New Zealand's Preferential Trading Arrangements:

Implications for the New Zealand Dairy Industry

A thesis presented in partial fulfilment of the
requirements for the degree of

Master of Applied Economics

At the School of Economics and Finance
Massey University
Palmerston North
New Zealand

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2011

Abstract

Since the mid 1980's when New Zealand liberalised its agricultural sector, the dairy industry has become a significant and growing contributor to the prosperity of the economy. Today, the dairy industry earns around a quarter of the total value of New Zealand's merchandise exports, and directly accounts for 2.8 percent of GDP (New Zealand Institute of Economic Research, 2010). The international trade of dairy products however remains heavily distorted due to the continued protectionist policies of many countries. The Doha round of the WTO multilateral trade liberalisation efforts, of which New Zealand is a strong supporter, have stalled and continue to face numerous impasses. Consequently, New Zealand has begun pursuing a complementary approach of establishing bilateral and regional preferential trade agreements with key trading partners. The aim of this study is to conduct a quantitative analysis of the economic impact of the existing and proposed preferential trade agreements on the New Zealand dairy industry. Two quantitative techniques are used for this purpose. An ex post gravity model finds mixed results for the effect of New Zealand's existing preferential trade agreements on its dairy exports, but data issues hamper the conclusions that can be drawn. An ex ante computable general equilibrium model, known as GTAP, examines the proposed PTAs that New Zealand currently has under negotiation and indicates a largely positive effect of those agreements on the New Zealand dairy industry.

Acknowledgements

I would like to take the opportunity to formally thank my supervisors, Professor Hamish Gow and Dr. Hatice Ozer-Balli, for their input into this thesis. Their comments have been invaluable, relating to issues ranging from the construction of the finished product down to much finer details in the research techniques used. Professor Allan Rae's comments on the computable general equilibrium modelling aspect of this study were extremely insightful, and important in moulding this study's use of that form of analysis. The time that interview participants gave up to take part in the study was important, and I thank them for their participation. DairyNZ's support throughout this year and my time at Massey University has been extremely helpful, and I particularly thank Bill Barwood and Matthew Newman. I am grateful for my friends' ability to listen and appear interested in my work for the entire year, which can't have been easy. The biggest thanks must however go to my parents, Lindsay and Kerry, for the support they have provided me throughout this year and all those before, without which I would not know myself.

Table of Contents

List of Tables

List of Figures

List of Abbreviations

AANZFTA	ASEAN, Australia and New Zealand Free Trade Area
AFTA	Association of South East Asian Nations Free Trade Area
AGE	Applied General Equilibrium
ANZCERTA	Australia New Zealand Closer Economic Relations Trade Agreement
APEC	Asia-Pacific Economic Cooperation
ASEAN	Association of South East Asian Nations
AVE	Ad Valorem Equivalent
CAP	Common Agricultural Policy
CEP	Closer Economic Partnership
CER	Closer Economic Relations
CGE	Computable General Equilibrium
CIE	Centre for International Economics
CPI	Consumer Price Index
CUSTA	Canada – United States Trade Agreement
DDA	Doha Development Agenda
DIRA	Dairy Industry Restructuring Act
DR	Doha Round
EC	European Community
EEC	European Economic Community
EFTA	European Free Trade Association
EU	European Union
FTA	Free Trade Agreement
GATT	General Agreement on Tariffs and Trade
GCC	Gulf Cooperation Council
GDP	Gross Domestic Product

GSTP	Global System of Trade Preferences among Developing Countries
GTAP	Global Trade Analysis Project
HS	Harmonised System
I-O	Input-Output
IV	Instrumental Variable
kgMS	Kilograms of Milksolids
LAIA	Latin American Integration Association
MFAT	Ministry of Foreign Affairs and Trade
MFN	Most Favoured Nation
MR	Multilateral Resistance
NAFTA	North American Free Trade Agreement
NLS	Nonlinear Least Squares
NTB	Non Tariff Barrier
NZIER	New Zealand Institute of Economic Research
OECD	Organisation for Economic Co-operation and Development
OLS	Ordinary Least Squares
PTA	Preferential Trade Agreement
RIA	Regional Integration Agreement
RPTA	Regional Preferential Trade Agreement
RTA	Regional Trade Agreement
SEP	Strategic Economic Partnership
SPS	Sanitary and Phytosanitary
TFP	Total Factor Productivity
ToT	Terms of Trade
TPP	Trans Pacific Partnership
TRAINS	Trade Analysis and Information System
TRQ	Tariff Rate Quota

UNCTAD	United Nations Conference on Trade and Development
UR	Uruguay Round
URAA	Uruguay Round Agreement on Agriculture
US	United States
USDA	United States Department of Agriculture
WITS	World Integrated Trade Solution
WTO	World Trade Organisation

CHAPTER 1   INTRODUCTION

While the Doha round of trade negotiations have continually stalled in recent years, due to conflicts over the agricultural trade policy between the developed, emerging and developing countries, a phenomenal growth has been observed around the world in the establishment of preferential trade agreements (PTA) as countries have pursued these as a second best option. New Zealand, as a small open economy heavily dependent on international trade for its economic prosperity, has become an active participant in the development of PTAs, as a complementary strategy to their wider multilateral trade negotiations under the WTO. Questions however remain about the economic appropriateness and benefits that accrue to PTAs from both a country and individual sector basis. This is especially true for the New Zealand dairy sector that has seen huge growth over the past decade, but it remains to be seen how much of this growth can be attributed to the PTA strategy being pursued by the New Zealand government.

Over the past 60 years substantial liberalisation of international trade has been achieved through the multilateral frameworks of the General Agreement on Tariffs and Trade, and subsequently the World Trade Organisation and associate trade negotiation rounds. Today there are 153 members of the WTO involved in the current Doha Round. However, this Round has stalled, with no conclusion reached by the end of 2011. Frustrated by the lack of progress within the WTO multilateral negotiations, many countries have been opting for bilateral and regional preferential trade agreements, which can generally be concluded more rapidly than a multilateral negotiation. New Zealand is one of those countries, with the view that these bilateral and regional agreements complement the multilateral approach, and contribute to the liberalisation of international trade. As a result of this drive towards preferential trade agreements, they have become a much more significant part of the global trading system.

The dairy industry is a critical part of the New Zealand economy, contributing around a quarter of the value of New Zealand's merchandise exports and almost three percent of its GDP (New Zealand Institute of Economic Research, 2010). New Zealand's dairy industry produces largely for the export market, with approximately 96 percent of production destined for international trade (Fonterra, 2011b). International dairy trade is heavily distorted by the protectionist policies applied in many other countries, and the New Zealand dairy industry suffers considerably as a result. The industry, as well as the entire New Zealand economy, therefore stands to gain substantially from the liberalisation of international trade, but questions remain as to the appropriateness and effectiveness of PTAs.

1.1   New Zealand's Dairy Industry

New Zealand is famous around the world for its agricultural industry. Stories abound internationally about sheep allegedly strolling the main street of Auckland, while New Zealand's clean, green image makes it a preferred supplier of agricultural products in many overseas markets. New Zealand is blessed with good quality, fertile agricultural land and a

climate that support efficient pastoral based farming systems, and a people who are suited to working on and caring for that land. As a result, New Zealand's agricultural industries are world leading in their efficiency.

The New Zealand dairy industry is increasingly important at a regional, national and international level. New Zealand's rural towns and the employment within them rely upon farmers for their existence. As well as providing tens of thousands of jobs and stimulus to the New Zealand domestic economy, dairying is vitally important for export earnings. The dairy industry contributed 27 percent of the value of New Zealand's total merchandise exports for the year ended March 2009, and internationally New Zealand is the largest exporter of dairy products, with 31 percent of the world's cross-border trade (Ministry of Agriculture and Forestry, 2009).

Due to the increased competition from other producers and the reliance on international trade that makes up only a small part of total world consumption, the international competitiveness of the New Zealand dairy industry, and therefore access to export markets, is of critical concern. The New Zealand dairy industry suffers from significant import protection in many export markets, both in terms of actual tariff costs and lost export potential. Con Williams, ANZ Rural Economist, estimates that the dairy industry paid an effective tariff of 10.7 percent on its exports in 2010, amounting to a cost of $1,073 million or $0.75 per kilogram of milk solids (Bedford, 2011). Williams believes that New Zealand's average dairy farmer faces a loss in revenue of around $100,000 from the tariffs imposed in export markets. Of course, alongside these explicit costs lies the export potential that is lost due to this protection in overseas markets.

The removal of import protection overseas represents a significant opportunity for the New Zealand dairy industry to increase its exports and profitability. Fonterra (2011b) have highlighted the importance of free and open markets for the future of New Zealand's dairy industry. The resulting increase in export earnings would be expected to flow through the entire economy and benefit all New Zealanders. New Zealand therefore places great significance on World Trade Organisation negotiations that have so far contributed to a gradual liberalisation of trade barriers in dairy products (The Treasury, 2005).

However, due to the Doha round of WTO negotiations stalling, free trade agreements and other forms of preferential trading arrangements have become more attractive for countries with a heavy reliance on trade such as New Zealand. The basic premise of such agreements is to reduce the barriers to trade between the countries involved, and this is undertaken through the reduction and elimination of tariffs and the breakdown of non tariff barriers, as well as considering a whole range of other influences on trade. Williams believes that free trade agreements, particularly those focused on the relatively highly protected, growing Asian economies, are a key element of the export growth that will result in improved incomes for all New Zealanders (Bedford, 2011). The countries that New Zealand is targeting in its trade policy agenda are for the most part important export markets for the New Zealand dairy industry, and these agreements are therefore believed to provide significant opportunities for the dairy industry in particular.

Missing from the literature is a study that brings together all of New Zealand's preferential trade agreements, both existing and under negotiation, and analyses these agreements from the perspective of this critical industry. Economic theory would suggest that these agreements should increase the level of dairy exports from New Zealand, which holds comparative advantage in pasture based milk production, to its trade agreement partners, since barriers to that trade are being removed as a result of the agreement. However, this is an empirical question that requires quantitative analysis to determine if in fact it holds in practice.

1.2　Objectives of this Research

The objective of this study is to quantitatively analyse and determine the economic impact of New Zealand's preferential trade agreements on the New Zealand dairy industry. Two different modelling approaches will be employed to analyse the effects of the existing and proposed PTAs on the New Zealand dairy sector:

1. New Zealand's existing PTAs will be analysed using the ex post econometric technique of the gravity model; and

2. New Zealand's proposed PTAs currently negotiation will be analysed using an ex ante computable general equilibrium model.

Providing context for these quantitative techniques are a series of interviews that were conducted with ten leading experts associated with the New Zealand dairy industry. These interviews were conducted with the aim of gaining a deeper understanding of how New Zealand's preferential trade agreements are viewed by the dairy industry from a practical perspective. Interview participants were unanimously positive about the effect that these agreements have had, and are expected to have in the future, on the dairy industry in New Zealand. Another aspect of the study is an investigation into the trade policies of other dairy producing nations. The proliferation of preferential trade agreements around the world in recent years has resulted in a complex system of trade preferences, and this investigation is undertaken in order to identify the main trade policy threats to the competitiveness of the New Zealand dairy industry in its key markets.

1.3　Organisation of this Research

Following this introduction to the study, Chapter 2 provides a discussion of the relevant literature. The World Trade Organisation and its multilateral liberalisation efforts are covered, as are preferential trade agreements, and how these elements interact. The literature review then moves on to the quantitative techniques used in this study: the econometric gravity model and computable general equilibrium modelling. Chapter 3 details the preferential trade agreements that New Zealand is involved in, ranging from those agreements that are already in force to the agreements that are currently under negotiation. Chapter 4 provides an introduction to New Zealand's dairy industry and its exports, so that the relevance of the agreements mentioned in Chapter 3 can be clearly seen. The methodology and data used, results seen and conclusions gained from the gravity model are presented in Chapter 5, and

Chapter 6 presents the same for the Global Trade Analysis Project computable general equilibrium model. These chapters cover the quantitative techniques in some depth, so that replication of the methodology is possible from a careful study of these sections. Chapter 7 concludes. Detailed information is available in the appendices relating to the findings of the interviews undertaken with key personnel in and around the New Zealand dairy industry, as well as the trade policies of other dairy producing nations in New Zealand's key dairy export markets.

CHAPTER 2   LITERATURE REVIEW

Researchers widely agree that the largest benefits from trade liberalisation accrue to liberalisation undertaken on a non-discriminatory or 'most favoured nation' (MFN) basis[1] (Australian Productivity Commission, 2010a). Consequently, nations have generally supported the GATT and WTO multilateral trade negotiation processes and recognized their accomplishments: The dramatic reduction in trade barriers for most products and thus soaring world trade and resulting vastly improved welfare for all countries (LeClair, 1997). Director-General of the WTO, Mike Moore, points out that the benefits of this multilateral liberalisation are far-reaching:

> I believe that the free flow of goods and ideas promoted by bodies such as the WTO acts as a catalyst for development, and has lifted living standards worldwide and strengthened human rights (Moore, 2003, p. 6).

However, the latest Doha round of WTO negotiations reminds us that multilateral liberalisation is neither an easy process nor an over-night phenomenon. The sheer number of countries involved in the negotiations today and their substantially different economic positions, compared to the Uruguay Round, mean that reaching any conclusion is difficult and extremely complex, if not almost impossible[2].

New Zealand's Trade Minister Tim Groser states that New Zealand will never walk away from WTO multilateral negotiations,[3] it will just have to be patient in waiting for a conclusion of the current Doha round (Groser, 2011a). Groser believes in the potential of the WTO negotiations, stating that "A final deal still offers enormous possibilities for our dairy industry" (Groser, 2011a). It is Groser's belief that a reduction of up to 80% in trade distorting subsidies, and the elimination of all export subsidies, is possible through a conclusion being reached in this round of negotiations.

The challenge however is getting everyone to agree and the necessary compromises may not occur. As a consequence, many countries have turned to the establishment of preferential trade agreements (PTAs) with selected partners as a mechanism to continue developing their individual countries' bilateral benefits from trade. From a theoretical perspective we know that PTAs are second best, however, it is necessary to investigate whether PTAs actually provide empirically measurable economic benefits to a country. In the remainder of this chapter, we review the relevant trade literature and empirical methodologies used for answering this question.

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[1] The Most Favoured Nation principle is at the centre of World Trade Organisation multilateral liberalisation, and says that all WTO members should receive equal preferences into the markets of other members, while allowing for exceptions under certain circumstances.

[2] There are 153 member countries in the WTO (World Trade Organisation, 2011d).

[3] New Zealand places great emphasis upon World Trade Organisation multilateral trade negotiations, arguing that they "…remain the top trade priority for New Zealand because these multilateral trade negotiations offer the largest potential gains for a country like New Zealand" (Ministry of Foreign Affairs and Trade, 2009a, p. 14).

2.1 The World Trade Organisation

The WTO was established under GATT as an international organisation aimed at establishing and enforcing rules for the promotion of freer trade between countries (Ministry of Foreign Affairs and Trade, 2010g). Negotiations within the WTO are based upon 'first-difference reciprocity', where bargaining for market access concessions takes place for perceived advantages at the margin, rather than for full equality of market access (Bhagwati, 1998). A set of general principles guide the WTO, they include:

- reciprocity, where all countries must be prepared to reduce trade barriers;

- non-discrimination, where all WTO members receive the same preferences (the Most Favoured Nation principle);

- transparency, where trade barriers should be easily recognised by other countries and not disguised;

- national treatment, where imported goods should receive the same treatment within a country as domestic goods; and

- compensation, where countries harmed by changes in policies of another country are entitled to compensation (Reed, 2001).

Accession to the WTO requires demonstration of a country's commitment to these principles and the overall goal of freer trade (Reed, 2001).

The Uruguay Round began in September 1986, in Punta del Este, Uruguay, with a general commitment to liberalise agricultural trade, as well as other areas such as intellectual property, services, trade-related investment measures, and dispute settlement procedures (Reed, 2001)[4]. Until the Uruguay Round began, agriculture had been treated as an exception in the GATT negotiations, and had not been subject to the same discipline as industrial products (Goldin, Knudsen, & van der Mensbrugghe, 1993).

The negotiations were largely played out between the European Community (EC), the United States, and the Cairns Group, of which New Zealand is a member[5]. The latter two groups supported more open trade while the EC was more cautious (Reed, 2001). Negotiations broke down due to agricultural conflicts in December 1988, restarted in April 1989 and eventually concluded in December 1993, not before more conflict over agricultural trade issues (Reed, 2001). Commitments for liberalisation began in 1995, and benefits to the New

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[4] It should be noted that in WTO negotiations, forestry and fishing are treated as non-agricultural products (Ministry of Foreign Affairs and Trade, 2010e). Agricultural trade relates to products falling mainly in Chapters 1-24 of the Harmonized System code (Smith, 2009).

[5] The Cairns Group is a coalition of 18 agricultural exporting countries pushing for agricultural trade reform, accounting for one-third of the world's agricultural exports. Members are: Australia (permanent Chair), New Zealand, Argentina, Bolivia, Brazil, Canada, Chile, Colombia, Costa Rica, Guatemala, Indonesia, Malaysia, Pakistan, Paraguay, the Philippines, South Africa, Thailand and Uruguay (Ministry of Foreign Affairs and Trade, 2010c).

Zealand economy from the Uruguay Round are estimated at $1 billion annually for the nine years hence (Ministry of Foreign Affairs and Trade, 2010g).

As well as introducing agriculture to multilateral trade negotiations[6] and establishing protection reduction commitments[7], the Uruguay Round also formed the World Trade Organisation to supersede the GATT (Reed, 2001). Reed (2001) identifies the WTO as a more encompassing organisation, with its goal being to uphold the GATT and to provide a more enforceable dispute resolution system. There is a clear timetable for settlement, where "the losing party must either compensate the other party or withdraw the concessions covered by the complaint" (Reed, 2001, p. 93). It is considered that in order to obtain membership to the WTO, some degree of national sovereignty must be sacrificed so that the WTO can operate effectively (Reed, 2001).

The Doha Development Agenda was established in 2001 (Koo & Lynn Kennedy, 2005). The aim of this round of multilateral trade negotiations is to place the interests of developing countries at the 'heart' of the talks (Elliott, 2006). A deadline for completion of the talks was set for January 1, 2005, however the Round has still not been concluded by 2011 (World Trade Organisation, 2011a). Indeed, "the prospects for a satisfactory resolution to the DR [Doha Round] are uncertain, given the many contentious issues among WTO member countries" (Vollrath, Gehlhar, & Hallahan, 2009, p. 299).

Agricultural trade is a vital component of the Doha Round negotiations, since agriculture has not been afforded the same importance as other manufacturing sectors in previous Rounds. This means that the agricultural sector has the highest remaining barriers to trade in rich countries and the greatest potential gains from further liberalisation of merchandise trade (Elliott, 2006, p. 1).

The specified goals for agriculture in the Doha Round are "increasing market access; reducing, with a view to phasing out, export subsidies; and making substantial reductions in domestic support" (Martin & Anderson, 2008, p. 1). Martin and Anderson (2008) believe abolishing export subsidies to be the most easily achievable goal of these. Agreement seems to have been reached that reductions in these areas will be best served with a formula based approach, as opposed to request-and-offer negotiations or average across-the-board cuts[8] (Martin & Anderson, 2008).

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[6] Many perceive one of the great achievements of the UR to be the start made to bringing agricultural policies under multilateral discipline, and the agreement to return to the negotiating table in 2000 (K. Anderson, Hoekman, & Strutt, 2001, p. 192).

[7] A significant accomplishment of the negotiations was the agreement to transform non tariff barriers into tariffs, to make barriers more transparent and therefore easier to view and eliminate (LeClair, 1997).

[8] Anderson et al. (2001) discuss the differences involved in reducing MFN tariff levels by an across-the-board cut, by the 'Swiss formula' where tariff reductions are greater for higher tariffs, or by the 'zero-for-zero' approach where tariffs are eliminated altogether for certain products. The Uruguay Round Agreement on Agriculture (URAA) took an approach based on an across-the-board cut, but used simple averages to dictate required reductions, causing problems with implementation practices. It is likely that gains would have been greater under a 'Swiss formula' approach (Organisation for Economic Co-operation and Development, 1997).

The Doha Round is believed to represent massive opportunities for the growth of economic welfare throughout the world (K. Anderson & Martin, 2005). Liberalising agricultural trade is deemed to be extremely important for unlocking the benefits of the Doha Round, although agricultural policy is proving to be a major stumbling block for the negotiations (K. Anderson & Martin, 2005). Global agricultural trade reform is thought to be particularly important for developing countries (K. Anderson & Martin, 2005), as well as for New Zealand (Ministry of Foreign Affairs and Trade, 2010f).

Agriculture in the WTO

Historically, agriculture has been one the most heavily protected sectors in international trade (Grant & Lambert, 2008; Koo & Lynn Kennedy, 2005). It has been characterised by high levels of internal support, export subsidies that allow countries to dispose of accumulated surpluses, and high trade barriers to support domestic policies (Reed, 2001).

> …agriculture has no competitors for the title of most distorted sector of the global economy. It is now the only sector where both quantitative restrictions (tariff-rate quotas) and export subsidies are still permitted, and the level of protection for agriculture is far higher than that for manufactured goods (Elliott, 2006, p. 5).

Food is often considered differently from other goods for a number of reasons: it is vital for the nourishment of a country's people and that country may therefore see self-sufficiency in food as important (Reed, 2001); it may be subject to various religious ideas (Smith, 2009); its production may be associated with certain positive externalities, such as a green countryside (Bhagwati, 2002); or it may be otherwise politically sensitive (Smith, 2009). An example of this political sensitivity is given by many developed countries, where farming lobby groups have greater political power than the disorganised, diverse consumer group that suffers from the higher prices resulting from tariffs and other trade barriers (Reed, 2001). As a result of the high protection seen in agricultural markets,

> Domestic prices are pushed far above those on the international market. In such instances, the allocation of resources among sectors is grossly distorted, and consumers of foodstuffs bear a heavy burden to support high-cost local production (Josling, 1998, p. 8).

There are three measures of agricultural support by governments identified by the WTO (often known as the three pillars of agricultural support (Hoda & Gulati, 2007)): market access instruments, such as tariffs, quotas, and special safeguard measures; domestic support measures, such as domestic subsidies; and export policies, such as export subsidies (Smith, 2009). It is believed that export subsidies are the most distortionary form of agricultural support (Ministry of Foreign Affairs and Trade, 2010c).

As a result of the Uruguay Round Agreement on Agriculture (URAA), there has been a general shift to change non tariff barriers into tariff form, a process described as tariffication (Organisation for Economic Co-operation and Development, 1997). Tariffication makes barriers to trade more transparent (K. Anderson et al., 2001; Josling, 1998), thus making trade liberalisation easier to accomplish and progress easier to view (LeClair, 1997). Tariffs also

improve the flow of market signals to producers and consumers in comparison to other forms of protection (Josling, 1998).

Tariff rate quotas (TRQs), otherwise known as tariff quotas, have become increasingly popular as a result of the trend towards tariffication (Reed, 2001). The OECD (1997, p. 23) states that "to ensure that tariffication would not reduce the market access opportunities, countries were obliged to maintain current access by means of tariff quotas". A TRQ offers a low or zero tariff for a certain access level of imports, and then subjects higher levels of imports to a higher tariff. Elliott (2006) discusses that tariff rate quotas are potentially more flexible than simple quotas because imports can enter outside the quantitative restriction, although for many agricultural products the out of quota tariff is prohibitively high.

Non tariff barriers (NTBs) represent a diverse range of policies that have a distortionary impact on world trade. Even in recent times the use of NTBs has become more extensive: "As tariffs are reduced within the multilateral framework, non tariff barriers become increasingly important" (Grant & Lambert, 2008, p. 766). Quotas and tariff rate quotas are forms of NTBs, and Koo and Lynn Kennedy (2005) add to the list of NTBs in operation throughout the world: voluntary export restraints, international cartels, antidumping and countervailing duties, government procurement and competition policies, state trading operations, customs procedures, and technical barriers such as health and safety standards. Trade negotiations have begun to increasingly focus on these non tariff barriers, recognising the significant impediments to trade that they represent (LeClair, 1997).

The URAA also attempted to form rules relating to agricultural export subsidies, which have historically been popular amongst developed countries such as the United States of America and the European Union (Reed, 2001). Export subsidies have a distortionary effect on world trade since world prices are depressed due to the subsidy, and producers who do not receive such subsidies are severely disadvantaged. Export subsidies are particularly harmful in international dairy markets: "Dairy products are probably the products most affected by export subsidy use" (Ministry of Foreign Affairs and Trade, 2010c).

> The agreement attempts for the first time to ban new export subsidies. Existing subsidies are, however, allowed to continue subject to agreed on reductions (Josling, 1998, p. 30).

A cap was set on total expenditure on agricultural export subsidies, while this expenditure was to be reduced by 36 percent, and the quantity of subsidised exports to be reduced by 21 percent (Josling, 1998). Therefore, farm export subsidies still exist in many countries.

Export taxes are generally only found in developing countries where the government requires a simple method of capturing some of agriculture's earnings (Reed, 2001). Other policies followed by exporting countries that have a distortionary impact are domestic policies such as price supports, deficiency payments, and marketing boards (Reed, 2001). Domestic support policies are classified according to the level of distortionary impact they have on

international trade, with the more distortionary subject to reductions[9] (Josling, 1998). Elliott (2006) discusses how the costs of market price supports are generally met by consumers until surpluses develop, while taxpayers pay for farm or export subsidies.

As discussed by Elliott (2006), developed countries' agricultural support programs are gradually moving towards income support that does not provide direct production incentives and thus has less distortionary impact on international markets. Policies that do not directly affect production are known as decoupled support policies, and an example is a direct farm payment that is not linked to production (Sanderson, 1990). Under these types of policies, there is no financial incentive for farmers to increase production, as there would be if that policy artificially increased the price farmers received for their product or reduced input costs. However, it is still likely that decoupled income support does affect production to some extent, since the effect is to keep farmers farming who would not be able to if left at the mercy of market forces alone. Their risk is reduced, their exit from the industry is discouraged, and production is therefore higher than it would be if this income support did not exist (Elliott, 2006).

Anderson et al. (2001) highlight that new trade agenda issues featured prominently in the Uruguay Round negotiations on agriculture, with new rules for the application of sanitary and phytosanitary (SPS) standards, as well as agricultural production subsidies. The Uruguay Round sets out that SPS measures are to be

> Imposed only to the extent necessary to ensure adequate food safety and animal and plant health on the basis of scientific information, and are the least trade-restrictive measures available to achieve the risk reduction desired (K. Anderson et al., 2001, p. 205).

There are also improved dispute resolution procedures (Organisation for Economic Co-operation and Development, 1997).

Josling (1998) points out that implementation of the requirements of the Uruguay Round Agreement on Agriculture was not onerous for New Zealand, due to the policy reforms that had been undertaken in the mid-1980s. Trade distorting domestic subsidies had largely been removed, export subsidies were rarely used, and tariffication had already been conducted for the most part (Josling, 1998). The Cairns Group, which was led by New Zealand and Australia, therefore kept the issue of agriculture an important one in the Uruguay Round negotiations (Josling, 1998).

Anderson et al. (2001) propose that further WTO negotiations (after the Uruguay Round) must continue the process of agricultural trade liberalisation, which will be aided by providing linkages with other sectors in the negotiations. They give three reasons for non-agricultural negotiations being relevant to agricultural negotiations: the desire for reciprocity if agricultural importers lower trade barriers; reducing agricultural production costs; and the ability of farmers to compete with other sectors for mobile factors of production. Anderson et

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[9] Domestic policies were classified into either a green box (non trade distorting), blue box, or an amber box (trade distorting), with the amber box policies subjects to reductions (Koo & Lynn Kennedy, 2005).

al. (2001) believe that services liberalisation and further liberalisation of manufactures trade are key areas to address alongside agricultural trade.

> Liberalisation is more likely when the negotiation structure broadens the stakes beyond the agricultural sector through engaging exporter interests or raising a sense of international obligation (Davis, 2003, p. 71).

Elliott (2006) concurs, and further believes that developing countries should be provided aid-for-trade to address the adjustment costs associated with trade liberalisation, and to assist those countries to take advantage of new trade opportunities. Anderson et al. (2001) discuss the necessity of developing future multilateral agreements based around domestic subsidies, state trading and competition policy, technical standards, and environmental standards. "Domestic and international policy reform are mutually reinforcing. In fact, they are two parts of the same process" (Josling, 1998, p. 5).

> We have already seen that tariff rate quotas (TRQs) have become more popular as a result of tariffication. "The introduction of tariff rate quotas is expected to benefit traditional exporters such as New Zealand and Australia, especially in the case of dairy products" (Organisation for Economic Co-operation and Development, 1997, p. 23). Anderson et al. (2001) suggest that in further WTO negotiations, TRQs should be expanded, reducing their importance and lessening the impact of high above-quota tariffs. They do not believe that banning TRQs would be supported by agricultural-exporting countries, since they provide at least some market access at low or zero tariffs.

> The Doha Development Agenda (DDA) has included agriculture as a key element in negotiations, yet progress has been slow. Members have shown significantly different negotiating positions with respect to how ambitious trade reforms should be, and there is therefore disagreement on the extent of tariff cuts, the level of expansion of tariff rate quotas, and over reductions to domestic support (Ministry of Foreign Affairs and Trade, 2010f). However, the Hong Kong Declaration has shown some level of cooperation, where members have agreed to eliminate all export subsidies by 2013 (Elliott, 2006; Ministry of Foreign Affairs and Trade, 2010f).

> Agricultural liberalisation is the key to a successful Doha Round because that is what key countries want and most of what the rich countries have left to contribute in a reciprocal negotiation (Elliott, 2006, p. 1).

Article 24 of the GATT
Article 24 of the GATT allows member countries to eliminate barriers to trade with each other without extending that liberalisation to other member countries, as is normally required by the MFN principle. The exception that Article 24 provides to MFN is seen where those countries form a preferential trade agreement (PTA), subject to some requirements. The first requirement under Article 24 is that "substantially all" trade barriers among the members are removed (Frankel, 1997, p. 3), meaning that barriers must be completely removed (subject to a transition period), and that major sectors cannot be excluded from the agreement. This is

particularly important when it is considered that many countries are reluctant to liberalise trade in the agricultural sector. Other requirements pertain to barriers with countries external to the agreement, which cannot be increased as a result of the agreement, and that the timeframe for economic integration is within 'a reasonable length of time', currently not normally more than 10 years (Frankel, 1997). The objective of Article 24 of the GATT is to accommodate preferential trade agreements so that they are compatible with a rule-based and more open trading system, and their implementation contributes to free trade (Das, 2004). As Das (2004, p. 97) points out,

> Many countries would not have joined the GATT if it had prohibited future RIAs [regional integration agreements] among neighbours and the multilateral trading system would have been much less multilateral.

2.2   Preferential Trade Agreements

A bilateral free trade agreement is an agreement between two nations that improves their ability to trade with each other, through breaking down the barriers involved in such transactions. As such, a free trade agreement (FTA) improves market access and strengthens trade flows (Siriwardana & Yang, 2008), and may eventually lead to closer economic integration between the two nations (Ministry of Foreign Affairs and Trade, 2009b). A regional trade agreement (RTA) is a similar concept, although may include more than two countries. There is the possibility that a free trade agreement may include more than two countries who are not strictly regional partners, or that, at least in the short-term, trade is not totally free of duties, so preferential trade agreement (PTA) is perhaps a more suitable term to describe these policies. The terms preferential trade agreement, free trade agreement, and regional trade agreement are used interchangeably in this study.

Another form of trade agreement is a customs union, where members eliminate trade barriers with other members of the union, but have a common external tariff to non-members (Reed, 2001). However, since New Zealand is not part of a customs union and has no plans to be, the preferential trade agreements referred to in this study are of the bilateral and regional trade agreement mould, where tariffs with non-members have no part in the agreement[10].

Proliferation of Preferential Trade Agreements

New Zealand's Ministry of Foreign Affairs and Trade (2007a) states that World Trade Organisation multilateral negotiations remain New Zealand's number one trade policy priority, and that free trade agreements complement this multilateral approach.

> Preferential arrangements, though they may break new ground and offer lessons for wider application, can never be a substitute for multilateral action (Heydon & Woolcock, 2009, p. 5).

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[10] Indeed, Bhagwati (2008) describes customs unions as rare in comparison to preferential trade agreements.

However, there has been slow progress in WTO negotiations, with the Doha round of negotiations, which began in 2001, still not completed by late 2011 (World Trade Organisation, 2011b).

The slow progress of the WTO has meant that many countries have also been negotiating a number of preferential trade agreements, perhaps both as an alternative to, and to complement, the multilateral negotiations (Vollrath et al., 2009). There are many commentators who have observed that the surge in the number of PTAs around the world is, at least partially, the result of slow progress in WTO negotiations (Arnold, 2006; Bagrie, Goh, Williams, Croy, Zollner, Edwards, Smith, et al., 2011; Grant & Lambert, 2008; Koo & Lynn Kennedy, 2005; Lambert & McKoy, 2009; Ministry of Foreign Affairs and Trade, 2007a).

> With multilateral negotiations becoming increasingly complex and protracted, trade deals among selected partners are seen, rightly or wrongly, to hold the promise of quick and comprehensive improvements in market access and rules for trade and investment (Heydon & Woolcock, 2009, p. 3).

The Australian Productivity Commission (2010a) discusses rapid growth in bilateral and regional trade agreements , such that by July 2010 474 regional trade agreements had been notified to the WTO (World Trade Organisation, 2011c). The WTO sees regional trading agreements as "a very prominent feature of the Multilateral Trading System" (World Trade Organisation, 2011c). The New Zealand Ministry of Foreign Affairs and Trade (2008) highlights that this proliferation has been since the turn of the [21st] century. The rapid expansion of the number of preferential trade agreements in operation and under negotiation around the world prompted Tim Groser, New Zealand's Minister of Trade, to go so far as to say: "…if you are not at the cutting edge of FTA strategy, you are not part of the game" (Groser, 2011c). Scollay (2007) and Dent (2010) identify the Asia Pacific as one region in particular where the growth in PTAs has been remarkable, confirmed by the New Zealand Ministry of Foreign Affairs and Trade (2009b, p. 13): "There has been an explosion in the number of FTAs being negotiated throughout the global economy, and particularly the Asia-Pacific region". New Zealand's location therefore presents it with great opportunities in the preferential trade agreement phenomenon, since more than 70 percent of New Zealand's trade and investment occurs within this region (Ministry of Foreign Affairs and Trade, 2009a).

> It is essential that New Zealand be part of this activity in order to strengthen economic links, obtain improved access to markets and remain competitive (Ministry of Foreign Affairs and Trade, 2010d, p. 13).

New Zealand has been something of a leader in the development of preferential trade agreements, with New Zealand's first free trade agreement signed in 1983, the Australia-New Zealand Closer Economic Relations Agreement (CER). The WTO has described the CER as "the world's most comprehensive, effective and mutually compatible free trade agreement" (Ministry of Foreign Affairs and Trade, 2007a, p. 4). New Zealand, recognising multilateral WTO negotiations are its top trade policy priority but that progress can be painstaking, sees PTAs as a means of achieving positive benefits through trade liberalisation. ANZ note that "New Zealand's focus is increasingly centred around the negotiation of bilateral agreements" (Bagrie, Goh, Williams, Croy, Zollner, Edwards, Smith, et al., 2011, p. 7).

Bhagwati (2008) believes that a major driver of the recent proliferation of PTAs around the world has been the change in United States trade policy, where instead of staunchly supporting multilateral trade liberalisation, the US is now actively involved in pursuing PTAs. Frankel (1997) also identifies the United States, and adds Canada's instigation of a free trade area with the United States, as a major driver of the move towards 'regionalism'. The United States was a firm advocate of multilateral liberalisation through the GATT until the early 1980s, when despite the United States' strong support a new round of GATT negotiations was not launched. As a result, the United States turned to bilateral free trade agreements, beginning negotiations almost immediately with Canada and Israel (Reed, 2001) and the Caribbean (Frankel, 1997). The US believed that bilateral agreements could be pursued simultaneously with multilateral negotiations (Bhagwati, 2008), and would even help to initiate more multilateral liberalisation (Reed, 2001). According to Bhagwati (2008), other countries followed the United States' lead for various motivations, many not strictly economic. The result is a "spaghetti bowl" of criss-crossing PTAs (Bhagwati, 2008, p. 63).

Theory Surrounding Preferential Trade Agreements

A preferential trade agreement aims to improve market access for the trading partners' exporters and/or investors, through reducing existing barriers to trade between the relevant countries, and ensuring that current access is maintained (Ministry of Foreign Affairs and Trade, 2007a). Traded goods are the most obvious subject of a free trade agreement, where import tariffs are reduced and eliminated, and import quotas are dismantled. "A high-quality FTA will eliminate duties on most traded goods within a commercially meaningful period of time after entry into force" (Ministry of Foreign Affairs and Trade, 2007a, p. 10). This has the effect of increasing the size of the 'home' market for the member countries' firms (Das, 2004).

Preferential trade agreements often also include a range of other considerations, such as commercial instruments (safeguards and anti-dumping measures), trade in services, public procurement, investment and intellectual property rules, customs procedures, health and environmental standards, and dispute settlement mechanisms[11] (Frankel, 1997; Heydon & Woolcock, 2009; Ministry of Foreign Affairs and Trade, 2005a, 2008, 2009a). Indeed, a review conducted on the New Zealand – China Free Trade Agreement two years after its entry into force found that the effects of that agreement were certainly not limited to lower trade barriers:

> Benefits arising from the FTA include, *inter alia*, improved market access, improved customs procedures and trade facilitation, increased efficiency, and enhanced transfer of technology and skills (Ministry of Foreign Affairs and Trade, 2010a, p. 2).

LeClair (1997) discusses the strongest argument for the elimination of trade barriers as resulting from the concept of comparative advantage. "The elimination of trade barriers between members of FTAs allows for the exploitation of comparative advantage within the

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[11] Frankel (1997) believes that the integration among countries involved in regional agreements in many of these areas is simply a matter of harmonising on a single standard, rather than negotiating what that standard should be.

region" (LeClair, 1997, p. 1). Without tariffs or other trade barriers, countries can specialise in production best suited to their resource and labour endowments, thereby increasing intra-bloc trade and increasing economic growth and standards of living within the member countries (LeClair, 1997). As well as the pure theory of comparative advantage, the possibility of PTAs encouraging productivity gains through better technology and business practices has been proposed as an additional benefit (Kim et al., 2007). The possibility of economies of scale in production and therefore reduced average production costs and increasing returns has been discussed (Kim et al., 2007; LeClair, 1997), although Viner (1950) did not believe there was significant scope for this in the formation of customs unions.

Another branch of PTA theory is formed using the idea of 'natural partners' (Wonnacott & Lutz, 1989), which may or may not operate in conjunction with comparative advantage and scale economies theory. Natural partners are more likely to form preferential trade agreements than a randomly selected country pair, so that the choice of partner countries in a PTA is not exogenous (Magee, 2003). Natural partners can be determined either by the volume of trade between the countries involved or geographic proximity (Wonnacott & Lutz, 1989). The central tenet of this type of theory is that a PTA formed with a natural trading partner will lead to overall benefit since trade creation effects will outweigh trade diversion effects[12]:

> Trade creation is likely to be great and trade diversion small if the prospective members of an FTA are natural trading partners (Wonnacott & Lutz, 1989, cited in Bhagwati, 2008, p. 56)

Frankel (1997, p. 40) also highlights geography as an important part of any discussion of the trade between countries, both due to the natural trading blocs that form between countries located close together, and because "distance between countries is an important natural determinant of the volume of trade between them". Frankel (1997) discusses the reasons why trade with distant countries has higher costs associated than does trade with countries nearby, including higher shipping costs, greater time costs, and typically less cultural familiarity. Bhagwati (2008) does not believe that the natural partner hypothesis holds any promise as to why preferential trade agreements may be economically beneficial.

ANZ (Bagrie, Goh, Williams, Croy, Zollner, Edwards, Smith, et al., 2011) believe that the economic effects of PTAs can be divided into two broad categories; static and dynamic effects. Static effects are the direct impacts from trade liberalisation on economic growth, and include higher export returns and volumes resulting from lower trade barriers. Dynamic (productivity) gains are the result of domestic businesses striving to stay at the leading edge of business practice, in terms of innovation, technology, knowledge, research and product and service development.

> By removing barriers to investment, trade and competition, deeper integration could result in increasing returns on investment, increased investment and thus an increase

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[12] The concepts of trade creation and trade diversion will be discussed further below.

in the stock of investment, leading to a higher growth trajectory (Heydon & Woolcock, 2009, p. 214).

As an example of dynamic gains, where the countries involved in a bilateral trade deal are at varying levels of economic development, technology transfers that benefit developing economies are typically seen (Das, 2004).

Free trade agreements can have benefits for exporters not only in removing import barriers and therefore improving access to new or existing markets, but also in maintaining exporters' competitiveness relative to other exporting nations. If other exporting nations are negotiating their own free trade agreements, any preferential access gained that New Zealand does not enjoy will result in New Zealand exporters becoming disadvantaged.

As competitors gain preferential advantage through agreements with countries where New Zealand has significant markets, New Zealand, must match this, or find its own exporters disadvantaged (Bagrie, Goh, Williams, Croy, Zollner, Edwards, Smith, et al., 2011, p. 14).

It must be noted that the rationale behind the negotiation of preferential trade agreements are not always along economic lines. Economic gains are typically the key determinant of the feasibility of free trade agreements in quantitative studies, but political and strategic interests also often underpin negotiations (Australian Productivity Commission, 2010a; Ministry of Foreign Affairs and Trade, 2007a). Frankel (1997) discusses political implications as important criteria in forming regional trading arrangements, such as the European Economic Community's binding together of Germany and France, who had historically been enemies in many wars.

How Preferential Trade Agreements Affect Barriers to Trade and Investment

The two approaches to formulating a preferential trade agreement differ in how the goods and services included for preferential access are selected. A positive list approach means that every product that will be included in the agreement's provisions must be named and set out in a schedule (Bagrie, Goh, Williams, Croy, Zollner, Edwards, Smith, et al., 2011). A negative list approach, thought to offer advantages over a positive list, simply includes everything unless it is specifically excluded (Ministry of Foreign Affairs and Trade, 2005a). Obviously the negative list approach is more likely to result in an outcome that is compliant with Article 24 of the GATT requiring the PTA to cover 'substantially all trade'.

Adding to the complexity of preferential trade agreements, some sectors are seen as sensitive, and are therefore treated differently in the terms of a PTA. In some sectors tariffs are reduced to zero upon implementation of the agreement, and in more sensitive sectors tariffs are phased out over a period of time (Ministry of Foreign Affairs and Trade, 2007a, 2008). The purpose of the phase-out period is to allow adequate time for these sensitive sectors to adjust to tariff reductions (Ministry of Foreign Affairs and Trade, 2009a).

Another important consideration arises around rules of origin, designed to eliminate the possibility of external countries gaining preferential access as a result of a PTA. Without

rules of origin, an exporter who faces a high tariff into a particular market could instead export to a country that enjoys a PTA with the high tariff country, and then re-export through the intermediary to the high tariff country, gaining from the intermediary's preferential access (Frankel, 1997). The New Zealand Ministry of Foreign Affairs and Trade (2009a) notes that rules of origin are necessary in order to prevent countries outside of a PTA accessing its benefits 'through the back door'. The difficulties associated with applying rules of origin are touched on by Bhagwati (2008), while Frankel (1997) believes that rules of origin have been used to protect favoured industries.

A benefit of PTAs not often discussed in the literature is the prevention of 'backsliding', so that the PTA may be beneficial even when it has no immediately obviously effects (Australian Productivity Commission, 2010a). A PTA will effectively 'lock-in' existing levels of trade liberalisation, so that barriers cannot be increased in the future, even if this were legally possible under WTO rules[13]. There are however many trade restricting measures that are typically not covered by PTAs, such as production and export subsidies, and as such a PTA cannot prevent the introduction of all possible new trade barriers (Australian Productivity Commission, 2010a).

Trade facilitation is defined as a process of improving the efficiency of border procedures in international trade (Australian Productivity Commission, 2010b). This means reducing the transaction costs involved with international trade, reducing costs for both firms (reduced input costs) and consumers, as well as the time spent waiting for goods to arrive. In attempting to harmonise customs and quarantine procedures, health and environmental standards and the like, PTAs aim to reduce the transaction costs of international trade. As this trade facilitation occurs, it is likely that trade between the countries involved will expand (Australian Productivity Commission, 2010b), further increasing the benefits of the agreement.

Due to the complexities involved in formulating a preferential trade agreement, it is possible that negotiations between the countries involved will take some time, perhaps two years or more (Ministry of Foreign Affairs and Trade, 2010b). After feasibility studies, either jointly or separately, the countries will enter negotiations in the form of rounds. Each round is a short period of negotiation, after which some time will be given for contemplation and formulation of new ideas, typically a few months, before a new round takes place. The New Zealand Ministry of Foreign Affairs and Trade (2010b) discusses that earlier rounds typically involve the participants building confidence in each other, followed by discussion on specific texts and commitments in later rounds.

Trade Creation and Trade Diversion

A major consideration in determining whether PTAs are beneficial for global trade is the risk of trade diversion. Trade diversion is a situation where the growth in trade between the countries involved in a PTA is at the expense of other trade partners, reducing the overall benefit of the

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[13] An example is provided by tariff levels, where often applied tariffs are lower than the bound tariffs dictated by WTO sanctions, meaning that a WTO member could potentially increase its applied tariff up to the bound level if hit by some adverse event (Australian Productivity Commission, 2010a).

agreement (Australian Productivity Commission, 2010a). More simply, trade diversion is a decrease in trade between members and non-members as a result of a PTA (Frankel, 1997). Trade diversion occurs due to the removal of the intra-member tariff, while external countries are still subject to tariffs. The effect can be to divert trade away from a more efficient third country to a PTA partner, reducing global welfare (Rae, Chatterjee, & Shakur, 2001). Frankel (1997) concurs, identifying trade diversion as potentially harmful because a less efficient supplier in another PTA member is producing rather than a lower-cost non-member producer. Bhagwati (2008) notes that even the liberalising country itself can suffer when trade diversion occurs, since it is buying more expensive imports and thus suffers a 'terms of trade' loss.

The opposite situation to trade diversion is trade creation, where trade increases between members of a PTA as a result of trade liberalisation causing more efficient imports to displace domestic production (Frankel, 1997). Frankel (1997) identifies trade creation as positive because a more efficient producer is supplying the goods, rather than a higher-cost domestic producer. Rae, Chatterjee, and Shakur (2001, p. 305) discuss that trade creation "has the potential to improve welfare of the union members through allocative efficiency gains and consumer surplus gains within the union".

Reed (2001) identifies trade diversion as the main distinguishing factor between PTAs and pure trade liberalisation. Whether a PTA is beneficial or not, from both a global efficiency and individual country perspective, will depend on the relative sizes of the trade creation and trade diversion effects (Bhagwati, 2008; Rae et al., 2001). Bhagwati (2008) identifies Jacob Viner (1950) as the first economist to consider the trade diversion problem of PTAs. Viner discusses the effects of a customs union:

> It will be noted that for the free-trader the benefit from a customs union to the customs union area as a whole derives from that portion of the new trade between the member countries which is wholly new trade, whereas each particular portion of the new trade between the member countries which is a substitute for trade with third countries he must regard as a consequence of the customs union which is injurious for the importing country, for the external world, and for the world as a whole, and is beneficial only to the supplying member country (Viner, 1950, p. 44).

Thus, Viner (1950) posits that whether a customs union is beneficial or not from a free trade point of view depends upon which effect ensues. Another distortion that can result from a PTA is in the pattern of foreign direct investment, where the creation of the European Union has resulted in many companies establishing facilities in Europe to gain preferential access to European markets (Reed, 2001).

2.3   The Coexistence of the WTO and Preferential Trade Agreements

As seen above, GATT, and subsequently WTO negotiations are subject to the MFN principle, where members cannot differentiate between other member countries when setting their tariff levels (Reed, 2001). However, preferential trade agreements, and even customs unions, are allowed under Article 24 of the GATT. Of course, the gains from global trade liberalisation exceed the gains of any bilateral or regional trade agreement (LeClair, 1997), but there is also

the possibility that the PTA itself will actually reduce welfare. The resulting argument over whether PTAs are 'building blocks' or 'stumbling blocks' for global trade liberalisation is one of the most relevant debates in the literature surrounding trade economics.

Stumbling Block

Rae et al. (2001) state that if tariff removal is done in a non-discriminatory fashion, it will have greater benefits than if discrimination occurs, but note that most liberalisation is done through the discriminatory framework of PTAs. "From an economic efficiency standpoint, such schemes can create new distortions, such that their welfare implications are uncertain" (Rae et al., 2001, p. 294). Since only universal free trade offers the first best Pareto optimum, any form of PTA is subject to the theory of the second best[14] (Rae et al., 2001). Indeed, Bhagwati (1997) believes that preferential trade agreements violate the spirit of MFN such that they undermine WTO multilateral negotiations.

Perhaps the most famous advocate of multilateral trade liberalisation, Jagdish Bhagwati, is scathing in his condemnation of preferential trade agreements. Bhagwati sees PTAs as inherently discriminatory, and a major problem for the world trading system, one which has the potential to cause a "trade wreck" rather than work towards free trade (Bhagwati, 2008, p. xii). Bhagwati blames the ignorance of policy makers for the recent movement towards PTAs, arguing that few can tell the difference between PTAs and genuine, non-discriminatory trade liberalisation, and mistakenly believe that PTAs are a step along the road towards free trade (Bhagwati, 2008). Bhagwati (2008) sees PTAs as two-faced, freeing trade among members, and increasing protection against non-members since without the same preferential access as PTA members the non-members face a higher handicap, even if the actual tariffs they face haven't changed[15]. "This means they are fundamentally different from free trade" (Bhagwati, 2008, p. 17). Bhagwati (2008) strongly disagrees with the US view that FTAs can be building blocks towards multilateral free trade.

LeClair (1997) believes there is an inherent conflict between bilateralism and multilateralism, since "the formation of a common market eliminates many of the incentives of engaging in meaningful multilateral tariff negotiations" (LeClair, 1997, p. x). This is an example of the 'stumbling block' argument, where PTAs are detrimental to the overall goal of multilateral liberalisation. Similarly, the successful conclusion of WTO multilateral negotiations reducing tariff levels amongst all members will reduce the benefits enjoyed by countries under a PTA, making the PTA negotiations somewhat of a waste of time and resources (LeClair, 1997).

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[14] "According to the Theory of the Second Best, if the persistence of one distortion is taken as given, thus precluding the first-best solution, then eliminating another distortion does not necessarily yield the second-best solution; it may be only third best, or worse. So long as tariffs and other barriers against outsider countries remain in place, the elimination of barriers between two FTA members can as easily intensify distortions as eliminate them" (Frankel, 1997, p. 208).

[15] Bhagwati (2008) points out that it is plausible that a country may increase its tariffs to PTA non-members (which is supposed to be prohibited by Article 24) since applied MFN tariffs are typically below the bound WTO level. Also, the use of non-tariff barriers with respect to external countries may increase (Bhagwati, 2002).

The traditional objection to PTAs stems from the trade diversion argument, where trade shifts from efficient non-member countries to less efficient member countries as a result of trade preferences (Bhagwati, 2008). "Trade diversion does not occur when tariff rates are reduced multilaterally" (LeClair, 1997, p. 29). It is also possible that partial trade liberalisation in a PTA format can worsen the effects of tariff escalation, thus making trade diversion impacts more severe[16] (Rae et al., 2001).

The Australian Productivity Commission (2010a) shares Bhagwati's (2008) concern that retaining bargaining coin for PTA negotiations may inhibit global trade liberalisation. If tariffs and other trade barriers are not reduced so that this bargaining coin can be retained, economic gains that would otherwise be experienced in the liberalising country will not be realised. Another problem is noted by Bhagwati (2002, p. 117) as coming from South Africa's Trade Minister Alec Erwin: "The poorer countries are least able to manage a trading system riddled by complex preferences and rules of origin".

Building Block
The Ministry of Foreign Affairs and Trade (2007a) states that New Zealand's number one trade policy priority remains WTO negotiations, since there are some issues that only WTO negotiations can effectively consider such as trade distorting (production) subsidies and export subsidies. The attraction of bilateral and regional trade agreements is the ability to conclude negotiations faster since less countries are involved (Ministry of Foreign Affairs and Trade, 2007a, 2009b), and to include aspects in an agreement that WTO negotiations would not, known as WTO-plus considerations (Australian Productivity Commission, 2010a). The Australian Productivity Commission (2010a) also argues that PTAs can assist multilateral liberalisation through competitive pressures, advantaging efficient exporters and acting to the detriment of high-cost import substituting producers. It is thus possible that PTAs will aid the transition of domestic industry to multilateral free trade. The New Zealand Ministry of Foreign Affairs and Trade (2009a) believes that FTAs, through highlighting and reinforcing the benefits of trade reform, can assist progress in multilateral negotiations.

> …those agreements can be complementary to multilateral liberalization and become an alternative path to a similar end. The question is not one of choosing between the two but making the best use of each (Josling, 1998, p. 97).

Griswold (2003, cited in Australian Productivity Commission, 2010a) argues the usefulness of PTAs due to the difficulty of reaching a consensus among WTO members, who must all agree before multilateral negotiations can be concluded. Griswold believes that PTAs are useful for countries that may be more ambitious in terms of tariff reductions, or in other areas such as quarantine and technical barriers to trade, services, investment, electronic commerce, and labour and environmental standards, among others. These are known as WTO-

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[16] Tariff escalation is seen where tariffs are higher for downstream (processed) sectors than upstream (materials extraction/preparation) sectors. Typically used to protect domestic processing sectors from foreign processing competition, whilst not making imported inputs more expensive (The World Bank, 2011e).

plus issues, since they are above the scope of WTO negotiations. Their negotiation in regional deals can perhaps create models for their inclusion in later multilateral negotiations (Frankel, 1997). Griswold (2003, cited in Australian Productivity Commission, 2010a) argues that PTAs can provide a basis for wider regional or multilateral negotiations, very much the 'building block' argument, while Frankel (1997) believes that PTAs should be open to the accession of new members. Frankel (1997) also points out that it is a possibility that the time and resources involved in multilateral negotiations may be reduced if those negotiations take place between fewer trading blocs, each made up of many countries with a single unified voice, rather than each country separately participating in the negotiations. He notes that there are both proponents and critics of this argument.

The Australian Productivity Commission (2010a) sums up the building block argument as where appropriately designed PTAs can "provide an option for countries to start down the path to reducing trade and investment barriers prior to undertaking more extensive unilateral (or multilateral) actions" (Australian Productivity Commission, 2010a, p. 85). The New Zealand Ministry of Foreign Affairs and Trade believes that

> Entering into a comprehensive FTA with ASEAN is expected to help maintain momentum and provide a "building block" towards New Zealand's wider goal of multilateral trade liberalisation (Ministry of Foreign Affairs and Trade, 2009a, p. 10).

In contrast to Jagdish Bhagwati's argument, the Ministry of Foreign Affairs and Trade states that "All routes [multilateral, regional and bilateral] lead to the same ultimate destination – an easier trading and investment environment for New Zealand business" (Ministry of Foreign Affairs and Trade, 2009b, p. 13). It must be remembered that for a small country such as New Zealand, its unwavering support of multilateral liberalisation does not guarantee an outcome; there are much larger economies that dictate what happens on that avenue of trade liberalisation.

Heydon and Woolcock (2009) believe that it is possible that preferential trade agreements are both a building block and stumbling block for multilateral liberalisation.

> PTAs can complement the multilateral trading system, but only if that system is itself robust – strengthening trade rules and bringing down MFN barriers, so that the distorting effects of PTAs are held in check (Heydon & Woolcock, 2009, p. 260).

It is so far unclear which effect has prevailed: "While the incidence of preferential agreements has increased, their overall impact on multilateral liberalisation is not clear from available evidence" (Australian Productivity Commission, 2010a, p. 84).

2.4   Gravity Model of International Trade

In order to analyse the effect of the trade agreements that New Zealand already has in force, the gravity model of international trade will be used. The gravity model is an econometric technique used to describe the bilateral trade relationship between two nations. The model acquired its name through its basic similarity to Newton's theory of gravitation; that bilateral trade between two countries is influenced positively by the size of the two economies, and

negatively by the distance between them (Shuai, 2010). More generally, Bergstrand (1985) discusses that a flow (export) from one country to another will be affected by economic forces at both the flow's origin and destination, and economic forces either aiding or resisting the flow's movement. Modifications can be made to the basic model to incorporate variables such as population, GDP per capita, and other factors such as common language, religion, colonial history, and trading arrangements (Frankel, 1997; van Bergeijk & Brakman, 2010).

> The gravity model is one of the great success stories of economics. The success of the model is its great explanatory power: the equations fit well statistically and give quite similar answers across many different datasets (J. E. Anderson, 2010, p. 71).

The Australian Productivity Commission describes the gravity model as the "…primary *ex post* econometric technique used to examine the determinants of trade flows" (Australian Productivity Commission, 2010c, p. 9). Its popularity is not a recent phenomenon however, as shown by James Anderson when in 1979 he described the gravity equation as "probably the most successful empirical trade device of the last twenty-five years" (J. E. Anderson, 1979, p. 106). The gravity model's relevance to this study is its dominance as the ex post analysis tool for bilateral trade flows, particularly the way in which it can be used to analyse the effects of a bilateral or regional trade agreement on trade flows: "The gravity model has performed remarkably well as a tool for measuring the impacts of RTAs" (Grant & Lambert, 2008, p. 765). Carrere (2006) discusses two reasons for the suitably of the gravity model to assessing regional trade agreements: it presents a relevant counterfactual to isolate the effects of an RTA, and can further isolate trade creation and trade diversion effects of that RTA. Attributing changes in trade flows to the preferential trade agreement is done through the use of binary variables in regression analysis to signify the formation of a particular trade agreement, while holding other factors such as GDP, relative income levels and country-specific effects, fixed (Australian Productivity Commission, 2010c). "We expect a bright future for the gravity model" (van Bergeijk & Brakman, 2010, p. 22).

The number of studies that utilise the gravity approach to model some form of trade liberalisation is impressive: "It [the gravity model] is regularly used to estimate the impact of reciprocal trade agreements (RTAs) on trade flows between partners" (Cipollina & Salvatici, 2010, p. 63). Shuai (2010) uses a gravity model to analyse the benefits to agricultural trade between China and USA of China's accession to the WTO. The Australian Productivity Commission (2010a) uses the gravity model to examine the effects of 27 trade agreements, finding that preferential trade agreements are likely to increase trade flows between partner countries. The gravity model approach has been used to analyse whether regional trade agreements have a trade creation or diversion effect, and has had mixed results (Jayasinghe & Sarker, 2008; Koo, Lynn Kennedy, & Skripnitchenko, 2006; Lambert & McKoy, 2009; Vollrath et al., 2009). Grant and Lambert (2008) use a gravity approach to test whether regional trading agreements increased trade among members more for agricultural than non-agricultural trade, whether phase-in periods were important, and the effect across different agreements. Zamroni (2003) used an augmented gravity model to test the effect of the ASEAN, ANZCERTA, and AFTA-ANZCERTA trade agreements.

It is possible for a typical bilateral or regional trade agreement to have both a positive trade-creating effect, where cheaper imports replace domestic production, and a negative trade-diverting effect, where these imports displace more efficient exports from the rest of the world (Koo et al., 2006). These effects often combine, in viewing trade data from an uninformed perspective, to give the impression that trade growth resulting from a PTA is unambiguously beneficial. Koo, Lynn Kennedy, and Skripnitchenko (2006), through a gravity model approach, find that regional preferential trade agreements improve global welfare through increasing agricultural trade volumes, and do not have a negative trade diversion effect. The agreements of interest were the ASEAN Free Trade Agreement, Andean Community, the EU, and the North American Free Trade Agreement. Lambert and McKoy (2009, p. 19), in their own study of the agricultural trade creation and diversion effects of PTAs, find that "The implication of this empirical evidence is that current PTAs are generally welfare-improving, rather than welfare-diverting". Conversely, Vollrath, Gehlhar, and Hallahan (2009), through another gravity model approach, find that agricultural trade does suffer from trade diversion effects, to the extent that bilateral free trade agreements have little positive impact on agricultural trade.

Gravity Theory

Shuai (2010) attributes the introduction of the gravity model to international trade to Tinbergen (1962) and Poyhonen (1963), although these studies depict no apparent link between the gravity equation and economic theory (Vollrath et al., 2009). Frankel (1997) identifies three reasons for the gravity model's increasing popularity in recent decades: its empirical success at predicting trade flows; its improved theoretical foundations, mostly coming from modern theories of trade in imperfect substitutes; and a new interest among economists in the subject of geography and trade. A particular strength is its versatility (van Bergeijk & Brakman, 2010), and it can be used to explain some trade phenomena that cannot be explained by traditional factor endowment theory (Shuai, 2010).

Two of the earliest attempts at introducing microeconomic foundations to the gravity model come from the contributions of Anderson (1979) and Bergstrand (1985). Anderson (1979) derives the gravity equation from the properties of expenditure systems, while Bergstrand (1985, p. 475) notes that "the gravity equation is a reduced form from a partial equilibrium subsystem of a general equilibrium trade model with nationally differentiated products". Bergstrand (1985) believes that earlier specifications of the gravity equation mis-specify the gravity model since they ignore the existence of nationally differentiated products, and omit certain price variables.

The generalised gravity equation proposed by Bergstrand (1985) differs from earlier specifications since it includes price and exchange rate variables. Dummy variables indicating the presence of preferential trading arrangements are used as proxies for tariffs, while transport costs are proxied by distance and a dummy variable for adjacency. In order to incorporate prices, Bergstrand uses cross-country variation in aggregate price (and unit value) indices to approximate cross-country differences in aggregate price levels. This can be done for both export and import prices. "Price terms, derived from underlying utility and production

functions, importantly influence trade flows and lend behavioural content to the gravity equation" (Bergstrand, 1985, p. 480). Each country's GDP deflator is also included in the analysis, as well as an exchange rate index indicating changes in the value of one currency in relation to the other since the base period. Thus, Bergstrand's (1985) generalised gravity model specification regresses aggregate trade flows from *i* to *j* on: country *i*'s income; country *j*'s income; distance; an adjacency dummy; an EEC dummy; an EFTA dummy; exchange rate; *i*'s export unit value index; *j*'s import unit value index; *i*'s GDP deflator, *j*'s GDP deflator, and a constant[17].

Bergstrand (1985) discusses the coefficient signs that he expects will be seen in his gravity model study. An increase in the trade flow from country *i* to country *j* will be caused by a rise in *j*'s income, an appreciation of *j*'s currency, adjacency, and the presence of a preferential trading arrangement, while greater distance between the two countries should reduce the trade flow. The other coefficients' signs depend upon the value of associated elasticities, so are less obvious but are discussed in some detail in Bergstrand (1985). Bergstrand's results show signs conforming to his expectations, with positive coefficient signs for importer income, the importer's currency, adjacency, and preferential trading arrangements, while distance has a negative sign. Bergstrand (1985, p. 479) believes that the other results are all associated with elasticity values that are "intuitively plausible".

More recently, Cipollina and Salvatici (2010, p. 64) have noted that the standard formulation of the gravity model expresses bilateral trade between country *i* and country *j* as a function of the two countries' GDPs, the distance between them, and a set of binary variables indicating various mutual characteristics. Grant and Lambert (2008) concur, but instead use a modified equation that allows for endogeneity bias in the RTA variable, and multilateral resistance (price) terms. These multilateral resistance terms are discussed further below. Cipollina and Salvatici (2010) undertook a meta-analysis to attempt to explain the reasons behind the wide variance in coefficients for the RTA variable found in different studies that all used the gravity model to analyse the effect of various RTAs. From their analysis of 85 such studies, "Overall, there is evidence that *ex post* empirical estimates of an influence of RTAs on trade flows are positive and nontrivial" (Cipollina & Salvatici, 2010, p. 78), "…confirming the existence of a genuine impact of RTAs on bilateral trade" (Cipollina & Salvatici, 2010, p. 71). However, they found that omitted variables problems are likely to lead to a significant downward bias in the results, while data measurement and specification problems mean that studies are less likely to produce "good results" (Cipollina & Salvatici, 2010, p. 78).

Cipollina and Salvatici (2010) discuss a particular problem often seen in gravity type studies; that correlation between the omitted variables and the variable of interest (RTAs for their study) results in biased estimates: "The omitted variables problems associated with the gold medal mistake can seriously affect the estimation of RTA trade impacts in both directions" (Cipollina & Salvatici, 2010, p. 73). Magee (2003) points to the natural trading partners hypothesis, where countries with already large bilateral trade flows are more likely to enter into PTAs. Magee (2003) finds that a Hausman test strongly rejects the exogeneity of preferential trade agreements to trade flows, so that where PTAs are included as an

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[17] Expressed in natural logarithms, apart from the dummy variables.

explanatory variable in the standard gravity specification, biased results will ensue. Indeed, Magee (2003) finds in favour of the natural trading partner hypothesis, while discussing that the sensitivity of the effect of preferential agreements on trade flows to the specification of the model results in inconclusive evidence for this aspect of the study, and therefore advises caution in drawing conclusions from gravity equations about the effect of PTA formation on trade.

Baier and Bergstrand (2007, cited in Grant & Lambert, 2008) also discuss the bias resulting from the endogeneity of PTA membership, as do Anderson and van Wincoop (2003). Accordingly,

> The most recent gravity model estimations tend to use panel data regression techniques, since cross-section and pooled regression models may be affected by the exclusion or mismeasurement of trading pair-specific variables (Cipollina & Salvatici, 2010, p. 69).

Grant and Lambert (2008) discuss two studies that investigated the conflicting results of various gravity model studies, which found that cross-sectional gravity equations yielded unstable results[18].

In deriving a gravity model with theoretical justification, Anderson and van Wincoop (2003) believe that previous empirical gravity models are not grounded in theory and thus suffer from omitted variable bias, and cannot be used for comparative static exercises. They discuss how trade between two regions depends negatively upon their bilateral trade barrier relative to the average barrier of the two regions to trade with all their partners. The term 'multilateral resistance' is derived from the theoretically appropriate average trade barrier (J. E. Anderson & van Wincoop, 2003). In Anderson and van Wincoop's (2003) model, multilateral resistance is represented by price indices, which will increase when trade barriers rise. An increase in multilateral resistance for an exporter (average trade barrier faced over all trade partners) for a given bilateral trade barrier with country *j* will increase that country's exports to *j* since its supply price will fall with the greater overall exporting difficulty. Thus,

> The key implication of the theoretical gravity equation is that trade between regions is determined by *relative* trade barriers. Trade between two regions depends on the bilateral barrier between them relative to average trade barriers that both regions face with all their trading partners (J. E. Anderson & van Wincoop, 2003, p. 176).

The multilateral resistance terms in Anderson and van Wincoop's equation are derived as functions of distances, borders, and income shares, while the model is solved using nonlinear least squares (J. E. Anderson & van Wincoop, 2003). An alternative method, identified by Anderson and van Wincoop (2003), is to replace the multilateral resistance terms with country-specific fixed effects. Using country fixed effects in this way can account for the 'multilateral price' terms introduced by Anderson and van Wincoop (Baier & Bergstrand, 2005), and yield unbiased estimates of gravity equation coefficients (Baier & Bergstrand, 2009). This is a simpler method and allows the use of ordinary least squares, however the

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[18] Ghosh and Yamarik (2004); Baier and Bergstrand (2007).

fixed-effects estimator is less efficient than the nonlinear least squares estimator (J. E. Anderson & van Wincoop, 2003). Baier and Bergstrand (2009) note that nearly every gravity equation study, even by van Wincoop himself, since Anderson and van Wincoop's (2003) theoretically grounded gravity equation have used the simpler fixed effects technique for determining gravity equation parameter estimates.

> The fixed effects method produces consistent estimates of the *average* border effect across countries, and is simple to implement, so it might be considered to be the preferred empirical method (Feenstra, 2002, p. 503).

This study therefore makes use of the fixed effects method in its application of the gravity model.

Egger (2000) discusses the advantages of using panel data in a gravity model study over using cross sectional data: separating business cycle effects; disentangling the time-invariant country-specific effects (so that the fixed effects technique can be used); and interpreting correctly the coefficients as elasticities of the influence of independent variables on the dependent variable (which he believes is conceptually wrong if using cross sectional data). Egger (2000, p. 26) believes the fixed effects model is a better way to incorporate panel data into the gravity equation than random effects, since "some of the main forces behind the fixed export effects should be tariff policy measures and export driving or impeding 'environmental' variables" which are not random but deterministically associated with certain country facts. Egger (2000) also discusses sample selection as another reason favouring fixed effects over random effects, since when using the gravity equation the researcher is likely to have pre-determined countries of interest in mind.

When using bilateral specific fixed effects in a gravity model regression the PTA variable will only vary when there is a change in membership of a PTA during the period in question, as pointed out by Carrere (2006). It is therefore impossible to estimate the effects resulting from a PTA with fixed membership using this technique. Instead, Carrere (2006) uses a random effects model to test for the existence of trade creation and trade diversion effects in the RTAs of 130 countries. However, Baier and Bergstrand (2005) discuss that fixed effects are more suitable from a conceptual economic perspective.

Another issue identified by Cipollina and Salvatici (2010) relates to the use of logarithmic form in gravity model studies. Zero trade flows pose a problem for logarithmic form, since the natural log of zero is mathematically undefined (Cipollina & Salvatici, 2010). Yu (2010) points out that some authors (such as Silva and Tenreyro (2006) and Helpman, Melitz and Rubinstein (2008)) have argued that bias can result when using OLS estimates for a gravity model specification due to zero trade volumes across trading partners.

Using aggregate merchandise trade data in gravity model studies can also lead to incorrect conclusions, since "…The *ex post* impacts of RTAs on trade depend fundamentally on whether the analysis focuses on agricultural or non-agricultural sectors" (Grant & Lambert, 2008, p. 766). Van Bergeijk and Brakman (2010) discuss the possibility of using the gravity model to study trade issues at a more disaggregated level, rather than the typical macroeconomic formulation. They point out "…that an analysis by product type generates

both new insights and research questions" (van Bergeijk & Brakman, 2010, p. 16). This study makes use of these comments in its application of the gravity model to New Zealand's dairy export data.

Previous Gravity Studies

Table 2.1 presents a summary of some of the literature surrounding the gravity model, focusing mainly on those studies dealing with the effects of preferential trade agreements. The gravity model literature is vast, so much has been excluded. Further discussion of some important studies follows Table 2.1.

Table 2.1   Previous Gravity Model Studies

Study	Research Topic	Regression Technique	Explanatory Variables Used
Bergstrand (1985). *The gravity equation in international trade.*	Microeconomic foundations for the gravity model.	Cross-sectional.	Incomes of each trade partner, distance, adjacency, EEC, EFTA, exchange rate, exporter's export unit value index, importer's import unit value index, GDP deflator of each.
Dhar and Panagariya (1994). *Is East Asia less open than North American and the European Economic Community? No.*	Separate equations for each country in a gravity study, coefficients found to vary across countries.	Cross-sectional with relevant data averaged over 1980-1992.	GDPs of each country, per capita GDPs, distance, dummy variable indicating a common border, regional dummy variables.
Egger (2000). *A note on the proper econometric specification of the gravity equation.*	Comparing the fixed and random effects panel regression techniques.	Panel: fixed effects, random effects, ordinary least squares.	Relative factor endowments, sum of GDPs, similarity of GDPs, distance.
Anderson and van Wincoop (2003). *Gravity with gravitas: A solution to the border puzzle.*	Theoretical foundations for the gravity model. Trade between Canada and United States.	Cross-sectional.	Incomes of each partner (state), bilateral distance, dummy variable indicating whether both partners (states) are in the same country, price indices (multilateral resistance terms).
Baier and Bergstrand (2005). *Do free trade agreements actually increase members' international trade?*	Addressing the endogeneity of PTA membership.	Cross-sectional instrumental variables and control functions; panel fixed effects and first-differencing.	Various combinations, including real GDPs, distance, adjacency, common language, PTA dummy variable, multilateral price terms.
Koo, Lynn Kennedy, and Skripnitchenko (2006). *Regional*	Effect of PTAs on agricultural trade, and trade creation	Cross-sectional.	GDPs of each country, distance, populations, arable land areas, trade creation and diversion

preferential trade agreements: Trade creation and diversion effects.	and diversion effects.		dummy variables, and a common characteristic dummy.
Carrere (2006). *Revisiting the effects of regional trade agreements on trade flows with proper specification of the gravity model.*	Assessing effects of PTAs, including trade creation and trade diversion.	Panel: random effects.	GDPs of each country, per capita GDP, population, remoteness variables, distance, common border, landlocked, level of infrastructure, real exchange rate, and various PTA variables.
Grant and Lambert (2008). *Do regional trade agreements increase members' agricultural trade?*	Effects of PTA membership vary across agricultural versus non-agricultural trade, and that the effects of PTA formation occur over time as phase-ins completed.	Panel data: various techniques used, including time and bilateral pair fixed effects; and bilateral pair and country-by-time fixed effects.	Various fixed effect techniques, GDPs of each country, distance, adjacency, common language, landlocked countries, PTA variables.
Jayasinghe and Sarker (2008). *Effects of regional trade agreements on trade in agrifood products.*	Effects of NAFTA on agrifood trade, using disaggregated data.	Pooled cross-sectional.	GDPs of each country, per capita GDPs, distance, NAFTA dummy variables for trade creation and diversion.
Lambert and McKoy (2009). *Trade creation and diversion effects of preferential trade associations on agricultural and food trade.*	Determine if PTA membership creates or diverts agricultural food trade.	Cross-sectional, pooled cross-sectional.	Common country characteristics, specific attributes of exporting and importing countries such as GDP per capita, population, arable land, agricultural labour, dummy variables indicating PTA membership.
Vollrath, Gehlhar, and Hallahan (2009). *Bilateral import protection, free trade agreements, and other factors influencing trade flows in agriculture and clothing.*	Distinguishing among the different drivers that deter or aid trade in (land-intensive) agriculture and (labour-intensive) clothing.	Cross-sectional with exporter and importer dummy variables.	Each country's GDP, distance, difference in per-capita income, land/labour ratios, exchange rate measures, tariff protection, dummy variables representing common characteristics, and a trade agreement dummy variable.
Shuai (2010). *Sino-US agricultural trade potential: a gravity model approach.*	Agricultural trade between China and USA: effects of China's accession to the WTO.	Time series.	Nominal GDPs of each country, nominal agricultural value-added of each, per capita nominal GDPs, dummy variable indicating China's WTO membership.

Yu (2010). *Trade, democracy, and the gravity equation.*	The influence of democracy on trade.	Panel: country-pair specific fixed-effects.	Democracy indices, each country's GDP, GDPs per capita, price, bilateral distance cost, number of island countries, dummy variables indicating common borders, currency unions, PTAs, GSP members.
Australian Productivity Commission (2010c). *An econometric analysis of the links between the formation of trade agreements and merchandise trade.*	Impacts on trade of various PTAs.	Panel: fixed effects. Poisson estimator.	Sum of GDPs, similarity in economy size, difference in per capita income, trade creation and diversion dummy variables for various PTAs.

Koo, Lynn Kennedy, and Skripnitchenko (2006) use the gravity model approach to estimate the economic effects of RPTAs (regional preferential trade agreements) on agricultural trade. RPTAs are incorporated in this model through the use of dummy variables: a trade-creation dummy that allows common membership in one or several RPTAs to increase agricultural trade between countries, and a trade-diversion dummy that measures the effects of nonparticipation in a RPTA (Koo et al., 2006). Koo et al. (2006, p. 411) discuss how the gravity equation can typically suffer from an endogeneity problem, where income and RPTA dummies can be correlated with the error term, but that in the case of agricultural trade this is not likely to cause a significant problem since "…policies that affect GDP or a decision to form a RPTA are unlikely to be dependent on the volume of agricultural trade". It is doubtful whether this would be a valid argument in the case of New Zealand, where agriculture is such a vital part of its economy.

Koo et al. (2006, p. 412) find "the regression results show that most traditional gravity variables have a statistically significant impact on agricultural trade". Countries' GDPs and land area had statistically significant positive responses, distance and population had statistically significant negative relationships to agricultural trade. If countries shared a common border, currency, language, and colonial history, their bilateral agricultural trade tended to increase, while the landlocked variable was negative since without access to sea or ocean transportation agricultural trade is more difficult (Koo et al., 2006). Not only was the overall trade-creation variable positive and statistically significant, so too was the overall trade-diversion variable, reflecting the possibility that agricultural products traded with member and non-member countries are not close substitutes and that agricultural trade with non-members may increase due to increases in overall income (Koo et al., 2006).

> Although the benefits of RPTAs are greater for member countries than for non-members, the results of this analysis indicate that RPTAs are not harmful to non-member countries…This implies that, in general, RPTA are welfare enhancing with respect to agriculture for both member and non-member countries (Koo et al., 2006, p. 415).

Conversely, Vollrath, Gehlhar and Hallahan (2009) found that mutual PTA membership increased partner trade in clothing but not in agriculture.

Grant and Lambert (2008, pp. 768, 769) use the gravity model to test various hypotheses:

- The increase in members' trade after the formation of a regional trade agreement is greater in agriculture compared to nonagriculture.
- The effect of RTAs on trade occurs over time as the transitional period of trade liberalisation (i.e., phase-in) is completed.
- The effect of RTAs and their implementation period differs across specific agreements depending on the extent of agricultural trade liberalisation.

They find their empirical results strongly support the first hypothesis, with agricultural trade being affected by RTA formation more than non-agricultural trade, for all four gravity specifications used[19]. Grant and Lambert (2008, p. 773) point out that

> Most RTAs contain long transitional periods of trade liberalization – as much as fifteen years in the case of AGR [agricultural] trade – that cannot be captured with a binary RTA variable that changes from zero to one using the date the agreement entered into force.

They therefore include lagged RTA variables in the gravity equation to test the cumulative effect of an RTA for hypothesis two. The findings show that RTA phase-in is very important, with much of the trade increase, particularly for agricultural products, seen several years after the agreement entered into force (Grant & Lambert, 2008).

Grant and Lambert (2008) used nominal values for both trade flows and GDP data, since purchasing power parity rates are subject to large measurement error, and a previous study (Frankel, 1997) found little difference in gravity equation results when using real data. "Moreover, time fixed effects control for inflationary pressures and the growth in world trade over the sample period" (Grant & Lambert, 2008, p. 770). Carrere (2006) argues that it is necessary to look at intra-RTA trade before the agreement is implemented, so that an incorrect inference is not made about the regional dummy coefficient. It is possible that an increase in intra-RTA trade a few years before the implementation of an agreement signals an 'anticipation effect' (Carrere, 2006).

Jayasinghe and Sarker (2008) use the gravity model to assess the effects of NAFTA on trade in agri-food products. Disaggregated data is used, so that trade in six major agri-food commodities is analysed: red meat, grains, vegetables, fruits, sugar, and oilseeds. Jayasinghe and Sarker (2008) use a specification of the gravity model similar to the traditional specification, including GDP, GDP per capita, distance, and dummy variables representing whether NAFTA has been trade creating or trade diverting. Their findings suggest that both trade creation and trade diversion has occurred, although the magnitudes of each effect are

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[19] No time or country fixed effects; time fixed effects; time and bilateral pair fixed effects; and theoretically consistent gravity equation with bilateral pair and country-by-time fixed effects.

not investigated. Meanwhile, Lambert and McKoy (2009) found that membership of PTAs generally results in increased agricultural and food trade, with some evidence of trade creation and very little evidence of trade diversion.

The Australian Productivity Commission (2010c) uses the gravity model in an analysis of the impacts on trade of 27 regional and bilateral trade agreements. The Commission follows Adams, Dee, Gali and McGuire (2003) in believing that the size variables chosen – sum of bilateral GDPs, absolute differences in GDP per capita and the similarity in country size between the country-pairs – capture "not only the aggregate size of the trading partners but also the expenditure capabilities and taste preferences of each partner" (Australian Productivity Commission, 2010c, p. 48). Asymmetric country-pair fixed effects are used to control for factors such as distance, common language etc., in order to reduce the likelihood of omitted variables bias affecting the results. It is difficult to include these variables separately since it is difficult to include all relevant characteristics, particularly since some are unobservable (Australian Productivity Commission, 2010c). The inclusion of three dummy variables signifying different aspects of FTA membership allows the study to analyse the effects of FTAs on not just intra-member trade, but also on imports to members from non-members, and on exports from members to non-members.

The Commission notes that while this model has been derived based on the most recent developments in the gravity model literature, some important limitations can still be identified: possible endogeneity of changes in trade flows and the formation of agreements; the effects of the trade adjustment path due to transition periods; and the separate effects of agreements, such as broader provisions like trade facilitation measures (Australian Productivity Commission, 2010c). Sensitivity testing to assess the robustness of results, over different sample periods and varying the sample of trade agreements, leads to the conclusion that unobserved factors are unlikely to significantly bias the results, and that "time-invariant fixed effects provide a suitable proxy for time-varying multilateral resistance, in this analysis" (Australian Productivity Commission, 2010c, p. 50).

Limitations
Although the gravity model is widely described as the primary *ex post* econometric technique for assessing the effects of PTAs on trade flows, it does not come without limitations. Perhaps the most widely voiced criticism has been its apparent lack of theoretical microeconomic foundations (J. E. Anderson & van Wincoop, 2003; Baier & Bergstrand, 2005). In recent years there have been significant attempts at rectifying this criticism, with many studies developing a theoretical basis for the gravity model (J. E. Anderson, 1979; J. E. Anderson & van Wincoop, 2003; Baier & Bergstrand, 2009; Bergstrand, 1985), and describing its links to trade theories such as Heckscher-Ohlin and increasing returns to scale models (Evenett & Keller, 2002). Perhaps the most significant of these has been Anderson and van Wincoop's 'Gravity with Gravitas' (2003), which introduced the concept of multilateral resistance. The inclusion of multilateral resistance terms, which Anderson and van Wincoop accounted for using complex price indices, acknowledged that in determining the bilateral trade between two countries, what matters is the trade barriers between those countries relative to the barriers faced by

those countries to trade with the rest of the world (J. E. Anderson & van Wincoop, 2003). Anderson and van Wincoop (2003) argue that excluding such terms from a gravity study will result in bias due to the omitted variables problem.

Another option for dealing with this omitted variable bias, which is computationally simpler and has been used almost universally since, is the inclusion of country- or region-specific fixed effects, originally proposed by Anderson and van Wincoop (2003) as an alternative to their custom non-linear least squares program (Baier & Bergstrand, 2009).

These fixed effects replace all time-invariant country-pair specific factors such as distance and adjacency and, additionally, they control for *all* country-pair time-invariant specific effects which may affect trade flows, reducing the risk of omitted variables bias (Australian Productivity Commission, 2010c, p. 49).

Using fixed effects in such a way removes the possibility that the multilateral resistance faced by two trading partners changes over the sample period, instead capturing the average effect (Australian Productivity Commission, 2010c). Baier and Bergstrand (2009), through undertaking a Monte Carlo analysis, find that using fixed effects in a gravity model specification should result in unbiased estimates of gravity coefficients.

A particularly problematic source of inaccuracy in the results of the gravity model is given by the possible endogeneity of the existence of a preferential trade agreement. If a trade agreement is undertaken as a result of increases in trade between two countries, where this growth in trade, and the trade agreement itself, is caused by some other factors common to the countries involved then the existence of the trade agreement will cause endogeneity problems (Australian Productivity Commission, 2010c). Magee (2003) discusses the natural trading partners hypothesis, where if countries with disproportionately large bilateral trade flows are more likely to form preferential trade agreements then the gravity model should not treat preferential trade agreements as if they were assigned to random country pairs. Fixed effects panel regression techniques as identified by Anderson and van Wincoop (2003) are used in this study to overcome this endogeneity problem.

The specification of the gravity model used in this study does not deal with the presence of zero trade flows, since the dependent variable is a natural logarithm transformation of trade flows. The natural logarithm of zero is undefined, meaning that observations with zero trade flows are not included in computing the regression results. There is potential for this to cause bias in the regression results (Yu, 2010).

The dummy variable approach taken for the representation of the existence of free trade agreements (where the value 1 is taken if a free trade agreement exists between New Zealand and the other country) ignores the reality of these agreements including significant phase-in periods for sensitive products. For example, the New Zealand – China Free Trade Agreement does not begin eliminating tariffs on New Zealand's dairy exports until 2012, while progressive reductions are made over many years for some products. Of course, these partial tariff reductions and the preferred supplier status afforded to New Zealand by Chinese importers, due to the goodwill shown by the existence of the trade agreement, could have a

positive effect on New Zealand exports. Carrere's (2006) 'anticipation effect' may also be seen. The dummy variable approach is then likely to yield results reflective of these phenomena.

2.5 Computable General Equilibrium Modelling and the Global Trade Analysis Project

Important in assessing the potential of New Zealand's future trade agreements will be the use of computable general equilibrium (CGE) modelling, otherwise known as economy wide modelling. In particular the Global Trade Analysis Project (GTAP) model produced by Purdue University (Center for Global Trade Analysis, 2011b) will be used. GTAP is a multi-sector, multi-country general equilibrium model of the global economy (Australian Productivity Commission, 2010b), established in 1992 (Hertel, 1997). The advantage of general equilibrium models lies in their ability to include linkages between all agents, sectors, and economies within the one model (Brockmeier, 2001).

GTAP has been widely used as an analysis tool for changing trade policies (Australian Productivity Commission, 2010b; Devarajan & Robinson, 2005; DiCaprio, 2010; Hertel, 1997; Kim et al., 2007). It allows the modeller to investigate the economic effects of a shock to a variable or set of variables, so is ideal for examining the effect of a reduction in import barriers due to, for example, a particular preferential trade agreement. The general equilibrium nature of the model allows changes in one sector, or one region, to have flow-on effects in other sectors and other regions, an important consideration when conducting international trade analysis (Ballingall, 2000). This is the major advantage of general equilibrium over partial equilibrium analysis, which will only consider effects in the one sector or region, and ignore the linkages to other sectors and regions (K. Anderson, 2005).

Computable general equilibrium models are of course just a stylised model of the global economy, a simplification of reality. They rely upon assumptions about economic parameters, behaviour, and relationships. While CGE models can quantitatively indicate whether a PTA will have a positive or negative outcome, and the magnitude of such an outcome, there are also numerous other considerations, qualitative and geopolitical, that are important in determining whether a PTA will be suitable for the countries involved (Kim et al., 2007).

Computable General Equilibrium Modelling

The development of general equilibrium models was, in the opinion of Kenneth Arrow (2005), begun in the 1930s by Ragnar Frisch and Jan Tinbergen, focusing mainly on business cycle theories. The focus has since shifted from such short-term issues to more microeconomic based lines of inquiry, such as the effects of tax and welfare policies, economic development, the effects of climate change policies, and most importantly for this particular study, changes in foreign trade policies (Arrow, 2005). The increasing interest in using general equilibrium models to analyse trade policy issues was noted as long ago as 1986: "One of the areas in which they have had the greatest success is in international trade, with particular reference to trade liberalisation exercises" (Harris, 1986, p. 231). General equilibrium models are essentially

numerical models depicting equilibrium achieved simultaneously in more than one market, with CGE models using some form of computer program to solve the model (Scollay & Gilbert, 2000).

It has long been realised that global general equilibrium models offer a more suitable approach to modelling trade liberalisation than their individual country partial equilibrium counterparts. The inclusion of many countries and many sectors in CGE models, and the linkages between them, ensure that the changes in one sector or one country are felt in other sectors and countries as appropriate, and thus the full impact of any change can be seen. Computable general equilibrium modelling, otherwise known as applied general equilibrium (AGE) modelling, is the leading tool for assessing the impact of policy changes that will not occur in isolation; where these changes will perhaps have impacts in sectors and countries not involved in the policy change itself. Where policy changes will have far-reaching consequences outside of the sector where the changes occur, "general equilibrium is perhaps the only method capable of capturing the relevant feedback and flow-through effects" (Scollay & Gilbert, 2000, p. 177). In particular, CGE modelling is thought to be the main quantitative analysis tool for analysing preferential trade agreements, which have experienced a vast growth in popularity in recent years (Hertel, Hummels, Ivanic, & Keeney, 2007). There are limitations to its use, but these certainly do not preclude the use of CGE models: "Nevertheless, in all cases where the repercussions of proposed policies are widespread, there is no real alternative to CGE" (Arrow, 2005, p. 13).

In a general equilibrium model, consumers maximise utility subject to their budget constraint, producers maximise profits, and demand equals supply for all commodities (Shoven & Whalley, 1992). In the majority of models constant returns to scale production functions and perfect competition mean that each industry experiences zero economic profit. Equilibrium is then determined by a consistent process of optimisation (Shoven & Whalley, 1992). An important feature of CGE models is the constraint imposed by their economy wide nature, where the expansion in one sector can usually only occur at the expense of another, due to the scarcity of resources (Scollay & Gilbert, 2000). Shoven and Whalley (1992) believe that CGE modelling has an important part to play in the policy process, since it can give decision makers new perspectives on relevant issues.

As a result of the need for simplicity and the desire for actual observable relationships within markets, "Most CGE models have tended to be static in nature" (Arrow, 2005, p. 19). A static model considers "…the role that changes in relative prices have on the allocation of goods amongst consumers and of resources amongst productive activities, and the consequences for economic efficiency" (Scollay & Gilbert, 2000, p. 177), without having an explicit time dimension. A static model allows the modeller to make policy changes or introduce some other shock into the economic system, and observe the changes that would occur in long-run equilibrium compared to the baseline situation. Thus, the typical interpretation of the results of a static model relate to the depiction of the economy in the base year, had the observed policy (or other change) been in place (Scollay & Gilbert, 2000). Scollay and Gilbert (2000) discuss that it is also possible to run a static simulation from a projected future equilibrium, which would make the results of the experiment more relevant to the future year.

In order to introduce a time dimension into CGE models, it is possible to repeatedly solve the model, incorporating capital accumulation, population growth, and technological advancement, so that the time-path of the economy after a policy change can be seen (Scollay & Gilbert, 2000). These models are known as recursive dynamic, and although they offer a time dimension where economic agents will optimise in each period, inter-temporal optimisation will not occur (Scollay & Gilbert, 2000). This differs from a truly dynamic model, which explicitly models inter-temporal behaviour (Scollay & Gilbert, 2000), and is thus much better at accounting for the economic impacts of the policy change as they occur over time (Kim et al., 2007). As well as the effects captured by a static model, a dynamic model takes account of the impacts of dynamic productivity gains over time (Kim et al., 2007). Of course, a dynamic model is extremely complex (Scollay & Gilbert, 2000), so becomes less accessible for trade policy analysis, particularly if deep sectoral detail is required.

Although CGE models do have limitations, and these will be discussed below, there is wide support for their use as an aid in policy-making decisions (Devarajan & Robinson, 2005). It must be realised that conclusions must take the models' limitations into consideration: "However, like all models, CGE simulations present results based on a stylised version of reality. The results should be interpreted with due caution" (Scollay & Gilbert, 2000, p. 191). It is believed that general equilibrium models provide a valuable step forward in economic analysis, and hold more promise than any alternative in the ex ante assessment of trade policy issues (P. D. Adams, 1998; DiCaprio, 2010; Fretz, Srinivasan, & Whalley, 1986; Hertel et al., 2007).

Global Trade Analysis Project

The Global Trade Analysis Project (GTAP) was established in 1992 in an attempt to lower the cost of entry for those wishing to employ a quantitative economy wide framework in analysing international economic issues (Hertel, 1997). Perhaps the most important aspect of GTAP is the publicly available global database, which prevents the unnecessary duplication of research effort (Hertel, 1997). Along with the database, the GTAP AGE model and software designed to run the model aim to facilitate the use of computable general equilibrium modelling in the analysis of international economic issues (Hertel & Walmsley, 2008). The Centre for Global Trade Analysis, based at Purdue University, oversees the model and its database, releasing new versions of the database every few years. GTAP's website (Center for Global Trade Analysis, 2011b) provides technical and working papers on the model and the modifications to GTAP that have been made by some researchers, as well as other resources helpful to those undertaking GTAP modelling.

The GTAP model is valuable in analysing the effects of policy changes, since the model "produces projections of changes in economic values that are attributable to the shocks modelled, abstracting from any other influences, such as other policy changes or autonomous growth" (Australian Productivity Commission, 2010b, p. 3). The database and model are particularly well-suited to the analysis of trade policy issues, and it is widely used by international agencies and governments for this purpose (Valenzuela, Hertel, Keeney, &

Reimer, 2007). "The standard GTAP model is perhaps the most widely used CGE model for global trade policy analysis" (Valenzuela, Anderson, & Hertel, 2007, p. 397).

The GTAP model is a multi-sector, multi-country general equilibrium model of the global economy (Australian Productivity Commission, 2010b). Rae et al. identify GTAP as a "model built on a complete set of economic accounts and detailed inter-industry linkages for each of the economies represented" (2001, p. 307). The model exhibits perfect competition and constant returns to scale (Center for Global Trade Analysis, 2011a), and thus firms earn zero economic profit (Brockmeier, 2001). The standard GTAP model, and therefore the one which will be used in this study, is of a static nature, meaning that model results represent longer-term effects, after allowing for a period of adjustment (around 10 or more years) for changes to work through the global economy (Australian Productivity Commission, 2010b). However, investment changes do not flow through to changes in the capital stock, meaning that investment does not alter productive capacity in the standard GTAP model (Australian Productivity Commission, 2010b).

In modelling a trade liberalisation scenario, GTAP is not only able to describe the impacts on production and trade volumes and values, but also welfare effects. GTAP uses equivalent variation, broken into allocative efficiency and terms of trade effects, as a measure of national welfare[20]. The traditional theory relating to gains from trade liberalisation is captured in the measure of allocative efficiency, where resources are reallocated to efficient sectors of the economy (Kim et al., 2007). Terms of trade are defined as the ratio of a country's export prices relative to its import prices at world prices (Kim et al., 2007), and thus gains will result when exports become more profitable or imports less expensive in world markets (Young & Huff, 1997).

An additional possibility for the application of the GTAP model is provided by Anderson, Hoekman and Strutt (2001). Their study, conducted in 2001 and based on 1992 data, looks at the potential gains from agricultural market reform that will exist in 2005, when the commitments made in the Uruguay Round relating to trade liberalisation would be fully implemented. In order to conduct their simulations, it was necessary to generate a projection of the world economy in 2005 from 1992 data. Anderson et al. (2001) source data relating to rates of growth in factors and real GDP, and use this to shock the GTAP model so that a projection of what the database will look like in 2005 is developed. This approach has also been used in other studies (K. Anderson, Dimaranan, Hertel, & Martin, 1997; Valenzuela & Anderson, 2011).

The GTAP Database

The latest GTAP database, version 7, that will be used in this study is based on 2004 data, is thus expressed in 2004 US dollars, and was released in December 2008 (Center for Global Trade Analysis, 2011d). In order to construct the database,

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[20] Equivalent variation is a measure of welfare based upon the amount of income that would have to be given to, or taken from, an economy before trade liberalisation so that it is just as well off as it will be after the policy change comes into effect (Siriwardana & Yang, 2008).

The domestic data bases or input-output (I-O) tables are combined with international datasets on macroeconomic aggregates, bilateral trade, energy, agricultural input-output, and protection for the new reference year (Narayanan G. & Dimaranan, 2008, pp. 3-1).

The Australian Productivity Commission (2010b) also points out that measures of international transport margins are needed, in order to account for differences between *fob* and *cif* prices. Border protection on merchandise trade is estimated using tariff equivalents measured at the border of the importing country (Australian Productivity Commission, 2010b).

The database is now relatively dated, but this is unavoidable due to the time consuming and difficult nature of constructing such an intricate database. The sectoral and national detail, and the linkages between different sectors and countries, have resulted in the database becoming "the central ingredient to GTAP's success to date" (Hertel, 1997, p. 4). This data problem surfaces in trade liberalisation scenarios where the relatively dated data in the GTAP database involves tariff levels that may be significantly different from those actually present at the time of liberalisation. Ballingall (2000) recognises the need to compare actual tariff levels and GTAP tariff levels, and make changes to the GTAP database as necessary, in order that the reduction in tariffs due to the liberalisation scenario in the model is comparable to what would occur in 'real-life'. This issue is relevant for this study since the modelling, undertaken in 2011, will be based on 2004 data in the GTAP Version 7 database.

The GTAP 7 database breaks the global economy down into 113 regions, most of which are single countries, while some are regional aggregations of smaller countries. Each region is then disaggregated into 57 sectors (Narayanan G. & Dimaranan, 2008). In using the GTAP database in computable general equilibrium modelling, appropriate aggregations must be undertaken in order to make the results meaningful, since there is simply too much detail for all to be considered in depth, and most is not relevant to the scenario being modelled. This study aggregates the database to 18 regions and 11 sectors.

Previous GTAP Studies
Table 2.2   Previous GTAP Studies

Study	Database	Variations to Standard Model	Trade Liberalisation Scenario
MacLaren, (1997). *An evaluation of the Cairns Group strategies for agriculture in the Uruguay Round.*	Version 2, aggregated to 6 regions and 8 sectors.		Cairns Group strategies for reforms in agricultural trade as part of Uruguay Round. Separate simulations for domestic agricultural and trade policy liberalisation

			by US, EU, Australia, and Canada.
Adams, (1998). *Long-run effects of APEC trade liberalisation: An applied general equilibrium analysis.*	Version 3, modified to reflect post-NAFTA pattern of trade and protection.	Capital mobility, percentage changes in rates of return equalise.	Removal of all ad valorem import tariffs on intra-APEC trade, no change in protection with regard to the rest of the world.
Ballingall, (2000). *A computable general equilibrium analysis of the expansion of the Closer Economic Relations preferential trading agreement: Economic implications for New Zealand.*	Version 4, amended for tariff inaccuracies, aggregated to 14 regions and 17 sectors.		Expansion of the CER to include Singapore; Singapore and Chile; Singapore, Chile and the United States. Two scenarios for each: agriculture & food excluded or included. New Zealand – Singapore agreement.
Rae, Chatterjee, & Shakur, (2001). *The sectoral approach to trade liberalization: Should we try to do better?*	Version 4, aggregated to 11 regions and 10 sectors.	Allowance for substitution between the various feedstuffs in livestock and milk production.	Complete removal of tariffs and tariff equivalents by APEC economies for trade in grains and oilseeds; processed grains and oils; livestock; processed livestock products.
Anderson, Hoekman, Strutt, (2001). *Agriculture and the WTO: Next steps.*	Version 3, aggregated to 12 regions and 5 sectors, and projected to 2005 and updated to reflect post-Uruguay Round protection levels.	Values for Armington elasticities of substitution doubled.	All OECD countries remove all price and trade distortions to agriculture; textiles and clothing; other manufacturing; all goods combined. Then, all developing countries remove distortions in goods markets; OECD and developing countries together remove.
McDonald, Walmsley, (2003). *Bilateral Free Trade Agreements*	Version 5, aggregated to 10 regions and 10	Tariff revenue gathering pool for customs union tariff	Full liberalisation of trade between the EU and RSA, and where

and Customs Unions: The Impact of the EU Republic of South Africa Free Trade Agreement on Botswana.	sectors.	revenue created, changes in closure relating to trade balance, employment of unskilled labour, and prices and quantities of certain special commodities.	food and agricultural trade only partially liberalised.
Feridhanusetyawan & Pangestu, (2003). *Indonesian trade liberalisation: Estimating the gains.*	Version 3, aggregated to 19 regions and 12 sectors.		Full implementation of the Uruguay Round commitments by all countries. Full UR plus unilateral liberalisation by Indonesia. UR plus AFTA (excluding and including agriculture). Combination of UR and APEC schemes (excl. and incl. agriculture).
Centre for International Economics, (2004). *Economic analysis of AUSFTA: Impact of the bilateral free trade agreement with the United States.*	Version 5, updated to 2002, aggregated to 10 regions but will all 57 sectors. (Used in conjunction with G-Cubed model).	Macroeconomic results from G-Cubed used to calibrate investment response parameters in GTAP and incorporate capital and wealth accumulation and foreign income flows.	Bilateral liberalisation in merchandise and services; changes to Australian foreign investment rules; reduced barriers to Australian participation in the US government procurement market; dynamic productivity gains from above.
NZIER, CIE, KIEP, (2007). *Benefits and feasibility of a Korea-New Zealand free trade agreement.*	Version 6, updated to 2006, aggregated to 9 regions but with all 57 sectors. (CIE-GCubed model also used).	Uses both the standard comparative static model and a recursive dynamic capital accumulation model.	Barriers to trade in goods between Korea and NZ either eliminated or phased out according to their classification.
Siriwardana & Yang, (2008). *GTAP model analysis of the economic effects of an*	Version 6, aggregated to 10 regions and 20 sectors.	4 scenarios: 1. Capital, natural resources, land exogenous with prices	Removal of all bilateral tariffs on goods trade between Australia and China.

Australia-China FTA: Welfare and sectoral aspects.		endogenous. Skilled & unskilled labour endogenous, wages exogenous. Flexible current account. 2. Skilled & unskilled labour, land, natural resources exogenous with prices endogenous. Capital endogenous with rental exogenous. Flexible current account. 3. As in 1 but fixed current account. 4. As in 2 but fixed current account.	
Charteris & Winchester, (2010). *Dairy disaggregation and joint production in an economy-wide model.*	GTAP6inGAMS (solved using GAMS rather than GEMPACK).	Disaggregation of NZ's dairy production into nine processed dairy commodities, and accounting for joint production possibilities.	Removal of US tariffs on imported NZ dairy products.
Australian Productivity Commission, (2010b). *A CGE analysis of some economic effects of trade agreements.*	Version 7, aggregated to 25 regions but with all 57 sectors.	Accounting for bilateral capital flows to accommodate certain preferential scenarios, using a bilateral capital stock matrix and a bilateral saving and investment matrix.	A multitude of scenarios, covering tariff reductions, differing assumptions about trade liberalisation, reduction in barriers to foreign direct investment, amongst others.

Limitations

The use of CGE modelling in economic analysis does not come without limitations, and the recognition of these limitations is necessary in order to perform quality, credible analyses. CGE models have in some circumstances been criticised for performing poorly, and for relying upon weak econometric foundations (Hertel et al., 2007). A discussion of some of the limitations of CGE modelling follows, although it should be noted that this discussion may not be exhaustive of all possible limitations in various modelling scenarios.

It is likely that GTAP results will underestimate the effects of trade liberalisation, since simulations only reduce or eliminate tariffs on merchandise trade, and thus there may be other unobservable impacts (Grant & Lambert, 2008). Siriwardana and Yang (2008) discuss the

underestimation resulting from the exclusion of liberalisation in services trade and investment. "This [GTAP] database is suitable for considering the liberalisation of merchandise trade only and does not yet adequately capture the potential gains from services and investment liberalisation" (Government of India & New Zealand Government, 2009, p. 41). Fretz et al. (1986, p. 24) discuss the importance of modelling investment, where any unsatisfactory treatment of investment "is unfortunate since a significant part of the gains from liberal foreign trade in the real world is dynamic gains in terms of savings in investment costs". Siriwardana and Yang (2008) note that due to GTAP's comparative static nature it does not capture the dynamic effects of trade liberalisation, and thus results may be inaccurate.

> Current international trade literature suggests that economic models typically under-predict the gains associated with trade liberalisation if effects related to productivity linkages, pro-competitive effects, and investment dynamics are not taken into account. These effects have been termed the "dynamic productivity" effects of trade liberalisation (Kim et al., 2007, p. 49).

As noted above, the GTAP model exhibits constant returns to scale, and thus does not account for possibilities of economies of scale in production (K. Anderson et al., 2001; Australian Productivity Commission, 2010b). It is believed by some modellers, such as Herbert Scarf (Wigle, 1986) and Richard Harris (1986), that incorporating increasing returns to scale is very important in constructing a general equilibrium model so that gains from trade can be accurately estimated. Shoven and Whalley (1992) discuss that when increasing returns to scale are incorporated in CGE modelling, along with market structure features, the effects of removing trade distortions are found to be larger than under constant returns to scale.

Some modellers have expressed discomfort with the assumption of perfect competition that many CGE models, including GTAP, utilise (Harris, 1986). Due to this assumption, CGE models, for the most part, do not reflect subsequent developments in economic theory relating to imperfect competition, such as asymmetric information (Arrow, 2005). Francois and Shiells (1994, cited in Devarajan & Robinson, 2005) found that models that incorporated imperfect competition found larger benefits from trade liberalisation than those that assumed perfect competition.

The ability of AGE models to describe general equilibrium relies upon the use of parameters that may be based on assumptions, and upon which the welfare results are particularly sensitive (Hertel et al., 2007). Fretz et al. (1986) highlight that parameter specification was a major issue with CGE modelling as long ago as 1986. CGE modellers themselves recognise the problem: "Elasticity parameters and the poor state of parameter estimation in empirical economics are another problem area" (Kehoe, Srinivasan, & Whalley, 2005, p. 10); "Clearly there is a need for improved econometric estimation of these trade elasticities that is well-integrated into the CGE modelling framework" (Hertel et al., 2007, p. 613).

Ballingall (2000) discusses the limitation of potentially inaccurate values for key parameters such as elasticities, where these may be based on subjective judgements rather than objective econometric estimates. Often estimates of the required parameters are not available, or contradictory evidence exists, meaning that the modeller must make assumptions

in deciding what value to use (Kehoe et al., 2005; Shoven & Whalley, 1992). The parameters may also be subject to the Lucas critique; that they should change as a result of the policy changes that are being modelled. This means the model results, if parameters are held constant over the simulation, will suffer from inherent inaccuracies (Kehoe et al., 2005).

Kehoe (2005) notes that there will be always be some uncertainty about predictions relating to trade liberalisation using CGE models, due to the uncertainty surrounding choices of parameters and uncertainty about other potential shocks to the economy. While recognising that the choice of elasticity variables is not an exact science and is subject to controversy, Shoven and Whalley (1992) note that there is not a clearly superior alternative model that does not rely upon selection of key parameters in such a way.

> The experience of the past twenty years seems to demonstrate that it is better to have a good structural model capturing the relevant behaviour of economic actors and their links across markets, even if the parameters are imperfectly estimated, because the domain of applicability of such models makes them far more useful for policy analysis (Devarajan & Robinson, 2005, p. 406).

It is also likely that as CGE modelling is the subject of increasing intellectual consideration due to the advantages that it offers, parameter estimation will become less of an issue: "Furthermore, recent advances in methods of econometric parameter estimation should reduce the trade-offs" (Devarajan & Robinson, 2005, p. 406).

Another difficulty with using AGE models for trade liberalisation is highlighted by Shoven and Whalley (1992), pointing out that the treatment of non-tariff barriers is a difficult and contentious issue. Although import protection in the GTAP database is represented by an ad valorem equivalent tariff measure, Fretz et al. (1986) discuss that incorporating non-tariff barriers through the use of ad valorem tariffs in models is often inappropriate, since the ad valorem equivalents will not remain unchanged as prices change. Charteris and Winchester (2010) add that replacing tariff rate quotas with ad valorem equivalent tariffs creates approximation errors. The complex nature of non-tariff barriers makes them difficult for modellers to incorporate, particularly since the non-equivalency of tariffs and quotas in many situations has been well established (Fretz et al., 1986). Ballingall touches on this problem, noting that ad valorem tariff equivalents may not be accurate in the presence of non-tariff barriers, a particularly important issue in the agricultural sector (Ballingall, 2000).

A potentially important limitation of the use of GTAP for this study is provided by Charteris and Winchester (2010), when discussing the issue of an aggregated dairy sector. As they note, for countries with a heavy reliance on an aggregated export sector such as New Zealand's reliance on dairy, aggregation issues can be important when drawing conclusions from results. With only one single processed dairy sector, as in the GTAP database, dairy producers are unable to change their product mix in response to changes in relative prices. If this sector is to be disaggregated, joint production possibilities must be considered. This is an issue in the case of dairy production where protein-based and fat-based dairy products are produced jointly (Charteris & Winchester, 2010). "In summary, our illustrative analysis shows that joint production and disaggregation can have a large influence on quantitative assessments of the impact of trade liberalisation" (Charteris & Winchester, 2010, p. 499).

CHAPTER 3   NEW ZEALAND'S TRADE AGREEMENTS

New Zealand is a dynamic market economy, and seeks to maximise the benefits that flow from international trade through developing its international linkages (Government of India & New Zealand Government, 2009). Free trade agreements are important to the New Zealand dairy industry, and to the economy in general, so that trade can occur with as little impediment as possible, and therefore contribute to economic growth (Bagrie, Goh, Williams, Croy, Zollner, Edwards, Smith, et al., 2011). ANZ points out that New Zealand's agricultural sector paid nearly $1.5 billion of tariffs in 2010, on $18.5 billion worth of exports (Bagrie, Goh, Williams, Croy, Zollner, Edwards, Smith, et al., 2011). Therefore, "New Zealand is a huge beneficiary of trade liberalisation and the breaking down of trade barriers" (Bagrie et al., 2010, p. 4).

Tim Groser, New Zealand's Minister of Trade, identifies free trade agreements as New Zealand's more successful 'Plan B' of trade policies, behind the WTO multilateral negotiations of which progress in the latest Doha round has been very difficult (Groser, 2011a). The New Zealand Government views multilateral negotiations under the WTO are New Zealand's number one trade policy priority, but believes that bilateral agreements can help to build New Zealand's trade networks while progress in the Doha Round is limited (Edlin, 2011b).

Groser discusses the importance of New Zealand's free trade agreements for not only the New Zealand economy in general, but in particular the dairy industry due to the pattern of trade that the industry experiences (Groser, 2011a). The potential of New Zealand's trade policy agenda is shown in that it includes "Two emerging developing economic superpowers, India and China" (Groser, 2011c). This can be seen in the World Trade Organisation's International Trade Statistics 2010 (World Trade Organisation, 2010a), which specifically highlights the recent increasing food imports of India, China and Russia. New Zealand's free trade agreement with China and negotiations towards such an agreement with India and Russia therefore provide significant promise for the New Zealand agricultural industry.

New Zealand currently has eight bilateral and regional free trade agreements in place[21] (Ministry of Foreign Affairs and Trade, 2011o). These agreements are championed as the success story of New Zealand's trade policy:

> The recent brokering of new free trade deals with a number of fast-growing emerging economies in the Asia-Pacific basin portend of new and exciting opportunities in terms of access and entry. This is especially so with China, the biggest and fastest growing of them all (Bagrie, Goh, Williams, Croy, Zollner, Edwards, Smith, et al., 2011, p. 2).

These facets of New Zealand's trade policy have provided the New Zealand economy with a better outlook for the future: "As a result of various highly successful trade negotiations over the last 25 years…New Zealand is in a fundamentally better place" (Groser, 2011b).

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[21] The Anti-Counterfeiting Trade Agreement, SPARTECA agreement, or separate investment protocols are not included here.

The five agreements that New Zealand has under negotiation also have significant potential for contributing to dairy sector earnings and New Zealand's economic growth:

> What lies ahead, if all of the current bilateral negotiations are successful, is free access to over half the world's population, accounting for close to half of global GDP (Bagrie, Goh, Williams, Croy, Zollner, Edwards, Smith, et al., 2011, p. 2).

The Asia Pacific region is seen as particularly important, due to the rapid economic growth witnessed in this region over the last decade, and New Zealand's relatively close proximity to these markets. The dairy industry stands to gain since protein consumption, including dairy products, typically increases with living standards as consumers' tastes and preferences change (New Zealand Institute of Economic Research, 2010). The New Zealand Government recognises the importance of the New Zealand dairy industry in its trade policy agenda: "In trade policy, no issue looms larger than dairy" (Groser, 2011a).

> FTAs with countries in the Asia-Pacific region offer access to some of the fastest-growing markets that will demand more luxury food items as disposable income grows. New Zealand is well-placed to help deliver all they can eat (Bagrie, Goh, Williams, Croy, Zollner, Edwards, Smith, et al., 2011, p. 15).

3.1 Agreements in Force

New Zealand – Australia Closer Economic Relationship

The World Trade Organisation has described the Australia – New Zealand Closer Economic Relations (CER) Trade Agreement as "the world's most comprehensive, effective and mutually compatible free trade agreement" (Ministry of Foreign Affairs and Trade, 2007a, p. 4). The CER was established in 1983, before the recent proliferation of PTAs, and its success continues to this day.

New Zealand's former Minister for Trade Negotiations, Jim Sutton, notes that all goods and nearly all services come within the scope of the CER, that the CER has resulted in the removal of tariffs and quantitative restrictions, and that people are free to move between the two countries[22] (Ministry of Foreign Affairs and Trade, 2005a). The Ministry of Foreign Affairs and Trade describes the CER as based on comprehensiveness, and simplicity, and outlines that the next step is to create a Single Economic Market, more closely aligning the business environments in the two countries (Ministry of Foreign Affairs and Trade, 2005a).

CER has progressed from simply a bilateral free trade agreement, and covers much more than free trade in goods and services. There is cooperation in the countries in far broader areas, such as policies, laws, standards and regulatory regimes, and Australian and New Zealand markets are becoming increasingly integrated (Ministry of Foreign Affairs and Trade, 2005a). New Zealand and Australia have both used their experience from forming CER in establishing preferential trade agreements with many other nations, particularly in the Asia-

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[22] Services trade covers economic activities such as tourism, education, and transport (Ministry of Foreign Affairs and Trade, 2010d).

Pacific region. Indeed, Australia and New Zealand together have formed a PTA with ASEAN, showing the cooperation between the two countries.

The New Zealand Ministry of Foreign Affairs and Trade states emphatically that "Yes, CER has significantly benefited the economies of both countries" (2005a, p. 16), and cite growth in trans-Tasman trade and increases in the size of effective markets for both countries' businesses as evidence. Australia is New Zealand's largest trading partner (World Trade Organisation, 2010b), and

> The level of trade between the two countries has undoubtedly been assisted by the development of the Closer Economic Relationship since it was first signed in 1983 (Government of India & New Zealand Government, 2009, p. 10).

Not only did the CER result in free trade between New Zealand and Australia, but it led a period in which both countries reformed their trade policies and unilaterally reduced their trade barriers to other countries as well (Das, 2004). Both New Zealand and Australia transformed from highly protectionist economies to "fairly aggressive trade reformers" (Das, 2004, p. 143).

New Zealand – Singapore Closer Economic Partnership

The agreement establishing the New Zealand – Singapore Closer Economic Partnership (CEP) entered into force on 1 January 2001 (Ministry of Foreign Affairs and Trade, 2011a). "It is the most comprehensive trading agreement, outside of Closer Economic Relations with Australia, that New Zealand has negotiated" (Ministry of Foreign Affairs and Trade, 2011a). The aim of the agreement is to improve the trading environment between two nations that already enjoy a significant relationship, through provisions relating to goods, services, investment, and technical and quarantine goods trade issues (Ministry of Foreign Affairs and Trade, 2011a).

Significantly, negotiations took less than a year, showing the high level of cooperation on trade issues between the two economies. Relating to trade on goods, all tariffs were eliminated upon the agreement's entry into force, without any recourse to safeguard mechanisms (Ministry of Foreign Affairs and Trade, 2011b). Non-tariff measures and export subsidies, even for agricultural products, are not allowed under the terms of the agreement (Ministry of Foreign Affairs and Trade, 2011b).

New Zealand – Thailand Closer Economic Partnership

The agreement establishing the New Zealand – Thailand Closer Economic Partnership (CEP) entered into force on 1 July 2005 (Ministry of Foreign Affairs and Trade, 2011m). Jim Sutton, New Zealand's then Trade Minister, discusses the comprehensive coverage of goods trade between the two countries, with virtually all manufactured goods enjoying duty free access within five years (Ministry of Foreign Affairs and Trade, 2005c).

The FTA between New Zealand and Thailand allows for a phase out of tariffs on sensitive products, but it has been undertaken that all tariffs and quotas on all goods will be

removed over time (Ministry of Foreign Affairs and Trade, 2005c). The agreement covers rules of origin and safeguard mechanisms, as well as trade facilitation (Ministry of Foreign Affairs and Trade, 2005c). Although covering investment, the agreement itself does not liberalise trade in services, instead demonstrating a willingness to do so at a future date. Separate arrangements have been made relating to labour and environmental issues (Ministry of Foreign Affairs and Trade, 2005c).

The New Zealand Ministry of Foreign Affairs and Trade (2005c) discusses the reasons why Thailand is an attractive FTA partner. Among these, the strong growth of the Thai economy and the existing positive relationship between the two countries are prominent. The Ministry also believes the two economies to be complementary, where "Thailand exports mainly motor vehicles and electronic goods to New Zealand while New Zealand's exports are concentrated in agriculture-based products and niche manufactured goods" (Ministry of Foreign Affairs and Trade, 2005c, p. 12). This complementarity is said to make the two countries natural FTA partners. Thailand is discussed as a highly protectionist economy, where the removal of import barriers will open up significant opportunities for New Zealand exporters (Ministry of Foreign Affairs and Trade, 2005c). Maintaining New Zealand's current trade position is given as one reason behind the agreement, since Thailand is actively pursuing FTAs with other countries, and any preferential access granted to these economies will disadvantage New Zealand exporters (Ministry of Foreign Affairs and Trade, 2005c).

"The CEP offers substantial benefits to dairy exporters" (Ministry of Foreign Affairs and Trade, 2005c, p. 18). The New Zealand dairy industry is an important beneficiary of the New Zealand – Thailand Free Trade Agreement, since dairy exports made up over half of New Zealand's total exports to Thailand before the agreement came into force[23]. However, the dairy sector was identified as the most sensitive for Thailand in the agreement, and subject to the longest tariff and quota phase outs. Thus, benefits for the dairy industry will be realised in the medium to long term (Ministry of Foreign Affairs and Trade, 2005c). New Zealand's single largest export to Thailand, infant milk food, enjoys immediate tariff elimination while barriers on other dairy products are phased out between 2005 and 2025 (Ministry of Foreign Affairs and Trade, 2005c).

The Trans-Pacific Strategic Economic Partnership

The Trans-Pacific Strategic Economic Partnership (TPP), as it stands, includes New Zealand, Singapore, Chile, and Brunei Darussalam (the so called P4). The agreement liberalises trade between these nations in both goods and services, and as the first such agreement to involve several Pacific-rim countries has been termed "groundbreaking" (Ministry of Foreign Affairs and Trade, 2005b, p. 2). As will be seen below, membership of the TPP is not limited to the existing participants, as highlighted by former Minister of Trade Negotiations, Jim Sutton:

> The shared vision is to stimulate more open trade within the Asia-Pacific region, and New Zealand is keen to see the membership of the Trans-Pacific SEP expand as other

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[23] 58 percent in 2004 (Ministry of Foreign Affairs and Trade, 2005c, p. 18)

Asia-Pacific nations look to take part (Ministry of Foreign Affairs and Trade, 2005b, p. 3).

The Trans-Pacific SEP entered into force for New Zealand and Singapore on 28 May 2006, for Brunei on 12 July 2006, and for Chile on 8 November 2006 (Ministry of Foreign Affairs and Trade, 2011p). On entry into force, the agreement allowed 90 percent of New Zealand's '2004' exports to Chile to enter duty free, as well as 92 percent of New Zealand's '2004' exports to Brunei Darussalam (Ministry of Foreign Affairs and Trade, 2005b). All of New Zealand's exports to Singapore already enjoyed duty free access due to the separate trade agreement between New Zealand and Singapore. As well as tariff reductions and eliminations, the agreement covers trade in services and trade facilitation, and sets out rules of origin and an allowance for agricultural safeguard mechanisms[24] (Ministry of Foreign Affairs and Trade, 2005b). As part of the partnership, the members have also entered agreements focusing on environmental and labour issues.

Important within the agreement is the mutual desire of the four countries involved for expansion within the Asia-Pacific region. As such, "Other APEC members have followed the conclusion of negotiations with interest" (Ministry of Foreign Affairs and Trade, 2005b, p. 12). The four countries involved are all relatively small, open economies, and so the potential strategic benefits of an FTA linking Latin America, Southeast Asia and New Zealand are a key aspect (Ministry of Foreign Affairs and Trade, 2005b). The New Zealand Ministry of Foreign Affairs and Trade (2005b) sees the agreement as assisting multilateral trade liberalisation efforts.

Tariffs have been eliminated under the Trans-Pacific SEP on entry into force for some tariff lines and subsequently at the beginning of each new calendar year for others. The deadline for elimination of tariffs is set as 2017 (Ministry of Foreign Affairs and Trade, 2005b). Dairy trade, as is often the case, was a sensitive area of negotiations for Chile. However, entry into force was an important date for dairy trade liberalisation in Chile, when tariffs on 55 percent of New Zealand's '2004' dairy exports to Chile were eliminated. Tariffs on liquid milk were eliminated in 2008, while butter, milk powders and whey have to wait until 2017 (Ministry of Foreign Affairs and Trade, 2011p). Brunei Darussalam and Singapore implemented a zero tariff on dairy exports from New Zealand, even before the agreement came into force (Ministry of Foreign Affairs and Trade, 2011p).

New Zealand – China Free Trade Agreement
Then Trade Minister Phil Goff describes the importance of the establishment of the New Zealand – China Free Trade Agreement for New Zealand's export competitiveness, on which its standard of living, jobs, and economic growth rely (Ministry of Foreign Affairs and Trade, 2008). Goff highlights that

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[24] Although not explicitly covering investment, the agreement does indicate that negotiations on this topic are to commence subsequently (Ministry of Foreign Affairs and Trade, 2005b).

This deal opens the door for New Zealand businesses to the world's fastest growing economy, with its population of 1.3 billion and rapidly expanding middle class (Ministry of Foreign Affairs and Trade, 2008, p. 2).

The agreement covers not only tariff reductions, but also non-tariff barriers, customs, labour, environmental, and intellectual property issues, services trade and investment provisions, as well as an agreement not to introduce or maintain export subsidies for trade between the two countries (Ministry of Foreign Affairs and Trade, 2008). China is very important for New Zealand's economy, being New Zealand's second largest trading partner overall (Ministry of Foreign Affairs and Trade, 2010a).

The agreement entered into force on 1 October 2008 (Ministry of Foreign Affairs and Trade, 2011f). This is the first such agreement that China has signed with an OECD economy, a feature that Goff believes to be of great importance to New Zealand (Ministry of Foreign Affairs and Trade, 2008). New Zealand's annual exports to China were approximately $2 billion at the time of the agreement's entry into force, but growing rapidly (Ministry of Foreign Affairs and Trade, 2008). China has a growing middle class that "will fuel demand for New Zealand's agricultural products" (Ministry of Foreign Affairs and Trade, 2011f), which is obviously an important aspect of the agreement for the New Zealand dairy industry. China is the world's fastest growing major economy, currently with an annual growth rate of 9.5 percent (Ministry of Foreign Affairs and Trade, 2011f). As such, "Securing preferential access to China's economy has the potential to deliver significant gains to our exporters" (Ministry of Foreign Affairs and Trade, 2011f).

Tariff eliminations on goods trade began immediately with the agreement's entry in force, with 35 percent of New Zealand's '2008' exports duty free from day one. The elimination of tariffs on New Zealand exports to China is to continue over 12 years from entry into force, with just 4 percent of '2008' exports not subject to preferences under the agreement (Ministry of Foreign Affairs and Trade, 2008).

The New Zealand – China FTA not only gains improved access for New Zealand exporters into Chinese markets, but helps to maintain competitiveness in these markets as other preferential trade agreements are signed (Ministry of Foreign Affairs and Trade, 2008). This is seen as although New Zealand was the first country to conclude an FTA with China, there are a number of others now implemented, and even more under negotiation (PricewaterhouseCoopers, 2009). The New Zealand – China agreement includes provisions that as China makes concessions to third parties as new agreements are signed, the new allowances for services trade and investment are also extended to New Zealand (Ministry of Foreign Affairs and Trade, 2008).

Dairy exports account for a significant 18 percent of New Zealand's total exports to China (Ministry of Foreign Affairs and Trade, 2008), and have been growing phenomenally in recent years (Newman & Nichol, 2011). Important dates for the dairy industry are 2017, when tariffs on butter, cheese and liquid milk are eliminated, and 2019, when tariffs on skim and whole milk powders are eliminated, although tariff reductions will take place during these phase out periods (Ministry of Foreign Affairs and Trade, 2008). Some dairy products' trade will be liberalised in 2012/2013, including infant milk formula, casein, yoghurt and whey. The

long phase out period for dairy products is due to China's sensitivity about the development of the domestic Chinese industry, as demonstrated by the special safeguard mechanisms included in the agreement for dairy products (Ministry of Foreign Affairs and Trade, 2008). Charlie Pedersen, the President of Federated Farmers in New Zealand, highlights the promise of the New Zealand – China Free Trade Agreement for the agricultural sector:

> China has the biggest potential market in the world, with the biggest population. The Chinese want our meat, wool and dairy products. Their middle class is growing all the time and as the population gets wealthier they will demand more of our produce. It is a great time to be a food producer in New Zealand (Ministry of Foreign Affairs and Trade, 2008, p. 29).

ANZ predicts a significant food shortage occurring in China over the next 15 years, with growth in food demand set to outstrip growth in the food supply (Bagrie et al., 2010). "The shortage is likely to be concentrated in high grade agricultural products, dairy, meat and other high protein products" (Bagrie et al., 2010, p. 24). The New Zealand dairy sector, with a free trade agreement with China in place, is ideally placed to help meet this food shortage. Fonterra's investment in the Chinese dairy industry adds to the benefits that the New Zealand dairy industry can hope to achieve from the agreement[25].

ASEAN – Australia – New Zealand Free Trade Area

New Zealand's Trade Minister Tim Groser describes the FTA that New Zealand and Australia have recently concluded with ASEAN (Association of Southeast Asian Nations) as an important opportunity for New Zealand businesses (Ministry of Foreign Affairs and Trade, 2009a). He highlights that the ASEAN nations represent New Zealand's third largest export market, where exports have grown 121% since 2000. The FTA that New Zealand now enjoys is important in maintaining export competitiveness into this important market, since ASEAN are entering into a number of other trade arrangements (Ministry of Foreign Affairs and Trade, 2009a). Further, the preferential trade agreement that has been signed with Australia and ASEAN is seen as a 'building block' towards the wider goal of multilateral trade liberalisation (Ministry of Foreign Affairs and Trade, 2009a).

After being signed in 2009, the ASEAN, Australia and New Zealand Free Trade Area (AANZFTA) originally entered into force on 1 January 2010 for Australia, Brunei Darussalam, Burma, Malaysia, New Zealand, Singapore, the Philippines, and Viet Nam. Thailand joined on 12 March 2010, followed by Lao PDR on 1 January 2011 and Cambodia on 4 January 2011, while Indonesia will join once certain requirements are met (Ministry of Foreign Affairs and Trade, 2011c). As well as the reduction of merchandise import tariffs, the agreement includes provisions for services trade and investment, as well as many other measures, including those relating to customs procedures and standards (Ministry of Foreign Affairs and Trade, 2009a).

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[25] Fonterra has invested in the Chinese dairy industry in the form of large-scale dairy farms, where "Fonterra's dairy farms in China are a leading example of how large dairy farms, which are becoming increasingly common in that country, should be managed" (Kilsby, 2011, p. 54).

Liberalised trade in goods under the AANZFTA is to be sequentially phased in over the next decade, with the end result being that by 2020, 99 percent of New Zealand's exports to these key ASEAN markets (Indonesia, Malaysia, the Philippines, and Viet Nam) will be duty free (Ministry of Foreign Affairs and Trade, 2009a). Dairy is a particularly important sector in New Zealand's exports to ASEAN countries, making up approximately 50 percent of those exports in 2007 (Ministry of Foreign Affairs and Trade, 2009a). Important liberalisation dates for the New Zealand dairy industry include 2010 with Indonesia and the Philippines, and 2016-17 with Viet Nam, when tariffs on major dairy products are eliminated.

New Zealand – Malaysia Free Trade Agreement

Although Malaysia is part of the AANZFTA that New Zealand signed with Australia and ASEAN in February 2009, New Zealand's Trade Minister Tim Groser believes that the separate agreement New Zealand and Malaysia signed in October 2009 is a useful supplement to AANZFTA (Ministry of Foreign Affairs and Trade, 2009b):

> It [New Zealand – Malaysia FTA] eliminates tariffs on 99.5 percent of New Zealand's current exports within seven years (by 2016) of entry-into-force – five years earlier than provided for under the AANZFTA (Ministry of Foreign Affairs and Trade, 2009b, p. 2).

Groser believes that the Most Favoured Nation treatment afforded to New Zealand through the FTA is particularly significant, future proofing New Zealand's investment and services interests as Malaysia concludes other trade agreements (Ministry of Foreign Affairs and Trade, 2009b).

The New Zealand Ministry of Foreign Affairs and Trade (2009b) notes that Malaysia is New Zealand's eighth most important export destination, and that the FTA will have benefits in terms of enhanced market access, improved firm competitiveness, greater trade and investment certainty for businesses, as well as longer term gains from regional integration. Malaysia is an attractive FTA partner due to the growing bilateral trade in goods and services, and flourishing investment linkages, between the two countries (Ministry of Foreign Affairs and Trade, 2009b). Besides tariff removals, the FTA covers rules to govern trade, trade in services, movement of business people, and protection for investment, as well as trade facilitation and other issues such as environmental and labour standards (Ministry of Foreign Affairs and Trade, 2009b). "The bilateral FTA builds on and extends the commitments made by New Zealand and Malaysia under the AANZFTA Agreement signed in February 2009" (Ministry of Foreign Affairs and Trade, 2009b, p. 10).

New Zealand – Hong Kong, China Closer Economic Partnership

New Zealand's Trade Minister, Tim Groser, identifies two reasons for the attractiveness of the recently concluded Closer Economic Partnership (CEP) with Hong Kong:

> The benefits to New Zealand flow from the fact that Hong Kong is both an important trading partner in its own right – it is currently the 9th largest export destination for

New Zealand exports – and is strategically important as a trading partner located within the dynamic Asia region (Ministry of Foreign Affairs and Trade, 2010d, p. 2).

Groser discusses the CEP as complementary to New Zealand's free trade agreement with China, where Hong Kong can be used as a platform for trade with mainland China. It will thus help New Zealand businesses to take advantage of opportunities in the wider region, for which Hong Kong is an important trading hub (Ministry of Foreign Affairs and Trade, 2010d). As well as trade in goods and services, the agreement covers areas such as customs procedures, education, sanitary and phytosanitary measures, intellectual property, e-commerce, movement of business persons, and government procurement, amongst others (Ministry of Foreign Affairs and Trade, 2010d). Although investment is not explicitly covered, negotiating a protocol on investment in the near future is required by the CEP, while separate agreements cover environmental and labour issues (Ministry of Foreign Affairs and Trade, 2010d).

The CEP, following entry into force on 1 January 2011, guarantees New Zealand goods exporters duty free access to Hong Kong markets, while New Zealand service providers will benefit from greater certainty of access and enjoy earlier access to the liberalisation that Hong Kong has offered as part of its WTO Doha Round negotiations (Ministry of Foreign Affairs and Trade, 2010d). Services trade is also subject to future-proofing rules so that some New Zealand service providers will benefit from any improved access that Hong Kong grants to other trade partners (Ministry of Foreign Affairs and Trade, 2010d). The CEP builds on an already strong relationship between two economies which both believe, and work together, in the multilateral trading system (Ministry of Foreign Affairs and Trade, 2010d).

3.2   Agreements under Negotiation

As highlighted by New Zealand's Trade Minister, Tim Groser (2011b), trade policy is very important if New Zealand is to lift its income from the lower end of the developed country spectrum. "Historically, New Zealand has suffered more than any developed country from distortions in international trade" (Groser, 2011b). The problem is caused by New Zealand's reliance on traditional primary export industries that are the industries worst affected by export subsidies and market access barriers in other countries. New Zealand's trade policy, in participating in WTO multilateral negotiations, concluding the PTAs that are already in existence, and negotiating towards agreements that are not yet completed, is providing New Zealand with greater opportunities for economic prosperity. Aside from the multilateral negotiations under the WTO's Doha Round, this section outlines the agreements that New Zealand is currently negotiating.

Expansion of the Trans-Pacific Partnership

Tim Groser (2011b) identifies the roots of the expanded Trans-Pacific Partnership (TPP) in the New Zealand - Singapore CEP, completed over ten years ago. He discusses that agreement as something of a 'Trojan horse', concluded more for its strategic benefits than any realisable gains from trade, since there were no significant trade barriers to remove. The idea was to move from the CEP to merge the CER between Australia and New Zealand with the ASEAN FTA,

now completed, and then to seek links with the Americas. Chile and, significantly, USA were the economies in mind (Groser, 2011b). Groser sees the potential expansion of the TPP as the fruit of that strategy, with nine countries rather than five involved. The aim is "to expand the opportunities for all our economies by wider and wider concentric rings of freer trade and investment" (Groser, 2011b). As such, the vision for the TPP is that of a Free Trade Area of the Asia Pacific (Groser, 2011b).

Expansion of the Trans-Pacific Partnership to include the United States, Australia, Peru, Viet Nam and Malaysia represents an opportunity for taking a step towards free trade in the Asia Pacific region. As discussed by Tracy Watkins (2011), the inclusion of the United States in the expanded agreement is particularly important for New Zealand. New Zealand Trade Minister Tim Groser describes New Zealand Prime Minister John Key's visit to the United States in July 2011 as a chance to reaffirm political commitment to striking an agreement, in a tough time in US politics: "Whenever the US economy is in retreat, it shows little appetite for free-trade deals" (Watkins, 2011). New Zealand's enthusiasm for the United States' involvement is apparent from a cursory glance at the countries involved in the negotiations; of the potential expansion partners, New Zealand already has preferential trading arrangements with all but Peru[26].

According to the New Zealand Ministry of Foreign Affairs and Trade (2011d), the sixth round of negotiations in establishing the expanded Trans-Pacific Partnership conducted in late March 2011 were positive. Preliminary discussions took place surrounding services and investment, government procurement, rules of origin, and goods market access (Ministry of Foreign Affairs and Trade, 2011d). Tim Groser identifies challenges to the inclusion of the United States and New Zealand together in a PTA as New Zealand's public health service, in particular Pharmac, and intellectual property rights, alongside the major issue of dairy trade (Groser, 2011b). New Zealand Prime Minister John Key remains confident of success in reaching an agreement on the expanded TPP (Watkins, 2011).

The strong political clout of subsidised American dairy producers is a significant issue for the New Zealand dairy industry. American producers see New Zealand's dairy farmers as a threat that would become greater under a free trade arrangement, and are therefore unsupportive of such an agreement:

> The TPP has already run into heavy opposition from the US dairy lobby, among others, which vociferously opposes a deal removing barriers against the New Zealand dairy industry (Watkins, 2011).

American opposition to the New Zealand dairy industry is justified by the US on the basis of claims of anti-competitive behaviour by the New Zealand industry, as well as objection to the control it holds over world dairy markets (Watkins, 2011). "The [US] dairy lobby is claiming losses of around US$20 billion within a decade should the TPP open the door to New Zealand dairy" (Watkins, 2011). Tim Groser points out that this argument is fundamentally wrong, since

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[26] Peru also has significant potential as a free trade partner for New Zealand, with a rapidly growing economy and significant imports of New Zealand dairy products (International Trade Association of Peru, 2011).

"We have no capacity to 'flood the American market' with our milk. We can't even keep up with the opportunities in China" (Groser, 2011b). The New Zealand dairy industry is small in terms of total production in global terms, and as such Groser believes that the United States has a substantial interest in including a 'quality deal on dairy' (Groser, 2011b). Indeed, late in 2011 Groser has discussed the United States as the major beneficiary of a strong dairy outcome in the TPP negotiations and believes that the United States will overtake New Zealand to be the world's largest dairy exporter as trade barriers are reduced (Edlin, 2011d). The possible inclusion of Japan, Mexico and Canada in TPP negotiations makes those negotiations increasingly attractive for the United States dairy industry.

Japan, Canada and Mexico have all also expressed interest in joining TPP negotiations, vastly increasing the scope of the potential free trade zone covered by the expanded Trans Pacific Partnership (Edlin, 2011d). Japan's possible participation in the negotiations for the expansion of the Trans Pacific Partnership is undecided in late 2011, with manufacturers, exporters and many business leaders strongly in favour of joining the negotiations, and others, particularly the farming community, strongly opposed (Foster, 2011). Canada's involvement in the TPP would necessitate the elimination of its protectionist supply control system, which will be a lengthy process if undertaken (Edlin, 2011d).

New Zealand – India Free Trade Agreement
Negotiations for a preferential trade agreement between New Zealand and India began in early 2010 (Ministry of Foreign Affairs and Trade, 2011j). Stronger economic interaction is the goal of negotiations between these countries, whose key exports are complementary in nature according to their respective Prime Ministers[27] (Kissun, 2011). Currently, New Zealand's key exports to India are in coal, unprocessed logs, wool, scrap aluminium, and sheep skin leather, which together account for around 80% of New Zealand's exports to India (Ministry of Foreign Affairs and Trade, 2011g). The Indian market is an important and growing export destination for New Zealand, being the 10th largest in 2010 (Ministry of Foreign Affairs and Trade, 2011n), while the Indian economy is growing rapidly[28] (Government of India & New Zealand Government, 2009). India views international trade as a means to economic growth and national development (Government of India & New Zealand Government, 2009).

India's average tariff is a relatively high 11.9 percent, which varies significantly across sectors and is particularly high for agricultural and value-added products (Ministry of Foreign Affairs and Trade, 2011n), so that "a number of key New Zealand agricultural products are significantly impeded by tariffs…" (Government of India & New Zealand Government, 2009, p. 34). Hoda and Gulati (2007) discuss that India has been insulated from world agricultural

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[27] The products of New Zealand's and India's agricultural sectors are generally not in competition, due to countercyclical seasons, different target markets, and indeed different products (Government of India & New Zealand Government, 2009).

[28] With growth in real GDP of 8.8% in 2010 and a population of almost 1.2 billion (Ministry of Foreign Affairs and Trade, 2011n). India has been predicted to become the world's second largest economy by 2050, with India's aggregate consumption expected to double in the next twenty years (Government of India & New Zealand Government, 2009).

markets by an autarkic trade policy regime, and Subramanian (1993) discusses the extensive historical government intervention in agriculture in India.

New Zealand's Trade Minister, Tim Groser, believes that removing the high trade barriers that New Zealand exporters face in India will allow trade to flourish (Groser, 2010), which has previously been under-developed but is beginning to expand: "India's economic growth has been matched by an expansion in New Zealand's trade and economic relationship with India" (Government of India & New Zealand Government, 2009, p. 17). Further, the New Zealand Ministry of Foreign Affairs and Trade (2011g) identifies India's growing middle class as of particular importance for New Zealand. The growing demand for high quality food products, particularly protein, makes the New Zealand dairy industry's outlook on trade with India very positive.

Rabobank Australia and New Zealand have identified dairy demand in India as booming so that satisfying consumer demand will require imports, while the domestic dairy industry will see changes in its structure that make the organised milk sector more prominent (Gieskes, 2011). "At the moment India cannot produce enough food to supply growing demand…" (Government of India & New Zealand Government, 2009, p. 34). Cameron Bagrie, chief economist at ANZ, believes that the Indian dairy market has similar potential to the Chinese market, and that a preferential trade agreement between New Zealand and India will help to realise these opportunities for the New Zealand dairy industry (Kissun, 2011).

However, India is a much larger producer of milk than is New Zealand, with 14 percent of world production as opposed to 2.2 percent for New Zealand (Government of India & New Zealand Government, 2009). Dairy has not previously featured in the bilateral trading relationship between the two countries, which is unusual for New Zealand since it is typically such an important export product (Government of India & New Zealand Government, 2009), although dairy has very recently become a significant trade item (Ministry of Foreign Affairs and Trade, 2011n). It is expected that access to the Indian dairy market for New Zealand products will have benefits for both countries, in the form of a new market for New Zealand producers, and increased supply and a wider range of products for Indian consumers, while Indian dairy producers are not expected to suffer (Government of India & New Zealand Government, 2009). As well as improved access for New Zealand's exports, there is the opportunity for the New Zealand dairy industry to help develop the domestic Indian industry:

India's Commerce Minister, Shri Anand Sharma, said last month [June 2011] that he wants to tap into the New Zealand dairy industry's state-of-the-art technology as part of an FTA (Edlin, 2011c).

New Zealand – Korea Free Trade Agreement
New Zealand and Korea entered into negotiations towards a free trade agreement in 2009, although agriculture is proving to be a difficult issue in the negotiations (Ministry of Foreign Affairs and Trade, 2011h). The New Zealand Ministry of Foreign Affairs and Trade (2011d) points out that although negotiations are continuing with the Republic of Korea, progress has been slow. Reasons for this include Korea's political preoccupation with the requirements of

its FTAs with the European Union and the United States, as well as the recovery from a serious outbreak of foot-and-mouth disease. With this slow progress there is building concern over the impact of Korea's other FTAs (such as with the EU and US) on New Zealand businesses (Ministry of Foreign Affairs and Trade, 2011d), where some New Zealand businesses may effectively be shut out of the Korean market (Ministry of Foreign Affairs and Trade, 2011h).

However, if negotiations do reach a satisfactory conclusion, the large Korean market provides a significant opportunity for New Zealand's exporters, particularly in agricultural products since this is an area where there are currently substantial tariffs in existence. Korea is New Zealand's fifth largest bilateral trading partner, and the two economies are believed to be particularly complementary (Ministry of Foreign Affairs and Trade, 2011h).The optimal growing periods in New Zealand and Korea are counter-seasonal, and New Zealand does not export many of the agricultural products that Korea finds sensitive (Ministry of Foreign Affairs and Trade, 2011k). The New Zealand dairy industry cannot compete in Korea in liquid milk supply, which makes up the majority of the Korean industry. Therefore, it is believed that New Zealand's dairy exports would not displace domestic Korean dairy production, and that even more general perceptions of the New Zealand – Korea FTA endangering the Korean agricultural sector are misguided (Ministry of Foreign Affairs and Trade, 2011k). Indeed,

> New Zealand can also be part of the long term solution to Korea's food security concerns. New Zealand agribusinesses supply safe, healthy food to Korean consumers… (Ministry of Foreign Affairs and Trade, 2011h).

New Zealand – Russia – Belarus – Kazakhstan Free Trade Agreement
The free trade agreement that New Zealand is negotiating with Russia and its Customs Union partners Belarus and Kazakhstan is Russia's first foray into the bilateral free trade arena (Groser, 2011b). Negotiations began in early 2011 (Ministry of Foreign Affairs and Trade, 2011l). The opportunities that would be provided by the successful conclusion of this agreement for the New Zealand economy, and in particular the New Zealand dairy industry, are significant. Russia has at times been one of the world's largest dairy importers, and since it is not yet a member of the WTO has many barriers to trade[29] (Bagrie, Goh, Williams, Croy, Zollner, Edwards, Smith, et al., 2011, p. 14). Belarus and Kazakhstan have populations of 9.5 and 16 million (Ministry of Foreign Affairs and Trade, 2011l), respectively, so represent significant markets in their own right.

The opportunities presented to New Zealand by the negotiations towards this preferential trade agreement are a direct result of the sheer scale and nature of the partners' markets. Russia is the world's largest country, with the 12th largest economy, and one of the world's leading food importers (Ministry of Foreign Affairs and Trade, 2011l). However, as pointed out by the New Zealand Ministry of Foreign Affairs and Trade (2011l), current trade with Russia is modest. A free trade agreement could boost this relationship and ensure that New Zealand exporters are in a good position to take advantage of the opportunities,

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[29] Russia has, in late 2011, completed negotiations regarding its accession to the WTO (World Trade Organisation, 2011f).

particularly for high-quality food products, in the Russian market where household debt is low and disposable income high (Ministry of Foreign Affairs and Trade, 2011l).

As well as being among the highest importers in the world of dairy products, beef and sheep meat, Russia has vast natural endowments and aims to develop its agricultural sector (Ministry of Foreign Affairs and Trade, 2011l). Thus, the opportunities presented to New Zealand from the possibility of this agreement are not limited to growth in merchandise trade, although these are significant. New Zealand's rural community, through partnering with Russia and helping to develop its agricultural sector, will benefit due to the huge levels of human capital and technological capabilities present in this sector in New Zealand. There is a possibility that if managed properly this bilateral relationship will see Russia look to New Zealand for the supply and associated support of agricultural technology and expertise.

An interesting additional aspect of these negotiations is provided by the smallest of the four economies involved, Belarus. As pointed out by Tim Groser (2011a), Belarus is fast becoming a significant exporter in world dairy markets. Belarus' inclusion in the negotiations for the PTA involving New Zealand and Russia could have interesting implications for who New Zealand's dairy partners are in the future (Groser, 2011a).

The objective of negotiations between New Zealand and the Russia – Belarus – Kazakhstan Customs Union was originally to conclude a free trade agreement in 2011 (Ministry of Foreign Affairs and Trade, 2011l), although this is more likely to be closer to mid-2012 (Ministry of Foreign Affairs and Trade, 2011e). The New Zealand Ministry of Foreign Affairs and Trade (2011e) believes that the negotiations are progressing well, with the third round of negotiations held in September 2011. These negotiations included discussions on technical barriers to trade and intellectual property, as well as building on areas from earlier rounds such as goods access, customs procedures, sanitary and phytosanitary issues, rules of origin, services and investment (Ministry of Foreign Affairs and Trade, 2011e). The joint report from the respective ministries points out that the majority of tariffs should be eliminated from entry into force, with a phase out period allowed for sensitive sectors of no more than ten years (Russia MED & New Zealand MFAT, 2010).

New Zealand – Gulf Cooperation Council Free Trade Agreement
New Zealand has concluded negotiations towards a free trade agreement with the Cooperation Council of the Arab States of the Gulf, although the agreement has not yet been signed. The Gulf Cooperation Council (GCC) was formed in 1981 and is made up of Bahrain, Oman, Kuwait, Saudi Arabia, the United Arab Emirates and Qatar (Ministry of Foreign Affairs and Trade, 2007b). The New Zealand Ministry of Foreign Affairs and Trade (2007b) identifies the GCC as a region where economies are growing quickly, markets are maturing, and demand for imported goods and services is high and expected to grow. Further, the GCC is New Zealand's seventh largest trading partner, and a market to which New Zealand's exports have been growing significantly in recent years (Ministry of Foreign Affairs and Trade, 2011i). In 2006, Saudi Arabia and the United Arab Emirates were New Zealand's largest export destinations in the Gulf Cooperation Council, while these two countries and Qatar were the three most important import sources for New Zealand of the GCC (Ministry of Foreign Affairs

and Trade, 2007b). The GCC has massive reserves of oil, at least 44 percent of the world's proven reserves, high per capita income (on a par with the NAFTA and EU trading blocs), and has experienced high rates of GDP growth (Ministry of Foreign Affairs and Trade, 2007b).

The New Zealand Ministry of Foreign Affairs and Trade (2007b) discusses deeper economic integration between New Zealand and the GCC countries as the objective of a free trade agreement, with benefits falling broadly into three categories: removal of tariff barriers to maintain New Zealand's competitive edge; a platform to develop trade in services and investment; and reducing non-tariff barriers to trade. In the period 2004-2006, dairy products were New Zealand's largest exports to the GCC, making up 67 percent of New Zealand's total exports to these countries (Ministry of Foreign Affairs and Trade, 2007b). The GCC has a common external tariff of, generally, either 0 percent or 5 percent, based on the category the specific product falls into. The majority of New Zealand's exports fall into the 5 percent category, so its removal is of key interest to New Zealand (Ministry of Foreign Affairs and Trade, 2007b). There is growing demand for the protein and calcium inherent in high-quality dairy products in Middle Eastern diets, and New Zealand is able to provide those products (Edlin, 2011a). Adding to the interest in the free trade agreement between New Zealand and the Gulf Cooperation Council is Fonterra's investment in the Saudi dairy industry (Edlin, 2011a).

CHAPTER 4   NEW ZEALAND'S DAIRY INDUSTRY

The New Zealand dairy industry is an extremely important part of the New Zealand economy. It directly accounts for almost three percent of New Zealand's GDP, and provides just over a quarter of New Zealand's total merchandise exports (New Zealand Institute of Economic Research, 2010). The industry employs around 35,000 workers, as well as thousands more who are self-employed, and the employment provided by the dairy industry is extremely important in particular regions of New Zealand (New Zealand Institute of Economic Research, 2010). Many rural areas and communities rely heavily upon the dairy industry for their prosperity, while even New Zealand's largest cities benefit substantially (New Zealand Institute of Economic Research, 2010). The importance of the dairy industry to the economic well-being of all New Zealanders is discussed by the New Zealand Institute of Economic Research (2010, p. 15): a $1 rise in dairy payout (per kilogram of milk solids) provides over $270 of additional spending for every New Zealander. Not only do farmers benefit from increased profitability in the dairy industry; so do the firms that sell goods and services to the sector, households that reap the benefits of the increased taxation revenue generated by the dairy sector, borrowers who enjoy lower interest rates due to the contribution the sector makes to New Zealand's current account, and consumers who enjoy increased consumption spending (New Zealand Institute of Economic Research, 2010).

International trade is vitally important to New Zealand as a small, relatively isolated economy, and has been equivalent to almost 60 percent of New Zealand's GDP in recent years (World Trade Organisation, 2010b). "The value of trade as a proportion of GDP in New Zealand is one of the highest in the OECD" (Organisation for Economic Co-operation and Development, 1987, p. 24). As such, "New Zealand's economic well-being is dependent on our ability to sell our products on the international market" (Ministry of Agriculture and Forestry, 2011). Trade in dairy products makes up a large portion of New Zealand's total trade: "The dairy sector is New Zealand's single largest merchandise goods export sector and a key contributor to the New Zealand economy" (Government of India & New Zealand Government, 2009, p. 35). New Zealand's dairy exports totalled $NZ12.1 billion for the 2010-2011 dairy season, accounting for 27 percent of New Zealand's total merchandise exports[30] (Newman & Nichol, 2011). The dairy sector is therefore a vital contributor to New Zealand's export earnings. Recent increases in the value of New Zealand dairy exports are due to higher commodity prices and an increase in export volumes (Newman & Nichol, 2011).

4.1   New Zealand's Dairy Production

New Zealand's agricultural industry has benefited significantly from technological advances, beginning with the development of refrigerated shipping, which allowed New Zealand's meat and dairy products to be exported around the world. The introduction of exotic grasses, the

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[30] The dairy season refers to the year ending 31 May. Newman and Nichol (2011) note that the June 2011 quarter data in their report is provisional, making figures for the 2010-2011 season provisional.

use of superphosphate fertiliser, lime and trace elements, and aerial topdressing all contributed to greater agricultural productivity in New Zealand (Ross & Sheppard, 1990). In Ross and Sheppard's (1990) opinion, New Zealand's comparative advantage in agricultural production pre-dates 1950. 1964 was the start of an era of increased government intervention in agriculture, and culminated in high levels of agricultural support in the early 1980s (Ross & Sheppard, 1990).

Economic troubles saw the 1984 election won by the Labour party on the basis of conservative type reforms to the economy, including extensive agricultural policy reforms that reduced the level of agricultural support and opened the sector up to more direct market forces.

> It is assumed that general liberalisation will reduce distortions induced by government intervention in the economy, and improve the efficiency of resource allocation, thereby raising, in the long run, the average level of real incomes. The process of change is a traumatic one… (Ross & Sheppard, 1990, p. 303).

Agricultural reforms were seen as necessary in order to control the fiscal deficit, and were sold to farmers along with a devaluation of the currency, which was meant to improve export prices such that agricultural assistance would no longer be needed. The subsequent float of the New Zealand dollar in 1985 coincided with greater government borrowing in the domestic market, increasing interest rates and attracting inflow of capital. The New Zealand dollar therefore floated above the level achieved in the 1984 devaluation, and farmers were put under severe pressure (Ross & Sheppard, 1990). The Organisation for Economic Cooperation and Development (1987) notes that in 1986 about 10 percent of farmers were experiencing serious financial difficulties.

In anticipation of the policy changes, adjustments to the pattern of farm output and increased efficiency in input use were being seen even in the early 1980s (Organisation for Economic Co-operation and Development, 1987).

> Prior to the period of reforms in the mid 1980s and early 1990s New Zealand had relatively high tariff rates. The reforms, which included widespread unilateral tariff reductions, transformed the New Zealand economy from one of the most closed in the world to one of the world's more open economies (Government of India & New Zealand Government, 2009, p. 22).

The end result of these reforms is an agricultural industry that is world leading in its efficiency.

The New Zealand dairy industry is made up of two separate but highly interdependent industries; dairy farming where raw milk is produced, and dairy processing where raw milk is transformed into consumer and export products, as well as inputs for other industries (New Zealand Institute of Economic Research, 2010). Milk production in New Zealand, although subject to fluctuations due to variable climatic conditions, has grown by approximately 2.4 percent per season for the last decade (Newman & Nichol, 2011). Over 1.4 million tonnes of milksolids were processed in the 2009-2010 dairy season (Newman & Nichol, 2011), from a production base of approximately 16.5 billion litres of milk (Graham, 2011).

The New Zealand dairy industry is dominated by Fonterra, the world's leading dairy exporter, which accounts for around a third of global trade in dairy products (Fonterra, 2011b). The lion's share of New Zealand's milk is processed by Fonterra, with production of 1.2 billion kgMS in 2009 (Graham, 2011). Fonterra is a cooperative owned by 10,500 supplier shareholders, and contributes approximately 25 percent of New Zealand's total exports by volume with operating revenue of $17 billion in the 2010 financial year (Fonterra, 2011b). Fonterra's farmers make up about 96 percent of all dairy farmers in New Zealand (Fonterra, 2011a), and it operates 20 processing plants across New Zealand (Graham, 2011). Fonterra was formed in 2001 as a merger between the New Zealand Dairy Board, the marketing network representing New Zealand's dairy farmers, and New Zealand Dairy Group and Kiwi Co-operative Dairies, New Zealand's two largest cooperative dairy producers (Fonterra, 2011a). As part of the Dairy Industry Restructuring Act (DIRA) that authorised Fonterra's creation in 2001, regulations were put in place to ensure competition in the milk supply market in New Zealand (Commerce Commission New Zealand, 2011). The DIRA also removed the market power that the New Zealand Dairy Board had over New Zealand's dairy exports, resulting in the formation of other dairy companies able to export dairy products from New Zealand:

> The passing of the DIRA removed the single desk selling status of the NZ Dairy Board allowing independent dairy companies to produce and export New Zealand made dairy products (Open Country Dairy Limited, 2011a).

Open Country Dairy is New Zealand's second largest dairy processor with the capacity to process approximately 900 million litres of milk per year, and is currently exporting to around 45 countries (Open Country Dairy Limited, 2011a). Open Country Dairy operates three whole milk powder plants throughout New Zealand, located in Waikato, Wanganui, and Southland, which are supplied by over 500 independent dairy farmers. Open Country Dairy produces milk powders, milk proteins and milk fats, as well as a range of cheeses (Open Country Dairy Limited, 2011b) from its 40 million kgMS processed in 2009 (Graham, 2011). The company was formed in 2001 as a result of the DIRA, with production commencing in 2004 (Open Country Dairy Limited, 2011a).

Westland Milk Products is an independent, cooperatively owned dairy processor based on the West Coast of the South Island, with its single processing site located in Hokitika producing milk powders, milk fat and milk protein products (Westland Milk Products, 2007a). Westland is supplied by more than 380 farmer shareholders, and has been in existence for more than 60 years (Westland Milk Products, 2007b). In 2009 Westland processed 45 million kgMS (Graham, 2011), but is looking to expand its operations into Canterbury (Lee, 2011).

Tatua, established in 1914, is a cooperatively owned dairy processor, with just over 100 local farmer shareholders (The Tatua Co-operative Dairy Company Ltd, 2009). These farmers supply up to 190 million litres of milk each year to Tatua's manufacturing facilities in the Waikato (The Tatua Co-operative Dairy Company Ltd, 2009), and the business processed 12 million kgMS in 2011 (Searle, 2011). Tatua claim that 90% of their products are exported, which range from caseinates and anhydrous milkfat through to cheeses and sweet desserts (The Tatua Co-operative Dairy Company Ltd, 2009).

Synlait's processing facilities, completed in 2008, are located in Canterbury, on the east coast of the South Island. The facilities process more than 300 million litres of milk per year, turning raw milk into milk powder and anhydrous milkfat (Synlait, 2011). Synlait focuses on value-added formulated milk powders, producing primarily for the milk powder export market (Synlait, 2011). Synlait processed 16 million kgMS in 2009 (Graham, 2011).

Russian-owned New Zealand Dairies Limited is located in South Canterbury, a region dominated by Fonterra (Wood, 2010). Most of its production is exported to China (Wood, 2010). New Zealand Dairies processed 15 million kgMS in 2009, and is focused on producing milk powders and nutritional products (Graham, 2011), particularly infant formula (Wood, 2010).

4.2   New Zealand's Dairy Trade

At this point note should be taken that this study considers only New Zealand's exports of dairy products. This is due to the study's emphasis on the effect of New Zealand's preferential trade agreements on the New Zealand dairy industry, rather than on New Zealand's consumers of dairy products, while exports clearly dominate New Zealand's trade in dairy products.

The United States has historically been New Zealand's largest dairy export market, but over time the New Zealand industry has seen a shift in the relative importance of these export markets (Graham, 2011). Perhaps the earliest catalyst for change for New Zealand's agricultural industries was the accession of the United Kingdom to the European Economic Community (Organisation for Economic Co-operation and Development, 1987).

> The loss of traditional markets entailed the development of completely new markets, rather than an increased sales effort in already established markets (Organisation for Economic Co-operation and Development, 1987, p. 17).

China is now New Zealand's largest dairy export market, surpassing the United States of America in the last two dairy seasons, and accounting for 17 percent of New Zealand's total dairy exports (Newman & Nichol, 2011). The value of exports to China has experienced phenomenal growth in recent years, with exports totalling $NZ2.3 billion in 2010-2011 from an already significant $NZ352 million in 2006-2007 (Newman & Nichol, 2011). Charlie Graham (2011), of the ANZ National Bank, discusses the importance of China and other Asian markets for New Zealand dairy products growing, with recent strong increases in export volumes. China's growing importance is driven by population and economic growth, the relatively close proximity to New Zealand, and improved market accessibility from New Zealand's trading arrangements (Graham, 2011). The Strategy for New Zealand Dairy Farming 2009/2020 identifies growing dairy demand from Asia in general as driven by population growth and an expanding middle class where dietary changes are increasingly including Western style foods (DairyNZ, DCANZ, & Federated Farmers, 2009).

Other countries that are particularly important export destinations for the New Zealand dairy industry are the United States, Australia, the Philippines, Japan, Saudi Arabia, and Malaysia, who alongside China have all been in the top ten export destinations every year

since the 2006-2007 season (Newman & Nichol, 2011). However, the value of exports to the United States in 2010-2011 was lower than in 2006-2007, the result of a significant drop from 2008-2009 to 2009-2010, and the value of dairy exports to Western Europe has also fallen in this period. Significant increases in export value have been experienced in exports to North Asia, South East Asia, the Middle East, and Africa, which respectively make up the largest regional export destinations of New Zealand dairy products by value (Newman & Nichol, 2011). Countries outside of these regions to also experience significant increases in export values are Venezuela and Australia (Newman & Nichol, 2011).

Whole milk powder and skim milk powder combined make up over half of the value of New Zealand's dairy exports, while the portion of export value made up by whole milk powder has increased from 30 percent to 42 percent over the past five seasons, largely the result of increased demand from China (Newman & Nichol, 2011). The portions of total export value that skim milk powder, cheese and casein represent have diminished in the past five seasons, the significant decrease for casein probably the result of the decline in value of the North American export market (Newman & Nichol, 2011). The share accounted for by anhydrous milkfat and butter has increased slightly in the last five seasons. The absolute value of New Zealand's dairy exports has increased for each of these six product categories in recent years, with over 100 percent increases in value since 2006-2007 in whole milk powder, anhydrous milkfat, and butter. In terms of export volumes, whole milk powder has experienced the largest growth, with skim milk powder export volumes increasing slightly in recent years, while cheese and butter export volumes have decreased from their 2006-2007 levels (Newman & Nichol, 2011).

International prices of dairy products have been extremely volatile since 2006 (Newman & Nichol, 2011). Rapid increases in the prices of whole milk powder, skim milk powder, cheese and butter were seen in 2007, before increasing supply out of the United States and the global financial crisis drove a dramatic decline (Newman & Nichol, 2011). Strong demand from Asia, particularly China for milk powders, has seen increases in prices since mid-2009 (Newman & Nichol, 2011). Newman and Nichol (2011) point out that the current troubled global economic situation threatens demand for New Zealand dairy exports, where a recession in the United States and Europe will affect Chinese exports and growth, thereby impacting on demand for New Zealand's dairy products. All of these external effects show the vulnerability of the New Zealand dairy industry to international developments.

4.3   New Zealand's Dairy Exports to Preferential Trade Agreement Partners

China

China has been New Zealand's largest dairy export market in both the 2009-2010 and 2010-2011 dairy seasons; in 2010-2011 the value of dairy exports to China was three times the value of dairy exports to the United States, New Zealand's second largest dairy export market (Newman & Nichol, 2011). China accounted for 17 percent of the value of New Zealand's dairy exports in 2010-2011, after rapid growth in recent years has seen the value of dairy exports to China rise from $NZ352 million in 2006-2007 to $NZ2.3 billion in 2010-2011 (Newman &

Nichol, 2011). The New Zealand – China Free Trade Agreement entered into force in 2008, and is thought to be a key enabler for this export growth to China, with New Zealand now given preferred supplier status in Chinese dairy markets[31]. China is New Zealand's largest export market, by value, for whole milk powder and skim milk powder, and in the top ten export destinations for butter, cheese and casein.

The importance of the Chinese market for the New Zealand dairy industry is discussed by Gary Romano, Fonterra's trade and operations managing director (Cronshaw, 2011). Romano discusses that Fonterra is a major player in the Chinese dairy import market, contributing about 300,000 tonnes of milk powder or approximately 6-7 percent of China's total consumption. As well as the direct export of product from New Zealand to China, New Zealand's largest dairy processor is involved in foreign direct investment in China, building up farm investments with the aim to produce around 30 billion litres of milk in China from 100,000 cows (Cronshaw, 2011). Although Fonterra's Chinese business is primarily based upon the export of milk powder from New Zealand, the growth in the food services industry, such as in the number of bakeries and fast food outlets in urban China, is also providing opportunities for Fonterra (Cronshaw, 2011). The increasing Western influence on Chinese diets is exciting for the dairy sector and with New Zealand's free trade agreement with China, accompanied by Fonterra's existing investments in China, New Zealand is well placed to capitalise on the opportunities presented.

Australia
Australia is New Zealand's original bilateral free trade agreement partner, with the Closer Economic Relations agreement between the two countries established in 1983. The World Trade Organisation has described CER as "the world's most comprehensive, effective and mutually compatible free trade agreement" (Ministry of Foreign Affairs and Trade, 2007a, p. 4). Due to the close geographical proximity of the two nations and their relative isolation from the rest of the world, Australia is New Zealand's largest overall export destination (World Trade Organisation, 2010b). By value of dairy exports, Australia was New Zealand's third largest export destination in 2010-2011 with $NZ519 million of exports, after China and the United States, and has been in the top ten export destinations for each of the last five dairy seasons (Newman & Nichol, 2011), showing its importance to the New Zealand dairy industry.

Singapore
Singapore, although not as large in terms of export value as China and Australia, is still a significant export market for the New Zealand dairy industry. According to Newman and Nichol (2011), Singapore was New Zealand's tenth largest dairy export destination in 2009-2010, with an export value of NZ$306 million. From data from Newman and Nichol (2011), Singapore seems to be a significant market for New Zealand's exports of whole and skim milk powders, and casein to some extent. New Zealand and Singapore entered a bilateral free trade agreement in 2001, and have since both been involved in the Trans-Pacific Partnership (P4) agreement, and the ASEAN-Australia-New Zealand free trade agreement (AANZFTA).

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[31] See Appendix D – Interviews with Key Dairy Industry Personnel.

Thailand

In 2010-2011, Thailand was New Zealand's tenth largest dairy export destination, with an export value of $NZ394 million (Newman & Nichol, 2011). Thailand has been a substantial and relatively consistent export market for the New Zealand dairy industry over the past decade (DairyNZ Economics Group, 2011). Thailand is a large market for New Zealand's skim milk powder in particular, having been the fourth largest export destination by value in 2010-2011, and in the top ten for each year since 2006-2007 (Newman & Nichol, 2011). New Zealand and Thailand entered a bilateral free trade agreement in 2005, and are both members of AANZFTA.

Malaysia

Malaysia is an important dairy export market for New Zealand, having featured in New Zealand's top ten dairy export destinations in each of the last five years (Newman & Nichol, 2011). Total dairy exports to Malaysia totalled $NZ430 million in 2010-2011, and it has been as high as number six in total dairy export values from New Zealand[32] (Newman & Nichol, 2011). Malaysia is an extremely important market for New Zealand's exports of milk powders, particularly skim milk powder in which it was the third largest market in 2009-2010 and 2010-2011, and the largest in 2008-2009 (Newman & Nichol, 2011). New Zealand and Malaysia are both members of AANZFTA, however also entered a bilateral free trade agreement in 2010.

Trans-Pacific Partnership

The Trans-Pacific Partnership entered into force between New Zealand, Chile, Singapore and Brunei Darussalam in 2006. New Zealand has a bilateral free trade agreement in place with Singapore, as seen above, and New Zealand's dairy exports to Chile and Brunei Darussalam are not particularly noteworthy (DairyNZ Economics Group, 2011). However, this agreement, now known as the P4 agreement, forms the basis of negotiations towards a trade deal that could prove extremely important for the New Zealand dairy industry. The expansion of the Trans-Pacific Partnership involves negotiations with the United States, Australia, Peru, Viet Nam and Malaysia. However, New Zealand already has trade agreements in place with Australia, Viet Nam and Malaysia, and Peru is not a particularly large export destination for New Zealand's dairy products (DairyNZ Economics Group, 2011).

Where the possible expansion of the Trans-Pacific Partnership becomes interesting for the New Zealand dairy industry is the potential inclusion of the United States of America. The United States is currently New Zealand's second largest dairy export destination by value, after China (Newman & Nichol, 2011), and has been the largest for every year since 2000 with the exception of the last two dairy seasons, although trade values have declined since their peak in 2008-2009 (DairyNZ Economics Group, 2011). Most of the value of New Zealand's dairy exports to the United States is in casein, the United States being by far New Zealand's largest market for casein (Newman & Nichol, 2011) The United States takes a protectionist mindset towards its dairy producers, and the trade weighted average ad valorem equivalent tariff on New Zealand dairy exports to the United States was 7.6 percent in 2010 (The World Bank, 2011d). The United States dairy lobby does not want New Zealand's dairy products to be included in any free trade agreement involving the two countries (Watkins, 2011), so

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[32] In 2008-2009 and 2009-2010.

negotiations will be complex. The inclusion of the United States in an expanded TPP will however provide huge opportunities for the New Zealand dairy industry.

ASEAN

New Zealand, along with Australia, entered into a free trade agreement with the ASEAN economies in 2010[33]. These countries are Brunei Darussalam, Burma (Myanmar), Cambodia, Indonesia, Lao PDR, Malaysia, Singapore, Thailand, the Philippines, and Viet Nam. Malaysia, Singapore and Thailand also have bilateral free trade agreements with New Zealand, and Brunei Darussalam is also a part of the Trans-Pacific Partnership, as seen above. Of particular note among the ASEAN countries is the Philippines, which was New Zealand's fourth largest dairy export market in 2010-2011, by value (Newman & Nichol, 2011). New Zealand's exports of whole milk powder to Indonesia and the Philippines are substantial, while the Philippines is an extremely important market for New Zealand's exports of skim milk powder, being the second largest by value in 2009-2010 and 2010-2011, and largest in 2006-2007 and 2007-2008 (Newman & Nichol, 2011). Indonesia and Viet Nam have also been in New Zealand's top ten export destinations for skim milk powder for each of the past five seasons (Newman & Nichol, 2011). The Philippines is a large market for New Zealand's cheese, being the fifth largest by value for the past three dairy seasons, while Indonesia featured in the top ten export destinations for New Zealand's cheese exports in those years (Newman & Nichol, 2011). Indonesia is also a significant market for New Zealand's exports of casein (Newman & Nichol, 2011). New Zealand's relatively close proximity to the ASEAN countries makes the free trade agreement with those countries important, particularly for the New Zealand dairy industry which exports a large amount of product to that region.

Hong Kong

Hong Kong has been a consistent dairy export market for New Zealand, having been in the top thirty export destinations by value for most of the last decade (DairyNZ Economics Group, 2011). In the early 2000's, Hong Kong was as high as number fifteen in terms of New Zealand's total dairy export values (DairyNZ Economics Group, 2011). New Zealand entered a free trade agreement with Hong Kong in 2011, although Hong Kong does not charge tariffs on its imports. New Zealand's dairy exporters however now have guaranteed duty free access to the Hong Kong market.

India

New Zealand currently has negotiations under way towards a free trade agreement with India. Although India has not been a large dairy export market for New Zealand historically, it has been growing in importance in the last three dairy seasons, and is now just outside New Zealand's top twenty export destinations for dairy products, by value (DairyNZ Economics Group, 2011). Newman and Nichol (2011) note that export values of whole milk powder, skim milk powder, cheese and casein to India have grown by large multiples in recent years, from small bases. The growing middle class in India is demanding more high quality food products (Ministry of Foreign Affairs and Trade, 2011g), meaning that the outlook on trade with India is very positive for the New Zealand dairy industry. When one considers the high level of import

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[33] The agreement did not enter into force for all countries at the same time. See Chapter 3 for more detail.

protection currently in place on New Zealand's dairy exports to India that could potentially be eliminated in a free trade agreement, the New Zealand dairy industry should be very enthusiastic about these negotiations indeed[34].

Russia, Belarus and Kazakhstan

Negotiations towards a free trade agreement between Russia and its Custom Union partners Belarus and Kazakhstan began in 2011 (Ministry of Foreign Affairs and Trade, 2011l). Russia is discussed as historically one of the world's leading dairy importers (Ministry of Foreign Affairs and Trade, 2011l), and has been just outside New Zealand's top twenty dairy export markets in the last two years (DairyNZ Economics Group, 2011). Russia is currently a very important market for New Zealand's butter exports, being the second largest market in 2010-2011, with New Zealand's butter exports to Russia totalling $NZ168 million in 2010-2011, and recently experiencing rapid growth (Newman & Nichol, 2011). Removal of the relatively high 20 percent trade weighted average ad valorem equivalent tariff on New Zealand's dairy exports to Russia (The World Bank, 2011d) will further develop the dairy trade relationship between New Zealand and Russia. Further, interview participants highlighted that not only does New Zealand stand to gain from improved access for dairy exports to Russia, but also through partnering with Russia in the development of its own agricultural industry, for which New Zealand has significant intellectual property to offer[35]. Belarus and Kazakhstan are not noteworthy dairy export markets for New Zealand in their own right, however the growth of dairy exports from Belarus could provide an interesting additional aspect to the potential free trade agreement (Groser, 2011a).

Korea

Korea is currently a significant export market for New Zealand in cheese and casein, and New Zealand's twentieth largest dairy export destination by overall value in the past two seasons (DairyNZ Economics Group, 2011). It has been in New Zealand's top five cheese export destinations, by value, for each of the past five dairy seasons, being third behind Australia and Japan in 2009-2010 and 2010-2011, and has grown in value significantly from 2006-2007 (DairyNZ Economics Group, 2011). In casein, it has featured in New Zealand's top ten export destinations by value in four of the past five years, although the value of those exports has declined since 2006-2007 (Newman & Nichol, 2011). Korea is heavily protectionist in the importation of dairy products, charging a 40 percent trade weighted average ad valorem equivalent tariff on New Zealand's products in 2010 (The World Bank, 2011d). Although progress in negotiations towards a free trade agreement between New Zealand and Korea has been slow (Ministry of Foreign Affairs and Trade, 2011d), if a deal is struck the potential benefits to the New Zealand dairy industry could be large.

Gulf Cooperation Council

New Zealand has concluded negotiations towards a free trade agreement with the Gulf Cooperation Council (GCC), although the agreement has not yet been signed. The GCC is made up of Bahrain, Oman, Kuwait, Saudi Arabia, the United Arab Emirates and Qatar. Of these

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[34] With a trade weighted average ad valorem equivalent tariff of 27.85 percent in 2010 (The World Bank, 2011d).
[35] See Appendix D – Interviews with Key Dairy Industry Personnel.

countries, Saudi Arabia has been in New Zealand's top ten dairy export destinations, by value, in each of the past five seasons (Newman & Nichol, 2011), and is therefore a very important market for the New Zealand dairy industry. It is also mentioned by Newman and Nichol (2011) as a market to which dairy exports have experienced significant growth in the past five years, being in the top ten growth markets by value, although it is overshadowed by the United Arab Emirates which has experienced the second largest increase in value behind only China. The United Arab Emirates was only just outside the top ten for New Zealand's dairy export destinations in 2010-2011 (DairyNZ Economics Group, 2011). The value of dairy exports to the Middle East has grown substantially in recent years, and in the 2010-2011 season accounted for 12.5 percent of New Zealand's total dairy exports (Newman & Nichol, 2011). Of course the GCC does not include all Middle Eastern countries, but the growing importance of that region in New Zealand's dairy export profile makes improved trade relations with the GCC an important foothold in that growing market.

The United Arab Emirates and Saudi Arabia are significant markets for New Zealand's exports of whole milk powder, and Saudi Arabia also for skim milk powder, butter and cheese, while Bahrain has recently become an important market for New Zealand's cheese. Exports of casein to Saudi Arabia have been growing significantly, as have skim milk powder exports to the United Arab Emirates (Newman & Nichol, 2011).

Excluded Countries

Key countries missing from New Zealand's trade policy agenda from the perspective of the dairy industry, taken both from Newman and Nichol's (2011) analysis, and the author's own analysis of DairyNZ Economics Group (2011) data, seem to be: Japan, Venezuela, Mexico, Sri Lanka, Taiwan, Algeria, Egypt, Iran, Sudan, Nigeria, Azerbaijan, and of course the European Union. The difficulties associated with negotiating a bilateral free trade agreement with Japan and the European Union are likely to be significant, and possibly with Mexico. Perhaps in the future there will be the opportunity for Japan and Mexico to come under an expanded Trans-Pacific Partnership agreement, as discussed by Edlin (2011d). However, opportunities to look towards some of the other countries listed above in free trade negotiations could be beneficial for the New Zealand dairy industry.

CHAPTER 5   GRAVITY MODEL OF INTERNATIONAL TRADE

The gravity model of international trade is widely used to analyse the effects of trade agreements on trade between the countries involved. In this study, the gravity model is used to analyse the effect of New Zealand's existing free trade agreements on New Zealand's dairy exports.

Table 5.1   The Incidence of New Zealand's Preferential Trade Agreements

Preferential Trade Agreement	Countries Involved (along with New Zealand)	Year of Implementation
AANZFTA	Australia, Brunei Darussalam, Malaysia, Singapore, Thailand, the Philippines, Viet Nam[36]	2010
China	China	2008
Malaysia	Malaysia	2010
Singapore	Singapore	2001
Thailand	Thailand	2005
TPP	Singapore, Chile, Brunei Darussalam	2006

Source: Information taken from the website of the New Zealand Ministry of Foreign Affairs and Trade.

Table 5.1 shows the year of implementation of, and the countries involved in, each of New Zealand's preferential trade agreements that are included in this gravity analysis. Six agreements are included in this study as agreements in force, they are: ASEAN, Australia and New Zealand Free Trade Agreement (AANZFTA); New Zealand – China Free Trade Agreement (CHINA); New Zealand – Malaysia Free Trade Agreement (MALAYSIA); New Zealand – Singapore Closer Economic Partnership (SINGAPORE); New Zealand – Thailand Closer Economic Partnership Agreement (THAILAND); and the (P4) Trans-Pacific Strategic Economic Partnership Agreement (TPP)[37] (Ministry of Foreign Affairs and Trade, 2011o).

Following Grant and Lambert (2008), the relevant date for each of New Zealand's preferential trade agreements is taken from the year the agreement entered into force, not

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[36] Burma (Myanmar) is a part of this agreement as well but is excluded due to data limitations, while Lao PDR and Cambodia entered in 2011, after the scope of this analysis.

[37] Closer Economic Relations (CER), the comprehensive agreement between Australia and New Zealand, is excluded from this gravity model analysis since the data runs from 1989-2010, and is therefore not powerful enough to include the CER, which entered into force in 1983, in this fixed effects regression estimation. Carrere (2006) noted this problem with fixed effects estimation. Similarly, the agreement between New Zealand and Hong Kong is excluded since it entered into force in 2011, too recent for the available data. The SPARTECA agreement is not included.

when negotiations were commenced or concluded, so any anticipation effect is ignored (see Carrere, 2006). Examining the effects of phase-ins of trade agreements using the gravity equation methodology of Grant and Lambert (2008) is not feasible in this study since New Zealand's agreements are for the most part too recent.

Figure 5.1   New Zealand's Total Dairy Exports, 1989 to 2010
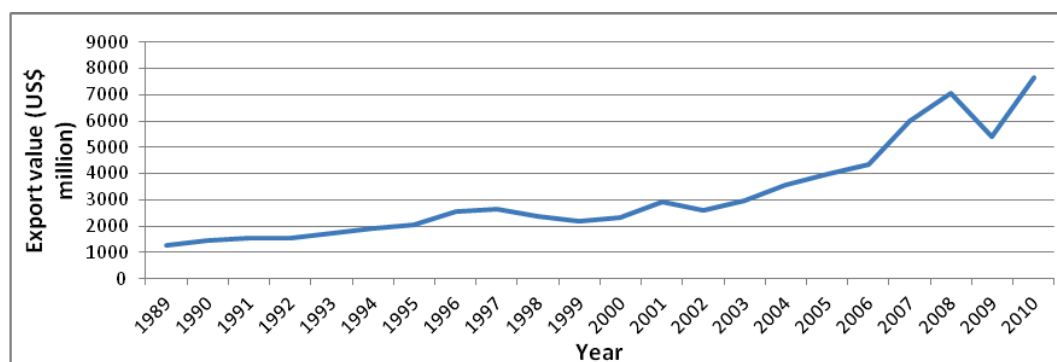
Source: World Bank's WITS software, using UN COMTRADE data.

Figure 5.1 shows New Zealand's total dairy exports from 1989 to 2010. As can be readily seen, the value of New Zealand's dairy exports has been increasing over time, the result of increased prices and export volumes (Newman & Nichol, 2011). As an example of the relevance of the gravity model, China has been a key driver of the growth in demand for New Zealand's dairy products, and the New Zealand-China Free Trade Agreement entered into force in 2008. However, the growth in the value of exports to China since 2008 (see Figure 5.2) cannot be wholly attributed to the free trade agreement's existence; there are many factors at work, of which trade relations are but one part. Figure 5.1 shows that the value of New Zealand's total dairy exports actually fell from 2008 to 2009; this is a result of the global financial crisis.

Figure 5.2   New Zealand's Dairy Exports to China, 2000 to 2011[38]
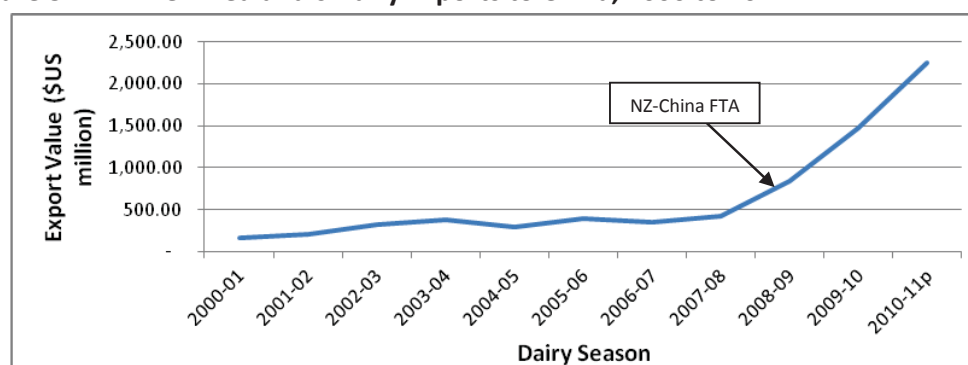
Source: DairyNZ Economics Group.

Therefore, in order to analyse the effect of New Zealand's free trade agreements on its dairy exports, other factors influencing those exports must be controlled for. This is where the

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[38] The dairy season on the horizontal axis of Figures 5.2 to 5.7 refers to the year ending 31 May. That is, the 2000-01 dairy season represents the period 1 June 2000 to 31 May 2001. 2010-11p reflects the provisional nature of the data for the final quarter of that dairy season.

gravity model is useful. The specification of the gravity model used in this study controls for the size of the trading partner's economy, the expenditure capabilities and taste preferences of that partner, and various specific-country effects such as distance from New Zealand, language similarity, cultural history, etc. Once these variables are controlled for, the effect of New Zealand's trade agreements on its dairy exports can be seen.

A selection of New Zealand's dairy exports to its key trading partners with which New Zealand has trade agreements follows. Figures 5.2 to 5.7 show the trends in the value of those exports over the period in which the agreements were implemented.

Figure 5.3   New Zealand's Dairy Exports to Singapore, 2000 to 2011
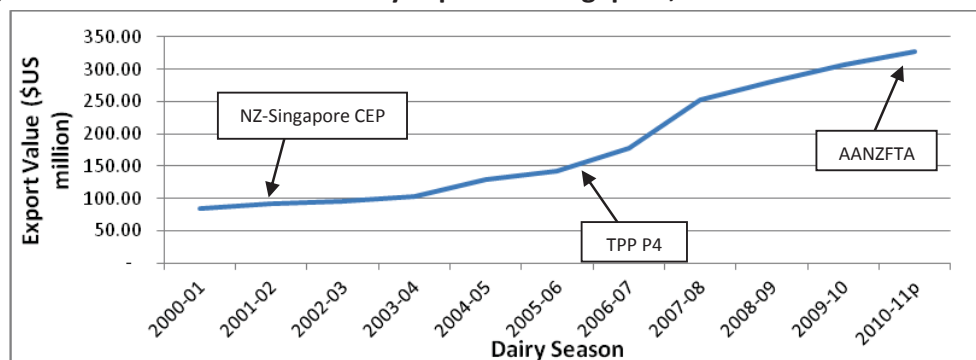
Source: DairyNZ Economics Group.

Figure 5.4   New Zealand's Dairy Exports to Thailand, 2000 to 2011
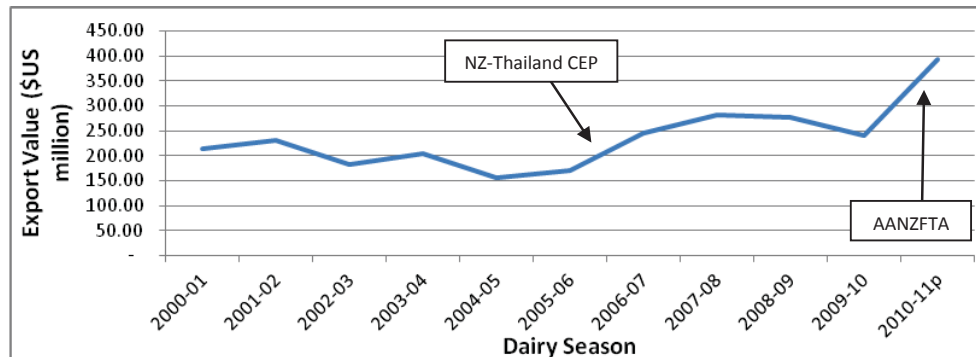
Source: DairyNZ Economics Group.

Figure 5.5   New Zealand's Dairy Exports to Malaysia, 2000 to 2011
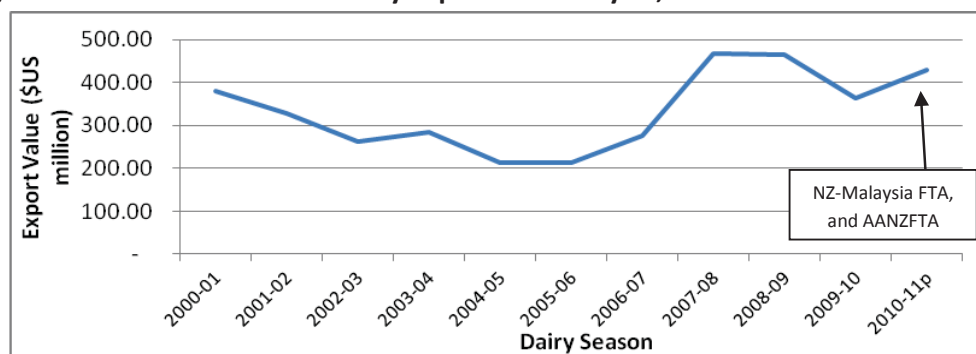
Source: DairyNZ Economics Group.

Figure 5.6   New Zealand's Dairy Exports to the Philippines, 2000 to 2011
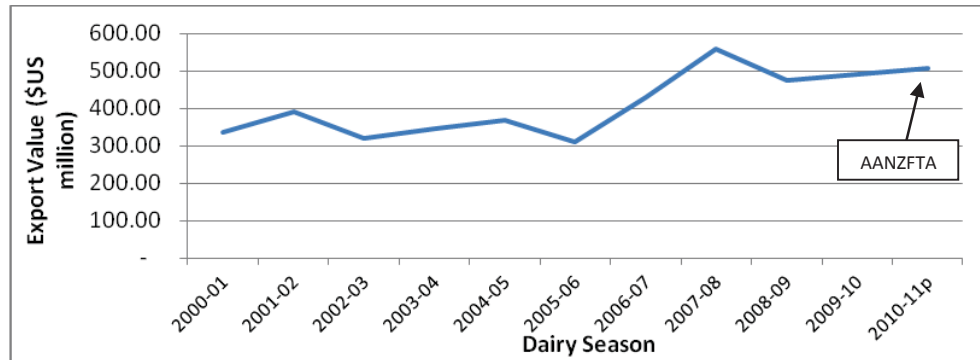
Source: DairyNZ Economics Group.

Figure 5.7   New Zealand's Dairy Exports to Viet Nam, 2000 to 2011
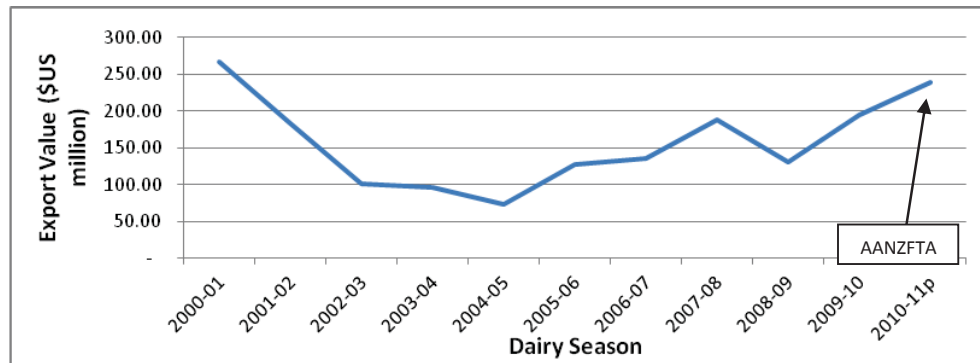
Source: DairyNZ Economics Group.

As seen from Figures 5.2 to 5.7, New Zealand's free trade agreements that are analysed in this study are all relatively recent, limiting the number of observations on which confident conclusions can be drawn. Another problem for this gravity study is presented by the global financial crisis and resulting recession, which has resulted in greater volatility in international trade since 2008. Where the gravity model predicts New Zealand's dairy exports to a country with which it has recently entered a PTA, the result for the effect of that PTA could be influenced by its implementation coinciding with the global recession. However, this study aims to generate a framework for which future analyses of New Zealand's trade agreements can be much more powerful, given data more suited to the gravity analysis.

5.1   Gravity Model Methodology

The gravity model specification of this study uses panel data and takes the form:

$$\ln T_{NZit} = \beta_0 + \beta_1 \ln GDP_{it} + \beta_2 \ln SIMILARITY_{NZit} + \beta_3 RELINC_{NZit} + X\delta + \sigma_t + \alpha_i + error$$

The subscript *i* represents the partner country to which New Zealand exports dairy products, and the subscript *t* represents the year.

The dependent variable $\ln T_{NZit}$ is the natural log of New Zealand's dairy exports to country i in year t.

$\ln GDP_{it}$ is simply the natural log of the nominal GDP of country i in year t.

$$\ln SIMILARITY_{NZit} = \ln\left(1 - \left(\frac{GDP_{NZt}}{GDP_{NZt} + GDP_{it}}\right)^2 - \left(\frac{GDP_{it}}{GDP_{NZt} + GDP_{it}}\right)^2\right)$$

This variable represents the similarity in economic size (proxied by GDP) between New Zealand and country i.

$$\ln RELINC_{NZit} = abs[\ln(GDPPC_{NZt}) - \ln(GDPPC_{it})]$$

This variable reflects the difference in relative incomes between New Zealand and country i, through showing the absolute differences in GDP per capita between the two countries (*GDPPC* represents GDP per capita).

The above three size variables (*'GDP'*, *'SIMILARITY'*, and *'RELINC'*) chosen for this study are taken from the Australian Productivity Commission (2010c). The Commission follows Adams, Dee, Gali, and McGuire (2003), who believe that these variables capture the expenditure capabilities and taste preferences of each partner as well as their aggregate size.

Size variables are necessary in the gravity model since trade flows typically increase with GDP, which provides an indicator of demand in the importing country and level of supply in the exporting country (Australian Productivity Commission, 2010c). However, where the Australian Productivity Commission uses the log of sum of GDPs for both partner countries, this study instead uses just the log of the partner country *i*'s nominal GDP. This is since New Zealand is one country in the country pair for each observation, and including its GDP in the summation procedure is therefore not meaningful since its value will not vary from one cross-section to another. While an increase in GDP in country *i* is expected to result in an increase in dairy exports to that country since greater GDP is likely to mean greater demand, it is also possible that the similarity or disparity in country size, as measured by differences in GDP, will affect dairy trade. It is also important to include per capita incomes since these can account for differences in the composition of trade between two countries (Australian Productivity Commission, 2010c).

X represents a set of dummy variables denoting the existence of New Zealand's preferential trade agreements. In Table 5.5, the variable *'FTA'* combines information for all of the agreements included in this study, and takes the value of one if New Zealand and country *i* were members of any of these agreements in year *t*. The individually named agreements split this variable into its component parts, specifically identifying each agreement. These variables take the value of one if both New Zealand and country *i* were members of trade agreement *k* in year *t*, and zero otherwise. Table 5.1 above outlines the dates of implementation, and the countries involved, in each of the six agreements (AANZFTA, China, Malaysia, Singapore, Thailand, and TPP).

σ_t represents the time fixed effect, controlling for changes in the level of dairy exports from New Zealand to all of its trade partners in a particular year. The inclusion of time fixed effects controls for global events occurring in each year, such as the global financial crisis, and accounts for the effects of inflation on nominal values. While an overall effect from the global financial crisis is controlled for in this way, it is unlikely that the recession affected exports to each trading partner in the same way. Where the recession has caused greater volatility in international trade and trading partners are affected differently, the time fixed effect will have impacts more suitable for some trading partners than others.

α_i represents a country-specific fixed effect, which controls for all time-invariant country-specific effects which may affect trade flows, with the aim of reducing the risk of omitted variables bias (Australian Productivity Commission, 2010c). Such effects can include distance (from New Zealand), language and cultural similarities (to New Zealand), colonial history, etc. Baier and Bergstrand (2009) find that including such fixed effects in a gravity model is a method for accounting for multilateral resistance that should generate unbiased estimates of the gravity coefficients.

5.2   Data

New Zealand dairy export data is sourced from the COMTRADE database using the World Bank's World Integrated Trade Solution (WITS) software (The World Bank, 2011d). Annual data has been sourced for New Zealand dairy exports for the period 1989-2010, after classifying dairy products according to the HS 1988/92 nomenclature[39]. Product codes 0401, 0402, 0403, 0404, 0405, 0406, 170210, 2105, and 350110 are included in the dairy products classification. This classification is taken from the GTAP concordance feature in the WITS software, in order to match the classification used in the GTAP section of this study (see Chapter 6). Trade data is reported in current US dollars, and the data used is that of gross exports.

GDP and GDP per capita data, necessary for the calculation of the three size variables, is taken from the World Bank's World Development Indicators (The World Bank, 2011b). GDP and GDP per capita data is sourced in current US dollars, so that its form matches that of the trade data taken from the COMTRADE database[40]. Data on New Zealand's GDP for the 2010 year is missing from the World Bank's World Development Indicators. This poses a significant problem since it is one of the most important values in the data needed for this gravity study.

[39] Trade data was available for earlier years under the SITC Revision 1 nomenclature, but its detailing of dairy products is less than clear from an analysis of the nomenclature concordance feature of the WITS software. In order to include all products that are included under the HS classification some non-dairy products would need to be included, while many of the trade values shown using the SITC classification are still lower than that found under HS.

[40] Trade flows and GDP data were not converted to real dollars, following Grant and Lambert (2008), who discussed that purchasing power parity rates are subject to large measurement error, and that there is likely to be little difference in the gravity equation results when using real data. "Moreover, time fixed effects control for inflationary pressures and the growth in world trade over the sample period" (Grant & Lambert, 2008, p. 770).

In order to allow the calculation of the relevant size variables, New Zealand's 2010 GDP has been calibrated from information taken from Statistics New Zealand[41].

The Russian Federation data provides for some confusion, when it is considered the collapse of the Soviet Union and subsequent formation of the Russian Federation took place at the end of 1991 (Keep, 1995). Due to discrepancies in treatment among the various data sources, it has been necessary to discard the information relating to the Soviet Union and Russian Federation for the years 1989-1991.

Table 5.2   Descriptive Statistics[42]

Variable	Minimum	Maximum	Mean	Standard deviation	Skewness	Observations
T_{NZit}	671	1,314,229,411	26,317,633	64,301,233	6.297	2500
GDP_{it}	11,610,697	14,582,400,000,000	297,000,000,000	111,000,000,000	-1.473	2500
$lnSIMILARITY_{NZit}$	-8.238	-0.693	-1.988	1.368	-1.473	2500
$lnRELINC_{NZit}$	0.001	5.38	1.888	1.263	0.318	2500

The value of dairy exports from New Zealand to country i has a wide range, from a minimum $US671 to Cambodia in 2003 to a maximum $US1.3 billion to China in 2010. Of course, due to the natural log form that dairy exports take in the regression analysis, observations with zero trade values are excluded, along with any observations for which GDP was not reported by country i in a particular year. Of the included observations, the smallest nominal GDP is seen in Tuvalu in 1995, of $US11.6 million, while the largest GDP, perhaps unsurprisingly, is shown by the United States in 2010, of $US14.6 trillion. The mean value of New Zealand's dairy exports to country i in year t is approximately $US26 million, while the mean GDP of the included observations is approximately US$297 billion.

The variable 'ln *SIMILARITY*' is a measure of the similarity of size of two economies, bounded by ln(0.5), or -0.693147, where the economies have the exact same GDP. As the two economies become more disparate in terms of GDP, the figure inside the brackets will become

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[41] Quarterly GDP data was sourced from Statistics New Zealand's March 2011 quarterly data set (2011a), which included revised historical data for the four 2010 quarters, along with monthly US-NZ exchange rate data from the Reserve Bank of New Zealand (2011). The quarterly GDP data was then summed for the 2010 year, and converted to US dollars using an average of that year's monthly US-NZ exchange rates. This procedure follows the World Bank, where GDP figures are converted from domestic currencies using single year official exchange rates (The World Bank, 2011a). In order to calculate GDP per capita for that year, this converted US dollar GDP estimate is divided by the 2010 mid-year New Zealand population, sourced from Statistics New Zealand (2011b).

[42] For common sample (panel data is unbalanced in raw form).

smaller, and the end result more negative. Of course, New Zealand makes up one side of each country pair in this study, and the country with the most similar GDP in any particular year is that of Peru in 2009, with $US126.9 billion compared to New Zealand's $US126.7 billion. The country with the GDP least similar to New Zealand's for a particular year is Tuvalu in 2007, with $US18.3 million compared to New Zealand's $US138.3 billion. The variable 'ln *RELINC*' shows the absolute difference in (natural) log GDP per capita between New Zealand and country *i*. As the gap between GDP per capita in New Zealand and country *i* becomes larger, so too does the value of 'ln *RELINC*'. The country with the GDP per capita most similar to New Zealand's is Macao, China in 1994, with $US14,974 compared to New Zealand's $US14,989. The largest difference between New Zealand's GDP per capita and country *i*'s is shown by the Democratic Republic of the Congo in 2005, with $US124 compared to New Zealand's $US26,846.

All of the series included in this gravity model study, with the exception of the dummy variables, have been tested for unit roots using the Fisher-ADF test. This is to avoid the spurious regression problem that can be present when conducting regression analysis on variables involving unit roots (Wooldridge, 2006).

Table 5.3   **Results of Fisher-ADF Unit Root Test**

Variable	P-value	Conclusion
T_{NZit}	0.0000	Strongly reject unit root.
GDP_{it}	0.0000	Strongly reject unit root.
$lnSIMILARITY_{NZit}$	0.0000	Strongly reject unit root.
$lnRELINC_{NZit}$	0.0000	Strongly reject unit root.

As can be seen in Table 5.3, the null hypothesis of unit roots have been rejected for all four relevant variables, so these variables can be confidently used in their level form in the regression analysis.

Regressions have been computed in this study using the White method for the correction of standard errors. Specifically for the panel data structure, the White cross-section method has been used, which allows for errors to be contemporaneously (cross-sectionally) correlated (Quantitative Micro Software, 2010). The errors are therefore clustered according to the time period in which they belong in performing this correction. This method of correction was chosen since it is considered a possibility in this study that error terms for a particular period are cross-sectionally correlated (correlated across countries).

Table 5.4   Correlation Among Regression Variables

	lnT_{NZit}	$lnGDP_{it}$	$lnSIMILARITY_{NZit}$	$lnRELINC_{NZit}$	FTA	AANZFTA	CHINA	MALAYSIA	SINGAPORE	THAILAND	TPP
lnT_{NZit}	1										
$lnGDP_{it}$	0.561636	1									
$lnSIMILARITY_{NZit}$	0.354026	0.62538	1								
$lnRELINC_{NZit}$	-0.19423	-0.3616	-0.12761	1							
FTA	0.183332	0.142075	0.077281	-0.12725	1						
AANZFTA	0.079243	0.039893	0.040181	0.001153	0.307152	1					
CHINA	0.074605	0.074736	-0.0267	0.004337	0.237824	-0.00155	1				
MALAYSIA	0.036268	0.01905	0.017943	-0.00859	0.137253	0.446856	-0.00069	1			
SINGAPORE	0.088667	0.046426	0.058744	-0.08355	0.434815	0.13901	-0.0022	-0.00127	1		
THAILAND	0.078799	0.047139	0.042274	0.008045	0.336536	0.180781	-0.0017	-0.00098	-0.00311	1	
TPP	0.040055	0.039953	0.052404	-0.08156	0.514894	0.11662	-0.0026	-0.0015	0.41986	-0.00368	1

As can be seen from Table 5.4, there are no highly collinear variables to be included in the regression analysis. Thus, multicollinearity will not be a problem in the results. Indeed, the highest correlation between variables is between 'ln T_{NZit}' and 'ln GDP_{it}', with a correlation of 0.56.

5.3 Results

Table 5.5   Gravity Model Regression Results

Dependent variable: lnT_{NZit}

Column:	I	II	III	IV	V	VI	VII	VIII	IX	X	XI
$lnGDP_{it}$	0.893***	0.889***	0.886***	0.879***	0.888***	0.888***	0.889***	0.895***	0.893***	0.882***	0.897***
	(0.154)	(0.152)	(0.153)	(0.151)	(0.154)	(0.154)	(0.153)	(0.152)	(0.152)	(0.152)	(0.154)
$lnSIMILARITY_{NZit}$	-0.385***	-0.338***	-0.367***	-0.336***	-0.368***	-0.366***	-0.368***	-0.370***	-0.369***	-0.337***	-0.367***
	(0.113)	(0.119)	(0.111)	(0.118)	(0.112)	(0.112)	(0.111)	(0.113)	(0.113)	(0.118)	(0.113)
$lnRELINC_{NZit}$	-0.411***	-0.379***	-0.403***	-0.387***	-0.402***	-0.401***	-0.403***	-0.398***	-0.399***	-0.386***	-0.394***
	(0.134)	(0.140)	(0.135)	(0.137)	(0.135)	(0.135)	(0.135)	(0.135)	(0.135)	(0.139)	(0.137)
FTA	-0.268**	-	-	-	-	-	-	-	-	-	-
	(0.108)										
AANZFTA	-	0.373***	0.145*	-	-	-	-	-	0.249***	-	0.205**
		(0.104)	(0.083)						(0.093)		(0.082)
CHINA	-	0.502*	-	0.516*	-	-	-	-	-	0.515*	-
		(0.279)		(0.280)						(0.279)	
MALAYSIA	-	-0.876***	-	-	-0.512***	-	-	-	-	-0.503***	-
		(0.156)			(0.091)					(0.091)	
SINGAPORE	-	0.572*	-	-	-	0.194	-	-	-	0.198	0.583*
		(0.300)				(0.167)				(0.169)	(0.303)
THAILAND	-	0.103	-	-	-	-	0.179	-	-	0.178	-
		(0.140)					(0.127)			(0.126)	
TPP	-	-0.836***	-	-	-	-	-	-0.672***	-0.688***	-	-0.830***
		(0.203)						(0.142)	(0.151)		(0.201)

Note: *,**,and *** represent that the relevant coefficient is statistically significant at the 10%, 5%, and 1% levels respectively. Period and cross-section fixed effects are included, and the coefficient covariance matrix is calculated using the White cross-section method. A constant is included in each regression but is excluded from Table 5.5. Standard errors are reported in parentheses. The R-squared value for each column is 0.85.

Table 5.5 shows that the size variables 'ln *GDP*', 'ln *SIMILARITY*' and 'ln *RELINC*' are all highly significant in each specification of the gravity model (all are statistically significant at the 1 percent significance level). The estimated coefficients for these variables are remarkably similar and robust to the different specifications of the gravity model seen in Columns I to XI.

The positive coefficient on 'ln *GDP*', as expected, shows that the size of an economy is important in determining New Zealand's dairy exports to that country. As an economy becomes larger, in GDP terms, it becomes a larger export destination for the New Zealand dairy industry. The negative coefficient for 'ln *SIMILARITY*' shows that countries with a GDP less similar to New Zealand's (and therefore a more negative value for 'ln *SIMILARITY*') will be larger export destinations for New Zealand's dairy industry. This result is driven by the New Zealand economy's relatively small size by developed country standards. Its small size means that many of the export markets which have been becoming more important for the New Zealand dairy industry, such as China, South East Asia, the Middle East etc., have economies that are larger in GDP terms than is New Zealand's. Thus, in the fixed effects estimation we see a negative coefficient on 'ln *SIMILARITY*'; as these economies have been growing faster than New Zealand's in recent years at the same time as New Zealand dairy exports to those countries have been increasing, the size of the two economies are becoming more disparate as dairy exports from New Zealand increase.

The negative coefficient on 'ln *RELINC*' shows that as a country's GDP per capita becomes further from New Zealand's, it becomes less important as an export destination for the New Zealand dairy industry. This is logical when New Zealand's standing within the world is considered. As a developed country, New Zealand has a high GDP per capita by world standards, although it is at the lower end of the spectrum for developed countries (Guillemette, 2009). Further, it is widely believed that as a country's living standards increase, so too does its demand for protein, and dairy products in particular (New Zealand Institute of Economic Research, 2010). Thus, while New Zealand's traditional dairy export markets are countries such as the United States and Japan with high per capita incomes, markets that are becoming more important are those in which per capita GDPs are increasing, such as China and the rapidly growing economies of South East Asia. Since these countries' GDPs per capita are mostly below New Zealand's, but growing at a faster rate, dairy exports from New Zealand to these countries are increasing at the same time as the two countries are becoming closer in terms of GDP per capita, and we see a negative coefficient on 'ln *RELINC*'.

Perhaps the most surprising aspect of Table 5.5 is the negative coefficient on the *'FTA'* variable in Column I, which is statistically significant at the 5 percent level. Thus, it appears that after controlling for the size of the trading partners' economies, and the differences in GDP and GDP per capita between New Zealand and its trading partners, having a free trade agreement with a country reduces the dairy exports to that country. This result does not fit with the majority of the gravity model literature, where typically a positive, nontrivial effect of trade agreements on trade is found (Cipollina & Salvatici, 2010). There are three possible reasons for this result, only one of which is concerning for the New Zealand dairy industry.

Firstly, the 'newness' of the trade agreements included in this study has been discussed above, where for many of these agreements there are only a few years in which the

agreement has been active. While not problematic in itself due to the statistical significance that is achieved, where these observations occur must be considered. Closer Economic Relations, New Zealand's successful, comprehensive free trade agreement with Australia is not included, and the two highest correlations, from Table 5.4, between *'FTA'* and individual agreements are seen with Singapore and with TPP. This means that these two agreements have substantial weight in determining the coefficient on *'FTA'*. Now, since Singapore does not practice import protection in the form of tariffs and quotas, and Chile and Brunei Darussalam are not large dairy export markets for New Zealand, the New Zealand dairy industry was never likely to make significant gains from these agreements. The potential for gains from these agreements comes in the form of the expanded TPP, when the New Zealand dairy industry may gain improved access to the United States' market. New Zealand's agreement with Thailand is the next oldest, however we will see the insignificance of its effect below, and New Zealand's agreements with China, ASEAN and Malaysia are only very recent, and coincide with the global recession and the resulting increased volatility in dairy trade. Thus, the exclusion of CER due to data limitations, and the relative newness of other agreements, makes the estimated coefficient on *'FTA'* unreliable.

A second reason for the negative coefficient on *'FTA'*, from a theoretical rather than practical perspective although related to the first reason above, is given by the sensitivity of the dairy industry in trade negotiations. Countries are often reluctant to allow improved access for imports of dairy products, due to the sensitivity of their domestic industries. As a result, transition periods for dairy import protection are often longer than those for other products. Thus, it is probable that in some of the agreements included above, tariffs and other trade barriers on dairy products have not yet been eliminated, and the effect of the agreement on dairy trade has not yet been fully seen. This argument is supported by a survey of the important liberalisation dates for dairy trade in some of New Zealand's preferential trade agreements. It is even possible that the removal of barriers on other products but not dairy is distorting the pattern of trade, and there is actually a temporary negative effect on New Zealand's dairy exports during the transition period. As these barriers are eliminated over time as part of the implementation of the trade agreements, it is therefore likely that the New Zealand dairy industry will see a more positive impact on its exports to those countries.

The third, more concerning, possible explanation for the negative coefficient on *'FTA'* above is that New Zealand's free trade agreements are actually detrimental for the level of dairy exports from New Zealand. However, the author finds the above two arguments more compelling, since there is no valid reason for why this would occur. It will be interesting to undertake this analysis with more years of data available, and when the effects of the global recession have subsided somewhat.

When controlling for all six individual agreements together in Column II of Table 5.5, the effect of the AANZFTA agreement between Australia, New Zealand and the ASEAN economies on New Zealand's dairy exports is positive and significant at the 1 percent level, despite its only entering into force in 2010. Without controlling for any other agreements (Column III), the effect is still positive, although only significant at the 10 percent level. Including *'TPP'* in the regression equation as well (Column IX) makes the coefficient on *'AANZFTA'* both more positive and more significant, reduced somewhat when *'SINGAPORE'* is

also included (Column XI). Thus, it appears that New Zealand's dairy exports to Singapore and Brunei Darussalam have been negatively affected by TPP (which is confirmed by the statistically significant negative coefficient on *'TPP')*, but positively by AANZFTA. The effects of the global recession could be playing some part in this result. Overall, it can be concluded with some confidence that AANZFTA has been beneficial for the level of dairy exports from New Zealand.

It has been discussed above that it appears that New Zealand's dairy exports to Singapore and Brunei Darussalam have been negatively affected by TPP, although there is no clear reason why this would be so since neither country charged import tariffs on New Zealand's dairy products, even before TPP entered into force in 2006 (Ministry of Foreign Affairs and Trade, 2011p). It is likely that the result is driven by Brunei Darussalam since New Zealand already had an agreement with Singapore since 2001, and on controlling for this agreement as well the coefficient on *'TPP'* becomes even more negative (Columns II and XI). This phenomenon is therefore likely to be a result of the volatility seen in New Zealand's dairy exports to Brunei Darussalam in the past five years. Coincidentally, New Zealand's dairy exports to Chile have also been volatile in that period, making the negative coefficient for *'TPP'* unreliable. It should be noted that Chile and Brunei Darussalam are relatively small markets for New Zealand's dairy exports.

The effect of New Zealand's free trade agreement with Singapore on New Zealand dairy exports is positive for all of the relevant equations, however the positive coefficient is only statistically significant when *'AANZFTA'* and *'TPP'* are controlled for, and only then at the 10 percent significance level (Columns II and XI). This suggests that the marginally significant positive effect running from the trade agreement between New Zealand and Singapore to New Zealand's dairy exports exists only prior to these two other agreements involving New Zealand and Singapore entering into force, which is a logical result. The lack of significant trade barriers between New Zealand and Singapore (Groser, 2011b), however, points to any benefit from the agreement being due to, perhaps, reduced technical barriers to trade, a closer trading relationship, or even dynamic gains, rather than traditional gains from lower tariffs. When it is considered that the New Zealand – Singapore Closer Economic Partnership was something of a strategic partnership rather than a free trade agreement for material gains in itself (Groser, 2011b), it has certainly been beneficial for the New Zealand dairy industry.

The coefficient on the variable *'CHINA'* is remarkably similar across all equations, and is significant at the 10 percent level in all (Columns II, IV and X). This suggests we can have confidence that the marginally positive relationship between the existence of the New Zealand – China Free Trade Agreement and New Zealand's dairy exports is robust. While the agreement is relatively recent, only entering into force in 2008, and thus the degree of dairy trade liberalisation under the agreement by 2010 is likely to have been modest, the agreement is extremely important for the New Zealand dairy industry. China is New Zealand's largest dairy export market, and has become much more important since the implementation of this agreement. While some tariffs on New Zealand's dairy products will not be eliminated until 2017 or 2019, many interview participants discussed the agreement as a key enabler of the dairy export growth to China, where New Zealand is now regarded as a preferred supplier (see Appendix D). Thus, while China's dairy tariff reductions are likely to have been modest over

this period, the agreement has still contributed positively to growth in New Zealand's dairy exports. It must be remembered that the above coefficient on *'CHINA'* comes after already controlling for the huge economic growth in China over this period. As Chinese protection on dairy imports from New Zealand is further removed in the future, it will be interesting to see whether the *'CHINA'* variable becomes more statistically significant.

The coefficient on *'MALAYSIA'* is negative and highly statistically significant in each relevant equation (Columns II, V and X). It is more negative when *'AANZFTA'* is controlled for as well (Column II), although both agreements entered into force in 2010. The strong negative influence of this variable in the regression results is likely to be due to the global recession causing substantial volatility in New Zealand's dairy exports to Malaysia since 2008. A massive fall in the value of these exports from 2008 to 2009 was followed by a substantial rise to 2010, although this rise did not claw back even half the value lost from 2008 to 2009. Meanwhile, Malaysia's GDP and GDP per capita fell from 2008 to 2009, but rose in 2010 to levels higher than those seen in 2008. Thus, based on the New Zealand dairy industry's previous trading relationship with Malaysia and Malaysia's 2010 GDP and GDP per capita, the gravity model has predicted a higher level of dairy exports to Malaysia in 2010 than what actually occurred, and has subsequently shown a strongly negative coefficient on '*MALAYSIA'*. This is more likely to be due to volatility associated with the global recession rather than the actual effect of that agreement.

Although the free trade agreement between New Zealand and Thailand has been in existence since 2005, the regression results in Table 5.5 show no statistically significant relationship between '*THAILAND'* and New Zealand's dairy exports (Columns II, VII and X). The statistical insignificance of this relationship is likely due to the sensitivity with which Thailand views its dairy sector, which has meant that dairy product tariffs and quotas face long phase outs under the agreement, with some not eliminated until 2025. This is yet another aspect of this gravity study that will perhaps benefit from being undertaken sometime in the future, when further dairy trade liberalisation between New Zealand and Thailand has been completed.

5.4   Conclusions

The gravity model of international trade has been used in this study to analyse the effects of New Zealand's preferential trade agreements on New Zealand's dairy exports. The New Zealand dairy industry is a key export earner within the New Zealand economy, and as such a great emphasis is placed on dairy trade policy. New Zealand has entered into a number of preferential trade agreements, and it is therefore important to determine whether or not these have been beneficial for one of New Zealand's most important sectors. The results generated are mixed, since the majority of agreements included in this analysis are very recent developments. It will be very interesting to repeat this analysis in the future, using the framework generated here, when more years of data are available.

All of the size variables ('*GDP*', '*SIMILARITY*', and '*RELINC*') included in this study's specification of the gravity model are highly statistically significant, and all have the expected signs. The statistically significant negative relationship running from New Zealand's free trade agreements to New Zealand's dairy exports (overall effect) is unexpected and has three possible explanations. The most concerning of these is that New Zealand's free trade agreements actually have a negative effect on New Zealand's dairy exports. However, there is little that could explain this conclusion and it is therefore unlikely to accurately reflect reality. The more plausible explanations are instead related to which countries are influencing that result, while the sensitivity of many countries' domestic dairy industries has also resulted in long transition periods for dairy trade liberalisation under some agreements. New Zealand's comprehensive free trade agreement with Australia is excluded while many of New Zealand's other trade agreements are very recent.

> …The trade flow effects of RTAs depend on the specific agreement, and on the length of the implementation (i.e., phase-in) period. It may take several years or even longer than a decade, in the case of agriculture, before the trade flow effects of RTAs are measurable (Grant & Lambert, 2008, p. 766).

From the inclusion of dummy variables representing individual trade agreements, the above results show that it is likely that AANZFTA has been beneficial for the New Zealand dairy industry's level of exports. There is some positive effect from the individual agreement with Singapore, which is however complicated by New Zealand and Singapore's mutual membership in AANZFTA and TPP, and is only statistically significant at the 10 percent level. This effect is more likely to come from strategic or dynamic benefits rather than traditional gains from trade as a result of lower tariffs, since even before this agreement there were no significant barriers to trade between New Zealand and Singapore. There is a positive relationship between the New Zealand – China Free Trade Agreement and New Zealand's dairy exports, however it is statistically significant only at the 10 percent level. There are long phase outs for Chinese import protection on many dairy products under this agreement, and once more liberalisation is undertaken it is anticipated that this result will become more significant. Similarly, long phase outs for dairy trade liberalisation under the trade agreement between New Zealand and Thailand have limited the significance of its effect, with no statistical significance shown. The results show a statistically significant negative effect on New Zealand's dairy exports from the free trade agreement between New Zealand and Malaysia. However, with this agreement only a very recent development, and coinciding with AANZFTA, as well as

significant volatility in New Zealand's dairy exports to Malaysia in recent years due to the global recession, it is difficult to ascribe this effect to the agreement itself. Similarly, volatility in New Zealand's dairy exports to Chile and Brunei Darussalam, two relatively small dairy export destinations, have resulted in a statistically significant negative relationship between New Zealand's dairy exports and the TPP agreement.

Due to the age of many of New Zealand's preferential trade agreements resulting in few observations on which to base conclusions, and these observations coinciding with the global recession which introduced massive volatility to commodity markets, the regression results should not be taken as a concrete summary of the effects of New Zealand's preferential trade agreements on the New Zealand dairy industry. Rather, the contribution of this study is to generate a framework for future ex post analyses of New Zealand's preferential trade agreements. As discussed by Grant and Lambert (2008), much of the effect of a PTA on agricultural trade is seen several years after the agreement enters into force. The gravity model is widely described as the primary ex post analytical tool for this type of analysis, and the framework generated by this study is therefore up to date with the latest econometric techniques.

CHAPTER 6   GLOBAL TRADE ANALYSIS PROJECT

6.1   GTAP Methodology and Data

As discussed above, this study makes use of the Global Trade Analysis Project (GTAP) database and model developed by Purdue University in order to assess the preferential trade agreements that New Zealand currently has under negotiation. GTAP is used to simulate the economic effects of these agreements on the dairy sector in New Zealand, if they are implemented. The latest database is Version 7, released in 2008 and based on 2004 data. This database is aggregated to 18 regions and 11 sectors for use in this study, which can be viewed in the Appendices.

Due to the age of the seventh version of the GTAP database, this study follows the approach set out by Anderson, Hoekman and Strutt (2001). Their study of the potential benefits existing from further trade liberalisation following the implementation of Uruguay Round commitments took place before these commitments were fully implemented. The study, undertaken in 2001, simulated further trade liberalisation taking place in 2005. Further, the study used version 3 of the GTAP database, which was based upon 1992 data. In order to overcome these difficulties, the modellers sourced both historical data and projections on the growth rates of factors of production and real GDP, and used these to update the version 3 database. Thus, the database was projected forward from 1992 to 2005, assuming no changes to existing trade and other policies. From this 2005 base, adjustments were made representing the full implementation of Uruguay Round commitments, providing a baseline for their simulations of further trade liberalisation occurring post Uruguay Round.

In this study, 2004 data will be used to simulate the effects of changes in trade policy occurring in the years following 2011. Thus, the database should be updated according to the growth rates of factors of production and real GDP between 2004 and 2010 (the most recently available data), and import protection data updated to 2010. Then, since New Zealand has existing PTAs for which tariff reduction and elimination commitments are not fully completed, these tariffs must be removed to provide a baseline for the simulation of New Zealand's PTAs under negotiation. This suggests that some point in the future will be a better base for simulations than the current year. A future year baseline is reinforced when considering that in New Zealand's negotiations with potential PTA partners immediate protection elimination is not likely, phase in periods are more common, particularly in the typically sensitive dairy sector.

Of course, the further one projects into the future, the greater potential for inaccuracy. The year chosen for this study is 2017, a significant year as commitments for dairy trade liberalisation will be fully realised for all of New Zealand's existing PTAs with the exception of AANZFTA, Thailand and China, all of which will have made significant reductions by this time. Further, in the six years from when negotiations are currently taking place and 2017, it is likely that a great deal of tariff reduction will have taken place for New Zealand's potential PTA partners (the simulation targets). This means that the assumption made in the

simulations, that tariffs between New Zealand and the relevant countries are eliminated, will not be unsuitable. Of course, the effects of the likely phase in periods themselves will not be captured in these simulations since tariffs are eliminated in one step.

In projecting the baseline for simulations forward to 2017 and then estimating the economic gains from further trade liberalisation in the form of PTAs, the inherent assumption is that no other trade policies change in this time. A significant danger in this assumption is presented by the Doha Round of WTO negotiations, which although not concluded by the time of this study, have the potential to be concluded by 2017. If this is the case, and significant MFN protection reductions are undertaken by 2017, the effects of merchandise trade liberalisation under New Zealand's PTAs will be less significant than estimated in this study. This is of course due to the erosion of the preferences given by the PTAs, and should be viewed as positive, particularly for a country such as New Zealand that heavily supports multilateral negotiations. Due to the impossibility in predicting if and when Doha negotiations will conclude, and the timing and magnitude of protection reductions, it has been necessary in this study to assume no changes to MFN protection levels from 2010 to 2017. PTAs formed by New Zealand's dairy producing competitors will also affect the assumption made here, and further research could investigate these threats in a GTAP framework. Another assumption inherent in the projection of the GTAP Version 7 database is that the structure of the economies and the trade relationships between countries do not change between 2004 and 2017, so presents a significant limitation. For example, where exports have grown by more than what is predicted under the growth rates used for the projections, such as has occurred for New Zealand's dairy exports between 2004 and 2010, inaccuracies will be present in the projected database.

It should be noted at this stage that dairy production in the GTAP model is broken down into two sectors: Raw Milk and Processed Dairy Products. The Raw Milk sector is not subject to tariffs in the GTAP version 7 database, and the value of international trade in this sector is negligible in comparison to the other sectors. This is in accordance with the structure of these sectors in New Zealand, where the vast majority of output from the Raw Milk sector is used as an input in the Processed Dairy Products sector, rather than consumed or exported directly. Thus, the Raw Milk sector does not play a direct part in the trade liberalisation simulations of this study, rather acting as an input for the Processed Dairy Products sector.

Growth Rates for Projections

In order to project the GTAP version 7 database forward to 2017, various assumptions are of course necessary. It is vital for the levels of the endowment commodities (land, natural resources, skilled and unskilled labour, and capital) to grow at a reasonable rate, as with total factor productivity (TFP). Production, and therefore output, in the GTAP model depends upon these assumptions. This study draws on the growth rates developed by Valenzuela and Anderson (2011), in their projection of the world economy to 2050 using the GTAP model.

Valenzuela and Anderson (2011) point out that their projection has been calibrated to ensure that the real prices of primary products remain relatively constant between 2004 and 2050, but that other projections are of course possible where real prices either increase or

decrease. For this study, Valenzuela and Anderson's growth rates for population, labour, capital and the implied TFP growth rate from 2004 to 2030 will be used. Not only are these projections very recent, they have been formulated for the same version of the GTAP database to be used in this study. This study combines these growth rates with changes in tariff policies according to New Zealand's preferential trade agreements, as seen below.

The growth rates for the relevant endowment commodities and the implied TFP growth rate can be seen in Table 6.1. Implied TFP growth is assumed to be constant across the non-primary sectors, but higher for primary sectors, as detailed below. Data in Table 6.1 and Table 6.2 should be attributed to Valenzuela and Anderson (2011) Table 3(a).

Table 6.1   Assumed Growth Rates for the Period 2004 to 2017 (% per year)

Region[43]	Population	Unskilled labour	Skilled labour	Capital	Real GDP	Implied TFP[44]
NewZealand	0.7	1.0	0.0	3.6	3.4	1.2
RussiaBK	-0.6	-0.7	-1.0	3.2	3.2	1.2
Korea	0.3	-0.4	2.0	4.9	4.7	1.9
India	1.1	1.5	3.0	5.9	5.8	1.8
RestWestAsia	1.6	2.0	2.4	4.1	4.6	1.0
Australia	0.6	0.8	-0.2	3.7	3.4	1.5
China	0.6	0.5	4.5	6.0	6.0	2.2
HongKong	0.4	0.2	0.6	4.9	4.5	1.8
Malaysia	1.3	1.5	5.0	5.7	5.7	1.6
Singapore	0.4	0.2	0.6	4.9	4.5	1.8
Thailand	0.5	0.1	2.0	4.0	4.7	1.7
VietNam	1.2	1.5	2.9	4.1	4.4	1.2
OtherASEAN	1.2	1.4	3.3	4.4	4.8	1.4
RestSEAsia	1.2	1.5	2.9	4.1	4.4	1.2
USA	0.7	0.8	-0.2	3.2	2.6	1.4
Chile	1.3	1.6	2.9	3.5	4.0	1.0
Peru	1.3	1.6	2.9	3.5	4.0	1.0
RestofWorld	1.0	1.2	1.1	3.1	2.9	1.3

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[43] RussiaBK are Valenzuela and Anderson's Russia projections; RestWestAsia is derived from Middle East/Nth Africa; VietNam is from Rest of East Asia; OtherASEAN is from a simple average between Valenzuela and Anderson's Indonesia and Rest of East Asia; RestSEAsia is from Rest of East Asia; Chile and Peru are from Rest of Latin America; and RestofWorld are Valenzuela and Anderson's World projections.

[44] Assumed to be constant across non-primary sectors, but with additional shocks for extraction, agricultural sectors, and forestry, as detailed in Table 6.2. Thus, TFP growth in New Zealand's Raw Milk sector is 1.2+0.9=2.1% per year.

Table 6.2   Additional TFP Growth Rate Shocks for Primary Sectors (% per year)

Sector	Additional Shock
RawMilk	0.9
DairyProc	0.9
Lvstock_Wool	0.9
MeatProducts	0.9
Cropping	0.9
OtherFood	0.9
Forestry	1.2
Extraction[45]	1.7

Updating Tariff Levels

The GTAP version 7 database has been updated in order to more closely reflect the levels of import protection as they stand as negotiations take place. Obviously, with negotiations taking place in 2011 and any trade liberalisation taking place after this date, there is scope for the 2004 protection levels in the database to be out of date. If this is the case, any benefits that are seen from reduced tariff levels will be inaccurate. It is therefore necessary to check the accuracy of the database with respect to current data, and make changes where necessary.

If correcting particular tariffs is necessary, it is not in accordance with the general equilibrium nature of the database to simply change the tariff in question whilst leaving the rest of the database unchanged: "Doing this destroys the internal consistency of the data base" (Malcolm, 1998, p. 1). Thus, it is necessary to update the relevant tax and then allow the change to flow through the rest of the database so that any corresponding adjustments are made (Malcolm, 1998).

Ensuring that the ad valorem equivalent tariff levels in the GTAP database accurately reflect import protection levels for 2004 is made simpler by the development of the AlterTax tool in the RunGTAP software. AlterTax uses a general equilibrium closure to ensure that consistency is maintained in the database, while specifying a model structure that will minimise disturbances to the database (Malcolm, 1998). Thus, it is possible to correct tariff rates without drastically altering the database in areas where changes are not specifically required, since "In general, only one part of the data base will be considered inaccurate" (Malcolm, 1998, p. 1).

However, Malcolm (1998) does not believe that using AlterTax is the correct method for updating tariff levels to incorporate information that post-dates the base year. In this study, the aim is to update 2004 data with 2010 protection levels, so Malcolm (1998, p. 2) suggests that AlterTax is not the correct method for this alteration: "Using this procedure to do

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[45] This is a share-weighted average of Valenzuela and Anderson's separate projections for the four sectors involved, weighted according to total worldwide value of output of the four sectors in the GTAP version 7 database.

so would be equivalent to making the assumption that changes in tariffs have minimal effects on trade flow". In updating to 2010 protection data, Malcolm would suggest using the original GTAP model and allowing trade flows to change, so that the result is an estimate of how the global economy would look with the new tariffs in place.

The relative ease of running simulations with both AlterTax and the original GTAP model mean that the difficulty in updating tariff levels lies in sourcing appropriate protection data. As seen above, this study aggregates the GTAP database to 18 regions and 11 sectors. Of course, trade and tariff data, as reported by databases such as COMTRADE and the WTO, do not use this same aggregation of the global economy. Tariff data is typically available at the tariff line level, meaning that significant aggregation is necessary to match the data provided by the GTAP database. Fortunately, the World Bank's World Integrated Trade Solution (The World Bank, 2011d) allows data queries for import protection using one's own aggregation of the database. The World Integrated Trade Solution (WITS) draws on the UN COMTRADE, UNCTAD TRAINS, and WTO IDB and CTS databases (The World Bank, 2011d). Thus, after classifying goods according to HS code (at the 6 digit level) into this study's 11 aggregated GTAP sectors, ad valorem equivalent tariffs for New Zealand's exports to each of the relevant regions were found (as well as New Zealand's imports from these regions) [46]. WITS provides both a simple average tariff within each aggregation, and a trade weighted tariff, of which the trade weighted version is used in this study, while the 'effectively applied tariff rates' are the relevant tariff rates[47].

Baseline for Simulations

The baseline for the simulations of the preferential trade agreements that New Zealand currently has under negotiation has been generated in order to provide the most accurate baseline possible using the GTAP version 7 database. Firstly, GTAP tariff levels were corrected where significant discrepancies were found between GTAP tariffs and the actual 2004 tariffs found from the TRAINS database using the WITS software[48]. The AlterTax tool is used for this purpose. It should be noted that changes were only made to tariffs relating to New Zealand's imports and exports, rather than for every region in this study's GTAP aggregations. This is in order to keep the task of updating tariff levels manageable, whilst not detracting from the results since New Zealand is the country of interest in this study.

Following correction of the tariff levels in the GTAP database to accurately reflect the base year 2004, a projection to 2010 was formed using both WITS to source 2010 tariff levels, and the growth rates as detailed in Tables 5.1 and 5.2 above. This step is necessary in order to ensure that the baseline for the simulations of future PTAs represents the environment in

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[46] Aggregations were conducted using the product concordance function in the WITS software (The World Bank, 2011c).

[47] The trade weighted tariff is calculated using the formula (Sum of duties collected/Total imports)x100, down to the tariff line level of detail (The World Bank, 2011e).

[48] Significant is defined here as more than a 1 percentage point difference, and where this is the case, the GTAP tariffs have been corrected to the actual WITS tariffs.

which liberalisation is likely to occur. These 2010 tariffs will be carried forward to 2017 for relevant countries, so will be the tariffs that are altered in the simulation of potential PTAs.

From 2010, Valenzuela and Anderson's projections for population, skilled and unskilled labour, capital and TFP growth will again be used to shock the model, this time for seven years (2010 to 2017). Any additional trade liberalisation that should occur as a part of one of New Zealand's existing PTAs, where phase-ins have meant that elimination of tariffs was not complete in 2010, will also be conducted in the projection to 2017. Thus, all tariffs between New Zealand and its current PTA partners will be zero following this projection. Also, tariffs on trade between other members of New Zealand's existing PTAs will be reduced to zero in the projection from 2010 to 2017 (such as, for example, tariffs on Australian exports to Malaysia which should be zero under the AANZFTA)[49].

Following this step, the database reflects the 2017 situation where liberalisation has been fully completed between New Zealand and all of its existing PTA partners, and thus is the ideal baseline from which to conduct simulations relating to the agreements New Zealand is currently negotiating.

The GTAP version 7 database shows that the values of export subsidies relating to New Zealand's exports and imports are typically zero or negligible, particularly in the agricultural and food categories. The only significant export subsidy in these sectors is a 5.33% export subsidy on processed dairy exports from USA to New Zealand, other than the values for the highly aggregated Rest of the World region. There are no agricultural export subsidies on trade between other members of New Zealand's existing PTAs (such as Australia and Malaysia). Brunei Darussalam, Hong Kong, Malaysia, Thailand, and Viet Nam provide small export subsidies for the exports of a few non-agricultural sectors to New Zealand, which will not be altered either in the formation of the baseline or the simulations[50][51]. The US export subsidy on processed dairy products is not altered in forming the baseline for simulations in this study, but does play a part in the simulated expansion of the TPP agreement. Export taxes are not altered in the GTAP database, in either forming the baseline or any of the simulations, since New Zealand's preferential trade agreements typically do not make mention of these policies.

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[49] Tariffs on trade between partners of PTAs external to New Zealand are also removed in this step. This includes trade between Australia and the United States; Australia and Chile; Peru and Singapore; Chile and the United States; Singapore and the United States; Peru and the United States; Korea and all of the ASEAN countries; Korea and Chile; Korea and India; Korea and Peru; India and the ASEAN countries; India and Chile; China and the ASEAN countries; China and Chile; China and Hong Kong; and China and Peru. Tariffs on intra-regional trade within the regions 'RestWestAsia' (GCC), 'RestSEAsia' (Brunei Darussalam), and 'OtherASEAN' (Cambodia, Indonesia, Lao People's Democratic Republic, Myanmar (Burma), Philippines) have also been reduced to zero, while tariffs on Australian exports to Peru have been updated to 2010 levels from WITS since these were significantly overestimated by the values in the GTAP version 7 database.

[50] Small export subsidies exist for one sector for each of these countries.

[51] Since "Production and export subsidies typically remain outside the scope of BRTAs" (Australian Productivity Commission, 2010a, p. 88), which is shown in many of New Zealand's PTAs where export subsidies are only discussed in terms of agricultural trade. A noted exception is given by CER.

Simulations

In order to represent the implementation of the various preferential trade agreements, tariff rates are shocked to zero using the RunGTAP software programme developed by Mark Horridge of the Centre of Policy Studies, Monash University (Center for Global Trade Analysis, 2011e). Since tariff rates are calculated in the GTAP model as a ratio of the value of imports at market prices in comparison to the value of imports at world prices, their elimination also represents the non-existence of non-tariff barriers that drive a wedge between the world price and the market price in the importing country, such as quotas.

The United States' involvement in the possible expansion of the TPP is very important to New Zealand. However, the strong dairy lobby in the US opposes the TPP since American farmers currently enjoy significant protection from New Zealand imports. In order to simulate the possible expansion of the TPP, four scenarios will be modelled:

1. The TPP does not include the US, but fully includes all other countries involved in the negotiations.
2. The TPP includes the US, but not for the agricultural and food sectors (fully includes other negotiating countries).
3. The TPP fully includes the US (and other negotiating countries).
4. The TPP fully includes the US, and also eliminates the US export subsidy on processed dairy products.

In order to simulate scenario 1, all tariffs will be removed on all trade between New Zealand and Peru, Chile and Peru, Chile and Viet Nam, Chile and Malaysia, Brunei Darussalam and Peru, Australia and Peru, Peru and Viet Nam, and Peru and Malaysia. There are no agricultural export subsidies on trade between any of these countries, and the small export subsidies that can be found on some trade in other sectors are not altered.

Scenario 2 involves all of the changes outlined in scenario 1, but also includes import tariffs on trade (in both directions) in the United States' forestry, extraction, and both manufacturing sectors. Thus, tariffs will also be removed on trade in these sectors between New Zealand and the United States, Brunei Darussalam and the United States, Viet Nam and the United States, and Malaysia and the United States. Export subsidies are not altered. The exclusion of the United States' agricultural and food sectors means that tariffs are not removed for United States' exports in those sectors, either.

Scenario 3 represents the full implementation of the expanded TPP. As well as the changes in scenarios 1 and 2, the United States' agricultural and food sectors will also be included in tariff eliminations. Thus, all import tariffs will be removed on all trade between New Zealand and the United States, Brunei Darussalam and the United States, Viet Nam and the United States, and Malaysia and the United States.

Scenario 4 represents an optimistic addition to scenario 3. As well as full inclusion of the United States in terms of tariff elimination, the United States' export subsidy on processed dairy products will be removed for exports to all of the expanded TPP partners. This export subsidy is the only agricultural and food export subsidy amongst possible TPP expansion partners in the projected GTAP version 7 database.

The free trade agreement that New Zealand is negotiating with Russia, Belarus and Kazakhstan represents an exciting opportunity for New Zealand's agricultural and food exporters to gain improved access to a large market that is new to the bilateral trade agreement arena. The ad valorem equivalent tariffs found using the WITS software from the TRAINS database on New Zealand exports to these countries are significant, and largest for the processed dairy sector. An ad valorem equivalent tariff of 20 percent is placed on imports of New Zealand dairy products. In the simulation of this free trade agreement all tariffs on trade between New Zealand and the Russia-Belarus-Kazakhstan Customs Union will be removed. There are no tariffs on trade amongst the Customs Union partners and no export subsidies on trade between New Zealand and the Union, while export taxes present in the projected database in the extraction and manufacturing sectors will not be altered.

Substantial trade barriers exist for New Zealand's exports of agricultural and food products to Korea. Using the WITS software, and derived from the TRAINS database for the year 2010, the trade weighted average ad valorem equivalent Korean tariff on New Zealand exports of processed dairy products was 40.46 percent, 36.47 percent for meat products, while a tariff of 41.63 percent was found in the Other Food sector. The dry stock farming sector faced a tariff of 17.49 percent, while the products of the cropping sector were subject to a 45.08 percent trade weighted tariff. Non-agricultural sectors did not suffer such high protection levels, but tariffs did exist for these sectors. New Zealand's trade weighted tariffs on Korean exports were also significant. According to the GTAP database, no export subsidies existed on New Zealand and Korea's bilateral trade, and the export taxes found in some sectors (extraction and manufacturing) in the projected GTAP database are not altered. All tariffs on all trade between New Zealand and Korea are eliminated in the simulation of that PTA.

India is widely believed to be developing into a great power in the global economy, through rapid economic growth and development, and is predicted to be the world's second largest economy by 2050 (Government of India & New Zealand Government, 2009). The rapid growth in the middle class in India shows significant potential for New Zealand's dairy industry, through increased demand for imports of higher value dairy products, on which New Zealand prides itself. Indian import tariffs on New Zealand's agricultural and food exports are large: a 27.86 percent ad valorem equivalent tariff exists for processed dairy, with the highest tariff being a 56.77 percent AVE tariff in the other food sector. There are some commentators who believe that the Indian dairy market has similar potential to China's (Kissun, 2011), making access to that market important for New Zealand dairy producers. In simulating a free trade agreement between New Zealand and India, import tariffs on all trade between the two countries will be removed, while there are no export subsidies present. As before, export taxes present in the projected database in the extraction and manufacturing sectors are not altered.

The Gulf Cooperation Council (GCC) consists of Bahrain, Oman, Kuwait, Saudi Arabia, the United Arab Emirates and Qatar (Ministry of Foreign Affairs and Trade, 2011i). However, in the simulation of the free trade agreement between New Zealand and the Gulf Cooperation Council, the level of disaggregation in the GTAP Version 7 database has meant that the 'RestWestAsia' region must be used as a proxy for the GCC. While all of the countries involved in the Gulf Cooperation Council are included in the Rest of Western Asia region, so are Iraq,

Israel, Jordan, Lebanon, Occupied Palestinian Territory, the Syrian Arab Republic, and Yemen (Center for Global Trade Analysis, 2011c). This means that the effects of the New Zealand – GCC Free Trade Agreement will be overstated in the simulation results, however there is no way to solve this problem with the time and resources available. Perhaps a later version of the database will provide the required disaggregation. The simulation of this agreement therefore removes all tariffs on all trade between New Zealand and the Rest of Western Asia area, as well as the very small export subsidies that are found on exports of cropping and other food from the Rest of Western Asia to New Zealand.

Limitations

A major limitation of using the GTAP model based on the version 7 database is its age, as has been discussed in the computable general equilibrium modelling section of the literature review in this study. The database has 2004 as its base year, and this is a cause for concern when assessing the validity of results. Even a cursory glance at export data for New Zealand from the UN COMTRADE database shows that dairy exports from New Zealand should be closer to US$8 billion than the US$4 billion shown in the projected baseline for 2010. When the recent world dairy price volatility and general inflation are considered (since the values in even the projected baseline are measured in 2004 USD) things become less clear, however inaccuracy is still an issue. An explanation is provided when looking at this same export data for the year 2004. In that year the US$4 billion export figure for New Zealand's dairy exports seems reasonably accurate. Thus, the actual value of dairy exports from New Zealand has grown much faster since 2004 than predicted by the growth rates of endowments and TFP used to project the database. Of course, the massive increases in the world prices of dairy commodities in recent years largely explain this. The only solution to this problem, when considering the magnitude of the GTAP database, is to use a version of the database constructed using more recent data, which is currently not available.

Due to the existence of missing data in the TRAINS database, some assumptions have been necessary in compiling the tariff data from the WITS software. The updated figures for Malaysia and Thailand's tariffs relate to 2005 and 2009 rather than 2004 and 2010 respectively, Hong Kong's 2004 tariff figures are estimated by their 2005 figures (Hong Kong does not use import tariffs anyway), and India's 2010 figures are derived from their 2009 tariffs. For the Gulf Cooperation Council (GCC) this study uses 2005 and 2009 data since many of the countries involved were missing 2004 and 2010, presenting reason for suspicion of these figures' accuracy. Further, the 2004 tariff levels for Russia, Belarus and Kazakhstan (RussiaBK) are derived from the year 2005 in the TRAINS database, since Russia had data for 2005 but not 2004, and is by far the largest economy in this group. Even after the appropriate estimations are made using data from other years, there is still some missing data in the WITS output. Where missing data exists, no changes are made to the GTAP tariff levels.

A further limitation is provided by the regional aggregations used when the GTAP version 7 database was constructed. The Gulf Cooperation Council, as New Zealand is currently in negotiations for a preferential trade agreement with, is made up of Bahrain, Oman, Kuwait, Saudi Arabia, the United Arab Emirates, and Qatar (Ministry of Foreign Affairs and Trade,

2011i). However, these countries are aggregated in the GTAP database as part of 'Rest of Western Asia', along with Iraq, Israel, Jordan, Lebanon, Occupied Palestinian Territory, Syrian Arab Republic, and Yemen (Center for Global Trade Analysis, 2011c). Similarly, Brunei Darussalam enters New Zealand's trade policy agenda both as part of the AANZFTA and the TPP (Ministry of Foreign Affairs and Trade, 2011o), yet is aggregated in the GTAP database with Timor-Leste under 'Rest of Southeast Asia' (Center for Global Trade Analysis, 2011c). This makes accurate representation of these regions in GTAP for this study impossible given resource constraints. In deriving tariff levels from WITS for these aggregations, this study includes only the countries relevant to New Zealand's trade policy agenda, yet the GTAP results will still misrepresent these countries. It is the opinion of the author that these aggregation limitations are not serious enough to preclude the use of the GTAP model from providing valuable insights into the effects of New Zealand's preferential trade agreements with the relevant countries.

Another effect of the regional aggregations used in this study is to obscure the effects of the free trade agreement between New Zealand, Russia, Belarus and Kazakhstan. As discussed by Groser (2011a), Belarus' dairy sector is becoming important in world markets. It is therefore possible that this agreement may affect dairy production differently in Russia, Belarus and Kazakhstan. Sensitivity of the results to this aggregation is examined, by repeating the baseline set up procedure with Russia, Belarus and Kazakhstan included separately. The results are affected negligibly, but it must be remembered that Belarus' dairy industry's importance is likely to have grown since the 2004 database was constructed.

In simulating the implementation of the preferential trade agreements that New Zealand currently has under negotiation, tariffs on trade between the relevant countries have been shocked to zero in one movement from 2010 to 2017. Of course, this does not capture the effects of the phase-ins for sensitive sectors that may exist under that agreement.

6.2   Results

This section examines the results of the GTAP simulations of the preferential trading agreements that New Zealand is currently negotiating. Results are examined both at an economy-wide level, in terms of welfare using the equivalent variation measure (broken down into terms of trade, and allocative efficiency effects), changes in GDP, changes in trade balances, and changes in terms of trade; and the specific implications for the New Zealand dairy industry[52]. Economy-wide results are reported for the countries directly affected by the trade liberalisation scenario, while the implications for other countries will also be discussed where relevant. Specific implications for the New Zealand dairy industry take the form of changes in price and the quantity of output for the raw milk sector, and changes in price, quantity of output, quantity of exports (both New Zealand's and globally), value of exports, and trade balance for the processed dairy product sector.

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[52] It should be noted that the services sector is not discussed in this section, due to the difficulties associated with that sector in the GTAP model.

It is important that it is recognised that these results reflect economic effects in the long-run, once adjustment processes have been allowed to move through the economy. They do not represent over-night changes. The movement from baseline to simulated data shows how the economy would be different at that point in time, had the specific trade liberalisation policies been enforced by that date, relative to if they had not been implemented (while ignoring phase-in periods). Proportionate changes are more relevant than actual dollar figures, and it is important to consider the importance of the various industries and trade linkages as a part of the overall economic system.

Expansion of the Trans-Pacific Partnership

As detailed above, four possible scenarios are simulated for the expansion of the TPP.

Scenario 1: The expansion of the TPP does not include the US, but fully includes all other countries involved in the negotiations. Tariffs are eliminated on all trade between New Zealand and Peru, Chile and Peru, Chile and Viet Nam, Chile and Malaysia, Brunei Darussalam and Peru, Australia and Peru, Peru and Viet Nam, and Peru and Malaysia.

Table 6.3   Economy-Wide Results of TPP Expansion Scenario 1

Region	EV[53] (2004 US$ million)	Terms of Trade Effects on EV	Allocative Efficiency Effects on EV	% Change in GDP	Change in Trade Balance (2004 US$ million)	% Change in Terms of Trade
NZ	0.25	0.21	0.03	0.001	-0.03	0.001
Australia	-0.44	-1.04	0.50	0	-0.47	-0.001
Malaysia	27.39	29.63	1.96	0.021	10.44	0.015
Singapore	-4.40	-4.22	-0.27	-0.003	-0.13	-0.002
Viet Nam	6.57	1.52	3.35	0.007	-8.23	0.004
Brunei	0.01	0.05	0.01	0.002	0.06	0
USA	-12.89	-8.32	-1.15	0	5.41	-0.001
Chile	17.90	20.32	2.17	0.058	4.80	0.051
Peru	-0.20	-10.31	7.20	-0.122	-10.09	-0.074
World	13.37	-0.01	13.38			

The effect of TPP Expansion Scenario 1 on New Zealand's welfare is a US$0.25 million gain made up mostly of the terms of trade effect, and is matched by similarly small changes in the other macroeconomic indicators shown above. Major welfare gainers in this scenario are Malaysia (US$27.39 million) and Chile (US$17.90 million), and Viet Nam to a lesser extent (US$6.57 million). Malaysia and Chile's welfare gains are driven by improvements in their terms of trade (which change by just 0.02 percent and 0.05 percent respectively). Malaysia's

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[53] Equivalent Variation

terms of trade effects come in through increased export prices in the manufacturing sectors. The removal of tariffs on exports to Chile and Peru is the likely cause, driving down the prices of Malaysian imports in these previously protected markets and thus increasing the volume of manufacturing exports to both countries and increasing the price received by Malaysian exporters. Chile's manufacturing export prices have the largest terms of trade effects, while export prices in the cropping and other food sectors also have significant effects. In each of these sectors the removal of tariffs on Chilean exports to Malaysia, Viet Nam and Peru have resulted in lower prices for Chilean products within those markets, and thus higher demand and higher prices received by Chilean exporters.

Significantly, while terms of trade improvements play a part in Viet Nam's welfare gains, particularly in the light manufacturing sector, allocative efficiency gains are more significant. Viet Nam's cropping and light manufacturing sectors enjoy the majority of the gains in allocative efficiency. The small increase in production in Viet Nam's light manufacturing sector is largely allocated to an increase in exports to Peru as a result of the removal of an 18.93 percent ad valorem equivalent tariff, which is largely responsible for the gains in this sector. Viet Nam's cropping sector gains from very slightly reducing its own production levels and increasing its imports from Chile and Peru when the high protection levels on imports from these markets are removed. Malaysia and Chile experience small allocative efficiency gains as well, which are however overshadowed by the larger terms of trade effects discussed above.

Although Peru is faced with a small welfare loss overall of US$0.20 million, it experiences the largest allocative efficiency gain of any region, of US$7.20 million. This is what would be expected from such an agreement, since Peru features most heavily in the tariff eliminations conducted under Scenario 1. The majority of the allocative efficiency gain comes in the heavily protected light manufacturing sector, showing that import protection caused distortion to the allocation of resources within the Peruvian economy. A small portion of light manufacturing production in Peru is displaced by Malaysian imports following liberalisation, and is the driving force behind the allocative efficiency gains. Peru's allocative efficiency gain is outweighed by its $US10.3 million terms of trade loss. This loss is despite an overall decline in terms of trade of just 0.07 percent, and is driven mainly by declines in Peru's export prices for the manufacturing and other food sectors. In each of these sectors, the decline in the market prices of imports has been greater than the decline in the price of domestically produced goods, meaning imports have become relatively cheaper and thus favoured over domestic goods. Due to the need to export surplus domestically produced goods (domestic production has increased in both heavy manufacturing and other food, while light manufacturing imports have increased by more than the decline in domestic production) export prices have fallen.

Other significant welfare losses are experienced by the United States (US$12.89 million) and by Singapore (US$4.40 million). Both losses are underpinned by declines in terms of trade, most notably the heavy manufacturing and cropping sectors for the United States and heavy manufacturing sector for Singapore. The United States' suffers a decline in export prices for heavy manufacturing and both a decline in export prices and rise in import prices in the cropping sector. It is likely that the decline in export prices for the USA comes as a result of their exclusion from the expanded TPP in this scenario, meaning trade amongst TPP partners

may to some extent divert trade away from the USA (The United States' exports to Peru seem to display this trend which is logical since preferences under the United States – Peru FTA are being eroded[54]). Chile is a significant import source for the United States' cropping sector, and the rise in its export price coincides with a greater volume of exports to the United States, driving a small terms of trade loss for the United States in this sector. Singapore's terms of trade loss for the heavy manufacturing sector comes mainly through a rise in import prices, most likely as a result of an increase in export prices for Malaysia's heavy manufacturing sector, the most significant source of Singapore's heavy manufacturing imports amongst the TPP partners. Malaysia's increase in heavy manufacturing export prices is due to the removal of tariffs for these exports into Chile and Peru.

The largest effect on GDP amongst the possible TPP expansion countries is shown by Peru, with a 0.12 percent decline in GDP. Chile's GDP increases by 0.06 percent as a result of TPP Expansion Scenario 1, while there are no other significant changes for other countries. A large decline in Peru's trade balance of US$10.09 million contributes to its decline in GDP, while Viet Nam also suffers a decline in its trade balance. Peru's total value of exports increases (by 0.65 percent) as a result of trade liberalisation, yet this is outstripped by the increase in the value of its imports (0.90 percent). The same is true for Viet Nam, but at a lower level. Malaysia enjoys the largest improvement in trade balance with a US$10.44 million increase, driven by its light manufacturing sector, while USA and Chile also show increases.

The equivalent variation for the world as a whole is US$13.37 million, a relatively small change showing that the potential for traditional 'gains from trade' under an expansion of the Trans-Pacific Partnership is limited without the United States' involvement.

Table 6.4 **Implications for the New Zealand Dairy Industry of TPP Expansion Scenario 1**

Sector	% Change in Price	% Change in Output	% Change in Export Volumes from NZ	% Change in Value of Exports from NZ	% Change in Value of Global Exports	Change in Sectoral Trade Balance (2004 US$ million)
Raw Milk	0.003	0.015				
Processed Dairy Products	0.002	0.018	0.023	0.025	0.006	0.90

As can be seen from Table 6.4, the effects of TPP Expansion Scenario 1 on New Zealand's dairy industry are not expected to be large. Changes in price and output for both the raw milk and

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[54] United States' exports to Peru have declined in all sectors other than a miniscule increase in the cropping sector.

processed dairy product sectors are negligible, as are the changes in export volumes and values for processed dairy products. The small growth in output for these two dairy sectors come at the expense of New Zealand's other agricultural and food sectors. New Zealand's sectoral trade balance for processed dairy products has increased by around US$900,000. This has almost offset trade deficits in some other sectors, notably processed meat products and heavy manufacturing. New Zealand production and exports have not changed significantly in any sector as a result of TPP Expansion Scenario 1.

Table 6.5   **Effect of TPP Expansion Scenario 1 on New Zealand's Export Sales of Processed Dairy Products**

Trading Partner	% Change in Volume of Exports
Australia	-0.014
Malaysia	-0.004
Singapore	-0.039
Viet Nam	0.004
Brunei	-0.003
USA	-0.008
Chile	-0.055
Peru	3.483

The results in Table 6.5 show that the only significant change in export volumes of processed dairy products to New Zealand's trading partners as a result of TPP Expansion Scenario 1 is given by exports to Peru. This is as expected since Peru is the only country that removes tariffs on New Zealand's exports in Scenario 1. New Zealand exports a greater value of processed dairy products to Peru than does any other country in the baseline, including the highly aggregated Rest of World region. However, the growth in New Zealand's exports to Peru is outstripped by growth in Chilean exports to Peru. Although it would appear from the above table that the growth in New Zealand's exports to Peru are diverting trade from other trading partners (apart from Viet Nam), the other values are negligible.

Scenario 2: The expansion of the TPP includes the forestry, extraction, light and heavy manufacturing sectors for the United States, and fully includes all other countries involved in the negotiations. This scenario is simulated due to the significant lobbying power of the agricultural and food sectors in the United States. If these sectors deem certain potential TPP partners as threatening to their own industries, it may be the case that these sectors will lobby to be excluded from the TPP agreement.

Table 6.6   Economy-Wide Results of TPP Expansion Scenario 2

Region	EV (2004 US$ million)	Terms of Trade Effects on EV	Allocative Efficiency Effects on EV	% Change in GDP	Change in Trade Balance (2004 US$ million)	% Change in Terms of Trade
NZ	12.77	12.28	0.26	0.053	-22.17	0.043
Australia	-13.92	-12.85	0.97	0.001	19.13	-0.012
Malaysia	378.99	379.29	2.73	0.280	77.59	0.189
Singapore	-55.53	-53.14	-2.02	-0.021	4.37	-0.030
Viet Nam	1235.76	886.14	85.90	4.348	-891.57	2.425
Brunei	2.01	84.62	0.48	2.874	42.42	1.695
USA	-427.06	-425.67	170.01	-0.026	59.74	-0.040
Chile	16.22	17.20	1.45	0.052	5.50	0.045
Peru	-2.10	-12.79	7.15	-0.138	-8.47	-0.091
World	-151.82	-11.99	-137.87			

The large differences in welfare changes between Table 6.3 and Table 6.6 show the significance of the United States being involved in the final expansion agreement, even if only for non-agricultural sectors. New Zealand now benefits from a much larger US$12.77 million gain in welfare, which comes almost entirely through the terms of trade effect, from an improvement of 0.04 percent in New Zealand's terms of trade. The largest terms of trade effect for New Zealand (other than the services sector which will not be discussed here) results from an increase in export prices for processed dairy products, closely followed by meat products and heavy manufacturing.

The removal of United States tariffs on New Zealand exports of manufacturing products has encouraged exports in these sectors, and thus resources have been diverted into manufacturing where production has increased as a result. Production in the agricultural and food sectors has declined, by up to 0.20 percent (found in the meat products sector). New Zealand's GDP declines by 0.05 percent, while the trade balance deteriorates by a significant US$22.17 million. Aside from the manufacturing and services sectors, the largest influence on the trade balance is given by the meat products sector, resulting from both a fall in export volumes and increase in imports. The movement of resources from New Zealand's traditional strengths in agricultural production to the production of manufactures will be discussed more below.

The largest welfare gain is a huge US$1,236 million for Viet Nam, of which US$886 million comes from terms of trade effects and US$86 million from allocative efficiency gains. Viet Nam's terms of trade improves by 2.43 percent, with gains from this improvement driven largely by export prices in the light manufacturing sector, along with heavy manufacturing and the other food sector. The United States and Peru previously charged high tariffs on Viet Nam's exports of light manufacturing (11.2 percent and 18.9 percent ad valorem equivalents,

respectively), while Peru also charged high tariffs on Viet Nam's exports of heavy manufacturing and other food products. Thus the removal of these tariffs has resulted in higher prices for Viet Nam's exports in these sectors (by around 2.5-3 percent), and a corresponding increase in production and exports. Viet Nam's allocative efficiency gains are driven by a US$126 million gain in the light manufacturing sector, which comes about due to a 9.18 percent increase in production in this sector. The removal of the large United States tariff on Vietnamese exports of light manufacturing results in a huge 77 percent increase in exports to the United States, from a base of US$6,077 million. Thus, the value of Vietnamese light manufacturing exports to the United States has increased by around US$4,970 million. Vietnamese exports of light manufacturing to Peru also increase by 171 percent, albeit from a much smaller base. The source of the massive economic gain to Viet Nam can therefore largely be seen as the removal of the United States tariffs on Viet Nam's exports of light manufacturing products.

Malaysia also has a large welfare gain from TPP Expansion Scenario 2, of US$379 million. This is largely driven by the terms of trade effect, in particular an increase in export prices for heavy manufacturing, although the export price of light manufacturing also contributes significantly. Again, the removal of import tariffs in these sectors by the United States is the cause, since the United States is a major export destination for Malaysia's exports in both manufacturing sectors. While Malaysia's light manufacturing exports to the United States face a 5.42 percent ad valorem equivalent tariff, and thus its removal offers exporters a higher price for their products, the effect in the heavy manufacturing sector is less obvious. A relatively small 0.55 percent tariff is removed, and the aggregate export price index for Malaysia's exports of heavy manufacturing increases by just 0.17 percent. However, when the importance of the Malaysian heavy manufacturing sector's exports are considered (making up approximately 70 percent of Malaysian exports), and also the United States as an export market for Malaysia's heavy manufacturing sector (making up approximately 20 percent of that sector's exports), the benefits of the United States' tariff removal can be seen.

Chile and Brunei Darussalam also benefit from liberalisation under scenario 2, and again the major gains come from terms of trade effects. Chile's gains are driven by higher export prices in the heavy manufacturing, cropping and other food sectors, likely caused by the removal of Peru's tariffs on Chilean exports, as well as lower import prices in both the light and heavy manufacturing sectors. Brunei Darussalam's gains coincide with a significant 1.70 percent improvement in terms of trade, and come about through higher export prices in both manufacturing sectors, most likely as a result of the removal of the United States' tariffs in these sectors.

The United States faces a large welfare loss as a result of TPP Expansion Scenario 2, of approximately US$427 million. This occurs despite an allocative efficiency gain of US$170 million, which comes mostly from the light manufacturing sector, although the heavy manufacturing sector also realises an allocative efficiency gain. The United States' imports of light manufacturing products increase by 0.87 percent (equivalent to around US$2.5 billion), with Vietnamese exporters of light manufacturing being the main beneficiary of this increase. Light manufacturing production in the United States has decreased by 0.22 percent as a result of the trade liberalisation in scenario 2, with resources being diverted towards the heavy

manufacturing sector, where production increases. Although not possible to examine in this study due to the sectoral aggregations used, it is logical that the removal of protection in industries such as clothing and apparel will cause imports in this industry to displace domestic production in the United States. This is shown here when the 11.18 percent ad valorem equivalent tariff is removed on imports of light manufacturing from Viet Nam, where clothing production is likely to be much less costly due to lower labour costs. The result is an allocative efficiency gain, as observed.

The United States' allocative efficiency gain is however outweighed by its terms of trade loss of US$426 million, which comes from a very small 0.04 percent reduction in its terms of trade. The loss can be attributed to a fall in the United States' export prices of light and heavy manufacturing, and an increase in world price and the United States' import prices of light manufacturing. The fall in the export price of the United States' heavy manufacturing is due to the large increase in output of this sector in the United States (the 0.08 percent increase corresponds to an over US$2 billion increase in value of output), where most of this increase is exported. Although the price index for global exports of heavy manufacturing increases, the larger share of global exports that is captured by the United States as a result of the above increase in exports means the export price received for the United States' products decreases by a small percentage (0.04 percent). With such a large volume of exports, this small change in price can substantially affect welfare. The United States' imports of light manufacturing have become more affordable to consumers than domestically produced goods as a result of trade liberalisation, and the inevitable decline in the consumption of domestically produced light manufacturing products has outstripped the decline in production in this sector. Exports of surplus have therefore been necessary, and export prices received in this sector have fallen as a result. The world price of light manufacturing exports to the United States has increased as a result of the increased demand due to tariff removal, particularly for Vietnamese exports, and this has also contributed to the terms of trade loss.

Singapore, Australia and Peru also all suffer welfare losses as a result of trade liberalisation under this scenario. Each of these countries is affected negatively by a large terms of trade effect. Singapore's import prices for light and heavy manufacturing increase, which outweigh the gain from a higher export price in heavy manufacturing. Australia's terms of trade loss is heaviest for import prices in the manufacturing and extraction sectors, while Peru's export prices for manufacturing and other food decline and are the source of its loss. All regions external to the expanded agreement suffer a welfare loss, with the exception of Russia, Belarus and Kazakhstan. China's welfare loss is second only to the United States' in magnitude, and is made up of both significant terms of trade and allocative efficiency effects.

Viet Nam and Brunei Darussalam show the largest changes in GDP, with a 4.3 percent and 2.9 percent improvement, respectively. Viet Nam's GDP growth comes despite a large deterioration in its trade balance from reductions in exports of heavy manufacturing and other food that coincide with increases in imports in those sectors. The trade balance of Viet Nam's light manufacturing sector increases markedly, due to growth in exports from this sector of 13.25 percent, translating to an increase in value of US$3.2 billion. Brunei's trade balance improves, since it has enjoyed a large increase in exports of light manufacturing while also

receiving a higher price for those exports. The only other notable change to GDP is Malaysia's 0.28 percent increase, coinciding with an improved trade balance.

Table 6.7   Implications for the New Zealand Dairy Industry of TPP Expansion Scenario 2

Sector	% Change in Price	% Change in Output	% Change in Export Volumes from NZ	% Change in Value of Exports from NZ	% Change in Value of Global Exports	Change in Sectoral Trade Balance (2004 US$ million)
Raw Milk	0.035	-0.030				
Processed Dairy Products	0.044	-0.022	-0.020	0.024	0.040	0.47

As can be seen in Table 6.7, the volume of processed dairy exports from New Zealand has decreased slightly as a result of TPP Expansion Scenario 2. The decreased export volumes come from slightly reduced output in both the raw milk and processed dairy product sectors, an effect that is mirrored in all of New Zealand's other agricultural and food sectors. Resources have been diverted into forestry and manufacturing production, and thus production in those sectors has increased. This is as a result of the removal of the tariffs on New Zealand exports of forestry and manufacturing products to the United States, which increase significantly as a result. These results provide an interesting illustration of the theory of the second best, since it is widely acknowledged that New Zealand's comparative advantage lies in the production of dairy products and pastoral agriculture more generally. The removal of tariffs on exports to the United States of forestry and manufacturing products and not agricultural and food products appears to have diverted resources away from the areas where New Zealand's natural advantage lies.

However, the prices received by New Zealand producers of both raw milk and processed dairy products have risen very slightly, and the value of exports of processed dairy products from New Zealand has actually risen (by just 0.02 percent). The sectoral trade balance has therefore improved by US$470,000, despite lower export and higher import volumes. The value of global exports of processed dairy products has increased by a greater proportion than has New Zealand's, and the New Zealand sector is therefore capturing a slightly smaller share of the value of the global export market. The values of Chile and Peru's exports of processed dairy products have grown by the largest proportion, but from very small bases.

Table 6.8   **Effect of TPP Expansion Scenario 2 on New Zealand's Export Sales of Processed Dairy Products**

Trading Partner	% Change in Volume of Exports
Australia	-0.178
Malaysia	0.167
Singapore	-0.102
Viet Nam	6.318
Brunei	1.383
USA	-0.314
Chile	-0.342
Peru	3.202

As can be seen from comparing Tables 6.5 and 6.8, New Zealand's growth in exports of processed dairy products to Viet Nam and Brunei Darussalam has greatly increased from TPP Expansion Scenario 1, although tariffs have not changed. In both countries, processed dairy product production has decreased significantly and thus New Zealand imports are an alternative source of the dairy products that they desire. The transfer of resources into the light manufacturing sector in order to increase exports to the United States is a key contributor of the decline in processed dairy production, although both Viet Nam and Brunei Darussalam have also stepped up production of livestock and wool and forestry, and Viet Nam also processed meat products. The increased production of livestock and wool, forestry, and in Viet Nam's case meat products, is explained by the greater demand for raw materials by the light manufacturing sector, such as the clothing industry's demand for wool, or wood processing industries' demand for forestry outputs.

The growth in New Zealand's exports of processed dairy products to Peru is similar to, although slightly smaller than, that under scenario 1, while the extra growth in exports to Malaysia is a result of greater demand for processed dairy products as intermediate inputs in Malaysia's production processes. The significant growth in the light manufacturing sector in Malaysia and in that sector's demand for processed dairy products makes it likely that the growth in exports from New Zealand are becoming inputs to the light manufacturing sector. This is logical when the numerous uses of dairy products such as casein are considered.

The declines in New Zealand's exports of processed dairy products to Australia, Singapore, the United States and Chile are of small proportions, yet Australia and the United States are important trading partners in this sector. In both Australia and the United States production of processed dairy products has increased while imports have decreased, and both have chosen to switch the source of a small proportion of these imports from New Zealand to elsewhere due to New Zealand's higher export prices in this sector.

Scenario 3: The United States is now fully included in the tariff elimination amongst the partners in the expanded Trans-Pacific Partnership. The export subsidies on United States exports of processed dairy products are not altered, since this would be particularly hard for the United States dairy lobby to accept.

Table 6.9   Economy-Wide Results of TPP Expansion Scenario 3

Region	EV (2004 US$ million)	Terms of Trade Effects on EV	Allocative Efficiency Effects on EV	% Change in GDP	Change in Trade Balance (2004 US$ million)	% Change in Terms of Trade
NZ	135.39	137.49	5.13	0.466	-23.61	0.485
Australia	-84.54	-83.40	3.12	-0.036	24.10	-0.079
Malaysia	406.04	312.98	110.11	0.168	-56.79	0.156
Singapore	-65.75	-63.34	-2.50	-0.041	3.53	-0.035
Viet Nam	1218.36	859.39	98.37	4.156	-897.12	2.345
Brunei	4.39	86.20	2.29	2.898	42.09	1.761
USA	-218.90	-232.31	143.37	-0.017	13.03	-0.019
Chile	14.79	15.31	1.55	0.046	5.19	0.040
Peru	-3.45	-14.30	7.22	-0.143	-7.37	-0.104
World	-86.23	-11.22	-73.31			

The importance that New Zealand should attach to the inclusion of the United States' food and agricultural sectors in any expansion of the TPP agreement is readily apparent from a comparison of Tables 6.6 and 6.9. Without the inclusion of the United States' food and agricultural sectors New Zealand's welfare gain is US$12.77 million, compared to US$135.39 million when those sectors do participate in tariff eliminations. The welfare gain to New Zealand is thus over 10 times greater under the more complete tariff eliminations. New Zealand experiences a substantial 0.466 percent increase in GDP, again showing the potential of the expanded TPP for benefiting all New Zealanders, so long as the United States' agricultural and food sectors are included in trade liberalisation. New Zealand's trade balance deteriorates by US$23.61 million, as a result of declining export volumes in the manufacturing, cropping, and livestock and wool sectors. The sectoral trade balance of the meat products sector is the largest improver, by US$268.58 million, while the processed dairy sector's trade balance improves by an also very significant US$103.42 million.

Terms of trade effects dominate New Zealand's welfare gains, with the largest benefits accruing to the processed dairy and meat product sectors, followed closely by the manufacturing sectors, and then the livestock and wool, other food, and cropping sectors. In all of these sectors, increases in export prices drive the terms of trade benefits. Agricultural and food export prices show greater increases than manufacturing export prices. The overall change in New Zealand's terms of trade is a 0.485 percent improvement. The cause of the significant increases in New Zealand's export prices for all the agricultural and food sectors can be identified as the tariff eliminations conducted on bilateral trade in food and agricultural products between New Zealand and the United States; Malaysia and the United States; Viet Nam and the United States; and Brunei Darussalam and the United States, since these are the only changes from scenario 2 where the changes in prices were negligible in comparison. Of course, the elimination of protection from New Zealand exports in the United States' markets

is the driving force behind the increase in New Zealand's export prices. The removal of tariffs in these sectors has resulted in an increase of 49 percent in New Zealand's exports of processed dairy products to the United States, a 91 percent increase in New Zealand's exports of meat products to the United States, and a 15 percent increase in New Zealand's exports of other food to the United States. The allocative efficiency gain for New Zealand seen in Table 6.9 is largely attributable to the services sector.

Viet Nam is again the heaviest beneficiary of the expanded TPP, with similarly large gains to welfare and GDP, as in scenario 2. The welfare gain, while still enormous, is not quite so large as in scenario 2 due to a smaller improvement in overall terms of trade (while still a 2.35 percent improvement) resulting in a slightly smaller terms of trade effect on welfare. Export prices in the light manufacturing sector are again the driver of the terms of trade gain. Allocative efficiency gains are however slightly larger than in scenario 2, due to an even higher increase in production in the light manufacturing sector. Again, the removal of United States' tariffs on Vietnamese exports of light manufacturing is the source of Viet Nam's huge economic gain from the expanded TPP. The trade balance deterioration is again the result of lower exports of heavy manufacturing and services, while the export volume of the light manufacturing sector increases by 13.5 percent and the trade balance in this sector consequently improves.

Malaysia is still a significant beneficiary of the expansion of the TPP, to the extent of a welfare gain of US$406.04 million, but the change to the make-up of this welfare gain from scenario 2 is interesting. Instead of the very small allocative efficiency gain in scenario 2 (US$2.73 million), Malaysia has an allocative efficiency gain under scenario 3 of US$110.11 million. This comes as a result of the removal of heavy protection of Malaysia's other food (47.99 percent ad valorem equivalent tariff) and cropping (30.76 percent AVE tariff) sectors from United States exports. Huge increases in imports from the United States in these sectors drive an increase in the total volume of Malaysia's other food and cropping imports, and therefore its allocative efficiency gain. The price of the United States' other food products in the Malaysian market drops by 32 percent as a result of the removal of the tariff, and by 23 percent for the United States' cropping exports. An increase in the export price received for Malaysian exports of heavy manufacturing as a result of the removal of the United States' tariff on those exports is again the source of Malaysia's terms of trade gain.

The United States suffers a large welfare loss of US$218.9 million, although this is around half that of when the United States' agricultural and food sectors were excluded from trade liberalisation. The terms of trade loss is significantly smaller than under scenario 2, while the allocative efficiency gain is also smaller. The allocative efficiency gain is again centred in the light manufacturing sector, however the heavy manufacturing and meat products sectors do realise gains as well. Light manufacturing production declines by 0.23 percent, again as a result of competition from efficient producers such as Malaysia and Viet Nam, diverting resources into the heavy manufacturing sector. The expansion of the cropping and other food sectors has drawn resources from the meat products sector, which has realised an allocative efficiency gain along with a 0.07 percent fall in production. While the sectoral terms of trade effects in the light manufacturing and heavy manufacturing sectors in scenario 2 are also seen under scenario 3, these losses are partially offset by a substantial gain as a result of increased

prices for United States' exports in the cropping sector. A 0.23 percent increase in the price index for these exports has yielded a large terms of trade gain over such a large volume of trade.

Australia, Singapore and Peru's welfare losses all become larger under scenario 3 than under scenario 2. Australia's is the largest change, and comes about through a much larger terms of trade loss. This loss is largely the result of a reduction in the price received for exports in the cropping sector, due to increased exports from the United States where production has increased significantly, and therefore greater competition in export markets. Brunei Darussalam and Chile benefit from TPP Expansion Scenario 3, as in scenario 2.

The global welfare effect changes from scenario 2 to scenario 3 from a loss of US$151.82 million to a loss of US$86.23 million. The welfare loss in scenario 3 is not expected, since the complete nature of tariff removal amongst the expanded TPP partners would be expected to benefit the global economy. Indeed, when only the expanded TPP members are included in the welfare calculations, the overall gain to this trading community is US$1,405 million. However, large welfare losses experienced by the highly aggregated Rest of World region and China, as well as welfare losses for all other external countries (apart from Russia, Belarus and Kazakhstan) results in an overall welfare loss. The global loss in allocative efficiency suggests that trade diversion is occurring. Thus it can be seen that the preferences given to members under the expanded TPP agreement may be detrimental for external parties where large import barriers remain with respect to other countries.

Interestingly, in both TPP expansion scenarios 2 and 3, all countries included in the agreement have experienced an allocative efficiency gain, with the exception of Singapore which suffers a small loss in each[55]. This provides evidence that the creation of a free trade 'region' or trading bloc such as the expanded TPP would provide benefits for the allocation of resources within the economies involved. As expected, these countries largely gain from the increased production specialisation and international trade among members that such arrangements encourage.

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[55] Singapore does not practice import protection so its economy is not expected to see allocative efficiency gains from the implementation of a PTA; its economy is not distorted by import protection. Where the allocation of resources within the Singaporean economy is distorted by other countries' import protection a PTA could be the source of allocative efficiency gains, however.

Table 6.10   Implications for the New Zealand Dairy Industry of TPP Expansion Scenario 3

Sector	% Change in Price	% Change in Output	% Change in Export Volumes from NZ	% Change in Value of Exports from NZ	% Change in Value of Global Exports	Change in Sectoral Trade Balance (2004 US$ million)
Raw Milk	1.083	1.706				
Processed Dairy Products	0.725	1.639	2.209	2.950	0.398	103.42

The percentage changes in output of the raw milk and processed dairy product sectors seen in Table 6.10 equate to growth in output of US$43 million and US$78 million, respectively, for these two sectors. The market price in both of these sectors has also increased. The largest change in output by sector is shown by the processed meat products sector, with a 5.99 percent higher output once trade liberalisation has occurred, equating to an increase of approximately US$261 million. All of the agricultural and food sectors show an increase in output, with the exception of the cropping sector, while the output of all non-agricultural sectors falls. The cropping sector's demand for land has fallen by 2 percent as a result of higher demand by the raw milk and livestock and wool sectors, while all other endowments have been transferred into the agricultural and food sectors from the cropping and non-agricultural sectors. This reinforces that New Zealand's natural advantage lies in pastoral agricultural and food production, and proves that the fall in output of these sectors in scenario 2 was an example of the theory of the second best. The removal of United States tariffs on only non-agricultural imports introduced new distortions to international trade.

As will be seen below, the removal of the United States' tariffs on New Zealand exports of processed dairy products leads to a substantial increase in those exports to the United States. New Zealand's volume of processed dairy product exports has correspondingly increased by 2.2 percent, and the value of those exports by 3 percent, both very significant changes when it is considered that the dairy industry is estimated to provide around a quarter of the value of New Zealand's total merchandise exports (New Zealand Institute of Economic Research, 2010). The effect of TPP Expansion Scenario 3 is to increase the value of New Zealand's exports of processed dairy products by around US$111 million, and New Zealand's total exports by around US$221 million. The volume of exports of the processed meats sector has increased by 10.66 percent, or a value of approximately US$274 million, by far the largest increase in this trade liberalisation scenario.

Aside from a small increase in exports of the other food sector, all other sectors experience a decline in export volumes from New Zealand, reflecting greater purchases of intermediate inputs by the processed dairy and meat products sectors, and the decline in

output of the cropping and non-agricultural sectors. While the reasons for the decline of output of the non-agricultural sectors is clear when considering where New Zealand's natural advantage lies, it is less clear when considering the cropping sector. On top of the greater demand for land and other resources by other agricultural and food sectors diverting those resources away from the cropping sector, the fall in demand for New Zealand's exports in that sector is also likely to have played a part. New Zealand's exports in the cropping sector have declined by around 3 percent. The growth in output of the United States' cropping sector is likely to be largely to blame. This increase in output comes as a result of resources being diverted from the raw milk, livestock and wool and light manufacturing sectors to the cropping sector in the United States, and has seen significant growth in United States exports in this sector (which make up around a quarter of global cropping exports), taking market share from New Zealand (and most other countries).

Of interest is the size of growth in New Zealand's exports of processed dairy products compared to global growth of these exports. The value of global exports in the processed dairy sector has increased by 0.40 percent as a result of TPP Expansion Scenario 3, with the largest increases in value shown by New Zealand and the United States, respectively. The higher percentage growth for the value of New Zealand's exports shows that the New Zealand industry is capturing a slightly larger share of the value of the global export market. The sectoral trade balance for processed dairy in New Zealand has improved by US$103 million, as a result of an increase in both export volumes and prices.

Table 6.11   **Effect of TPP Expansion Scenario 3 on New Zealand's Export Sales of Processed Dairy Products**

Trading Partner	% Change in Volume of Exports
Australia	-3.583
Malaysia	-3.482
Singapore	-4.119
Viet Nam	-7.192
Brunei	7.406
USA	49.084
Chile	-4.706
Peru	-0.459

The removal of significant protection in the processed dairy sector by the United States has resulted in a 10 percent increase in its imports in this sector. Despite the increase in price received by New Zealand exporters, the market price of New Zealand's processed dairy products in the United States has fallen 6.4 percent as a result of the removal of tariffs. This has driven a massive 49 percent increase in the volume of exports in this sector from New Zealand to the United States. The base value of these exports of US$447 million not only makes New Zealand the largest single country source of the United States' processed dairy imports, providing almost a third of all exports of processed dairy to the United States, but also means that the value of New Zealand's exports to the United States in this sector increases by

around US$220 million as a result of TPP Expansion Scenario 3. Accordingly, the proportion of New Zealand's processed dairy exports going to the United States has increased from 12 percent to approximately 17 percent.

Despite this large increase in imports from New Zealand, the United States' sales of domestically produced processed dairy products have fallen by just 0.23 percent, and production by just 0.17 percent. This is a result of United States' imports of processed dairy products equating to just 2.7 percent of its production in this sector, while imports have fallen from its other major import sources; Australia, Chile, and the aggregated Rest of World region. Huge proportionate increases in exports of processed dairy products to the United States from Viet Nam, Brunei Darussalam and Malaysia come from very small base values.

Outstripping the large increase in processed dairy exports from New Zealand to the United States is the increase in New Zealand's exports of meat products to the United States. From a base of approximately US$396 million, export volumes have increased by 91 percent, translating into an increase in value of approximately US$365 million. The proportion of New Zealand's exports of meat products going to the United States increased from 16 percent to 28 percent. In this sector, Australia is by far the largest import source for the United States (excluding the Rest of World region), yet Australia's exports to the United States decline by almost 4 percent as a result of trade liberalisation under scenario 3. Consequently, New Zealand gains considerable market share of the United States' imports of meat products.

As can be seen in Table 6.11, New Zealand's exports of processed dairy to Brunei Darussalam show the only increase other than the United States, which comes from a very small base value. The decline in export volumes to Australia, Malaysia, Singapore, Viet Nam, Chile and Peru represents significant loss of value when the size of New Zealand's exports of processed dairy to those countries is considered. Malaysia, for example, in the projected baseline data is almost as significant as the United States as a destination for those exports. However, the overall volume of exports from New Zealand has increased by 2.21 percent, and the adjustments in export volumes to specific destinations under TPP Expansion Scenario 3 is just a result of removing the existing import protection in the United States' and Peruvian markets. If this protection did not exist prior to the expanded agreement such large negative changes would not be seen.

Scenario 4: Scenario 4 simulates the full removal of all import protection amongst all of the countries involved in negotiations for TPP expansion, as in scenario 3, but also includes the removal of the United States' export subsidies on exports of processed dairy products to all TPP partners. This represents an optimistic situation that is not likely under the negotiations taking place. Due to results being, for the most part, very similar to those in scenario 3, only the main points of interest will be discussed.

Table 6.12   Economy-Wide Results of TPP Expansion Scenario 4

Region	EV (2004 US$ million)	Terms of Trade Effects on EV	Allocative Efficiency Effects on EV	% Change in GDP	Change in Trade Balance (2004 US$ million)	% Change in Terms of Trade
NZ	138.72	140.83	5.29	0.476	-23.59	0.497
Australia	-82.38	-81.48	3.15	-0.033	22.36	-0.077
Malaysia	403.77	310.56	110.09	0.168	-56.61	0.153
Singapore	-67.10	-64.65	-2.58	-0.041	3.43	-0.036
Viet Nam	1216.84	858.12	98.05	4.158	-897.32	2.343
Brunei	4.36	86.16	2.29	2.897	42.08	1.759
USA	-218.83	-232.03	146.76	-0.018	22.52	-0.019
Chile	14.56	15.12	1.51	0.046	5.22	0.039
Peru	-3.78	-14.63	7.25	-0.141	-7.36	-0.107
World	-85.66	-11.24	-72.72			

The additional welfare benefit to New Zealand from the removal of United States' export subsidies on processed dairy exports to the expanded TPP partners, over and above complete tariff removal amongst those partners, is seen to be just over $US3 million. The gain comes mostly from a slightly larger improvement in New Zealand's terms of trade. Of course, this is logical since any export subsidy, particularly when it is implemented by a large country such as the United States, has the tendency to depress world prices through an excess supply of product on global markets. The removal of the United States' export subsidy on processed dairy exports to other TPP partners causes a decline in export volumes, and indeed production, of processed dairy in the United States. This allows the export prices received by other countries such as New Zealand, who do not subsidise their exporters, to rise. Thus, the price index for global exports of processed dairy has increased by a greater proportion (0.10 percent compared to 0.07 percent) when United States' export subsidies are removed as well as full tariff removal. The resulting improvement in terms of trade has resulted in a welfare gain for New Zealand since processed dairy exports play such an important role in generating New Zealand's export earnings.

Australia also sees a slight improvement in its welfare change from scenario 3 to scenario 4, although the overall effect is still negative. Again, the change between the two scenarios is due to an improved terms of trade effect, since Australia is also a significant dairy exporter. The only other changes to welfare between the two scenarios worth discussing are shown by Malaysia, Singapore and Viet Nam. All of these countries suffer a slightly worse welfare effect under scenario 4 than scenario 3, which comes through a worsened terms of trade effect. This is due to these countries being net importers of processed dairy products, and therefore suffering as a result of the higher world price of processed dairy exports when the United States removes its export subsidy. While the United States does not show a significant change in welfare between scenario 3 and 4, the allocative efficiency effect on

welfare is however larger under scenario 4, to the extent of US$3.39 million. The extra gains to allocative efficiency in the United States as a result of the removal of its export subsidies on processed dairy exports show that these subsidies had a distortionary impact on the allocation of resources within the United States economy.

Table 6.13   Implications for the New Zealand Dairy Industry of TPP Expansion Scenario 4

Sector	% Change in Price	% Change in Output	% Change in Export Volumes from NZ	% Change in Value of Exports from NZ	% Change in Value of Global Exports	Change in Sectoral Trade Balance (2004 US$ million)
Raw Milk	1.132	1.915				
Processed Dairy Products	0.753	1.883	2.516	3.289	0.363	115.82

The removal of United States' export subsidies on processed dairy exports to the TPP expansion partners, as well as complete tariff removal amongst those countries, has resulted in a slightly larger increase in price for processed dairy products in New Zealand than without the subsidy removal. The market price in the raw milk sector has also increased by a greater proportion, due to higher output and export volume gains in the processed dairy sector. These have led to greater demand for raw milk as an input in the production process, and the price and output of raw milk has subsequently increased by more than in the case of tariff liberalisation without the export subsidy removal.

As a result of larger increases in both price and export volumes of processed dairy in New Zealand, the value of these exports has also increased by a larger proportion (3.29 percent) than under scenario 3 (2.95 percent). This is to be expected when we consider the distortionary effect that the United States' export subsidies previously had on world markets. Interestingly, although the global price index of processed dairy exports has increased by a greater proportion in scenario 4 than scenario 3, the volume of these exports has increased by a smaller proportion, and this has resulted in smaller growth in the value of those exports. The cause of this smaller growth in volume is, as expected, the United States whose processed dairy exports grow by 2.35 percent with full tariff removal under TPP expansion, but instead decline by 1.17 percent when its export subsidies are removed as well. This means that New Zealand's share of the value of global processed dairy exports is higher after the trade liberalisation undertaken in scenario 4, than under scenario 3. The benefit to New Zealand's trade in processed dairy is seen from comparison of the changes in the sectoral trade balance, US$103 million in scenario 3, and US$116 million in scenario 4. The value of New Zealand's exports of processed dairy products increases by US$111 million under scenario 3 and US$123 million under scenario 4.

The sector to gain most from TPP expansion involving the United States food and agricultural sectors is still the meat products sector, now with a 5.92 percent higher output under scenario 4. As seen above, in moving from scenario 3 to scenario 4, resources are diverted more towards the dairy sector so that production may increase by a greater proportion. This means that fewer resources are available for the other sectors, and consequently the gains (losses) in production in all of those sectors are lower (higher) than if the United States' processed dairy export subsidies were not removed. A similar story is seen when considering export volumes. However, the lower production in all of these other sectors does result in higher market prices in those sectors.

Table 6.14   **Effect of TPP Expansion Scenario 4 on New Zealand's Export Sales of Processed Dairy Products**

Trading Partner	% Change in Volume of Exports
Australia	-3.260
Malaysia	-1.669
Singapore	-2.254
Viet Nam	-2.522
Brunei	9.528
USA	48.817
Chile	-1.595
Peru	1.696

Of interest from a comparison of Tables 6.11 and 6.14, the growth in New Zealand's exports of processed dairy to the United States is smaller under scenario 4 than scenario 3. There are two forces at work behind this result. Firstly, aggregate imports of processed dairy by the United States grow by a slightly smaller proportion under scenario 4, and so there is less potential for New Zealand exports in the United States market. When coupled with the information that sales of domestically produced raw milk and processed dairy in the United States have fallen by a greater proportion in scenario 4, it appears that the United States is simply consuming less dairy than when export subsidies were still in place.

The second explanation is given by another comparison of Tables 6.11 and 6.14, where it can be seen that New Zealand's exports of processed dairy to Australia, Malaysia, Singapore, Viet Nam and Chile have fallen by a smaller proportion under scenario 4; exports to Peru have changed from a fall under scenario 3 to an increase under scenario 4; and exports to Brunei Darussalam have increased by a greater proportion under scenario 4. Thus, as a result of the removal of United States' export subsidies, New Zealand's exports of processed dairy have become more attractive to these countries. The removal of its export subsidy has meant that United States' exports have become more expensive in these markets, making New Zealand's exports relatively cheaper in comparison. A small part of New Zealand's increased exports to the United States under scenario 3 has therefore been diverted to other TPP partners instead upon removal of the United States' dairy export subsidy. This is confirmed by analysing United States' processed dairy exports to these countries, which have all declined by a greater

proportion or grown by a smaller proportion under scenario 4 when compared to scenario 3, and many have changed from growth under scenario 3 to decline under scenario 4.

The New Zealand – Russia – Belarus – Kazakhstan Free Trade Agreement
In simulating the free trade agreement between New Zealand and the Russia-Belarus-Kazakhstan Customs Union, all tariffs on trade between New Zealand and the Union will be eliminated. There are no export subsidies, and export taxes present in the database for extraction and manufacturing will not be altered.

Table 6.15   Economy-Wide Results for New Zealand – Russia – Belarus – Kazakhstan Free Trade Agreement

Region	EV (2004 US$ million)	Terms of Trade Effects on EV	Allocative Efficiency Effects on EV	% Change in GDP	Change in Trade Balance (2004 US$ million)	% Change in Terms of Trade
NZ	11.93	12.02	0.57	0.038	-0.51	0.042
RussiaBK	5.58	-5.57	7.56	-0.005	-4.05	-0.002
World	3.09	0	3.10			

New Zealand's welfare gain, estimated using the equivalent variation measure, from the conclusion of a free trade agreement with Russia and its Customs Union partners Belarus and Kazakhstan is US$11.93 million. This gain originates from a 0.04 percent improvement in New Zealand's terms of trade. The processed dairy sector is the source of the largest value gain in terms of trade, which is driven by an increase in New Zealand's export price in this sector. The removal of Russia, Belarus and Kazakhstan's tariffs on New Zealand's exports of processed dairy has made imports from New Zealand more affordable in those markets, where consequently demand for New Zealand exports has drastically increased. The price received by New Zealand exporters has therefore risen. The meat products sector also benefits from an increase in its export price, although the gain is not so large since the increase in export price is not so large.

Russia, Belarus and Kazakhstan also experience a welfare gain from the implementation of this free trade agreement, although it is estimated to be around half the size of New Zealand's. Contrary to New Zealand, however, this gain is driven by an allocative efficiency gain, while suffering a significant terms of trade loss. Russia, Belarus and Kazakhstan's allocative efficiency gain is driven by the dairy processing sector, which experiences a 0.5 percent decrease in output as a result of the free trade agreement. This decline in output results from the increased imports in this sector from New Zealand, as will be seen below. Land is diverted into other agricultural uses, while other resources are diverted from dairy production into non-agricultural production. The most significant increase in production is seen in the heavy manufacturing sector, where exports also increase. The terms of trade loss comes through a decline in the export prices received by Russia, Belarus and

Kazakhstan for their heavy manufacturing exports, as a result of the increased production and export volume discussed above.

The global welfare change associated with this free trade agreement is a gain of US$3.09 million, coming entirely from allocative efficiency improvements. The removal of Russia, Belarus and Kazakhstan's tariffs on New Zealand exports of processed dairy products (since Russia, Belarus and Kazakhstan's allocative efficiency gains originate here) has resulted in a significant efficiency gain for global resource use. A potential source of bias in these results is provided, as discussed above, by Groser (2011a), where he discusses the growing importance of Belarus' dairy sector. It could be the case that output in Belarus' processed dairy sector is not being affected as much as indicated here, but that this is being overshadowed by the larger Russian and Kazakhstan economies. This theory has been tested by separating the three countries in the GTAP simulations, but it is not apparent in the resulting simulation effects; Belarus' dairy production still declines. No other regions in this simulation show noteworthy effects.

Table 6.16   **Implications for the New Zealand Dairy Industry of the New Zealand – Russia – Belarus – Kazakhstan Free Trade Agreement**

Sector	% Change in Price	% Change in Output	% Change in Export Volumes from NZ	% Change in Export Volumes from NZ to Russia, Belarus, Kazakhstan	% Change in Value of Exports from NZ	% Change in Value of Global Exports	Change in Sectoral Trade Balance (2004 US$ million)
Raw Milk	0.150	0.617					
Processed Dairy Products	0.088	0.714	0.905	261.94	0.994	0.052	36.31

The removal of the large 20 percent ad valorem equivalent tariff on New Zealand's exports of processed dairy products to Russia, Belarus and Kazakhstan has resulted in a significant (over 16 percent) drop in the price of those products in those markets. The resulting increase in demand for New Zealand's exports of processed dairy, where export volumes to Russia, Belarus and Kazakhstan have increased by a huge 262 percent, has driven up the price of New Zealand's exports in this sector. Although coming from a base of just US$19.91 million in the projected database, New Zealand exports of processed dairy to Russia, Belarus, and Kazakhstan have increased to US$72.14 million as a result of this tariff removal.

The increased exports of processed dairy to Russia, Belarus and Kazakhstan has meant a greater total volume of New Zealand exports in the dairy sector, and a corresponding increase in output in both the raw milk and processed dairy sectors. While the increased

demand for exports has driven up the price of processed dairy products in New Zealand, as discussed above, the increased output of the processed dairy sector has driven up the price of raw milk due to increased demand for raw milk as an input in the production process. Farmers have responded with increased production, resulting in greater profitability for dairy farming in New Zealand. The value of exports of processed dairy products from New Zealand has increased by 1 percent as a result of the introduction of this free trade agreement, a significant amount when the value of those exports was estimated at around $10 billion for 2009 (New Zealand Institute of Economic Research, 2010). The value of global exports of processed dairy products has increased, but by a much smaller proportion than has New Zealand's, and so New Zealand will capture a greater share of the value of global dairy trade as a result of the free trade agreement with Russia, Belarus and Kazakhstan. The trade balance of the processed dairy sector is seen to increase by US$36 million, as a result of the growing value of New Zealand's exports.

The huge growth in New Zealand exports of processed dairy to Russia is facilitated both by the increase in production of this sector, and a decline in export volumes to other trading partners. Export volumes to all other regions have decreased by around 0.3-0.5 percent. This is natural since the removal of Russia, Belarus and Kazakhstan's import tariff for New Zealand exports has made this market more profitable and therefore more attractive for exporters. Russia, Belarus and Kazakhstan's imports of processed dairy products have increased by 2.84 percent, with the only region to increase its volume of exports to this market being New Zealand. Exports of processed dairy from all other regions to Russia, Belarus and Kazakhstan have fallen by around 3.5-4 percent. Thus, New Zealand's industry is capturing a much larger share of the import market in Russia, Belarus and Kazakhstan as a result of the free trade agreement.

The increase in production of raw milk and processed dairy products in New Zealand due to increased export profitability has resulted in declining production in all other sectors. Resources have been diverted away from all other production to dairy production, even though tariffs on trade in all those sectors have also been eliminated. Total export volumes in all other sectors have declined, although exports to Russia, Belarus and Kazakhstan have increased in all sectors. While this is possibly due to the ad valorem equivalent tariff being largest for processed dairy products, it also shows where New Zealand's natural production advantage lies. New Zealand's export prices have improved in all sectors.

The removal of New Zealand's tariffs on imports in the manufacturing and other food sectors has resulted in increased exports from Russia, Belarus and Kazakhstan to New Zealand in these sectors. Exports to all other regions have also increased, so this increase is due not only to New Zealand's tariff eliminations but also increased production in these sectors as a result of resources moving out of Russia, Belarus and Kazakhstan's processed dairy sectors. The export price received by Russia, Belarus and Kazakhstan in these sectors has therefore fallen.

The New Zealand – Korea Free Trade Agreement

In simulating the potential free trade agreement between New Zealand and Korea, all tariffs on trade between New Zealand and Korea will be eliminated. There are no export subsidies on trade between these countries, and the small export taxes that exist on New Zealand's exports to Korea in the extraction and manufacturing sectors will not be altered.

Table 6.17   Economy-Wide Results for New Zealand – Korea Free Trade Agreement

Region	EV (2004 US$ million)	Terms of Trade Effects on EV	Allocative Efficiency Effects on EV	% Change in GDP	Change in Trade Balance (2004 US$ million)	% Change in Terms of Trade
NZ	148.36	149.48	6.92	0.489	-11.84	0.527
Korea	28.47	-27.76	48.30	-0.022	-67.80	-0.008
World	15.13	-0.28	15.40			

Table 6.17 shows that New Zealand stands to make a large welfare gain from a possible free trade agreement with Korea. The US$148 million welfare gain is made up mostly of the terms of trade gain realised through a 0.53 percent improvement in New Zealand's terms of trade. The largest terms of trade gain is seen in the processed dairy sector, originating from an improved export price. This sector is followed by the meat products and cropping sectors, while significant terms of trade gains from improved export prices are also found in the manufacturing, livestock and wool, and other food sectors. All sectors in New Zealand have seen increased export prices, with larger increases for the agricultural and food sectors than the others. The large increases in export prices for the agricultural and food sectors are a result of the very heavy import protection afforded to Korea's industries before the implementation of the free trade agreement. New Zealand's allocative efficiency gain seen in Table 6.17 originates mainly in the services sector, so is outside the scope of this study. However, small allocative efficiency gains are made in the dairy processing and other food sectors, alongside increases in output.

The potential welfare gains for Korea from the implementation of this agreement, although smaller than those of New Zealand, are still significant. In contrast to results for New Zealand, the US$28 million gain for Korea is driven by a large allocative efficiency gain, which is partially offset by a terms of trade loss. Allocative efficiency gains are seen in the heavy manufacturing, processed dairy, and meat products sectors. The removal of large tariffs on imports of processed dairy and meat products from New Zealand has resulted in a huge increase in those imports from New Zealand, and increases in the total volume of imports of 38 percent and 29 percent respectively. Imports of processed dairy and meat have become much cheaper than domestically produced items, which has resulted in significant reductions in Korean production in both sectors (2.8 percent and 3.1 percent). The allocative efficiency gains in these sectors are driven by the improved access that New Zealand exporters enjoy. The preferences given to other countries before the implementation of this agreement resulted in trade diversion since New Zealand exporters found it difficult to compete with such

heavy protection in place. Its removal puts New Zealand exporters back on an even footing with other meat and dairy producing nations, ensuring Korean imports are sourced from the most efficient supplier. Since not only New Zealand's exports to Korea, but also total exports to Korea, have increased markedly in these sectors as a result of the agreement, the removal of Korean tariffs on New Zealand imports in these sectors must be the source of the allocative efficiency gains.

Korean resources have been diverted from agricultural production into the heavy manufacturing sector, where the decline in market prices has been much smaller. Both production and export volumes of heavy manufacturing have increased substantially, resulting in an allocative efficiency gain for the heavy manufacturing sector. The overall allocative efficiency gain for Korea shows that the import protection it placed on New Zealand exports of agricultural and food products distorted its production and trade patterns. The Korean terms of trade loss is seen most significantly in falls in export prices in the manufacturing and other food sectors, while these are partially offset by a fall in import prices in the cropping sector. The fall in import prices in the cropping sector is driven by a movement away from Viet Nam as an import source.

The effect on global welfare of the free trade agreement between New Zealand and Korea is positive, shown through a substantial increase to allocative efficiency. Table 6.17 shows a significant increase of 0.49 percent in New Zealand's GDP, while Korea's GDP suffers a small decline. Both countries experience deteriorations in their trade balances; New Zealand's caused by lower export volumes in the manufacturing sectors and Korea's caused by higher import volumes in the meat and processed dairy sectors. All regions external to the agreement suffer welfare losses largely caused by negative terms of trade effects, the most significant of which are shown by the United States, Australia, and Viet Nam.

Table 6.18   Implications for the New Zealand Dairy Industry of the New Zealand – Korea Free Trade Agreement

Sector	% Change in Price	% Change in Output	% Change in Export Volumes from NZ	% Change in Export Volumes from NZ to Korea	% Change in Value of Exports from NZ	% Change in Value of Global Exports	Change in Sectoral Trade Balance (2004 US$ million)
Raw Milk	1.206	1.006					
Processed Dairy Products	0.788	0.842	1.451	545.05	2.251	0.201	68.23

From Table 6.18, it can be seen that the price and output of both the raw milk and processed dairy sectors increase as a result of the free trade agreement between New Zealand and Korea. The change in price and output of the processed dairy sector is a direct result of the removal of the large 40 percent ad valorem equivalent tariff on exports to Korea. The price of New Zealand processed dairy products in the Korean market has fallen by 28 percent, and as a result the volume of exports from New Zealand to Korea in this sector has dramatically increased. The 545 percent rise in export volumes translates to a US$219 million rise in the value of these exports. The drastic increase in New Zealand's exports of processed dairy to Korea has resulted in an increased total volume of processed dairy exports, although New Zealand's exports to every other region in the study have declined. Similarly, Korea's imports of processed dairy products have fallen from every other region in the study. The value of New Zealand's processed dairy exports has increased by a significant 2.25 percent (US$84 million), where New Zealand has captured a larger share of the value of global dairy exports.

While the output of the processed dairy sector increases by 0.84 percent, larger increases in output are experienced by the meat products (5.54 percent) and livestock and wool (2.25 percent) sectors. These sectors' demand for resources has increased by a larger proportion than has dairy's, and so the growth in output for the processed dairy sector is smaller due to the competition for those resources. Higher growth in the meat products sector is explained when considering New Zealand's meat exports to Korea, which are already larger than those for processed dairy products before tariff elimination, yet grow by a greater proportion as a result of this free trade agreement. Total volume of meat product exports from New Zealand grows by 9.79 percent as a result of tariff elimination, compared to 1.45 percent for processed dairy exports. The large increase in output of the meat products sector also explains the growth in the livestock and wool sector, the output of which is largely used as inputs in the production processes of the meat sector. This is confirmed by the total volume of livestock and wool exports from New Zealand falling, although the volume exported to Korea has risen.

While all agricultural sectors see a growth in output in New Zealand, the non-agricultural sectors are faced with declining production. Pre-liberalisation tariffs on exports to Korea were lower than for the agricultural sectors, so the growth in export volumes to Korea are smaller than for agricultural and food products. Exports to Korea in the forestry sector have in fact declined slightly, while New Zealand's total exports of light manufacturing, heavy manufacturing, and forestry have all fallen. Price increases are smaller than in the agricultural and food sectors, and non-agricultural sectors therefore face increasing competition for resources.

The US$68 million increase in the trade balance of the New Zealand processed dairy sector is due to the increased price and volume of exports discussed above, although this is overshadowed by a massive US$252 million improvement in the trade balance of the meat products sector.

The New Zealand – India Free Trade Agreement

In simulating the potential free trade agreement between New Zealand and India, all tariffs on trade between New Zealand and India will be eliminated. There are no export subsidies on trade between these countries, and the small export taxes that exist on some of New Zealand's exports (extraction and manufacturing) to India will not be altered.

Table 6.19 Economy-Wide Results for New Zealand – India Free Trade Agreement

Region	EV (2004 US$ million)	Terms of Trade Effects on EV	Allocative Efficiency Effects on EV	% Change in GDP	Change in Trade Balance (2004 US$ million)	% Change in Terms of Trade
NZ	50.31	48.49	4.56	0.157	-2.18	0.171
India	-17.92	-13.91	-2.25	-0.019	-20.51	-0.011
World	-9.21	-0.03	-9.18			

As a result of the possible free trade agreement between New Zealand and India, New Zealand experiences a welfare gain of US$50 million. This gain is made up mostly of the terms of trade effect, the result of a 0.17 percent improvement in New Zealand's terms of trade. All sectors experience a terms of trade gain due to increases in New Zealand's export prices, most significantly the forestry, manufacturing, and processed dairy sectors. The removal of large Indian tariffs on New Zealand exports results in decreases in the prices of those products in the Indian market, with a 22 percent fall in price shown by New Zealand's processed dairy products, and the largest being a 36 percent drop for the other food sector. Subsequent large increases in Indian demand for New Zealand products have driven up the price received by New Zealand exporters, and resulted in the terms of trade gain seen above.

Although the prices of New Zealand exports of forestry and light manufacturing in Indian markets see a smaller decline in price than most of the agricultural sectors, the value of exports from New Zealand to India in these sectors prior to tariff removal is far higher than in any other sector. This is why the relatively small increase in price to New Zealand exporters for light manufacturing can result in a significant terms of trade gain, although the greatest increase in export price is seen for New Zealand's forestry sector. India is New Zealand's second most important export destination for forestry products in the projected GTAP baseline, so the removal of tariffs on those exports has significantly boosted the price index of New Zealand's aggregate forestry exports.

The only significant sectoral allocative efficiency gain for New Zealand, other than in the services sector which is outside the scope of this study, is seen in the light manufacturing sector. This sector has experienced a 0.44 percent gain in production, a 1.93 percent increase in export volumes, and a 61.65 percent increase in exports to India as a result of trade liberalisation. Thus, the 7.16 percent ad valorem equivalent tariff that was present in this sector before its removal contributed to distortions in production and trade patterns in New Zealand.

India faces a non-trivial US$17.92 million loss in welfare following implementation of tariff elimination on bilateral trade between New Zealand and India. While the majority of this loss is the result of a 0.01 percent decline in India's terms of trade, a small allocative efficiency loss is seen as well. India's terms of trade loss is caused by a fall in export prices in the manufacturing sectors, which are by far India's greatest exports in the projected baseline. Thus, the 0.02 percent and 0.01 percent declines in export prices for the light and heavy manufacturing sectors, respectively, drive this loss. Export prices have declined in all sectors in India, since exports from India to all other regions have increased as a result of this free trade agreement, rather than just New Zealand as would be expected. In most sectors, the fall in the market price of imports has been greater than the fall in the price of domestically produced goods, and thus the fall in demand for domestically produced goods has been greater than the fall in production. The resulting need to export surplus has meant that the market price of India's exports in all regions has declined, even though tariffs have not changed. Indian exporters therefore receive a lower price. India's production of light manufacturing grows while its demand for domestically produced light manufacturing products falls and imports increase, while the growth in demand for India's domestically produced heavy manufacturing is smaller than the growth in its production.

India's small allocative efficiency loss originates in the light manufacturing sector, and is caused by the reduction in imports from the GCC, China, and the Rest of World region. Imports from New Zealand have displaced these due to the preferential access New Zealand's industry receives while significant protection remains in place with respect to the GCC (14.9 percent AVE), China (17.1 percent AVE), and the Rest of World (13.4 percent AVE). This is an example of trade diversion resulting from the implementation of a preferential trading agreement. The global allocative efficiency loss observed supports this theory.

Table 6.20   **Implications for the New Zealand Dairy Industry of the New Zealand – India Free Trade Agreement**

Sector	% Change in Price	% Change in Output	% Change in Export Volumes from NZ	% Change in Export Volumes from NZ to India	% Change in Value of Exports from NZ	% Change in Value of Global Exports	Change in Sectoral Trade Balance (2004 US$ million)
Raw Milk	0.199	-0.201					
Processed Dairy Products	0.160	-0.207	-0.222	426.77	-0.062	0.022	-3.83

Increases in price for New Zealand's raw milk and processed dairy sectors are met with reduced outputs, and a reduced export volume for the processed dairy sector. This is since the removal of India's tariffs on New Zealand's exports has encouraged production in the cropping, forestry, and light manufacturing sectors instead, while a small increase is also seen in the extraction sector. Resources have flowed out of all other agricultural sectors to the cropping sector, since it experiences the largest gain in value of exports to India of the agricultural and food sectors. Of these sectors, cropping is the only one to experience an increase in its aggregate volume of exports as a result of this free trade agreement. The Indian tariff on cropping imports from New Zealand was second in magnitude behind only the other food sector, which had only a very small value of exports from New Zealand to India before trade liberalisation.

Prior to implementation of this free trade agreement, the two largest export values from New Zealand to India were found in the forestry and light manufacturing sectors. Thus, upon removal of the tariffs in these sectors, the growth in value of exports to India has been far greater than in any others, with the exception of the cropping sector discussed above. Strong growth in demand for New Zealand's exports of cropping, forestry and light manufacturing in India are therefore the driving forces behind the decline in production of New Zealand's dairy sectors. While the volume of exports to India do increase remarkably (427 percent in the processed dairy sector), the drag on resources from the cropping, forestry and light manufacturing sectors means that the fall in export volumes to other trading partners outweigh the increase in export volume to India, and the total volume of exports from New Zealand falls by 0.2 percent. This drives a decline in the value of those exports, which when coupled with an increased import volume contributes to a sectoral trade balance deterioration.

The limitations of using a database based on 2004 data show up clearly here. Historically, New Zealand's two key agricultural exports, meat and dairy products, have not featured in the bilateral relationship with India (Government of India & New Zealand Government, 2009). The significant change in dairy trade between India and New Zealand in the last few years (Ministry of Foreign Affairs and Trade, 2011n) has not been realised in the construction of the database. Had a more recent database been available that recognises the growth in dairy consumption that has occurred in India as incomes have risen, a far different result may have been achieved.

The New Zealand – Gulf Cooperation Council Free Trade Agreement
The simulation of this agreement removes all tariffs on all trade between New Zealand and the Rest of Western Asia area, as well as the very small export subsidies that are found on exports of cropping and other food from the Rest of Western Asia to New Zealand. Export taxes on trade between the two countries in extraction and manufacturing are not altered.

Table 6.21   **Economy-Wide Results for New Zealand – Gulf Cooperation Council Free Trade Agreement**

Region	EV (2004 US$ million)	Terms of Trade Effects on EV	Allocative Efficiency Effects on EV	% Change in GDP	Change in Trade Balance (2004 US$ million)	% Change in Terms of Trade
NZ	29.27	29.45	1.26	0.096	-6.27	0.104
GCC	-3.37	-3.04	-2.86	-0.006	-10.05	-0.001
World	-12.57	-0.01	-12.56			

The implementation of the free trade agreement between New Zealand and the GCC brings a welfare benefit of US$29.3 million to New Zealand, again the result of a terms of trade gain, this time from a 0.1 percent improvement in New Zealand's terms of trade. Major contributions are provided by increases in New Zealand's export prices in the processed dairy, meat products, and manufacturing sectors, while all of New Zealand's other agricultural and food sectors also show significant gains from export price rises (with the exception of the raw milk sector). Processed dairy, heavy manufacturing, meat products, and light manufacturing, respectively, are New Zealand's most important exports to the GCC in the projected GTAP baseline. Therefore the removal of tariffs and the resulting fall in the prices of New Zealand dairy, manufacturing, and meat products in GCC markets, which makes these exports more attractive to GCC buyers, causes the rise in export price and subsequent terms of trade gains for New Zealand.

The Gulf Cooperation Council suffers a small overall welfare loss in these simulation results, from a negative effect coming from both terms of trade and allocative efficiency. The terms of trade loss is due to reduced export prices in the manufacturing sectors, where production has increased since increased imports from New Zealand have displaced a small amount of domestic production in nearly all other sectors. Resources have been diverted into manufacturing and production has increased, however domestic sales of domestic production has fallen in the light manufacturing sector and increased by a much smaller amount (than the increase in imports) in the heavy manufacturing sector, meaning surpluses have had to be exported. This is shown since exports of manufacturing to all other regions have increased, not just to New Zealand. The resulting fall in export prices has caused the small terms of trade loss seen above.

The allocative efficiency loss of the GCC is seen in the processed dairy sector, as a result of the fall in production of 0.75 percent. While the removal of the GCC's tariff on New Zealand processed dairy exports will always lead to an increase in those exports, in this scenario there are still very restrictive tariffs on New Zealand processed dairy exports to Russia, Belarus and Kazakhstan, India, Korea, and the United States. The removal of the GCC's tariff causes New Zealand exports to target this market due to the improved access, when had the other countries' tariffs also been eliminated New Zealand exporters could have found those markets more attractive than the GCC's. Thus, it is possible that the reduction in the

GCC's processed dairy production could have occurred more efficiently instead in Russia, Belarus, Kazakhstan, India, Korea, or the United States, and so the GCC's allocation of resources is being distorted by the protection remaining in other markets. The majority of the US$12.6 million global loss in allocative efficiency is attributed to the processed dairy sector, and therefore lends support to this argument. From the simulation representing the simultaneous implementation of all of New Zealand's PTAs under negotiation, the GCC's production of processed dairy products declines by a smaller proportion (0.42 percent) than under the bilateral agreement only, which further supports this possibility.

New Zealand's GDP rises by 0.1 percent as a result of the agreement, a significant increase. The small deterioration in New Zealand's trade balance is largely due to an increase in import volumes from the GCC in the heavy manufacturing sector. The GCC's trade balance deterioration comes from a significant increase in aggregate import volumes in the processed dairy sector, as a result of growth in imports from New Zealand.

Table 6.22   Implications for the New Zealand Dairy Industry of the New Zealand – Gulf Cooperation Council Free Trade Agreement

Sector	% Change in Price	% Change in Output	% Change in Export Volumes from NZ	% Change in Export Volumes from NZ to GCC	% Change in Value of Exports from NZ	% Change in Value of Global Exports	Change in Sectoral Trade Balance (2004 US$ million)
Raw Milk	0.295	1.075					
Processed Dairy Products	0.182	1.240	1.593	39.983	1.779	0.084	64.05

The removal of the GCC's tariff on New Zealand exports of processed dairy products sees a 5 percent drop in the market price of those products in the GCC. The resulting 40 percent increase in export volume to the GCC, equating to an increase in value of almost US$100 million, has resulted in a higher price received by New Zealand dairy exporters, as well as a higher total dairy export volume from New Zealand. New Zealand exports of processed dairy products to every other region have declined in this simulation as a result of the greater profitability of exporting to the GCC. The almost 2 percent (US$67 million) increase in the value of processed dairy exports from New Zealand is very beneficial for the New Zealand dairy industry, particularly when the growth in global market share that results is considered.

The increased profitability of exporting dairy products from New Zealand has resulted in increased output in the processed dairy sector, and also the raw milk sector as demand for raw milk in processed dairy production grows. However, output in all other sectors in New

Zealand declines due to the increased demand for resources in the dairy sectors. Aggregate export volumes in all of these sectors apart from forestry and heavy manufacturing (which experience very small increases) fall, despite export volumes from New Zealand to the GCC rising across the board.

Simultaneous Implementation

This simulation combines all of the previous preferential trading agreements that New Zealand is currently negotiating. TPP Expansion Scenario 3, where the United States' export subsidies for processed dairy products are not altered, is the form of the Trans-Pacific Partnership included. Results will only be discussed for New Zealand in this scenario.

Table 6.23   Economy-Wide Results for Simultaneous Implementation

Region	EV (2004 US$ million)	Terms of Trade Effects on EV	Allocative Efficiency Effects on EV	% Change in GDP	Change in Trade Balance (2004 US$ million)	% Change in Terms of Trade
NZ	366.08	367.12	18.15	1.211	-44.23	1.295
World	-78.85	-12.36	-64.91			

The welfare gain to New Zealand if all of the free trade agreements that New Zealand currently has under negotiation are implemented is estimated to be around $US366 million. The large 1.3 percent improvement in New Zealand's terms of trade has driven the welfare gain, with significant gains in all sectors from improved export prices due to the better access enjoyed to many export markets. The processed dairy sector experiences the largest gain from higher export prices. The positive allocative efficiency effect is driven by the services sector, although the light manufacturing and other food sectors do see significant gains as well. New Zealand's 1.2 percent GDP gain shows that the preferential trade agreements currently under negotiation have the potential for delivering substantial benefits to all New Zealanders.

Table 6.24   **Implications for the New Zealand Dairy Industry of Simultaneous Implementation**

Sector	% Change in Price	% Change in Output	% Change in Export Volumes from NZ	% Change in Value of Exports from NZ	Change in Sectoral Trade Balance (2004 US$ million)
Raw Milk	2.866	3.920			
Processed Dairy Products	1.895	3.936	5.563	7.563	255.38

Higher prices and output in both the raw milk and processed dairy sectors in New Zealand show that New Zealand's potential free trade agreements are likely to have a large positive effect on New Zealand's dairy industry. Output has increased by almost 4 percent in both sectors in this simulation, a very significant effect. Price has increased by almost 3 percent for raw milk, and almost 2 percent for processed dairy products. Output has increased in every agricultural and food sector in New Zealand, as a result of resources reallocated from the manufacturing sectors.

These preferential trade agreements therefore contribute to moving New Zealand's resources to the areas of production where New Zealand's advantage lies. Export volume in the processed dairy sector increases by 5.6 percent as a result of higher exports to Russia, Belarus and Kazakhstan, Korea, India, the GCC, Brunei Darussalam and the United States. Significant declines are seen in export volumes to all other regions. Greater price and export volumes drive a 7.6 percent increase in the value of processed dairy exports from New Zealand, equivalent to US$284 million in this simulation. It is therefore clear to see that the New Zealand dairy industry stands to gain significantly from the preferential trade agreements that New Zealand has under negotiation. The greatest growth in value in New Zealand exports is seen in the meat products sector, a 20 percent increase in the value of exports equating to an increase of US$487 million.

6.3　Conclusions

Overall

- The preferential trade agreements that New Zealand has under negotiation show significant potential benefit for New Zealand, the welfare gain of implementing all potential PTAs estimated to be US$366 million using the equivalent variation measure. GDP is estimated to increase by 1.2 percent.
- Implementing all of the agreements that New Zealand currently has under negotiation drives an almost 4 percent growth in output of the dairy sectors in New Zealand, with the value of processed dairy exports increasing by US$284 million (7.6 percent). The price received by farmers for their milk increases by almost 3 percent, while the price of processed dairy products increases by almost 2 percent.
- The independent implementation of each of New Zealand's potential PTAs is estimated to have positive welfare effects on New Zealand, with the only negative effects for New Zealand's dairy industry seen in the TPP expansion with the United States' agricultural sectors excluded and the agreement between New Zealand and India.
- The largest positive effect on the New Zealand dairy industry comes from expansion of the Trans-Pacific Partnership when the United States' agricultural sectors are included in tariff elimination and its dairy export subsidies to the TPP partners are removed. Even if the United States' dairy export subsidies are not removed this agreement still has the greatest benefit for the New Zealand dairy industry. The value of New Zealand's exports of processed dairy products increases by US$111 million in this case, or US$123 million if the United States' export subsidies on processed dairy are removed as well.
- Prices in both the raw milk and processed dairy sectors increase in every simulation, with the largest increases seen in TPP expansion with the United States' agricultural sectors included in tariff eliminations, and in the agreement between New Zealand and Korea.
- The greatest overall welfare gain for New Zealand comes from the New Zealand – Korea Free Trade Agreement (US$148 million), closely followed by expansion of the TPP when the United States removes its tariffs in all sectors and export subsidies for processed dairy with regard to the expanded TPP partners (US$139 million).
- Global welfare declines in all of the simulations with the only exceptions being the free trade agreements between New Zealand and Russia, Belarus and Kazakhstan, New Zealand and Korea, and the expansion of the TPP without the United States' involvement.

Expansion of the Trans-Pacific Partnership

- The expansion of the TPP without the United States' involvement has a negligible impact on New Zealand's dairy industry and on total welfare.
- When tariffs on exports to the United States are removed for just non-agricultural sectors, New Zealand slightly shifts its production focus towards forestry and manufacturing, so that the dairy industry sees a small decline in output and export volumes. This form of 'trade liberalisation' therefore slightly moves New Zealand's

production away from the areas where it has natural advantage and is an illustration of the theory of the second best at work.

- When the United States' agricultural and food sectors are also included in tariff removal, the welfare gain to New Zealand is over ten times as large, with a US$135 million welfare gain shown. GDP increases by almost half a percent.

- The welfare loss experienced by the United States declines by almost half as a result of including its agricultural and food sectors in tariff eliminations (to US$219 million).

- Output in the dairy sector in New Zealand increases by over one and a half percent when tariffs are removed on exports to the United States. Exports to the United States increase by 49 percent, while the value of New Zealand's exports of processed dairy products increases by almost 3 percent, or around US$111 million.

- The global welfare effect of the expanded TPP when the United States is fully included in tariff elimination is negative, resulting from a significant allocative efficiency loss. There is an overall welfare gain amongst the countries involved, but losses to China and the highly aggregated Rest of World region outweigh this. Preferences given to TPP partners when large import barriers still exist for these other regions may therefore lead to trade diversion. If more countries were to join, this external welfare loss would likely become smaller and the agreement would likely become more beneficial.

- When the United States also removes its export subsidy on processed dairy products exported to the expanded TPP members, New Zealand's dairy industry benefits more, with an almost 2 percent rise in production and 3.3 percent rise in the value of its exports (US$123 million).

- The greatest gain for New Zealand from the expansion of the TPP is seen in scenario 4, when the United States removes all its tariffs and export subsidies on processed dairy. Conversely, the only positive effect on global welfare from expansion of the TPP comes when the United States is excluded from the agreement.

- In all of the simulations of the expanded TPP including the United States, all countries included in the agreement have experienced an allocative efficiency gain, with the exception of Singapore which suffers a small loss in each. This provides evidence that the creation of a free trade 'region' or trading bloc such as the expanded TPP would provide has benefits for the allocation of resources within the economies involved. As expected, these countries largely gain from the increased production specialisation and international trade that such arrangements encourage.

- It is interesting to note that Singapore has suffered a welfare loss in all four of the TPP expansion scenarios. Singapore is a member of the existing Trans-Pacific Partnership, and negotiations to expand the TPP include the United States, Australia, Peru, Viet Nam, and Malaysia. Singapore has trade agreements in place with all of these countries, and therefore the tariffs faced by Singaporean exports are not affected in the TPP expansion scenarios[56]. Thus, the only effects on Singapore come when its trade with certain partners is influenced by the erosion of the trade preferences

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[56] Singapore does not practice import protection, as seen in the data collected from the TRAINS database using WITS software.

established under its existing trade policy agenda. However, since Singapore is a small, open economy that thrives on international trade and as such heavily supports free trade, the strategic benefits for Singapore of establishing an expanded TPP must surely outweigh the welfare losses seen in the GTAP simulations above.

New Zealand – Russia – Belarus – Kazakhstan Free Trade Agreement

- New Zealand experiences a small welfare gain of US$12 million from the implementation of a free trade agreement with Russia and its Customs Union partners Belarus and Kazakhstan.
- Following this agreement, the value of New Zealand's exports of processed dairy to Russia, Belarus and Kazakhstan increases by approximately US$52 million (262 percent). Output and price increase in the dairy sectors in New Zealand, making dairy farming in New Zealand more profitable. The total value of New Zealand's exports of processed dairy products increases by US$37 million (1 percent).

New Zealand – Korea Free Trade Agreement

- A free trade agreement with Korea is estimated to result in a US$148 million increase in welfare for New Zealand, with GDP expected to increase by around half a percent.
- Price and output in the dairy sectors in New Zealand increase by around 1 percent as a result of the agreement. The value of New Zealand's exports of processed dairy to Korea increases by US$219 million (545 percent), and by around US$84 million overall (2.3 percent).

New Zealand – India Free Trade Agreement

- A welfare gain for New Zealand of US$50 million is seen from a free trade agreement with India, although the estimated effect for India is negative.
- Interestingly, output and export volumes in the dairy sectors decline with this agreement, with production increasing in the cropping, forestry and light manufacturing sectors instead. New Zealand's cropping exports to India show the greatest gain in value of the agricultural sectors, while forestry and light manufacturing are New Zealand's two most important exports to India in the projected GTAP database.
- This result for the dairy sector ignores the growth in trade of dairy products between New Zealand and India in recent years (Ministry of Foreign Affairs and Trade, 2011n). A more recent database is required to capture this phenomenon.

New Zealand – Gulf Cooperation Council Free Trade Agreement

- A free trade agreement with the Gulf Cooperation Council results in a US$29 million welfare gain for New Zealand. The GCC sees a welfare loss, since the influx of processed dairy products from New Zealand drives down domestic production while tariffs still remain in New Zealand's other export markets, where production could perhaps be more efficiently reduced (such as Russia, Belarus, Kazakhstan, India, Korea, or the United States).
- Output increases in the New Zealand dairy sectors by over 1 percent, while the value of exports to the GCC increases by almost US$100 million (427 percent). Total growth in the value of New Zealand's dairy exports is around US$67 million (1.8 percent).

CHAPTER 7   CONCLUSION

New Zealand relies heavily upon its agricultural industries. Agriculture contributes an unusually large proportion of GDP for a developed country, and the dairy industry in particular is a key export earner for the New Zealand economy. The high levels of distortion in international dairy markets due to the agricultural protectionism present around the world have resulted in New Zealand strongly supporting movements towards free trade. The avenue with the greatest potential is multilateral trade liberalisation under the World Trade Organisation framework, however in recent years the popularity of bilateral and regional preferential trade agreements has been rapidly increasing. This study has investigated New Zealand's preferential trade agreements, from the perspective of the New Zealand dairy industry.

In order to analyse New Zealand's existing preferential trade agreements, the ex post econometric technique known as the gravity model was used. This model describes the trade flows between two countries as a function of the forces both driving and restricting trade, and modifications allow the inclusion of bilateral and regional trading arrangements in the model's specification. An unexpected negative result is seen in the overall effect of New Zealand's preferential trade agreements on New Zealand's dairy exports. With the Australia – New Zealand CER agreement excluded due to data limitations and the limited number of observations on which to draw conclusions due to the relative newness of many of New Zealand's other preferential trade agreements, this negative result is unreliable. The results for individual trade agreements are mixed, with some agreements generating statistically significant positive relationships, and others statistically significant negative relationships.

Due to the age of many of New Zealand's preferential trade agreements resulting in few observations on which to base conclusions, and these observations coinciding with the global recession which introduced massive volatility in commodity markets, the regression results should not be taken as a concrete summary of the effects of New Zealand's preferential trade agreements on the New Zealand dairy industry. Rather, the contribution of this study is to generate a framework for future ex post analyses of New Zealand's preferential trade agreements. The gravity model is widely described as the primary ex post analytical tool for this type of analysis, and the framework generated by this study is therefore up to date with the latest econometric techniques.

For the analysis of the preferential trade agreements that New Zealand currently has under negotiation, the computable general equilibrium model known as GTAP, produced by Purdue University, was used. Computable general equilibrium models allow impacts in one sector or one region to flow through to other sectors and regions, and thus present a stylised model of the global economy. As such, these models, and GTAP in particular, are widely used for the ex ante analysis of trading arrangements that are under consideration. The GTAP model used in this study is likely to underestimate the impacts of trade liberalisation on the New Zealand dairy industry, however the results seen are remarkably promising.

A large welfare gain to the New Zealand economy from implementing all of the preferential trade agreements that New Zealand currently has under negotiation is indicated

by the GTAP results, with large increases in the prices, output and exports of the New Zealand dairy industry. From the individual simulations of the agreements under negotiation, positive welfare effects are seen for the New Zealand economy in each, and the New Zealand dairy industry is impacted positively in all but two scenarios. One of these is expected, when the expansion of the Trans Pacific Partnership excludes the United States' agricultural sectors, while the negative effect from the New Zealand – India agreement was unexpected. On closer inspection, the age of the GTAP database, where the most recent release is based on 2004 data, drives this result, where the dairy trade relationship between New Zealand and India has developed since this date. With more recent data, it is almost certain that a positive effect would be seen for the New Zealand dairy industry in this agreement as well. These results indicate that the preferential trade agreements that New Zealand has under negotiation will be beneficial for the New Zealand dairy industry. This is since New Zealand holds comparative advantage in pastoral based dairy production, one of the world's most highly protected sectors. When this protection is reduced and New Zealand gains improved access to key export markets, the New Zealand dairy industry will therefore be a major beneficiary.

Interviews with ten key participants in and around the dairy industry in New Zealand yielded interesting results. While largely recognising the importance of the Doha Round of the World Trade Organisation's multilateral negotiations, participants were unanimously positive about the effect that New Zealand's existing preferential trade agreements have had on the industry, with the agreements discussed as key enablers of export growth. New Zealand's agreement with China was mentioned by participants as particularly important, while New Zealand's agreement with Australia is believed to be the most comprehensive of its agreements. Participants noted that dairy trade policy is seen as very important by the New Zealand Government, and dairy issues enjoy special consideration in New Zealand's trade policy due to the heavy protectionism afforded to dairy products around the world. With a reduction in the barriers faced by New Zealand's exports, the dairy industry is expected to benefit substantially.

Participants were therefore also unanimously positive about the effect of the preferential trade agreements that New Zealand is currently negotiating on the dairy industry. The United States and India in particular were mentioned as key markets with which New Zealand is conducting negotiations. Participants noted that it will be very difficult to negotiate on dairy issues with some countries, such as the United States, but that New Zealand has a very good track record in trade negotiations. Participants believed that New Zealand is targeting the right regions and countries in its trade negotiations for the dairy industry, those being the countries in which demand for dairy products is growing. External trade policy developments that concerned participants included anything undertaken by Latin American countries due to their low cost dairy production structure, while the United States and European Union's agreements with Korea were also mentioned. More detailed insights into the interview responses are discussed in Appendix D.

From the investigation into external trade policy developments that may threaten the competitiveness of the New Zealand dairy industry in international markets, some key situations are identified that should be monitored by the industry. The MERCOSUR trading bloc, encompassing Argentina, Brazil, Paraguay and Uruguay, is important due to the low cost

of dairy production in those countries, along with Chile. Where these Latin American countries gain preferential access to markets that New Zealand does not enjoy, the New Zealand dairy industry will be at a significant disadvantage. The United States is a large dairy producer that may become a much larger exporter with international dairy trade liberalisation, although its issues with the political power of domestic dairy producers make the outcome less obvious.

This study has shown that New Zealand's preferential trade agreements are very important for the New Zealand dairy industry. With the New Zealand economy so reliant on international trade in a sector that is highly distorted by protectionism overseas, any improved access to international markets is beneficial for the New Zealand industry. While multilateral liberalisation under the World Trade Organisation framework would be desirable, the slow progress seen in that avenue even with New Zealand's ardent support makes bilateral and regional agreements the more achievable option for a small open economy such as New Zealand. New Zealand's agreements are comprehensive in their coverage of goods and services, and as such present the New Zealand dairy industry's best hope for dairy trade liberalisation at present.

Appendices

Appendix A GTAP Sectoral Aggregations

Sector	GTAP Notation	Commodities Covered
Raw Milk	RawMilk	RMK Raw Milk.
Processed Dairy Products	DairyProc	MIL Dairy Products.
Drystock Farming	Lvstock_Wool	CTL Bovine cattle, sheep and goats, horses; OAP Animal products nec; WOL Wool, silk-worm cocoons.
Meat Products	MeatProducts	CMT Bovine meat products; OMT Meat products nec.
Cropping	Cropping	PDR Paddy rice; WHT Wheat; GRO Cereal grains nec; V_F Vegetables, fruit, nuts; OSD Oil seeds; C_B Sugar cane, sugar beet; PFB Plant-based fibres; OCR Crops nec.
Other Food	OtherFood	FSH Fishing; VOL Vegetable oils and fats; PCR Processed rice; SGR Sugar; OFD Food products nec; B_T Beverages and tobacco products.
Forestry	Forestry	FRS Forestry.
Mining and Extraction	Extraction	COA Coal; OIL Oil; GAS Gas; OMN Minerals nec.
Light Manufacturing	LightMnfc	TEX Textiles; WAP Wearing apparel; LEA Leather products; LUM Wood products; PPP Paper products, publishing; OMF Manufactures nec.
Heavy Manufacturing	HeavyMnfc	P_C Petroleum, coal products; CRP Chemical, rubber, plastic products; NMM Mineral products nec; I_S Ferrous metals; NFM Metals nec; FMP Metal products; MVH Motor vehicles and parts; OTN Transport equipment nec; ELE Electronic equipment; OME Machinery and equipment nec.
Services	Services	ELY Electricity; GDT Gas manufacture, distribution; WTR Water; CNS Construction; TRD Trade; OTP Transport nec; WTP Water transport; ATP Air transport; CMN Communication; OFI Financial services nec; ISR Insurance; OBS Business services nec; ROS Recreational and other services; OSG Public administration, defense, education, health; DWE Dwellings.

Appendix B GTAP Regional Aggregations

Region	GTAP Notation	Countries Included
New Zealand	NewZealand	New Zealand.
Russian Federation and its Customs Union partners	RussiaBK	Russia, Belarus, and Kazakhstan.
Republic of Korea	Korea	Republic of Korea.
India	India	India.
Gulf Cooperation Council (Rest of Western Asia)	RestWestAsia	Bahrain, Iraq, Israel, Jordan, Kuwait, Lebanon, Oman, Occupied Palestinian Territory, Qatar, Saudi Arabia, Syrian Arab Republic, United Arab Emirates, Yemen.
Australia	Australia	Australia.
China	China	People's Republic of China.
Hong Kong	HongKong	Hong Kong, China.
Malaysia	Malaysia	Malaysia.
Singapore	Singapore	Singapore.
Thailand	Thailand	Thailand.
Viet Nam	VietNam	Viet Nam.
Other ASEAN (not elsewhere classified)	OtherASEAN	Cambodia, Indonesia, Lao People's Democratic Republic, Myanmar (Burma), Philippines.
Rest of Southeast Asia (Brunei Darussalam)	RestSEAsia	Brunei Darussalam, Timor-Leste.
USA	USA	United States of America.
Chile	Chile	Chile.
Peru	Peru	Peru.
Rest of the World	RestofWorld	All countries not specified above.

Appendix C HS Code Aggregations

The HS codes have been allocated to the GTAP groups as defined by the product concordance reference within the WITS software: https://wits.worldbank.org/WITS/

GTAP Sector	HS Codes
RawMilk	According to WITS product concordance, there are no HS codes corresponding to the Raw Milk sector in GTAP
DairyProc	0401-0406, 170210-170211, 170219, 2105, 350110
Lvstock_Wool	0101-0106, 020820, 030760, 0407, 0409-0410, 0502-0507, 0510, 051110, 051199, 152190, 4101-4103, 4301, 5001, 510111, 510119, 5102
MeatProducts	0201-0207, 020810, 020830, 020840, 020850, 020890, 0209-0210, 1501-1506, 160100, 160220, 160231-160232, 160239, 160241-160242, 160249-160250, 160290, 1603, 230110
Cropping	0601-0603, 0701-0709, 0713-0714, 0801-0810, 0813, 090111, 090220, 090240, 0903-0910, 1001-1005, 100610, 100620, 1007-1008, 1201-1207, 1209-1211, 121210, 121291-121292, 121299, 1213-1214, 140310, 140390, 1801, 2308, 2401, 5201, 530110, 530210, 530310, 530410, 530511, 530521, 530591
OtherFood	0301-0306, 030710-030759, 030791, 030799, 0408, 0508-0509, 051191, 0710-0712, 0811-0812, 0814, 090112-090190, 090210, 090230, 100630, 100640, 1101-1109, 1208, 121220, 121230, 1302, 140420, 1507-1517, 152110, 152200, 160210, 1604-1605, 1701, 170220-170290, 1703-1704, 1802-1806, 19-20, 2101-2104, 2106, 22, 230120, 2302-2307, 2309, 2402-2403, 350210-350211, 350219, 350510, 710110, 710121
Forestry	0604, 1301, 1401-1402, 140300, 140390, 140410, 140490, 400130, 440110, 440320-440399, 4404, 450110
Extraction	2501-2517, 251810, 2519, 252010, 252100, 2524-2530, 260111-260112, 2602-2617, 2621, 2701-2703, 2709, 271111, 271121, 2714, 310410, 710210, 710221, 710231, 710310
LightMnfc	0501, 3406, 3605-3606, 3704-3706, 3804, 4104-4115, 42, 4302-4304, 440121-440122, 440130, 440310, 4405-4421, 450190, 4502-4504, 46-49, 5002-5007, 510121, 510129-510130, 5103-5113, 5202-5212, 530121, 530129-530130, 530290, 530390, 530490, 530519, 530529, 530590, 530599, 5306-5311, 54-58, 5901-5903, 5904-5905, 590699, 5907-5911, 60-62, 630120-630190, 6302-6310, 64, 6501-6505, 650692, 650699-650700, 66-67, 710122, 710229, 710239, 710391, 710399, 710490, 7105, 7113-7114, 711590, 7116-7118, 844250, 871500, 8804, 902300, 911390, 9401, 9403-9404, 95-96, 9701-9703, 9705-9706
HeavyMnfc	1518-1520, 251820, 251830, 252020, 2522-2523, 260120, 2618-2620, 2704, 2706-2708, 2710, 271112-271114, 271119, 271129, 2712-2713, 2715, 28-30, 3101-3103, 310420, 310430, 310490, 3105, 32-33, 3401-3405, 3407, 350190, 350220, 350290, 3503-3504, 350520, 3506-3507, 3601-3604, 3701-3703, 3707, 3801-3803, 3805-3825, 39, 400110, 400121-400122, 400129, 4002-4017, 440200, 590610, 590691, 590699, 630110, 650610, 650691, 68-70, 710410, 710420, 7106-7112, 711510, 72-76, 78-83, 8401-8441, 844210-844240, 8443-8485, 85-86, 8701-8714, 8716, 8801-8803, 8805, 89, 9001-9022,

	9024-9033, 9101-9112, 911310, 911320, 9114, 92-93, 9402, 9405-9406, 9704
Services	Nil

Appendix D Interviews with Key Dairy Industry Personnel

This section details the insights gained from seven interviews undertaken involving ten key participants in and around the dairy industry in New Zealand.

Question 1
Over the past decade New Zealand has entered into a number of free trade agreements, from your perspective, do you think that they have benefited the New Zealand dairy industry in terms of perhaps better (cheaper) export market access, increased international trade, or in any other ways?

Interview participants were unanimously positive about the effect that New Zealand's free trade agreements have had on the New Zealand dairy industry, although one pointed out the problem of trade diversion that must be considered when assessing the overall effect of free trade agreements. While it is recognised that it is not possible to ascribe all of the gain in export volumes to a country following the successful implementation of a free trade agreement to the trade agreement, it is noted that the agreements have definitely played some part, and indeed are viewed as key enablers of that trade growth. Other benefits mentioned by participants include lower costs of exporting, the relationships built up between New Zealand and other countries, and around the systems involved in dealing with non tariff barriers. One participant believes that New Zealand's free trade agreements are all movements towards the philosophy of open markets and exploiting comparative advantages. Another believes that another benefit of New Zealand's trade agreements is the opportunity to move towards a more international supply chain.

The New Zealand – China Free Trade Agreement in particular is mentioned as a key example, where the successful conclusion of trade negotiations between New Zealand and China has led to greater Chinese favour for New Zealand dairy products, where New Zealand is referred to as a preferred supplier, and New Zealand exports more generally. The benefit of this attitude towards New Zealand, fostered by the trade relations between New Zealand and China, is huge and immeasurable, and made even more important by the huge growth in demand for dairy in China. Government and industry level relationships between the two countries have resulted in a building of confidence and a greater understanding of the other country's systems. One participant noted that there has been huge growth in the percentage of New Zealand's dairy production going to China, from approximately five percent to approximately 20 percent, and that while this is not due solely to the free trade agreement, it has been the enabler for that growth. Some participants believe that the benefit to New Zealand of the New Zealand – China Free Trade Agreement will only grow as more opportunities arising from the agreement are exploited. Other participants noted that the long phase-ins in this agreement for Chinese imports of New Zealand dairy products mean that the Chinese market will be more open in the future, while excluded tariff lines and safeguard mechanisms are problematic, along with producing certification for rules of origin requirements.

It is believed that the agreement with Australia is the most comprehensive trade agreement that New Zealand is involved in, with one interview participant describing the

importance of achieving regulatory unity between the two countries. It is hoped that all of New Zealand's other trade agreements will reach a level of economic integration similar to that of the Closer Economic Relations (CER) between New Zealand and Australia. This level of integration allows New Zealand to work with the trading partner to simplify the export process, where currently some countries have not only tariffs on imports but a whole range of other measures that make exporting to that country more difficult. It is recognised that safeguard mechanisms and tariff rate quotas built into some of New Zealand's trade agreements are less desirable than a truly integrated trade agreement such as the CER. The New Zealand – China agreement, for example, has a safeguard mechanism for New Zealand dairy exports to China that is typically filled in the first couple of months of the year, after which the higher global tariff rate applies.

One participant singled out three agreements as being particularly important for New Zealand's dairy industry, not only in terms of trade flows but also investment flows: Australia, Thailand, and China. It is believed that the free trade relationship in these cases has improved the confidence to invest in the other country's industry. Another participant noted that this is an additional advantage of free trade agreements, where New Zealand capital should be invested offshore in order to capture economic benefits in those overseas industries. In the opinion of this participant this will be better for the New Zealand economy and for income levels in New Zealand in the long-term than if that capital was invested in New Zealand farm land prices. Fonterra's investment in the Chinese dairy industry was cited as an example.

One interview participant pointed out that dairy is one of the most heavily protected sectors in the world, and this fact as well as its extreme importance to New Zealand's export profile means that New Zealand has always had a strong emphasis on dairy trade policy. Another participant noted that the high import protection for dairy products that still exists around the world means that international dairy prices are very volatile, since small fluctuations in supply and demand are magnified by this protection. With more trade liberalisation, world dairy markets will become more stable.

An important distinction was made by one participant, who discussed the differences between assessing the effects of free trade agreements based on actual trade or on opportunities for trade. In this participant's opinion, free trade agreements should be viewed on the basis of creating opportunities for trade, so that New Zealand's dairy industry can capitalise on any opportunities presented when markets develop or change. A long term view on how the future trading world will look is vital for this attitude to succeed. The major benefit of a free trade agreement is therefore that the agreement opens up significant markets to give New Zealand dairy exporters the opportunity to sell in that market. China and the Southeast Asian countries are mentioned as important examples of New Zealand's free trade agreements providing access to markets where there are significant opportunities for trade.

Question 2
Other countries are often reluctant to allow better access for imported agricultural products. Has your organisation suffered from access restrictions imposed by New Zealand's existing or potential free trade partners? Are there any good examples that you can provide?

Participants were quick to point out that dairy markets are particularly problematic in terms of protectionism, and that many countries protect their domestic industries heavily. The United States is one country that is believed to be heavily protected from imports, along with the European Union, India, Japan, Canada and Korea. An example given by one participant is the European Union's protection of butter, where the in quota tariff rate is still reasonably high, while the out of quota tariff rate is generally prohibitive to trade. Quotas are often not filled due to the high in quota tariff rates. This participant also discussed the United States' dairy import quotas as being small in comparison to the total market, while all the trade growth to the United States has been in areas that are not covered by quotas, such as casein and caseinates. Canada, Japan, and Korea all have very high dairy import tariffs, which are backed up by quotas in the case of Canada and Japan. The safeguard mechanisms built into some of New Zealand's existing free trade agreements were also discussed, where even though a trade agreement exists there may still be lingering protection that ensures the dairy market is not completely open. One participant discussed India as having state control in the importation of dairy products, so that another barrier is presented alongside the tariff barrier that means India may or may not be willing to accept New Zealand's exports, even if exporters are willing to pay the tariff.

The huge dairy markets which New Zealand has only very limited access to were discussed, such as cheese exports to the European Union and the United States of America. One participant believes that in some of the large, heavily protected dairy markets, the way that access to those markets is provided is deliberately intended to limit the opportunity presented. The United States and the European Union have multiple quotas for cheese imports, and in the United States the quotas are much higher for European style cheeses than cheddar cheese in order to limit the degree of market access. This participant described in quota tariff rates as nonsense, where there is no need to have an in quota tariff rate when there is a quota in existence.

Another participant pointed out that in some countries rules for imports may change over time, adding another level of difficulty in exporting to that country. An example is given as the sanitary requirements for exportation of dairy products, where a certificate is given proving the disease-free status, but then after one or two years that certificate is no longer accepted by that country, and the process must start again. This participant summed up by discussing that even though tariffs may be opened up through a free trade agreement, there may still be tariff rate quotas and safeguard mechanisms to deal with, along with sanitary and phytosanitary barriers, and then technical barriers to trade such as labelling issues. Another participant noted that dealing with the administration issues provided by import protection is very complex, and often the time spent on those issues does not earn a good return.

While dairy farmers typically do not export directly, as one participant discussed, it is likely that they would get higher prices at the farm gate if no trade barriers existed in world markets. This participant pointed to work done by the ANZ National Bank in the March 2011 edition of Rural Focus, which found that New Zealand's dairy exports faced an effective tariff of 10.7 percent in 2010, or just over $1 billion in tariff costs. This translated to almost $100,000 per farmer, or $0.75 per kilogram of milk solids. It is the opinion of this participant that New Zealand farmers receive lower prices for their products as a result of other countries'

protectionist policies. Further, this participant believes that farmers are aware that free trade is likely to be financially beneficial for them. Another participant pointed out that the above argument relating to tariff savings looks good for public opinion of free trade agreements, yet who actually receives those savings depends on the relative situations of the buyers and sellers. This participant believes that the buyer is usually in a better position to capture those savings unless there is a single seller, which no longer exists in the New Zealand dairy industry.

One participant believes that the global trading environment is changing for the better, and dairy markets around the world are becoming more open, beginning with the conclusion of the Uruguay Round (of multilateral negotiations under the then GATT). Their opinion is that developing countries are also beginning to change their mindset with regard to food security, where they are realising that putting huge import barriers around the import of dairy products is not a realistic solution. In the opinion of this participant, dairy is a particularly difficult area for developing countries to do well in, where it is difficult for these countries to move away from very small holder production to industrial scale, high technology dairy production. Another participant also noted that developing countries are generally more open to trade than developed countries, with relatively low tariffs and few quotas, and an applied tariff rate below the bound WTO rate. The reason given by this participant for the lower applied rate is that many of these countries are milk deficit and therefore need imports, so that increasing the tariff to the bound rate would simply increase food costs since dairy products have become a more important part of these peoples' diets.

Question 3
From your perspective, will the dairy industry gain direct benefits from the free trade agreements that New Zealand is currently negotiating?

The interview participants were all confident that the New Zealand dairy industry would gain direct benefits from the successful conclusion of the free trade agreements that New Zealand has under negotiation. One believes that the tariffs currently paid by New Zealand exporters represented significant foregone revenue for New Zealand, and that any free trade agreement that reduces tariffs will therefore benefit New Zealand. Opinions varied on which would generate the greatest gains, but most agreed that negotiations with the United States under the proposed expansion of the Trans Pacific Partnership and the negotiations with India will be very important to the New Zealand industry. One participant made mention of all the agreements New Zealand is currently negotiating, believing that all show significant potential benefits for the New Zealand dairy industry. Another participant noted that currently 40 percent of New Zealand's trade is covered by its FTAs, which would increase to 52 percent if the TPP and Indian agreement are concluded, but that even this is likely to be an understatement since India plays a relatively small part in New Zealand's export profile currently but is expected to grow.

Forecasts of New Zealand dairy production were discussed by one participant, which they assumed would increase by two to three percent per year over the next ten years, in comparison to growth in consumption in India. The seven million tonnes of whole milk equivalent that the New Zealand industry will grow by in ten years at three percent annual growth is equivalent to 18 months of consumption growth in India alone. This participant

therefore believes that having free trade agreements with these fast growing economies such as China and India will be beneficial for the New Zealand dairy industry. Another participant is more general on this issue, stating that developing countries are becoming much more important in New Zealand's export profile since these are where growth is occurring, as well as for trade policy reasons. Restrictions are generally less severe in the developing countries, in this participant's opinion, and easier to overcome in comparison to the heavy protection in some large developed country markets.

One participant noted that while negotiating a free trade agreement with India is important for the dairy industry as there is a huge potential market for dairy products in India, it is a massive dairy producer itself. As a result the potential benefits for the New Zealand industry lie with the Indian population becoming wealthier and demanding New Zealand's products in particular. The consumption of dairy products is believed to be a relatively natural part of Indians' diets, rather than a Westernisation as in some other Asian countries. Another participant discussed India's physical size as relatively small with huge water problems, so that they cannot possibly supply their own milk needs.

Some participants made special mention of the political sensitivity of dairy in some economies, such as the United States where the dairy lobby has significant political influence and a massive resource base, which will make it difficult to conclude an agreement with that country that comprehensively includes dairy. As they point out, for gains to the New Zealand dairy industry to eventuate, the agreement must fully include dairy products. This is important for the entire New Zealand economy since dairy is so big in New Zealand's export profile. One participant discussed that concluding an agreement with India will be very difficult due to the heavily protectionist mindset in that country. Another noted that New Zealand's necessity for the inclusion of dairy, and other countries' sensitivity to its inclusion, make negotiations much more difficult, but the deal must be comprehensive in dairy's inclusion since otherwise dangerous precedents will be set for other agreements that New Zealand may negotiate in the future. This problem of precedent setting was also discussed by another participant, using the example of the Trans Pacific Partnership with the possible inclusion of the United States and Japan. New Zealand however has a very good track record in negotiating free trade agreements that are comprehensive in goods trade.

Also discussed were the advantages that one participant believes will come from the trade agreements that New Zealand has under negotiation in the form of extracting value from New Zealand's intellectual property in agricultural technology. This participant believes that for Russia in particular, not only would the trade agreement bring benefits to the New Zealand dairy industry in the form of exports since Russia has historically been one the world's largest dairy importers, but also bring opportunities for New Zealand to commercialise its intellectual property in dairy production.

Question 4
Are the agreements that New Zealand is currently negotiating targeted in the right regions or countries for the dairy industry? Are there perhaps other countries that should be considered from the perspective of the dairy industry?

The interview participants unanimously agreed that New Zealand is targeting the right countries and regions for the dairy industry in its trade negotiations. Some participants identified that New Zealand is largely targeting countries with growing economies where demand for protein, and dairy products in particular, is booming. India is mentioned as a key example, where dairy consumption growth will outstrip domestic supply growth, while Korea is not a big dairy market but has a lot of potential. The Middle East and Russia are two more large dairy markets that New Zealand is targeting in its trade policy negotiations.

One participant believes that such is the dairy industry's, and indeed Fonterra's, importance in the New Zealand economy that the government makes special consideration for the dairy industry in considering its prospective free trade agreement partners. An important consideration in determining where New Zealand should be looking to form free trade agreements, in one participant's opinion, is that the countries with the highest protection should be targeted since that is where the biggest gains from the trade agreement will occur. One participant pointed out that negotiating a free trade agreement with a country such as India will give New Zealand preferential access to that market over other large dairy producing regions such as the United States and the European Union.

The main regions that participants believe should be included in New Zealand's trade negotiations from the perspective of the dairy industry, but currently are not, are Japan, the European Union, and Canada. As noted by one participant, there have been discussions with all of these countries on how New Zealand might be able to construct a trade deal at some stage in the future. Another pointed out however, that in order to negotiate a free trade agreement with another country, not only does New Zealand have to be keen, but so does that other country. It is not possible to force that country's hand, so New Zealand can only negotiate with the countries that have a desire for a trade agreement with New Zealand. Another participant discussed Japan as a country in this category, where the very high protection for agricultural products and the importance of Japan in New Zealand's export profile means New Zealand's desire for a trade agreement is present, although Japan's may not be at this stage. It may therefore be better, in this participant's opinion, to focus on countries where progress can be made more easily. Another participant pointed out that it will be easier to include Japan in a trade deal under the expanded TPP than attempting to persuade Japan to negotiate bilaterally with New Zealand. The same goes for Canada, as discussed by another participant, who believes that Canada is very interested in joining TPP yet the negotiation of a bilateral deal between New Zealand and Canada would be severely hampered by the Canadian dairy industry's inefficient supply management model.

One of the interview participants had a detailed look at New Zealand's top twenty dairy export destinations, and found that New Zealand already has either an existing trade agreement or an agreement under negotiation with the majority of these countries. The exceptions that this participant found were Venezuela, Sri Lanka, Mexico, Taiwan, and a few Middle Eastern countries, of which they thought Mexico and Taiwan should be particular priorities. Another participant pointed out that New Zealand has shown interest in negotiating a trade agreement with Mexico, but that TPP may be the best option for getting such an agreement. Brazil was also discussed as a missing link in New Zealand's trade negotiations from an agricultural point of view, but it was pointed out that in order to engage with Brazil,

New Zealand would have to team up with Australia since Brazil would not be interested in a bilateral deal, and Australia is not currently interested in taking part in those discussions.

Question 5
Do you see any threats to the New Zealand dairy industry's export competitiveness resulting from the free trade agreements that other dairy producing countries, for example Australia, are negotiating?

A key issue in the negotiation of free trade agreements, according to one participant, is the issue of catching up to other countries who have already concluded an agreement with a key market. One participant discussed the concern that New Zealand would have if other big dairy exporters showed interest in negotiating with New Zealand's most important markets. Several participants made mention here of Latin American countries, where dairy production costs are lower than in New Zealand. As these countries negotiate free trade agreements and potentially gain access to New Zealand's key markets or even preferential access to markets where New Zealand doesn't share those preferences, there is a potential competitiveness threat to New Zealand's industry. One participant used the example of the potential expansion of the Trans Pacific Partnership, where although New Zealand could gain access to the United States' market if negotiations are successful, this would also mean that some lower cost Latin American countries would have the same preferential access to that market.

Another participant is particularly concerned about New Zealand being at a competitive disadvantage in exporting to Korea, since the European Union has completed, and the United States has all but completed, their trade negotiations with Korea. Trade negotiations between New Zealand and Korea have been launched, but this participant discussed that those negotiations are not currently progressing, and that negotiating with Korea on agriculture is extremely difficult. However, Korea was this participant's only worry, since they believed that New Zealand is a leader in the trade agreement movement. The Chinese market, as discussed by this participant, is more than big enough for both New Zealand and Australia if Australia successfully negotiates an agreement with China. Concern over New Zealand's trade policy disadvantage for exports to Korea, in comparison to the European Union and the United States, is shared by another participant, who believes that the New Zealand dairy industry will lose a significant amount of trade for as long as the United States has a free trade agreement with Korea and New Zealand does not. Peru is another country in this category, since both the European Union and the United States have an agreement with Peru while New Zealand does not.

One participant discussed the concern within the New Zealand dairy industry at the time Australia negotiated a free trade agreement with the United States, where it was possible that this agreement would give the Australian industry an advantage over New Zealand's. However, it turned out that the deal did not include dairy, and the threat was not realised to the expected extent. This gives an interesting example of how the details of a free trade agreement can prove to be very important in its implications for the world trading environment. This participant also noted that the Australian dairy industry produces more for its domestic market than does New Zealand's, and the smaller export volumes from Australia than New Zealand means, in the opinion of this participant, that Australia is not a huge threat

to the New Zealand industry. Indeed, as discussed by another participant, an Australian free trade agreement with another country may be less of a concern than trade deals negotiated by other dairy producing nations, since Fonterra is so active in the Australian market. This participant's opinion is that Fonterra's successful development of its international supply chain means that to some extent it is able to make use of other countries' free trade agreements and limit the damage that those agreements will do to the competitiveness of the New Zealand industry. On the Australian dairy industry, another participant pointed to the problems surrounding their water infrastructure and the ability to produce more milk as another issue in assessing their competitive threat.

The opinion of another participant is that New Zealand has generally had first-mover advantage in most of the key dairy markets, so that there is not a great threat posed by other dairy producers negotiating free trade agreements. Two exceptions were raised: Australia's better progress on dealing with Japan than New Zealand has had, although the participant was not sure how important dairy was in those negotiations; and the deal negotiated between the United States and Korea. The participant noted that these dairy producing nations may gain some competitiveness over New Zealand from those agreements, but is not particularly worried that the effect would be detrimental to the New Zealand industry.

One participant believes that in order for New Zealand to manage the threats raised by external free trade agreements, embracing those developments, perhaps with the potential of investment in relevant overseas industries, is a reasonable plan. This participant believes that the New Zealand dairy industry will be better off by developing to become the best in the world, not the cheapest, by producing the best products. They believe that there is the opportunity to develop into niches that other lower cost dairy producers cannot.

In a discussion around the issues involved in negotiating the expansion of the Trans Pacific Partnership, one participant noted the size of the American dairy industry. Their belief was that the United States produced in a year just over four times the milk solids that New Zealand produces, putting perspective on the size of the relative industries. This participant believes that the United States' dairy industry can become more competitive, so that the New Zealand industry must hope it can remain more competitive than its American counterpart, a key issue in a free trade world. As pointed out however, the United States has a lot of issues surrounding farm subsidies that must be dealt with in its attempts to liberalise trade, and the current fiscal situation in the United States adds another layer of complexity here.

Another problem with external trade agreements raised by a participant was the precedent that may be set by those agreements, should they not comprehensively include dairy. An example used was that if Australia is to negotiate a free trade agreement with an important market that does not include dairy, this makes it harder for New Zealand to negotiate a deal with that country that does comprehensively include dairy. A related issue was raised by a different participant, that of geographic indications. A geographic indication is where a product is named after a region and the country then tries to claim that only products produced in that region can use that name. In the European Union's trade agreements, as discussed by this participant, the European Union has been trying to export its perspective on

geographic indications to other countries, which may create a regulatory barrier for a country such as New Zealand that uses some of those names for its products.

Other Information

More than one participant made special mention of the Doha Round of the WTO negotiations, where they believe that this is the best way to get the best trade deal. Reasons cited for the importance of the Doha Round include the sheer number of countries that any agreement will cover, the strategic importance of some countries that are involved in WTO negotiations with whom New Zealand finds it difficult to engage in bilateral discussions, such as Europe, the United States, and Japan, and the difficulty in confronting domestic or export subsidies in a bilateral free trade agreement. However, in one participant's opinion politics have come in the way, resulting in the delays that we are seeing in reaching a conclusion of those negotiations, while another commented on the extreme difficulty inherent in multilateral negotiations. These participants believe that free trade agreements are a suitable trade policy option for New Zealand in the absence of a conclusion to the Doha Round, but that a successful conclusion to the Doha Round would still be the most desirable outcome.

Another participant believes that although the Doha Round would have a large effect on the freeing up of markets globally, New Zealand is probably gaining more advantage from bilateral trade agreements currently anyway. Another pointed out that while a conclusion to the Doha Round is desirable from the New Zealand dairy industry's perspective, it is certainly a long way off, and businesses are largely ignoring it in their planning.

The other activities of the WTO were also discussed by one participant, who noted that if the Doha Round were to fail altogether, this could undermine the WTO's role in trade disputes settlement and the rules on which international trade is based. The WTO is very important even without progress currently being made, since it provides the basis on which bilateral free trade agreements are negotiated. Even though free trade agreements are not a full substitute for multilateral WTO negotiations and there are many criticisms of them, in the opinion of this participant New Zealand has done well out of its bilateral and regional trade agreements.

Appendix E External Preferential Trade Agreements

Preferential trade agreements, by their very definition, provide preferential access to certain markets for some exporters, and not others. Where one exporter has a preferential trade agreement with a key market and a competing exporter does not, the latter will suffer from a competitive disadvantage since they must pay higher tariffs on their exports to that market. The rapidly increasing number of preferential trade agreements in operation around the world has led to the 'spaghetti bowl' effect (Bhagwati, 2008), where trade preferences vary widely depending on where a product is deemed to have originated (Bhagwati & Panagariya, 1996). New Zealand is concerned about the potential for suffering trade disadvantages where a third country concludes a preferential trade agreement with New Zealand's key export markets (Ministry of Foreign Affairs and Trade, 2009a). The purpose of this section is to outline any areas of concern from the perspective of the dairy industry, where another dairy exporting nation is negotiating a trade deal with one or more of New Zealand's key dairy export markets.

The selection of dairy producing nations to be included in this analysis has been made with the aid of data sourced from the website of the United States Department of Agriculture's (USDA) Foreign Agriculture Service (Foreign Agricultural Service, 2011). A custom query using the Production, Supply and Distribution online database of the Foreign Agricultural Service found the top ten to twelve dairy exporters in 2010, by volume, for each commodity grouping of butter, cheese, dry whole milk powder, fluid milk and non fat dry milk. The EU-27 was included as one group. The possible 56 places in these lists are taken by 15 exporters, they are: Argentina, Australia, Brazil, Canada, Chile, China, EU-27, India, Indonesia, Mexico, New Zealand, Philippines, Russia, Ukraine, and the United States. Uruguay is also included in this analysis since Uruguay's 2010 exports of dairy products were not reported in the above database and it is mentioned by one interview participant as a major South American dairy producer alongside Brazil, Argentina, and Chile, which are all included. Belarus would also be included in this analysis due to its growing importance in world dairy markets, but it is part of a Customs Union with Russia so is a participant in Russia's trade negotiations.

The next step in determining which trade agreements under negotiation around the world could potentially be a threat to the competitiveness of the New Zealand dairy industry involves identifying the New Zealand industry's key export markets. Where a major dairy producing nation is negotiating a preferential trade agreement with one of New Zealand's key dairy export markets, this could be a concern for the New Zealand dairy industry. Data sourced from the DairyNZ Economics Group (2011) shows New Zealand's dairy exports to all dairy trade partners for the years 2000 to 2010. From conducting a sort on this data, the largest 26 dairy export destinations for the 2009-2010 dairy season were found. The 26 largest were chosen for this analysis since some important, growing markets were included that were not in the top twenty destinations, such as India and Russia. Also, the 26th largest destination, Nigeria, has an export value of almost $NZ100 million, below which the value of exports drops away significantly. These 26 countries are: Algeria, Australia, Belgium, China, Denmark, Egypt, India, Indonesia, Iran, Japan, Republic of Korea, Malaysia, Mexico, Nigeria, Philippines, Russia, Saudi Arabia, Singapore, Sri Lanka, Sudan, Taiwan, Thailand, United Arab Emirates, United States of America, Venezuela, and Viet Nam.

Information for this section is taken largely from the websites of individual countries' trade ministries, as well as the World Trade Organisation's Regional Trade Agreements Information System (World Trade Organisation, 2011e). There is the possibility that some agreements under negotiation will be missed from the WTO's data however, since only negotiations where an early notification has been made to the WTO will be included. It should be noted that where tariffs are referred to in this section, the applied trade weighted average ad valorem equivalent tariff is the tariff of interest.

Argentina

Argentina is a part of the MERCOSUR trading bloc, along with Brazil, Uruguay and Paraguay, which has a preferential trade agreement with India (Government of India: Ministry of Commerce and Industry: Department of Commerce, 2011). However, this agreement does not include dairy products, so is not relevant to the New Zealand dairy industry at this time[57]. The relationship between the MERCOSUR countries and India should be monitored however, since if negotiations were to be entered into between those nations that included dairy, the access advantages to be gained from the potential New Zealand – India free trade agreement would be compromised to some extent. The Republic of Korea's Ministry of Foreign Affairs and Trade (2011) also identifies that a free trade agreement is under consideration between Korea and MERCOSUR, a potential threat to the benefits that are likely to come if New Zealand's agreement with Korea is concluded. The New Zealand industry should not be concerned with any trade policy competitiveness threat coming from the MERCOSUR agreement itself, since these countries are not huge export destinations, but with any agreement that the MERCOSUR trading bloc negotiates with one of New Zealand's key markets. The low cost of dairy production in those nations (Graham, 2011) makes them a significant threat to New Zealand's export competitiveness, and they must be monitored closely.

The only other agreements that the WTO identifies Argentina as being involved with are the Global System of Trade Preferences among Developing Countries (GSTP), and the Latin American Integration Association (LAIA). It appears that the GSTP is based on tariff concessions which do not include dairy in any of New Zealand's significant export markets (United Nations Conference on Trade and Development, 2010), so should not be considered a particular threat. The LAIA should however be monitored since its stated objective is to establish the Latin American Common Market (Ministry of Foreign Affairs of the People's Republic of China, 2002), and the inclusion of Mexico and Venezuela signify a trade policy threat to the competitiveness of the New Zealand dairy industry[58]. Mexico appears to already generally charge higher tariffs on New Zealand's dairy exports than on Argentina's, and although Argentina's exports to Mexico are not as large as New Zealand's, they are still substantial enough to be concerning, particularly in the mid-2000s (The World Bank, 2011d). Further, it appears that MERCOSUR has a desire to negotiate towards a free trade agreement with Mexico at some stage in the future (SICE, 2011j), and if this agreement was to comprehensively include dairy this would be a worrying development for the New Zealand

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[57] Only one tariff line is covered; in MERCOSUR's imports of Indian dairy products.
[58] The Latin American Integration Association is made up of Argentina, Bolivarian Republic of Venezuela, Plurinational State of Bolivia, Brazil, Chile, Colombia, Cuba, Ecuador, Mexico, Paraguay, Peru, and Uruguay (World Trade Organisation, 2011e).

dairy industry. In the latter half of the last decade, after a free trade agreement between Venezuela and MERCOSUR entered into force (SICE, 2011b), Venezuela has charged higher tariffs on New Zealand's dairy exports than Argentina's, which has led to a disadvantage for the New Zealand industry in the Venezuelan market.

Australia

Information regarding Australia's trade policy agenda is taken from the website of the Australian Department of Foreign Affairs and Trade (Australian Department of Foreign Affairs and Trade, 2011a). Australia is of course a part of the ASEAN, Australia and New Zealand Free Trade Agreement (AANZFTA). Entering into force in 2010, the countries of interest here are Indonesia, Malaysia, the Philippines, Singapore, Thailand and Viet Nam, which are all important dairy export destinations for New Zealand while Australia enjoys the benefits of a free trade agreement under AANZFTA[59] [60]. Of course, New Zealand is also privy to the preferential access that the agreement allows, so the agreement itself is not a competitiveness threat to the New Zealand dairy industry. Australia does have a free trade agreement with the United States, which was a particular concern for the New Zealand dairy industry at the time it was under negotiation, as discussed by interview participants[61]. However, the agreement does not comprehensively include dairy; there are still quotas in place on Australian dairy exports to the United States (Australian Department of Foreign Affairs and Trade, 2011b), so the threat to the New Zealand industry is diminished.

Of the agreements that Australia has under negotiation, the majority of countries involved are also involved in an agreement, or negotiations towards an agreement, with New Zealand. China, the Gulf Cooperation Council (GCC), India, Korea, Malaysia, Indonesia, and the TPP are all in this category. The New Zealand dairy industry should not be particularly concerned about these agreements, since Australian dairy exporters will not have preferential access over their New Zealand counterparts, so long as New Zealand's negotiations with the GCC, India and Korea are concluded satisfactorily. It must be remembered however that Australia is a low-cost dairy producer (Graham, 2011). The only area of concern for the New Zealand industry should come from Australia's free trade negotiations with Japan, since New Zealand is not currently in formal negotiations with Japan. As discussed by interview participants, it is very difficult for New Zealand to enter into bilateral free trade negotiations with Japan, and the New Zealand dairy industry should be hopeful that Japan chooses to enter the Trans-Pacific Partnership in the future, in which it has shown some interest.

Brazil

Brazil is a member, alongside Argentina, of MERCOSUR. As seen above, MERCOSUR has a free trade agreement in place with India, and has an agreement with Korea under consideration. Also like Argentina, Brazil is a member both of GSTP and LAIA, of which GSTP is not considered here since it has already been established above that dairy products are not included in this

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[59] Australia also has a separate agreement with Singapore, which entered into force in 2003. This is after New Zealand's agreement with Singapore entered into force (2001), and Singapore does not practice import protection to any significant degree, anyway (Groser, 2011b).
[60] Separate agreements involving Thailand entered into force in 2005 for both Australia and New Zealand.
[61] See Appendix D – Interviews with Key Dairy Industry Personnel.

agreement for any of New Zealand's key dairy export markets. With regards to the LAIA, New Zealand appears to pay higher tariffs than Brazil on dairy exports to Venezuela while Brazilian dairy exports to Venezuela are approximately the same as New Zealand's, meaning that the New Zealand industry is at a disadvantage in the Venezuelan market in comparison to Brazilian producers. There is a free trade agreement between MERCOSUR and Venezuela to explain this (SICE, 2011b), although it is unclear how comprehensively dairy is included in this deal. Meanwhile, Brazilian dairy exports to Mexico are negligible in comparison to New Zealand's (The World Bank, 2011d). In 2010 Brazil and Mexico announced the beginning of the negotiation process for a Strategic Economic Integration Agreement (SICE, 2011c).

Brazil is a dairy producing nation that the New Zealand industry must monitor closely, since its low cost dairy production structure means that trade policy developments with any of New Zealand's key markets will become a threat.

Canada

Information on Canada's trade policy agenda is taken from the website of Foreign Affairs and International Trade Canada (2011d). Canada is a part of the North American Free Trade Agreement (NAFTA), along with the United States and Mexico. This gives preferential access to Canadian exporters into the important US and Mexican markets that New Zealand exporters do not share. However, this situation is many years old (NAFTA entered into force in 1994, and was preceded by a bilateral agreement between Canada and the United States). In any case, Canadian dairy exports to the United States are not covered by NAFTA (Bailey, 2002), and Mexican trade weighted average ad valorem equivalent tariffs on a very small value of Canadian dairy exports do not seem to be substantially lower than those on New Zealand's (The World Bank, 2011d). New Zealand is actively seeking preferential access into the United States market, and according to an interview participant has expressed interest in Mexico as well, perhaps as part of an expanded TPP arrangement.

The major Canadian trade policy threat to the New Zealand dairy industry's competitiveness comes from negotiations that are under way between Canada and the European Union. European tariffs on dairy imports from both Canada and New Zealand have been very high in the past, with a weighted average of 43 and 59 percent respectively in 2009 (The World Bank, 2011d). Canada's aim is to conclude these negotiations in 2012 (Foreign Affairs and International Trade Canada, 2011a), which, assuming that the agreement comprehensively includes dairy (which will be a difficult negotiating point) will give Canadian dairy exporters a significant access advantage into Europe over New Zealand's. Perhaps the saving grace here for New Zealand is that Canada has much smaller export volumes than does New Zealand[62], while New Zealand tends to be focused more on the growing economies of Asia in its trade policy agenda. Canada entered negotiations towards a free trade agreement with India in late 2010 (Foreign Affairs and International Trade Canada, 2011c), another potential threat for the New Zealand dairy industry, this time in New Zealand's particular area of interest. New Zealand also has negotiations under way with India however, which should limit the scale of the threat to the New Zealand industry. Negotiations are also under way between Canada and the Republic of Korea towards a bilateral free trade agreement.

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[62] From data sourced from the USDA's Foreign Agricultural Service (2011).

However, it seems that Canada is having the same trouble with negotiating with Korea that New Zealand is, with negotiations starting in 2005 but still not complete, while Foreign Affairs and International Trade Canada is certainly not discussing an optimistic deadline for negotiations (2011b). The threat posed by these negotiations remains to be seen, although it is not likely to be significant since New Zealand has negotiations under way with Korea also. The free trade agreement that is being negotiated between Canada and Singapore is unlikely to prove a threat to the New Zealand dairy industry.

Chile

Chile has an impressive number of free trade agreements in place. Its agreement with Australia will not be concerning to the New Zealand dairy industry in itself, since Australia has minimal dairy tariffs (The World Bank, 2011d) and New Zealand is involved in CER with Australia. Chile's agreement with Japan does not consider the reduction or elimination of Japanese customs duties on imports of Chilean dairy products (SICE, 2011a), so is not of particular concern to the New Zealand dairy industry. Likewise, Chile's agreement with Korea sets out no schedule for the elimination of tariffs on dairy products, instead it defers those negotiations until after the conclusion of the Doha Round (SICE, 2011h).

An Association Agreement exists between Chile and the European Union (SICE, 2011e), although this does not appear to significantly liberalise trade for Chile's dairy exports to the EU, which are negligible anyway (The World Bank, 2011d). Chile and India have a partial preferential trade agreement in force which does not include dairy products. Negotiations are now underway in order to deepen that agreement (SICE, 2011f), although it is still doubtful whether dairy will be included in any new agreement. Chile's trade agreement with China, however, does include dairy products, with the 2006 date of entry into force (SICE, 2011d) and particular phase-in periods meaning that for many tariff lines Chile's products will enter China duty free before New Zealand's will. However, New Zealand does have an agreement in place that will ensure that Chilean products do not have preferential access to the Chinese market over New Zealand's in the medium- to long-term. In any case, Chile's dairy exports to China are currently miniscule in comparison to New Zealand's (The World Bank, 2011d). Chile is also a member of the existing Trans-Pacific Partnership, meaning that it shares New Zealand's access to Singapore under that agreement, although Singapore's tariffs on dairy imports are zero anyway (The World Bank, 2011d).

More concerning for the New Zealand dairy industry is Chile's agreement with the United States, in which Chile's dairy exports to the United States are included. In dairy products, some tariff lines had tariffs eliminated on entry into force in 2004, while others are subject to duty free access under an expanding quota (SICE, 2011g). In an article regarding the prospects of the Chilean dairy industry, Adamson (2011, p. 26) discusses Chile's "extensive network of free trade agreements", and highlights that Chile's agreement with the United States means that United States' quotas on Chilean dairy imports will be removed in the future. Chile also has an agreement in place with Mexico (SICE, 2011i), and exports substantial values of dairy products to Mexico (The World Bank, 2011d). All documentation relating to the agreement remains in Spanish, so within the limitations of this study a more in depth look at dairy tariff concessions in the agreement cannot be made, although for most years in the past decade Mexican tariffs on New Zealand's dairy exports have been higher than those on Chilean

dairy exports (The World Bank, 2011d). Chile is also a member of GSTP and LAIA (World Trade Organisation, 2011e), the latter reinforcing the lower tariffs charged by Mexico, and also contributing to the preferential access enjoyed by Chile over New Zealand in the Venezuelan market, where Chilean dairy exports are substantial (The World Bank, 2011d).

In summary, the New Zealand dairy industry should be monitoring the Chilean industry along with other Latin American dairy producers, since their low cost dairy production is a threat to the competitiveness of the New Zealand industry. Where Chile and these other Latin American countries have preferential or even the same level of access to New Zealand's key dairy export markets, there is a competitiveness threat to the New Zealand industry. Chile's preferential access to the United States market should be a particular concern to the New Zealand dairy industry.

China

China has an agreement in place with the ASEAN countries, which covers New Zealand's key dairy export markets of Indonesia, Malaysia, the Philippines, Singapore, Thailand and Viet Nam, after entering into force for goods trade in 2005 (World Trade Organisation, 2011e). However, for the most part ASEAN tariffs on Chinese dairy products were no lower than on New Zealand dairy products in the latter stages of the last decade, and in many cases actually higher (The World Bank, 2011d). The New Zealand dairy industry will not be concerned with this agreement, particularly since New Zealand now has its own agreement with ASEAN (having entered into force in 2010), as well as individual agreements with many of the countries involved. China is also a part of the Asia Pacific Trade Agreement, along with Bangladesh, India, Korea, Laos, and Sri Lanka (World Trade Organisation, 2011e). However, India, Korea and Sri Lanka do not extend tariff concessions to their partners on dairy trade in this agreement (United Nations ESCAP, 2011), so it is not of concern to the New Zealand dairy industry. In addition to its agreement with ASEAN, China also has a trade agreement with Singapore (World Trade Organisation, 2011e), but again, Singaporean tariffs on dairy trade are zero, and New Zealand has its own agreement with Singapore.

China has negotiations towards a free trade agreement underway with Australia (Australian Department of Foreign Affairs and Trade, 2011a), although New Zealand's involvement with Australia in the CER agreement and Australia's existing very low dairy tariffs mean that the New Zealand dairy industry will not be concerned with this development. China is a low cost dairy producer (Graham, 2011), however its production systems are relatively low-tech as discussed by one interview participant, and its growing domestic demand for dairy products makes its potential for increased exports uncertain. It is likely that in the future as the Chinese industry grows with increased investment, some of which is coming from Fonterra, the Chinese dairy industry will become more of a player in global dairy export markets.

European Union

The European Union itself is an economic union of 27 countries (Europa, 2011). The duty-free movement of goods among member countries is a basic premise of such a union, and New Zealand exporters are therefore at a severe disadvantage in exporting to, say, Germany, in comparison to French exporters. This situation has existed for many years (Europa, 2011), so is not a new concern of the New Zealand dairy industry, although achieving the same

preferential access to European markets that intra-EU trade enjoys would be extremely beneficial for New Zealand. The European Union and Algeria have a free trade agreement in place (World Trade Organisation, 2011e). This means that the New Zealand dairy industry is at a trade policy disadvantage in Algeria in comparison to the large EU dairy industry, since New Zealand pays a trade weighted average ad valorem equivalent tariff of approximately 7 percent on its dairy exports to Algeria (The World Bank, 2011d). A trade agreement came into force between Mexico and the European Union in 2000, although tariff negotiations were deferred on some sensitive products, including dairy (Villarreal, 2010). The European Union recently entered into a free trade agreement with Korea, although dairy trade is not comprehensively included in that deal. Korea is removing its duties on some European dairy tariff lines subject to transition periods, but is keeping quotas in place for others (World Trade Organisation, 2011e). Provided that New Zealand is eventually able to conclude a free trade agreement with Korea, New Zealand dairy exporters should have an access advantage in the Korean market over their European counterparts.

The European Union is currently in negotiations with India towards a free trade agreement, after negotiations were launched in 2007 (European Commission, 2011d). The European Commission (2011d) notes that there are important issues outstanding in the negotiations, and it is therefore unclear whether or not dairy trade will be comprehensively included in any final deal. This deal should be monitored by New Zealand since India is an important growing market for New Zealand dairy exports and the European Union is a large dairy producer, with exports from some European Union countries, such as Ireland, to India already substantial (Edlin, 2011c). The bilateral agreement that New Zealand is currently negotiating with India will however, if concluded, result in New Zealand being at no competitive disadvantage in the Indian market in comparison to the EU from a trade policy perspective. The European Union is currently negotiating an agreement with Russia to replace their Partnership and Cooperation Agreement (European Commission, 2011b), although it is unclear to what extent, if at all, this will address trade barriers on dairy products. The European Union has also expressed interest in negotiating towards free trade agreements with individual ASEAN members, after negotiations with the group as a whole were too difficult (European Commission, 2011a). New Zealand's existing agreement with ASEAN means that the New Zealand dairy industry will not be too concerned with these developments, so long as European governmental support of its farmers does not escalate, although monitoring the progress made by the EU in the South-East Asian region would definitely be advised.

India

India and Japan entered into a free trade agreement in 2011 (World Trade Organisation, 2011e), however India's exports of dairy products to Japan are excluded from any trade liberalisation under that agreement. India is a part of the Asia Pacific Trade Agreement, along with Bangladesh, China, Korea, Laos, and Sri Lanka (World Trade Organisation, 2011e). However, Korea and Sri Lanka do not extend tariff concessions to their partners on dairy trade in this agreement (United Nations ESCAP, 2011), and China on very few tariff lines, so it is not of concern to the New Zealand dairy industry. The bilateral free trade agreement between India and Korea also does not liberalise India's dairy exports to Korea. India and Sri Lanka are also both members of the South Asian Free Trade Agreement, and have a separate bilateral agreement (World Trade Organisation, 2011e), although it is unclear as to the extent, if at all,

that Sri Lanka should reduce its tariffs on Indian dairy exports under these agreements. From WITS data for the years 2004, 2005, 2006, 2009 and 2010, the only year in which the Sri Lankan trade weighted average ad valorem equivalent tariff on India's dairy exports was lower than on those from New Zealand was 2010. Export values from India to Sri Lanka were much smaller than those from New Zealand to Sri Lanka in any case, although the New Zealand dairy industry would still benefit significantly if the large tariffs it faces in the Sri Lankan market were removed (The World Bank, 2011d). India has an agreement in place with the ASEAN countries under which the ASEAN members reduce and eliminate tariffs on some but not all dairy tariff lines, although New Zealand's own agreement with ASEAN means that the New Zealand dairy industry will not be at a trade policy disadvantage in that marketplace. India also has a separate bilateral agreement with Singapore, Malaysia, and is a part of the GSTP, although none of these will concern the New Zealand dairy industry.

India is currently in negotiations with the European Union towards a free trade agreement, after negotiations were launched in 2007 (European Commission, 2011d). The European Commission (2011d) notes that there are important issues outstanding in the negotiations, and it is therefore unclear whether or not dairy trade will be comprehensively included in any final deal. India is a large and low-cost dairy producer (Graham, 2011), although it is believed that the growth in demand for dairy products in India is outpacing the growth in domestic supply (Bagrie, Goh, Williams, Croy, Zollner, Edwards, & Smith, 2011), and the Indian industry's prospects for increased exports in the near future is therefore doubtful. When combined with the declining value of dairy exports from New Zealand to Western Europe (Newman & Nichol, 2011), the New Zealand dairy industry's possible trade policy disadvantage in the EU marketplace in comparison to Indian dairy exporters is less concerning. This trade agreement should however be monitored in regards to dairy trade operating in the opposite direction, as seen above. India has also shown interest in working towards a trade agreement with the Gulf Cooperation Council, and conducted a joint feasibility study on the potential of an agreement with Australia (Government of India: Ministry of Commerce & Industry: Department of Commerce, 2011). Provided New Zealand's agreement with the GCC enters into force shortly, as anticipated, there are no concerns for the New Zealand dairy industry with these two developments. As the Indian dairy industry develops, potentially with the aid of New Zealand's dairy technology and human capital, it may become a larger player in world dairy export markets.

Indonesia

Indonesia, as part of ASEAN, has free trade agreements existing with Malaysia, the Philippines, Singapore, Thailand, Viet Nam, and Australia (World Trade Organisation, 2011e), although the New Zealand dairy industry suffers no competitive disadvantage from these agreements. Indonesia is also a member of the GSTP. ASEAN's agreement with China has eliminated tariffs on ASEAN dairy products entering the Chinese market from 2010 (Association of Southeast Asian Nations, 2011a), although the value of dairy exports from Indonesia to China is miniscule in comparison to that of New Zealand's (The World Bank, 2011d). It appears that most tariff lines relating to dairy products are excluded from the free trade agreement between ASEAN and India (Association of Southeast Asian Nations, 2011b), while Indonesian dairy exports to India are negligible (The World Bank, 2011d).

ASEAN has a free trade agreement with Korea (World Trade Organisation, 2011e), and according to the Korean Ministry of Foreign Affairs and Trade (2011), Indonesia and Korea have launched a joint study regarding a bilateral agreement between the two countries. It is unlikely that Korean import protection of dairy products is covered by the ASEAN – Korea agreement, since the trade weighted average ad valorem equivalent tariff on those imports is far higher on Indonesian exports than on New Zealand's (The World Bank, 2011d). In any case, Indonesian dairy exports to Korea are tiny (The World Bank, 2011d). Japan's import tariffs on dairy products are largely excluded from the ASEAN – Japan Free Trade Area, while the tariff lines that are included simply have large tariffs locked in (Association of Southeast Asian Nations, 2011c), and dairy is excluded from the bilateral agreement that Indonesia has with Japan (World Trade Organisation, 2011e). The New Zealand dairy industry is therefore unlikely to desire a trade agreement with Japan the likes of which Indonesia has. As discussed above, the European Union has expressed interest in negotiating trade deals with individual ASEAN members, although it is unknown if and when these negotiations may begin.

Mexico

Mexico is a member of NAFTA, along with the United States and Canada. Mexican dairy producers do have preferential access into the United States, a key export market for the New Zealand dairy industry (The World Bank, 2011d; United States International Trade Commission, 2011). New Zealand hopes to overcome this disadvantage with the current negotiations towards an expansion of the Trans Pacific Partnership to include the United States. A trade agreement came into force between Mexico and the European Union in 2000, although tariff negotiations were deferred on some sensitive products, including dairy (Villarreal, 2010). Similarly, the free trade agreement between Mexico and Japan entered into force in 2005, yet did not include dairy products in its tariff reductions and eliminations (Ministry of Foreign Affairs of Japan, 2011). Mexico is a member of the GSTP, yet this poses no threat to the New Zealand dairy industry. Mexico is also a member of the LAIA, and although tariffs on New Zealand's dairy products in Venezuela appear to be higher than those facing Mexico's dairy products, Mexican dairy exports to Venezuela are very small (The World Bank, 2011d), and do not pose a threat to the New Zealand industry.

According to the WTO, Mexico and Korea have entered into negotiations towards a free trade agreement. However, given Mexico's history with concluding agreements that do not include dairy products, combined with an interview participant's observation that Korea is very sensitive in trade negotiations on agricultural issues, it is unlikely that this agreement will include dairy trade. If it does not cover Mexico's dairy exports to Korea, it poses no threat to the competitiveness of the New Zealand dairy industry in the Korean market; however progress should be monitored in case a comprehensive deal is struck.

Philippines

The Philippines, through its involvement in ASEAN, has free trade agreements with Indonesia, Malaysia, Singapore, Thailand, Viet Nam, and Australia (World Trade Organisation, 2011e), none of which will be concerning to the New Zealand dairy industry. The Philippines is also a member of the GSTP. ASEAN's agreement with China has eliminated tariffs on ASEAN dairy products entering the Chinese market (Association of Southeast Asian Nations, 2011a), although the value of dairy exports from the Philippines to China is negligible (The World Bank,

2011d). It appears that dairy products are not included in the tariff reductions undertaken by India on the Philippines' exports as part of the ASEAN – India Free Trade Area (Association of Southeast Asian Nations, 2011b), while the Philippines' dairy exports to India are very small (The World Bank, 2011d).

ASEAN has a free trade agreement in place with Korea, although as discussed above it is unlikely that dairy products are covered by this agreement. Exports of dairy products from the Philippines to Korea are negligible in comparison to those exports from New Zealand to Korea, in any case (The World Bank, 2011d). Although the Philippines is part of the ASEAN – Japan Free Trade Area, and has its own bilateral agreement with Japan (World Trade Organisation, 2011e), the trade weighted average ad valorem equivalent tariff on the Philippines' dairy exports to Japan is higher than that of New Zealand's dairy exports to Japan (The World Bank, 2011d). Japan's import tariffs on dairy products are largely excluded from both agreements, while the tariff lines that are included in the ASEAN – Japan deal have large tariffs locked in, most of which are greater than 20 percent (Association of Southeast Asian Nations, 2011c). Again, there is the possibility that the European Union may show interest in negotiating a trade deal with the Philippines.

Russia

As discussed in Chapter 3, New Zealand is the first partner with which Russia has entered into negotiations towards a free trade agreement. The European Union is currently negotiating an agreement with Russia to replace their Partnership and Cooperation Agreement (European Commission, 2011b), although it is unclear to what extent, if at all, this will address trade barriers on dairy products. Likewise, Russia and Korea have a free trade agreement under consideration (Ministry of Foreign Affairs and Trade Republic of Korea, 2011), and progress on this initiative has been slow. However, Russia has recently completed negotiations towards its accession to the WTO, which will see its import barriers reduced substantially. Russia's average tariff on dairy products is set to fall by approximately a quarter (World Trade Organisation, 2011f). This will mean that any preferential access New Zealand gains on exports to Russia under the bilateral agreement if and when it enters into force will not give New Zealand exporters such a large advantage over those of other countries, than if Russia did not accede to the WTO. Also, it is possible that the tariffs faced by Russia's dairy exports will fall as a result of its accession, since it will have access to world markets based on the WTO's Most Favoured Nation rates. There is therefore a potential competitiveness threat in those markets in which New Zealand dairy exporters face MFN tariff rates rather than preferential rates. However, New Zealand is a strong supporter of the WTO and will not be concerned with Russia's accession, particularly since it is so well placed to help in the development of the Russian dairy industry.

Ukraine

Ukraine is a member of the Common Economic Zone and Commonwealth of Independent States, along with Russia, and also has its own trade agreement with Russia (World Trade Organisation, 2011e). The net result of these agreements is that Ukraine's dairy products are not charged tariffs on entry into the Russian market, and have entered duty free since at least 2007 (The World Bank, 2011d). Russia's imports of Ukrainian dairy products are much larger than for New Zealand's dairy products (The World Bank, 2011d), and therefore while

considering distance and other factors it is still likely that the New Zealand dairy industry currently suffers a trade policy disadvantage in the Russian market, relative to Ukrainian producers. The free trade agreement New Zealand is currently negotiating with Russia, Belarus and Kazakhstan will address this disadvantage.

According to the WTO's Regional Trade Agreements Information System (2011e), Ukraine and Singapore have entered into negotiations for a free trade agreement. New Zealand's close trade policy relationship with Singapore has been discussed above, and the New Zealand dairy industry will not be concerned with this development. Ukraine and the European Union are negotiating towards a "deep and comprehensive" free trade agreement (European Commission, 2011c). Whether or not that agreement will include dairy products is unclear, but already the European Union's trade weighted average ad valorem equivalent tariff is far lower for Ukraine's dairy exports than New Zealand's (The World Bank, 2011d). Ukraine's dairy exports to the EU are certainly large (The World Bank, 2011d), and thus the New Zealand dairy industry suffers a competitive disadvantage from trade policy in the EU, in comparison to Ukraine. The additional disadvantage from the negotiation of the new trade agreement between the EU and the Ukraine is likely to be relatively small, since the EU's tariffs on Ukraine's dairy exports are already so low[63]. However, the New Zealand dairy industry would almost certainly gain from 'catching up' to Ukraine's access advantage in European markets.

United States

Information regarding the United States' trade agreements is taken from the website of the United States Department of Agriculture's Foreign Agricultural Service (2011). Perhaps the most significant market for the New Zealand dairy industry with which the United States has a free trade agreement is Australia. However, Australian tariffs on dairy products are minimal (The World Bank, 2011d), so the New Zealand dairy industry will not have been concerned with the United States gaining any competitive advantage in Australia from this agreement, particularly with the existence of CER. The United States – Singapore Free Trade Agreement is not likely to be concerning to the New Zealand dairy industry, however, the United States does have a free trade agreement with Mexico under the North American Free Trade Agreement (NAFTA). In the last three years United States' dairy exports have entered Mexico with a zero tariff (The World Bank, 2011d) due to the market access provided by NAFTA (Dobson, 2007), while New Zealand's have been subject to weighted average tariff rates of over 20 percent (The World Bank, 2011d). With this preference advantage, Mexican imports of United States dairy products are just over three times larger, by value, than Mexican imports of New Zealand dairy products in these years (The World Bank, 2011d). An interview participant pointed out that New Zealand has shown interest in conducting trade negotiations with Mexico, but that perhaps Mexico's possible inclusion in TPP would be the best method for undertaking those negotiations. This could be one method for reducing the disadvantage faced by New Zealand exporters in Mexico. The United States' dairy trade with Canada is excluded from NAFTA (Dobson, 2007).

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[63] Trade weighted average ad valorem equivalent tariff being 1.38 percent in 2010 (The World Bank, 2011d).

The United States is a large dairy producer, and New Zealand's Trade Minister, Tim Groser, believes that the United States dairy industry stands to gain significantly from the expansion of the Trans Pacific Partnership: "It [the United States] would be the major beneficiary of a strong dairy outcome in TPP" (Edlin, 2011d, p. 21). Indeed, Groser believes that with the reduction of international dairy trade barriers the United States will surpass New Zealand as the world's largest dairy exporter. The United States may gain the same preferential access to the markets of Malaysia and Viet Nam that New Zealand currently enjoys under the possible expansion of the Trans-Pacific Partnership. However, both already have minimal tariffs on imports of American dairy products in 2010 (The World Bank, 2011d), and so the New Zealand dairy industry should be relatively unconcerned with this development. Japan, Mexico and Canada's possible inclusion in TPP negotiations (Edlin, 2011d) may result in improved access to those markets for American dairy producers. However, New Zealand will also enjoy that improved access and currently does not enjoy preferences in those markets in any case, so developments in this area are positive for the New Zealand dairy industry[64].

The major concern with American trade agreements from the perspective of the New Zealand dairy industry should come from the United States – Korea Free Trade Agreement, for which negotiations have been concluded. Korea has relatively high tariffs on dairy products, around 40 percent on New Zealand and American exports (The World Bank, 2011d), and so any country that enjoys preferential access will enjoy a significant advantage in the Korean market. One interview participant was particularly concerned with this development, especially so since the European Union already has a free trade agreement with Korea. The conclusion of the US – Korea agreement (which is currently held up in the United States Congress) will mean that New Zealand exporters are at a disadvantage compared to both United States' and European producers[65]. New Zealand does have formal negotiations under way with Korea on a bilateral trade agreement, however progress has been slow (Ministry of Foreign Affairs and Trade, 2011d).

Uruguay
Uruguay is a member of MERCOSUR, along with Argentina, Brazil and Paraguay. Although this agreement itself is not particularly concerning to the New Zealand dairy industry, it is the trade policy developments of MERCOSUR with third countries that need to be monitored. As discussed above, MERCOSUR has a trade agreement in place with India, although it currently does not include dairy products, and has an agreement with Korea under consideration. The low cost structure of dairy production in the MERCOSUR countries makes them a very real threat to the competitiveness of the New Zealand dairy industry, and where these countries negotiate a trade agreement with New Zealand's key dairy export markets this threat will become even larger.

Uruguay is also a member of the GSTP and LAIA agreements, and a free trade agreement between Uruguay and Mexico entered into force in 2004 (SICE, 2011k). Mexico's

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[64] Indeed, Mexico's involvement would result in New Zealand catching up to the preferences enjoyed by American dairy exporters.
[65] Although dairy trade is not comprehensively covered in the European Union – Korea agreement.

tariffs on Uruguay's dairy exports are far lower than the tariffs placed on New Zealand's dairy exports, and Uruguay's dairy exports to Mexico are substantial, those not as large as New Zealand's (The World Bank, 2011d). A similar story is seen in the Venezuelan market, and the Foreign Trade Information System of the Organisation of American States (SICE, 2011b) identifies a free trade agreement that is in place between Venezuela and MERCOSUR. The New Zealand dairy industry therefore suffers a significant competitive disadvantage in both the Mexican and Venezuelan markets as a result of the tariff preferences that Uruguay enjoys.

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