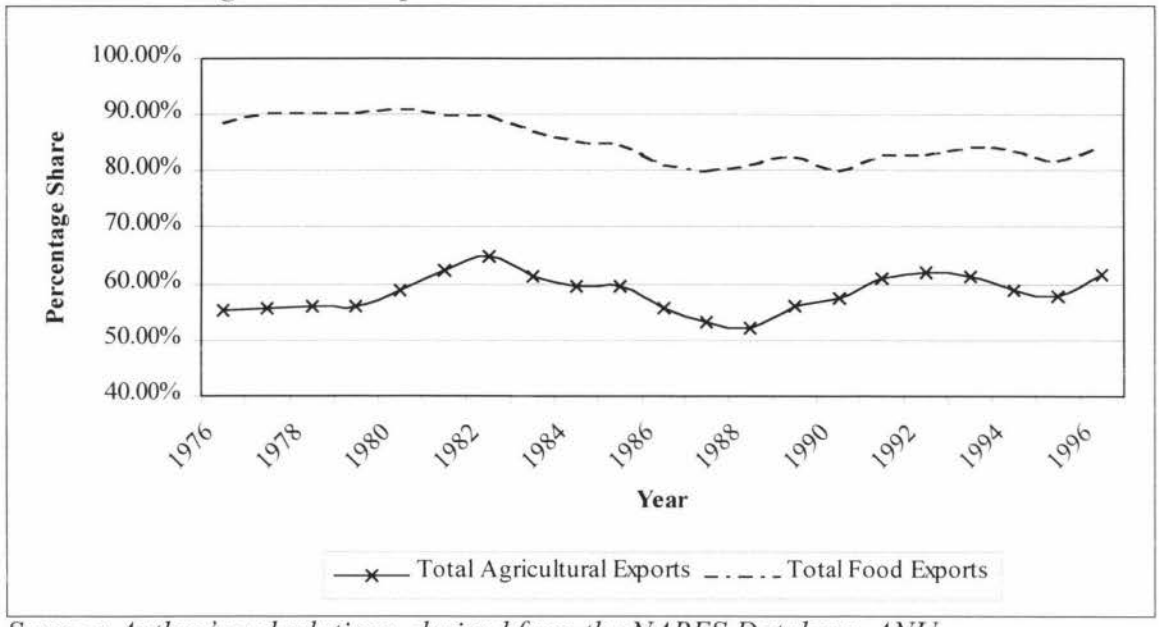
The changing nature of world food consumption patterns away from traditional non-processed foods, to more processed foods, will have important implications for those countries that are major exporters of both non-processed bulk commodities and processed food products. This is particularly so as major exporters of such products reduce trade barriers (e.g., import tariffs and government subsidies paid to agro-food producers) under the recently completed Uruguay Round of the General Agreement on Tariffs and Trade (GATT) negotiations. These reductions should make New Zealand's processed food exports more competitive with foreign produced processed food products in international markets and should also help to lower the prices of processed food products in formerly protected markets, thus increasing the international demand for processed food products.

As extensively documented New Zealand has traditionally been regarded as an agricultural producing nation. Due to favourable climatic conditions and resource endowment which are conducive to producing agricultural and argo-food products, the New Zealand economy has for many years been heavily dependant on both agricultural and agro-food products for export receipts. Figure 1.2 illustrates the important role that processed food exports have played in terms of both total food exports and agricultural exports from New Zealand over the past twenty years.[3] An interesting trend revealed by Figure 1.2 is the declining percentage of processed food exports in New Zealand's total

[3] The high proportion of processed food exports in New Zealand's total food exports may surprise the reader, given that New Zealand is often considered a commodity trader as opposed to a processed food trader. The reason being is that while agro-food products such as carcass beef, frozen lamb and butter are generally considered to be bulk commodities, because a small amount of processing has taken place from the raw commodity (beef, lamb and milk respectively), they are included in the processed food category. Refer to Appendix A for the processed food aggregate used in this research.

food and agricultural exports between 1982 and 1988, a result that went against the world trend over this period (Figure 1.1).

Figure 1.2 Processed Food as a Percentage of Total New Zealand Food and Agricultural Exports



Source: Author's calculations, derived from the NAPES Database, ANU

While world processed food trade expanded by 49.2 percent between 1982 and 1988 New Zealand's processed food exports grew by only 21.8 percent. Contrary to the growth of New Zealand's processed food exports, New Zealand's exports of non-processed foods expanded by 159.3 percent between 1982 and 1988. During the same period, there was only a modest expansion in world non-processed food trade of 26.6 percent. As illustrated by Figure 1.2 since 1987 for total food exports and 1988 for agricultural exports, the declining share of processed food exports has been reversed. Since this time processed food exports have generally exhibited a rising share of both total food exports and agricultural exports. By 1996 however, processed foods share of both total food and agricultural exports had still not reached the levels that were attained in 1982.

One explanation for the declining share of processed food between 1982 and 1988 is that this period of New Zealand's history was characterised by intense economic reforms, particularly in the agricultural sector. One of the main forms of government support to be abolished during this period was the Supplementary Minimum Price

(SMP) scheme. Between 1978 and 1984 the government guaranteed minimum prices for sheepmeat,[4] beef, dairy and wool products. If international prices fell below these minimum set levels the difference in price was paid to producers by the government in the form of a SMP payment.

Until 1982 only minimal SMP payments had been required, but as international agricultural prices fell during the 1980s there was heavy demand on SMPs, particularly from sheepmeat producers, but also from beef producers (Table 1.2). The heavy demand on SMPs and other government subsidies meant that the producer subsidy equivalent (PSE)[5] for New Zealand's agro-food producers began to rise to unsustainable levels. In 1982, the PSE for beef producers peaked at 24 percent. This meant that 24 percent of beef producers' income was generated from government assistance. At the same time the PSE for sheepmeat producers was 36 percent and peaked at 90 percent in 1984 (Table 1.3).

Table 1.2 Value of SMP Payments (NZ$ millions)

	1980	***1981***	***1982***	***1983***	***1984***
Sheepmeat	0	0	53	183	264
Beef	0	1	43	58	0
Dairy	17	0	0	0	0

Source: Sandrey and Reynolds

Table 1.3 New Zealand Producer Subsidy Equivalents (Percentage)

	1980	***1981***	***1982***	***1983***	***1984***
Sheepmeat	15	15	36	84	90
Beef	5	17	24	19	13
Dairy	32	10	17	18	13

Source: Sandrey and Reynolds

With deregulation and the abolition of government subsidies, agro-food producers' incomes declined, forcing some inefficient producers out of the industry and others to diversify into more profitable ventures such as forestry and horticulture. Between 1981 and 1991 the New Zealand sheep flock experienced a 21 percent decline,

[4] Sheepmeat also received SMP payments for the 1984/85 season as a transitional measure.
[5] This measure of assistance as defined by Sandrey and Reynolds, includes assistance to output, input and value-adding factors. It is expressed as a percentage of the final value of output.

as sheep numbers fell from 69.8 million sheep to 55.2 million. During the same period the national beef herd declined by 7.8 percent, from 5.1 million to 4.7 million head of cattle (Statistics New Zealand 1997, p.434). This reduction in livestock numbers resulted in less stock being slaughtered, causing a reduction in the amount of meat processing in New Zealand.

An additional factor influencing the decline of processed foods as a percentage of both total food and agricultural exports was the kiwifruit boom to 'hit' New Zealand during the 1980s. Between 1981 and 1991 the number of export trays of kiwifruit rose from 6.2 million to 59.8 million (Statistics New Zealand 1997, p.452). This increase in kiwifruit exports is one explanation for the large growth in the value of non-processed food observed over the 1982-88 period.

1.1 Objectives of the Research

The main objective of this research is to describe the trends in processed food trade over the 1976-1996 period and to compare and contrast the relative performance of New Zealand's processed food exports with that of other major world processed food exporters. Specifically it will:

- Document the structure and pattern of world processed food trade,
- Identify factors influencing changing consumption patterns,
- Measure changes in major processed food exporters' shares of world processed food trade and comparative advantage,
- Identify sources of growth and determine the influencing factors of New Zealand and her competitors' overall performance in the processed food trade.

1.2 Thesis Outline

This study is divided into seven chapters. Following the introductory chapter, chapter two examines trade flows and the growth of world processed food trade. Chapter three reviews the changing nature of world consumption patterns, identifying and discussing three major determinants. Chapter four backgrounds different measure of

export competitiveness before chapter five describes the method and issues of data and selection of study countries and regions. The main findings are presented in chapter six. The study ends with a concluding chapter which draws together the main findings of the study and areas of further research.

Chapter Two
International Processed Food Trade

2.0 Introduction

World trade in processed food products is dominated by the industrialised countries of the European Union (EU) and the North American Free Trade Agreement (NAFTA),[6] on both the demand and supply sides (see Figures 2.4 and 2.5). While developing countries[7] are not large exporters or importers, their combined contribution to the demand and supply of processed foods is significant. This chapter focuses on international trade flows in processed foods, and the patterns and trends that have developed during the 1976-96 period. Changes in the composition of world processed food trade are discussed, along with changes in the world economy that have influenced the growth in processed foods. The main exporters and importers of processed foods and the changes in their share of world processed food trade are also analysed. The chapter concludes with a discussion on government policies which influence international trade flows in processed foods.

2.1 Changing Nature of Processed Food Composition

Although processed meat products have consistently been one of the most important commodities in the processed food aggregate, Figure 2.1 illustrates that the composition of the processed food aggregate has changed over the past twenty years. Two distinguishing features of this change has been the rising importance of processed fish products and beverages, and the demise of sugar and honey, and coffee and cocoa products. The latter two were two of the most important processed food commodities in the late 1970s and early 1980s.

For the 1976-80 period coffee and cocoa, sugar and honey, and meat products provided the greatest contributions to world processed food exports, accounting for

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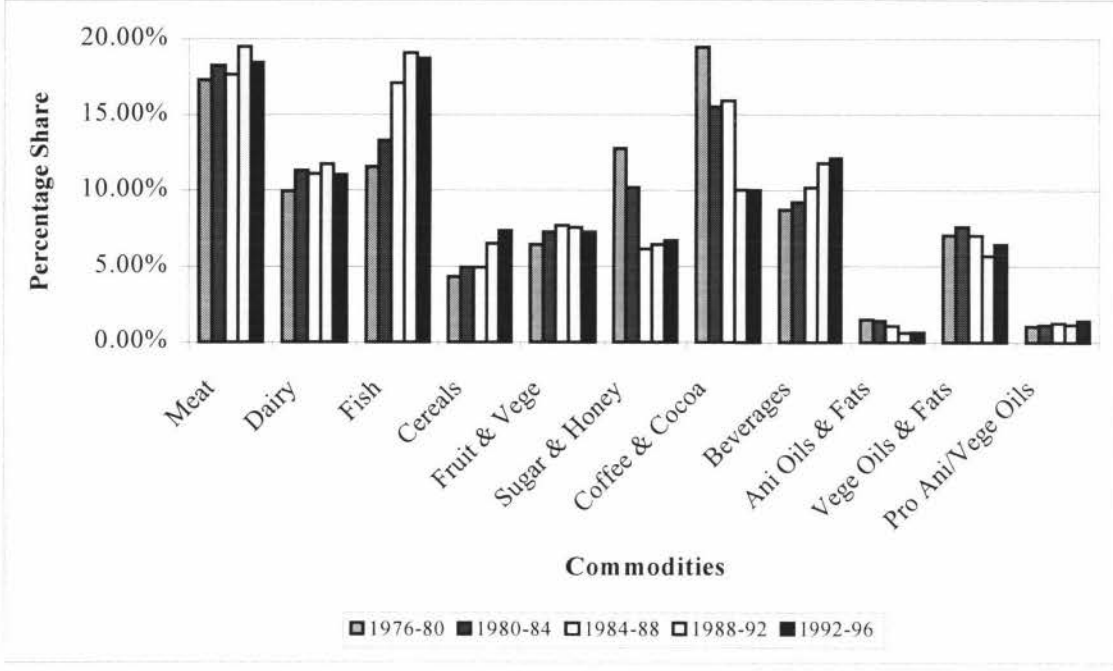
[6] Refer to Appendix B for a complete list of the countries included in the European Union and North American Free Trade Agreement used in this study.

[7] The Rest of the World (ROW) aggregate comprised in this study is used as a proxy for an aggregate of developing countries.

19.45, 12.77 and 17.31 percent of the total value of processed food trade respectively. Processed fish products made the fourth largest contribution, accounting for 11.55 percent during this period.

Figure 2.1 *Individual Commodities as a Share of Total World Processed Food Exports* [a]



Note: a. Percentage shares are calculated by dividing the sum of each commodity's value over the same period by the total value of processed food exports over the respective period. This eliminates the possibility of a commodity's share being excessively higher or lower than average trends suggest for any individual year. Exporter and importer shares represented in Figures 2.4 and 2.5 are also calculated using this method.

Source: Author's calculations, derived from the NAPES Database, ANU

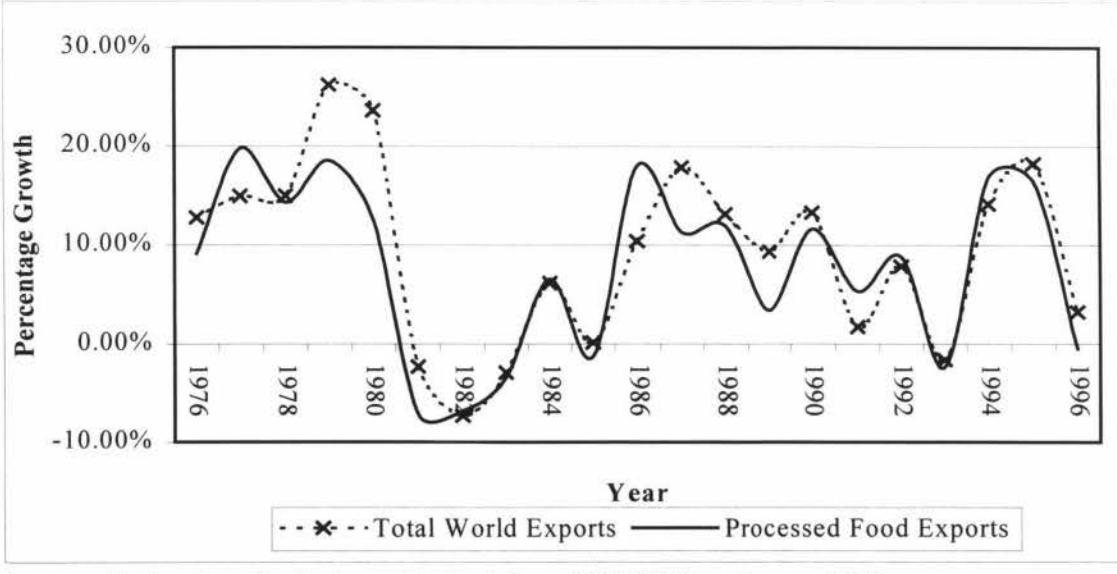
By the 1992-96 period coffee and cocoa products had declined to 10.01 percent of the total value of processed food trade while sugar and honey products had declined to 6.69 percent. However fish products had increased its share of the processed food trade to 18.70 percent and provided the greatest contribution, slightly higher than meat products which accounted for 18.44 percent of processed food trade during this period. Likewise, beverage products also increased its share of the processed food trade from 8.69 percent to 12.07 percent between the 1976-80 and 1992-96 periods. Beverage products became the third most important processed food commodity behind processed fish and meat products.

Of the other commodities, cereals, dairy products and processed animal and vegetable oils (though not a significant commodity), all generally increased their share of world processed food trade between 1976 and 1996. Fruit and vegetables increased its contribution between 1976 and 1988 before declining slightly between 1988 and 1996. The small contribution of animal oils and fats was further reduced to just 0.66 percent in the 1992-96 period (Figure 2.1). Vegetable oils and fats contribution to total world processed food trade was also reduced. Though it did increase its contribution between the 1976-80 and 1980-84 periods, rising from 7.02 to 7.58 percent only to decline during the latter part of the study period, accounting for just 6.41 percent between 1992 and 1996.

2.2 Growth in World Processed Food Trade

Between 1976 and 1996 world processed food trade grew from US$64 billion to over US$263 billion dollars. This trade increased over three hundred percent (see Table 1.1) and averaged annual growth of 6.9 percent. Despite having had one of the highest growth rates during this period, Figure 2.2 shows that the annual growth rate in the value of world processed food trade has been subject to a large amount of variability. However growth in processed food trade has generally mirrored the fluctuations in the growth of the value of total world exports.

Figure 2.2 Annual Growth Rate of World Processed Food Trade and Total World Trade



Source: Author's calculations, derived from NAPES Database, ANU

Figure 2.2 shows that high positive growth in world processed food trade during the middle to late 1970s was followed by a large decline in the growth rate of processed food trade during the early 1980s, including three consecutive years of negative growth between 1981 and 1983. Although many inter-related factors are responsible for the contraction in the value of world processed food trade, possibly two of the main contributing factors were declining world food prices (Figure 2.3) and the economic conditions prevailing at the time (high inflation, high interest rates and poor growth in productivity and the volume of international trade) due to a global recession which affected most of the industrialised world (International Monetary Fund (IMF), various years).

Figure 2.3 Food Price Index [a]

Note: a. 1980 is the Base Year. No food price data could be obtained for 1976 and 1977 with 1980 as the base year. Indices are for total food prices, as no processed food price indices could be obtained. Therefore the data is used as a proxy for the trends that may have been expected for processed food prices.

Source: United Nations Monthly Bulletin of Statistics

World oil prices began to escalate during 1979 and 1980 with the onset of the second world oil crisis. As a result many of the world's industrialised countries experienced current account deficits, rising inflation and the threat of recession. In order to control inflationary pressures and reduce the impact of a recession, many of the industrialised countries imposed restrictive financial policies which lead to weak import demand (IMF various years). As many of the world's wealthier nations account for the majority of world-wide processed food trade (Figure 2.4), the combination of weak

import demand (due to the recession) and falling world food prices led to a contraction in the value of world processed food trade.

As countries lowered inflation and came out of recession, increased demand for processed foods assisted 1984 in achieving the best growth performance since 1981. Though it was not until 1985 that world food prices bottomed out and began to rise again. Throughout the mid 1980s trade in processed food products prospered as inflation and world food prices remained stable. By the end of the 1980s world growth began to slow as industrialised countries implemented restrictive monetary policies to help counteract rising inflationary pressures (IMF various years). By the early 1990s, many countries were again experiencing the effects of a recession, including the United States (US), Canada and the United Kingdom (UK). Although these countries were out of recession by 1992 it was not until after 1993 that many other European countries came out of recession and world growth once again picked up. But while these countries experienced a decline in growth, many Asian countries continued to prosper (IMF various years).

Despite many countries being out of recession in 1993, there was a contraction of world processed food growth, as world food prices reached their lowest level since 1987 (Figures 2.2 and 2.3). However, this contraction lasted only one year, as world processed food trade experienced rapid growth in 1994 and 1995 (Figure 2.2). Despite world food prices in 1995 and 1996 having recovered to be at their highest level since 1980 (Figure 2.3) the annual growth in the value of world processed food trade declined from 15 percent in 1995 to just 1 percent in 1996 (Figure 2.2).

So while processed food trade has recorded some of the fastest overall growth rates within the last two decades (see Table 1.1), Figure 2.1 suggests two trends in world processed food trade. Firstly, that growth in processed food trade is subject to extreme volatility and the economic cycles of the world (as is total world trade). Secondly, the growth in processed food trade may be declining.

2.2.1 World Export Growth of Individual Processed Food Commodities

The growth of world trade in individual processed food commodities has tended to follow the same path of growth as total processed foods, with rapid growth between 1976 and 1980, negative growth between 1980 and 1984, and high positive growth from 1984 to 1996, albeit exhibiting a slowing trend (Table 2.1). However, as indicated by Table 2.1 the average annual growth rates among the eleven individual processed food commodities has tended to vary widely.

Table 2.1 Individual Processed Food Commodities Annual World Export Growth Rates [a]

	1976-80	***1980-84***	***1984-88***	***1988-92***	***1992-96***
Meat	12.91	-3.30	10.01	7.50	3.46
Dairy	14.84	-2.96	12.13	5.08	2.75
Fish	14.27	1.05	15.24	5.52	4.39
Cereals	13.97	-0.67	9.51	11.87	7.55
Fruit & Vege	11.22	3.35	4.72	7.33	4.45
Sugar & Honey	11.79	-15.95	5.21	6.91	7.66
Coffee & Cocoa	10.25	-1.76	1.19	-2.80	11.17
Beverages	14.71	-2.11	11.93	8.29	5.87
Ani Oils & Fats	8.42	0.99	-21.73	-4.01	12.81
Vege Oils & Fats	15.01	5.93	-4.12	4.99	9.74
Pro. Ani/Vege Oils	15.55	1.30	5.21	3.08	9.84
Total Pro. Food	12.79	-2.29	7.72	5.75	5.73

Note: a. Annual rates are calculated by using the compound growth rate formula; $g = \sqrt[t]{\frac{X_2}{X_1}} - 1$, where X_1 and X_2 are the initial and terminal years respectively and t is the number of years. Annual import demand growth rates in Table 2.2 are also calculated using this formula.

Source: Authors calculations, derived from the NAPES Database, ANU

Between 1976 and 1980 world processed food trade experienced 12.79 percent annual growth. Although fruit and vegetables, sugar and honey and coffee and cocoa

products achieved growth rates inferior to total world processed food trade during this period, animal oils and fats was the only commodity which failed achieve annual growth above ten percent (Table 2.1). However, annual growth rates declined during the world recession period as only five of the eleven commodities managed to achieve positive annual growth between 1980 and 1984, with none of the commodities exceeding six percent annual growth. A distinguishing feature of this period (1980-84) is the dramatic decline in the growth of sugar and honey products, recording –15.95 percent annual growth over this period, after growing at 11.79 percent annually between 1976 and 1980. In addition to sugar and honey products poor performance during the recessionary period, processed meat and dairy products recorded growth below that of total processed foods (Table 2.1).

After 1984, a large reversal in the growth of all commodities transpired. Of the five commodities which accounted for the largest shares of processed foods over the 1984-88 period (Figure 2.1), only coffee and cocoa products failed to achieve annual growth in excess of ten percent. Furthermore coffee and cocoa products had the third worst annual growth for this period. Only animal and vegetable oils and fats grew at a rate slower than coffee and cocoa, with both experiencing negative growth. This is a peculiar result given that both commodities experienced positive growth during the recessionary period, suggesting that animal and vegetable oils and fats may be inferior goods.

An interesting characteristic of Table 2.1 is that each of the main processed food commodities meat, dairy, fish and beverages, show positive but declining annual growth rates after 1984. Sugar and honey products went against this declining growth trend by increasing its annual growth rate in each of the last three periods. Growth in coffee and cocoa products has fluctuated throughout the whole period. Coffee and Cocoa products show excellent growth rates during the 1976-80 and 1992-96 periods, poor growth during the 1984-88 period, and negative growth during both the 1980-84 and 1988-92 periods.

In fact Table 2.1 shows that some of the less important commodities have achieved the better performing growth rates over the 1992-96 period. In particular, animal and vegetable oils and fats and processed animal and vegetable oils generally

out-performed the more important commodities, despite their declining share of total world processed food trade.

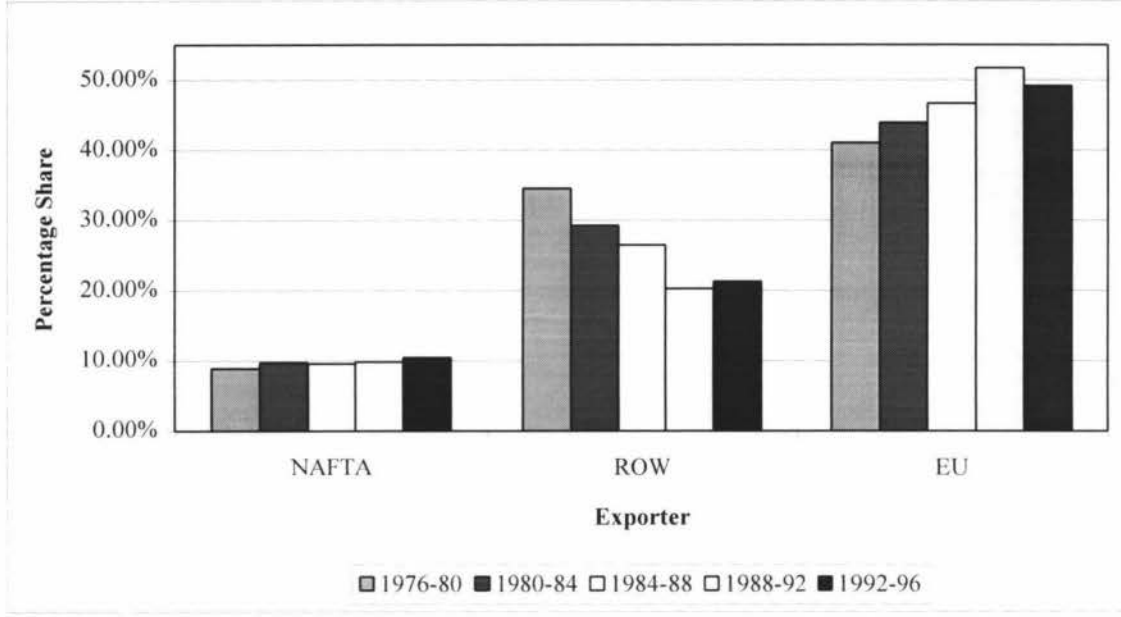
2.3 Processed Food Exporters

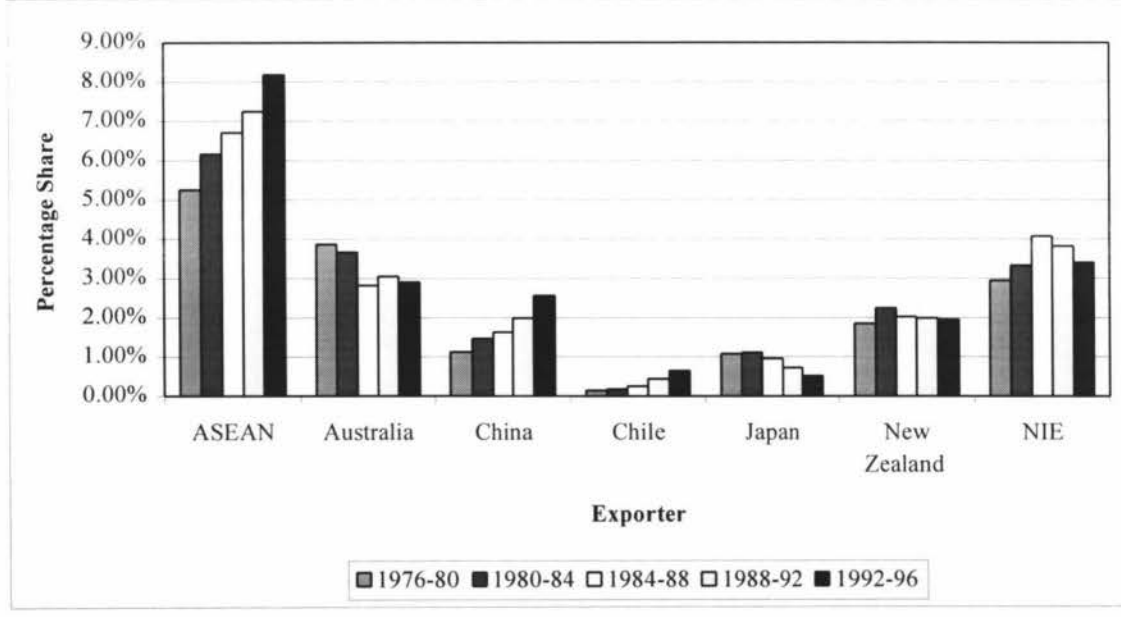
The leading exporters of processed foods are the industrialised countries of the EU and NAFTA which accounted for slightly less than half of all trade in processed foods during the 1976-80 period (Figure 2.4). Between 1976 and 1996 both the EU and NAFTA were able to increase their individual market shares of world processed food trade. By the 1992-96 period, the dominance of these two regions accounted for almost 60 percent of world processed food trade (although the EU alone accounted for over half of all processed food trade during the 1988-92 period) (Figure 2.4). The increasing dominance of the EU can be partially accredited to the growing share of beverage products in total world processed food trade (Figure 2.1). The EU accounted for approximately three-quarters of all beverage exports throughout the study period. NAFTA's rising share can be partially explained by the increasing importance of meat and fish products in world processed food trade (Figure 2.1) as both commodities increased their share of NAFTA's total processed food exports (see Appendix I, Figure I1).

While individual developing nations in the ROW aggregate tend to be small exporters in the world processed food market their combined share of world processed food trade, though declining, is very significant (Figure 2.4). Between 1976 and 1996 developing countries' combined share declined from approximately one third to just over one fifth of world processed food exports. The decline in the ROW's share of world processed food trade can be accounted for by the declining importance of coffee and cocoa and sugar and honey products in world processed food trade. The fore mentioned commodities are the ROW's two main processed food exports, and the two commodities in which the ROW dominated world trade. In 1976 the ROW accounted for 79.6 percent of world coffee and cocoa trade, and 59.5 percent of world sugar and honey trade. By 1996 the ROW's export share of both commodities had declined, accounting for only 48.9 percent of coffee and cocoa trade, and 38 percent of sugar and honey trade.

The declining share of sugar and honey in total processed foods can also be partially attributed to some of the decline in Australia's share of world processed food trade (Figure 2.4). Sugar and honey products accounted for the largest share of Australia's processed food exports (see Appendix F, Figure F1) during the study period.

Figure 2.4[a] *Exporters Share of World Processed Food Trade*





Note: a. ASEAN is the acronym for the Association of South East Asian Nations and NIE is the acronym for Newly Industrialised Economies. Refer to Appendix B for the list of countries included in these country aggregates.

Source: Author's calculations, derived from the NAPES Database, ANU

A distinguishing feature of Figure 2.4 is the rising importance of the Asian nations of ASEAN, NIE and China as exporters of processed foods. Although since the late 1980s NIE's share of world processed food trade has fallen away. The growing share of world processed fish trade (see Figure 2.1) has been an important feature in the growth of processed food exports from these Asian countries. In 1996, 41 percent of NIE's total processed food exports was from fish, while for China and ASEAN, processed fish exports accounted for 38 and 32 percent of their total processed food trade respectively. The rising importance of fish also partially explains Chile's ability to increase her share of world processed food trade throughout the study period. Although only a very minor player in world processed food trade Chile has been able to increase its share in every period, rising from just 0.15 percent of world processed food trade in the 1976-80 period, to 0.64 percent by the 1992-96 period (Figure 2.4). Since 1984 processed fish exports from Chile has accounted for approximately 60 percent of her processed food trade (see Appendix G, Figure G1).

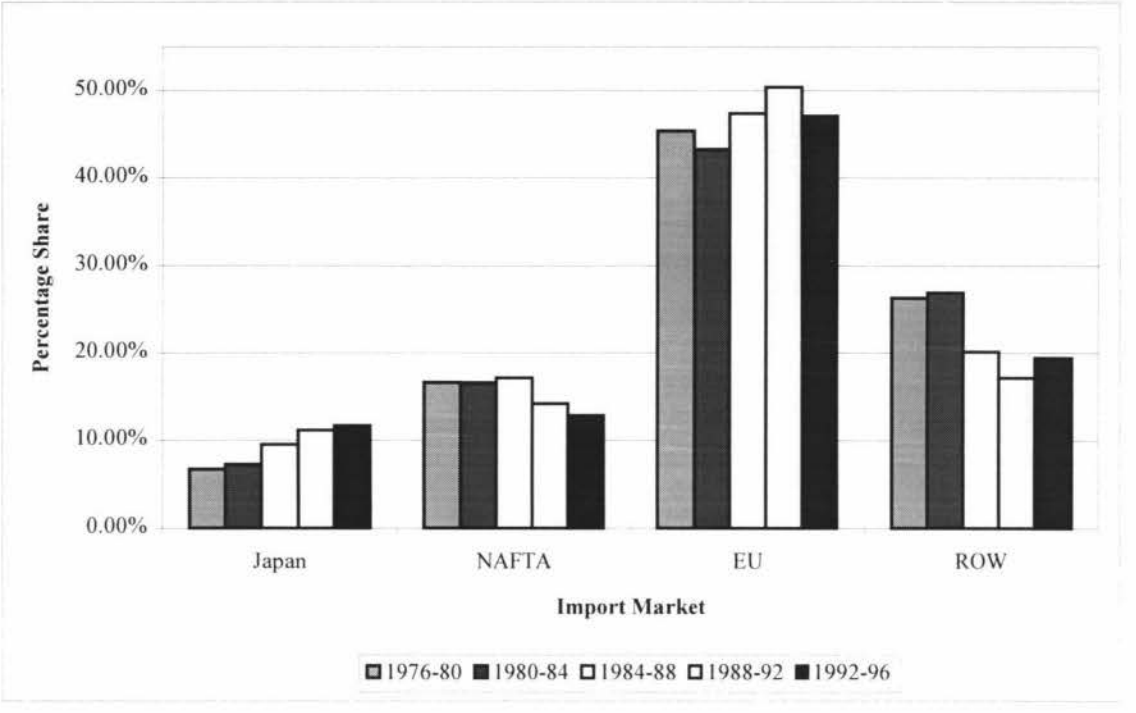
Despite the importance of processed food exports to New Zealand (see Figure 1.2), Figure 2.4 indicates that New Zealand is only a small exporter in terms of world processed food trade. Although New Zealand was able to increase its share of world processed food trade from 1.85 percent to 2.23 percent between the 1976-80 and 1980-84 periods New Zealand has not been able to maintain this growth in market share. Since the 1980-84 world recession period New Zealand has witnessed its share of world processed food trade decline to just 1.95 percent, only 0.1 percent higher than 16 years earlier. This is a surprising result given that New Zealand's three main processed food exports, meat, dairy and fish products (see Appendix J, Figure J1) all increased their importance of world processed food trade (Figure 2.1).

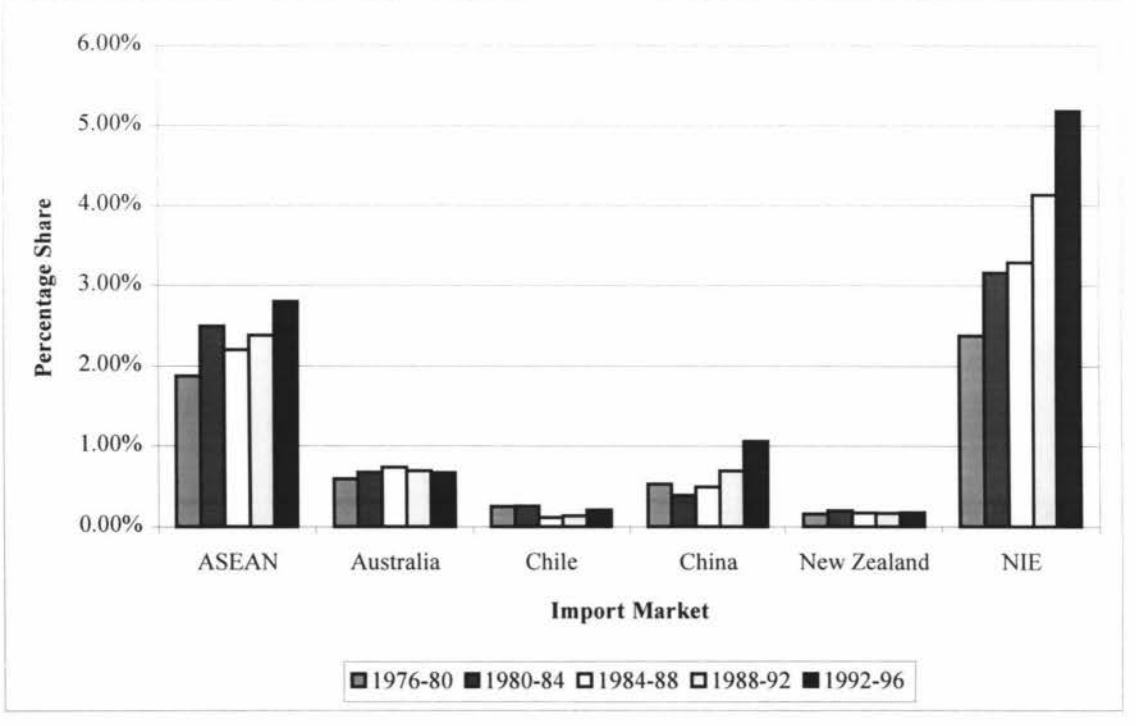
2.4 Processed Food Importers

As with processed food exports the EU and NAFTA have dominated the importation of processed food products (Figure 2.5). Although individual developing countries do not command a large share of processed food imports, their combined import share is also significant. However, the developing countries import share of world processed food trade (like their export share) is declining to the extent that by the

1992-96 period the developing countries imported less than one fifth of all processed food trade, down from a quarter during the 1976-80 period (Figures 2.5).

Figure 2.5 Percentage Share of World Processed Food Imports





Source: Author's calculations, derived from the NAPES Database, ANU

Despite annual import demand growth in the EU declining from a post recession high of 11.23 percent during the 1984-88 period, to just 3.34 percent by the 1992-96 period (Table 2.2) the EU has continued to account for the largest share of processed food imports. Between 1988 and 1992 the EU imported over half of all processed food trade.

Table 2.2 Annual Import Demand-Growth for Processed Foods

	1976-96	***1976-80***	***1980-84***	***1984-88***	***1988-92***	***1992-96***
ASEAN	10.06	19.66	1.46	4.21	8.55	8.92
Australia	7.89	12.71	4.52	5.82	3.54	6.63
Chile	10.58	37.73	-15.06	-3.95	16.41	16.63
China	11.75	14.90	-11.98	32.68	-1.76	20.95
EU	7.04	12.32	-2.90	11.23	6.14	3.34
Japan	9.71	10.86	2.19	16.61	5.11	6.26
NAFTA	5.20	9.12	2.06	2.38	3.49	4.84
New Zealand	8.07	16.23	-1.20	4.65	4.46	10.36
NIE	11.99	18.69	3.64	7.58	11.34	9.19
ROW	5.90	15.55	-5.74	0.35	5.75	10.08
World	6.97	12.79	-2.29	7.72	5.75	5.73

Source: Author's calculations, derived from the NAPES Database, ANU.

A noticeable feature of Figure 2.5 is the decline in NAFTA's share of world processed food imports between 1984 and 1996. Initially NAFTA's share remained stable between 1976 and 1984, consuming approximately 16.5 percent of world processed food imports. Over the following four years (1984-88) consumption slightly increased to just over 17 percent. However, after 1988 NAFTA's import share declined, accounting for only 12.9 percent in the 1992-96 period. Some of this decline may be attributed to the relatively poor import demand-growth registered in the NAFTA countries throughout the period of the study (Table 2.2).

The most interesting feature of Figure 2.5 is the rising share of imports destined to Asian countries, particularly Japan and the fast growing countries of NIE. The ASEAN group of countries and China has also increased their import market shares of processed food trade. Table 2.2 indicates that these countries have exhibited some of the

best performance in terms of annual import demand growth throughout the period of the study. Japan's share of processed food imports increased from 6.69 percent to 11.64 percent, while the NIE countries have more than doubled their share from 2.37 percent to 5.18 percent. The ASEAN countries and China increased their market shares from 1.87 to 2.8 percent, and 0.53 to 1.05 percent respectively.

The increasing import share of the Asian countries has predominantly resulted from increased demand for processed fish products. At the same time both Japan and NIE have also shown strong import demand growth in meat products. This increased demand for meat products coincided with a large import demand-growth in ASEAN countries for beverage products. Fish imports increased its share of Japan's total processed food imports from 32.2 to 45.6 percent, while meats share of imports grew from 18.9 percent to 27.9 percent. Both commodities annual growth rates (11.54 and 11.74 percent respectively) out performed Japan's total annual growth rate of 9.71 percent. Annual import demand-growth for processed fish and meat products by NIE countries (13.93 and 12.07 percent respectively) also out performed their annual import demand-growth for total processed foods of 11.99 percent. Annual import demand growth of 12.66 percent for fish and 12.79 percent for beverages within ASEAN out performed total annual import demand-growth of 10.06 percent.

While the Asian economies have consistently tended to display faster import demand-growth (particularly NIE) NAFTA and the EU have both tended to display demand-growth below that of the world average demand growth rate (Table 2.2). An important feature of Table 2.2 is the declining trend of the EU's import demand-growth since the 1984-88 period, whereas NAFTA has increased her annual import demand since the 1984-88 period. Tyers and Anderson (1992, p.28) suggest that the reason for the relatively poorer demand-growth in the EU and NAFTA compared to that of Asian countries is that one would expect food consumption growth to be slower in higher income countries for at least three reasons. Firstly, slower population growth in high-income country's results in a smaller increase in consumers, thus a smaller increase in demand than would be the case in a country with relatively faster population growth. Secondly, high-income countries tend to have slower income growth which results in slower food demand-growth. This is because consumers in high-income countries tend to have already satisfied their food consumption requirements and any change is more

likely to be in terms of quality and not quantity. The third reason is that high-income countries have a lower income elasticity of demand for food than low-income countries. Therefore, as incomes rise the associated increase in food demand is lower than what it would be in low-income countries with higher income elasticities of food demand. Furthermore, Tyers and Anderson (1992, p.28) suggest that even if population and per capita income growth rates were the same in both developed and developing countries, food consumption in developed countries would grow at a slower rate. The reason being is that consumers in developed countries tend to spend a declining share of their income on food, as their incomes rise.

2.5 Intra-Regional Trade

A prominate feature of processed food trade is the increasing role of trade between countries which are linked through agreements amongst themselves. The large export and import share of world processed food trade accounted for by the EU and NAFTA can be partially explained by intra-regional trade. Table 2.3 indicates that intra-regional trade has not only been an important feature of processed food trade for the countries of the EU and NAFTA regions, but the importance of intra-region trade has been increasing throughout the study period.

Table 2.3 Percentage of Total Processed Food Trade that is Intra-Regional

	1976-80	***1980-84***	***1984-88***	***1988-92***	***1992-96***
ASEAN	12.43	14.76	13.32	12.25	12.21
CER	1.36	2.10	3.17	3.56	4.21
EU	65.78	62.38	67.72	70.87	70.13
NAFTA	34.31	35.64	39.82	39.24	40.66

Source: Author's calculations, derived from the NAPES Database, ANU

Although intra-regional trade between ASEAN countries also accounts for a moderate proportion of her total trade in processed foods, it has not played the increasingly important role that it has for the EU and NAFTA. Despite the Closer Economic Relations (CER) trade agreement between Australia and New Zealand, which promotes free trade between the two countries, the percentage of both countries' total processed food trade which is intra-regional is very small, although increasing in nature

(Table 2.3). The main reason for this small intra-regional trade between Australia and New Zealand is due to the small size of both countries' consumer markets, in relation to the size of the NAFTA and EU markets. A small market limits the potential for exporters to expand and increase market share as opposed to a large market.

One of the primary reasons for the large amount of intra-regional trade is the preferential treatment given to member countries which increases internal trade among member countries, while discriminating against outside or 'third' countries. Additionally, according to Traill (1997) high transport costs may act as a significant barrier to very long distance trade in many products, particularly as many processed foods remain bulky and perishable. However, Coyle, Gehlhar, Hertal, Wang and Yu (1998, p.1056) state that "in the long-run, under competitive conditions with constant returns to scale, [they] would expect transportation to have a neutral effect on the composition of trade." They suggest that greater innovation in the shipping industry (with respect to containerised shipping) could reduce transportation costs which would favour trade in non-bulk commodities over bulk commodities.

2.6 Protectionism and Processed Food Trade

Many factors influence the growth rate of a country's imports and exports of processed food products. One of the major determinants is the degree of government intervention, whether it is aimed at supporting domestic producers, providing consumer protection or for the purposes of generating revenue. Government protection can take many forms. Export subsidies and commodity price supports are generally used to promote export-led growth while import policies in the form of quotas and tariffs are commonly used to protect domestic producers. Two increasingly important features of trade protection in the processed food industry are tariff escalation (Henderson *et al* 1996, Matthews 1994) and technical barriers. Matthews (1994, p.178) notes that although traditional tariffs are not unimportant in the processed food industry, a distinctive feature of protection in the food industry "...is the relatively greater importance of technical barriers to trade arising from the prevalence of differing food standards, labeling and packaging requirements, ingredient laws and similar measures."

"Tariff escalation occurs when tariffs applied along a product 'chain,' are increased as the level of processing is increased" (Organisation for Economic Cooperation and Development (OECD) 1997, p.31). This favours the importation of the raw commodities over final processed products as they incur the lowest tariff. By having a tariff schedule structured in such a manner, a country can increase the use of its domestic manufacturing capacity. Matthews (1994, p.181) states that "...as a consequence of the escalation of tariffs with the degree of processing, the effective protection (protection given to the value added) in the food industry is much higher than the nominal tariff." Furthermore, according to Mori (1992 cited in Matthews 1994, p.181) tariff escalation not only results in lower exports of processed food from developing countries, but it also hinders the learning process which is linked to manufacturing and marketing activities for the international market. This is because tariff escalation protects processing industries in the industrialised countries at the expense of developing countries (OECD 1997, p.31).

Henderson *et al* (1996, p.61) provide the following example of tariff escalation. If an importing country has a relatively low tariff on soybeans, a higher tariff on soybean oil, and an even higher tariff on margarine, then the importer can increase processing throughput (and utilisation of its associated factors of production) in its own market at the expense of its trading partners and overall efficiency by importing increased quantities of soybeans that incur the lowest tariff. Table 2.4 shows the extent of tariff escalation for coffee and cocoa imports into the EU even after commitments to the Uruguay Round of GATT negotiations are taken into consideration.

Table 2.4 The EU's Tariff Reductions on Coffee and Cocoa Imports[a]

	Percentage Reduction
Coffee Products	
Not Roasted	100
Roasted	50
Instant Coffee	30
Cocoa Products	
Cocoa Beans	100
Cocoa Paste/Butter/ Powder	40
Chocolate and Chocolate Confectionery	31

Note: a. These are agreed tariff reductions for coffee and cocoa imports into the EU under the Uruguay Round of the GATT negotiations.

Source: OECD 1997, pp116-117

Although the EU will reduce that existing tariff on non-roasted coffee products by 100 percent, it will reduce that tariff on instant coffee products (a downstream product from non-roasted coffee) by only 30 percent. Similarly for cocoa products, while the tariff on cocoa beans will be reduced by 100 percent the tariff on chocolate and chocolate confectionery imports into the EU will only be reduced by 31 percent (Table 2.4). Therefore tariff escalation on these two products increases due to the declining percentage reduction at higher levels of processing (OECD 1997, p.31).

In examining the Asia Pacific Economic Cooperation group's (APEC) proposed Early Voluntary Sectoral Liberalisation (EVSL), Dee, Hardin and Schuele (1998, p.13) found that partial liberalisation in which lowly-protected upstream sectors are liberalised while more highly protected downstream processing sectors remain protected (which increases tariff escalation) "...has the potential to move resources further away from their pattern in a world free of protective distortions, leading to allocative efficiency losses." Such liberalisation would make imported inputs cheaper for downstream processing, thereby encouraging domestic resources to move out of the upstream sector and into the more highly protected downstream processing sector. This may result in a second best welfare loss (Dee, Hardin and Schuele 1998).

In addition to the increasing importance of tariff escalation, Matthews (1994) points out that differing food standards and regulations between countries, combined with increased health, safety and environmental concerns in developed countries are likely to become increasingly important in the future as these concerns can be used as non-tariff barriers to food trade. Matthews (1994, p.182) states that "...without harmonisation of some kind, *de facto* import prohibitions may arise, or costly adaptations may be needed, thereby reducing the gains from trade."

Chapter Three
Determinants Influencing Changing Consumption Patterns Towards Processed Foods

3.0 Introduction

Around the world food consumption patterns are changing, and with similar changes being observed across countries, world consumption patterns are said to be 'internationalising.' Popkin (1993) states that the recent overall world-wide trend in food consumption has been towards a diet relatively high in fat and processed foods, and low in fibre, fresh fruit and vegetables and carbohydrates. However Taylor and Findley (1996) state that most of the literature on consumption patterns points towards two influencing, but different trends changing the nature of diets in both developing countries and Western countries. In developing countries consumption trends have moved towards a change in nutritional balance as consumers increase their consumption of animal protein foods, foods that are high in fats, oils and sugar, and towards more processed foods. Secondly is the Westernisation of developing countries diets as consumers increasingly accept Western products (Taylor and Findley 1996, p.2). In Western countries, eating habits are exhibiting trends towards convenience and 'fast food,' and towards healthy foods and a more nutritionally balanced diet (Taylor and Findley 1996, p.6). Coyle *et al* (1998, p.1051) note that in "...highly affluent markets like the EU, North America and Japan, consumer-ready processed goods make up a large and growing share of the food and agricultural imports." Although food imports into developing countries are "...still dominated by bulk and intermediate products, consumer-ready products are also beginning to make inroads" Coyle *et al* (1998, p.1051).

Rising incomes, urbanisation and demographic and socio-economic developments are emphasised in the literature as the three main factors contributing to rising consumption levels of value-added and high-valued processed foods. Pingali and Rosegrant (1998) state that the decline in the consumption levels of rice and the increased consumption of bread, meat and other processed foods (commonly called the Westernisation of Asian diets) is an inevitable consequence of such factors. This chapter

reviews these three factors influencing dietary change, as well as examining the issue of convergence (or globalisation) of international consumption patterns.

3.1 Consumption Effects Due to Changes in Income

As economies develop and per capita incomes and expenditures rise, consumers tend to prefer a more varied and diverse diet. For consumers at low-income levels food is generally received raw and largely unprocessed and the food preparation which occurs at home is both basic and repetitive (Johnson 1997, p.113). As incomes rise and consumers' expectations of the way food is delivered increase, more processing, preparation and packaging is done centrally. With rising incomes consumers demand foods which require less preparation time such as value-added processed foods. Mitchell, Ingco and Duncan (1997, p.75) cite the example of where increasing incomes induces consumers to substitute away from traditional staples such as rice, towards more non-traditional wheat products in the form of bread and noodles which usually require less preparation time. Taylor and Findley (1996, p.3) state that such a transfer (the consumption of raw cereals to the consumption of cereals as part of a processed food product like bread) is a common development as incomes rise. Additionally, Coyle *et al* (1998) mention that in countries where cereals and legumes are dietary staples, expenditure on non-traditional food items such as meat, beverages and fruit tends to grow at a faster rate than expenditure on traditional food staples. Traill (1998, p.37) also notes that the diversity of food products consumed increases as incomes rise, but that there are also changes in food-related behaviour. Traill (1998, p.37) points out that "the relationship between the growth in personal incomes and the demand for convenience foods is not only related to increases in the economic means with which to satisfy demand, but also changes in lifestyles." (Such factors are discussed in section 3.3.)

Garnaut and Ma (1992 cited in Rae 1995, p.24) identified three distinct changes that transpire in food consumption patterns as consumers' incomes rise. As incomes rise initially (phase I) there is an increase in the consumption of traditional foods such as rice and starchy root crops. The second phase sees a shift away from traditional staples towards non-traditional staples such as wheat based products. As incomes reach the upper levels (phase III) there is an increase in the consumption of higher-value and higher-protein foods such as animal products as consumers shift away from the

consumption of non-traditional staples. In a similar approach, Mitchell *et al* (1997, p.75) also identified three stages of diet transformation as incomes rise in economies where both cereals and starchy roots are food staples. With a rise in incomes (stage I), the consumption of total cereals increases and replaces root crops. As incomes continue to grow, cereal consumption peaks, or grows very slowly. The consumption of root crops continues to decline and there is a rapid expansion in the consumption of non-traditional foods such as livestock products and processed foods (stage II). The final stage (stage III) sees per capita consumption of total cereals decline while the consumption of livestock products and processed foods continues to increase. Furthermore, Rae (1995, p.24) suggests that a fourth stage could be added, whereby health concerns result in a movement away from livestock products back to cereal-based foods, a trend observed in Western diets in recent times.

Engel's law states that when incomes rise, the proportion of expenditure allocated to food declines. However Traill (1998) contends that Engel's law is not a perfect relationship, as it is influenced by national differences in preferences for food and prices. Mitchell *et al* (1997, p.74) profess that although Engel's law may be true for food in aggregate, individual food items may show a range of increasing shares, particularly when extremely low income levels are involved. In addition to this Mitchell *et al* point out that although Engel's law implies that the income elasticity of demand for food is less than one (which appears true for aggregate food), individual food items, particularly non-staples may have income elasticities greater than one. This means that for non-staples such as high-value and value-added processed foods, as incomes rise the proportion of expenditure spent on these food items also increases.

"Although the proportion of expenditure on food falls as incomes rise, the level of expenditure on food still rises" (Traill 1998, p.37). Using the EU as an example Traill points out that since consumers in the EU are adequately fed, they use the increase in income to upgrade quality (at a higher price) rather than increase the quantity of food consumed. The demand for quality may take a variety of forms:

- Growth in consumption of convenience foods
- Growth in meat consumption in the poorer countries
- Growth in consumption of generally more expensive ecological foods

- More eating out and higher value-added foods in general. (Traill 1998, p.37)

Although the importance of prices diminishes as incomes rise, the relative prices of close substitutes are still important to consumers as consumption patterns change (Traill 1998, p.38)

Mitchell *et al* (1997, p.74) mention a second law, known as Bennett's law. This states "that the staple ratio (the proportion of calories an individual derives from staples) declines with rising income." So as incomes increase, the importance of non-staple foods such as processed foods also increases, as consumers demand more convenience and variety in their diets. This relationship was observed in seven economies using data for the late 1960's (Chaudri and Timmer 1986 cited in Mitchell *et al* 1997, p.74).

Within the fast developing economies of Asia rising incomes are resulting in a decline in per capita consumption of traditional foods and increased consumption of higher-valued and processed foods, as Asian consumers seek to add variety to their diets (Mitchell *et al* 1997, p.73). In Asian countries such as Japan, Malaysia, Nepal, Thailand and Taiwan average per capita consumption of rice has declined as consumers eat more cereals such as wheat in the form of bread and noodles (Mitchell *et al* 1997, p.73). Complementary to the increase in non-staple cereals, is a rapid increase in the consumption of livestock products, vegetable oils and other high-valued food items (Mitchell *et al* 1997, p.83). Pingali and Rosegrant (1998) also agree that as Asian incomes rise, rice becomes an inferior good as consumers substitute rice for bread and high-valued products such as meat, poultry products, fruit and vegetables.

Mitchell *et al* (1997, p.73) cite the example of Japan. Since 1961 per capita consumption of rice has declined from about 107 kilograms to less than 65 kilograms, whereas red meat consumption has increased from about 5 kilograms to nearly 40 kilograms. Mitchell *et al* do however point out that because Japan has achieved the highest income level of all Asian countries its rapid decline in rice consumption and increased red meat consumption is not typical of Asian economies. Nevertheless similar consumption patterns (away from rice and towards meat) do appear to be under way in other Asian economies. According to Pingali and Rosegrant (1998, p.954) it is just "the extent of substitution out of rice [that] varies by country and region." Japan having

completed the transformation process, while countries such as Bangladesh and Nepal are in the early stages of it. Additionally, Mitchell *et al* (1997, p.92) provide evidence from Indonesia for 1980, where the household budget shares for the staple foods of rice, maize and root crops declined with income, while the budget shares for non-traditional foods (wheat, livestock products and fruit and vegetables) increased with income.

3.2 The Role of Urbanisation as a Determinant of Changing Consumption Patterns

The rapid growth of urban populations has profound affects on consumers' diets (Popkin and Bisgrove 1988). The migration from rural areas to urban cities (and to a lessor extent the movement from small urban areas to large urban cities), coupled with international migration is changing food consumption patterns towards more value-added processed food products. Key factors responsible for changes in urban dietary behaviour include improved transportation and food distribution systems, greater penetration of food marketing practices, increased heterogeneity of diet, occupational patterns less compatible with home food production and consumption, differences in disease patterns and in the availability of health services (Popkin 1993, p.142). Rae (1995, p.26) also suggests that better shopping facilities and advertising has a greater degree of influence on the diets of urban populations than rural populations.

In some low-income countries urban dwellers consume more fat and protein (particularly from animal sources) than rural dwellers. The latter tend to consume more coarse grains, roots, tubers, and pulses (Popkin and Bisgrove 1988, p.9). Popkin (1993, p.142) suggests that:

> "...compared with rural diets, urban diets show trends toward increased consumption of grains that consumers deem more desirable or superior, more milled and polished (e.g., rice or wheat, rather than corn or millet); food higher in sugar and in fat (more animal products); and increased consumption of food prepared away from the home; processed foods..."

Mitchell *et al* (1997, p.92) state that compared to rural areas of Indonesia, households in urban areas had a lower average budget share of the staple food (rice) and

a higher budget share of livestock products (beef, poultry, and milk products) and processed foods.

In evaluating the demand for calories for urban and rural populations in the Philippines, Bouis (1990) suggests that one of the reasons that such trends are observable (that rural households tend to have a higher proportion of staple food in their diet than urban households) is that the activity levels of rural households can be expected to be higher than those of urban households.

According to Pinstrup-Anderson and Pandya-Lorch (1998) there is currently a rapid increase in food consumption of animal origin, amongst middle and high-income consumers in developing countries. They suggest that such trends towards higher-value food commodities such as meats and processed foods are further accelerated by rapid urbanisation in middle-income developing countries.

In studying the effects of urbanisation on the demand for cereals grains in Asia, Huang and David (1993, p.121) concluded that urbanisation significantly altered the consumption patterns for cereal grains in Asia (although the rate of change differed by country and income level). Urbanisation lowered the demand for rice and coarse grains, while increasing the demand for wheat. An increase in the demand for wheat was observed in all countries due to greater convenience of consuming wheat products. Huang and David also observed that urbanisation significantly decreased cereal grain consumption in high-income countries while increasing the consumption of non-cereal goods. In low-income countries urbanisation increased cereal grain consumption. In examining the effect of expenditure and urbanisation growth on the demand for animal based products over time, Rae (1998) also found that urbanisation often had a significant positive effect on the consumption of such products.

Huang and Bouis (1996 cited in Rae 1999, p.360) estimated that moving a Chinese consumer from a rural area to an urban area, but leaving expenditure and prices the same as experienced in the rural area, would produce an increase in consumption of meat and fish by between 5 and 9 kg per year. Huang and Bouis also examined Taiwanese data for 1981 and 1991. They concluded that the demand for food was substantially influenced not only by growth in incomes and price changes, but also by

differences in urban and rural lifestyles. Additionally, in comparing Taiwanese villages they found that per person consumption of rice had fallen by 35.3 kg: income factors provided an increase in consumption of 31.4 kg, but urbanisation had provided a downturn in consumption of 26.6 kg. Both income and urbanisation worked in a similar direction for meat. The total per person consumption of meat rose by 24.2 kg. 18.2 kg of this increase was contributed from income effects and 3.4 kg contributed from the effect of urbanisation.

3.3 Demographic and Socio-Economic Developments

In addition to income- and urbanisation-related dietary changes, a number of demographic and socio-economic changes are taking place which are also influencing food consumption patterns of consumers in both developed and developing countries.

One of the most significant changes occurring at the moment is the increasing participation of paid women into the labour force. Gordon (1998, p.92) gives the example of France, where more than 75 percent of women between the ages of 25 and 40 now work, compared with only 40 percent in 1970. This phenomenon is observable in other developed countries like the United States, Germany and the United Kingdom. In New Zealand females made up 30 percent of the employed labour force in 1976. This rose to 45 percent by 1999 (Statistics New Zealand 1999).

The increasing female participation in the Japanese labour force, from 45 to 50 percent between 1970 and 1989 (with an associated decline in the average number of persons per household) has lead to a decline in the demand for food consumed in-home and an increase in the demand for convenience food (Australian Meat and Livestock Corporation 1992 cited Mitchell *et al* 1997, p.93). Furthermore there has also been an increase in the demand for value-added meat products, easy to prepare cuts of meats and processed foods in Japan.

As both labour force opportunities for women increase, and the number of women entering the labour force rises, this will influence food consumption behaviour. Particularly with respect to the time allocated to food preparation and the nutritional balance of food. With less time available for food preparation there is likely to be an

increase in the demand for processed foods which offer substantial time savings (Pokin 1993). Senauer, Sahn and Alderman (1986, p.920) note that in comparison to processed foods, many traditional foods are time intensive and require long preparation times. They cite the example of wheat products, such as bread which offer substantial time savings when purchased from a bakery or store, over conventional preparation methods. Likewise, microwaveable frozen 'ready-meals' available from supermarkets offer substantial time savings compared to cooking a traditional meal.

Gordon (1998, p.92), states that the increasing number of women in the labour force has contributed to the demise of the family meal in favour of convenience products and snacking. This has led to an increase in the demand for service products such as frozen or chilled 'ready-meals' (Gordon 1998) as women and men now assemble their meals as opposed to preparing them (Senauer, Asp and Kinsey 1993, p.65).

In testing the hypothesis that the opportunity cost of time affects developing countries food consumption patterns, Senauer *et al* (1986, p.926) provide strong evidence that the opportunity cost of time (of Sri Lankan women) is an important determinant of food consumption patterns. Thus the increased value of human time must be considered one of the factors underlying the shift from time intensive traditional foods to time saving processed foods. Prochaska and Schrimper (1973, p.600) found that households with employed homemakers that had a high opportunity cost of time tended to consume more meals away from the home, than did households with homemakers whose opportunity cost of time was low. Therefore, those households with employed homemakers were likely to consume more convenient processed food products than non-processed food products.

Using value of time elasticities to represent the percentage change in the number (or expenditure) of meals eaten away from the home associated with a one percent increase in the value of homemakers time, Prochaska and Schrimper (1973) found that in nearly all cases studied, the coefficients for the unemployed homemakers were less than the corresponding coefficients for employed homemakers. Schur (1989 cited in Senauer *et al* 1993, pp.65-66) makes the point that as the opportunity cost of time rises,

many people believe that time is too important to waste in the kitchen. As such consumers seek the convenience of processed food products like microwaveable meals.

Although the world's population is continuing to grow the population growth rate is declining as humans conceive fewer children, particularly in developed countries. In New Zealand for example, the total fertility rate[8] has declined from 4.31 births per women in 1961, to 2.04 in 1995 (Statistics New Zealand 1997, p.114). As population growth declines the average size of households is also declining. In France for example, between 1960 and 1995 the average number of persons per household declined from 3.1 to 2.5 (Gordon 1998, p.92). During the same period in New Zealand the average number of people per household declined from approximately 3.9 to 2.7 (Statistics New Zealand 1997, p.126). Associated with the declining household size, is an increasing trend of single-person households. In both France and Germany, approximately 30 percent of households are considered to be single-person (Gordon 1998, p.92). In 1986, 19.6 percent of all New Zealand households comprised of just one occupant. This had risen to 21.1 percent in 1991 (Statistics New Zealand 1997, p.127). This trend towards smaller and single households will increase the demand for processed foods particularly in the form of single-person packaging, and products adapted to the different social circumstances of food consumption (Gordon 1998, p.92).

The popularity of the microwave oven has been linked with increased female participation in the labour force and single person households which demand convenience products and processed foods that require less preparation time (Gordon 1998, p.92). Conner (1994, p.160) notes that high incomes result in early adoption and ownership of household appliances such as food processors, microwave ovens and other convenience items. Ownership of such items is more prevalent in urban areas with rising incomes. According to Conner (1994, p.160), such ownership patterns are "indicative of the high value placed on 'convenience' (household time-saving) by high-income consumers."

The food industry itself has contributed to the shift in diets towards increased consumption of processed foods. Increased refinement of foods, and continual

[8] Average births a women would have during her reproductive life if she was exposed to the fertility rates characteristic of various childbearing age groups experienced during that year (Statistics New Zealand 1997, p.114).

developments in food processing technology has produced a greater variety of convenient processed foods designed to reduce preparation time in the home. The development of food stabilisers, emulsifiers and additives allow processed foods to be stored for longer periods of time without degradation, before being consumed, as well as reducing the preparation time involved compared to preparing the same meal conventionally. By incorporating acids and salts into processed foods, producers are able enhance flavours and produce foods which are more palatable. New processing technology such as extrusion cooking allows for faster processing times, lower processing cost, and greater flexibility to produce more types of end products (Gray and Chinnaswamy 1995). The ultra-pasteurisation (UHT) of milk allows products like long-life milk to be stored for long periods of time without refrigeration. In addition, home appliances such as the microwave oven enables processed foods to be prepared in the home with less preparation time required than conventional cooking methods.

3.4 Convergence of World Consumption Patterns

With increasing tourism, international migration, telecommunications and international trade, an important aspect of changing consumption patterns is to what extent global consumption patterns will converge. In describing general trends in the consumption of animal and crop products in OECD countries, Herrmann and Roder (1995, p.403) found that OECD consumption patterns of these two products were "...more or less homogeneous when comparing countries," and "the fact that almost no contradictory trends could be identified supports the convergence hypothesis."

Of the various factors exerting an influence on food consumption patterns, price and income variables have become less satisfactory as explanatory variables for changes in food demand. It is health consciousness and socio-demographic variables that have gained in importance as explanations for changing consumption trends (Senauer *et al* 1993). However, because changes in food consumption may be affected by prices, income, preferences and other factors, it is necessary to control for income, prices and other explanatory variables in order to associate convergence or divergence with long run changes in preferences or with habit formation (Pollack 1970 cited in Herrmann and Roder 1995, p.404). This is because "statistical indicators might reveal convergence

simply due to convergence of income across countries" (Herrmann and Roder 1995, p.404).

In analysing changes in food consumption patterns Blandford (1984) found that despite existing differences in dietary patterns among OECD countries there was an increasing similarity in the structure of diets between these countries. Herrmann and Roder[9] (1995) also found strong evidence that relative differences in per capita calorie, protein and fat demand, and absolute differences in per capita calorie demand declined when aggregated across all food products. When they disaggregated the food products into individual food items, the evidence of convergence was less clear although they found more foods exhibiting convergence than divergence.

In an examination of the convergence of consumption patterns between Northern America and Western Europe, Conner (1991 cited in Traill 1997, p.392) found that for a range of processed foods, European consumption patterns correlated strongly with American consumption five and ten years earlier, but not with consumption patterns during the same time period. Thus, historical food consumption trends in Northern America could be used as good predictors of current and future trends in Western Europe (Connor 1994, p.169). Conner (1994, p.156) found that "there is evidence that Northern America has been in many ways a precursor of changing European food expenditure patterns, in the sense that many American patterns have subsequently been observed in Western Europe." Conner (1994, p.156) goes on to mention that although European and American food consumption and expenditure patterns have been, and still are quite different, "the underlying forces for change appear to be quite similar and inexorable" and "if present trends continue, a certain homogenisation of food-expenditure patterns seems all but inevitable."

As consumption patterns become more homogeneous trade in ingredients used to manufacture processed foods such as pizza toppings or meat patties, may become more prevalent. This would allow firms to supply food components on a regional or global basis, or foreign products may be supplied by domestic firms under contract or license, a trend that is already occurring. Furthermore, as companies expand and set up

[9] Herrmann and Roder's research focused on the demand for the food nutrients, calories, protein and fat. Food nutrient demand was split into two groups; nutrients from crop products and nutrients originating from animal products.

operations in foreign markets there is the potential for increased competitiveness and performance in the foreign market. The reason being is that when a company sets up in a foreign country they carry with them the production processes and productivity levels of their home country. As a consequence competing domestic firms upgrade their performance and may imitate superior methods observed from the foreign firm. For consumers convergence has the potential to increase the variety of processed foods as producers continually try and differentiate their products from competitors with new flavours or better nutritional value.

However, Traill (1997, pp.392-393) cites two reasons that food consumption patterns should not be expected to completely converge among countries. Firstly, culture is an important influence on behaviour. Cultural diversity has proved resistant to pressures from foreign travel, global media and telecommunications. Secondly, individuals differ both within and between countries. Personality is another determinant of food consumption. In their study, Herrmann and Roder (1995) found that differences in preferences were more important as a determinant of consumption levels than differences in income and the availability of food. A point worth remembering is that the globalisation of consumers' eating behaviour does not imply a narrowing of consumer tastes, but rather a broadening of the range of preferences and an increased diversity in consumption patterns within individual countries (Senauer *et al* 1993, p.64).

Chapter Four
Indicators of Export Competitiveness

4.0 Introduction

In examining competitiveness, one of the problems facing researchers is that there is no agreement amongst economists on how to define and measure it. Problems arise as any definition of competitiveness is dependent on the unit of observation (nations, sectors, or individual firms), and the objective of the analysis being under taken (policy prescription, sector productivity growth, export performance) (Silva 2000, p.3). For example, while the objective of an individual firm may be to increase market share or maximise profits (or both) the objective of a country is more likely to be in terms of improving living standards or stimulating investment and productivity. In trying to measure competitiveness, there are many factors which influence a firm or nations competitiveness. These include productivity, technological innovation, investment and the government policy environment in which they operate. Thus the composition of competitiveness indicators is dependent on what aspect of competition is being studied (Durand, Simon and Webb 1992).

In analysing export competitiveness, this study uses the definition of competitiveness as being *'the ability of a country or region to maintain or increase its market share and comparative advantage.'* Henceforth, this chapter looks at the application of three different market share based techniques which can be employed to analyse a country's relative export competitiveness. First a brief summary on why market shares are commonly-used indicators of export performance is provided. This is followed by discussions on the Trade Share Accounting method, the usefulness and limitations of the Constant Market Share analysis and an examination of the commonly used Revealed Comparative Advantage concept.

4.1 Market Shares

Firms have traditionally established a direct link between the trend in their market shares and their relative (export) competitiveness (Hatzichronoglou 1996, p.25). However changes in market shares are not entirely determined by changes in export

competitiveness as market shares are influenced by prices, non-price factors (e.g. product quality, delivery and service schedules), changes in world demand and constraints on domestic supply. But in the absence of analysing both price and non-price determinants of export performance, one can expropriate changes in a country's export shares as ex-post reflections of changes in export performance. Market shares are a commonly-used method of determining a country's or firm's relative export performance in international markets as they provide an accepted measure of changes in a country's or firms export performance vis-à-vis competing exporters in the world market

The underlying assumption of market share analysis "is that in the absence of changes in competitiveness, a market share should remain constant" (Bowen and Pelzman 1980, p.III-5). A decline in market share is usually associated with displaced sales from competing suppliers and a deteriorating export performance in individual markets and for this reason is of concern to policy makers. But this need not be the case as changes in market shares are also influenced by differences in growth among countries (Gehlhar and Vollrath 1997). A decline in market share may simply indicate that individual markets are becoming relatively larger and that the country is becoming smaller relative to world trade, rather than implying a deterioration in a country's competitiveness (Bowen and Pelzman 1980, p.III-5).

Since world trade is composed of various country-commodity markets import levels in individual markets change relative to each other as differential growth occurs over time, thereby changing the structure of world trade Gehlhar and Vollrath (1997). An important point noted by Bowen and Pelzman (1980, p.III-5) is that because changes in a country's market share is likely to reflect changes in the structure of export markets the evaluation of export performance requires an understanding of the trade structure of the market in question.

4.2 Trade-Share Accounting

In analysing the US export performance in agricultural markets Gehlhar and Vollrath (1997) developed and implemented an accounting framework called Trade-Share Accounting (TSA). Gehlhar and Vollrath's TSA method expressed the change in

the aggregate market share as the net effect of changes in individual markets. This provided a means for understanding the relationship between structure and performance in individual markets and allowed Gehlhar and Vollrath to quantify the effects of individual markets on the aggregate market share.

Gehlhar and Vollrath noted that individual market share changes affected the aggregate market share. However when the US agriculture market share was calculated as the US to World ratio of total agricultural trade it was difficult to account for how individual commodity markets affected the aggregate market share. Gehlhar and Vollrath also noted that a simple accounting relationship exists between the aggregate market share and the elements making up that share, and that these elements consist of market specific trade shares. In order to preserve the accounting relationship between individual trade shares and the aggregate market share, Gehlhar and Vollrath calculated the aggregate market share from the country-commodity level. This provided them with the means to measure the effect that individual markets have on a country's overall market share. Thus they were enable them to pin point key individual markets and precisely quantify their effects on the country's aggregate market share in any given time interval.

The individual market share is calculated as follows:

$$M_{it} = \frac{V_{it}}{VCP_{it} + V_{it}} \tag{4.1}$$

Where M_{it} is an exporting country's share of import market i in time period t
V_{it} is the value of a country's exports market i in time period t
VCP_{it} is the value of competitors exports to market i in time t

A country's individual market share is linked to its aggregate market share by using what Gehlhar and Vollrath termed, structural shares. A country's structural share, S_{it}, is the relative size of individual markets in the world total and is expression by the following equation:

$$S_{it} = \frac{V_{it} + VCP_{it}}{\sum_{i \in IMKT} V_{it} + \sum_{i \in IMKT} VCP_{it}} \tag{4.2}$$

The TSA method requires that the set of individual markets, *IMKT*, contains all markets, such that $\sum_{i \in IMKT} S_{it} = 1$ (4.3)

A country's aggregate market share, M_t, can then be calculated as a size-weighted average, represented by:

$$M_t = \sum_{i \in IMKT} M_{it} S_{it} \quad (4.4)$$

Gehlhar and Vollrath decomposed the aggregate market share into two effects; effects due to structural changes on market shares, and the effects of individual market shares on the aggregate market share, known as the performance effect. In order to determine the structural effect, SE_t, and performance effect, PE_t, two hypothetical market shares were calculated, a fixed-performance market share, MFP_t, and an aggregate base-period share, MB_t. In both hypothetical market shares a country retains constant individual market shares over all time periods. Also they are both calculated at a single period t_b, as Gehlhar and Vollrath state that changes in structure and performance are relative to a base period.

The Fixed-Performance share is calculated as:

$$MFP_t = \sum_{i \in IMKT} M_{it_b} S_{it} \quad (4.5)$$

The Base-Period Share is represented by the following equation:

$$MB_t = \sum_{i \in IMKT} M_{it_b} S_{it_b} \quad (4.6)$$

The fixed-performance market share indicates what a country's aggregate market share would have been had that country maintained their base-period shares in every individual market. If the fixed performance share deviates from the base-period share, then Gehlhar and Vollrath determined this change to be entirely due to changes in market structure, whereas if the fixed performance share differs from the observed share, then the difference is due to changes in performance. These relationships are illustrated by the following equations:

$$SE_t = MFP_t - MB_t \quad (4.7)$$

$$PE_t = M_t - MFP_t \tag{4.8}$$

The actual change in a country's aggregate market share, or total effect, TE_t, is simply the sum of the structural and performance effects:

$$TE_t = SE_t + PE_t \tag{4.9}$$

One of the limitations of the TSA method is that although the effect of individual markets and commodities on the aggregate market share can be quantified, it does not provide any explanation as to the nature of the market or commodity. For example if an individual market or commodity displayed greater or inferior growth relative to world growth, then this will influence the performance of a commodity or market.

4.3 Constant Market Share Analysis

The Constant Market Share (CMS) model is a commonly accepted procedure for accounting for the sources of a country's export growth and competitiveness. The CMS model was developed by Tyszynski (1951) in an investigation of changes in the export market shares for manufactured commodities between countries over the period 1899-1950. Noting that a country's share of world trade in a good could decline for one or a combination of factors, and that these factors could be isolated, Tyszynski computed hypothetical market shares, which represented what a focus country's share of a commodity traded would be if its initial market share remained constant. Any difference between the hypothetical share and the actual market share was a change in market share due to structural changes in the world. Any residual that remained after this effect was deducted was assumed to be as a result of changes in competitiveness.

Leamer and Stern (1970 cited in Walton 1993) revised Tyszynski's 1951 CMS model by identifying Tyszynski's structural effect as a commodity composition effect. Leamer and Stern made the additional observation that exports are differentiable by both destination and type of commodity. Taking this into account they calculated a market distribution effect thereby making allowances for differences in the growth rates of export markets. Any change in competitiveness was then captured by any remaining residual after removing the commodity composition and market distribution effects.

Thus the CMS model decomposes actual growth of a country's exports into four components: world trade, commodity composition, market distribution and (residual) competitiveness.

The CMS model allows the following questions to be answered (Bowen and Pelzman 1984, p.470):

1. What would a country's processed food exports been had they expanded at the same rate as world trade?
2. What is the influence of the commodity composition of processed food exports on a country's export performance?
3. What is the effect of the choice of end markets on a country's export performance?
4. What portion of export growth is not explained by these other factors?

The CMS identity for accounting for the changes in a country's total exports of commodity *i* can be written as:

$$\left(X^1 - X^0\right) \equiv \Sigma_i\left(rX_i^0\right) + \Sigma_i\left(r_i - r\right)X_i^0 + \Sigma_i\Sigma_j\left(r_{ij} - r_i\right)X_{ij}^0 + \Sigma_i\Sigma_j\left(X_{ij}^1 - X_{ij}^0 - \left(r_{ij}X_{ij}^0\right)\right) \quad (4.10)$$

Where 0 and 1 are the initial and final years of the study period;

X is the value of a country's total exports

X_i is the value of a country's exports of commodity *i* to the world

X_{ij} is the value of a country's exports of commodity *i* to market *j*

r is the world growth of exports over the study period

r_i is the world growth of commodity *i* exports over the study period

r_{ij} is the growth in world exports of commodity *i* to market *j* for the study period.

The left-hand side of equation (4.10) is the actual change in the value of a country's total exports between the initial and final years. Note that X can refer to a country's total exports, or to an aggregation of certain commodity exports such as processed foods.

The first term on the right hand side of equation (4.10) is the world trade component and indicates growth in exports due to the general expansion of world trade. This component measures what a country's exports would have been had they grown at the same rate as total world exports, or in other words, what a country's exports would have been had they maintained their existing market share of world trade. The second term (the commodity composition effect) measures whether the composition of a country's exports was skewed towards, or concentrated on those commodities whose growth rate either exceeded or fell short of the world growth rate for total exports (i.e. whether a commodity experienced faster or slower growth than the world average growth for total exports, $\left(r_i \lesseqgtr r\right)$. The third term (the market distribution effect) measures whether a country focused on exporting commodities to destinations which exhibited demand-growth faster or slower than world demand-growth for those commodities, $\left(r_{ij} \lesseqgtr r_i\right)$. The fourth term (the competitiveness residual) measures the difference between the actual increase in a country's total exports and the increase that would have occurred had that country maintained it's export share in each market with respect to each commodity and is usually equated with a change in competitiveness. An increase (decrease) in competitiveness is indicated by a positive (negative) residual value. A positive residual makes a beneficial contribution towards maintaining or expanding a country's market share while the opposite is true for a negative residual.

Although the CMS model allows the researcher to identify different factors responsible for stimulating or retarding export growth over a period of time it must be recognised that the model has several limitations. Richardson (1971a and b) criticised both the application and the theoretical foundations of this model. Richardson (1971b, p.300) suggested that the simplicity and popularity of CMS analysis had "obscured some critical problems of theoretical foundation, interpretation and application." The model is represented by an identity and therefore it has no power to explain the observed value of the four CMS components which constitute growth. Also the CMS model has no stochastic basis and consequently it cannot be used for econometric projection of probable changes in future market shares. Richardson (1971b) found that

alternative choices of a 'world,' or standard area caused the CMS effect results to vary. Richardson (1971b) proposed that the appropriate 'world' should include only 'true'[10] competitors to the country in question, and that it should possibly vary from focus country to focus country, and perhaps even from market to market for a given focus country. Richardson (1971b) also found that altering the commodity classification level (or the degree of aggregation) led to substantial variations in the value of CMS effects. Smith (1993, p.11) asserts that only short time periods should be used to minimise the effects of structural change during the study period.

Criticism is directed at the CMS analysis because of the use of value data as opposed to quantity data. This may cause distortions in all effects by which export growth is explained due to the addition of a price bias (Richardson 1971a). A positive commodity composition effect is typically associated with export concentration on goods experiencing rapid growth, but may alternatively be the result of a faster increase in the relative price of those commodities due to inflation. This might also apply to the competitiveness residual. However, a lack of reliable volume data means that most CMS analyses use value data.

A further criticism is based on the interpretation of the competitiveness residual. As explained above, a positive (negative) residual implies that the focus country's exports are more (less) competitive than its rival exporters. However, non-price variables may significantly influence the competitiveness value. The value of the residual may also be influenced by discriminatory protection policies directed against other exporters, which add a further distortion to the competitive residual. One example would be the NAFTA agreement between the United States, Canada and Mexico, which encourages trade between the three countries, while discriminating against non-member 'third countries.' The competitiveness residual would therefore be over-valued for NAFTA countries. However, the opposite would be the case for the EU's exports to NAFTA. Also the model cannot identify non-price factors such as consumer loyalty, exchange rate policy, trade policy, marketing strategies or the appearance of new products and varieties of products in the market.

[10] For example, if three countries, x, y and z exported processed foods, and country's x and y exported only processed meat products, and country z exported only processed fish products, then x and y would be considered 'true' competitors, and not country z as country x and y are competing in the same market.

Despite the shortcomings of the CMS model it is a useful method for identifying factors responsible for enhancing or retarding the export performance of a country.

4.4 Revealed Comparative Advantage Indices

The direction and composition of international trade is generally explained through the application of David Ricardo's theory of comparative advantage. Ricardo claimed that trade enables a country to specialise in producing the goods which they produce best, and that through specialisation, world production and consumption possibilities increase. Case and Fair 1996, p.483 explicitly state that "comparative advantage is the advantage in the production of a product enjoyed by one country over another when that product can be produced at a lower cost in terms of other goods than it could be in the other country."

In analysing the production of agricultural products, often it is the traditional role of abundant fertile land, climate and favourable farm structure that are emphasised (Henderson *et al*, 1996, p.43). However, if this traditional view of agricultural production and comparative advantage was applied to the processed food sector, then many of the differentiating features between raw agricultural commodities and processed foods would be overlooked. Processed foods differ from raw agricultural products in that technology, highly differentiated value-added foods branded and made convenient for consumers and the market structure of many of the industries add dimensions that are not captured by focusing solely on a nation's natural endowments (Henderson *et al* 1996, p.44). However, it should not be forgotten that productive land is fundamental to the processed food industry, as agricultural commodities are major inputs into processed food products.

In addition for the need to make a distinction between raw agricultural commodities and processed foods in terms of comparative advantage, Hillman (1980) points out that finding an empirically relevant measure of comparative advantage is a fundamental difficulty. This is because "...comparative advantage is usually specified with respect to *pre-trade* relative prices, [whereas] empirical researchers in international economics confront trade data generated by trade flows in *post-trade* equilibria" (Hillman 1980, p.315) as is the case in this research. Changes in comparative advantage

are linked to economic development, restructuring as resources and economic inputs are redirected to more productive commodities, capital accumulation and growth of the skilled labour force (United Nations Industrial Development Organization 1982).

In examining the reallocation of resources following the freeing of trade barriers Balassa (1965) introduced the concept of 'revealed' comparative advantage (RCA) for the purpose of indicating the possible consequences of trade liberalisation. Balassa (1965, p.103) suggested that "...revealed comparative advantage can be indicated by the trade performance of individual countries in regard to manufacturing products, in the sense that the commodity pattern of trade reflects costs as well as differences in non-price factors." Balassa proposed two measures of revealed comparative advantage. One was based on export-import ratios, which Balassa (p.103) said "...would reflect relative advantage," while the other measure recognised export performance through the use of relative export shares. With respect to export performance, Balassa (p.103) pointed out that "...comparative advantage would be expected to determine the structure of exports." In addition, Balassa noted that the export performance of individual industries in a particular country can be evaluated by:

(a) comparing the relative shares of a country in the world exports of individual commodities, and
(b) indicating changes in relative shares over time (Balassa 1965, p.105).

However, the use of export-import ratios as a measure of comparative advantage has been the subject of considerable criticism. Much of the criticism stems from the fact that import levels are greatly influenced by the degree of protection through tariffs and other trade distorting policies used by an importing country. Though it should be noted that Balassa himself criticised the export-import measure of comparative advantage, noting that "imports will be affected by intercountry differences in tastes, as well as by interindustry disparities in the degree of protection" (Balassa 1965, p.103). For this reason, in two later studies Balassa (1977 and 1979) solely used his export share measure to determine RCA indices.

In assessing the appropriate measurement technique of comparative advantage Webster (1990) found that comparative advantage indices based upon net exports did

not behave significantly different from indices based on either export-cum-production measure or net trade measure. Because of this, Webster (1990, p.307) suggests that there are grounds for supporting the hypothesis that trade barriers are unlikely to significantly jeopardise the ability of such indices to 'reveal comparative advantage'. However, Webster did find that export share based measures of RCA were more vulnerable to the influence of barriers to trade.

Marchese and De Simone (1988, p.158) point out that "the export performance measure of RCA is also affected by trade policy measures like export subsidization or other arrangements discriminating among suppliers." These factors also affect the CMS model. Government intervention policies aimed at assisting domestic producers (which may be done through export subsidies, decoupling payments, commodity support programs or through quantitative import restrictions), play a significant role in influencing world agriculture trade. Also, as a country develops and its agricultural comparative advantage becomes weaker, historical evidence reveals that the nominal rate of protection rises as governments provide increased levels of protective support towards the agricultural sector (Tyers and Anderson 1992, p.76).

Since the publication of Balassa's original article in 1965, a point of conjecture has arisen about the appropriate interpretation of RCA indices. A number of alternative indices have since been put forward.[11] Hillman (1980) in considering the relation between the export share measures of RCA, and comparative advantage as indicted by pre-trade relative prices proved diagrammatically that the export share (performance) measure of RCA was not appropriate for cross-commodity comparisons of comparative advantage. This is because the index values "...are independent of comparative advantage as indicated by pre-trade relative prices" (Hillman 1980, p.317). For cross-country comparisons, Hillman (1980) showed that assuming identical homothetic preferences between countries, comparative advantage as revealed by pre-trade relative prices was subject to one condition.[12] In critiquing Hillman's condition, Marchese and

[11] Vollrath (1991) compares the theoretical under-pinnings of ten alternative revealed comparative advantage indices.

[12] Hillman's condition; $1-\frac{X_{ij}}{W_j} > \frac{X_{ij}}{T_i}\left(1-\frac{T_i}{Z}\right)$ Where: X_{ij} is country i's exports of good j

W_j is total world trade in good j
T_i is country i's total trade
Z is total world trade

De Simone (1989, p.159) found that Hillmans condition failed to hold for only 9.5 percent of commodities exported by 118 developing countries in 1985. This lead Marchese and De Simone (p.165) to conclude that when used for cross-country comparisons, Balassa's export performance index is a good indicator of comparative advantage as indicated by pre-trade prices.

Yeats (1985, p.62) argued that "the major difficulties associated with the use of the RCA index for economic analysis stems from the fact that little or no evidence has been complied concerning the distribution of country index values within different industries." Yeats concluded that the index used in the traditional manner fails to serve as either a reliable cardinal or ordinal measure of a country's RCA, for country-industry comparisons.

In studying the theoretical interpretation of trade intensity indices and RCA, Bowen (1983, p.465) proved that the theoretical basis for the common interpretation of the RCA index "...rests on the implicit assumption that a country exports every commodity," and that "such an assumption is, in general, inappropriate in a trading environment." Bowen (p.465) showed that "under economically reasonable assumptions values of a trade intensity index above (below) unity cannot be used to infer a country's relative advantage (disadvantage) in any given commodity." In response to this, Bowen developed two alternative indices for revealing comparative advantage. These have been subsequently criticised by Ballance, Forstner and Murray (1985, 1986 and 1987) and Vollrath (1991). Pitts and Lagnevik (1997) point out that while RCA indices compare the comparative advantage between a country's industries, it does not reveal anything about the competitiveness of the country in question.

Despite the various conjectures on the appropriate interpretation of RCA indices, the empirical and theoretical literature appears to agree that a country reveals a comparative advantage (disadvantage) in a commodity if an index value is greater (less) than unity. A particular attraction to the use of the approach is that such an index can be easily quantified in the form of an index that is used in various types of inter-country and inter-industry comparisons and that the indices are not dependant on any theory regarding inter-industry trade, factor endowments or the existence or otherwise of free trade or perfect competition (Pitts and Lagnevik 1997).

The RCA index of export performance defined in equation (4.11) below is the most common and widely-used measure of RCA found in the literature.

$$RCA = \left(\frac{\frac{X^k_{iw}}{X^t_{iw}}}{\frac{X^k_{ww}}{X^t_{ww}}} \right) \tag{4.11}$$

where; X^k_{iw} is country $i's$ exports of commodity k to the world

X^t_{iw} is country $i's$ total exports to the world

X^k_{ww} is world exports of commodity k

X^t_{ww} is total world exports

The RCA index takes the values between zero and infinity. A RCA index value greater than unity for commodity k is interpreted as indicating that country i has a comparative advantage in the trade of commodity k. This occurs when a commodity $k's$ share in a country $i's$ total exports exceeds commodity $k's$ share in total world exports. By the same reasoning, a RCA index value less than unity is taken to indicate that the country has a revealed comparative disadvantage in the trade of the commodity. The higher the value of the RCA index, the greater the country's comparative advantage in the commodity concerned.

Chapter Five
Method and Materials

5.0 Introduction

This chapter presents the methodology used to determine the export performance of the six processed food exporters studied. The selection of the exporting countries/regions and export destinations is discussed, along with a discussion on the data used in this study.

5.1 Selection of Export and Import Countries and Regions

5.1.1 Export Countries and Regions

The export countries and regions selected for this study are considered to be either major competitors or potential competitors to New Zealand's processed food exports. The countries/regions selected are:

ASEAN, Australia, Chile, European Union, NAFTA, New Zealand,
(See Appendix B for complete disaggregated list of export regions.)

Australia, the EU and NAFTA are considered to be 'traditional' competitors to New Zealand in world meat and dairy trade; two of New Zealand's most important processed food exports (see Appendix J, Figure J1). The inclusion of ASEAN as a competitor in world processed food trade is due to ASEAN's rising share of world processed food exports (see Figure 2.4). This rising growth in the processed food exports from ASEAN could have important implications not only for New Zealand but also for world processed food trade. Also there is a growing share of both fish and meat exports (though the share of meat is small) in ASEAN's total processed food exports (see Appendix E, Figure E1). Both commodities being important processed food exports for New Zealand (see Appendix J, Figure J1). Although Chile is only a very minor exporter of processed food commodities in the world market, Chile is included due to its major market orientated reforms of the past two decades having achieved remarkable success (Athukorala and Sen 1998). Athukorala and Sen also found that a major factor in the

success of Chile's economic growth has been export expansion, led by processed food exports.

One issue that arises with the inclusion of the ASEAN, the EU and NAFTA regions is whether intra-regional trade should be included or excluded from the study. One argument for excluding intra-regional trade from the study is that because of preferential treatment given to region members in the form of lower tariff barriers, or complete exemption to tariffs, then intra-regional trade is not part of the world market (Gehlhar and Vollrath 1997). However, as a consequence of the preferential treatment given to member countries of regional trading blocs, whilst discriminating against non-member 'third' countries such as New Zealand who are required to pay tariff duties on all exports, demand for New Zealand's processed food exports is likely to be reduced due to higher price differentials against domestically produced goods. The expansion of regional trading blocs will also be an important determinant in the success of New Zealand's processed food exports. It is possible that New Zealand's processed food exports will be displaced by new-member country's exports which are tariff exempt or traded at a lower tariff rate. For the latter two reasons, intra-regional trade is included in this study.

5.1.2 Export Destinations

In addition to the inclusion of the six exporters as export destinations, the Asian nations of China, Japan Singapore, and NIE countries are included, with the ROW aggregate included as a residual to account for 100 percent of a country's processed food exports. The complete list of export destinations chosen for this study is:

> ASEAN, Australia, Chile, China, the EU, Japan, NAFTA, NIE, New Zealand, ROW, and Singapore (See Appendix B for a complete disaggregated list of export markets.)

Japan and the NIE countries are included as export destinations due to their rising share of world processed food imports (see Figure 2.5). With already high-incomes in Japan and rising incomes in the fast growing countries of the NIE one would expect an increase in processed food demand from both countries/regions. China is

included due to its large population, rising incomes, and the opening up of its borders to international trade which presents processed food exporters with a potentially large and lucrative market. The inclusion of Singapore as an export destination is to avoid a country's processed food exports to Singapore being incorporated into the overall results twice. This is because Singapore is included in both the ASEAN and NIE region aggregates (taken from the NAPES database) and thus processed food exports to Singapore are included twice. Therefore, a CMS (see section 5.3) is calculated for Singapore, and is deducted from the summation of all other export destinations. Therefore the sum of the four CMS components is equal to the actual change in a country's total processed food exports.

5.2 The Data

All the data was derived from the NAPES database held at ANU. The trade data acquired is based on the trade data collected and maintained by the United Nations Statistical Office (UNSO), but is enhanced by incorporating estimates to improve the quality and consistency of the data by the International Economic Databank (IEDB) at ANU. The data is classified by the SITC Revision 1, up to the three-digit level.[13]

Annual data was obtained covering the 20-year period, 1976-1996. The data is reported in thousands of current US dollars ($000), and recorded free-on-board (fob) which is the value of goods at a country's port before export. Because imports are recorded inclusive of customs, insurance and freight (cif) and due to the differences in the timing and reporting of exports and imports, a country's exports are not always equal to the value of a partner country's imports. Therefore, to avoid discrepancies in the data, the value of a focus country's exports to a partner country/region are also taken to be the value of the partner country/regions imports from the focus country.

The commodities included in the processed food aggregate used in this study are those defined in the Commodity Aggregate Composition for processed foods, as stated

[13] SITC Revision 1 was derived in the early 1960s. Since this time there have been two subsequent revisions to the SITC in the 1970s and 1980s which are more detailed. It is not possible to convert from Revision1 to the later versions. Also, many developing countries have not adopted the new classifications. In order to maintain a time series back to 1965 and coverage of the developing countries all data is kept in the SITC Revision 1. (Note taken from NAPES Database.)

in the NAPES database (refer to Appendix A for a complete list of the SITC classifications used in the aggregate). The processed food commodity aggregate which comprises 24 commodities was summed to the following 11 sub-aggregates:

Meat	Sugar and Honey
Dairy	Beverages
Fish	Coffee and Cocoa
Cereals	Animal Oils and Fats (Ani Oils & Fats)
Fruit and Vegetables (Fruit & Vege)	Vegetable Oils and Fats (Vege Oils & Fats)

Processed Animal and Vegetable Oil (Pro Ani/Vege Oil)

To avoid small discrepancies in the value of the data the total value of a country's processed food exports is the summation of the eleven sub-commodity aggregates.

One of shortcomings of the data is that it is only disaggregated to the 3-digit level, as opposed to the more disaggregated 5-digit level. The result of this is that the processed food aggregate is not able to distinguish between processed food products which require a high amount of processing, such as chocolate and commodities which have received only a small or lowly amount of processing such as butter and frozen carcass meat. Additionally, the data does not distinguish between commodities on which varying degrees of processing are carried out to produce differentiated products, such as 'bulk' cheddar cheese, which requires a relatively small amount of processing in comparison to high-value specialty cheese products which require a greater level of processing.

5.3 The Method

To determine the performance of a country's processed food exports over the 1976-1996 period a CMS model is applied to the data. RCA indices are also used to evaluate a country's performance. The advantage of the CMS method over the TSA method is that it indicates four sources of growth in a country's export performance. This helps to indicate whether a change in a country's market share was due to being reliant on the expansion of world trade as a source of growth, whether or not they exported 'growth' commodities, if commodities were exported to high or low demand

growth areas of the world, or whether a change in competitiveness was responsible for enhancing or retarding export growth. In comparison, the TSA method simply identifies how each commodity and market influenced a country's overall market share but fails to indicate whether a change in market share was due to changes in export composition or demand factors of importing destinations.

The use of RCA indices support the CMS results as the RCA indices assert whether a country is exporting processed food products in which they hold a comparative advantage or disadvantage. Also, the use of an export performance RCA index will help to elucidate the degree of advantage exhibited by study nations with respect to processed food exports. RCA indices also provide an explanation as to whether changes in export composition are related to changes in comparative advantage in those exports, and if a change in export composition and market share is consistent with changes in a country's comparative advantage.

For the CMS analysis the twenty year study period is divided into two ten year periods, 1976-86 and 1986-96. Each ten year period is then divided into five two-year sub-periods (for a total of ten two-year sub-periods covering the 1976-96 study period). The use of two-year sub-periods minimises the effect of structural changes and allows changes in the growth performance of a country's processed food exports to be identified. The RCA analysis is applied to the entire twenty year study period for each of the six processed food exporters' total processed food exports. For the individual commodities, the RCA analysis is applied to five year, 1976, 1981, 1986, 1991 and 1996 and is used as an approximation of the general trend in comparative advantage achieved by each exporter in each commodity.

The CMS model applied to the data is equation (5.1) which is defined by:

$$\left(X^1 - X^0\right) \equiv \Sigma_i\left(rX_i^0\right) + \Sigma_i\left(r_i - r\right)X_i^0 + \Sigma_i\Sigma_j\left(r_{ij} - r_i\right)X_{ij}^0 + \Sigma_i\Sigma_j\left(X_{ij}^1 - X_{ij}^0 - \left(r_{ij}X_{ij}^0\right)\right) \tag{5.1}$$

Where 0 and 1 are the initial and final years of the study period;

X is the value of a country's total processed food exports

X_i is the value of a country's exports of commodity i to the world

X_{ij} is the value of a country's exports of commodity i to market j

r is the world growth of processed food exports over the study period

r_i is the world growth of commodity i exports over the study period

r_{ij} is the growth in world exports of commodity i to market j for the study period.

Equation 5.2 is used to calculate the RCA indices used in this study.

$$RCA = \left(\frac{\frac{X^k_{iw}}{X^t_{iw}}}{\frac{X^k_{ww}}{X^t_{ww}}} \right) \tag{5.2}$$

where; X^k_{iw} is country $i's$ exports of processed food commodity k to the world

X^t_{iw} is country $i's$ total exports to the world

X^k_{ww} is world exports of processed food commodity k

X^t_{ww} is total world exports

However, it should be remembered that the results of the CMS and RCA analysis need to be carefully interpreted having regards for the limitations of the respective models being used (as outlined in chapter four) and the limitations of the data.

Chapter Six

Comparative Export Performance: Empirical Results

6.0 Introduction

In this chapter the main findings from the CMS analysis and RCA indices for each of the six processed food exporters studied are presented. Firstly the CMS results are presented along with the associated commentary for each of the study exporters. The RCA results are presented and discussed in section 6.7. The results from this research are presented in both tables[14] and figures. Frequent reference is made to Appendices C-J.[15]

6.1 ASEAN

6.1.1 World Trade Effect

The world trade effect results for ASEAN shown in Table 6.1 indicate that the growth of ASEAN's processed food exports exceeded the growth that would have occurred, had ASEAN grown at the world growth rate for total processed foods. This result was accomplished in both the 1976-86 and 1986-96 periods. The two-year sub-period results in Table 6.1 indicate that on only three occasions ASEAN failed to either match or better the growth in processed food exports that would have occurred at the world growth rate for processed foods.

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[14] By convention the results presented in tables 6.1, 6.3-6.7 are calculated as percentages of the actual change in export value (i.e., world trade effect results divided by the actual change in export value). A positive world trade effect result below (above) 100 indicates a country's ability to grow faster (slower) than the world growth rate. The opposite applies for a negative world trade effect result. For the three other components in the CMS model the interpretation of a negative and positive result, as discussed in Chapter four, still applies.

[15] Appendix C lists the respective commodities frequency of achieving export growth above the world average growth. Appendix D details the respective export destinations frequency of recording demand-growth above the world demand-growth per commodity. Appendices E-J illustrate each of the six processed food exporters commodity share and export destination share of their total world processed food trade, along with the raw CMS results for each period.

Table 6.1 Constant Market Share Results for ASEAN's Processed Food Exports

Period	World Trade Effect	Commodity Composition Effect	Market Distribution Effect	Competitiveness Residual
1976-86	63.76	-14.66	7.79	43.11
1986-96	63.08	-1.21	13.76	24.37
1976-78	90.50	-3.00	-6.83	19.33
1978-80	72.31	-2.52	-0.58	30.79
1980-82	-338.69	-140.85	123.14	256.41
1982-84	9.42	71.95	7.95	10.67
1984-86	237.53	-304.58	-44.78	11.82
1986-88	58.34	-10.26	31.15	20.77
1988-90	111.58	-25.71	-15.66	29.79
1990-92	55.08	-8.70	7.69	45.93
1992-94	43.33	28.87	24.90	2.91
1994-96	276.81	-49.62	2.37	-129.56

Three results of special interest are for the three sub-periods covering the period 1980-86. What makes these significant is that both the 1980-82 and 1982-84 periods are associated with the world recession and a decline in the value of world processed food trade. Although the value of ASEAN's processed food exports also declined between 1980-82, the actual decline experienced by ASEAN was only –$250,206 compared to a decline of –$847,434 that would have occurred had ASEAN declined at the world rate (Appendix E, Table E1). Furthermore, only three of the eleven commodities actually experienced a decline in value. By 1982-84 the decline experienced during the 1982-84 sub-period had been reversed as ASEAN's trade in processed foods began to expand. This expansion was significantly higher than what would have occurred had ASEAN only grown at the world rate. There was an actual increase of $1,848,642 compared to a world trade effect result of $174,133 (Appendix E, Figure E1). Most of the expansion can be attributed to ASEAN's main processed food commodity, vegetable oils and fats (Appendix E, Figure E1) which grew by $1,510,860 compared to a world trade effect result of just $60,551 (Appendix E, Table E1). Despite world trade in processed foods growing by 16.42 percent over the 1984-86 sub-period ASEAN's processed food exports experienced a contraction of $546,455. This was mainly due to a large decline in ASEAN's processed vegetable oils and fats exports.

Table 6.1 shows that between 1990 and 1994 ASEAN experienced rapid growth in her processed food exports followed by a decline in growth as ASEAN fail to exceed the world growth rate for the 1994-96 sub-period. This slow down in growth can probably be attributed to the Asian crisis which was beginning to severely affect export trade from the Asian region. It is well documented that the Asian regions exports were generally slowing down during this time.

6.1.2 Commodity Composition Effect

The commodity composition results shown in Table 6.1 suggest that over the study period, processed food exports from ASEAN countries were concentrated on commodities that experienced growth below the world average growth rate for total processed foods. Furthermore, the commodity composition result was the single source of negative growth during both the 1976-86 and 1986-96 periods. Not only was the commodity composition result the single source of negative growth for the 1976-86 period, but was a major factor retarding the growth of ASEAN's processed food trade. Although the small size of the commodity composition value for the 1986-96 period suggests that over this period the commodity composition component did not significantly inhibited the growth of ASEAN's processed food exports.

The two-year sub-period results confirm the above overall commodity composition results for ASEAN. The ten sub-period results indicate that with the exception of the 1982-84 and 1992-94 sub-periods the composition of ASEAN's processed food exports was skewed in favour of those commodities experiencing slower growth than the world average. In this respect ASEAN failed to take advantage of growth points in world processed food trade. These commodity composition results are confirmed by Table 6.2, which shows that on only four occasions more than half of ASEAN's processed food exports experienced faster than average world growth. The worst period was 1994-96, when only 14.21 percent of ASEAN's total processed food exports were derived from 'growth' commodities. Despite 69.94 percent of ASEAN's processed food exports experiencing relatively faster growth in 1976-78 and 75.17 percent in 1986-88, the commodity composition results for both sub-periods are negative (Tables 6.1 and 6.2).

Table 6.2 *Percentage of Total Processed Food Exports Derived from 'Growth' Commodities ($r_i > r$)*

Period	ASEAN	Australia	Chile	European Union	NAFTA	New Zealand
1976-78	69.94	16.53	51.29	54.93	52.88	37.31
1978-80	18.82	87.47	34.30	74.49	38.31	90.72
1980-82	28.50	73.51	92.21	80.62	77.17	98.93
1982-84	68.14	20.49	28.34	28.12	40.70	4.39
1984-86	40.69	73.30	69.28	72.43	66.05	94.60
1986-88	75.17	95.82	86.08	85.99	85.66	97.70
1988-90	22.66	74.03	30.29	60.62	49.03	47.87
1990-92	19.74	72.67	32.00	74.89	52.28	81.76
1992-94	75.23	15.17	64.52	19.79	40.23	18.43
1994-96	14.21	48.91	38.19	58.49	35.71	46.04

The general trend of negative commodity composition results can be attributed to the poor growth performance of ASEAN's main processed food commodities. Appendix E, Figure E1 illustrates that the composition of ASEAN's processed food trade was initially dominated by vegetable oils and fats, a commodity which achieved superior growth to the world average growth rate for only four of the ten sub-periods (Appendix C). Although vegetable oils and fats share of ASEAN's total processed food exports has declined it still accounted for a quarter of all ASEAN's processed food exports between 1992 and 1996. Though processed fish exports increased in relative importance over the study period it managed growth in excess of the world average during only five of the ten sub-periods (Appendix C).

One of the features of ASEAN's processed food trade has been an ability to shift away from the relatively slow growth sugar and honey and coffee and cocoa commodities into the relatively faster growing fish, beverages, fruit and vegetables, and meat commodities (Appendices C and E, Figure E1). However, there is a noticeable increase in processed animal and vegetable oils share of total ASEAN's processed food exports. Processed animal and vegetable oils achieved growth above the world average during only four of the ten sub-periods.

Overall, ASEAN has predominantly exported slow growth commodities. However, Appendix E, Figure E1 indicates that there has been a shift away from the

slower growth commodities, towards commodities that have experienced relatively faster growth than the world average growth rate. This may explain the small negative commodity composition result for the 1986-96 period.

6.1.3 Market Distribution Effect

The positive market distribution results in Table 6.1 indicate that over the study period ASEAN has been able to exploit regions of the world where import demand-growth for processed foods exceeded world import demand-growth. Furthermore, the ability of ASEAN to export her processed food products to high demand-growth areas of the world has been an increasingly important factor contributing to the overall growth of ASEAN's processed food trade. Appendix E, Figure E2 shows that initially ASEAN exported predominantly to NAFTA, the EU and the ROW, all of which have had relatively slow demand-growth in relation to other export destinations (Appendix D). More importantly, Appendix E, Figure E2 indicates that ASEAN has moved away from NAFTA, the EU and the ROW into exporting more processed food products to Japan, China and NIE regions which have experienced relatively faster import demand-growth (Appendix D).

The two-year sub-periods results in Table 6.1 show that although the 1976-86 period had a positive result, this period was in fact dominated by negative results (1976-78, 1978-80 and 1984-86), whereas the 1986-96 period (which also had an overall positive result) had only one negative sub-period result.

An interesting feature of the market distribution results is for the first four sub-periods from 1976 to 1984. Although the market distribution results for the 1976-78 and 1978-80 sub-periods are negative, the majority of the commodities actually provided positive contributions (Appendix E, Table E1). However, large negative results for sugar and honey and vegetable oils and fats in the 1976-78 sub-period, and for fish and vegetable oils and fats in the 1978-80 sub-period resulted in an overall negative market distribution results. For the 1980-82 and 1982-84 sub-periods the positive market distribution results indicate that despite a world recession ASEAN was able to export her processed food commodities to those destinations in which import demand-growth did not decline as much as the overall world decline. For both sub-periods only three of

the eleven commodities were exported to relatively slow import demand-growth destinations.

Between 1986 and 1996 only one of the five sub-periods (1988-90) experienced a negative result as ASEAN's main processed food commodities were generally exported to high import demand-growth destinations. Although the 1994-96 sub-period result was positive, ASEAN's two main processed food commodities, fish and vegetable oils and fats (which account for approximately 60 percent of ASEAN's total processed food exports) were exported to slow import demand-growth destinations. This is indicated by their negative contributions (Appendix E, Table E1). However, a large positive contribution by sugar and honey helped offset the negative contributions by other commodities.

6.1.4 Competitiveness Residual

The success of ASEAN to increase her share of world processed food trade (see Figure 2.4) is borne out by the competitiveness residual results (Table 6.1). The positive results imply that the actual increase in ASEAN's processed food exports was larger than what it would have been had ASEAN only maintained her export share of world processed food trade. The 1976-86 and 1986-96 results indicate that increased competitiveness was a major factor contributing to the growth of ASEAN's processed food exports. Although it could be postulated that the role of ASEAN's competitiveness was declining over the two periods is due to the decrease in the size of the competitiveness residual value.

A closer examination of the two-year sub-periods reveals that 1994-96 was the only sub-period in which ASEAN failed to increase her overall competitiveness (Table 6.1). For the 1978-80 sub-period all eleven commodities experienced an increase in competitiveness (Appendix E, Table E1). One of the main influencing factors on the increasing competitiveness of ASEAN's processed food exports has been the ability of ASEAN's processed fish exports to increase in competitiveness during seven of the ten sub-periods. Also the rising share of beverage exports in ASEAN's total processed food exports has been associated with an increase in competitiveness in every sub-period but one (1992-94). The decline in overall competitiveness for the 1994-96 sub-period can

be traced back the to 1992-94 sub-period which had only a very small positive result. As mentioned previously this time period was associated with a slow-down in the growth of the Asian region's exports. This may partially explain why eight of the eleven commodities lost competitiveness during the 1992-94 and 1994-96 sub-periods.

6.2 Australia

6.2.1 World Trade Effect

The 1976-86 and 1986-96 world trade effect results in Table 6.3 indicate that over the study period Australia has been able to rely less on the general expansion of trade as a source of growth for her processed food exports. The 1976-86 result indicates that the actual increase in Australia's processed food exports was lower than what it would have been had Australia expanded at the world growth rate for processed food. This is indicated by the world trade effect value exceeding 100. During this period Australia's processed food exports increased by $373,231, compared to the world trade effect of $2,424,450 as only three of the eleven commodities had an actual increase in trade value greater than the world trade effect result (Appendix F, Table F1). The 1986-96 result indicates that during this period Australia was able to expand her processed food exports faster than the world growth rate as six of the eleven commodities had actual increases exceeding the world trade effect results.

The two-year sub-period results in Table 6.3 indicate that for the first decade of the study period (1976-86) Australia managed to increase her processed food exports in excess of the world growth rate in only one sub-period, 1978-80. For the three sub-periods between 1980 and 1986 Australia experienced a contraction in the value of her processed food exports. Even though growing at the world growth rate for the 1980-82 sub-period would have resulted in a contraction, the actual contraction experienced by Australia's processed food exports over this period was far greater. Had Australia's processed food exports grown at the world growth rate for the 1982-84 and 1984-86 sub-periods then they would experienced an actual increase and not contracted.

Table 6.3 Constant Market Share Results for Australia's Processed Food Exports

Period	World Trade Effect	Commodity Composition Effect	Market Distribution Effect	Competitiveness Residual
1976-86	649.59	-228.84	22.85	-343.60
1986-96	86.94	10.60	34.03	-31.56
1976-78	191.62	-62.21	-21.61	-7.80
1978-80	80.87	22.30	7.34	-10.52
1980-82	-85.98	-13.03	49.76	-50.74
1982-84	-15.04	-65.84	20.97	-70.16
1984-86	1529.93	129.95	-1102.06	-657.82
1986-88	50.24	17.37	13.48	18.91
1988-90	76.52	26.43	-6.61	3.66
1990-92	320.93	24.77	10.81	-256.52
1992-94	70.93	-31.10	38.60	21.56
1994-96	316.18	31.46	193.82	-441.46

For the second decade, 1986-96, the sub-period results indicate a turn around in the growth performance of Australia's processed food trade as only two sub-periods, 1990-92 and 1994-96 achieved growth below that of the world growth rate. This was due to two of Australia's main processed food commodities meat and fish, failing to grow at least as well as the world growth rate. (Both of these commodities contracted in the 1994-96 sub-period.)

6.2.2 Commodity Composition Effect

Table 6.3 shows that between the 1976-86 and 1986-96 periods, Australia experienced a complete reversal in the performance of the composition of her processed food exports. Between 1976-86 the negative commodity composition result implies that Australia concentrated on exporting those processed food commodities which experienced slower growth than the world average for total processed foods. Contrary to this, the positive 1986-96 result implies that the composition of Australia's processed food exports was skewed towards those commodities that experienced growth above the world average.

The two-year sub-period results confirm the overall results for the 1976-86 and 1986-96 decades. Between 1976 and 1986 three of the five sub-periods incurred negative composition results (1976-78, 1980-82 and 1982-84) while over the 1986-96 period only one of the respective sub-periods achieved a negative result (1992-94) (Table 6.3). During the 1992-94 sub-period 84.83 percent of Australia's total processed food exports failed to achieve growth in excess of the world average (Tables 6.2). One of the primary reasons for these results is that during the late 1970s and early 1980s a high proportion of Australia's processed food exports comprised of sugar and honey products (Appendix F, Figure F1). Sugar and honey was one of four commodities achieving the lowest frequency of achieving growth above the world growth rate for total processed food exports (Appendix C). Over the study period however, Australia has been able to diversify away from sugar and honey exports and into other commodities which have achieved a higher frequency of growth above the world average, namely dairy, fish and beverages (Appendices C and F, Figure F1).

Table 6.2 indicates that between 1984 and 1992 all the sub-periods had at least 70 percent of Australia's processed food exports derived from commodities experiencing relatively faster growth. Despite only 48.91 percent of Australia's processed food commodities experiencing relatively faster growth for the 1994-96 period the commodity composition result was still positive. The slower growth rates of meat and fish were outweighed by sugar and honey, cereals and beverage products (Appendix F, Table F1).

Overall, between 1976 and 1986 Australia failed to take advantage of those fast growing commodities, therefore achieving only one positive sub-period result. However, for the second decade (1986-96) the overall commodity composition result was reversed as Australia relied less on meat, and sugar and honey exports and diversified into other relatively faster growing commodities such as dairy and fish and to some extent beverages.

6.2.3 Market Distribution Effect

The positive market distribution results in Table 6.3 show that for the 1976-86 and 1986-96 periods Australia has been able to focus on exporting her processed food

commodities to regions and countries of the world where import demand-growth for processed foods was higher than world demand-growth. The 1976-86 result shows that the only commodities with negative market distribution results were cereals, sugar and honey products, and animal oils and fats. However, all eleven commodities produced positive market distribution results for the 1986-96 period (Appendix F, Table F1).

The main factor contributing to these results has been the ability of Australia to diversify her main processed food commodities away from NAFTA and the ROW (which have generally experienced relatively slower demand-growth) and into the growing Asian markets of ASEAN and NIE. These markets have shown a greater frequency of achieving demand-growth by commodity above the world average (Appendices D and F, Figure F2). Japan, which has always been a major importer of Australian processed food products has continued to consume increased proportions of Australian processed food exports. Japan has also performed well in terms of achieving demand-growth in excess of world demand-growth by commodity. Being able to exploit areas of strong import demand-growth has significantly helped to enhance the growth of Australia's processed food exports.

The two-year sub-period results in Table 6.3 show that for only three sub-periods 1976-78, 1984-86, and 1988-90 Australia failed to record a positive market distribution result. The negative result for the 1976-78 sub-period can be predominantly accredited to sugar and honey products (which experienced a contraction in world demand over this period), as Australia's two main export destinations for sugar and honey products Japan and NAFTA, both experienced a contraction in import demand-growth in excess of the world contraction. Cereals and coffee and cocoa products also recorded negative results (Appendix F, Table F1).

The 1984-86 negative result can be attributed to the fact that predominantly all of Australia's main commodities were exported to slow growth regions. For Australia's three main processed food commodities meat, sugar and honey and dairy products only two of Australia's export destinations for processed meat products (one of whom was Japan, which imported 26.97 percent of Australia's processed meat exports) recorded import growth above that of the world. For dairy products, ASEAN, NIE and the ROW which import 28.27, 23.63, and 36.23 percent of Australia's total exports of processed

dairy products respectively, all recorded lower import growth than the world average, with the ROW experiencing a contraction in import demand. All four of Australia's main export destinations for sugar and honey products NAFTA, NIE, ASEAN and Japan (which account for 93 percent of Australia's sugar and honey exports collectively) experienced contractions in import demand-growth.

Although dairy and sugar and honey products made positive contributions to the 1988-90 sub-period result, these were outweighed by negative contributions from meat and fish products. Australia's two main export destinations for meat and fish products, Japan and NAFTA experienced slower import demand-growth than that of the world.

6.2.4 Competitiveness Residual

The competitiveness residual results presented in Table 6.3 indicate that throughout the study period the decline in Australia's competitiveness has been a major factor contributing to the decline in its market share of world processed food trade (Figure 2.4). Both the 1976-86 and 1986-96 results show that only three of the eleven commodities were able to produce a positive competitiveness residual. Beverages was one of the three commodities in both periods (Appendix F, Table F1). This gives some indication as to why beverage products have become Australia's fifth most important commodity by 1996 (Appendix F, Figure F1).

The two-year sub-period results in Table 6.3 confirm the above results. Between 1976 and 1986 all five sub-periods recorded negative competitiveness residual results, while over the 1986-96 period only two of the five sub-periods resulted in a loss of competitiveness. Most significantly, the 1976-86 result shows that of Australia's main processed food commodities, meat, dairy, sugar and honey and fish, meat products recorded a positive result in only one of the five sub-periods. Dairy, sugar and honey, and fish achieved only two positive results each (Appendix F, Table F1). Over the five sub-periods between 1986 and 1996, meat, sugar and honey and dairy products all only managed to achieve a gain competitiveness twice. Fish products not only lost competitiveness in all five sub-periods, but lost competitiveness in every sub-period from 1982-84 onwards. Contrary to the above results, beverage products gained competitiveness in eight of the ten sub-periods. It is interesting to note that for the sub-

periods in which Australia has managed to gain competitiveness (1986-88, 1988-90, and 1992-94), only five commodities gained competitiveness during the 1986-88 and 1992-94 sub-periods, while only six commodities gained competitiveness during the 1988-90 sub-period.

6.3 Chile

6.3.1 World Trade Effect

The CMS results exhibited in Table 6.4 indicate that over the study period, Chile has not relied heavily on the general expansion of world processed food trade as a source of positive growth. This is indicated by the 1976-86 and 1986-96 results being well below 100.

Table 6.4 Constant Market Share Results for Chile's Processed Food Exports

Period	World Trade Effect	Commodity Composition Effect	Market Distribution Effect	Competitiveness Residual
1976-86	26.67	10.93	-4.77	67.17
1986-96	19.39	1.50	-0.47	79.58
1976-78	49.80	5.17	-7.44	52.48
1978-80	31.66	0.08	-0.28	68.54
1980-82	-71.07	32.71	7.78	-69.42
1982-84	57.98	14.22	-5.31	33.12
1984-86	38.32	20.84	-10.50	51.35
1986-88	33.20	13.96	-5.45	58.29
1988-90	33.76	1.05	2.54	62.64
1990-92	21.88	0.15	-2.49	80.46
1992-94	79.39	2.05	13.72	4.84
1994-96	37.54	-9.48	0.49	71.45

The individual commodity results in Appendix G, Table G1 show that for the 1976-86 period only four of the eleven commodities had an actual change in value less than what would have occurred had they grown at the world average growth rate for total processed food. All eleven commodities exceeded the world growth rate for the

1986-96 period, as Chile expanded her processed food trade by $1,660,149 compared to a world trade effect result of $321,889.

The two-year sub-period results indicate that on only one occasion Chile failed to exceed the growth that would have occurred had Chile expanded at the world rate. This was during the 1980-82 sub-period, when the actual decline in Chile's processed food exports was more severe than would have occurred at the world rate (Table 6.4). Although the 1982-84 sub-period results was positive, only three of the eleven commodities managed to exceed the world growth rate, only three of the eleven commodities managed to exceed the world average growth rate. These were Chile's three main processed food commodities, fish, fruit and vegetables, and animal oils and fats. This positive result can however be attributed to the large increase in the value of fish exports which accounted for nearly 95 percent of the actual change in Chile's processed food exports over this period (Appendix G, Figure G1).

6.3.2 Commodity Composition Effect

The commodity composition results in Table 6.4 show that for both the 1976-86 and 1986-96 periods the composition of Chile's processed food exports was concentrated around commodities that grew relatively faster than the growth of total world processed food trade. This was a significant source of growth for the 1976-86 period, but negligible for the 1986-96 period. The above results are confirmed by the two-year sub-period results which indicate that the commodity composition component was a significant source of growth for Chile's processed food trade between 1980 and 1988. However between 1988 and 1994 it did not significantly enhanced the growth of Chile's processed food trade, and was a factor which retarded growth for the 1994-96 sub-period.

Appendix G, Figure G1 illustrates that while processed fish products are an integral part of Chile's processed food exports, accounting for approximately 60 percent of Chile's processed food exports between 1984 and 1996, there has been a movement away from what was Chile's second most important processed food commodity during the 1976-80 period (animal oils and fats). There has been a subsequent shift towards fruit and vegetables, and beverages (though beverages share of Chile's processed food

exports initially declined before rising again). While fish and fruit and vegetables have only managed to exceed the world average growth rate for total processed foods for five of the ten sub-periods, beverage products managed this on eight of the ten occasions (Appendix C). Appendix G, Figure G1 also shows that Chile has moved away from sugar and honey products, which achieved growth in excess of the world average for only four of the ten sub-periods.

The results in Table 6.2 indicate that with the exception of the 1982-84 and 1992-94 sub-periods, on those occasions where a high proportion of Chile's processed food exports were accrued from 'growth' commodities, the commodity composition component has been a high source of positive growth. For those sub-periods where only a small proportion of Chile's processed food commodities have grown in excess of the world growth rate, the commodity composition component did not contribute significantly to the overall growth of Chile's processed food exports. So while Chile may have generally been able to focus on the faster growing commodities with a heavy reliance on processed fish products, any decline the growth of this commodity will have a significant influence on the overall outcome for Chile's processed food trade.

6.3.3 Market Distribution Effect

The negative market distribution results for both the 1976-86 and 1986-96 decades indicate that Chile's processed food exports have generally been destined to areas of the world which have experienced slower import demand-growth for processed food products compared with the world import demand for these commodities (Table 6.4). The primary reason for these negative results is Chile's main export destinations for processed food exports have been NAFTA, the EU, Japan and ROW (Appendix G, Figure G2). However, Chile has shifted away from the relatively slow import demand-growth countries in the ROW aggregate, and the EU over the latter part of the study period. Chile has increasingly exported processed foods to the Japanese market which has displayed import demand-growth for fish above the world import demand-growth for fish, for seven of the ten sub-periods (Appendix D). There has also been an increase in the proportion of Chile's processed food exports destined to NAFTA. This is despite NAFTA having achieved some of the slowest import demand-growth (see Table 2.2).

Analysing the individual two-year sub-period results reveals that on only two occasions between 1976 and 1992 Chile experienced a positive market distribution result, 1980-82 and 1988-90 (Table 6.4). The primary reason for this has been the poor import demand-growth performance of Chile's main destinations for her fish products, NAFTA, the EU and Japan. Over the 1976-92 period, NAFTA, the EU and Japan recorded import demand-growth for processed fish products above that of the world for only two, four and six of the eight sub-periods respectively (Appendix D). Appendix D also indicates that for Chile's main export destinations for fruit and vegetables and beverages have been Japan, NAFTA, the EU and ROW. Import demand-growth for these products in NAFTA and ROW has generally below that of the world, but the EU and Japan have both experienced relatively good import demand-growth in terms of the frequency of achieving import demand-growth above that of the world.

In general the market distribution results indicate that Chile has exported her processed food commodities to regions which have experienced slower demand-growth than that of the world (Appendix D). However, two positive market distribution results for the last two sub-periods may indicate that Chile could be reversing this trend.

6.3.4 Competitiveness Residual

The competitiveness residual results in Table 6.4 suggest that a significant factor behind Chile's rising share of world processed food trade (see Figure 2.4) has been the increase in Chile's competitiveness. Table 6.4 also shows that between 1982 and 1992 (with the exception of the 1980-82 sub-period) the competitiveness component increased in importance in terms of explaining Chile's rising world share of processed food trade.

The two-year sub-period results show that Chile lost competitiveness in only one sub-period, that of 1980-82. For this sub-period an increase in fish product's competitiveness did not outweigh a loss in competitiveness by seven other commodities (Appendix G, Table G1). The relatively poor result for the 1992-94 sub-period is due to a decline in competitiveness in Chile's two main processed food commodities, fish and fruit and vegetables (along with coffee and cocoa, and vegetable oils and fats).

The one of the main factors in Chile's rising competitiveness has been the ability to increase competitiveness in her main processed food commodities. Processed fish exports gained competitiveness in every sub-period except for one (1992-94). Beverage products lost competitiveness in only two of the ten sub-periods and fruit and vegetable products in three of the ten sub-periods.

6.4 European Union

6.4.1 World Trade Effect

The world trade effect results presented in Table 6.5 for the EU show that both the 1978-86 and 1986-96 decades have recorded values less than 100, implying that in both periods the EU has been able to expand her processed food exports at a faster rate than she would have at the world growth rate. The increase in the size of the value suggests that the EU has over the latter part of the study period relied more heavily on the expansion of world processed food trade as a source of export growth.

Table 6.5 Constant Market Share Results for the European Union's Processed Food Exports

Period	World Trade Effect	Commodity Composition Effect	Market Distribution Effect	Competitiveness Residual
1976-86	69.87	8.61	0.13	21.39
1986-96	95.49	13.68	-5.68	-3.46
1976-78	80.23	3.00	0.59	16.18
1978-80	82.33	7.51	-0.90	11.06
1980-82	-142.63	57.29	-25.37	10.70
1982-84	-78.18	-143.78	-48.16	13.76
1984-86	60.23	2.79	17.17	19.81
1986-88	76.07	21.09	-0.23	3.07
1988-90	64.52	11.18	3.54	20.75
1990-92	94.67	10.43	1.97	-7.07
1992-94	451.63	-87.64	-116.55	-147.44
1994-96	109.39	10.48	-3.39	-16.47

The two-year sub-period results reveal that with the exception of the 1982-84 sub-period, for every sub-period between 1976 and 1992 the EU achieved an actual

change in the value of processed food exports greater than the world trade effect result (note that for the 1980-82 sub-period, the actual decline was less than what it would have been under the world trade effect, Appendix H, Table H1). The 1982-84 sub-period resulted in a contraction in the value of the EU's processed food trade despite positive world growth.

For the last two sub-periods however, the results show the EU failed to increase her processed food exports in line with the world growth rate. The 1994-96 sub-period result was only slightly below that of the world trade effect (an actual increase of $15,825,712 against a world trade effect result of $17,311,380, Appendix H, Table H1). However, there is a large discrepancy between the world trade effect result of $14,919,480 and the actual increase in value of the EU's processed food exports, $3,303,498, for the 1992-94 sub-period. For the 1992-94 sub-period, only three of the eleven processed food commodities managed to achieve growth in excess of the world average growth rate (Appendix H, Table H1). More significant is the fact that two of the EU's top three processed food commodities, meat and dairy products (Appendix H, Figure H1) experienced a contraction in the value of trade over this period and failed to achieve growth in excess of the world average for processed foods for the 1994-96 sub-period. These results could possibly be attributed to the bovine spongiform encephalopathy (BSE or mad cow disease as it is commonly referred to) outbreak that was experienced throughout Europe during this period.

6.4.2 Commodity Composition Effect

The positive commodity composition results for both the 1976-86 and 1986-96 periods indicate that throughout the study period the EU has focused on exporting those processed food commodities that experienced faster growth than the world average growth rate for processed food products (Table 6.5). Furthermore, Table 6.5 indicates that the composition of the EU's processed food trade has become a relatively important source of growth. The primary reason for the positive and increasing value of the results has been the ability of the EU to diversify into the faster growing commodities and away from those commodities which have experienced relatively slow growth. Appendix H, Figure H1 indicates that the EU's main processed food commodities have been meat, dairy and beverage products. Those commodities have performed well in

terms of the frequency of achieving growth in excess of the world average growth rate (Appendix C). Although meat and dairy product's shares of the EU's total processed food exports has declined, beverages share has increased, coupled with cereals share. Cereals has also been one of the best performing commodities in terms of achieving growth above the world average. Furthermore, there has been a decline in the share of sugar and honey, animal oils and fats, and vegetable oils and fats in the EU's total processed food exports. These have been some of the worst performing commodities in terms of achieving growth above the world average growth rate (Appendices C and H, Figure H1).

The two-year sub-period results reveal that on only two occasions (1982-84 and 1992-94) the EU failed to record a positive commodity composition result (Table 6.5). In both these periods the EU had a relatively small percentage of her processed food exports derived from high growth commodities, 28.12 and 19.79 percent respectively (Table 6.2). For all other periods, at least half of all the EU's processed food commodities experienced growth above that of the world growth rate (Table 6.2). The 1982-84 sub-period that is associated with the world recession, saw negative world growth for the EU's three main processed food commodities, meat, dairy products and beverages. The 1992-94 sub-period also saw the EU's top four commodities, meat, dairy, beverages and cereals experience world growth rates below the world average as indicated by their negative results (Appendix H, Table H1).

6.4.3 Market Distribution Effect

The positive market distribution result for the 1976-86 period indicates that the EU was able to focus on exporting her processed food commodities to those countries and regions of the world that were experiencing faster import demand-growth than the world average. This was however negligible as a source of growth for the EU's processed food exports (Table 6.5). The individual commodity results show that the EU's main processed food commodities were exported to destinations where demand-growth for these products was lower than world demand for these commodities, as indicated by the negative sign (Appendix H, Table H1). This pattern of exporting to slow demand-growth areas of the world continued for the 1986-96 period as only two of the eleven commodities were exported to high demand-growth areas of the world

(Appendix H, Table H1.). The two-year sub-period results reveal that three of the five sub-periods between 1976 and 1986 had negative results. This helps to explain the very small positive market distribution result for this period. Likewise, three of the five sub-periods between 1986 and 1996 also had negative results.

One of the main factors for the EU's poor market distribution results is that a large proportion of the EU's processed food trade is intra-regional (Appendix H, Figure H2). Appendix D shows that the EU has had some of the slowest import demand-growth in terms of the frequency of achieving growth above world import demand-growth for her main processed food commodities, meat, dairy and beverage products. In terms of meat products the EU achieved import demand-growth in excess of world import demand-growth for only three of he ten sub-periods. In regards to dairy products the EU managed import demand-growth above that of the world for only four of the ten sub-periods. Beverages import demand-growth was above the world average for six sub-periods out of ten for beverages. This poor import demand-growth for the EU's three main processed food commodities was also witnessed in the EU's two other main export destinations, NAFTA and the ROW. For only two of the ten sub-periods NAFTA recorded import demand-growth above the world for processed meat products and only for four sub-periods for both dairy and beverage products. The ROW recorded import demand-growth above that of the world for meat, dairy and beverage products for five, five and two of the ten sub-periods respectively.

6.4.4 Competitiveness Residual

The competitiveness results in Table 6.5 indicate that over the two decades, 1976-86 and 1986-96, there has been a reversal in the fortunes of the EU's competitiveness. The 1976-86 result indicates that for the first ten years of the study period the EU was able to increase competitiveness as indicated by her rising share of world processed food trade (see Figure 2.4). The individual commodity results indicate that processed fish products was the only commodity to experience a decline in competitiveness over this period (Appendix H, Table H1). However, this increase in competitiveness was reversed for the 1986-96 period. The negative result over this period implies there was a loss in competitiveness and was associated with a lower share of world processed food trade (see Figure 2.4). The individual commodity results

also show that for this period, only coffee and cocoa products achieved a gain in competitiveness. This helped to reduce the impact of the loss in competitiveness from the other commodities in terms of the overall competitiveness result (Appendix H, Table H1).

The two-year sub-period results shown in Table 6.5 indicate that the EU was able to gain competitiveness between 1976 and 1990, before the three sub-period negative results. The results also suggest that the competitiveness residual component has been a significant factor contributing to the growth of the EU's processed food exports during this period. While there are various fluctuations in each individual commodity's competitiveness shown in the sub-period results between 1976 and 1990, an interesting result revealed by the data for the 1982-84 sub-period is that despite eight of the eleven commodities experiencing a decline in competitiveness the EU still managed to achieve an overall positive competitiveness residual (Table 6.5 and Appendix H, Table H1). For the three sub-periods between 1990 and 1996 the EU has generally experienced a decline within her competitiveness in her main processed food commodities, beverages and cereals declining in competitiveness in all three sub-periods (Appendix H, Table H1).

6.5 NAFTA

6.5.1 World Trade Effect

The results presented in Table 6.6 for the 1976-86 and 1986-96 periods reveal that as a whole, NAFTA has been able to grow her processed food exports faster than the world average growth rate throughout the study period. The decline in size of the world trade effect values between the 1976-86 and 1986-96 periods suggests that NAFTA has had to rely less on the general expansion of world processed food trade as a source of growth for her processed food exports over the course of the study period.

The results for the two-year sub-periods reveal that on only three occasions NAFTA failed to expand her processed food exports faster than the world growth rate. These sub-periods were 1978-80, 1984-86, and 1988-90 (Table 6.6). An interesting

feature of the world trade effect results is for the two periods associated with the world recession during the 1980-82 and 1982-84 sub-periods.

Table 6.6 Constant Market Share Results for NAFTA's Processed Food Exports

Period	World Trade Effect	Commodity Composition Effect	Market Distribution Effect	Competitiveness Residual
1976-86	85.13	15.24	4.35	-4.73
1986-96	77.01	5.98	-1.49	18.50
1976-78	78.29	7.55	0.44	13.73
1978-80	118.06	-6.41	-9.22	-2.44
1980-82	-459.37	182.34	155.94	21.09
1982-84	74.55	92.65	169.74	-236.95
1984-86	213.61	-32.30	-87.77	6.46
1986-88	76.91	14.15	-7.93	16.87
1988-90	121.43	7.57	-23.35	-5.65
1990-92	67.83	-0.64	-2.15	34.96
1992-94	85.22	2.12	23.60	-10.94
1994-96	78.85	-2.00	-1.81	24.97

For the 1980-82 sub-period, despite a decline in the value of NAFTA's processed food exports, the contraction was significantly less than what would have occurred had NAFTA followed the world rate. NAFTA's processed food exports declining in value by -$301,265 against a world trade effect of –$1,383,918. The individual commodity results indicate that only five commodities experienced a contraction which were more severe than the world trade effect result (Appendix I, Table I1). Furthermore, NAFTA's main processed food exports meat, dairy and fish products (Appendix I, Figure I1) actually continued to expand over this period. However, for the following period 1982-84 these three commodities experienced a decline in their export value. This was despite the world trade effect results indicating a continued expansion. The fast expansion of the sugar and honey and vegetable oils and fats commodities contributed significantly to the overall positive world trade result for this period.

6.5.2 Commodity Composition Effect

The positive commodity composition results for the 1976-86 and 1986-96 periods indicate that in general, NAFTA has been able to skew her processed food exports towards those commodities experiencing relatively faster growth (Table 6.6). Although the decline in the size of the commodity composition value between the two periods (1976-86 and 1986-96) suggests that as a positive source of growth for NAFTA's processed food exports, the commodity composition component is becoming less important. For the 1976-86 decade only three of the eleven commodities incurred negative results, whereas four of the eleven commodities had negative results during the 1986-96 period (Appendix I, Table I1).

The two-year sub-period results show that during four sub-periods NAFTA experienced a negative commodity composition result (Table 6.6). The 1978-80 sub-period had an overall negative result despite six of the eleven commodities having positive commodity composition results (Appendix I, Table I1). This was due to a large negative contribution from processed fish products which was NAFTA's main processed food commodity over this period. For the 1984-86 sub-period, despite two-thirds of NAFTA's processed food exports stemming from 'growth' commodities (Table 6.2) two large negative contributions from animal oils and fats and vegetable oils and fats gave rise to an overall negative result. The 1990-92 sub-period also had over half of NAFTA's total processed food exports derived from 'growth' commodities despite an overall negative result.

Both of NAFTA's main processed food exports, meat and fish performed relatively well in terms of growth exceeding the world average growth rate (Appendices C and I, Figure I1). But of greater significance is that NAFTA was able to reduce the export share of commodities which had not performed well in relation to the world growth rate (coffee and cocoa, animal oils and fats, and vegetable oils and fats), while being able to increase the importance of the best-performing commodity, beverages (Appendices C and I, Figure I1).

However, Table 6.2 indicates that despite the commodity composition results indicating that NAFTA generally concentrated on those processed food commodities

experiencing relatively fast growth. Of the ten sub-periods covering the study period during only five sub-periods did NAFTA have more than half her total processed food exports derived from 'growth' commodities. Of these five sub-periods only two of them had more than 75 percent of NAFTA's total processed food exports derived from 'growth' commodities.

6.5.3 Market Distribution Effect

The positive 1976-86 result (Table 6.6) indicates that over this period NAFTA was generally able to concentrate on exporting her processed food commodities to those destinations experiencing relatively faster demand-growth than the world average. However the individual results do show that this was the case for only six of the eleven commodities (Appendix I, Table I1). However, this positive result is reversed for the 1986-96 period, despite six of the eleven commodities again providing positive contributions. Although the two-year sub-period results tend to fluctuate they can be split into two periods, 1976-84 and 1984-96 (Table 6.6). Between 1976 and 1984 the only period to record a negative market distribution result was during 1978-80, where six of the eleven commodities registered negative results. These commodities included NAFTA's two main processed food commodities meat and fish (Appendix I, Table I1). The other three periods in this group experienced positive results despite the associated world recession occurring during two of these periods. Between 1984 and 1996 the general trend has been for negative results. The only sub-period to record a positive result was 1992-94 (Table 6.6).

The primary factor associated with these poor results was NAFTA's weakness in focusing only the four export destinations, Japan, the EU, ROW and intra-NAFTA trade, for her main processed food exports, meat and fish products. Over the study period NAFTA has been able to reduce its dependence on the EU and ROW as export destinations (both destinations having performed relatively poorly with respect to import demand-growth for meat and fish products), and increased the share of exports destined to the Japanese market. The Japanese market has performed relatively well in terms of import demand-growth in excess of world import demand for meat and fish products. However the NIE countries have achieved some of the best import demand-growth for these two commodities (Appendix D). One of the reasons contributing to the

negative market distribution results over the latter part of the study period is a combination of increasing intra-NAFTA trade and poor import demand-growth within NAFTA (Appendices D and I, Figure I2).

However, given the relatively higher importance of the EU, the ROW and NAFTA as export destinations over the 1976-86 period, one would probably have expected a negative market distribution result for this period and a positive result for the 1986-96 period. This is due to the relatively lower importance of the EU and ROW, and the rising share of the excellent performing NIE countries during the 1986-96 period.

6.5.4 Competitiveness Residual

Although the results for the 1976-86 period indicate a loss of competitiveness for NAFTA's processed food exports the two-year sub-period results tend to suggest otherwise, as only two of the five sub-periods between 1976 and 1986 incurred a negative result (Table 6.6). The negative result for the 1978-80 sub-period has only four of the eleven commodities losing competitiveness, albeit two of NAFTA's main commodities. For the 1982-84 sub-period seven commodities lost competitiveness including NAFTA's three main commodities (Appendix I, Table I1).

The positive result for the 1986-96 period is confirmed by the individual sub-period results over this period as only two of the five sub-periods recorded a loss in competitiveness, 1988-90 and 1992-94 (Table 6.6). The 1988-90 sub-period result shows that only three of the eleven commodities experienced a decline in competitiveness, dairy, sugar and honey and vegetable oils and fats (Appendix I, Table I1). Also for the 1992-94 sub-period, only three commodities lost competitiveness, though a large loss of competitiveness experienced by processed fish exports was the main contributor to the overall decline in NAFTA's processed food competitiveness (Appendix I, Table I1). Therefore it may be inappropriate to suggest that NAFTA lost overall competitiveness in the processed food sector.

The positive results in Table 6.6 indicate that increasing competitiveness was a significant source of growth for NAFTA's processed food trade. These results are generally consistent with NAFTA's rising share of world processed food trade (see

Figure 2.4). An interesting observation is that for the whole study period on only two occasions did NAFTA's processed meat exports lose competitiveness. This may be a possible explanation for processed meats' rising share of NAFTA's total processed food exports (Appendix I, Figure I1 and Table I1).

6.6 New Zealand

6.6.1 World Trade Effect

The world trade effect results for the 1976-86 and 1986-96 periods (Table 6.7) show that New Zealand was able to expand her processed food trade throughout the study period at a faster rate than what would have occurred by growing at the world rate for processed food growth. The declining size of the of the world trade effect values implies that over the second decade New Zealand had to rely less on the general expansion of world processed food trade as a positive source of growth. However, the two-year sub-period suggest that the overall results may not be a true reflection of the growth in New Zealand's processed food trade. This is due to the fact that between 1982 and 1996 New Zealand was able to expand her processed food trade faster than that of world processed food trade on only two occasions 1986-88 and 1994-96 (Table 6.7)

Table 6.7 Constant Market Share Results for New Zealand's Processed Food Exports

Period	World Trade Effect	Commodity Composition Effect	Market Distribution Effect	Competitiveness Residual
1976-86	98.04	8.50	-2.77	-3.77
1986-96	82.14	2.80	2.33	12.73
1976-78	96.39	2.94	-2.52	3.18
1978-80	79.14	6.91	-7.64	21.59
1980-82	-128.04	112.22	39.00	76.81
1982-84	-21.31	-108.91	9.33	-21.73
1984-86	976.96	388.32	-516.26	-749.02
1986-88	63.82	33.12	-3.59	6.65
1988-90	149.51	-10.06	-5.28	-34.17
1990-92	118.59	32.12	-19.54	-31.17
1992-94	102.14	-64.43	34.05	28.24
1994-96	64.33	-6.02	6.32	35.37

The world trade effect results in Table 6.7 indicate that between 1976 and 1982, New Zealand was able to expand her processed food exports faster than the world expansion of processed food trade. The 1980-82 sub-period saw New Zealand continue to expand her processed food exports in the face of a world contraction in processed food trade. New Zealand's processed food exports grew by $240,789 compared to a world trade effect result of –$308,295). However, after this period New Zealand relied heavily on the world expansion of processed food trade as a source of growth, as indicated by the world trade effect results exceeding 100. The 1982-84 sub-period saw a decline in the value of New Zealand's processed food trade by $342,050 lead by a contraction in New Zealand's two main processed food commodities, meat and dairy products (Appendix J, Table J1). New Zealand's meat exports continued to contract in the 1984-86 sub-period, as New Zealand's total processed food exports grew by just $36,862 compared to an increase of $360,124 that would have occurred if the world growth rate had been achieved. 1986-88 saw a brief revival, but this was followed by three periods of relatively slow growth as New Zealand failed to match the world growth rate. Table 6.7 does however indicate that the value of the world trade effect results were declining in size as New Zealand relied less on the expansion of world processed food trade as a source of growth. A lessening of the reliance on the expansion of world processed food trade culminated in the extraordinary reversal of the world trade effect result for the 1994-96 sub-period. New Zealand's processed food trade grew by $1,070,983 as opposed to an increase of only $688,990 had New Zealand grown at the world growth rate.

A significant factor in the poor growth performance of New Zealand's processed food exports between 1982 and 1996 was due to the poor growth of New Zealand's processed meat exports which on only one occasion between 1982 and 1996 managed to grow in excess of the world average growth rate. This was during the 1986-88 sub-period.

6.6.2 Commodity Composition Effect

The commodity composition results in Table 6.7 indicate that generally New Zealand was able to concentrate her processed food exports on commodities which experienced relatively faster growth than the world average. However, Appendix J,

Figure J1 reveals that New Zealand's processed food trade was largely centred around two commodities for the early part of the study period, meat and dairy products, while for the latter part processed fish products also became an important export. Therefore the commodity composition results are predominantly influenced by whether or not one of these three main commodities grew faster or slower than the world average growth rate.

As shown in Table 6.2 the periods where New Zealand had a low proportion of processed food exports expanding faster than the world average growth rate is primarily due to either one, two or all three of New Zealand's main processed food commodities growing at a slower rate. Hence one would expect a negative result as indicated in Table 6.7 (with the exception of 1976-78). Therefore it may be inappropriate to suggest that New Zealand has been able to skew her processed food exports towards those commodities growing relatively faster, given the dominance of the three main commodities. Had processed food exports grown relatively slower, then the results would be negative. Appendix C shows the frequency of each commodity to grow at a faster rate than the world average per sub-period. Given the relatively high frequency of meat and dairy products to do just that, one would expect New Zealand to generally have had positive commodity composition results, as opposed to the ability of New Zealand producers to diversify between products due to higher in growth rates in export value among other commodities.

Nevertheless Table 6.7 reveals that on three occasions between 1988 and 1996 New Zealand experienced a negative commodity composition result. Appendix J, Table J1 shows that over these periods New Zealand's main processed food commodities did not performed well relative to the world average growth rate. One of the most interesting results is that despite processed meat products having a relatively high frequency in terms of exceeding the world average growth rate, its share of New Zealand's total processed food exports has declined significantly (Appendix J, Figure J1).

6.6.3 Market Distribution Effect

The market distribution results shown in Table 6.7 indicate that for the first decade (1976-86) New Zealand tended to focus on exporting her processed food products to slow import demand-growth destinations. Although this result is reversed for the second period (1986-96) the sub-period results indicate that in fact three of the five sub-periods between 1986 and 1996 experienced negative results. The main feature of the market distribution results in Table 6.7 however, is the four negative results between 1984 and 1992.

Appendix J, Figure J2 shows that initially New Zealand relied heavily on the EU, NAFTA and ROW as destinations for her processed food exports. These destinations had some of the lowest frequencies in achieving commodity demand-growth above the world commodity demand-growth (Appendix D). However, over the past twenty years New Zealand has been able to reduce the importance of these export destinations and increase the amount of processed food exports to destinations that were experiencing relatively higher import demand-growth, namely ASEAN, NIE, Australia and Japan (Appendices D and J, Figure J2).

The main export destinations for New Zealand's processed meat products have been NAFTA, the EU and the ROW, which have not displayed a high frequency of achieving import demand-growth above world demand-growth. This is reflected in the market distribution results. Meat exports contributed a positive result for only three of the ten sub-periods. Although NAFTA is still an important export destination for meat products this importance has declined since the early 1990s. The share of processed meat products exported to the EU and ROW fluctuates throughout the study period, whereas Japan and NIE have become relatively more important over the latter period.

The main export destinations for New Zealand's processed dairy exports have been ASEAN, the EU and the ROW. However the dominance of the EU has declined over the study period, whereas the ROW (though fluctuating) and ASEAN have increased their share of New Zealand's dairy exports. Similarly the NIE countries have also become more important for New Zealand's dairy exports. Appendix D indicates that while import demand-growth in the EU and ROW for dairy products has not been

overly impressive in relation to world demand-growth, import demand-growth in ASEAN and NIE has generally exceeded world demand-growth for dairy products.

New Zealand's fish exports were predominantly concentrated on Australia, Japan, NIE and NAFTA. There was a growing importance on the NIE and Japanese markets as export destinations. Both NIE and Japan had performed relatively well with respect to their demand-growth for fish products against the world demand-growth (Appendix D). The opposite is true for import demand-growth for fish products in Australia and NAFTA.

6.6.4 Competitiveness Residual

The competitiveness results for New Zealand show that between 1976 and 1986, New Zealand lost competitiveness in world processed food trade, but was able to turn this around between 1986 and 1996. The positive competitiveness residual implies a gain in competitiveness during the latter period (Table 6.7). The sub-period results indicate that the 1976-86 result may not be a true representation of the period as New Zealand was able to increase her competitiveness during the first three sub-periods. The competitiveness results can be broken down into three periods, 1976-82, 1982-92 and 1992-96.

The results for the 1976-82 period show that the competitiveness component was an increasingly important source of positive growth for New Zealand's processed food sector. During this period most of New Zealand's processed food commodities experienced an increase in competitiveness (Appendix J, Table J1). This is reflected in the increase in New Zealand's share of world processed food trade (see Figure 2.4). However, between 1982 and 1992 New Zealand's overall competitiveness declined as New Zealand found her main processed food commodities losing competitiveness. This was particularly so for processed meat products which during this period only achieved a gain in competitiveness in one of the six sub-periods. Dairy products lost competitiveness in four out of the six sub-periods, while fish lost competitiveness in three of the six sub-periods. The loss in competitiveness over this period is reflected by the decline in New Zealand's share of world processed food trade (see Figure 2.4). However New Zealand managed to regain some of the lost competitiveness over the last

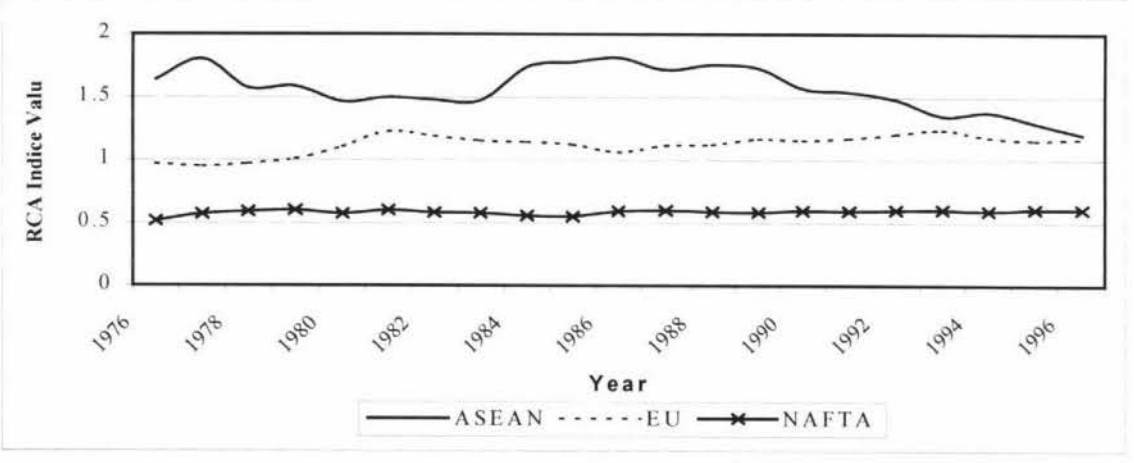
two sub-periods. Despite being able to increase overall competitiveness for processed food exports between 1992 and 1996 two of New Zealand's main processed food exports, meat and fish products continued to lose competitiveness.

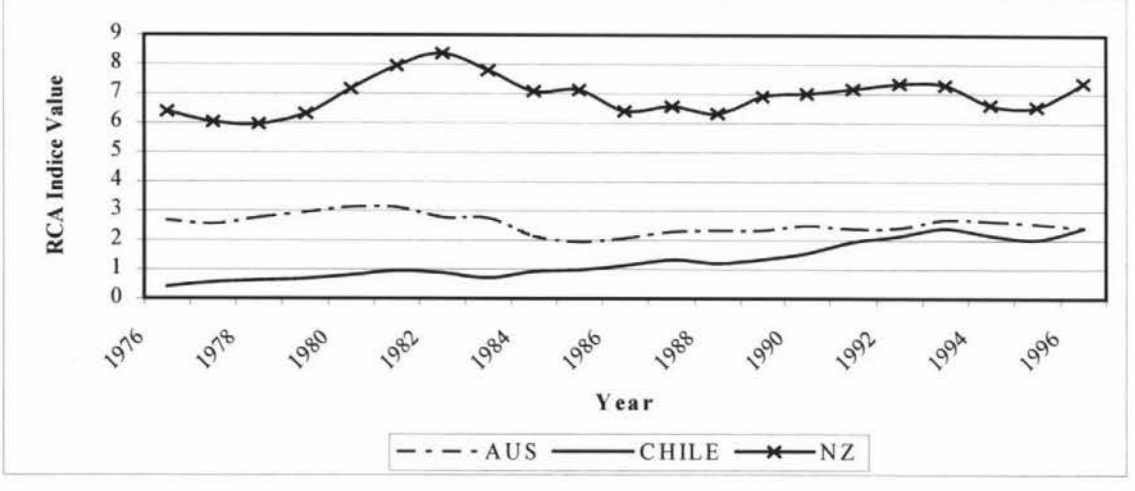
6.7 Revealed Comparative Advantage Indices

6.7.1 ASEAN

Over the study period ASEAN's overall comparative advantage in processed food trade has fluctuated (Figure 6.1). It declined between 1976 and 1983 then experienced an increase in comparative advantage between 1983 and 1986 before a continual decline until 1996. Throughout the study period ASEAN has ranked fourth out of the six processed food exporters with respect to overall comparative advantage in processed food trade (Figure 6.1).

Figure 6.1 Overall Processed Food Revealed Comparative Advantage Indices





ASEAN consistently enjoyed a comparative advantage in six of the eleven commodities, which included her main processed food commodities, fish, vegetable oils and fats, sugar and honey and coffee and cocoa. ASEAN also held a comparative advantage in coffee and cocoa products until 19941 (Table 6.8). Fish exports increasing share of ASEAN's processed food trade coincides with the general increase in fish products comparative advantage. The declining share of sugar and honey, coffee and cocoa and vegetable oils and fats (ASEAN was the only exporter to exhibit a comparative advantage in vegetable oils and fats) exports in ASEAN's total processed food trade is associated with a decline in their comparative advantage indices (Table 6.8). Despite processed animal and vegetable oils share of ASEAN's processed food exports increasing there has been a decline in the comparative advantage enjoyed by ASEAN for this commodity since the mid 1980s (Table 6.8 and Appendix E, Figure E1).

Table 6.8 Revealed Comparative Advantage Indices for ASEAN's Individual Processed Food Commodities

	1976	***1981***	***1986***	***1991***	***1996***
Meat	0.17	0.13	0.26	0.30	0.21
Dairy	0.12	0.13	0.14	0.15	0.09
Fish	2.15	1.75	2.56	3.03	2.18
Cereals	0.53	0.83	0.68	0.58	0.55
Fruit & Vege	1.70	1.46	1.78	1.77	1.05
Sugar & Honey	2.96	2.33	2.05	1.74	1.26
Coffee & Cocoa	1.06	1.36	2.26	1.44	0.93
Beverages	0.16	0.19	0.23	0.58	0.36
Ani Oils & Fats	9.00	8.41	8.65	5.61	4.94
Vege Oils & Fats	2.00	4.00	7.86	7.50	5.71
Pro Ani/Vege Oils	1.65	1.51	1.82	1.56	1.19

6.7.2 Australia

Australia's overall comparative advantage in processed food trade has fluctuated over the study period (Figure 6.1). In spite of the fact that Australia had a large decline from the early to mid 1980s before increasing its comparative advantage. Australia has managed to maintain the second highest overall ranking behind New Zealand. The RCA indice results in Table 6.9 disclose that Australia held a comparative advantage in six of

the eleven commodities throughout the study period as well as gaining a comparative advantage in beverage products.

Table 6.9 *Revealed Comparative Advantage Indices for Australia's Individual Processed Food Commodities*

	1976	***1981***	***1986***	***1991***	***1996***
Meat	6.02	7.02	5.70	6.00	4.48
Dairy	2.83	2.10	2.36	2.64	3.84
Fish	1.23	1.80	1.52	1.35	1.35
Cereals	3.23	3.00	2.04	1.66	1.93
Fruit & Vege	0.91	0.95	0.76	0.77	0.77
Sugar & Honey	5.76	7.87	4.51	4.65	6.50
Coffee & Cocoa	0.15	0.23	0.16	0.42	0.51
Beverages	0.25	0.38	0.47	0.91	1.48
Ani Oils & Fats	5.64	4.88	6.20	7.33	7.00
Vege Oils & Fats	0.02	0.05	0.12	0.10	0.08
Pro Ani/Vege Oils	0.71	0.50	0.43	0.50	0.57

The individual commodity indices show that for Australia's two main processed food commodities, meat and sugar and honey products, Australia has revealed a high level of comparative advantage. However, a decline in both commodities comparative advantage between 1981 and 1986 (Table 6.9) may partially explain Australia's overall decline during this period (Figure 6.1). Since 1981 Australia has been able to increase its comparative advantage in processed dairy products after experiencing an initial decline (Table 6.9). However, despite Australia's relative comparative advantage in world processed food trade over the 1976 to 1996 period, Australia's share of world processed food trade has declined (see Figure 2.4).

6.7.3 Chile

Chile has been able to move from a state of comparative disadvantage to a state of comparative advantage in world processed food trade (Figure 6.1). Since 1986 Chile has enjoyed a comparative advantage in world processed food trade. Chile has been able to increase this to the extent that by 1996, Chile was only just below Australia (ranked second overall). Associated with the rise in Chile's comparative advantage has been a rise in Chile's share of world processed food trade (see Figure 2.4).

Table 6.10 Revealed Comparative Advantage Indices for Chile's Individual Processed Food Commodities

	1976	*1981*	*1986*	*1991*	*1996*
Meat	0.10	0.27	0.36	0.35	0.24
Dairy	0.05	0.00	0.14	0.11	0.32
Fish	1.64	3.46	4.12	6.20	7.33
Cereals	0.70	1.50	0.54	0.92	1.33
Fruit & Vege	0.63	1.29	2.11	3.72	5.36
Sugar & Honey	0.10	0.51	0.19	0.59	0.53
Coffee & Cocoa	0.00	0.00	0.03	0.32	0.47
Beverages	0.64	0.85	0.68	1.52	3.03
Ani Oils & Fats	4.36	9.50	9.40	10.33	7.25
Vege Oils & Fats	0.00	0.00	0.03	0.03	0.06
Pro Ani/Vege Oils	0.57	0.67	0.14	0.17	1.57

The individual commodity results in Table 6.10 show that Chile has held a comparative advantage in only two commodities, fish and animal oils and fats, throughout the 1976-1996 period. Despite the high level of comparative advantage in animal oils and fat products, animal oils and fat share of Chile's total processed food exports has declined (Appendix G, Figure G1).

More importantly has been the fact that Chile has gained a comparative advantage in an additional four commodities throughout the study period, namely cereals, fruit and vegetables, beverages and processed animal and vegetable oils. Despite gaining a comparative advantage in cereals, cereals export share has experienced a decline in its share of Chile's total processed food trade. The rise of both beverage and fruit and vegetable products share of Chile's processed food trade has coincided with the rise of comparative advantage in these two products.

6.7.4 European Union

Although dominating world processed food trade, the EU has only enjoyed a comparative advantage in processed food trade over one of the other five processed food exporters studied in this research, NAFTA. As Figure 6.1 illustrates, the EU held a comparative disadvantage in processed food trade in 1976 and it was not until 1979 that the EU managed to gain a comparative advantage.

Table 6.11 Revealed Comparative Advantage Indices for the European Union's Individual Processed Food Commodities

	1976	*1981*	*1986*	*1991*	*1996*
Meat	1.28	1.43	1.35	1.31	1.28
Dairy	2.00	2.20	1.91	1.89	1.89
Fish	0.55	0.57	0.48	0.50	0.51
Cereals	1.47	1.83	1.64	1.63	1.57
Fruit & Vege	1.11	1.07	1.07	0.98	1.03
Sugar & Honey	0.45	0.87	0.86	1.06	0.84
Coffee & Cocoa	0.32	0.53	0.44	0.80	0.91
Beverages	1.95	2.19	1.87	1.84	1.83
Ani Oils & Fats	0.55	0.50	0.80	1.00	0.75
Vege Oils & Fats	0.67	0.72	0.82	0.87	0.78
Pro Ani/Vege Oils	1.43	1.83	1.29	1.00	1.00

The individual commodity results show that the EU has been able to hold a comparative advantage in six of the eleven commodities although fruit and vegetable exports incurred a loss in comparative advantage in 1991 (Table 6.11), but does not hold the highest rank among the study regions in any of these six commodities. While the EU holds a comparative advantage in her three main commodities, meat, dairy and beverage products, its comparative advantage for dairy products has declined. This decline is in conjunction with dairy products declining share of the EU's total processed food exports. After initially rising the comparative advantage enjoyed by the EU in beverage exports declined between 1981 and 1986. After 1986 beverages comparative advantage remained stable despite its share of the EU's total processed food trade increasing (Appendix H, Figure H1). Processed meat products comparative advantage has remained relatively stable throughout the study period, though its share of the EU's processed food trade has declined.

6.7.5 NAFTA

Over the entire study period NAFTA held a comparative disadvantage in processed food trade (Figure 6.1) and has only been able to hold a comparative advantage in one commodity for the entire twenty-year period. This being animal oils and fats (Table 6.12). NAFTA has only succeeded in obtaining a comparative advantage in one other commodity that of processed meat products. Despite holding a comparative

advantage in animal oils and fats, its share of NAFTA's processed food trade has declined from approximately eight percent to just two percent (Appendix I, Figure I1). The ability to gain a comparative advantage in meat products partially explains meats rising dominance of NAFTA's processed food trade.

Between 1981 and 1986 NAFTA held a comparative advantage in fish products. NAFTA also held a comparative advantage in cereals for the initial period of the study, 1976-81. This comparative advantage has since decline to the extent that NAFTA now holds a comparative disadvantage in cereal exports.

Table 6.12 Revealed Comparative Advantage Indices for NAFTA's Individual Processed Food Commodities

	1976	***1981***	***1986***	***1991***	***1996***
Meat	0.56	0.58	0.66	0.73	1.03
Dairy	0.14	0.19	0.23	0.11	0.14
Fish	0.97	1.13	1.08	0.94	0.72
Cereals	1.23	0.93	0.82	0.66	0.67
Fruit & Vege	0.70	0.68	0.51	0.65	0.67
Sugar & Honey	0.11	0.38	0.41	0.44	0.42
Coffee & Cocoa	0.25	0.26	0.33	0.34	0.37
Beverages	0.41	0.42	0.39	0.45	0.48
Ani Oils & Fats	2.73	3.25	3.00	2.67	1.75
Vege Oils & Fats	0.81	0.85	0.68	0.45	0.47
Pro Ani/Vege Oils	0.43	0.50	0.29	0.33	0.43

6.7.6 New Zealand

New Zealand has held the highest comparative advantage in world processed food trade, in relation to the other five processed food exporters studied. The comparative advantage held by New Zealand has fluctuated with a significant decline between 1982 and 1988, during New Zealand's economic reform period. Since 1988 New Zealand experienced a steady rise over the rest of the study period (Figure 6.1), but never reached the high level achieved in 1982.

Table 6.13 Revealed Comparative Advantage Indices for New Zealand's Individual Processed Food Commodities

	1976	*1981*	*1986*	*1991*	*1996*
Meat	21.22	22.87	16.73	15.27	14.15
Dairy	22.68	23.00	20.16	23.75	29.88
Fish	1.91	4.08	5.78	5.57	6.07
Cereals	0.70	0.47	0.93	0.61	1.45
Fruit & Vege	0.35	0.76	1.49	1.37	1.51
Sugar & Honey	0.15	0.28	0.84	0.82	1.24
Coffee & Cocoa	0.31	0.30	0.17	0.64	0.51
Beverages	0.11	0.32	0.45	0.55	0.83
Ani Oils & Fats	10.55	11.25	10.40	12.67	11.00
Vege Oils & Fats	0.00	0.03	0.03	0.00	0.00
Pro Ani/Vege Oils	0.29	0.17	0.14	4.67	4.43

The individual commodity results in Table 6.13 indicate that New Zealand has held a comparative advantage in only four of the eleven commodities. Three of these being New Zealand's main processed food commodities, meat, dairy and fish. New Zealand has held the highest comparative advantage of all six exporters studied in both meat and dairy products. Also New Zealand has been able to gain a comparative advantage in an additional four commodities (cereals, fruit and vegetables, sugar and honey and processed animal and vegetable oils) over the study period.

Most significantly has been the decline in New Zealand's comparative advantage in meat exports over the study period, coupled with a decline in its share of New Zealand's processed food trade. The opposite is true of both dairy and fish products. An interesting result is the large comparative advantage held in animal oils and fats held by New Zealand, despite this commodity representing just 2.4 percent of New Zealand's total processed food exports in 1976 and just 1.11 percent in 1996 (Appendix J, Figure J1). The growth in the RCA indice for beverage products (despite still holding a comparative disadvantage in the commodity) has resulted in an increase in its relative importance in the composition of New Zealand's total processed food exports.

Chapter Seven

Summary, Conclusion and Suggestions for Future Research

7.1 Summary and Discussion

ASEAN's rising share of international processed food trade is associated with an increase in competitiveness (Table 7.1). While ASEAN has been able to increase her share of world processed food trade and has exported those commodities in which she has enjoyed a comparative advantage, overall comparative advantage declined during the latter part of the study period (Table 7.2). The only source of negative growth was due to the composition of ASEAN's processed food exports (Table 7.1) as ASEAN generally exported those commodities which experienced relatively slower growth than the world average growth rate. However, there is evidence to suggest that ASEAN to some extent has been able to diversify away from the slower growth commodities and into other relatively faster growing commodities. This shift will aid the future expansion of ASEAN's processed food trade.

Table 7.1 *Summary of the Main Constant Market Share Results for the Six Processed Food Exporters Studied*

	World Trade Effect		**Commodity Composition Effect**		**Market Distribution Effect**		**Competitiveness Residual**	
	76-86	***86-96***	***76-86***	***86-96***	***76-86***	***86-96***	***76-86***	***86-96***
ASEAN	63.76	63.08	-14.66	1.21	7.79	13.76	43.11	24.37
Australia	649.59	86.94	-228.84	10.60	22.85	34.03	-343.60	-31.56
Chile	26.67	19.39	10.93	1.50	-4.77	-0.47	67.17	79.58
EU	69.87	95.49	8.61	13.68	0.13	-5.68	21.39	-3.46
NAFTA	85.13	77.01	15.24	5.98	4.35	-1.49	-4.73	18.50
New Zealand	98.04	82.14	8.50	2.80	-2.77	2.33	-3.77	12.73

Despite ASEAN generally exporting slow growth commodities, the CMS results indicate that ASEAN has focused on exporting her processed food products to destinations which experienced relatively faster demand growth than the world average. Furthermore, ASEAN has also demonstrated the ability to reduce the reliance on regions experiencing relatively slower demand growth, namely the EU, NAFTA and the ROW as export destinations. This has been paramount in enhancing the growth of

ASEAN's processed food exports. The positive contributions of the market distribution and competitiveness residuals meant that ASEAN was not reliant on the general expansion of world processed food trade as a source of growth. This is shown by the low world trade effect results (Table 7.1)

Table 7.2 Summary of Revealed Comparative Advantage Indices for Total Processed Food Trade for the Six Processed Food Exporters Studied

	1976	***1981***	***1986***	***1991***	***1996***
ASEAN	1.64	1.50	1.81	1.54	1.20
Australia	2.68	3.11	2.07	2.40	2.43
Chile	0.42	0.95	1.13	1.95	2.42
EU	0.97	1.23	1.06	1.17	1.17
NAFTA	0.52	0.60	0.59	0.59	0.60
New Zealand	6.38	7.94	6.40	7.15	7.36

In contrast to ASEAN, Australia has experienced a decline in its share of world processed food trade. This decline has been associated with a loss in competitiveness, particularly between 1976 and 1986 (Table 7.1). Furthermore, Australia's processed food exports were focused around slow growth commodities during the 1976-86 period. This focus significantly inhibited Australia's growth in processed food trade. This also meant that Australia was largely dependant on the general expansion of world processed food trade for a positive source of growth as indicated by the large world trade component results. However, over the 1986-96 period Australia's processed food trade moved through a transitional phase. This was due to Australia's ability to diversify her processed food exports away from slow growth commodities and towards those commodities experiencing growth above the world average. This allowed Australia to be less reliant on the expansion of world processed food trade, as the commodity composition component for Australia became a positive source of growth. The only factor which has benefited the growth of Australia's processed food trade has been her ability to further penetrate the high demand growth countries of the Asian region. This has reduced the importance of the slow demand growth countries of NAFTA and the ROW for Australia's processed food exports.

The fluctuating CMS components are reflected in the fluctuating comparative advantage indices, as Australia experienced a large decline in comparative advantage

between 1981 and 1986 (Table 7.2). However, over the latter period of the study, Australia managed to regain some of the lost comparative advantage (but not to the high levels achieved in the early 1980s), and maintain her second-ranked position among the study exporters.

Chile's success in increasing her share of world processed food trade, similar to ASEAN's, is associated with an increase in competitiveness and the ability to be unreliant on the general expansion of world processed food trade as a source of growth (Table 7.1). Also, Chile's ability to focus on exporting 'growth' commodities played a significant role in the expansion of Chile's processed food trade over the 1976-86 period. The role of these three CMS components has been a factor in the rising comparative advantage of Chile. Although initially having a comparative disadvantage in world processed food trade, Chile has been able to turn this around with a combination of increased competitiveness and the general exportation of 'growth' commodities. Chile's overall comparative advantage increased to be just below the comparative advantage of Australia (Table 7.2). It could be postulated that this success in increasing competitiveness, market share and comparative advantage was due to the market-orientated reforms undertaken in Chile.

The only factor retarding the growth of Chile's processed food trade was the market distribution component. This was due to Chile's inability to capitalise on the potential offered by high import demand-growth regions. Chile's main processed food destinations were NAFTA, the EU and the ROW which experienced relatively poor demand-growth. However, the market distribution results for the latter part of the study suggest that Chile has been able to some extent shift away from these slow demand growth areas.

Despite Chile's success in increasing its competitiveness and share of world processed food trade, Chile's processed food industry may be more susceptible to fluctuations in world demand due to her narrow commodity range and number of export markets. By having a wider commodity range and diversifying into a greater number of processed food markets Chile may be able to reduce her vulnerability to external demand factors.

Although the EU has dominated world processed food trade, it has not always enjoyed a comparative advantage in the trade of such goods. It was not until 1979 that the EU managed to gain an overall comparative advantage in processed food trade. Since that time the EU has failed to significantly increase its comparative advantage, generally ranking fifth out of the six exporters studied (Table 7.2). The only other exporter to rank below the EU was NAFTA (initially Chile also ranked below the EU, but has since surpassed it). Also the EU has not held the highest comparative advantage among the six exporters studied in any commodity.

Despite the EU's three main processed food commodities all experiencing a decline in comparative advantage after an initial increase, the EU was able to increase her overall competitiveness until the 1990s. This rise in competitiveness and the EU's ability to concentrate on exporting 'growth' commodities were two important factors assisting the growth of the EU's processed food exports (Table 7.1). This enabled the EU to increase its dominance of world processed food trade. A wide commodity base has helped to reduce fluctuations in world demand-growth. However, the large amount of intra-EU trade and the relatively slow demand growth experienced within the EU was a major factor retarding the growth of its processed food exports. This was particularly evident between 1986 and 1996. With such a large proportion of trade being of an intra-EU nature, the EU has not exploited the potential offered by other export markets which have displayed higher import demand-growth, especially in the Asian region. A loss in competitiveness over the latter part of the study period was associated with a loss in market share. This meant that the EU had to rely heavily on the general expansion of world processed food trade as a source of growth.

Despite NAFTA contributing significantly to overall world trade in processed foods, NAFTA has had a comparative disadvantage throughout the study period (Table 7.2). In fact, NAFTA held a comparative advantage in only one processed food commodity.

Although NAFTA experienced a decline in competitiveness between 1976 and 1986, the ability of NAFTA to focus both on exporting 'growth' commodities to high demand growth regions was fundamental to the growth of NAFTA's processed food exports (Table 7.1). Exporting 'growth' commodities to high import demand-growth

regions were the two main factors which enabled NAFTA to increase her share of world processed food trade. However, between 1986 and 1996 NAFTA managed to increase competitiveness, but exported 'growth' commodities to slow import demand-growth regions. This caused the market distribution component to progress into a source of negative growth. One of the main factors limiting the ability of NAFTA to increase its share of world processed food trade has been the inability to consistently achieve positive growth trends in the CMS components.

New Zealand has enjoyed a comparative advantage in the processed food trade and has been able to maintain this over the entire study period (Table 7.1). However, in terms of New Zealand's share of world processed food trade, New Zealand has not performed up to a level that might be expected due to possessing such a comparative advantage. In the early part of the study period, New Zealand increased her share of world processed food trade as there was an increase in both competitiveness and comparative advantage. New Zealand relied less on the world expansion of processed food trade as a source of growth because New Zealand's main processed food commodities experienced growth in excess of the world average growth rate. Although poor demand-growth in New Zealand's traditional export market, the EU (United Kingdom) was a source of negative growth and constituted a negative market distribution result.

However, from the mid 1980s to early 1990s, the CMS results reveal that New Zealand did not perform as well as could have been expected, given the RCA that was enjoyed. During this period of economic reform New Zealand's processed food export performance was largely influenced by the trends in world processed food trade as New Zealand was heavily reliant on the general expansion of world processed food trade as a source of growth. This heavy reliance on world processed food trade as a source growth was due to New Zealand's failure to capitalise on the potential offered by the Asian countries where import demand-growth for processed food products generally exceeded world import demand-growth. As a consequence the growth in New Zealand's processed food trade was limited.

An increasing realisation of the potential offered by the fast growing Asian countries enabled New Zealand to rely less on the EU and NAFTA as export

destinations. The market distribution component become a positive source of growth over the latter part of the study period (Table 7.1). This allowed New Zealand to reduce dependence on the general expansion of world processed food trade as a source of growth over the last two sub-periods of the study. However, further research into the heavy reliance on the EU may indicate that it was more profitable to export products to the EU under tariff-quotas than to export them to Asian markets. Although the CMS results indicate that New Zealand has concentrated on exporting a narrow range of commodities, indicating that New Zealand is potentially more susceptible to the fluctuations in world processed food demand in comparison to a country which has a much wider commodity range.

The results indicate that it is not sufficient for New Zealand to rely on its apparent comparative advantage in processed food trade in order to boost (future) exports, as the loss in New Zealand's competitiveness between 1982 and 1992 was probably eroded not only by the abandonment of the SMP scheme, due to the 'export subsidy' nature of the government enacted policy, but also by the prevalence of production subsidies and trade barriers such as tariffs used by competitors. New Zealand therefore requires domestic policies aimed at increasing competitiveness and decreasing the dependence upon the 'world trade effect' to expand exports and reduce the vulnerability of the processed food sector to external demand factors. The encouragement of diversification of exports is perhaps a long-term policy that could overcome this vulnerability. Also New Zealand needs improved market distribution techniques to align her processed food exports to growth points in world demand. This would provide a useful means of expanding and diversifying New Zealand's processed food exports. Therefore the government needs to work towards reducing world-wide tariff and non-tariff barriers to trade and in association with the private sector to further increase the productivity and efficiency of the New Zealand processed food sector, both within the commodities already exported and new commodities.

7.2 Conclusion

Given the changing nature of world food consumption patterns and the increasingly important role of processed foods, this research has sought to analyse and document the comparative export performance of six processed food exporters. A CMS

model was implemented to identify the role of four sources of growth in processed food trade, and was combined with RCA indices to determine the overall performance of an exporter's processed food trade over the 1976-96 study period.

The empirical results of the CMS analysis suggest that an increase in competitiveness and reduced reliance on the general expansion of world processed food trade are major driving forces for an increased share of world processed food trade. This was particularly so for ASEAN and Chile which were able to increase their share of world processed food trade throughout the study period. This also enabled Chile to shift from an initial state of comparative disadvantage to one of comparative advantage in processed food trade. Also ASEAN and Chile have shown the ability to diversify away from factors responsible for retarding growth towards those responsible for enhancing growth.

Increased competitiveness and a low reliance on the world expansion of processed food trade also allowed the EU to initially increase its dominance of world processed food trade. However, a decline in competitiveness during the latter part of the study period, combined with poor market distribution (due to poor demand growth within the EU) have been factors responsible for the loss in market share during the 1990s. Poor market distribution results were also a factor responsible for retarding the growth of NAFTA's processed food exports and increasing its reliance on the expansion of world processed food trade as a source of growth. Additionally, the inability of NAFTA to consistently increase competitiveness was a factor responsible for inhibiting the ability of NAFTA to significantly increase its share of world processed food trade and move from a state of comparative disadvantage.

The results for suggest that Australia's processed food trade is in a transitional period. After losing market share in world processed food trade due to losses in competitiveness and exporting slow growth commodities, Australia has shifted away from slow growth commodities and aligned herself towards 'growth' commodities in world processed food trade. This resulted in the commodity composition component becoming a positive source of growth during the 1986-96 period. Furthermore, competitiveness also started to increase over this period. The ability of Australia to

penetrate the high demand-growth countries in the Asian region throughout the study period has been a source of positive growth.

New Zealand initially performed relatively well as competitiveness increased along with market share and comparative advantage. However, during the economic reform period this was reversed. New Zealand lost competitiveness, market share and comparative advantage and was heavily reliant on the expansion of world processed food trade as a source of growth. Although New Zealand has been able to export high growth commodities, the inability of New Zealand to take advantage of the potential offered by high demand-growth countries in the Asian region and a heavy reliance on the EU as an export destination has been a major factor limiting the growth of New Zealand's processed food exports. Nevertheless, there is evidence to suggest that a shift in export focus towards the Asian countries and an increase in competitiveness is currently under way in New Zealand's processed food trade. Further research is warranted to determine if this is a result of the economic reforms.

However, it should be remembered that the empirical results must be considered along with the limitations of the data and the models used in this study. Nevertheless, this research provides an insight into the export performance of processed food exporters. This renders the basis for further research to be undertaken to quantify and refine the competitiveness component.

7.3 Future Research

The empirical results of the CMS analysis used in this study provide a means of identifying sources of growth, the influence they exert on the performance of a country's processed food exports and its share of world processed food trade. The CMS model identifies three sources of growth, plus a residual term associated with changes in a country's competitiveness. However, this model does not provide an explanation for the changes in competitiveness. Therefore the competitiveness residual needs qualification. While the CMS analysis in this study serves as a good first step in the examination of a country's export performance further investigation into the determinants of changes in competitiveness (and hence export performance) would be a logical extension of this research.

The use of an econometric model is warranted to identify the determinants of competitiveness and to quantify them in order to ascertain the explanatory power of each variable. Possible explanatory variables may include unit labour costs, total factor productivity, processed food prices, exchange rates and the level of government assistance to the food-processing sector. An investigation into the effect of foreign direct investment on the expansion of processing plants, their ability to extract gains from economies of scale and the effect on the competitiveness of domestic producers may also provide further interesting results.

At present, this study is hampered by the lack of highly disaggregated data. Further disaggregation would be beneficial in terms of a more detailed examination of the processed food products exported by a country. This would elucidate the type of product exported, in terms of distinguishing between countries which export predominantly lowly processed products and those which concentrate on exporting highly processed, differentiated goods. Currently no distinction can be made with the data presently available from the NAPES database. More recent data would also be invaluable in order to determine if New Zealand's economic reforms of the mid 1980s were responsible for the increased competitiveness during the 1990s (given the increase in competitiveness for New Zealand over the last two sub-periods) and to determine the impact of the Asian crisis during the late 1990s.

Given the high importance of intra-regional trade, an examination of the potential gains and losses likely to be accrued from entering into a major regional trade agreement for a country such as New Zealand would be beneficial. Increased regional trade provides expanding market opportunities for both new and existing members. Such expansion will have important implications for non-member countries as they compete against the discriminatory practices of member countries in terms of barriers to trade. Overall, further empirical analysis is required in order to draw firm conclusions as to the factors determining a country's trade performance in processed foods.

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Appendix A

Processed Food Commodity Aggregate Composition

3 Digit Standard International Trade Classification

Meat

011 Meat Fresh, Chilled, Frozen

012 Meat Dried, Salted, Smoked

013 Meat Tinned NES or Prepared

Dairy

022 Milk and Cream

023 Butter

024 Cheese and Curd

Fish

031 Fish Fresh, Simply Preserved

032 Fish etc Tinned, Prepared

Cereals

046 Wheat etc Meal or Flour

047 Meal and Flour Non-Wheat

048 Cereal etc Preparations

Fruit and Vegetables (Fruit & Vege)

053 Fruit Preserved, Prepared

055 Vegetables etc Preserved, Prepared

Sugar and Honey

061 Sugar and Honey

062 Sugar Preparations Non Chocolate

Coffee and Cocoa

071 Coffee

072 Cocoa

073 Chocolate and Products

Beverages

111 Non-Alcoholic Beverages NES

112 Alcoholic Beverages

Animal Oils and Fats (Ani Oils & Fats)

411 Animal Oils and Fats

Vegetable Oils and Fats
(Vege Oils & Fats)

421 Fixed Vegetable Oil, Soft

422 Fixed Vegetable Oil, Non-Soft

Processed Animal and Vegetable Oil
(Pro Ani/Vege Oil)

431 Processed Animal, Vegetable Oil, etc

Appendix B

Focus Country's and Regions

Focus Exporters

Countries

Australia

Chile

New Zealand

Regions

ASEAN	Association of South East Asian Nations (Brunei, Indonesia, Malaysia, Philippines, Singapore, Thailand)
EU	European Union (Belgium, Denmark, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, United Kingdom)
NAFTA	North American Free Trade Agreement (Canada, Mexico & the United States)

Focus Markets, (Export Destinations)

ASEAN	Australia
Chile	China
European Union	Japan
NAFTA	New Zealand

NIE (Newly Industrialised Economies, Hong Kong, Korea, Singapore, Taiwan)

ROW

Appendix C

Frequency of Commodities Recording Growth Above the World Growth Rate for Total Processed Foods

The values in the table represents the number of two-year sub-periods (out of the ten two-year sub-periods between 1976 and 1996) that each commodity achieved world export growth above the growth rate for total world processed food exports, ($r_i > r$).

Processed Food Commodity	***Frequency***
Beverages	8
Cereals *Dairy*	7
Meat	6
Fish *Fruit and Vegetables* *Animal Oils and Fats*	5
Sugar and Honey *Coffee and Cocoa* *Vegetables Oils and Fats* *Processed Animal and Vegetables Oils*	4

Appendix D

Frequency of Two-Year Sub-Periods an Export Destination Recorded Import Demand-Growth Above World Demand-Growth by Commodity

Commodity	Country of Destination									
	ASEAN	*Australia*	*Chile*	*China*	*EU*	*Japan*	*NAFTA*	*NIE*	*New Zealand*	*ROW*
Meat	7	7	6	7	3	8	2	8	7	5
Dairy	8	5	5	4	4	5	4	9	8	5
Fish	6	4	7	9	5	7	3	6	5	6
Cereals	6	5	6	6	5	5	6	6	7	2
Fruit & Vege	5	6	8	7	6	7	5	8	6	4
Sugar & Honey	7	7	6	4	6	3	4	7	5	5
Coffee & Cocoa	6	6	8	5	5	6	4	9	6	5
Beverages	8	6	5	7	6	7	4	9	6	2
Ani. Oils & Fats	6	7	6	5	5	4	10	6	5	3
Vege. Oils & Fats	5	5	5	6	3	5	5	6	4	6
Pro. Ani/Vege Oils	6	6	6	6	4	5	7	6	4	4

Values recorded in table are the number of two-year sub-periods (out of the ten two-year sub-periods between 1976 and 1996) a country or region recorded import demand-growth for a commodity in excess of the world demand-growth for the commodity, ($r_{ij} > r_i$).

Appendix E

ASEAN

Figure E1 *Percentage Share of Each Commodity in ASEAN's Total Processed Food Exports*

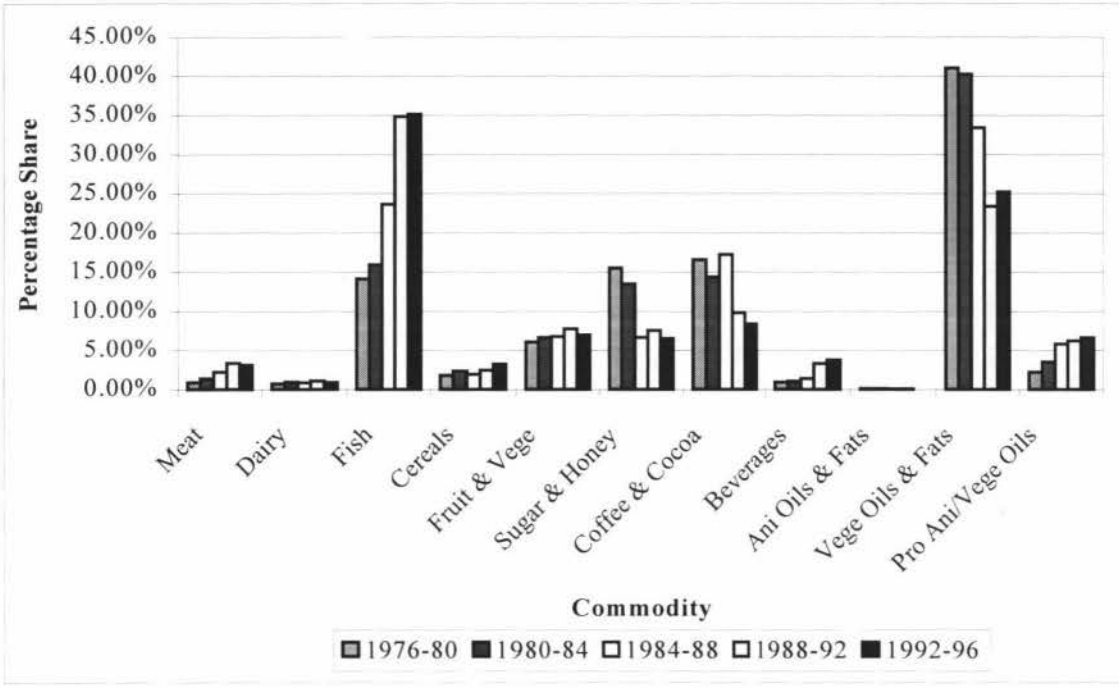

Figure E2 *Export Destinations Share of ASEAN's Total Processed Food Exports*

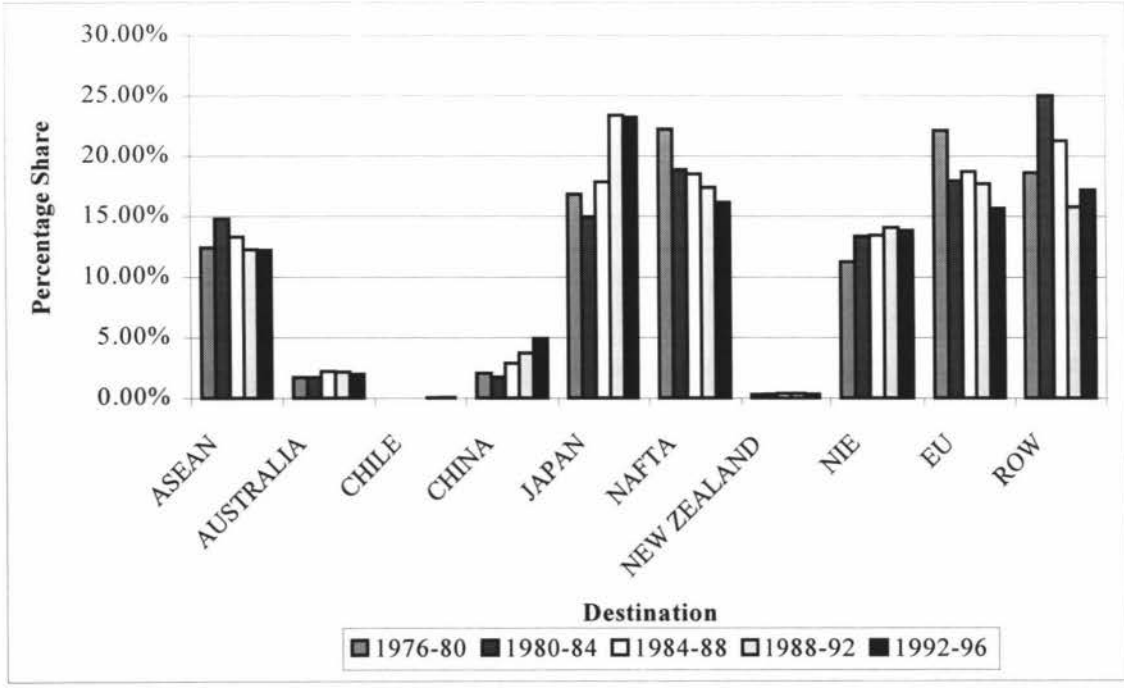

Table E1 ASEAN's Constant Market Share Results

1976-86	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	19,399	392	15,714	128,432	163,937	163,937
Dairy	19,399	3,649	6,401	8,502	37,951	37,951
Fish	385,554	484,782	263,469	218,072	1,351,877	1,351,877
Cereals	38,798	3,940	-7,081	46,876	82,532	82,532
Fruit & Vege	189,140	39,433	89,487	569	318,630	318,630
Sugar & Honey	754,134	-966,246	-137,876	9,289	-340,699	-340,699
Coffee & Cocoa	332,207	12,894	153,751	879,620	1,378,472	1,378,472
Beverages	21,824	11,245	2,653	32,668	68,389	68,389
Ani Oils & Fats	4,850	-5,034	-356	8,371	7,830	7,830
Vege Oils & Fats	938,424	-223,308	-67,751	251,058	898,423	898,423
Pro Ani/Vege Oils	33,948	8,834	16,291	267,602	326,675	326,675
Total Pro. Food	2,737,675	-629,419	334,702	1,851,058	4,294,017	4,294,017
% of Actual Change	63.76%	-14.66%	7.79%	43.11%	100.00%	

1976-78	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	8,014	-81	1,860	14,395	24,188	24,188
Dairy	8,014	693	2,654	-2,479	8,883	8,883
Fish	159,284	56,287	65,396	-81,461	199,506	199,506
Cereals	16,029	-4,005	-490	21,537	33,071	33,071
Fruit & Vege	78,139	-4,114	20,458	-15,528	78,956	78,956
Sugar & Honey	311,556	-316,885	-146,492	-233,672	-385,494	-385,494
Coffee & Cocoa	137,245	54,470	25,719	164,262	381,696	381,696
Beverages	9,016	2,859	5,391	4,206	21,472	21,472
Ani Oils & Fats	2,004	-261	-654	-2,693	-1,606	-1,606
Vege Oils & Fats	387,692	175,390	-61,554	329,941	831,470	831,470
Pro Ani/Vege Oils	14,025	-1,830	2,405	43,034	57,634	57,634
Total Pro. Food	1,131,019	-37,477	-85,307	241,541	1,249,776	1,249,776
% of Actual Change	90.50%	-3.00%	-6.83%	19.33%	100.00%	

1980-82	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	-8,560	6,375	16,737	20,693	35,245	35,245
Dairy	-8,560	9,779	8,098	-2,347	6,969	6,969
Fish	-119,839	162,879	119,704	-15,691	147,053	147,053
Cereals	-19,022	10,278	-2,312	24,973	13,917	13,917
Fruit & Vege	-51,360	60,952	54,643	-8,281	55,954	55,954
Sugar & Honey	-116,986	-310,660	46,259	592,094	210,707	210,707
Coffee & Cocoa	-136,008	-103,139	90,113	-64,617	-213,651	-213,651
Beverages	-8,560	4,701	1,547	9,281	6,969	6,969
Ani Oils & Fats	-951	285	-905	1,560	-11	-11
Vege Oils & Fats	-353,811	-178,083	-26,750	31,425	-527,219	-527,219
Pro Ani/Vege Oils	-23,778	-15,786	973	52,452	13,861	13,861
Total Pro. Food	-847,434	-352,420	308,106	641,541	-250,206	-250,206
% of Actual Change	-338.69%	-140.85%	123.14%	256.40%	100.00%	

1986-96	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	218,381	9,187	219,235	27,479	474,282	474,282
Dairy	70,194	-333	57,944	-22,496	105,309	105,309
Fish	2,098,021	121,735	285,174	2,541,812	5,046,743	5,046,743
Cereals	148,187	194,633	124,956	165,175	632,952	632,952
Fruit & Vege	623,947	-13,928	-10,233	222,634	822,421	822,421
Sugar & Honey	592,749	187,243	539,797	-239,865	1,079,925	1,079,925
Coffee & Cocoa	2,059,024	-1,693,934	162,414	-529,196	-1,692	-1,692
Beverages	109,191	43,126	196,363	350,425	699,104	699,104
Ani Oils & Fats	15,599	-2,541	3,842	-30,161	-13,262	-13,262
Vege Oils & Fats	2,293,004	878,108	325,997	426,939	3,924,048	3,924,048
Pro Ani/Vege Oils	428,963	111,053	-17,158	432,336	955,195	955,195
Total Pro. Food	8,657,260	-165,651	1,888,332	3,345,083	13,725,025	13,725,025
% of Actual Change	63.08%	-1.21%	13.76%	24.37%	100.00%	

1978-80	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	15,326	477	-1,076	3,079	17,805	17,805
Dairy	10,217	2,824	2,608	17,461	33,110	33,110
Fish	210,727	-21,467	-63,383	134,870	260,747	260,747
Cereals	25,543	13,175	2,451	23,906	65,075	65,075
Fruit & Vege	97,062	-21,147	-7,860	23,468	91,524	91,524
Sugar & Honey	153,256	194,399	45,312	18,722	411,689	411,689
Coffee & Cocoa	251,596	-195,099	35,603	166,567	258,667	258,667
Beverages	15,326	144	2,045	290	17,805	17,805
Ani Oils & Fats	1,277	-763	-496	3,236	3,254	3,254
Vege Oils & Fats	628,350	-44,436	-39,833	207,159	751,241	751,241
Pro Ani/Vege Oils	31,928	21,614	13,050	14,752	81,344	81,344
Total Pro. Food	1,440,608	-50,278	-11,581	613,511	1,992,260	1,992,260
% of Actual Change	72.31%	-2.52%	-0.58%	30.79%	100.00%	

1982-84	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	2,845	-15,167	16,566	-1,640	2,603	2,603
Dairy	2,032	-13,027	-3,721	-9,095	-23,812	-23,812
Fish	29,869	-24,598	9,153	118,386	132,811	132,811
Cereals	4,470	276	3,098	8,525	16,369	16,369
Fruit & Vege	12,598	53,295	32,961	-44,911	53,943	53,943
Sugar & Honey	31,088	-220,993	-106,624	-175,608	-472,137	-472,137
Coffee & Cocoa	22,960	135,421	-5,205	259,044	412,220	412,220
Beverages	2,032	-5,078	1,777	896	-373	-373
Ani Oils & Fats	203	923	61	-444	744	744
Vege Oils & Fats	60,551	1,353,173	196,567	-99,430	1,510,860	1,510,860
Pro Ani/Vege Oils	5,486	65,901	2,413	141,614	215,413	215,413
Total Pro. Food	174,133	1,330,125	147,047	197,337	1,848,642	1,848,642
% of Actual Change	9.42%	71.95%	7.95%	10.67%	100.00%	

1984-86	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	16,674	6,862	-2,525	63,085	84,096	84,096
Dairy	7,696	1,621	-6,190	9,673	12,800	12,800
Fish	192,391	357,019	10,606	51,744	611,760	611,760
Cereals	28,217	-16,703	-27,623	-29,791	-45,899	-45,899
Fruit & Vege	80,804	-63,070	-17,111	37,629	38,253	38,253
Sugar & Honey	100,043	-86,505	-127,341	8,337	-105,465	-105,465
Coffee & Cocoa	198,804	155,979	-32,536	217,293	539,541	539,541
Beverages	11,543	10,790	-11,726	11,908	22,516	22,516
Ani Oils & Fats	1,283	-4,299	93	8,372	5,449	5,449
Vege Oils & Fats	593,847	-1,945,952	-47,481	-268,342	-1,667,928	-1,667,928
Pro Ani/Vege Oils	66,696	-80,118	17,141	-45,294	-41,576	-41,576
Total Pro. Food	1,297,998	-1,664,375	-244,692	64,615	-546,455	-546,455
% of Actual Change	237.53%	-304.58%	-44.78%	11.82%	100.00%	

1986-88	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	45,636	11,577	37,304	10,409	104,926	104,926
Dairy	14,669	13,909	-2,968	39,251	64,861	64,861
Fish	438,428	246,249	118,158	630,713	1,433,548	1,433,548
Cereals	30,967	28,990	23,596	8,404	91,956	91,956
Fruit & Vege	130,388	-16,563	-4,583	55,631	164,872	164,872
Sugar & Honey	123,868	7,667	468,032	-522,332	77,235	77,235
Coffee & Cocoa	430,279	-744,767	91,657	-2,119	-224,950	-224,950
Beverages	22,818	8,102	39,171	34,264	104,354	104,354
Ani Oils & Fats	3,260	1,157	-2,881	-14,798	-13,262	-13,262
Vege Oils & Fats	479,174	93,698	148,277	214,523	935,672	935,672
Pro Ani/Vege Oils	89,641	31,828	50,241	190,069	361,778	361,778
Total Pro. Food	1,809,127	-318,153	966,005	644,013	3,100,991	3,100,991
% of Actual Change	58.34%	-10.26%	31.15%	20.77%	100.00%	

1988-90	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	44,693	24,579	-15,498	50,064	103,838	103,838
Dairy	19,154	-15,533	10,283	2,424	16,329	16,329
Fish	494,820	-20,293	-148,526	725,028	1,051,029	1,051,029
Cereals	33,520	53,260	13,124	-36,112	63,792	63,792
Fruit & Vege	106,945	58,814	-9,233	77,857	234,383	234,383
Sugar & Honey	89,387	69,722	-47,782	363,998	475,324	475,324
Coffee & Cocoa	234,640	-422,000	-23,122	-174,093	-384,575	-384,575
Beverages	30,328	28,494	44,444	65,802	169,069	169,069
Ani Oils & Fats	0	0	0	14,087	14,087	14,087
Vege Oils & Fats	443,741	-80,776	-34,909	-649,419	-321,363	-321,363
Pro Ani/Vege Oils	111,733	-67,075	-14,533	-10,005	20,121	20,121
Total Pro. Food	1,608,962	-370,807	-225,753	429,632	1,442,034	1,442,034
% of Actual Change	111.58%	-25.71%	-15.66%	29.79%	100.00%	

1990-92	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	57,575	5,203	45,947	44,395	153,120	153,120
Dairy	20,563	13,976	10,625	-21,766	23,397	23,397
Fish	623,046	-25,782	89,224	447,709	1,134,197	1,134,197
Cereals	41,125	30,196	906	84,077	156,304	156,304
Fruit & Vege	135,713	3,739	10,613	179,572	329,637	329,637
Sugar & Honey	154,219	-52,262	693	-45,807	56,843	56,843
Coffee & Cocoa	166,557	-179,103	6,290	-76,175	-82,432	-82,432
Beverages	53,463	418	28,160	190,511	272,551	272,551
Ani Oils & Fats	2,056	-697	3,547	-742	4,165	4,165
Vege Oils & Fats	374,239	-33,114	88,810	510,589	940,524	940,524
Pro Ani/Vege Oils	108,982	-36,931	-42,319	136,252	165,984	165,984
Total Pro. Food	1,737,539	-274,359	242,494	1,448,615	3,154,289	3,154,289
% of Actual Change	55.08%	-8.70%	7.69%	45.93%	100.00%	

1992-94	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	77,004	-59,781	78,692	-55,341	40,574	40,574
Dairy	23,101	-25,000	24,084	-7,456	14,729	14,729
Fish	759,774	132,853	368,090	547,703	1,808,420	1,808,420
Cereals	61,603	-7,959	43,166	104,414	201,225	201,225
Fruit & Vege	177,109	-121,504	47,734	-33,032	70,308	70,308
Sugar & Honey	156,575	-20,229	-40,677	-160,624	-64,956	-64,956
Coffee & Cocoa	148,875	368,234	12,751	380,480	910,340	910,340
Beverages	89,838	-11,607	64,394	-65,457	77,169	77,169
Ani Oils & Fats	2,567	6,497	-3,046	-24,270	-18,252	-18,252
Vege Oils & Fats	492,826	824,531	576,274	-437,252	1,456,379	1,456,379
Pro Ani/Vege Oils	128,340	324,866	45,269	-106,957	391,518	391,518
Total Pro. Food	2,117,612	1,410,900	1,216,732	142,209	4,887,454	4,887,454
% of Actual Change	43.33%	28.87%	24.90%	2.91%	100.00%	

1994-96	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	93,072	-5,383	48,429	-64,295	71,824	71,824
Dairy	28,326	105	25,188	-67,626	-14,007	-14,007
Fish	1,141,146	-678,897	-143,942	-698,758	-380,451	-380,451
Cereals	101,165	79,085	11,263	-71,839	119,675	119,675
Fruit & Vege	210,424	42,740	-57,728	-172,215	23,221	23,221
Sugar & Honey	165,911	136,811	386,173	-153,416	535,479	535,479
Coffee & Cocoa	311,589	-34,247	26,509	-523,926	-220,075	-220,075
Beverages	113,305	19,158	-76,218	19,716	75,960	75,960
Ani Oils & Fats	0	0	0	0	0	0
Vege Oils & Fats	785,043	-7,899	-136,886	272,577	912,836	912,836
Pro Ani/Vege Oils	206,377	-117,301	-55,790	-17,491	15,795	15,795
Total Pro. Food	3,156,360	-565,828	26,996	-1,477,273	1,140,256	1,140,256
% of Actual Change	276.81%	-49.62%	2.37%	-129.56%	100.00%	

Appendix F

Australia

Figure F1 *Percentage Share of Each Commodity in Australia's Total Processed Food Exports*

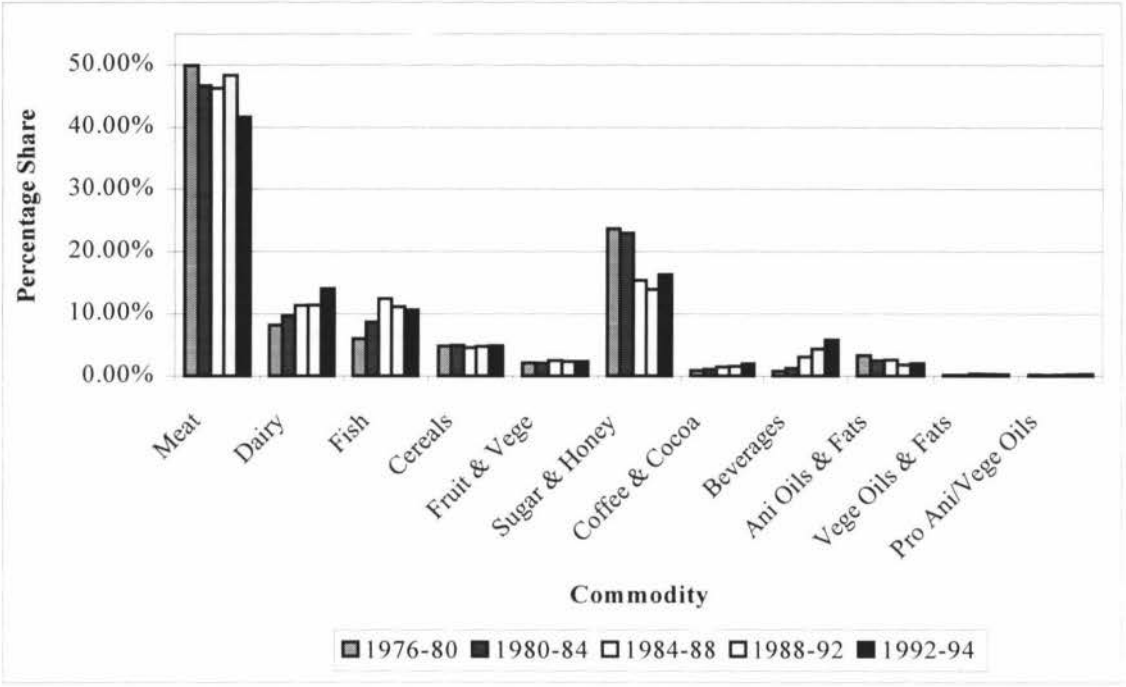

Figure F2 *Export Destinations Share of Australia's Total Processed Food Exports*

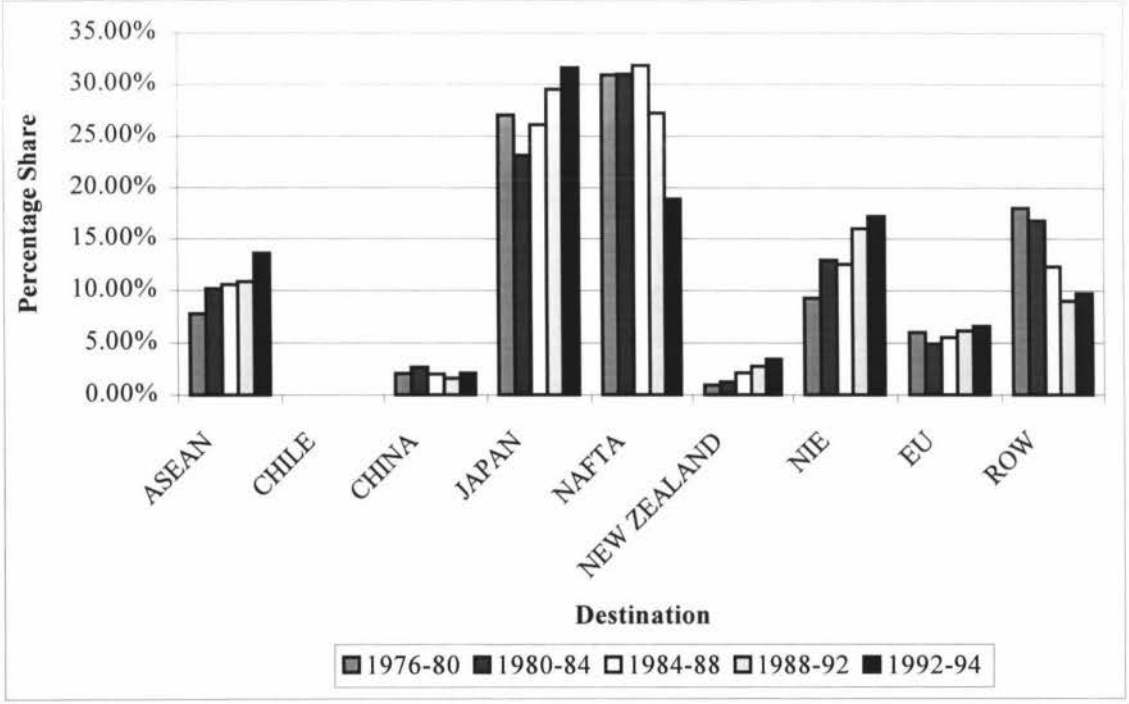

Table F1 Australia's Constant Market Share Results

1976-86	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	943,940	19,073	188,071	-718,921	432,163	432,163
Dairy	246,532	46,373	16,497	-216,836	92,566	92,566
Fish	119,970	150,846	50,068	-64,592	256,292	256,292
Cereals	127,880	12,986	-69,489	-75,432	-4,055	-4,055
Fruit & Vege	55,371	11,544	10,990	-56,906	20,999	20,999
Sugar & Honey	797,603	-1,021,941	-151,697	-109,544	-485,580	-485,580
Coffee & Cocoa	25,049	972	21,948	-29,633	18,336	18,336
Beverages	18,457	9,510	1,239	20,930	50,135	50,135
Ani Oils & Fats	81,738	-84,851	-14,078	1,334	-15,857	-15,857
Vege Oils & Fats	1,318	-314	427	6,859	8,290	8,290
Pro Ani/Vege Oils	6,592	1,715	31,314	-39,680	-58	-58
Total Pro. Food	2,424,450	-854,085	85,288	-1,282,422	373,231	373,231
% of Actual Change	649.59%	-228.84%	22.85%	-343.60%	100.00%	

1986-96	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	1,751,850	73,696	138,765	-1,036,896	927,414	927,414
Dairy	433,655	-2,058	345,668	62,454	839,719	839,719
Fish	459,502	26,662	81,554	-238,957	328,761	328,761
Cereals	163,697	215,004	116,103	-178,718	316,087	316,087
Fruit & Vege	97,644	-2,180	2,630	-12,496	85,599	85,599
Sugar & Honey	479,605	151,502	681,396	-331,995	980,508	980,508
Coffee & Cocoa	54,566	-44,891	8,666	98,262	116,603	116,603
Beverages	83,285	32,894	2,784	361,038	480,001	480,001
Ani Oils & Fats	89,028	-14,505	30,083	-22,923	81,683	81,683
Vege Oils & Fats	11,488	4,399	4,617	-13,409	7,095	7,095
Pro Ani/Vege Oils	8,616	2,230	9,602	-5,291	15,157	15,157
Total Pro. Food	3,632,934	442,754	1,421,869	-1,318,931	4,178,627	4,178,627
% of Actual Change	86.94%	10.60%	34.03%	-31.56%	100.00%	

1976-78	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	389,971	-3,951	4,012	277,900	667,932	667,932
Dairy	101,850	8,812	7,007	-135,912	-18,244	-18,244
Fish	49,563	17,514	12,686	-23,173	56,591	56,591
Cereals	52,831	-13,199	-8,624	-30,608	399	399
Fruit & Vege	22,875	-1,204	1,486	-13,360	9,797	9,797
Sugar & Honey	329,515	-335,151	-135,519	-100,956	-242,111	-242,111
Coffee & Cocoa	10,348	4,107	-2,004	-9,496	2,955	2,955
Beverages	7,625	2,418	910	-7,144	3,810	3,810
Ani Oils & Fats	33,768	-4,406	4,590	3,438	37,390	37,390
Vege Oils & Fats	545	246	340	3,921	5,052	5,052
Pro Ani/Vege Oils	2,723	-355	2,140	-5,363	-854	-854
Total Pro. Food	1,001,616	-325,170	-112,977	-40,752	522,717	522,717
% of Actual Change	191.62%	-62.21%	-21.61%	-7.80%	100.00%	

1978-80	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	575,827	17,907	12,630	-106,464	499,899	499,899
Dairy	86,074	23,792	36,913	-59,760	87,020	87,020
Fish	63,739	-6,493	-33,270	53,318	77,294	77,294
Cereals	47,940	24,728	-382	-17,119	55,167	55,167
Fruit & Vege	23,970	-5,222	548	-4,885	14,410	14,410
Sugar & Honey	217,365	275,719	75,869	34,868	603,820	603,820
Coffee & Cocoa	10,351	-8,026	5,965	-978	7,311	7,311
Beverages	8,172	77	349	7,638	16,235	16,235
Ani Oils & Fats	43,037	-25,714	-2,907	-42,760	-28,344	-28,344
Vege Oils & Fats	2,179	-154	875	152	3,052	3,052
Pro Ani/Vege Oils	2,179	1,475	1,564	-4,561	657	657
Total Pro. Food	1,080,833	298,089	98,154	-140,553	1,336,522	1,336,522
% of Actual Change	80.87%	22.30%	7.34%	-10.52%	100.00%	

1980-82	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	-298,907	222,622	115,349	-329,352	-290,289	-290,289
Dairy	-46,332	52,930	53,288	26,766	86,651	86,651
Fish	-36,036	48,979	37,365	31,474	81,781	81,781
Cereals	-26,705	14,429	622	11,852	197	197
Fruit & Vege	-11,583	13,746	1,428	-3,506	85	85
Sugar & Honey	-168,598	-447,718	143,765	-125,579	-598,129	-598,129
Coffee & Cocoa	-5,148	-3,904	13,118	5,561	9,628	9,628
Beverages	-5,470	3,004	2,185	7,513	7,233	7,233
Ani Oils & Fats	-13,514	4,047	-12,566	17,338	-4,695	-4,695
Vege Oils & Fats	-1,287	-648	508	-3,359	-4,785	-4,785
Pro Ani/Vege Oils	-965	-641	581	-1,365	-2,390	-2,390
Total Pro. Food	-614,546	-93,154	355,644	-362,658	-714,714	-714,714
% of Actual Change	-85.98%	-13.03%	49.76%	-50.74%	100.00%	

1982-84	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	55,613	-296,524	198,641	-561,253	-603,522	-603,522
Dairy	12,404	-79,531	-18,100	30,448	-54,778	-54,778
Fish	10,061	-8,286	16,814	-16,972	1,618	1,618
Cereals	5,720	353	-2,483	-36,802	-33,213	-33,213
Fruit & Vege	2,481	10,495	-2,119	-34,372	-23,515	-23,515
Sugar & Honey	18,882	-134,227	-34,074	105,385	-44,033	-44,033
Coffee & Cocoa	1,378	8,129	-2,605	-12,152	-5,249	-5,249
Beverages	1,378	-3,444	841	3,511	2,286	2,286
Ani Oils & Fats	2,757	12,523	-1,402	5,766	19,643	19,643
Vege Oils & Fats	138	3,080	-412	-65	2,740	2,740
Pro Ani/Vege Oils	138	1,656	-423	-1,142	229	229
Total Pro. Food	110,951	-485,775	154,679	-517,648	-737,794	-737,794
% of Actual Change	-15.04%	-65.84%	20.97%	-70.16%	100.00%	

1984-86	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	218,544	89,940	-98,747	-51,595	158,142	158,142
Dairy	61,852	13,031	-52,093	-30,874	-8,083	-8,083
Fish	57,728	107,126	-5,020	-120,826	39,009	39,009
Cereals	27,215	-16,109	-25,987	-11,724	-26,606	-26,606
Fruit & Vege	10,309	-8,046	444	17,514	20,221	20,221
Sugar & Honey	100,613	-86,997	-188,255	-30,487	-205,126	-205,126
Coffee & Cocoa	7,010	5,500	488	-9,307	3,690	3,690
Beverages	8,247	7,709	-4,345	8,961	20,571	20,571
Ani Oils & Fats	18,968	-63,574	-336	5,090	-39,852	-39,852
Vege Oils & Fats	1,237	-4,054	1,952	3,096	2,231	2,231
Pro Ani/Vege Oils	825	-991	2,694	-227	2,301	2,301
Total Pro. Food	512,547	43,536	-369,205	-220,378	-33,501	-33,501
% of Actual Change	1529.93%	129.95%	-1102.06%	-657.82%	100.00%	

1986-88	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	366,088	92,870	98,361	81,840	639,158	639,158
Dairy	90,622	85,932	33,741	-119,680	90,615	90,615
Fish	96,023	53,933	28,187	-13,528	164,614	164,614
Cereals	34,208	32,024	22,670	-12,135	76,767	76,767
Fruit & Vege	20,405	-2,592	1,327	10,956	30,096	30,096
Sugar & Honey	100,224	6,203	8,938	213,821	329,186	329,186
Coffee & Cocoa	11,403	-19,737	2,662	31,261	25,589	25,589
Beverages	17,404	6,179	-3,129	121,250	141,705	141,705
Ani Oils & Fats	18,604	6,606	6,569	-21,779	10,000	10,000
Vege Oils & Fats	2,401	469	638	-2,992	516	516
Pro Ani/Vege Oils	1,800	639	3,821	-3,303	2,958	2,958
Total Pro. Food	759,182	262,526	203,785	285,712	1,511,206	1,511,206
% of Actual Change	50.24%	17.37%	13.48%	18.91%	100.00%	

1988-90	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	327,376	180,040	-86,252	181,693	602,856	602,856
Dairy	70,641	-57,285	23,368	99,545	136,269	136,269
Fish	85,402	-3,502	-37,996	-32,360	11,544	11,544
Cereals	33,212	52,770	1,633	-36,576	51,040	51,040
Fruit & Vege	17,397	9,567	-8,975	-20,201	-2,212	-2,212
Sugar & Honey	113,343	88,407	49,439	-158,436	92,752	92,752
Coffee & Cocoa	11,071	-19,911	-5,504	16,296	1,953	1,953
Beverages	32,685	30,709	4,684	-67,007	1,071	1,071
Ani Oils & Fats	13,179	-35,199	-1,209	44,331	21,101	21,101
Vege Oils & Fats	1,582	-288	133	4,720	6,147	6,147
Pro Ani/Vege Oils	1,582	-949	-424	1,831	2,039	2,039
Total Pro. Food	707,469	244,360	-61,104	33,836	924,560	924,560
% of Actual Change	76.52%	26.43%	-6.61%	3.66%	100.00%	

1990-92	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	398,707	36,030	38,325	-312,356	160,707	160,707
Dairy	86,936	59,088	31,787	-82,345	95,466	95,466
Fish	82,739	-3,424	27,333	-46,415	60,233	60,233
Cereals	38,971	28,614	-9,387	-77,770	-19,572	-19,572
Fruit & Vege	16,188	446	1,120	16,379	34,133	34,133
Sugar & Honey	121,111	-41,042	-50,593	-206,522	-177,046	-177,046
Coffee & Cocoa	10,792	-11,605	3,958	21,032	24,177	24,177
Beverages	31,177	244	-14,320	42,317	59,418	59,418
Ani Oils & Fats	15,589	-5,283	-3,518	-2,673	4,115	4,115
Vege Oils & Fats	2,398	-212	2,971	-258	4,899	4,899
Pro Ani/Vege Oils	1,799	-610	-506	4,058	4,740	4,740
Total Pro. Food	806,408	62,247	27,169	-644,552	251,272	251,272
% of Actual Change	320.93%	24.77%	10.81%	-256.52%	100.00%	

1992-94	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	406,731	-315,762	290,211	-318,415	62,765	62,765
Dairy	97,183	-105,172	78,355	208,168	278,534	278,534
Fish	88,185	15,420	72,137	-77,924	97,818	97,818
Cereals	34,794	-4,495	27,076	-4,678	52,697	52,697
Fruit & Vege	20,397	-13,993	16,036	-15,111	7,329	7,329
Sugar & Honey	91,784	-11,858	-88,832	482,809	473,903	473,903
Coffee & Cocoa	13,798	34,128	16,348	-23,874	40,400	40,400
Beverages	38,393	-4,960	3,697	77,696	114,826	114,826
Ani Oils & Fats	15,597	39,481	23,921	-56,013	22,986	22,986
Vege Oils & Fats	2,999	5,018	1,529	-17,024	-7,477	-7,477
Pro Ani/Vege Oils	2,400	6,074	1,611	-8,680	1,405	1,405
Total Pro. Food	812,262	-356,119	442,090	246,953	1,145,186	1,145,186
% of Actual Change	70.93%	-31.10%	38.60%	21.56%	100.00%	

1994-96	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	467,619	-27,043	-41,049	-937,599	-538,072	-538,072
Dairy	153,437	568	155,202	-70,373	238,834	238,834
Fish	114,713	-68,246	-19,704	-32,210	-5,447	-5,447
Cereals	47,493	37,127	15,254	55,281	155,154	155,154
Fruit & Vege	24,112	4,897	-2,554	-10,201	16,254	16,254
Sugar & Honey	178,280	147,010	556,190	-619,768	261,712	261,712
Coffee & Cocoa	21,920	-2,409	-3,198	8,172	24,484	24,484
Beverages	61,375	10,377	5,408	85,819	162,980	162,980
Ani Oils & Fats	21,189	8,391	3,971	-10,070	23,481	23,481
Vege Oils & Fats	2,192	-22	-652	1,492	3,010	3,010
Pro Ani/Vege Oils	2,923	-1,661	2,535	217	4,014	4,014
Total Pro. Food	1,095,251	108,989	671,404	-1,529,240	346,403	346,403
% of Actual Change	316.18%	31.46%	193.82%	-441.46%	100.00%	

Appendix G

Chile

Figure G1 *Percentage Share of Each Commodity in Chile's Total Processed Food Exports*

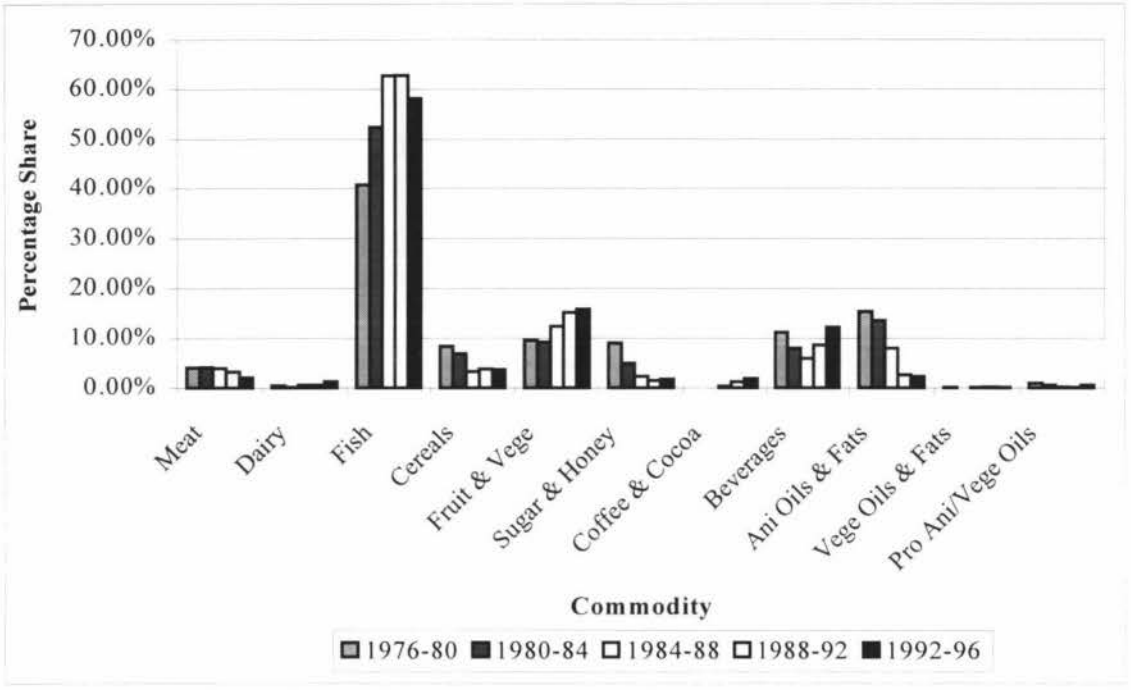

Figure G2 *Export Destinations Share of Chile's Total Processed Food Exports*

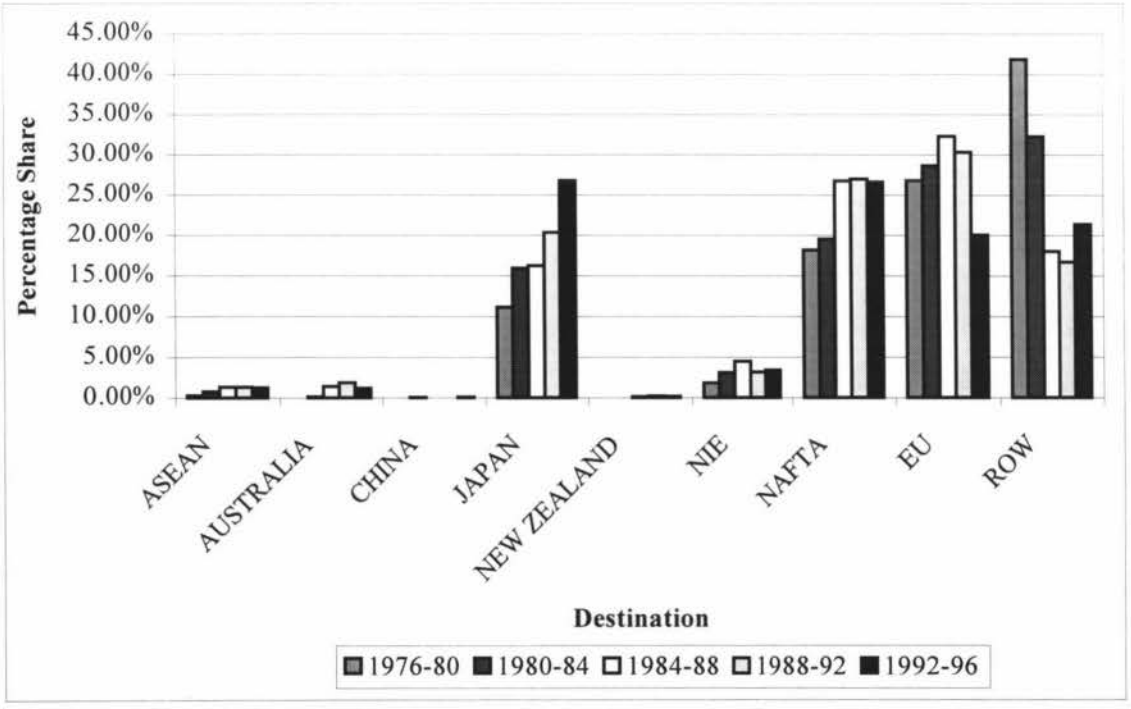

Table G1 Chile's Constant Market Share Results

1976-86	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	2,366	48	765	9,594	12,773	12,773
Dairy	592	111	6	2,188	2,897	2,897
Fish	23,859	30,000	-2,818	93,475	144,516	144,516
Cereals	4,141	420	-3,091	-176	1,294	1,294
Fruit & Vege	5,718	1,192	-1,381	25,636	31,165	31,165
Sugar & Honey	2,169	-2,779	844	105	339	339
Coffee & Cocoa	0	0	0	1,186	1,186	1,186
Beverages	7,099	3,658	-4,058	1,961	8,659	8,659
Ani Oils & Fats	9,465	-9,825	381	7,966	7,986	7,986
Vege Oils & Fats	0	0	0	395	395	395
Pro Ani/Vege Oils	789	205	-699	-783	-488	-488
Total Pro. Food	56,197	23,030	-10,051	141,547	210,723	210,723
% of Actual Change	26.67%	10.93%	-4.77%	67.17%	100.00%	

1986-96	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	18,141	763	7,982	-7,858	19,029	19,029
Dairy	4,186	-20	-666	19,903	23,403	23,403
Fish	201,413	11,687	-1,877	660,091	871,313	871,313
Cereals	6,977	9,164	-2,375	64,185	77,951	77,951
Fruit & Vege	44,190	-986	-9,142	241,434	275,496	275,496
Sugar & Honey	3,256	1,029	-825	23,730	27,190	27,190
Coffee & Cocoa	1,395	-1,148	408	38,602	39,257	39,257
Beverages	19,537	7,716	1,862	253,860	282,974	282,974
Ani Oils & Fats	21,862	-3,562	-4,144	10,697	24,853	24,853
Vege Oils & Fats	465	178	-161	2,119	2,600	2,600
Pro Ani/Vege Oils	465	120	1,186	14,310	16,082	16,082
Total Pro. Food	321,889	24,941	-7,753	1,321,072	1,660,149	1,660,149
% of Actual Change	19.39%	1.50%	-0.47%	79.58%	100.00%	

1976-78	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	978	-10	-15	337	1,289	1,289
Dairy	244	21	15	-697	-416	-416
Fish	9,857	3,483	-2,071	5,834	17,103	17,103
Cereals	1,711	-427	-237	1,456	2,502	2,502
Fruit & Vege	2,362	-124	296	663	3,198	3,198
Sugar & Honey	896	-911	-226	9,384	9,143	9,143
Coffee & Cocoa	0	0	0	0	0	0
Beverages	2,933	930	-453	-1,758	1,652	1,652
Ani Oils & Fats	3,910	-510	-827	8,493	11,066	11,066
Vege Oils & Fats	0	0	0	246	246	246
Pro Ani/Vege Oils	326	-43	47	509	840	840
Total Pro. Food	23,217	2,408	-3,469	24,468	46,623	46,623
% of Actual Change	49.80%	5.17%	-7.44%	52.48%	100.00%	

1978-80	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	1,315	41	1,393	3,855	6,604	6,604
Dairy	82	23	76	948	1,129	1,129
Fish	14,628	-1,490	-794	30,008	42,352	42,352
Cereals	2,383	1,229	0	8,958	12,571	12,571
Fruit & Vege	3,205	-698	-163	6,848	9,192	9,192
Sugar & Honey	3,863	4,899	-318	9,322	17,765	17,765
Coffee & Cocoa	0	0	0	0	0	0
Beverages	3,205	30	-259	9,883	12,859	12,859
Ani Oils & Fats	7,232	-4,321	327	10,391	13,630	13,630
Vege Oils & Fats	82	-6	-35	-288	-246	-246
Pro Ani/Vege Oils	575	389	-554	-759	-348	-348
Total Pro. Food	36,571	97	-327	79,167	115,507	115,507
% of Actual Change	31.66%	0.08%	-0.28%	68.54%	100.00%	

1980-82	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	-1,416	1,055	526	-3,192	-3,027	-3,027
Dairy	-185	211	2	-1,403	-1,375	-1,375
Fish	-11,577	15,735	3,368	10,088	17,614	17,614
Cereals	-2,648	1,431	-476	-6,207	-7,900	-7,900
Fruit & Vege	-2,525	2,996	98	-2,542	-1,973	-1,973
Sugar & Honey	-3,941	-10,466	-639	-13,218	-28,264	-28,264
Coffee & Cocoa	0	0	0	0	0	0
Beverages	-3,017	1,657	146	-8,005	-9,219	-9,219
Ani Oils & Fats	-4,742	1,420	84	-5,216	-8,454	-8,454
Vege Oils & Fats	0	0	0	0	0	0
Pro Ani/Vege Oils	-185	-123	199	165	56	56
Total Pro. Food	-30,235	13,916	3,308	-29,530	-42,541	-42,541
% of Actual Change	-71.07%	32.71%	7.78%	-69.42%	100.00%	

1982-84	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	216	-1,152	335	-1,207	-1,808	-1,808
Dairy	0	0	0	0	0	0
Fish	2,983	-2,457	-357	8,418	8,588	8,588
Cereals	339	21	-1,147	-1,392	-2,178	-2,178
Fruit & Vege	484	2,046	1,705	-721	3,514	3,514
Sugar & Honey	31	-219	205	-20	-3	-3
Coffee & Cocoa	0	0	0	0	0	0
Beverages	381	-951	-1,051	1,579	-42	-42
Ani Oils & Fats	772	3,505	-485	-2,094	1,698	1,698
Vege Oils & Fats	0	0	0	0	0	0
Pro Ani/Vege Oils	41	494	313	-1,567	-718	-718
Total Pro. Food	5,247	1,287	-480	2,997	9,050	9,050
% of Actual Change	57.98%	14.22%	-5.31%	33.12%	100.00%	

1984-86	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	937	386	222	8,170	9,715	9,715
Dairy	0	0	0	3,559	3,559	3,559
Fish	18,449	34,235	-2,532	8,707	58,859	58,859
Cereals	1,581	-936	-2,198	-2,148	-3,701	-3,701
Fruit & Vege	3,338	-2,606	-3,183	19,684	17,234	17,234
Sugar & Honey	176	-152	193	1,481	1,698	1,698
Coffee & Cocoa	0	0	0	1,186	1,186	1,186
Beverages	2,167	2,026	-1,107	324	3,410	3,410
Ani Oils & Fats	4,685	-15,704	142	923	-9,954	-9,954
Vege Oils & Fats	0	0	0	395	395	395
Pro Ani/Vege Oils	117	-141	-159	-136	-318	-318
Total Pro. Food	31,451	17,108	-8,621	42,147	82,084	82,084
% of Actual Change	38.32%	20.84%	-10.50%	51.35%	100.00%	

1986-88	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	3,791	962	554	-348	4,959	4,959
Dairy	875	830	-928	-2,297	-1,521	-1,521
Fish	42,090	23,640	-4,869	84,512	145,373	145,373
Cereals	1,458	1,365	-1,338	7,530	9,015	9,015
Fruit & Vege	9,234	-1,173	-2,875	19,751	24,937	24,937
Sugar & Honey	680	42	237	2,387	3,347	3,347
Coffee & Cocoa	292	-505	3	1,741	1,531	1,531
Beverages	4,083	1,450	-1,671	5,348	9,208	9,208
Ani Oils & Fats	4,569	1,622	-421	-577	5,193	5,193
Vege Oils & Fats	97	19	-30	198	284	284
Pro Ani/Vege Oils	97	35	296	-144	284	284
Total Pro. Food	67,266	28,286	-11,042	118,102	202,611	202,611
% of Actual Change	33.20%	13.96%	-5.45%	58.29%	100.00%	

1988-90	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	3,135	1,724	-1,462	-3,050	348	348
Dairy	313	-254	189	2,689	2,937	2,937
Fish	48,695	-1,997	7,309	96,230	150,237	150,237
Cereals	2,299	3,653	109	19,623	25,684	25,684
Fruit & Vege	9,614	5,287	-1,516	1,225	14,610	14,610
Sugar & Honey	940	734	1,892	-560	3,007	3,007
Coffee & Cocoa	418	-752	-106	2,697	2,258	2,258
Beverages	3,971	3,731	-832	20,382	27,252	27,252
Ani Oils & Fats	3,657	-9,768	-115	-3,458	-9,683	-9,683
Vege Oils & Fats	104	-19	-23	87	150	150
Pro Ani/Vege Oils	104	-63	69	39	150	150
Total Pro. Food	73,252	2,275	5,515	135,905	216,948	216,948
% of Actual Change	33.76%	1.05%	2.54%	62.64%	100.00%	

1990-92	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	3,026	273	-952	5,862	8,209	8,209
Dairy	726	494	-497	2,984	3,706	3,706
Fish	68,146	-2,820	-5,577	169,874	229,623	229,623
Cereals	5,931	4,355	-1,487	-16,633	-7,834	-7,834
Fruit & Vege	11,257	310	-2,104	115,030	124,493	124,493
Sugar & Honey	1,331	-451	-1,041	10,332	10,171	10,171
Coffee & Cocoa	726	-781	268	16,998	17,211	17,211
Beverages	7,747	61	-866	66,357	73,298	73,298
Ani Oils & Fats	2,058	-697	613	-636	1,338	1,338
Vege Oils & Fats	121	-11	71	1,883	2,065	2,065
Pro Ani/Vege Oils	121	-41	38	17	135	135
Total Pro. Food	101,191	691	-11,534	372,068	462,417	462,417
% of Actual Change	21.88%	0.15%	-2.49%	80.46%	100.00%	

1992-94	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	4,070	-3,160	3,964	2,683	7,558	7,558
Dairy	1,221	-1,321	-130	11,456	11,226	11,226
Fish	97,948	17,127	5,227	-10,515	109,786	109,786
Cereals	4,612	-596	-362	8,892	12,547	12,547
Fruit & Vege	28,353	-19,452	4,851	-16,287	-2,534	-2,534
Sugar & Honey	2,713	-351	996	4,998	8,357	8,357
Coffee & Cocoa	3,120	7,718	5,078	-12,665	3,251	3,251
Beverages	17,772	-2,296	7,789	1,886	25,151	25,151
Ani Oils & Fats	2,171	5,494	821	21,425	29,911	29,911
Vege Oils & Fats	407	681	-329	-2,547	-1,788	-1,788
Pro Ani/Vege Oils	136	343	178	590	1,247	1,247
Total Pro. Food	162,523	4,189	28,084	9,916	204,712	204,712
% of Actual Change	79.39%	2.05%	13.72%	4.84%	100.00%	

1994-96	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	5,776	-334	4,013	-11,500	-2,045	-2,045
Dairy	3,150	12	3,117	776	7,055	7,055
Fish	127,593	-75,908	-14,141	198,750	236,294	236,294
Cereals	7,176	5,610	5,404	20,348	38,538	38,538
Fruit & Vege	31,504	6,399	1,931	74,155	113,989	113,989
Sugar & Honey	4,376	3,608	490	-6,165	2,309	2,309
Coffee & Cocoa	4,026	-442	3,093	8,330	15,006	15,006
Beverages	23,978	4,054	-1,567	121,599	148,065	148,065
Ani Oils & Fats	7,176	2,842	54	-11,977	-1,905	-1,905
Vege Oils & Fats	175	-2	96	1,621	1,890	1,890
Pro Ani/Vege Oils	350	-199	342	13,772	14,265	14,265
Total Pro. Food	215,280	-54,361	2,833	409,710	573,461	573,461
% of Actual Change	37.54%	-9.48%	0.49%	71.45%	100.00%	

Appendix H

The European Union

Figure H1 *Percentage Share of Each Commodity in the European Union's Total Processed Food Exports*

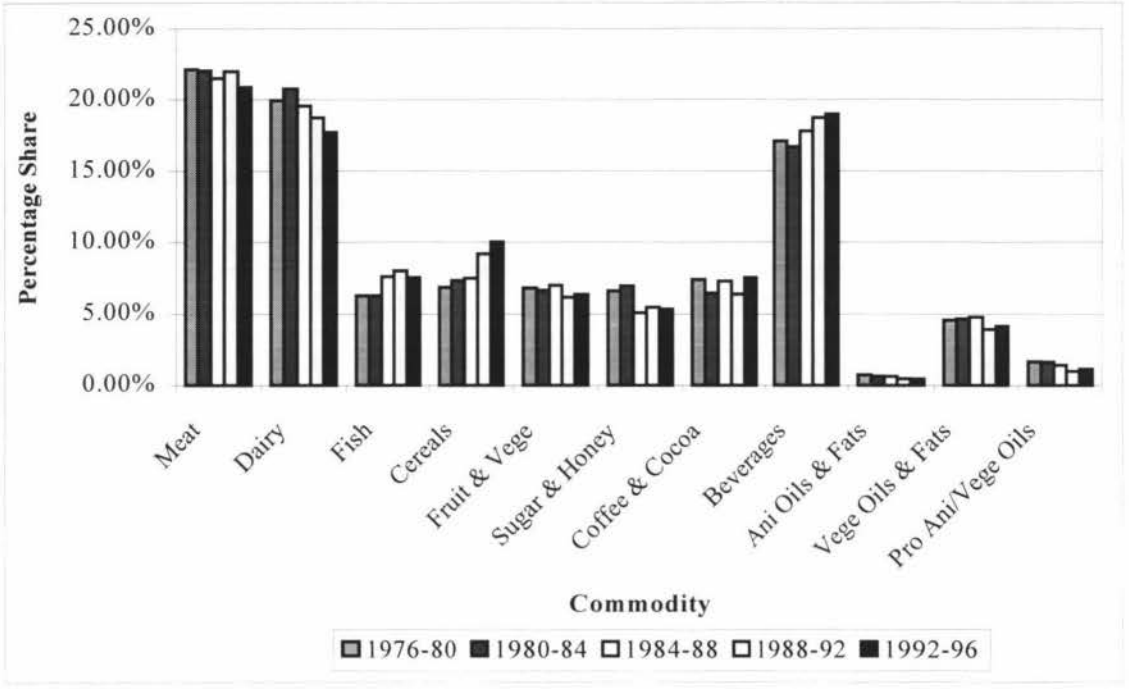

Figure H2 *Export Destinations Share of the European Union's Total Processed Food Exports*

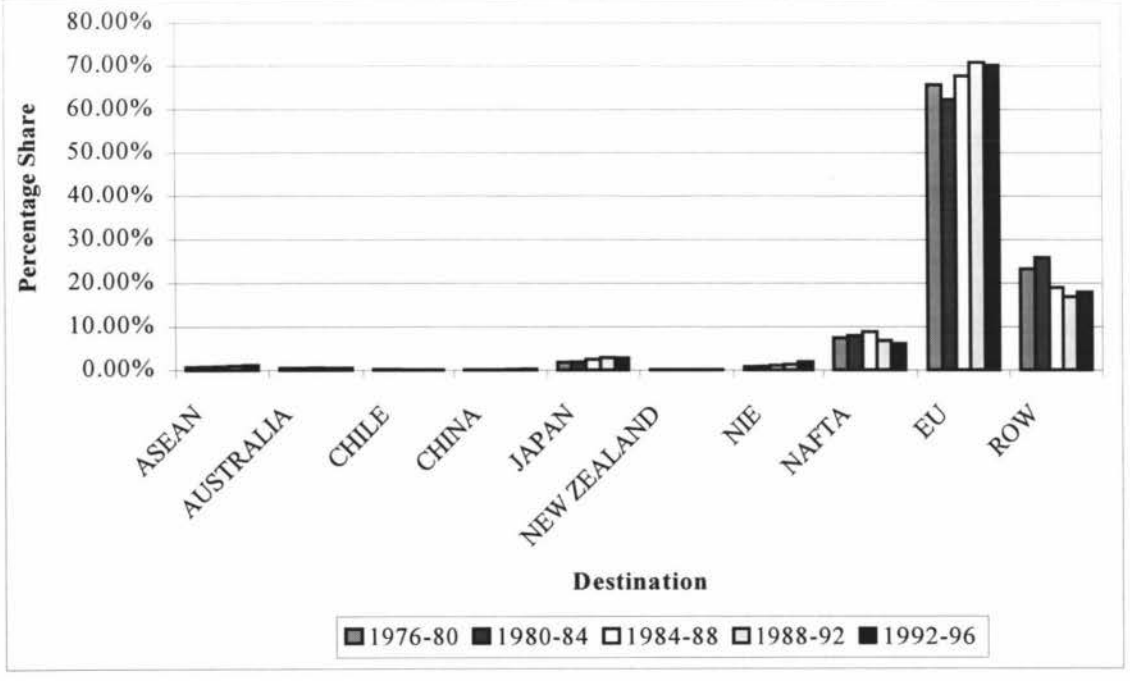

Table H1 The European Union's Constant Market Share Results

1976-86	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	5,048,370	102,009	-547,957	2,151,617	6,754,039	6,754,039
Dairy	4,384,111	824,664	-32,006	425,539	5,602,308	5,602,308
Fish	1,361,731	1,712,193	-158,107	-132,541	2,783,277	2,783,277
Cereals	1,461,370	148,400	288,550	428,684	2,327,003	2,327,003
Fruit & Vege	1,693,861	353,148	-235,082	427,019	2,238,947	2,238,947
Sugar & Honey	1,561,009	-2,000,067	414,061	1,034,038	1,009,041	1,009,041
Coffee & Cocoa	1,361,731	52,853	167,541	1,373,489	2,955,614	2,955,614
Beverages	3,620,213	1,865,347	181,386	273,931	5,940,877	5,940,877
Ani Oils & Fats	199,278	-206,868	2,256	126,814	121,480	121,480
Vege Oils & Fats	963,176	-229,198	-15,519	615,492	1,333,952	1,333,952
Pro Ani/Vege Oils	332,130	86,431	-23,697	8,664	403,528	403,528
Total Pro. Food	21,986,981	2,708,910	41,426	6,732,749	31,470,066	31,470,066
% of Actual Change	69.87%	8.61%	0.13%	21.39%	100.00%	

1986-96	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	14,594,851	613,965	-1,897,505	-1,116,426	12,194,885	12,194,885
Dairy	12,365,082	-58,688	-620,556	-995,680	10,690,158	10,690,158
Fish	5,067,657	294,044	-57,134	-11,760	5,292,806	5,292,806
Cereals	4,662,244	6,123,504	-382,636	-1,165,160	9,237,951	9,237,951
Fruit & Vege	4,864,950	-108,595	58,738	-950,158	3,864,936	3,864,936
Sugar & Honey	3,243,300	1,024,525	-255,107	-369,290	3,643,429	3,643,429
Coffee & Cocoa	5,270,363	-4,335,864	96,941	4,889,133	5,920,573	5,920,573
Beverages	11,756,963	4,643,495	-276,776	-1,916,120	14,207,562	14,207,562
Ani Oils & Fats	405,413	-66,053	-59,629	-24,328	255,403	255,403
Vege Oils & Fats	2,837,888	1,086,772	-367,061	-369,597	3,188,001	3,188,001
Pro Ani/Vege Oils	912,178	236,152	-164,572	-359,095	624,662	624,662
Total Pro. Food	65,980,888	9,453,258	-3,925,296	-2,388,483	69,120,367	69,120,367
% of Actual Change	95.46%	13.68%	-5.68%	-3.46%	100.00%	

1976-78	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	2,085,639	-21,132	-36,652	202,559	2,230,414	2,230,414
Dairy	1,811,213	156,701	-47,875	224,392	2,144,431	2,144,431
Fish	562,574	198,799	-58,510	54,382	757,244	757,244
Cereals	603,738	-150,837	51,751	244,741	749,392	749,392
Fruit & Vege	699,787	-36,843	-93,473	-28,600	540,871	540,871
Sugar & Honey	644,902	-655,932	139,620	249,840	378,430	378,430
Coffee & Cocoa	562,574	223,276	86,199	507,671	1,379,720	1,379,720
Beverages	1,495,623	474,238	9,939	293,992	2,273,791	2,273,791
Ani Oils & Fats	82,328	-10,743	2,348	-37,763	36,170	36,170
Vege Oils & Fats	397,918	180,016	-9,154	64,251	633,032	633,032
Pro Ani/Vege Oils	137,213	-17,905	22,897	56,405	198,611	198,611
Total Pro. Food	9,083,507	339,638	67,090	1,831,868	11,322,104	11,322,104
% of Actual Change	80.23%	3.00%	0.59%	16.18%	100.00%	

1978-80	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	2,631,759	81,843	-224,766	762,345	3,251,182	3,251,182
Dairy	2,354,732	650,880	-104,011	432,174	3,333,775	3,333,775
Fish	761,825	-77,608	362,980	-190,637	856,560	856,560
Cereals	796,453	410,823	-1,958	70,658	1,275,976	1,275,976
Fruit & Vege	813,768	-177,292	23,689	40,776	700,941	700,941
Sugar & Honey	709,882	900,458	-227,435	376,649	1,759,554	1,759,554
Coffee & Cocoa	969,596	-751,870	51,733	263,575	533,034	533,034
Beverages	2,112,333	19,833	25,522	-40,864	2,116,824	2,116,824
Ani Oils & Fats	86,571	-51,725	-16,919	21,658	39,585	39,585
Vege Oils & Fats	571,369	-40,406	-8,469	-66,917	455,577	455,577
Pro Ani/Vege Oils	190,456	128,929	-10,889	-56,988	251,509	251,509
Total Pro. Food	11,998,745	1,093,865	-130,523	1,612,430	14,574,517	14,574,517
% of Actual Change	82.33%	7.51%	-0.90%	11.06%	100.00%	

1980-82	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	-1,495,955	1,114,165	-400,029	-118,266	-900,085	-900,085
Dairy	-1,395,555	1,594,275	-162,152	-387,390	-350,823	-350,823
Fish	-421,679	573,124	-385,173	-65,637	-299,365	-299,365
Cereals	-491,958	265,805	-33,266	31,228	-228,191	-228,191
Fruit & Vege	-421,679	500,431	-182,350	2,344	-101,253	-101,253
Sugar & Honey	-522,078	-1,386,397	33,350	1,026,498	-848,627	-848,627
Coffee & Cocoa	-461,838	-350,228	-42,488	124,165	-730,390	-730,390
Beverages	-1,134,516	623,099	-52,924	-154,616	-718,957	-718,957
Ani Oils & Fats	-40,160	12,026	17,236	-23,903	-34,800	-34,800
Vege Oils & Fats	-291,159	-146,549	13,577	39,754	-384,377	-384,377
Pro Ani/Vege Oils	-110,440	-73,320	-12,853	34,874	-161,738	-161,738
Total Pro. Food	-6,787,018	2,726,432	-1,207,072	509,051	-4,758,606	-4,758,606
% of Actual Change	-142.63%	57.29%	-25.37%	10.70%	100.00%	

1982-84	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	294,217	-1,568,737	-348,799	748,179	-875,139	-875,139
Dairy	288,523	-1,849,864	65,322	-44,047	-1,540,066	-1,540,066
Fish	81,622	-67,217	-171,153	105,421	-51,327	-51,327
Cereals	98,705	6,091	-28,427	-323,707	-247,338	-247,338
Fruit & Vege	87,316	369,391	-145,576	-162,245	148,886	148,886
Sugar & Honey	87,316	-620,697	-46,116	-68,269	-647,765	-647,765
Coffee & Cocoa	77,825	459,014	-41,439	-16,328	479,073	479,073
Beverages	222,087	-555,022	25,475	-49,888	-357,348	-357,348
Ani Oils & Fats	7,593	34,495	-2,983	95,072	134,176	134,176
Vege Oils & Fats	51,251	1,145,344	-117,691	-7,245	1,071,658	1,071,658
Pro Ani/Vege Oils	18,982	228,014	1,163	-45,494	202,665	202,665
Total Pro. Food	1,315,437	-2,419,188	-810,223	231,450	-1,682,524	-1,682,524
% of Actual Change	-78.18%	-143.78%	-48.16%	13.76%	100.00%	

1984-86	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	1,536,680	632,408	479,828	398,752	3,047,667	3,047,667
Dairy	1,395,000	293,905	258,308	67,778	2,014,991	2,014,991
Fish	457,734	849,415	190,431	22,585	1,520,165	1,520,165
Cereals	523,125	-309,650	226,147	337,542	777,164	777,164
Fruit & Vege	523,125	-408,313	233,399	601,291	949,502	949,502
Sugar & Honey	392,344	-339,249	366,556	-52,200	367,451	367,451
Coffee & Cocoa	523,125	410,438	89,428	271,186	1,294,177	1,294,177
Beverages	1,209,726	1,130,801	154,476	131,563	2,626,567	2,626,567
Ani Oils & Fats	65,391	-219,167	1,327	98,799	-53,650	-53,650
Vege Oils & Fats	468,633	-1,535,644	94,205	530,868	-441,938	-441,938
Pro Ani/Vege Oils	141,680	-170,194	-31,095	-27,910	-87,519	-87,519
Total Pro. Food	7,236,562	334,750	2,063,011	2,380,252	12,014,576	12,014,576
% of Actual Change	60.23%	2.79%	17.17%	19.81%	100.00%	

1986-88	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	3,049,919	773,709	-254,319	-303,465	3,265,843	3,265,843
Dairy	2,583,959	2,450,230	57,966	69,404	5,161,559	5,161,559
Fish	1,058,999	594,801	37,570	-6,752	1,684,618	1,684,618
Cereals	974,280	912,063	127,512	245,941	2,259,796	2,259,796
Fruit & Vege	1,016,640	-129,145	75,039	-719,095	243,439	243,439
Sugar & Honey	677,760	41,950	-36,307	477,734	1,161,136	1,161,136
Coffee & Cocoa	1,101,359	-1,906,336	60,904	1,219,091	475,019	475,019
Beverages	2,456,879	872,327	105,277	54,316	3,488,799	3,488,799
Ani Oils & Fats	84,720	30,080	-7,476	-106,246	1,078	1,078
Vege Oils & Fats	593,040	115,964	-118,069	-237,635	353,300	353,300
Pro Ani/Vege Oils	190,620	67,681	-90,558	-136,504	31,238	31,238
Total Pro. Food	13,788,173	3,823,324	-42,461	556,790	18,125,825	18,125,825
% of Actual Change	76.07%	21.09%	-0.23%	3.07%	100.00%	

1988-90	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	2,410,716	1,325,771	280,481	488,807	4,505,775	4,505,775
Dairy	2,410,716	-1,954,902	-195,503	121,097	381,408	381,408
Fish	921,744	-37,801	688,222	94,311	1,666,476	1,666,476
Cereals	957,196	1,520,883	-108,468	-49,844	2,319,767	2,319,767
Fruit & Vege	673,582	370,436	82,564	91,227	1,217,810	1,217,810
Sugar & Honey	602,679	470,090	-217,609	381,758	1,236,918	1,236,918
Coffee & Cocoa	762,212	-1,370,836	41,754	1,503,022	936,151	936,151
Beverages	2,073,925	1,948,563	-44,215	360,495	4,338,767	4,338,767
Ani Oils & Fats	53,178	-142,025	319	184,672	96,143	96,143
Vege Oils & Fats	425,420	-77,441	88,608	479,854	916,442	916,442
Pro Ani/Vege Oils	124,081	-74,487	10,750	16,691	77,035	77,035
Total Pro. Food	11,415,449	1,978,250	626,904	3,672,088	17,692,692	17,692,692
% of Actual Change	64.52%	11.18%	3.54%	20.75%	100.00%	

1990-92	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	2,945,690	266,194	98,302	277,164	3,587,351	3,587,351
Dairy	2,343,651	1,592,909	107,751	-582,374	3,461,937	3,461,937
Fish	1,118,072	-46,267	-322,438	-538,942	210,425	210,425
Cereals	1,247,081	915,650	-6,289	-311,421	1,845,020	1,845,020
Fruit & Vege	817,053	22,511	-3,615	334,865	1,170,813	1,170,813
Sugar & Honey	752,549	-255,022	417,114	-403,726	510,915	510,915
Coffee & Cocoa	860,056	-924,841	54,116	886,886	876,216	876,216
Beverages	2,601,668	20,346	14,149	-469,614	2,166,549	2,166,549
Ani Oils & Fats	64,504	-21,859	11,400	-23,744	30,301	30,301
Vege Oils & Fats	537,535	-47,564	-113,505	-123,955	252,511	252,511
Pro Ani/Vege Oils	129,008	-43,718	21,822	-46,510	60,603	60,603
Total Pro. Food	13,416,866	1,478,339	278,806	-1,001,371	14,172,640	14,172,640
% of Actual Change	94.67%	10.43%	1.97%	-7.07%	100.00%	

1992-94	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	3,342,495	-2,594,914	-1,305,639	-283,057	-841,115	-841,115
Dairy	2,744,830	-2,970,468	-181,894	-605,280	-1,012,811	-1,012,811
Fish	1,106,786	193,532	-935,653	117,050	481,714	481,714
Cereals	1,460,958	-188,750	-334,874	-517,632	419,702	419,702
Fruit & Vege	951,836	-652,999	-244,442	55,289	109,684	109,684
Sugar & Honey	796,886	-102,955	-78,934	-386,069	228,928	228,928
Coffee & Cocoa	951,836	2,354,319	152,297	-1,547,427	1,911,026	1,911,026
Beverages	2,811,237	-363,201	-367,437	-1,109,233	971,367	971,367
Ani Oils & Fats	66,407	168,096	-59,718	-155,707	19,077	19,077
Vege Oils & Fats	553,393	925,863	-432,884	-396,120	650,253	650,253
Pro Ani/Vege Oils	132,814	336,191	-60,989	-42,345	365,672	365,672
Total Pro. Food	14,919,480	-2,895,286	-3,850,166	-4,870,530	3,303,498	3,303,498
% of Actual Change	451.63%	-87.64%	-116.55%	-147.44%	100.00%	

1994-96	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	3,628,133	-209,823	-214,468	-1,526,811	1,677,031	1,677,031
Dairy	2,928,422	10,844	-501,435	260,234	2,698,065	2,698,065
Fish	1,321,677	-786,300	366,944	347,251	1,249,573	1,249,573
Cereals	1,710,406	1,337,093	-144,259	-509,573	2,393,667	2,393,667
Fruit & Vege	1,088,440	221,079	165,941	-352,270	1,123,190	1,123,190
Sugar & Honey	932,949	769,311	-459,846	-736,881	505,532	505,532
Coffee & Cocoa	1,373,508	-150,963	-67,901	567,516	1,722,161	1,722,161
Beverages	3,317,151	560,861	208,480	-844,412	3,242,080	3,242,080
Ani Oils & Fats	77,746	30,787	-12,033	12,304	108,803	108,803
Vege Oils & Fats	725,627	-7,301	97,122	200,047	1,015,495	1,015,495
Pro Ani/Vege Oils	207,322	-117,838	25,041	-24,409	90,115	90,115
Total Pro. Food	17,311,380	1,657,750	-536,415	-2,607,003	15,825,712	15,825,712
% of Actual Change	109.39%	10.48%	-3.39%	-16.47%	100.00%	

Appendix I

NAFTA

Figure I1 *Percentage Share of Each Commodity in NAFTA's Total Processed Food Exports*

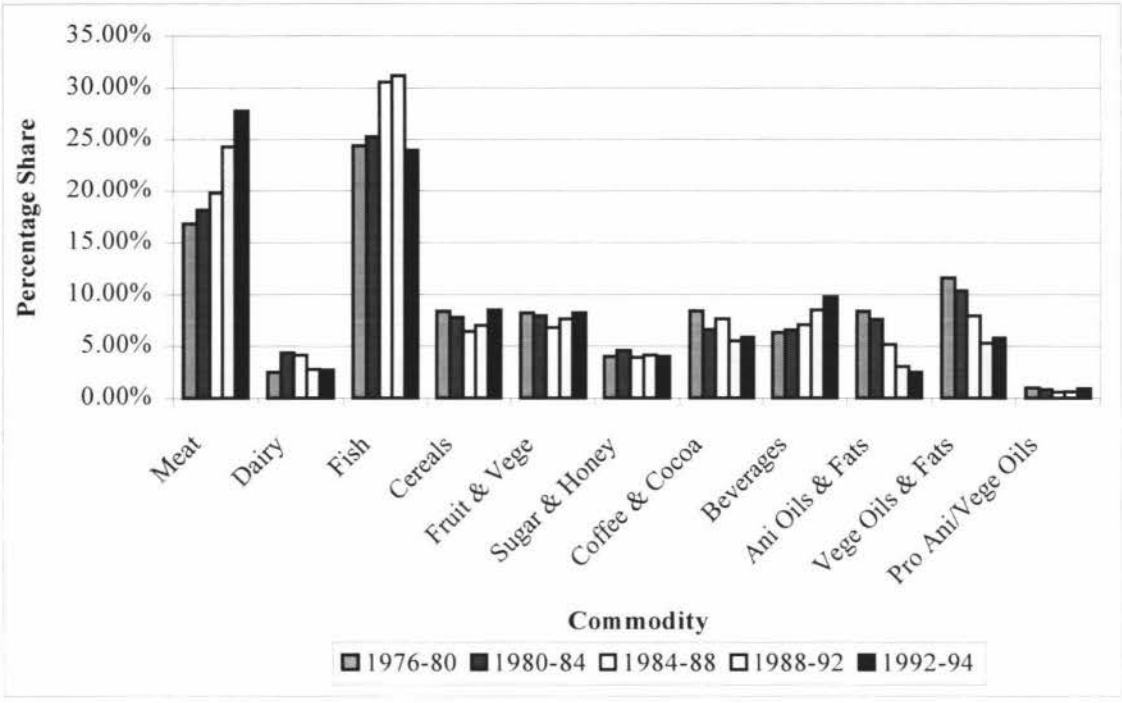

Figure I2 *Export Destinations Share of NAFTA's Total Processed Food Exports*

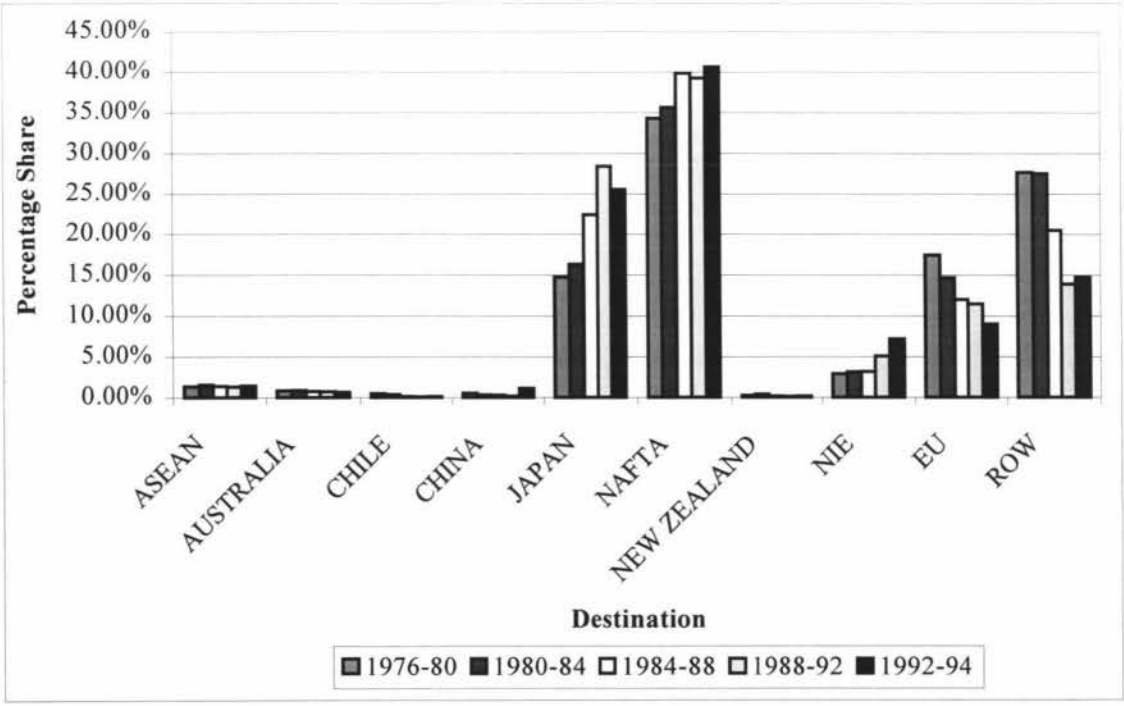

Table II NAFTA's Constant Market Share Results

1976-86	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	927,744	18,746	256,889	-54,894	1,148,485	1,148,485
Dairy	124,622	23,442	-9,019	183,540	322,585	322,585
Fish	996,978	1,253,565	-39,134	153,592	2,365,001	2,365,001
Cereals	512,336	52,027	-170,965	-258,573	134,825	134,825
Fruit & Vege	443,101	92,381	132,759	-455,873	212,369	212,369
Sugar & Honey	166,163	-212,899	13,270	309,524	276,058	276,058
Coffee & Cocoa	443,101	17,198	-100,883	345,928	705,344	705,344
Beverages	318,479	164,099	80,499	-180,317	382,759	382,759
Ani Oils & Fats	415,408	-431,230	6,527	6,194	-3,101	-3,101
Vege Oils & Fats	484,642	-115,326	94,517	-297,991	165,842	165,842
Pro Ani/Vege Oils	41,541	10,810	-15,470	-21,785	15,095	15,095
Total Pro. Food	4,874,116	872,814	248,990	-270,657	5,725,263	5,725,263
% of Actual Change	85.13%	15.24%	4.35%	-4.73%	100.00%	

1986-96	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	2,573,061	108,242	780,424	2,961,191	6,422,918	6,422,918
Dairy	543,604	-2,580	56,815	-364,206	233,633	233,633
Fish	4,095,154	237,616	-460,699	-1,439,429	2,432,642	2,432,642
Cereals	833,527	1,094,774	404	-202,066	1,726,640	1,726,640
Fruit & Vege	833,527	-18,606	8,935	728,834	1,552,690	1,552,690
Sugar & Honey	543,604	171,719	-131,065	345,172	929,431	929,431
Coffee & Cocoa	1,413,372	-1,162,764	-208,993	583,227	624,842	624,842
Beverages	869,767	343,521	-291,771	1,122,211	2,043,728	2,043,728
Ani Oils & Fats	543,604	-88,568	13,383	-321,761	146,659	146,659
Vege Oils & Fats	833,527	319,200	-109,979	-272,830	769,918	769,918
Pro Ani/Vege Oils	72,481	18,764	88,868	19,189	199,302	199,302
Total Pro. Food	13,155,229	1,021,319	-253,676	3,159,532	17,082,403	17,082,403
% of Actual Change	77.01%	5.98%	-1.49%	18.50%	100.00%	

1976-78	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	383,280	-3,883	13,040	-118,359	274,077	274,077
Dairy	51,485	4,454	14,804	-20,009	50,735	50,735
Fish	411,883	145,548	-60,327	651,001	1,148,106	1,148,106
Cereals	211,662	-52,882	-33,081	-52,457	73,242	73,242
Fruit & Vege	183,059	-9,638	38,854	-61,489	150,786	150,786
Sugar & Honey	68,647	-69,821	-25,647	107,155	80,334	80,334
Coffee & Cocoa	183,059	72,653	-33,050	-148,002	74,660	74,660
Beverages	131,574	41,720	10,095	-64,306	119,083	119,083
Ani Oils & Fats	171,618	-22,394	-8,215	21,763	162,773	162,773
Vege Oils & Fats	200,221	90,579	92,238	25,725	408,763	408,763
Pro Ani/Vege Oils	17,162	-2,239	2,620	12,057	29,599	29,599
Total Pro. Food	2,013,649	194,097	11,332	353,080	2,572,159	2,572,159
% of Actual Change	78.29%	7.55%	0.44%	13.73%	100.00%	

1978-80	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	438,311	13,631	-35,706	66,064	482,300	482,300
Dairy	63,523	17,559	36,874	-43,365	74,591	74,591
Fish	755,927	-77,007	-267,802	-262,278	148,840	148,840
Cereals	215,979	111,405	734	-209,906	118,213	118,213
Fruit & Vege	215,979	-47,055	-32,308	69,898	206,515	206,515
Sugar & Honey	88,933	112,808	74,448	75,484	351,672	351,672
Coffee & Cocoa	190,570	-147,777	-30,553	152,665	164,905	164,905
Beverages	158,808	1,491	-13,991	54,886	201,194	201,194
Ani Oils & Fats	209,627	-125,249	26,352	114,816	225,546	225,546
Vege Oils & Fats	317,617	-22,461	44,194	-84,130	255,219	255,219
Pro Ani/Vege Oils	25,409	17,201	-11,518	10,517	41,610	41,610
Total Pro. Food	2,680,684	-145,455	-209,276	-55,348	2,270,606	2,270,606
% of Actual Change	118.06%	-6.41%	-9.22%	-2.44%	100.00%	

1980-82	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	-241,197	179,640	118,676	88,707	145,825	145,825
Dairy	-35,586	40,654	6,516	252,955	264,539	264,539
Fish	-324,232	440,680	165,689	-19,084	263,052	263,052
Cereals	-102,805	55,546	19,588	-2,272	-29,943	-29,943
Fruit & Vege	-114,668	136,083	77,884	-129,304	-30,004	-30,004
Sugar & Honey	-83,035	-220,503	-12,802	-37,051	-353,391	-353,391
Coffee & Cocoa	-98,851	-74,962	15,888	39,762	-118,163	-118,163
Beverages	-90,943	49,948	64,941	-24,414	-468	-468
Ani Oils & Fats	-114,668	34,339	-6,288	-31,628	-118,245	-118,245
Vege Oils & Fats	-162,116	-81,598	12,407	-63,664	-294,971	-294,971
Pro Ani/Vege Oils	-15,816	-10,500	7,288	-10,467	-29,495	-29,495
Total Pro. Food	-1,383,918	549,326	469,786	63,542	-301,265	-301,265
% of Actual Change	-459.37%	182.34%	155.94%	21.09%	100.00%	

1982-84	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	55,801	-297,523	238,996	-137,868	-140,594	-140,594
Dairy	15,218	-97,572	-40,926	108,322	-14,958	-14,958
Fish	76,937	-63,359	213,017	-362,954	-136,360	-136,360
Cereals	21,137	1,304	8,630	37,475	68,545	68,545
Fruit & Vege	23,673	100,148	90,265	-265,937	-51,851	-51,851
Sugar & Honey	7,609	-54,091	50,112	85,356	88,987	88,987
Coffee & Cocoa	17,755	104,718	28,162	3,410	154,044	154,044
Beverages	19,446	-48,597	60,470	-32,568	-1,249	-1,249
Ani Oils & Fats	21,137	96,027	4,635	-53,253	68,545	68,545
Vege Oils & Fats	26,209	585,722	9,604	-247,141	374,395	374,395
Pro Ani/Vege Oils	2,536	30,468	-8,478	-48,456	-23,930	-23,930
Total Pro. Food	287,457	357,245	654,485	-913,613	385,575	385,575
% of Actual Change	74.55%	92.65%	169.74%	-236.95%	100.00%	

1984-86	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	295,610	121,656	-44,464	14,075	386,876	386,876
Dairy	84,460	17,794	-118,875	-35,701	-52,322	-52,322
Fish	417,021	773,863	-138,799	-110,722	941,363	941,363
Cereals	131,969	-78,115	-105,350	-43,736	-95,233	-95,233
Fruit & Vege	126,690	-98,885	-53,030	-37,852	-63,077	-63,077
Sugar & Honey	58,066	-50,208	-53,606	154,203	108,455	108,455
Coffee & Cocoa	126,690	99,400	-50,949	254,757	429,898	429,898
Beverages	110,854	103,621	-94,949	-55,326	64,200	64,200
Ani Oils & Fats	131,969	-442,314	130	-31,506	-341,720	-341,720
Vege Oils & Fats	211,150	-691,908	-35,591	-61,214	-577,563	-577,563
Pro Ani/Vege Oils	10,557	-12,682	-5,115	4,551	-2,689	-2,689
Total Pro. Food	1,705,035	-257,779	-700,599	51,530	798,188	798,188
% of Actual Change	213.61%	-32.30%	-87.77%	6.46%	100.00%	

1986-88	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	537,698	136,404	234,013	179,223	1,087,339	1,087,339
Dairy	113,598	107,719	-49,113	-110,382	61,822	61,822
Fish	855,773	480,656	-118,521	234,660	1,452,569	1,452,569
Cereals	174,184	163,061	-130,433	-173,149	33,662	33,662
Fruit & Vege	174,184	-22,127	4,590	139,009	295,656	295,656
Sugar & Honey	113,598	7,031	-86,590	115,114	149,153	149,153
Coffee & Cocoa	295,355	-511,229	-97,842	-14,601	-328,316	-328,316
Beverages	181,757	64,534	-67,145	129,365	308,510	308,510
Ani Oils & Fats	113,598	40,334	966	-5,745	149,153	149,153
Vege Oils & Fats	174,184	34,060	11,343	119,734	339,321	339,321
Pro Ani/Vege Oils	15,146	5,378	15,230	-10,045	25,709	25,709
Total Pro. Food	2,749,077	505,822	-283,501	603,182	3,574,580	3,574,580
% of Actual Change	76.91%	14.15%	-7.93%	16.87%	100.00%	

1988-90	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	503,688	277,003	-195,194	270,537	856,034	856,034
Dairy	80,590	-65,352	77,905	-251,096	-157,953	-157,953
Fish	758,890	-31,122	-435,710	159,658	451,716	451,716
Cereals	114,169	181,403	49,935	62,569	408,077	408,077
Fruit & Vege	154,464	84,948	-21,015	32,267	250,665	250,665
Sugar & Honey	94,022	73,337	198,452	-297,352	68,459	68,459
Coffee & Cocoa	134,317	-241,569	-2,240	125,119	15,628	15,628
Beverages	161,180	151,437	21,639	81,904	416,161	416,161
Ani Oils & Fats	94,022	-251,111	1,265	15,121	-140,703	-140,703
Vege Oils & Fats	161,180	-29,340	-136,538	-311,208	-315,906	-315,906
Pro Ani/Vege Oils	13,432	-8,063	4,975	6,907	17,250	17,250
Total Pro. Food	2,269,955	141,570	-436,526	-105,572	1,869,427	1,869,427
% of Actual Change	121.43%	7.57%	-23.35%	-5.65%	100.00%	

1990-92	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	603,000	54,492	97,085	286,504	1,041,080	1,041,080
Dairy	53,430	36,315	-49,475	195,095	235,365	235,365
Fish	786,190	-32,533	59,747	-425,897	387,507	387,507
Cereals	167,924	123,296	23,648	158,519	473,386	473,386
Fruit & Vege	183,190	5,047	-5,872	246,579	428,945	428,945
Sugar & Honey	99,228	-33,626	-132,779	169,220	102,042	102,042
Coffee & Cocoa	129,759	-139,534	-28,413	111,487	73,300	73,300
Beverages	213,721	1,671	-94,513	279,322	400,202	400,202
Ani Oils & Fats	68,696	-23,280	-7,563	32,790	70,644	70,644
Vege Oils & Fats	106,861	-9,456	48,624	204,422	350,451	350,451
Pro Ani/Vege Oils	15,266	-5,173	12,666	-7,060	15,699	15,699
Total Pro. Food	2,427,265	-22,781	-76,843	1,250,980	3,578,621	3,578,621
% of Actual Change	67.83%	-0.64%	-2.15%	34.96%	100.00%	

1992-94	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	727,365	-564,683	497,333	543,822	1,203,837	1,203,837
Dairy	84,577	-91,530	15,814	-49,745	-40,883	-40,883
Fish	811,942	141,975	277,966	-1,400,154	-168,271	-168,271
Cereals	228,359	-29,503	202,199	77,103	478,157	478,157
Fruit & Vege	236,816	-162,466	72,929	200,674	347,953	347,953
Sugar & Honey	109,950	-14,205	-64,824	28,034	58,955	58,955
Coffee & Cocoa	135,324	334,716	-125,508	24,455	368,987	368,987
Beverages	262,190	-33,874	15,866	343,739	587,920	587,920
Ani Oils & Fats	76,120	192,680	21,457	-271,000	19,257	19,257
Vege Oils & Fats	152,239	254,706	-132,672	114,563	388,836	388,836
Pro Ani/Vege Oils	16,915	42,818	6,434	23,747	89,914	89,914
Total Pro. Food	2,841,797	70,636	786,992	-364,763	3,334,662	3,334,662
% of Actual Change	85.22%	2.12%	23.60%	-10.94%	100.00%	

1994-96	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	1,009,000	-58,353	-165,225	1,449,206	2,234,628	2,234,628
Dairy	88,703	328	51,766	-5,516	135,282	135,282
Fish	887,033	-527,718	-184,096	133,903	309,122	309,122
Cereals	332,637	260,036	-33,821	-225,495	333,357	333,357
Fruit & Vege	321,549	65,312	-51,888	-105,501	229,472	229,472
Sugar & Honey	133,055	109,717	145,692	162,357	550,822	550,822
Coffee & Cocoa	210,670	-23,155	57,819	249,909	495,244	495,244
Beverages	388,077	65,616	-69,682	-53,076	330,934	330,934
Ani Oils & Fats	88,703	35,126	4,409	-79,930	48,307	48,307
Vege Oils & Fats	232,846	-2,343	129,563	-352,850	7,216	7,216
Pro Ani/Vege Oils	33,264	-18,907	29,753	6,621	50,731	50,731
Total Pro. Food	3,725,537	-94,341	-85,710	1,179,628	4,725,114	4,725,114
% of Actual Change	78.85%	-2.00%	-1.81%	24.97%	100.00%	

Appendix J

New Zealand

Figure J1 *Percentage Share of Each Commodity in New Zealand's Total Processed Food Exports*

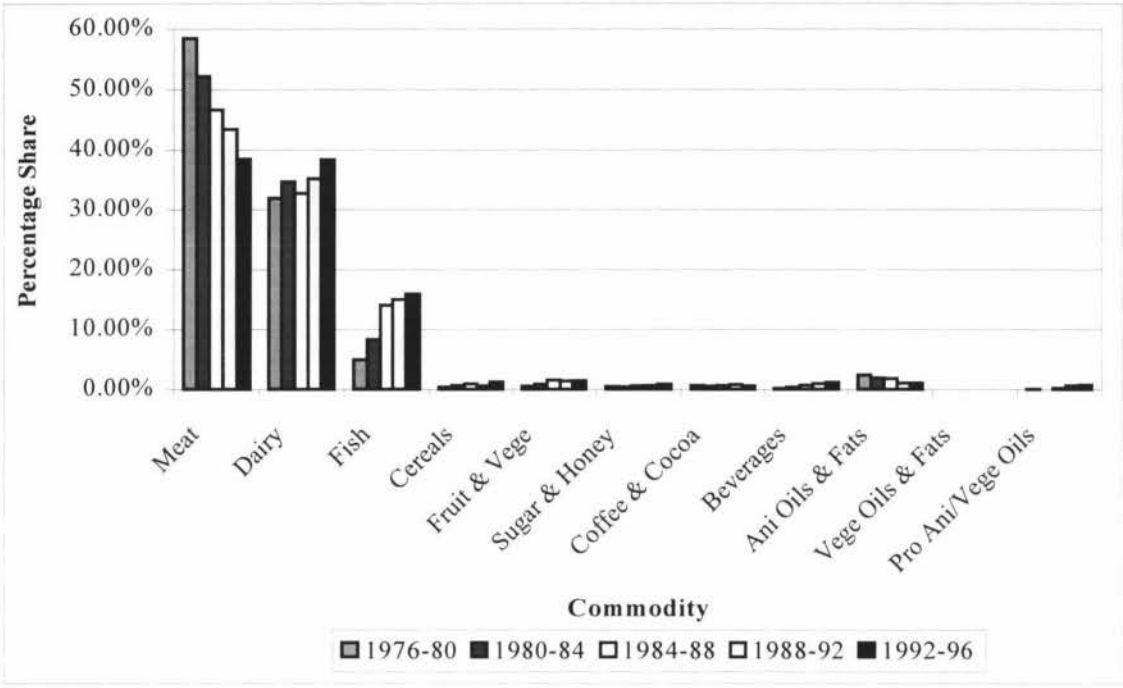

Figure J2 *Export Destinations Share of New Zealand's Total Processed Food Exports*

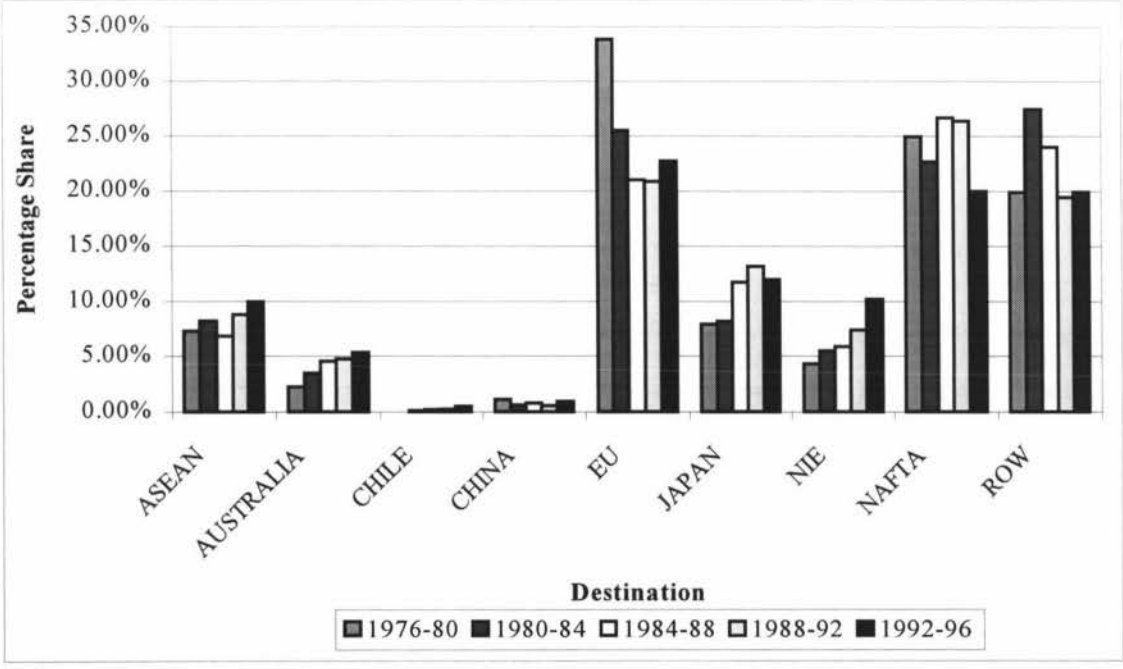

Table J1 New Zealand's Constant Market Share Results

1976-86	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	600,882	12,142	-15,417	-250,243	347,363	347,363
Dairy	356,245	67,011	-10,586	-76,327	336,343	336,343
Fish	33,554	42,190	-6,841	239,527	308,430	308,430
Cereals	4,997	507	2,040	1,679	9,224	9,224
Fruit & Vege	3,808	794	1,261	28,066	33,928	33,928
Sugar & Honey	3,808	-4,879	363	14,115	13,407	13,407
Coffee & Cocoa	9,519	369	4,695	-13,844	739	739
Beverages	1,428	736	-626	12,824	14,362	14,362
Ani Oils & Fats	27,605	-28,656	-4,387	4,162	-1,276	-1,276
Vege Oils & Fats	0	0	0	570	570	570
Pro Ani/Vege Oils	476	124	-3	-559	37	37
Total Pro. Food	1,042,321	90,338	-29,502	-40,032	1,063,126	1,063,126
% of Actual Change	98.04%	8.50%	-2.77%	-3.77%	100.00%	

1986-96	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	1,200,166	50,488	-148,597	-249,833	852,223	852,223
Dairy	864,924	-4,105	241,488	469,297	1,571,604	1,571,604
Fish	406,984	23,615	-46,370	65,403	449,631	449,631
Cereals	17,433	22,896	6,031	22,934	69,294	69,294
Fruit & Vege	44,922	-1,003	-268	-487	43,164	43,164
Sugar & Honey	20,785	6,566	14,840	4,948	47,139	47,139
Coffee & Cocoa	13,410	-11,032	508	25,703	28,588	28,588
Beverages	18,774	7,415	-7,175	40,867	59,880	59,880
Ani Oils & Fats	34,865	-5,680	12,808	-10,961	31,031	31,031
Vege Oils & Fats	670	257	167	-1,665	-570	-570
Pro Ani/Vege Oils	670	174	927	40,405	42,177	42,177
Total Pro. Food	2,623,603	89,589	74,358	406,611	3,194,161	3,194,161
% of Actual Change	82.14%	2.80%	2.33%	12.73%	100.00%	

1976-78	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	248,243	-2,515	-6,581	61,351	300,498	300,498
Dairy	147,176	12,733	-2,389	-60,876	96,645	96,645
Fish	13,862	4,899	-3,976	15,412	30,196	30,196
Cereals	2,065	-516	-472	-237	840	840
Fruit & Vege	1,573	-83	628	3,462	5,580	5,580
Sugar & Honey	1,573	-1,600	-96	3,810	3,687	3,687
Coffee & Cocoa	3,933	1,561	-4,003	-1,549	-59	-59
Beverages	590	187	-65	-40	673	673
Ani Oils & Fats	11,404	-1,488	5,741	-7,575	8,082	8,082
Vege Oils & Fats	0	0	0	0	0	0
Pro Ani/Vege Oils	197	-26	-38	470	603	603
Total Pro. Food	430,615	13,152	-11,250	14,228	446,745	446,745
% of Actual Change	96.39%	2.94%	-2.52%	3.18%	100.00%	

1978-80	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	324,935	10,105	-50,512	41,269	325,797	325,797
Dairy	165,437	45,729	1,236	23,954	236,357	236,357
Fish	22,623	-2,305	-1,260	71,563	90,622	90,622
Cereals	2,149	1,108	-662	-2,191	404	404
Fruit & Vege	3,286	-716	-591	806	2,785	2,785
Sugar & Honey	2,654	3,367	-2,621	752	4,152	4,152
Coffee & Cocoa	3,539	-2,744	3,230	1,160	5,185	5,185
Beverages	758	7	-73	2,298	2,991	2,991
Ani Oils & Fats	13,018	-7,778	-683	8,015	12,571	12,571
Vege Oils & Fats	0	0	0	526	526	526
Pro Ani/Vege Oils	379	257	-96	-1,150	-610	-610
Total Pro. Food	538,778	47,030	-52,031	147,004	680,781	680,781
% of Actual Change	79.14%	6.91%	-7.64%	21.59%	100.00%	

1980-82	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	-174,543	129,997	15,442	-30,266	-59,369	-59,369
Dairy	-98,335	112,337	62,305	197,626	273,933	273,933
Fish	-21,279	28,921	18,417	4,612	30,671	30,671
Cereals	-919	497	1,218	4,376	5,172	5,172
Fruit & Vege	-1,697	2,014	1,565	5,858	7,740	7,740
Sugar & Honey	-1,626	-4,318	2,675	1,088	-2,180	-2,180
Coffee & Cocoa	-2,121	-1,608	1,971	595	-1,163	-1,163
Beverages	-707	388	354	3,058	3,094	3,094
Ani Oils & Fats	-6,928	2,075	-10,059	-2,189	-17,100	-17,100
Vege Oils & Fats	-71	-36	39	63	-4	-4
Pro Ani/Vege Oils	-71	-47	-14	128	-4	-4
Total Pro. Food	-308,295	270,220	93,915	184,950	240,789	240,789
% of Actual Change	-128.04%	112.22%	39.00%	76.81%	100.00%	

1982-84	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	35,640	-190,031	40,422	-68,946	-182,914	-182,914
Dairy	28,915	-185,386	-20,169	-108,048	-284,689	-284,689
Fish	5,435	-4,476	8,179	66,446	75,583	75,583
Cereals	345	21	608	19,626	20,601	20,601
Fruit & Vege	585	2,477	805	6,239	10,106	10,106
Sugar & Honey	285	-2,028	613	829	-300	-300
Coffee & Cocoa	420	2,479	-122	-4,035	-1,258	-1,258
Beverages	240	-600	53	3,713	3,406	3,406
Ani Oils & Fats	991	4,502	1,068	10,830	17,390	17,390
Vege Oils & Fats	15	336	80	-418	12	12
Pro Ani/Vege Oils	15	180	386	-569	12	12
Total Pro. Food	72,887	-372,526	31,922	-74,334	-342,050	-342,050
% of Actual Change	-21.31%	-108.91%	9.33%	-21.73%	100.00%	

1984-86	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	173,523	71,412	-84,258	-197,325	-36,648	-36,648
Dairy	118,403	24,946	-73,232	-56,020	14,097	14,097
Fish	43,447	80,624	-25,450	-17,263	81,358	81,358
Cereals	5,354	-3,169	-2,814	-17,163	-17,793	-17,793
Fruit & Vege	5,003	-3,905	-1,987	8,606	7,717	7,717
Sugar & Honey	1,580	-1,366	-196	8,029	8,047	8,047
Coffee & Cocoa	2,194	1,722	245	-6,126	-1,966	-1,966
Beverages	1,931	1,805	-16	479	4,199	4,199
Ani Oils & Fats	8,514	-28,535	-2,490	291	-22,220	-22,220
Vege Oils & Fats	88	-288	-34	270	35	35
Pro Ani/Vege Oils	88	-105	-70	123	35	35
Total Pro. Food	360,124	143,139	-190,301	-276,100	36,862	36,862
% of Actual Change	976.96%	388.32%	-516.26%	-749.02%	100.00%	

1986-88	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	250,801	63,624	-21,179	52,146	345,392	345,392
Dairy	180,745	171,391	-8,914	-32,512	310,710	310,710
Fish	85,048	47,768	-11,992	2,909	123,733	123,733
Cereals	3,643	3,410	-675	-3,296	3,082	3,082
Fruit & Vege	9,388	-1,193	1,722	-2,925	6,992	6,992
Sugar & Honey	4,343	269	4,304	-5,274	3,642	3,642
Coffee & Cocoa	2,802	-4,850	1,056	15,168	14,175	14,175
Beverages	3,923	1,393	786	5,217	11,320	11,320
Ani Oils & Fats	7,286	2,587	3,697	4,530	18,100	18,100
Vege Oils & Fats	140	27	36	79	282	282
Pro Ani/Vege Oils	140	50	320	21,086	21,596	21,596
Total Pro. Food	548,260	284,476	-30,839	57,128	859,025	859,025
% of Actual Change	63.82%	33.12%	-3.59%	6.65%	100.00%	

1988-90	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	210,056	115,520	-17,586	-177,634	130,355	130,355
Dairy	160,885	-130,465	55,750	124,181	210,351	210,351
Fish	72,248	-2,963	-45,542	-50,262	-26,520	-26,520
Cereals	2,754	4,375	1,850	-6,982	1,997	1,997
Fruit & Vege	6,949	3,822	-4,149	-9,293	-2,671	-2,671
Sugar & Honey	3,278	2,557	1,352	-4,982	2,205	2,205
Coffee & Cocoa	3,934	-7,075	-2,162	15,004	9,701	9,701
Beverages	4,196	3,942	-1,108	2,776	9,805	9,805
Ani Oils & Fats	7,343	-19,611	-2,870	864	-14,274	-14,274
Vege Oils & Fats	131	-24	-60	-900	-853	-853
Pro Ani/Vege Oils	3,409	-2,047	-2,259	-1,370	-2,266	-2,266
Total Pro. Food	475,182	-31,968	-16,783	-108,599	317,832	317,832
% of Actual Change	149.51%	-10.06%	-5.28%	-34.17%	100.00%	

1990-92	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	218,389	19,735	-50,721	-68,931	118,472	118,472
Dairy	183,399	124,651	-35,827	-211,004	61,219	61,219
Fish	64,698	-2,677	8,600	135,162	205,783	205,783
Cereals	2,905	2,133	-1,251	4,329	8,115	8,115
Fruit & Vege	6,206	171	4,813	6,996	18,185	18,185
Sugar & Honey	3,433	-1,163	1,583	3,446	7,298	7,298
Coffee & Cocoa	5,149	-5,537	-2,913	-12,366	-15,667	-15,667
Beverages	5,414	42	-3,470	4,818	6,804	6,804
Ani Oils & Fats	4,885	-1,656	-1,503	291	2,017	2,017
Vege Oils & Fats	0	0	0	0	0	0
Pro Ani/Vege Oils	2,905	-984	-1,282	6,542	7,181	7,181
Total Pro. Food	497,383	134,714	-81,972	-130,718	419,407	419,407
% of Actual Change	118.59%	32.12%	-19.54%	-31.17%	100.00%	

1992-94	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	227,066	-176,280	37,507	-11,373	76,919	76,919
Dairy	185,303	-200,536	59,893	297,826	342,486	342,486
Fish	91,273	15,960	54,554	-123,731	38,055	38,055
Cereals	3,940	-509	1,445	22,912	27,787	27,787
Fruit & Vege	8,536	-5,856	2,749	-3,350	2,079	2,079
Sugar & Honey	4,334	-560	-988	2,437	5,223	5,223
Coffee & Cocoa	2,758	6,821	2,226	-2,352	9,453	9,453
Beverages	6,172	-797	-1,842	4,891	8,425	8,425
Ani Oils & Fats	4,990	12,632	17,576	-23,019	12,179	12,179
Vege Oils & Fats	0	0	0	0	0	0
Pro Ani/Vege Oils	3,809	9,640	6,306	-15,447	4,308	4,308
Total Pro. Food	538,181	-339,485	179,426	148,792	526,914	526,914
% of Actual Change	102.14%	-64.43%	34.05%	28.24%	100.00%	

1994-96	WT Effect	ComComp	Mkt Dist.	Comp. Res.	Summation	Actual Change
Meat	267,685	-15,481	-118,920	47,801	181,085	181,085
Dairy	262,718	973	180,284	202,862	646,837	646,837
Fish	108,730	-64,686	-11,693	76,229	108,579	108,579
Cereals	8,831	6,903	3,256	9,322	28,313	28,313
Fruit & Vege	9,935	2,018	-2,640	9,267	18,579	18,579
Sugar & Honey	5,703	4,703	7,573	10,792	28,771	28,771
Coffee & Cocoa	4,599	-506	-858	7,689	10,925	10,925
Beverages	8,279	1,400	-887	14,735	23,527	23,527
Ani Oils & Fats	7,543	2,987	4,949	-2,471	13,009	13,009
Vege Oils & Fats	0	0	0	0	0	0
Pro Ani/Vege Oils	4,967	-2,823	6,588	2,626	11,358	11,358
Total Pro. Food	688,990	-64,512	67,653	378,852	1,070,983	1,070,983
% of Actual Change	64.33%	-6.02%	6.32%	35.37%	100.00%	