THE PATTERNS OF TRADE BETWEEN THE ASEAN AND ANZCERTA COUNTRIES IN AGRICULTURAL PRODUCTS

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ABSTRACT

A gravity model of trade could explain the trade patterns of countries, supported by either the dominance of factor endowments or economies of scale as sources of trade. The gravity model is based on the principle that the trade flows between two trading countries is positively related to their economic size, represented by their GDP and population, and inversely related to the distance between them.

By using data from the period 1965-1999, this study applies the gravity model to identify empirically the determinants of agricultural trade among five member countries of the Association of Southeast Asian Nations (ASEAN): Indonesia, Malaysia, the Philippines, Singapore and Thailand; and also between the Australia-New Zealand Closer Economic Relations Trade Agreement (ANZCERTA) countries, vis-à-vis Australia and New Zealand. The variables used to identify the trade patterns between these two groups are: the incomes of exporting and importing countries, populations of exporting and importing countries, distances between them, and some other augmented variables. Distance has been found to be an impediment to trade for all five ASEAN countries, but not for the two ANZCERTA countries. The level of competitiveness, which is represented by the real exchange rate, was found to be significant in respect of agricultural trade. The Asian financial crisis was not found to have significant effects on agricultural trade of most ASEAN countries or of the ANZCERTA countries. The effect of a country's membership of ASEAN varied from one member country to another. The ANZCERTA membership, likewise, did not affect significantly the observed trade patterns between Australia and New Zealand. Furthermore, the ASEAN Free Trade Area (AFTA)-ANZCERTA relationship also did not have a significant effect on the trade patterns of the ASEAN and ANZCERTA countries.

Intra-industry trade (IIT) involving agricultural products among ASEAN countries is relatively low. Agricultural trade of the five ASEAN and the two ANZCERTA countries could be classified as *strongly inter-industry*, not *intra-industry*, on the basis of the findings. Generally, the IIT patterns of the ASEAN and ANZCERTA countries with their trading partners increased gradually from 1965 to 1999, but are still quite low, so that *inter-industry trade* still characterises the exchange of agricultural products among these countries.

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ABBREVIATIONS

AEM	ASEAN Economic Ministers
AFTA	ASEAN Free Trade Area
ANZECP	ASEAN New Zealand Economic Cooperation Programme
APEC	Asia Pacific Economic Cooperation
ASEAN	Association of Southeast Asian Nations
ANZCERTA	Australia-New Zealand Closer Economic Relations Trade Agreement
BENELUX	Belgium-Netherlands-Luxemburg
CACM	Central American Common Market
CAP	Common Agricultural Policy
CEP	Closer Economic Partnership
CEPT	Common Effective Preferential Tariff
CIE	Centre for International Economics
DFAT	Department of Foreign Affairs and Trade
ECM	European Common Market
EEC	European Economic Community
EFTA	European Free Trade Association
EU	European Union
FTA	Free Trade Area
FAO	Food and Agriculture Organisation
GATT	General Agreements On Tariffs and Trade
GDP	Gross Domestic Products
G-L	Gruble-Lloyd Index
H-O	Heckscher-Ohlin
IIT	Intra-Industry Trade
IOR-ARC	Indian Ocean Rim-Association for Regional Cooperation
MAF	Minister of Agriculture and Forestry
NAFTA	North American Free Trade Area
NAPES	National Asia Pacific Economic and Scientific database
OECD	Organisation for Economic Cooperation and Development
PTA	Preferential Trading Arrangements
PWT	Penn World Table
SAARC	South Asian Association for Regional Cooperation
SITC	Standard Industrial Trade Classification
URAA	Uruguay Round's Agreement on Agriculture
WTO	World Trade Organisation

CHAPTER 1
INTRODUCTION

1.1 Introduction

Regionalism is often directed at the enhancement of economic cooperation, especially among neighbouring countries. *Regionalism*, or *"open" regionalism* as stated by Frankel and Wei (1998), is defined as the reduction of the barriers to trade between groups of neighbouring countries. Such liberalisation is then extended to other countries under the notion of open regionalism. The degree of liberalisation of trade with non-members will not generally be as high as that for member countries. This action is often in response to increasing competition in the global economy, and it is also frequently seen as a potential alternative to multilateralism (Bhalla and Bhalla, 1997). Among developing countries, regionalism was formerly directed at augmenting domestic import substitution and planning policies at the regional level (Lawrence, 1996; Bhalla and Bhalla, 1997; Frankel, 1997).

In order for countries to compete in global trade, increasingly they have joined in regional trading arrangements; in addition, some countries are in more than one trading bloc, so that trade groupings may overlap. The main objectives in entering into multiple memberships are firstly, to access broader markets in other regions outside the immediate region - especially when there are tendencies for some regional blocs to protect their markets from outsiders, and secondly, to get the benefits of the process of globalisation (Bhalla and Bhalla, 1997; Frankel and Wei, 1998; Page, 2000).

A number of regional trading blocs have been established, examples of which are the Association of Southeast Asian Nations (ASEAN) Free Trade Area (AFTA), the North American Free Trade Area (NAFTA), the Asia Pacific Economic Cooperation (APEC) and the European Free Trade Association (EFTA) - together with trade agreements such as the Australia-New Zealand Closer Economic Relations Trade Agreement (ANZCERTA). All those trading blocs should ideally be in line with the

global trade order that, it is hoped, is emerging. The agreements within the blocs and the framework of the World Trade Organization (WTO) have been prepared to face trade globalisation.

ASEAN was the first regional grouping in Asia. It was formed in 1967 with the founding members being Indonesia, Malaysia, the Philippines, Singapore and Thailand. Now, ASEAN membership has been enlarged and incorporates ten countries. The additional countries are Brunei Darussalam, Vietnam, Myanmar, Laos, and Cambodia. ASEAN was founded to achieve certain aims and purposes such as the acceleration of economic growth and the promoting of regional peace and stability (ASEAN Secretariat, 2002a).

ASEAN members started to work together focusing on economic cooperation ten years after this regional grouping was established by forming the Preferential Trading Arrangement (PTA) in 1977. Then, ASEAN really accelerated their cooperation more intensively as a regional trading arrangement since the establishment of AFTA in 1992. Specifically, AFTA was founded to enhance ASEAN economic cooperation among the countries in the region and with the rest of the world as well. The ultimate objective of AFTA is to increase the ASEAN competitive edge as a production base geared for the world market by the elimination of intra regional tariffs and non-tariff barriers.

ANZCERTA was signed in 1982, and it became effective from 1 January 1983. This trade agreement was proposed to replace an earlier agreement (1965) between Australia and New Zealand that provided for free trade in some specific products such as forest products and selected manufactured products. ANZCERTA covers all merchandise trade and tariffs which are particularly significant for both countries because the 1965 agreement did not cover them. Through ANZCERTA both countries have tried to increase their close relationship in international trade.

The role of the Southeast Asian countries within the framework of AFTA has become more closely linked to the world economy through international trade inside and outside the ASEAN region. Also, most ASEAN countries' economies have shown a

tremendous growth rate - at least, they did before the 1997 Asian financial crisis hit these countries. The Asian financial crisis had an impact on international trade, especially in international trade involving Asian countries as trading partners. The volatility of some currencies in Asia has changed the flows of trade around the world. Some ASEAN countries have belonged to more than one membership in regional trading arrangements. Through regional trading membership ASEAN countries, to some extent, have contributed to trade with other ASEAN members, APEC members and with the rest of the world.

ASEAN is one of the regions with which Australia and New Zealand have strong trading relationships. Australia, New Zealand and the ASEAN countries have had a better relationship in terms of economic cooperation since there has been an AFTA-ANZCERTA relationship. The AFTA-ANZCERTA linkage was established in September 1995 during informal consultations between ASEAN Economic Ministers (AEM) and Ministers from Australia and New Zealand. The main focus of this relationship is to enhance and facilitate trade and investments between the two regions (DFAT Australia, 1997). In addition, the New Zealand government has a programme to support a better relationship by providing regional development assistance through the ASEAN-New Zealand Economic Cooperation Programme (ANZECP).

The Centre for International Economics-CIE (2000) found that there are some economic benefits for all countries in the ASEAN and ANZCERTA regions due to the presence of the AFTA-ANZCERTA agreement. CIE argued that if free trade existed between AFTA and ANZCERTA today, the 12 member countries would have a combined Gross Domestic Products (GDP) of around US$ 990 billion. It would encompass a market of over 530 million people from these two regions. Australia and New Zealand would account for about 45 percent of the combined and enlarged GDP. At this combined GDP level, AFTA-ANZCERTA currently represents only 3.3 percent of world GDP. Therefore, although AFTA-ANZCERTA would be a small trade grouping of countries compared to the European Union (EU) or NAFTA, it would be a potentially important trade relationship for member countries in these regions (CIE, 2000).

1.2 Importance of the Study

This study will be restricted to ASEAN and ANZCERTA countries and their trade relationship prior to and under the AFTA-ANZCERTA agreement. The study will focus on agricultural trade. There are three reasons for choosing agricultural trade as a core of study. Firstly, the agricultural sector has become the main sector in most ASEAN countries, Australia and New Zealand. Even though the shares of agricultural trade have decreased gradually in the ASEAN and ANZCERTA countries in the period of study 1965-1999, agricultural trade still remains important[1]. ASEAN-ANZCERTA, as one group, has been in the third position below the EU and NAFTA in the share of world exports and imports[2]. Secondly, the ASEAN countries have relatively higher tariffs in the agricultural sectors than in other sectors such as manufacturing sectors[3]. Conversely, Australia and New Zealand do not impose higher tariffs and relatively low protection on their agricultural products compared with their manufactured products (Lloyd, 1996). Thirdly, specifically for the ASEAN countries, the agricultural sectors were considered to be the sectors that saved their economies from the worst effects of the Asian financial crisis. Therefore, the agricultural trade patterns between the ASEAN and ANZCERTA countries will be investigated.

The ASEAN countries that will be analysed as the ANZCERTA (consisting of Australia and New Zealand) countries' trading partners are: Indonesia, Malaysia, the Philippines, Singapore, and Thailand. The justification for choosing these five ASEAN countries is that they have had longer trading relationships with Australia and New Zealand than have the rest of the ASEAN members. Also, the available data primarily come from those countries.

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[1] For ASEAN countries, the larger percentage of their population depends on the sustainability of the agricultural sectors as more than 50% of their population are in the rural areas - except for Singapore's population. Until now, the agricultural sector still plays a main role in international trade of both the ASEAN and ANZCERTA countries. Specifically for Australia and New Zealand, the shares of agricultural exports for both countries have been higher than those of ASEAN countries. In 1995-1999, the share of agricultural exports of Australia and New Zealand were 29.17% and 61.67% respectively, while those of the five ASEAN countries were less than 25% (more details of the shares of agricultural exports from the countries being studied can be found in Table 3.6 in Chapter 3).

[2] The ASEAN-ANZCERTA, as a group, had export share of 11.7% in the period 1965-1970. Then their joined export shares remained constant during the period of study and the share was 10.72% of total world exports in 1995-2000 (more figures can be seen in Table 3.2 Chapter 3).

[3] Among other ASEAN countries, Singapore is an exception from this case since this country has zero tariffs on its agricultural trade.

In this study, the gravity model will be used to analyse the trade patterns between the ASEAN and ANZCERTA countries in agricultural products. There are several reasons for using the gravity model in this study. First, using the gravity model to study the international trade patterns and the emergence of regional trade arrangements has been remarkably successful empirically (Frankel, 1997; Cornett and Iversen, 1998; Clark and Tavares, 2000). Secondly, the theoretical framework for using this model has in recent years been considerably elaborated and developed (Deardorf, 1998; Feenstra, Markusen and Rose, 2001). Finally, the gravity model has considerable flexibility due to the ability to adopt more representative proxies as variables (Sanso, Cuairan, and Sanz, 1993).

In general, the present study is thought to be important for three reasons. First, studies using the gravity model for agricultural products are rare. Most of the existing studies have been conducted in aggregate products of exports and imports, particularly in the manufacturing areas. Secondly, no studies examining critically the trade patterns of the ASEAN and ANZCERTA countries in agricultural products exist that apply the gravity model. Lastly, several studies have used only cross-sectional analysis as a static model or time series analysis, but not a combination of the two. The present study will apply the pooled cross-section-time series analysis.

1.3 Objectives of the Study

The present study has three objectives: firstly, to analyse the trade patterns between the ASEAN and ANZCERTA countries in agricultural products. The study will also investigate the trade patterns between individual countries of the two regions in order to recognise any possible cross-country patterns and main determinants affecting the countries' trade. Secondly, to ascertain whether or not the Asian financial crisis had a significant impact on the trade flows between the ASEAN and ANZCERTA countries. Finally, this research aims to find out whether or not the trade agreements[4] of ASEAN, ANZCERTA, AFTA-ANZCERTA have resulted in greater benefits to the member countries in the ASEAN and ANZCERTA regions.

[4] The trade agreements here are trade agreements in general that encompass all products including agricultural products.

1.4 Methodology

The gravity model describes the bilateral trade flows aggregated across goods from one country to another. The name *gravity* is derived from an analogy to the law of gravity in physics where two bodies are more strongly attracted to each other the larger their masses and the smaller the distance between them. In economics, the idea is similar to the nation that the higher the volume of transactions in an economy, as measured by its products, the more likely the transactions across borders (Clark and Tavares, 2000). This model uses a series of standard variables referring to the importer and exporter characteristics, such as GDP, population and geographical distance.

In addition to the basic gravity model, this study will use the augmented gravity model by inserting real exchange rate and some dummy variables. The exchange rate fluctuations can have a significant effect only when the time dimension is included. Since panel data are going to be used, the exchange rate variable as an explanatory variable will be employed in the model. In addition, the dummy variables being used are LANGUAGE, ASEAN, ANZCERTA, AFTA-ANZCERTA relationship, and the Asian financial crisis (AFC).

In analysing the agricultural trade patterns of the ASEAN and ANZCERTA countries, the study incorporates initially all the nominated variables in the model for each country. Then the study moves to the specific gravity models by excluding the insignificant variables. This method is applied because empirically different countries have different characteristics, so they are likely to have different variables affecting their own trade. It is therefore essential to find out the main determinants for each single country specifically. The study estimates the gravity model of trade patterns by applying panel data. Moreover, another analysis that is going to be used to investigate the trade pattern between the ASEAN and ANZCERTA countries is intra-industry trade (IIT) analysis. In analysing the IIT of those countries in agricultural products, the Gruble-Lloyd (G-L) Index will be applied.

1.5 Chapter Outline

The research presented herein is arranged into six chapters. The structure of the research is described in the introductory chapter. Chapter 2 presents the theoretical and empirical review of trade patterns, the gravity models and intra-industry trade analysis in the area of international trade, particularly in agricultural trade. This chapter also explores the theoretical aspects of preferential trading arrangements and recent emphasis in respect of agricultural trade and presents the model explaining the free trade area. Chapter 3 reviews the essential nature of ASEAN and ANZCERTA as regional trading arrangements. This chapter also describes the foreign agricultural trade performance of each single country of the five ASEAN countries and ANZCERTA countries. Chapter 4 discusses the methodology and technical design of the gravity models and IIT analysis being used. This chapter explores the general gravity models in explaining the trade patterns between the ASEAN and ANZCERTA countries and finally specifies the appropriate models. The empirical results and discussions will be presented in Chapter 5. Finally, this research ends with Chapter 6. This chapter includes the overall results, proposes the implications of possible policies and recommends possibilities for further research.

CHAPTER 2
TRADE PATTERNS, GRAVITY MODELS, INTRA-INDUSTRY TRADE AND PREFERENTIAL TRADING ARRANGEMENTS: A LITERATURE REVIEW

2.1 Introduction

This chapter reviews the theoretical and empirical literature in the areas of trade patterns, gravity models and intra-industry trade. This chapter also describes the theoretical aspects of preferential trading arrangements (PTA), their application to the formation of existing regional trading arrangements and their concerns about agricultural trade. The chapter is presented as follows: Section 2.2 defines and explains trade patterns as a general concept. Section 2.3 reviews the gravity models and selected research using these models in general industries, in the agricultural sector and in relation to the presence of trading blocs and regionalism as a whole. Section 2.4 investigates intra-industry trade (IIT) analysis and its use in specific industries such as in agricultural industries. Section 2.5 reviews the theoretical and empirical aspects of preferential trading arrangements (PTA) including the drawing of a simple model of PTA especially in the case of a free trade area (FTA). Section 2.6 ends this chapter by presenting a concluding discussion.

2.2 Trade Patterns

Trade patterns or *the structure of trade* can be defined broadly as the composition and direction of exports and imports of a country (Chacoliades, 1990; Pomfret, 1993; Bhagawati, Panagariya and Srinivasan, 1998; Gandolfo, 1998). It helps to identify the principles and policies that govern the international allocation of resources and the flows of trade (Chacoliades, 1990). The patterns of trade, in terms of the Heckscher-Ohlin (H-O) model, for example, depend on the relative abundance of specific

factors. The H-O theorem proposes that a country exports products that use its relatively abundant factors intensively.

The H-O model builds on neoclassical supply-side theories. It depends on three assumptions about production characteristics in each country (Markusen et al., 1995, p. 99): firstly, the production functions for goods X and Z exhibit constant returns to scale. Specifically, good X is always taken to be labour-intensive and good Z to be capital- intensive. Secondly, there are fixed total supplies of both labour and capital, which are homogenous and perfectly mobile between industries within each country. Thirdly, there are no market distortions such as imperfect competition that would influence production or consumption decisions. This last assumption guarantees that the factors of production are fully employed. From these starting points, there are conditions where the model allows trade. Then, two additional assumptions are required (Markusen et al., 1995). These are that preferences in both countries are taken to be identical and homogenous and the defining characteristic of the H-O model which is that countries are assumed to differ in their relative factor endowments.

Recent progress in international trade theory has increased the knowledge of the causes and direction of international trade. Until now, the factor-endowment model has continued to play a leading role in explaining international trade theory. Even though it is now broadly recognised that differences in relative factor endowments are not the only reason for trade flows in either goods or services (Markusen, 1986; Markusen and Wigle, 1990; Krugman, 1992).

Many recent studies of international trade analysis have given more attention to the concepts of imperfect competition and increasing returns to scale in explaining the direction of, and gains from, trade. Increasing returns to scale can obtain cost savings through increased specialisation. This gain can occur even in the absence of any natural pattern of comparative advantage and/or even if two trading countries are definitely identical in all aspects (Markusen et al., 1995).

In addition, Krugman (1992) noted that trade between two similarly endowed countries could happen because of the existence of economies of scale in imperfectly competitive situations. This will enable trading countries to achieve gains from trade even if the economies have identical tastes, endowment factors and technology. Evidence supporting Krugman's hypothesis is that there is an extensive trade among the North (developed) countries even though they could have relatively similar endowment factors and tastes. This kind of trade still dominates worldwide international trade flows. Many studies have explored the trade patterns between North and South (developing) countries. Studies by Markusen and Wigle (1990), Hirschberg, Sheldon and Dayton (1994), Hellvin and Nilsson (2000), Jensen (2000) and Martinez-Zarzoso and Nowak-Lehman (2001) used either the gravity models and/or intra-industry trade analysis to explain the existence of trade patterns between North and South countries.

2.3. Gravity Models

2.3.1. Theoretical Concepts and Equations

The gravity model is based on the logical argument that the trade flow between two trading countries is positively related to their economic size, represented by their own Gross Domestic Product (GDP) and inversely related to the distance between them (Frankel, 1997). From an economic standpoint, the logic behind the argument is that the product supply (export) of a country depends on its size, which is measured by GDP, and the product demand (import), to a certain extent, depends on the demanding (importing) country's size measured in GDP. Therefore, the demand and supply of trading countries can be proxied by their respective GDPs. With respect to any given pair of GDPs, the geographical distance between the two countries will also shape the bilateral trade flows. The distance reduces the trade flows since it represents the cost of transportation; the longer the distance the lower therefore the trade flows.

The gravity model has been developed and several additional determinants have been added to make the model more approximate to the actual situation. Common additional determinants in the gravity models (Frankel, 1997, p. 50) include population, per capita GDP and some dummy variables demonstrating other measures

of geographical or cultural proximity such as common borders, common languages and common membership in regional trading arrangements. Generally, the gravity models can be expressed through this linear equation:

$$X_{ij} = (GDP_i, GDP_j, Pop_i, Pop_j, Dist_{ij}, Dummies) \quad (2.1)$$

where, GDP, Pop, Dist and Dummies denote Gross Domestic Products of countries i and j, population of countries i and j, distance between the capital cities of countries i and j and additional dummy variables, respectively.

Evenett and Keller (2002) stated that there is strong evidence that the volume of international trade is determined by the extent of product specialisation, which in turn is due to increasing returns to scale (IRS) and difference in factor proportions. The gravity equation will be discussed in accordance with perfect and imperfect specialisation of production. The gravity equation is explained as follows (Evenett and Keller, 2002, p. 284): suppose there are two countries i and j and two goods X and Z (which are differentiated products and identically produced under IRS). The gravity theory says exports or imports of countries depend on their GDP. Under the condition of IRS that leads to perfect specialisation in production, then the imports of country i from country j, M_{ij}, are formed by the equation 2.2:

$$M_{ij} = \left[\frac{Y_i Y_j}{Y_w} \right] \quad (2.2)$$

where Y_i, Y_j and Y_w are GDPs of country i, country j and the world, respectively.

Under imperfect specialisation in production, there are two propositions (Evenett and Keller, 2002, pp. 285-286). If good X, for example, is capital-intensive and produced under IRS, and good Z is labour-intensive and produced under constant returns to scale (CRS), and country i is relatively capital-abundant, then country i's imports from country j are given by the following gravity equation:

$$M_{ij} = (1 - \gamma_i)\left[\frac{Y_i Y_j}{Y_w} \right] \quad (2.3)$$

This proposition states that for any value γ_i (the share of good Z in the GDP of country i) > 0, the level of bilateral trade imports is lower than in the case where both

goods are differentiated. Furthermore, as the share of homogenous good production in GDP decreases, the predicted level of imports rises. In a sense, the volume of trade is higher the lower the share of homogenous goods in GDP. Basically, this formula is in part due to H-O reasoning, since γ_i is inversely related to a country's capital-labour ratio. A decrease in γ_i implies an increase in the volume of imports due to an increase in the difference of a country's factor proportions.

If, however, both goods are homogenous and produced under CRS, with country i relatively capital-abundant and good X being relatively capital-intensive, then country i's imports from country j are given by the following gravity equation:

$$M_{ij} = (\gamma_j - \gamma_i)\left[\frac{Y_i Y_j}{Y_w}\right] \tag{2.4}$$

The gravity equation in the H-O imperfect specialisation, equation (2.4), depends not only on the GDPs in the familiar way, but also on γ_j and γ_i, which are characteristics of both countries. In the case where the factor proportions in countries i and j are equal so that $\gamma_j = \gamma_i$, then equation (2.4) shows that there is no trade under the H-O model when factor proportions are identical across countries. When, $\gamma_j=1$ and $\gamma_i=0$, equation (2.4) reverts to $M_{ij} = Y_i Y_j / Y_w$, the gravity equation for the perfect specialisation model. Finally, equation (2.4) can be rewritten as:

$$M_{ij} = (\gamma_j - \gamma_i)\left[\frac{Y_i Y_j}{Y_w}\right] = \left[(1-\gamma_i) - (1-\gamma_j)\right]\left[\frac{Y_i Y_j}{Y_w}\right] \tag{2.5}$$

In spite of its widespread empirical use in the international trade model, efforts have been devoted to searching for more suitable theory to support the gravity model. There are four approaches to justify the gravity model (Oguledo and Macphee, 1994, p. 110). The first approach is related to the physical laws of gravitation to conclude that the flow of goods from one country to another is equal to the product of the potential trade capacities of the two countries divided by a resistance or distance factor.

The second approach is built on the basis of the Walrasian general equilibrium model, in which each country has its own supply and demand functions for all traded goods. The level of supply in the exporting country and the level of demand in the importing country are proxied by aggregate income. In this approach the gravity model is regarded as a reduced-form equation for trade volume (proxied by value) and price is treated as an endogenous variable. The transport cost is proxied by the distance between the exporting country and the importing country.

The third theoretical explanation for the gravity equation is based on a probability model. The interaction between demanders and suppliers is supposedly random. This approach treats trade flows between countries as stochastic events.

The last approach is the micro-foundation approach, which assumes that trade flows are differentiated by place of origin. That means that the assumption of perfect product substitutability in the conventional gravity model is unrealistic, and thus the exclusion of price variables leads to misspecification of the gravity model.

In a world of production processes that are characterised both by IRS and transportation costs, there will be a tendency for producers to put their production process in the areas which are close to their largest markets, even if there are some potential markets in other places (Krugman, 1992). By focusing production in one place, producers can attain economies of scale and, moreover, by putting the production process near the larger market, they can minimise transportation costs. Apparently, Krugman's statement supports the gravity model in international trade that trade transactions will be larger the closer the exporting countries are to importing countries.

Most international economists have ignored distance and other geographical factors as determinants of trade (Anderson, 1979; Davis, 2000; Frankel, 1997). They have treated countries engaged in the international trade as disembodied entities that lacked a physical location in geographical space. The knowledge and recognition of geographical space will be included in the analysis of international trade. Empirical analysis of bilateral or multilateral trade cannot get very far without taking into

account the inhibiting effect of distance on trade. There are at least three basic reasons why the geographical space is important in describing bilateral or multilateral trade in the context of regionalism (Frankel, 1997, pp. 39-40). The first is that distance leads to agglomeration. Agglomeration means historically that countries can produce specific products in the specific region. The second is that geographical space is an important natural determinant of the volume of trade between countries in any given regions. Finally, countries that are located closely together tend to constitute a natural trading bloc, which means that a reduction in trade barriers between them can give economic benefits. This is parallel to the statement that the locations of producers (exporters) and consumers (importers) are closely related (Krugman, 1992).

2.3.2 Empirical Studies Using the Gravity Models

The gravity equation appeared first as an empirical endeavour in Tinbergen (1962). More important theoretical efforts were made by Anderson (1979) and Bergstrand (1985) who used product differentiation models where differentiation took place by country of origin. Helpman (1998) and Frankel, Stein and Wei (1993) used variables in the gravity equation to test the validity of monopolistic competition models. In recent years, gravity models have been used in empirical studies of changes in international trade pattern and integration economies (Cornett and Iversen, 1998). Most of the research using gravity models were done in total trade, rather than for more specific products such as in agricultural products. The vast majority of studies using the gravity models are summarised in Table 2.1, and Table 2.2 presents the definitions of the variables used in the models.

Oguledo and Macphee (1994) used a gravity model that was derived from a linear expenditure equation. By applying the expenditure model they confirmed that the conventional gravity variables such as GDP and distance are statistically significant. In their model, Oguledo and Macphee explicitly incorporated prices and tariffs as variables for discriminatory arrangements. Previous study that explicitly incorporated price variables in the models was done by Bergstrand (1985; 1989) that produced similar results.

Table 2.1 List of Previous Studies Using the Gravity Models

Variables	Tinbergen (1962)	Linnemann (1966)	Aitken (1973)	Sattinger (1978)	Brada and Mendez (1983)	Bergstrand (1985)	Thursby and Thursby (1987)	Bergstrand (1989)
Periods	1958	1958-1960	1967	1972	1954-1977	1976	1974-1982	1965-1976*
Observations	306	3532	132	380	17921	210	144	240
R2	0.84	0.63	0.87	0.8	0.56	0.81	0.64	0.66
Yi	0.74 (17.48)	0.86 (43.0)	0.911 (9.00)	0.91 (32.5)	0.357 (39.33)	0.84 (15.79)	2.03 (1.89)	0.70 (8.77)
Yj	0.62 (14.64)	0.98 (49.0)	1.052 (10.39)	0.79 (28.21)	0.131 (17.52)	0.56 (9.34)	0.55 (10.46)	0.72 (8.04)
YiYj								
Ni		-0.14 (4.67)	-0.369 (3.38)		0.899 (61.45)			
Nj		-0.21 (7.0)	-0.331 (3.03)		0.680 (50.20)			
NiNj								
D	-0.56 (11.78)	0.77 (25.67)	-0.349 (2.74)	-0.97 (19.84)	-0.760 (50.48)	-0.77 (10.92)	-2.839 (3.97)	-0.79 (6.01)
FCR								
C	0.05 (4.47)	1.27 (9.07)						
Ypi				0.25 (3.80)				0.62 (3.03)
Ypj				0.08 (1.22)				0.12 (0.62)
AA								
TM								
G								
P								
F		2.57 (9.88)						
FA								
B		6.8 (10.15)						
A	0.02 (2.33)		0.892 (4.41)			0.76 (5.62)	1.461 (5.75)	0.83 (4.20)
DUMMY								
EEC			0.887 (3.75)	0.81 (5.63)	2.307 (16.51)	0.18 (1.35)		0.73 (2.69)
EFTA								0.26 (0.86)
ECEFTA								-0.26 (1.17)
NAFTA								
APEC								
EFTA			0.572 (3.21)	0.97 (9.97)	2.095 (17.55)	0.73 (3.67)		
AUNZ								
OPECM								
Turk								
Soc								
Com								
CER								
AIC								0.37 (0.40)
Tj								
Aij				0.25 (4.94)				
Bij				-0.59 (3.30)				
Uij				0.42 (2.55)				
Iij				0.78 (9.07)				
Tij				0.09 (1.90)				
VEX							-0.95 (0.62)	
EXR						0.73 (1.62)	-4.126 (5.64)	
XUV						-0.96 (1.55)	-3.891 (0.99)	
MUV						1.85 (4.14)	0.495 (0.97)	
WPIi						-0.05 (0.07)		1.36 (1.03)
WPIj						-1.12 (1.67)		1.25 (1.06)
CPIi							-1.36 (0.34)	
CPIj							3.54 (4.31)	
PRF								
Lij								
TCF								
ANP					0.346 (1.54)			
CACM					1.916 (10.15)			
LFTA					-1.476 (17.14)			
PB	0.04 (1.49)							
TS							-0.113 (1.61)	

Sources: Studies from 1962 to 1987 is from Oguledo and Macphee, 1994; and studies from 1989 to 2001 are by the researcher. Numbers in the brackets are t-ratios.

Table 2.1 List of Previous Studies Using the Gravity Models (*Continued*)

Variables	Sanso, Cuairan and Sanz (1993)	Townsend and Ratnayake (1997)	Helvin and Nilsson (2000)	Clark and Tavares (2000)	Matyas, Konya Harris (2000)	Sanz and Gil (2001)	Haveman and Hummels (2001)
Periods	1964-1987*	1987-1992	1995-1996	1970-1995	1978-1997	1961-1995*	1990
Observations	n.a	1096	n.a	1325	2420	n.a	n.a
R2	0.83	0.66	0.86	n.a	0.915	0.55	0.62
Yi	0.81 (31.0)	1.265 (29.131)	0.83(30.58)		0.838 (8.836)		
Yj	0.77 (29.1)	0.889 (23.033)	0.89 (35.71)		0.689 (7.860)		
YiYj				1.687 (0.073)			0.9
Ni		-0.395 (8.932)			1.580 (4.121)	1.22 (2.35)	
Nj		-0.1733 (4.270)			2.007 (11.124)	0.56 (2.70)	
NiNj				0.771 (0.057)			
D	-0.77 (23.2)	-1.738 (14.379)	-0.87 (22.86)	-1.874 (0.125)	-0.876 (36.301)	-1.59 (4.43)	-1.03
FCR					0.056 (1.625)		
C							
Ypi	0.32 (3.6)		1.27 (15.15)			0.30 (1.08)	
Ypj	-0.21 (2.1)		0.67 (7.76)			1.25 (4.83)	
AA							
TM							
G							
P							
F							
FA							
B							
A	0.45 (6.00)		0.33 (2.95)	2.272 (0.432)			0.63
DUMMY							
EEC	0.08 (1.20)		0.32 (4.29)			0.48 (0.77)	
EFTA	0.05 (0.40)						
ECEFTA							
NAFTA			0.38 (1.07)				
APEC		0.298 (4.336)					
EFTA							
AUNZ			2.11 (16.44)				
OPECM						-3.81 (1.89)	
Turk			0.26 (2.22)				
Soc		-0.397 (5.218)					
Com		0.273 (5.841)					
CER		-0.291 (1.423)					
AIC							
tj							
Aij							
Bij							
Uij							
Iij							
Tij							
VEX							
EXR					-0.463 (10.790)		
XUV							
MUV							
WPIi							
WPIj							
CPIi							
CPIj							
PRF							
Lij			0.41 (4.00)	-0.814 (0.268)		1.94 (1.87)	0.56
TCF							
ANP							
CACM							
LFTA							
PB							
TS							

Sources: Studies from 1962 to 1987 is from Oguledo and Macphee, 1994; and studies from 1989 to 2001 are by the researcher. Numbers in the brackets are t-ratios.

Table 2.2 List of Variables Used in the Previous Studies Using the Gravity Models in Table 2.1

Variables	Description / Value
Yi	Exporter GDP
Yj	Importer GDP
Ni	Exporter population
Nj	Importer population
D	Distance
C	1, 2 2=Commonwealth preferences
AA	1, 2 2=Assoc. African EC preferences
TM	1, 2 2=Tunisia-Morocco-French preference
G	1, 2 2=GSP
P	1, 2 2=Portuguese preferences
FA	1, 2 2=Other French Africa preferences
F	1, 2 2=French preferences
B	1, 2 2=Belgian preferences
A	1, 2 2=Adjoining country
EFTA	1, 2 2=EFTA preferences
Tj	1 + tariff rate average
Aij	Absolute difference in agriculture land per capita
Bij	Absolute difference in crude birth rate
Uij	Absolute difference in urban-rural population
Iij	Absolute difference in per capita income
Tij	Absolute difference in average mean temperature
VEX	Exchange rate uncertainty proxy
EXR	Bilateral exchange rate
XUV	Export unit value index
MUV	Import unit value index
WPIi	Whole sale price index of exporter
WPIj	Whole sale price index of importer
PRF	Preferential margin
Lij	Common language
TCF	Transport cost factor
ANP	Andean pact
CACM	Central American common Market
LFTA	Latin American Free Trade Area
CPIi	Consumer price index of exporter
CPIj	Consumer price index of importer
PB	Benelux preference
FCRj	*Foreign currency reserves of importer*
DUMMY	*0,1,2 1 if EU member, 2 if NAFTA member*
EFTA	*0,1 1 if both countries are members of the EC*
ECEFTA	*0,1 1 if participation in the EC-EFTA in 1975, 1976*
NAFTA	*Binary variable for trade between the NAFTA countries*
APEC	*Binary variable for trade with APEC countries*
AUNZ	*Binary variable for free trade agreement between Australia and New Zealand*
OPECM	*Binary variable of Import comes from OPEC countries*
Turk	*Binary variable for the EU with Turkey*
Soc	*Binary variable of Socialist countries*
Com	*Binary variable of British Commonwealth countries*
CER	*Binary variable of Closer Economic Relation between Australia and New Zealand*
AIC	*Appreciation of importer currency*
Ypi	Income per capita of exporter
Ypj	Income per capita of importer
TS	Difference in taste

Sources:Oguledo and Macphee (1994), variables in italic letters are from the researcher.

Studies incorporating the presence of trade agreements and trading blocs into the gravity models were conducted by Bayoumi and Eichengreen (1995), Hellvin and Nilsson (2000), Martinez-Zarzoso and Nowak-Lehman (2001) and Porojan (2000). They found that free trade areas are responsible for an increase in trade volume that cannot be attributed to economic characteristics of member countries.

Soloaga and Winters (2001) used the gravity model to test the effect of preferential trading arrangements on trade using trade data from 1980 to 1996. They found that regionalism in the 1990s was insignificant in enhancing intra-bloc trade. Five of the blocs studied Gulf Cooperation Council, North American Free Trade Area (AFTA), Central American Common Market (CACM), Latin American Integration Association (LAIA) and ANDEAN Pact had significantly negative effects on trade flows. If analysed by each trading bloc, ASEAN has a significant positive effect on trade and also European Free Trade Area (EFTA), which is significantly positive only in 1980-1986 and in 1993.

Other studies found mixed results in accommodating trade agreements into the gravity models. Towsend and Ratnayake (1997) used the gravity model to analyse the impact of the Australia-New Zealand Closer Economic Relations Trade Agreement (ANZCERTA) between Australia and New Zealand on trade patterns with their trading partners. By using total trade data covering the period 1987-1992, they found that the conventional gravity variables, income, distance and population have highly significant impacts on their trade. The dummy variables such as membership in APEC and the British Commonwealth have also statistically significant influences on New Zealand's patterns of trade. The only dummy variable that has no significant influence is ANZCERTA. They argued that the ANZCERTA variable was insignificant because this agreement has not generated a significant amount of trade or due to the high level of trans-Tasman transport costs.

Hellvin and Nilsson (2000) used the gravity models to investigate the potential level of trade flows between the major trading blocs – namely, the European Union (EU), Asia and the North American Free Trade Area (NAFTA). To obtain the degree of trade integration, they compared the real level of trade flows among the trading

countries with the expected trade flows using the gravity model. They reached the conclusion that according to the existing level of trade integration: (1) trade between the EU and Asia and also trade between NAFTA and Asia are above the OECD average level of trade integration, (2) trade between the EU and NAFTA is the weakest among the major trading blocs and (3) the degree of trade integration between Asia and NAFTA is higher than that of trade between the EU and Asia (Hellvin and Nillsson, 2000, p. 11). They stated that the EU's less integrated market with Asia was because the level of foreign direct investment of European countries in Asian countries is less than what has been invested by North American countries in Asia. Another reason for the lower integration of the EU in Asia was the 1997 Asian financial and currency crisis.

The other issue to which the gravity model is applied is exchange rate volatility. The real exchange rate can be used as an indicator of competitiveness in international trade (Copeland, 1995). The greater the real exchange rate, the more competitive the domestic product in foreign markets. The underlying principle behind this concept is that the cost differential between countries is closely associated with relative price structure in the economy, which is represented by the real exchange rate.

Brocker and Rohweder (1990) analysed international trade patterns by applying the gravity model with the intention of assessing the impact of geographical distance, preferential agreements, language similarities, historical ties and exchange rate volatilities. The gravity model used was derived as a reduced form of a partial price equilibrium model. They studied trade data from 86 countries divided into industrialised and developing countries. They found no evidence to support the hypothesis that exchange rate uncertainties are impediments to trade. This is because exchange rate fluctuation does not always represent a cost in the international trade transaction.

Matyas, Konya and Harris (2000) used augmented gravity models which incorporated variables for foreign currency reserves and the real exchange rate to analyse trade patterns based on the panel data of 11 APEC countries. To obtain the model with the best explanation of trade patterns, the researchers tried to use these four different

models: (1) fully restricted model with no local and target country effects and no business cycle effects; (2) the model augmented by local effects; (3) the model with local and target effects, and (4) the unrestricted model with all kinds of specific effects. In econometric terms, local, target and business cycle effects are just fixed unknown parameters. They reached the conclusion that the fourth model, the unrestricted model, is the preferred model because this model has most significant variables. By using the unrestricted model the business cycle during the specific period of analysis can be traced. The model shows that all the business effects are statistically significant and have positive signs.

2.3.3 The Gravity Models in Agricultural Trade

Bergstrand (1989) used a generalised gravity equation that incorporated factor endowment variables in the framework of Heckscher-Ohlin and taste variables in the framework of Linder. This gravity equation explained the trade flows of some industries (among developed countries) by using the single-digit Standard Industrial Trade Classification (SITC). In his study, agricultural products (food products, beverages and tobacco, and animal and vegetable oils and fats) were the central focus. From the exporter's point of view, it showed that food products tend to be capital-intensive, and beverages and tobacco tend to be labour-intensive in production because the coefficient estimate for exporter per capita income are positive and statistically significant for food products and negative and statistically significant for beverages and tobacco. Meanwhile, from the importer's side, the results showed that beverages and tobacco are luxury products since the coefficient of importer per capita income are positive and statistically significant.

Sanz and Gil (2001) focused their research on agricultural trade by assessing the impact on Spanish agricultural trade with the entry of Spain into the European Union in 1986. Sanz and Gil used a dynamic gravity equation that shows the evolution and development of trade flows over time. Their empirical findings pointed out that internal trade creation and trade diversion are the major effects of EU integration on both Spain's agricultural imports and exports during the period of study.

2.4 Intra-Industry Trade (IIT)

Intra-industry trade (IIT) is defined as the simultaneous export and import of products that belong to the same industry (Grimwade, 1989). Within the same industry, the products are close substitutes for each other in terms of factor inputs and consumption (Tharakan, 1985; Grimwade, 1989; Wong, 1997). The IIT involves products that are classified as differentiated and not homogenous products.

In recent decades, individual countries have not concentrated on whole industries; rather, they have undertaken a much narrower type of specialisation. This has involved specialisation in the production of specific products or groups of products within a given industry. Such specialisation is known as an *intra-industry specialisation*, in contrast to *inter-industry specialisation* in which a country specialises in a whole industry. Inter-industry specialisation leads to inter-industry trade and intra-industry specialisation leads to intra-industry trade (Grimwade, 1989). Models of inter-industry specialisation are constructed in which each country specialises in a particular industry and it enjoys a comparative advantage. In such models, the opening up of trade between any two countries or the elimination of impediments to trade leads each country to concentrate on particular activities. One result of such specialisation is an increasing dissimilarity between the products, in which one country exports a specific product and imports another one.

In addition, IIT is a phenomenon that is difficult to explain by neoclassical trade theories, which assume perfect competition and homogenous products (Tharakan, 1985). Inter-industry trade is also associated with the Heckscher-Ohlin model, where the comparative advantage leading a country to export or import a given product depends on the variations in factor endowments they have and on factor intensities by commodity (Markusen et al., 1995).

Countries that have very different factor endowments will engage in Heckscher-Ohlin trade, whereas countries that have similar factor endowments will engage in intra-industry trade (Krugman, 1981). The theoretical explanation behind this is that the existence of economies of scale in the production process encourages each country to

produce only a subset of the products within each group, so that there is intra-industry specialisation in trade. Since firms in the same industry in different countries will produce differentiated products there will be two-way international trade within the industry. The existence of fixed costs in production prevents countries from domestically producing a complete range of products, thus economies of scale within each country's domestic production are the basic cause of intra-industry trade. Countries with similar factor endowments will still trade because of economies of scale, and their trade will be largely intra-industry trade (Krugman, 1981; Markusen and Wigle, 1990).

The theoretical developments of intra-industry trade have predominantly emphasised the existence of imperfect competition in industrial markets, particularly the role of economies of scale and product differentiation (McCorriston and Sheldon, 1991). In imperfectly competitive markets, existing firms produce differentiated products that are close substitutes. International competition forces monopolistically competitive firms to specialise in the production of fewer varieties of a specific good and to attain economies of scale by narrowing the production process. As trade impediments are increasingly abolished through globalisation, alterations in favour of intra-industry trade patterns can result from both specialisations in production and economies of scale (Qasmi and Fausti, 2001).

If internal economies of scale exist in an imperfect competition market, its presence has two implications (Wong, 1997, p. 253). Firstly, existing firms want to attain the advantage of economies of scale, which means that the output level being produced by each firm will not be too low, or that many varieties will be produced. Secondly, there are no two firms that are going to produce the same variety. Supposedly, if there are two firms producing the same products then one can produce slightly more, resulting in a lower average cost of production according to the existence of economies of scale. As a consequence, this allows the firm to sell the product at a lower price until the other firm is driven out of the market.

The existence of intra-industry trade increases the importance of product differentiation within the product groups. When product differentiation exists in an

economy, it is assumed that a condition of increasing returns to scale exist rather than constant returns to scale; otherwise, the number of varieties will be infinite and may not be determined. In the presence of product differentiation consumers prefer more variety to less. It is assumed that internal economies of scale occur in the production process (Wong, 1997; Qasmi and Fausti, 2001).

With the assumptions of economies of scale and product differentiation, there are a number of hypotheses that can be generated from the implications of the theoretical model developed by Helpman and Krugman (1985). Firstly, the greater the equality (inequality) of relative factor endowments between the countries, the higher (lower) the level of IIT will be. Secondly, the greater the average market size of two countries, the greater the share of IIT in trade between the two countries. Thirdly, the smaller (greater) the difference in market size between two countries, the higher (lower) the share of IIT in their bilateral trade will be.

Most empirical efforts in studying intra-industry trade were based on the use of the Grubel and Lloyd (GL) Index. This index is expressed as (Grubel and Lloyd, 1975):

$$GL_t = \left[1 - \frac{|X_t - M_t|}{(X_t + M_t)}\right] \tag{2.6}$$

where, X_t and M_t denote exports and imports of a given industry in year t. As the degree of IIT increases, the GL Index approaches 1 and as either exports or imports dominate bilateral trade in the particular industry (or inter-industry trade exists), the value of the GL Index approaches zero.

Intra-industry trade has been defined as the export and import of products within the same industry. The criteria of industry discussed in this chapter refers to those proposed by Grimwade (1989). Grimwade proposed three criteria in classifying products and defining them as constituting the output of an industry: (1) Substitution in production, which means that every single product produced by the industry has roughly similar input requirements or factor intensities; (2) Identical technology intensity, which means that every single product is produced by a roughly similar method or process of production; (3) Substitution in consumption, which means that

every single product has broadly similar uses such that consumers can substitute one for another in consuming the product.

2.4.1 Empirical Studies Analysing IIT

The analysis of intra-industry trade is concerned mainly with the effects of economic integration on specialisation in trade. The investigation of IIT effects on trade within economic integration was first considered in the formation of the Belgium-Netherlands-Luxemburg (BENELUX) in 1948 and the European Economic Community (EEC) in 1958 and the trade between these two groupings (Tharakan and Kol, 1989). These studies found that the increase in trade among the member countries of the economic blocs had taken place largely through the specialisation in production and export of products of the same industries rather than of different industries. This finding was unexpected because the Heckscher-Ohlin theory predicted that trade liberalisation was due mainly to specialisation of the inter-industry trade.

A number of studies have been done in the area of intra-industry trade, particularly after the forming of the European Union (EU) in Western Europe. The relative increase of intra-EU trade in particular emerged in the period 1985-1992, which coincides with the implementation of Europe as a single market. IIT is the general pattern of bilateral trade between individual EU country (Stone and Lee, 1995; Brulhart and Elliot, 1998). Since that time, theoretical and empirical studies in intra-industry trade have been conducted continuously. Due to the increasing phenomenon of IIT, there is no single model that perfectly covers all the determinants in explaining IIT. Instead, a wide range of models has been developed, each of them emphasising a set of main determinants. International trade researchers have developed some models based on imperfect competition models with strong assumptions of economies of scale, product differentiation and consumer preferences in taste and product variety.

The presence of high and growing levels of IIT is commonly interpreted as a reason to expect low adjustment costs following trade liberalisation. The rise in IIT greatly

facilitated trade liberalisation by reducing the pressure for each country to concentrate its production on a narrow range of industries according to comparative advantage (Brulhart, 1994; Grimwade, 1989). The IIT model provides a better construction for understanding international trade and its connection to the growth in cross-trade of specific products (MacCharles, 1987). The model puts emphasis on dynamic changes to production conditions between countries, spurred on by increasing competition as the economic environment is subjected to freer trade and growth in the specific industry.

The nature of trade has important implications for the process of structural adjustment towards trade liberalisation and the extent of costs to be carried. It is argued that adjustment costs are lower when new trade is of the intra-industry type because disruption is minimised when adjustment is internal to an industry. It is easier to transfer and adapt resources within firms or industries than to switch them from one industry to another (Hamilton and Kniest, 1991).

The possibility of lower adjustment costs suggests that the prospect for a common market is higher when more of actual and potential trade is of the intra-industry type (Hamilton and Kniest, 1991). Hamilton and Kniest considered the impact of trade liberalisation such as the creation of a free trade area on encouraging a greater degree of intra-industry trade. They found significant correlation between the lower adjustment costs and trade liberalisation in industries characterised by a high degree of IIT.

Hamilton and Kniest (1991) studied the trading arrangement that exists between Australia and New Zealand. As a consequence of the ANZCERTA agreement, trade in agreed products between the two neighbouring countries has been subjected to gradual reductions in tariff and non-tariff barriers to trade, so that by mid-1990 there was complete free trade in goods. To discover whether or not trade liberalisation under ANZCERTA has led to more IIT, Hamilton and Kniest employed disaggregated data for the manufacturing industry and tested whether IIT grew more quickly in sectors affected by the agreement than in sectors not affected by the agreement. They also tested whether, among the sectors affected by trade liberalisation, structural adjustment had been lower in sectors with a high level of IIT.

They found that both sectors experienced a statistically similar increase in levels of IIT over the period of study (1981-1987). They found a trend towards intra-industry trade in manufactured products between Australia and New Zealand that is independent of the liberalisations stemming from ANZCERTA. They also recognised that the elimination of barriers to trade has encouraged both intra-industry and inter-industry trade.

Another study that incorporates regionalism was done by Matthews (1998). He considered the pattern of IIT in Australian trade with its 14 trading partners by using pooled cross-section and time series regression analysis and focusing on manufacturing industries (SITC 5-8) by using the Australian bilateral trade data covering the period 1978-1993. Using the imperfect competition model as a basis of IIT, he proposed that factors contributing to the presence of IIT comprise similar taste, similarity in the endowment factors, economies of scale, geographical closeness and low impediments to trade.

In his study, Matthews found the main determinants in explaining the trend of IIT of Australia's bilateral trade. These factors were average and relative per capita incomes, distance and trade destination. For these main factors he found that Australia's highest level of IIT was with its closest neighbour, New Zealand at around 50 percent, largely reflecting the high degree of economic integration under the ANZCERTA agreement.

Markusen et al. (1995) used a simple model to examine the role of per capita income in analysing the total volume of trade and the direction of trade. In their analysis, they added a third determinant of trade, non-homothetic demand, to the key element of monopolistic competition and differing relative factor endowments. They came to the conclusion that trade between the North (developed countries) and the South (developing countries) would be either the traditional Heckscher-Ohlin trade based on differences in factor endowments or inter-industry trade. Meanwhile, the trade flows among the countries of the North would be primarily trade in differentiated products, as intra-industry trade.

Parallel to these findings, Murshed (2001) proposed that in IIT patterns, the North exports higher quality products that point towards its greater human skill resources, while the South tends to export more traditional products that reflect cheaper labour costs. To support this statement, he analysed the trade patterns of seven East Asian countries, Malaysia, Singapore, Thailand, Indonesia, the Philippines, South Korea and Hong Kong, with their trading partners in other Asian countries and the West. His study focused on intra-industry trade by analysing the bilateral trade of each country during 1980-1992. He found that the share of IIT as a proportion of total manufactured trade has risen since 1980 for every Asian economy in the sample.

2.4.2 IIT in Agricultural Products

Empirical studies on IIT in agricultural products have been limited, as most studies have focused on industrial products. This is because industrial products are easier to differentiate than agricultural products, which are naturally more homogenous. But the increasing use of technology is likely to lead to the production of differentiated agricultural products (Christodoulou, 1992). Christodoulou attempted to identify major determinants that explained cross-country variations in the levels of IIT in meat and meat products in the EEC during the 1980s. He found that supply and demand features of the market structure of meat products in the EEC played a major role in determining the intra-industry patterns of trade in these products. He explained that the most important factor on the demand side is consumer preference, which has common characteristics both in economic and cultural variables, suggested by per capita income and geographical location correspondingly. On the supply side, an imperfectly competitive market structure explains significantly the patterns of intra-industry trade.

Hirschberg, Sheldon, and Dayton (1994) studied the IIT in agricultural products. Their study analysed the determinants of bilateral intra-industry trade in the food-processing sector for a sample of 30 countries over the period 1964-1985 by applying pooled cross-section-time series analysis. They found that intra-industry trade is a positive function of a country's income per capita and the equality in income per capita between two trading partners. Other determinants that were found to be

significant were the existence of a common border and the membership in either a customs union or free trade area. Meanwhile, the fluctuations in exchange rate and distance were found to lessen IIT of bilateral trade.

McCorriston and Sheldon (1991) used IIT analysis to examine the trade patterns between the United States and the European Community (EC) in high-value processed agricultural products over the period 1977-1986. They found that any changes in international trade in the processed agricultural products for the US were mostly characterized by inter-industry specialisation (with the exclusion of exports to Canada), while the EC trade was characterised by IIT. They claim a possible explanation for the lower level of IIT of the United States of America (USA) was due to the increase in their foreign direct investment worldwide.

Another study focusing on agricultural products was conducted by Qasmi and Fausti (2001). Their study focused on the NAFTA's impact on intra-industry and inter-industry trade in agricultural food products. They used bilateral trade data in agricultural products covering 23 agricultural food product groups among the USA, Canada and Mexico and between their trade with the rest of the world during 1990-1995. They found that bilateral intra-industry trade in food products for the NAFTA countries increased significantly over the period of study, especially for trade in food products involving a greater degree of processing. This increase in bilateral intra-industry trade in food products was due to the creation of the NAFTA agreement. The USA-Canadian bilateral trade has been higher relative to Mexico's bilateral trade in the framework of NAFTA, because the USA and Canada's income and population have more in common.

2.5 Preferential Trading Arrangements (PTA)

It is a standard result of international trade theory that free trade in commodities maximises global efficiency in a distortion-free world (Plummer, 1996). Through trade, countries are able to specialise in both goods and the production processes in which they have comparative advantage. This means that the country produces at a lower opportunity cost relative to the rest of the world. It will export these products, and import those goods in which it is relatively uncompetitive. Hence, trade allows for a more efficient division of production and the gains from trade will be greater where there are no distortions affecting the international exchange of goods.

The movement toward regional trading arrangements is part of the process of the globalisation of trade, which started in the 1980s (Josling, 1993). During this time, there was little movement toward regional integration, with the exception of the European Common Market (ECM), and even the ECM provided a significant contribution in terms of global economic growth and rapid global reductions in tariff and non-tariff barriers (Bhalla and Bhalla, 1997; Krueger, 1999). One view is that the gradual introduction of free trade or trade liberalisation at a regional level could be considered the initial steps towards global liberalisation of trade. Such liberalisation may initially be easier when a small number of countries are involved (Bhalla and Bhalla, 1997).

In the last few decades many countries have been forming or strengthening regional trade agreements. This was driven by the need to both attract investment and promote international trade. Gaining access to overseas markets and thus achieving competitive economies of scale in domestic production were also important driving forces (Josling, 1993). The general reason for countries to join together to form a regional trading arrangement is because it is normally assumed that the benefits from joining outweigh the potential losses from not joining (Page, 2000).

Regionalism is designed to enhance economic cooperation, especially with neighbouring countries. Frankel and Wei (1998) defined regionalism as the elimination of barriers on imports from non-member countries that is undertaken

when member countries liberalise trade among themselves. The degree of liberalisation on imports from non-members need not be as high as that for member countries. This action is in response to increasing competition in a global economy and is also frequently seen as a potential alternative to multilateralism (Bhalla and Bhalla, 1997).

2.5.1 Definitions and General Overview of PTA

Before exploring the general overview of preferential trading arrangements (PTA), it is necessary to start with the definitions regarding PTAs. PTAs have been classified into several categories: free trade area (FTA), customs unions, common markets and economic union (Krueger, 1999, p. 111). The classification basically depends on the ease of access in either international trade and/or investment activities in an ascending order of economic integration. The first type, *FTA*, is described as a preferential arrangement in which tariffs are lowered on products traded to other members but maintained against countries that are not members. The second type, a *customs union*, is a preferential arrangement in which all tariffs among the members are abolished, while external tariffs are adjusted to a common level. In order to be consistent with the General Agreements on Tariffs and Trade (GATT) and the World Trade Organisation (WTO), the common external tariff must be no higher than the pre-union tariff, and compensation is negotiated by non-member countries when the accession of a member harms the non-member. A *common market* is a custom union that permits the free movement of factors of production, such as labour and capital, among the member countries. The final level is an *economic union*, which is a common market that has additional common economic standards across members.

The analysis of regionalism in accordance with their level of integration is complicated by the fact that actual preferential trading arrangements normally contain elements of more than one form. In recent years, the wave of new preferential trading arrangements has consisted almost entirely of free trade agreements rather than customs unions, with the exception of the tendency of some Eastern European countries to desire entry into the European Union (Krueger, 1999).

Empirically, PTAs in the global economy are all geographically based (Krugman, 1993). It would also appear that, in general, the closer countries are to each other, the larger the percentage of trade that takes place between them. Trade would be expected to intensify in response to lower transport costs. Efforts to form regional trade agreements are based mostly on geographic proximity and global economic development. The larger the volume of trade between countries within a regional bloc, the greater the potential for trade creation and the less for trade diversion, making the agreement more likely to be welfare-enhancing rather than welfare-reducing (Plummer, 1996; Sager, 1997; Frankel and Wei, 1998).

In an earlier step, regionalism was created when neighbouring countries were at early stages of development. With their small domestic markets, regionalism has been a vehicle for creating economies of scale; moreover, it supports industrialisation (Lawrence, 1996; Bhalla and Bhalla, 1997; Frankel, 1997). The need to create regional blocs has changed and developed due to general changes in the world economy and related inherently to changes in specific conditions in the given region. Regionalism at the current time differs from the regionalism of the 1960s, especially from the point of view of developing countries (de Melo, Panagariya, and Rodrik, 1993, p. 159).

Firstly, regionalism in the 1960s tended to be inward looking, as some developing countries extended their trade policy from an import-substitution-industrialisation strategy to become regional strategy. Current regionalism tends to be an outward-oriented strategy, in which countries in the given region expand their combined trade outside their regional agreement area. In Latin America, for example, several regional trading arrangements exist such as MERCOSUR, the ANDEAN Pact and the Central American Common Market (CACM). In 1992 the Association of Southeast Asian Nations (ASEAN) signed the Agreement on the Common Effective Preferential Tariff (CEPT) Scheme to form the ASEAN Free Trade Area (AFTA). In South Asia, the South Asian Association for Regional Cooperation (SAARC) created the South Asian Preferential Trade Agreement to augment their combined economic activity in 1995. The APEC forum was also formed in the 1990s to accommodate overall trade and investment in the Asia-Pacific region more intensively, however, this forum looks

more like a consultative body than a trading bloc (dell'Aquilla, Sarker and Meilke, 1999).

Secondly, developing countries have strong tendencies to pursue regional integration with other developing countries, but in recent decades some developing countries have combined with developed countries in the same regional agreements. A developing country was united with the developed economies in a regional trading bloc such as in the formation of the North American Free Trade Area (NAFTA) in 1993, which brought Mexico (developing country), Canada and the United States (developed countries) into a regional trade agreement.

2.5.2 The Waves of Regionalism in the Asia-Pacific Region

Over time, trade increasingly links countries in the Asia-Pacific region. In this area, regional trading arrangements consist of a diverse set of countries with differing levels of incomes that have undergone considerable trade integration since the 1980s (dell'Aquilla, Sarker and Meilke, 1999). The recent commitment of policymakers in developing countries to regional trading arrangements has been reinforced by the rise of regionalism in the trade relations of the United States and the new European Union (deRosa, 1995; dell'Aquilla, Sarker and Meilke, 1999). The renewed interest in regional trading blocs in North America and in Western Europe has had a widespread effect on the countries in the Asia Pacific region. In the case of Southeast Asia, ASEAN became more active in fostering economic cooperation in the region during the 1980s.

The Asia-Pacific region has been held up as a model of open regionalism because of its relatively high level of extra-regional trade activity. Despite this outward-looking trade pattern, trade relations within the area have grown in recent years and the movement toward regionalism in the Asia-Pacific grouping is stronger than ever (Poon and Pandit, 1996). The Asia-Pacific region has increased total trade, but this increase has not been disproportionately tilted towards exports outside the region. Empirically, the trade data show that the Asia Pacific region's propensity to trade extra-regionally is significantly higher today than in the 1960s, even though market

forces have deepened integration in the region. In the case of Asia itself, the data showed (Anderson and Norheim, 1993, p. 100-1 cited in Sager, 1997, p. 248) that Asia's index of propensity to trade extra-regionally has increased from 0.15 in 1968 to 0.19 in 1990. Asia's index of propensity to trade intra-regionally reveals a comparable increase, from 0.60 in 1968 to 0.67 in 1990.

Two characteristics of regional trading arrangements in Asia existed prior to the creation of APEC (Bergstend, 1997). One feature was that many Asian countries - including the big trading countries such as Japan, South Korea and China - did not belong to any regional trading arrangements. The AFTA and ANZCERTA are the only two regional trading arrangements in the East Asia/West Pacific region. Both AFTA and ANZCERTA are outward-looking regional trading arrangements which have lowered external trade barriers vis-à-vis outside countries during the period of regional trade liberalisation (Lloyd, 1996). The ANZCERTA appears to have provided an impetus for further steps toward trade liberalisation and both countries have remained strong supporters of the open multilateral trading system (Krueger, 1999).

The other one is that trade liberalisation tended to feature unilaterally, as some countries have tried to reduce trade barriers across the border as part of their national development policies. Regional countries have implemented much of the area's reduction in barriers without reference to international negotiations (at either global or regional levels) as part of their national development strategies.

Regional integration agreements are less structured in the Asia Pacific region than elsewhere. The ASEAN agreement is specifically concerned with food security, such as sharing rice stocks, rather than agricultural protection. ASEAN and its AFTA have little agricultural content. ANZCERTA is the only free trade agreement that fully incorporates agriculture (dell'Aquilla, Sarker and Meilke, 1999) in the Asia-Pacific region.

Preferential trading arrangements among developing countries have been allegedly less successful than similar arrangements among developed countries, generally

owing to the occurrence of large welfare-reducing trade diversion effects (de Simone, 1996). One of the negative effects of regional trading arrangements to the multilateral trading system can be recognised in the case of developing countries. Countries not grouped in the major trading blocs such as the EU, NAFTA and the Pacific Rim have the most to lose from the emergence of regional trading arrangements at the expense of multilateralism (Sager, 1997). According to Krugman (1993 cited in Sager, 1997) the creation of regional trade blocs is unlikely to reduce world welfare, but it is likely to leave out small economies which are geographically far from trading arrangements.

Most developing countries have policies that were biased against exports and aimed at import substitution and restricting foreign direct investment. Unsuccessful stories of regional trading arrangements involving developing countries were due mainly to their initial motivation in joining the regional agreements (Lawrence, 1996). The initial motivation to enter the regional agreement was to achieve economies of scale for protected domestic markets. This is because when countries have similar patterns of specialisation they can avoid competition among themselves and focus the region's trade toward countries outside the agreement. However, even when there was a scope for specialisation, once the extra-regional trade was diverted, the benefits from the agreement were exhausted (Lawrence, 1996).

2.5.3 Reasons for Existing Regional Trading Arrangements

The speed of multilateral economic integration among countries (under the General Agreements on Tariffs and Trade - GATT system) in the world economy slowed during the 1970s and 1980s, limiting the realisation of economic gains from greater consumption, specialised production and international trade (deRosa, 1995). The slow movement and limited success of the multilateral trade negotiations under the GATT may also be related to the fact that more than 100 countries were party to the negotiations. This number is substantially larger than in the previous rounds because many developing countries participated actively in the multilateral trade negotiations for the first time (deRosa, 1995; Sager, 1997). The larger the number of participating countries the larger the differing vested interests from each individual country. As a

consequence, more complicated problems arise in dealing with these different interests.

Another condition that made the GATT difficult to run (Sager, 1997) is that the formation of regional trade agreements was based on a number of reasons, including political interests of member countries, geographic proximity and dissatisfaction with slow, lengthy and uncertain process of GATT round negotiations. The recent proliferation of regional trade agreements can have a slowing effect on multilateral trade negotiations, but it is clear that member countries do not expect GATT, as a single institution, to serve and regulate trade among all members.

As a consequence, many countries that are geographically close to each other and have similar international trade policies have tended to arrange regional trade agreements rather than tolerate the lengthy and uncertain multilateral GATT negotiations. GATT rounds have always been perceived as long, slow and difficult (Baldwin, 1997; Sager, 1997; deRosa, 1995). The factors affecting the slow progress towards a positive outcome of the Uruguay Round resulted in a number of countries - both advanced and developing – in pursuing bilateral approaches through regional agreements to expand their trade relations. Many countries have turned back to regional agreements to achieve feasible economic gains without constantly depending on the slow-moving GATT negotiations (deRosa, 1995; Sager, 1997).

There are several preconditions that have to be in place in order to achieve successful regional trading arrangements. Those conditions are a low common external tariff, a comparable stage of development and similar production and price structures (Tichy, 1992 cited in de Simone, 1996). De Simone also noticed that other factors are needed to create preferential trading arrangement by endogenising monetary and fiscal policies, together with the institutional framework in the member countries. These preconditions are an ideal way to build and rearrange regional blocs. However, some regional blocs were built without fulfilling these criteria. Generally speaking, the formation of regional trade agreements or bilateral agreements can be assessed legally

under GATT as long as the institution is consistent with the necessary criteria of Article XXIV of the GATT (Sager, 1997)[1].

2.5.4 Multilateralism and Regionalism in Agricultural Trade

The Commitments of Trade Agreements in Agricultural Trade

The world agricultural food trade is currently more regionalised than it was in the 1960s and is increasingly moving towards even more regional integration (dell'Aquilla, Sarker and Meilke, 1999). Agricultural trade has historically remained outside of the GATT and the WTO process of multilateral trade agreements and in most free trade areas agriculture has also been excluded (Josling, 1993; dell'Aquilla, Sarker and Meilke, 1999).

The deals regarding agricultural trade in regional trading agreements vary widely across trading blocs and free trade areas. Despite the slow progress made during the Uruguay Round, liberalisation of agricultural food trade remains an indefinable goal (Josling 1993). Article XI of the GATT establishes the tariff principle which allows quantitative restrictions on imports where domestic agricultural policies control supplies. Article XVI, though banning most export subsidies, admits their use in primary products under certain conditions (Josling, 1993, p. 803).

The GATT's focus on agricultural products was started in 1982 when the GATT set up a Committee on Agricultural Trade to specifically focus on agricultural concerns (Josling, 1993). In the WTO framework, negotiations about the agricultural sector were initiated in Geneva in March 2000 and conducted as special sessions of the WTO Committee on Agriculture. These negotiations were expected to address three areas of national agricultural policies: market access (tariffs, tariff rate quotas and other trade barriers), domestic support and export subsidies (Maclaren and Josling, 1999; Burfisher, 2001). These are sometimes called the three pillars of the Uruguay Round's Agreement on Agriculture - URAA (Burfisher, 2001).

[1] Article XXIV requires that (a) the resulting tariffs and other restrictions on trade with other countries not party to the arrangement are on the whole not higher or more restrictive than the general incidence of duties and other regulations of commerce previously applicable in the territory of the union or area; and (b) duties and other restrictions on substantially all trade within the territory of the customs union or free trade area are eliminated (American Law Institute, 1990, p. 299 cited in Sager, 1997, p. 243).

Agriculture has been only partially integrated into most regional agreements, with the exception of the European Union (EU)'s Common Agricultural Policy (CAP) where a highly protective agricultural policy facilitated integration. In the Asia-Pacific region only the ANZCERTA between Australia and New Zealand fully incorporates agriculture in its regional agreements (Josling, 1993). This is because issues related to trade in agricultural food products have been difficult to deal with during negotiations for preferential trade agreements (Josling, 1993; dell'Aquilla, Sarker and Meilke, 1999; Rae, Chatterjee and Shakur, 2001).

Despite doubts about the ability of agricultural trade to be integrated into the world trading system either on a regional or multilateral basis, there is evidence which counters those doubts (Josling, 1993, p. 803). Firstly, there has been a major change due to the emergence of new countries, which were formerly centrally planned economies. This emergence will have positive effects on the inclusion of agricultural products particularly in regional trading arrangements encompassing those new countries and generally regional trading arrangements as a whole. Secondly, there is a tendency by developing countries to switch their policies toward liberalisation and away from import substitution policies. Thirdly, formation of regional trade groups has raised the spectre of protectionist blocs. Finally, the GATT seems to have been revitalised since the mid-1980s.

Furthermore, even though agricultural trade has often been excluded from multilateral or regional trade agreements, there are four reasons to include agriculture in the provisional agreements of regional trade agreements. These are that agricultural product exporting countries will want access to importing countries' markets; food cost differences can distort economies if agriculture is left out of the agreements; the food sector will tend to remain national, as a result of different raw material costs and regulations; and it is not GATT–legal to exclude agriculture (Josling, 1993).

Conditions of Agricultural Trade

There are several conditions that make agricultural products different from general merchandise trade in terms of their trade patterns and thus lead to differing concerns in the trading arrangements. Firstly, most developed countries have protected their

farmers and food processors from international competition through domestic agricultural policies. Developed countries resist agricultural trade liberalisation multilaterally and regionally, meanwhile developing countries have resisted tariff cuts on manufactured goods both multilaterally and regionally (Baldwin, 1997). As a result, the protection of farm production is generally very high in most industrial countries (Dam, 1970; Hathaway, 1987 cited in deRosa, 1995).

Secondly, the level of border protection for agricultural food products is much higher than for manufactured products. Thirdly, agricultural trade is governed by different international rules from those which control manufactured goods - even following the Uruguay Round (Meilke and Sarker 1997). Finally, as a consequence of these conditions agriculture has often been excluded from - or only partially included in - regional integration agreements (dell'Aquilla, Sarker and Meilke, 1999).

Furthermore, agricultural trade tends not to enjoy the economies of scale and product differentiation such as those found in many manufactured products (Josling, 1993). Raw products reveal a geographic bias generally less strong than for processed products, probably because of a stronger role of location-specific factors. From 1965 to the end of the 1970s the geographic bias in trading raw products seems to have declined in all of the regions, with the exception of the EU (dell'Aquilla, Sarker and Meilke, 1999). In the Asia-Pacific region almost 60 per cent of trade in processed agricultural food products is intra-regional. For example, the intra-regional trade share has increased gradually from 34.2 per cent in 1965 to 57.1 percent in 1993 (dell'Aquilla, Sarker and Meilke, 1999).

2.5.5 Models of Preferential Trading Arrangements

The main economic objective of a regional trading bloc is to increase trade among its members. The countries within a regional trading arrangement can trade among themselves at either lower tariffs than non-members or free from trade barriers altogether. The emergence of a regional trading agreement can then affect welfare adversely for either members or non-members.

International trade economists have different opinions regarding the effects of regional free trade. The first study on the effects of regional trading arrangements on national and world welfare was conducted by Viner (1950) who studied the effects of the European Community on the recently formed GATT (Sager, 1997). The probable success or failure of preferential trading arrangements in attaining the goal of increasing national and world economic welfare depends on a number of conditions. Viner's analysis specifically emphasised the importance of two concepts, trade creation and trade diversion. *Trade creation* refers to the extent to which preferential trading arrangements create and further expand new opportunities for trade between countries. In terms of production it can be recognised as imports from the regional partners that displace higher-cost domestic production in given countries. *Trade diversion*, on the other hand, refers to the extent of distraction of existing trade flows among countries in the region in which the regional agreement exists. In Viner's criteria, a preferential trading arrangement will always be welfare-enhancing to the global trading system as long as trade creation exceeds trade diversion[2].

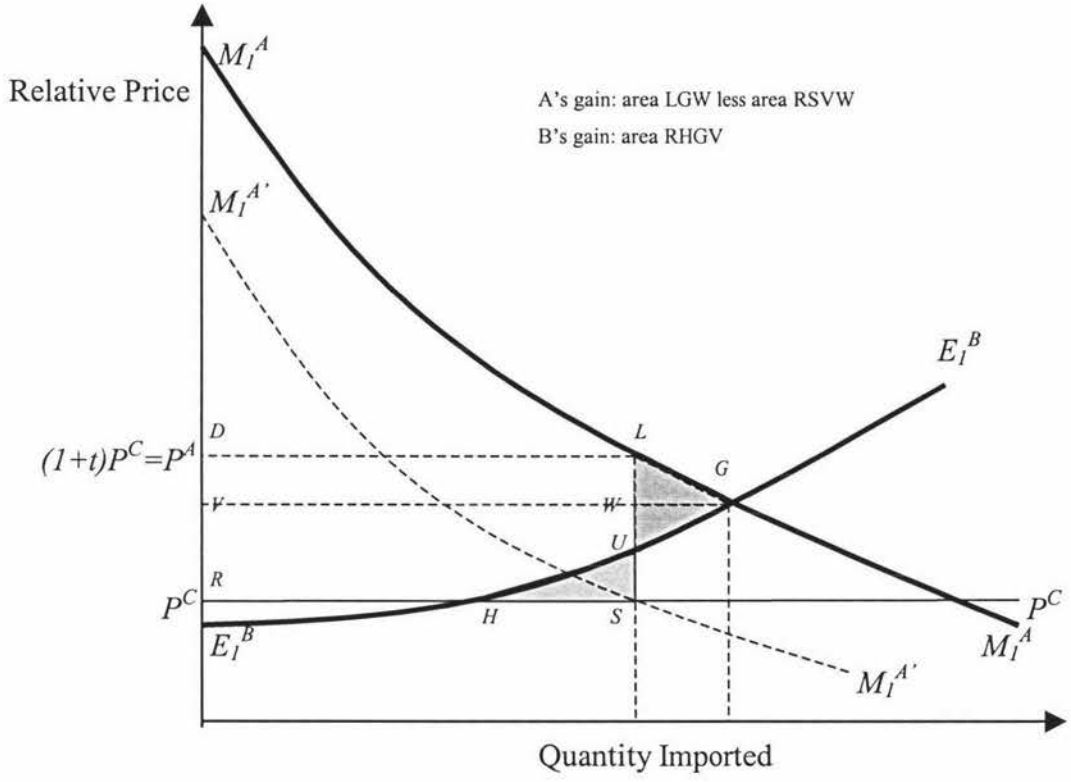
The Basic Economic Model of a Free Trade Area (FTA)

The model of the effects arising from the emergence of preferential trade arrangements is described following de Melo, Panagariya and Rodrik (1993, pp. 161-164). The model is set up from the viewpoint of participating countries in the regional agreement rather than the overall world. In the following model it is assumed that the countries in the model are small relative to the rest of the world, which means that the countries are not sufficiently large to change the price of world trade, or the countries are price-takers. To begin the model, the simple analysis of the model will be used with a two-goods-three-country model. Suppose there are good 1 and good 2 and three countries A, B and C. Countries A and B are in the FTA (Free Trade Area), meanwhile country C is an outsider. There are two possible trading patterns that could exist between countries A and B; they import the same products or import different products.

[2] Bhagwati (1993) argued that what had been proposed by Viner (1950) according to trade creation and trade diversion is simply the case that FTAs and other types of regional trading arrangements were not automatically welfare-improving for either member countries or outsiders. Basically, in the Vinerian view, FTAs and other forms of PTA are two-faced because in one way, they liberalise trade among members and in the other way they also protect against outsiders. In other words it can be said that the case of preferential trading arrangements differs from the case of free trade for all.

Suppose that countries A and B import the same products. In this model, countries A and B absolutely import the preferred products from country C. This means that there is no trade between countries A and B at the first equilibrium. After the formation of an FTA between countries A and B, as both countries still import only from country C, the equilibrium remains constant.

Figure 2.1 Basic Model of a Free Trade Area (FTA)



Source: de Melo, Panagariya and Rodrik (1993, p. 162).

Then, the model moves to the case when A and B import different products. It is assumed that, in this case, A imports good 1 from B. Suppose that the general equilibrium import demand curve of country A and export supply curve of country B are represented by M_I^A-M_I^A and E_I^B-E_I^B respectively, as shown in Figure 2.1. The relative price level at which country C wants to buy and sell in the world market is denoted by the horizontal line P^C-P^C. Meanwhile, the autarky prices in country A and country B are drawn by the heights of their curves at their points of origin. In the case of free trade, the gains from trade are exactly the same as the consumer's surplus and

the producer's surplus that are depicted by the area below the import demand curve M_I^A-M_I^A and above the world price for country A (as consumer), and gains of country B is the area above the export supply curve E_I^B-E_I^B and below the world price. Given constant costs and free trade, country C neither gains nor loses from this trade.

Now, the model turns to the situation when country A uses a non-discriminatory tariff restriction at rate t on its imports from countries B and C. By levying an ad valorem tariff at t level, the import demand curve of A moves from M_I^A-M_I^A to $M_I^{A'}$-$M_I^{A'}$. Country A is now facing the border price P^c and its total imports are RS (equal to DL). From these total imports, the quantity amount of RH comes from country B and HS from country C. The current domestic price in country A is now $P^A = (1+t)\ P^c$ which is exactly the height of the import demand curve from the residents' point of view. Country A gains from trade by an area $M_I^A LD$ plus $DRSL$, which is total tariff revenue, and country B gains by the area $RH\ E_I^B$.

When an FTA exists between A and B, it is assumed that imports from B are free from tariffs. As a consequence, country A no longer imports from country C (imports from C are totally stopped) and all imports come from country B. The emergence of FTA gives benefits to country B since its terms of trade have increased and its exports have grown. Total gains of country C are given by area $RHGV$. Meanwhile, country A faces ambiguity in the presence of net effects. This uncertainty comes from the deterioration of its terms of trade (equal to its total tariff revenue) and from the elimination of the distortion between domestic and border price. Its gain or loss depends on whether the area LGW is larger or smaller than area $RSWV$. Accordingly, the joint benefits of countries A and B depend on area LGU. If LGU is larger than HSU the FTA will benefit countries A and B, otherwise they lose.

Suppose that country A does not cut imports from country C totally by drawing the export supply curve of country B so that it crosses the import demand curve of country A (M_I^A-M_I^A solid curve) to the left of point L. In this case, the internal price faced by country A is unchanged and its terms of trade with country B deteriorate by the amount of the tariff. Exports of country B still increase but the total imports remain constant. In this situation, the welfare of country A decreases because its

terms of trade with country B deteriorate without any other compensation in increase of efficiency; the welfare of country B rises because its exports have grown and its terms of trade have improved. The FTA's welfare has decreased because imports coming from country B cost more than the price applied by country C, so that there is no benefit to efficiency in country A.

So, how can the benefits of an FTA be made greater? Following the idea of de Melo et al., (1993, p. 163) those benefits can be achieved by creating the following conditions. Firstly, the higher the initial tariff, the larger the joined-positive effects (*LUG*) and the smaller the negative effects (*USH*). Secondly, the lower the post-FTA tariffs on outsider countries the less likely it is that the lower-priced goods of the latter will be dislocated. The higher the tariffs in the outsiders, the larger the gain or the smaller the loss will be. As depicted in Figure 2.1, the higher the tariff in country C, the higher the price (P^c) faced by countries A and B and so the smaller the area *HSU*. Lastly, the greater the complementarity[3] of import demands of countries A and B, the larger the gain of an FTA will be. Graphically, the farther apart the import demand of country A and export supply of country B, the larger the gains (*LGW*) and the smaller the losses (*HSU).*

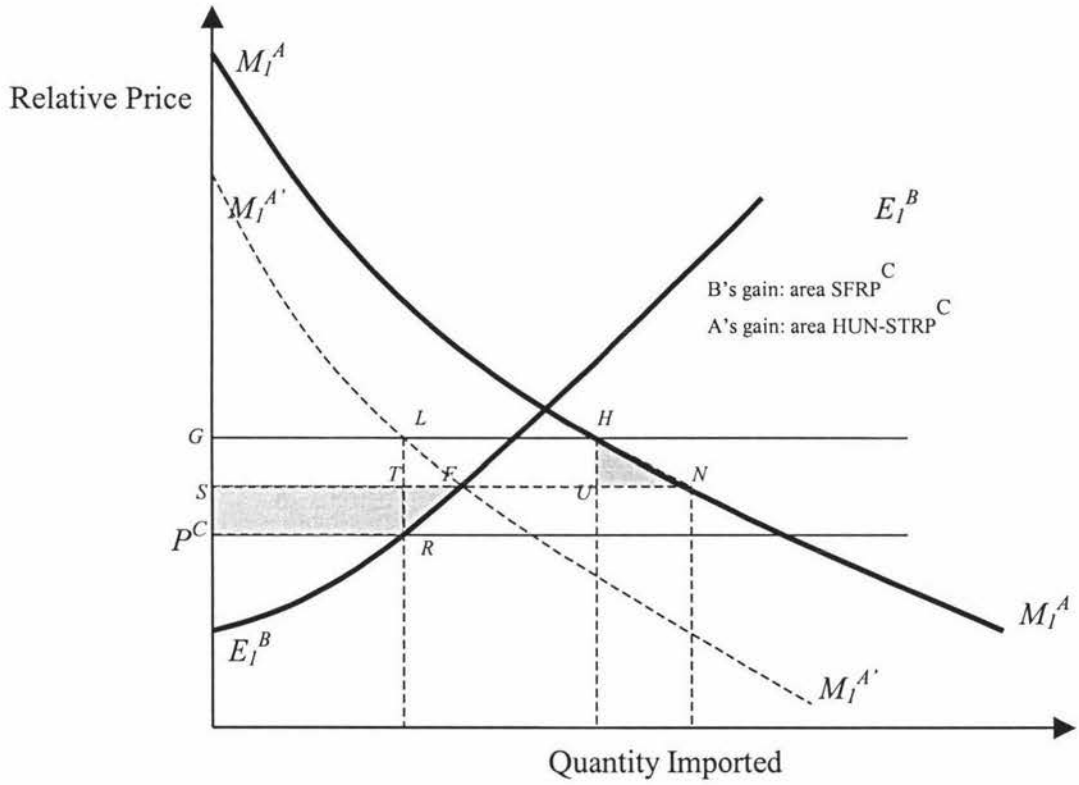
Model of Free Trade Area (FTA) Under Quantitative Restrictions (QRs)

This model is based entirely on the model proposed by Kemp and Wan (1976) and further developed by de Melo et al., (1993, pp. 164-165). In this model, countries A and B assume that they can implement a set of common external tariffs which increase their welfare without decreasing the welfare of outsiders. Setting the common tariffs in such a way that the external terms of trade and the quantity of traded goods with the outsiders remain constant whilst internal trade in the FTA is rearranged to get maximised gains can manifest this idea. More briefly, please have a look at Figure 2.2.

[3] The complementarity of imports is difficult to raise among the countries with low levels of income, but the complementarities are more likely to exist among high-income countries with similar per capita incomes. This is due to the condition that trade among them is intra-industry trade, which correlates negatively with differences in per capita incomes of partner countries (de Melo, et al., 1993, p. 163-164).

In this setting, the two-goods-three-country model is still being used. Consider that without a trade agreement country A levies quota licences that are auctioned competitively to domestic residents before importing. Total imports of country A run from *G* to *H*. Then, country A imports the amount *GL* of products from country B and *LH* from country C. Under an FTA, country C is facing the quota restrictions levied by country A at its original level of imports (*LH*), meanwhile imports from country B are free from any restrictions and total imports are going to expand.

Figure 2.2. FTA Under Quantitative Restrictions (QRs).



Source: de Melo, Panagariya and Rodrik (1993, p. 164)

By levying the quota restrictions, the import demand curve of country A as perceived by country B then moves from M_I^A-M_I^A to $M_I^{A'}$-$M_I^{A'}$. This new demand curve can be found by subtracting quantity *LH* horizontally from M_I^A-M_I^A everywhere. The new demand curve yields the new total imports, which are *SF* quantity from country B and *FN* (equal to *LH*) from country C. By creating an FTA between countries A and B and applying the restrictions, country A has both positive and negative effects. The positive effect for country A is *HUN* because of the reduced gap between the domestic and border prices and the negative effect is $STRP^c$, which comes from a

worsening in the terms of trade with country B. The net welfare effect on country A is still ambiguous. In this FTA, country B automatically gains from trade, that is $SFRP^c$, which is larger than the loss of country A. As suggested by de Melo et al., (1993), country B can compensate country A as long as country A loses on balance[4]. Kemp and Wan (1976), as cited in de Melo et al., (1993) proposed that the FTA has not reduced trade with outsiders and has enlarged trade inside the FTA. The FTA of the Kemp and Wan theorem will benefit the member countries as long as the numbers of outsiders are not large enough (Richardson, 1995). Finally, the outsiders' welfare is not affected so it can be said that the FTA improves the world's welfare.

2.6 Concluding Discussion

In summary, the factor-endowment model has still continued to play an outstanding role in determining international trade, particularly the trade patterns in developing countries. Even though the presence of the concept of imperfect competition and increasing returns to scale are also sources generating the trade patterns. The gravity models in trade could explain the trade patterns of countries supported by either the dominance of the factor endowment model or economies of scale as sources for trade. The gravity model is based largely on the argument that the trade flows between two trading countries is related to their economic size represented by their GDP and population and inversely related to the distance between them. Intra-industry trade is defined as the simultaneous export and import of products belonging to the same industry. The studies in agricultural products using either the gravity model or intra-industry trade are limited. Most of them were conducted in exports and imports of aggregate products particularly in manufactured products.

The emergence of regional trading arrangements over the last few decades has driven the growth of international trade through either intra or extra regional trade. In the process of the formation of most regional agreements, agricultural products have been excluded. By joining into regional agreements, a country expects that its economy will grow faster through increasingly intensive trade with partner countries inside the region and outside the region as well.

[4] Refers to footnote number 3 (p. 42).

CHAPTER 3

ASEAN AND ANZCERTA AND THEIR FOREIGN AGRICULTURAL TRADE PERFORMANCES

3.1 Introduction

This chapter reviews the Association of Southeast Asian Nations (ASEAN) and the Australia-New Zealand Closer Economic Relations Trade Agreement (ANZCERTA) as regional trading arrangements. Detailed descriptions of these arrangements can be found in section 3.2 below. This chapter also investigates the agricultural trade performance of ASEAN and ANZCERTA as groups among other regional trading arrangements and the trade performance of each country in the ASEAN and ANZCERTA regions, as shown in section 3.3. Section 3.4 ends this chapter by presenting a concluding discussion.

3.2 ASEAN and ANZCERTA

3.2.1 ASEAN-AFTA

The Association of Southeast Asian Nation (ASEAN) was established in 1967, the founding members being Indonesia, Malaysia, the Philippines, Singapore and Thailand. According to the 1967 ASEAN Declaration there were at least four aims in forming the ASEAN: first, to accelerate the economic growth, social progress and cultural development in the region through joint endeavours; secondly, to promote regional peace and stability; thirdly, to promote active collaboration and mutual assistance on matters of common interest in the economic, social, cultural, technical, scientific and administrative fields; and finally, to collaborate more effectively for the greater utilisation of ASEAN agriculture and industries and the expansion of their trade (ASEAN Secretariat, 2002a).

With the exception of Brunei and Singapore, the ASEAN countries are mainly middle-income developing countries. They have a number of economic similarities

attributable to their location in the same geographical area as well as to share aspects of their cultures, history, economic and social development. Generally, ASEAN countries share economic structures shaped by similar relative endowments of natural resources as well as labour (deRosa, 1995).

The adoption of more outward-oriented industrialisation strategies based on international trade and greater foreign direct investment were being pursued in all ASEAN members by the late 1980s (Plummer, 1996). ASEAN countries constitute a relatively small market, so that the region cannot possibly rely on intra-regional trade for sustainable economic growth based on the export-promotion industrialisation strategy that served the East Asian economies so well (Plummer, 1996). Statistically, intra- ASEAN Free Trade Area (AFTA) trade accounts for only 15 percent of AFTA exports, about half of which is entrepot trade with Singapore that is basically duty-free already (deRosa, 1995; Baldwin, 1997).

An attempt to cooperate in the economic area had been proposed in the first ASEAN Summit on 24 February 1976 by setting up a Preferential Trading Arrangement (PTA), where the member countries agreed to assist each other by according priority to the supply of the individual country's needs in critical circumstances, and priority to the acquisition of exports from member countries, in respect of basic commodities, particularly food and energy. Also, member countries would intensify cooperation in the production of basic commodities, particularly food and energy, in the individual member states of the region. The economic agreements covered in the instruments of PTA comprised the extension of tariff preferences, liberalisation of non-tariff measures on a preferential basis, long-term commodity contracts, the financing of procurement of ASEAN commodities at preferential interest rates, and preference in procurement by government institutions (Garnaut, 1994).

In terms of the success of the PTA, the ASEAN PTA could be said to have been limited in its achievements (Lloyd, 1996). Initially, the arrangements were narrow in scope and coverage. By 1980 it covered an estimated 2 percent of intra-ASEAN trade and only 5 percent by 1985 (CIE, 2000). Several factors account for the low PTA trade: relatively small tariff cuts, a limited number of products included relative to the

number of items traded by the ASEAN countries, inclusion of items in the preference list which were not traded at all by the ASEAN countries, and low price elasticities of relevant product groups (Page, 2000). The success of the scheme was also undermined by members drawing up long national exclusion lists of sensitive items (items whose preferred entry into a country might damage domestic interests).

In response to the small effect of the ASEAN PTA and the increasing competition among other regional trading arrangements, ASEAN also formed the ASEAN Free Trade Area (AFTA). The AFTA was formed in January 1992 during the fourth ASEAN Summit meeting in Singapore. At this meeting ASEAN members signed the Framework Agreement on Enhancing ASEAN Economic Cooperation, which resulted in the formation of the AFTA within 15 years. The formation of the AFTA was inspired by the current global trends of regionalism and the slow progress in ASEAN regional cooperation especially in the economic area (Kim, 1994). The strategic objective of AFTA was to increase the ASEAN region's competitive advantage as a single production unit. The elimination of trade barriers among members is expected to promote greater economic efficiency, productivity and competitiveness (ASEAN Secretariat, 2002b).

The Common Effective Preferential Tariff (CEPT) Scheme was intended to be the main driving force of the AFTA. The CEPT is as an agreed effective tariff, preferential to ASEAN, to be applied to goods originating from ASEAN member countries[1]. Upon implementation of the agreement by 2003, ASEAN should become a free trade area (FTA) with tariffs on all products covered ranging between 0 and 5 per

[1] Member countries agree to the following schedule of effective preferential tariff reductions (Agreement on the Common Effective Preferential Tariff Scheme for the AFTA: Article 4): (1) The reduction from existing tariff rates to 20% shall be done within a time frame of 5 years to 8 years, from 1 January 1993, subject to a programme of reduction to be decided by each member country, which shall be announced at the start of the programme. Member countries are encouraged to adopt an annual rate of reduction, which shall be (X-20)%/5 or 8, where X equals the existing tariff rates of individual member countries. (2)The subsequent reduction of tariff rates from 20% or below shall be done within a time frame of 7 years. The rate of reduction shall be at a minimum of 5% quantum per reduction. A programme of reduction to be decided by each member country shall be announced at the start of the programme. (3) For products with existing tariff rates of 20% or below as at 1 January 1993, member countries shall decide upon a programme of tariff reductions, and announce at the start, the schedule of tariff reductions. Two or more member countries may enter into arrangements for tariff reduction to 0%-5% on specific products at an accelerated pace to be announced at the start of the programme (ASEAN Secretariat, 2002b).

cent. Also, all non-tariff barriers and quantitative restrictions are intended to be eliminated (de Simone, 1996).

At the 6th ASEAN Summit in Hanoi on 16 December 1998, the ASEAN countries agreed to advance the implementation of the AFTA by one year from 2003 to 2002. At the summit, member countries also agreed to actualise, as soon as possible, tariff reduction to 0% and accelerate the transfer of products which were not at that time included in the tariff reduction scheme (the list of CEPT reduction of some agricultural products can be found in Appendix A)[2]. On the CEPT schedules AFTA members were free to adjust their tariff reduction on their products – in addition, they could exclude sensitive products from the tariff reduction (CIE, 2000).

Further, ASEAN-AFTA commitment in agricultural trade was found at the 14th Meeting of ASEAN Ministers of Agriculture and Forestry in 1992. The meeting deliberated on the areas of future cooperation in food, agriculture, fisheries and forestry. Two main elements were identified to enhance and accelerate international trade, especially in agricultural products: (1) Joint actions was to be adopted to build up trade promotion and agreements in ASEAN agricultural products to facilitate ASEAN's competitiveness and to keep the sustainability of the expansion of ASEAN agricultural exports in both regional and international markets; (2) ASEAN would improve the economic cooperation in both regional and international agreements and make mutual relationships with other regional groupings.

Other steps to strengthen cooperation in agricultural products were taken at the 15th Meeting of Ministers of Agriculture and Forestry (MAF) in Bandar Seri Begawan in 1993. The programmes were directed at enhancing cooperation in agriculture, food,

[2] The overall schedule of tariff reduction of five ASEAN countries on some agricultural products such as for live animal, vegetable products, fats and oil, prepared foodstuff, hides and leathers and wood and wood articles are prepared in Appendix A. From the tables in Appendix A, it can be seen that for all those products, Singapore is the only country that has not imposed tariffs (zero tariff) on its trade. Then, from the initial start of tariff reduction in ASEAN countries, the less restrictive country is Malaysia. Malaysia's tariff reduction starting in 1996 up to 2003 have shown the tariff level that always less than the ASEAN tariff on average. For example, in 1996 Malaysia imposed tariff on vegetable products of 3.17% compared to an average of 8.35%. In 2003, Malaysia's tariff rate is expected to fall to 1.04% and the ASEAN average to 2.27%. In addition, Indonesia and the Philippines have imposed relatively similar tariff levels on their agricultural exports. Meanwhile, Thailand has been in the higher tariff level in the agricultural products (ASEAN Secretariat, 2002b).

fisheries and forestry. The programmes included the following main targets: (1) Strengthening food-stock security in the ASEAN countries; (2) Enhancing the facilitation and promotion of both intra- and extra-ASEAN trade in agriculture, food, fishery and forest products; (3) Setting up and regularising ASEAN standards and quality assurance and (4) Keeping natural resources for sustainable development through management and conservation.

3.2.2 ANZCERTA

The Australia-New Zealand Closer Economic Relations Trade Agreement (ANZCERTA) was signed in 1982 to set up a free trade area covering the two neighbouring countries, Australia and New Zealand. The ANZCERTA came into operation in 1983 replacing the previous trade agreement established via the New Zealand-Australia Free Trade Agreement (NAFTA) which was in operation since 1965 and provided free trade in some specific products such as forest products and selected manufactured products.

The general agreement of the ANZCERTA was that all products originating in either country could be traded between Australia and New Zealand and were free from any tariffs or non-tariff barriers. By contrast, the 1965 trade agreement did not cover the liberalisation of most non-tariff barriers, which were particularly significant in both countries. The formation of ANZCERTA, which is consistent with World Trade Organisation (WTO) free trade principles, encompasses all merchandise trade and also services, and the elimination of tariffs and non-tariff restrictions to trade (CIE, 2000). Through the ANZCERTA both countries have tried to further increase the closeness of their relations in international trade.

The objectives of the ANZCERTA agreement are: to strengthen the broader relationship between Australia and New Zealand; to develop closer economic relations between Australia and New Zealand through a mutually beneficial expansion of free trade between the two countries; to eliminate barriers to trade between Australia and New Zealand in a gradual and progressive manner under an agreed timetable and with a minimum of disruption; and to develop trade between

Australia and New Zealand under conditions of fair competition (DFAT Australia, 1997).

There have been three general reviews on the ANZCERTA agreement since its formation in 1983 (CIE, 2000): firstly, the acceleration of the achievement of free trade in goods due to the ANZCERTA rules, therefore all tariffs and non-tariff barriers to trade were eradicated; secondly, the inclusion of trade in services in the ANZCERTA 1983 Agreement; and finally, enhancement of the ANZCERTA agreement by synchronising a range of non-tariff barriers to a free trade of goods and services, including quarantine and customs aspects, standards and harmonisation and business law.

As a form of regional trading arrangement, ANZCERTA is classified as an advanced trading arrangement, second to the European Union in terms of the extent of liberalisation of trade across borders. In addition, in a few areas of trade integration, ANZCERTA is more highly developed than the European Union in terms of the agreements in eradicating subsidies on intra-regional trade and competition law (Lloyd, 1996).

3.2.3 AFTA-ANZCERTA Relationship

The AFTA and ANZCERTA are the only two regional trading arrangements in the East Asia/West Pacific regions (Lloyd, 1996). Both the AFTA and ANZCERTA are outward-looking regional trading arrangements which have lowered external trade barriers vis-à-vis outside countries during the period of regional trade liberalisation. Both the AFTA and ANZCERTA are formal regional trading arrangements, which have been notified to GATT. They are both free trade areas in the GATT terminology. This means that they have agreed to remove border barriers to trade among the members of each agreement on trade among them. The member countries of the AFTA and ANZCERTA have, however, retained their own tariffs and other barriers to international trade with countries that are not members of the respective agreements (Lloyd, 1996). In addition they have agreed to certain free trading arrangements between the two groups.

The AFTA-ANZCERTA linkage was established in September 1995 during the informal consultations between the ASEAN Economic Ministers and Ministers from Australia and New Zealand. The aim of the agreement is to facilitate trade and investment flows between the two regions (DFAT Australia, 2002). The Ministers reaffirmed their commitment to the multilateral trading system and the need for both regional trading arrangements to reinforce the process of liberalisation within the WTO framework. The Ministers recognised the significant potential benefits of establishing linkage between the two regions to benefit their economies through comparative advantages in trade and investment.

The objectives of the AFTA-ANZCERTA agreement are: firstly, to improve the efficiency and competitiveness of firms and industries in member countries in order to enhance the welfares of the members' people; secondly, to liberalise and facilitate trade in goods and services; thirdly, to establish a conducive business environment for investment and finally, to formalise simple and transparent rules (Angkor Agenda, 2000).

At the consultations in Singapore in October 1999, the Ministers of ASEAN and ANZCERTA countries established a High Level Task Force to look into the feasibility of an AFTA-ANZCERTA free trade area. The High-Level Task Force of the Angkor Agenda have concluded that establishing a free trade area between AFTA and ANZCERTA is not only feasible but also advisable if both ASEAN and ANZCERTA are at least to keep pace with the rapidly changing world of today (Angkor Agenda, 2000). Even though the AFTA-ANZCERTA would be a small trading region in terms of intra- and extra-regional trade compared to other big groups such as the EU and the NAFTA, nonetheless the positive experience of the ANZCERTA in removing trade barriers may well encourage member countries to unilaterally continue the removal of trade barriers (CIE, 2000).

The AFTA-ANZCERTA link is intended to give Australia and New Zealand improved and guaranteed market access to Southeast Asia. Similarly, the ASEAN countries would get significant benefits through the market access to Australia and New Zealand (Lloyd, 1996). As such, Australia and New Zealand do not impose high

barriers to international trade but they have relatively high protection on manufactured products and low protection on agricultural products compared to other developed countries (Lloyd, 1996).

The member countries of the AFTA-ANZCERTA agreement vary both in the level of development and in the level of protection in traded products (Angkor Agenda, 2000). To reduce the impacts of these dissimilar characteristics, the Ministerial Meeting of the ASEAN Economic Ministers (AEM) and ANCERTA ministers in 1999 was set up. As had been suggested by the Angkor Agenda, development assistance to the countries in the regions was proposed to increase their competitiveness and market access in international trade.

The AFTA-ANZCERTA Ministers, at their 5^{th} and 6^{th} annual consultations in October 2000, agreed that these two regions should work towards economic integration through a Closer Economic Partnership (CEP) (CIE, 2000). The meeting agreed on the concept of CEP, whose goals are: (1) Deepening and broadening cooperation in all economic fields; (2) Promoting greater trade and investment flows regionally and globally; (3) Contributing to trade and investment facilitation through minimising impediments, reducing costs and related capacity building; (4) Improvement of business competitiveness; (5) Narrowing the development gap and delivering tangible benefits to all participating countries; and (6) Promoting transparency of regulations and cooperation among relevant authorities.

3.3 Trade in Agricultural Products

3.3.1 Agricultural Trade Patterns of ASEAN, ANZCERTA and Other Trading Blocs

During the period 1965-1970, world trade (imports plus exports) in agricultural products increased by 4.92% on annual average (see Table 3.1). These experiences were also replicated in some trading blocs such that their agricultural trade growth rates were not far from the world growth rate, with the exception of that of the South Asian Association for Regional Cooperation (SAARC) countries, which was negative (-2.45%).

In the period 1965-1970, the ASEAN and ANZCERTA had growth rates of 3.90% and 1.61% respectively, and as a joint group (ASEAN-ANZCERTA) the growth rate was 2.71%. Meanwhile, the highest growth rate was 6.01% in the European Union (EU). The higher growth rate of the EU compared to other blocs was because this trading bloc developed agricultural trade earlier. The Common Agricultural Policy (CAP) has played a large part in developing agricultural trade in the EU member countries.

In the following period from 1971-1976, the value of exports and imports of agricultural products increased noticeably. World agricultural trade grew by 18.98% on annual average during this period. Meanwhile, some other trading blocs had roughly similar growth. The ASEAN and ANZCERTA grew by 21.27% and 16.21% respectively, whereas in the previous period, 1965-1970, their growth rates were only 3.90% and 1.61% on average. Other trading blocs such as the North American Free Trade Area (NAFTA), the EU and the SAARC had also comparatively similar growth of 19.06%, 18.35% and 17.53% respectively in the 1971-1976 period. These significant growth patterns did not continue in the following period 1977-1994. In this subsequent period the world growth rate remained constant at the 5-6% level.

Table 3.1 Export and Import Growth Rates (%) in Agricultural Products of Some Regional Trading Blocs 1965 – 1999

Exports	1965-1970	1971-1976	1977-1982	1983-1988	1989-1994	1995-1999
ASEAN	2.85	21.81	5.46	7.44	6.62	-6.29
ANZCERTA	1.52	16.25	8.35	7.38	-0.09	1.87
ASEAN-ANZCERTA	2.07	18.81	6.87	7.41	3.48	-2.74
NAFTA[1]	2.83	21.79	9.40	2.04	4.39	-0.24
EU(15)[2]	8.81	19.74	9.31	10.9	6.13	-1.85
SAARC[3]	-1.35	15.23	4.67	1.44	-2.26	-0.57
World	4.88	18.95	6.84	6.61	5.15	-1.54
Imports						
ASEAN	6.28	20.16	10.1	5.38	10.71	-3.13
ANZCERTA	2.46	15.78	8.93	8.81	3.53	2.59
ASEAN-ANZCERTA	5.35	19.25	9.88	5.99	9.38	-2.14
NAFTA	6.59	14.78	4.68	5.77	5.29	6.45
EU(15)	4.66	17.52	4.44	9.31	4.54	-2.73
SAARC	-3.66	20.18	6.16	5.58	4.02	1.35
World	4.96	19.00	7.04	6.42	4.29	-0.65
Exports + Imports						
ASEAN	3.90	21.27	6.96	6.74	8.11	-4.98
ANZCERTA	1.61	16.21	8.41	7.54	0.38	1.99
ASEAN-ANZCERTA	2.71	18.90	7.57	7.06	5.10	-2.54
NAFTA	4.38	19.06	7.71	3.42	4.75	2.47
EU(15)	6.01	18.35	6.42	10.02	5.30	-2.29
SAARC	-2.45	17.53	5.31	3.43	0.69	0.35
World	4.92	18.98	6.95	6.51	4.70	-1.08

Source: FAO Statistical Database, 2002

Notes: The annual growth rate (%) in each period is calculated by using the formulae of $T_t = T_0 (1 + r)^n$, *where* T_t *and* T_0 *are trade values of the last and the first year of the period, r is annual growth rate and n is the length of the period.*

1. NAFTA countries: The USA, Canada and Mexico. 2. European Union (15) countries: Belgium, Germany, France, Italy, Luxemburg, the Netherlands, Denmark, Ireland, the UK, Greece, Spain, Portugal, Austria, Finland and Sweden. 3. SAARC Countries: Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka

Some basic reasons behind the significant growth rates after 1970 have been put forward by Arcal and Maetz (2000). They proposed three factors as fostering the growth of agricultural products after 1970: firstly, much of this growth was driven by increased import demand from middle-income developing countries; secondly, policy reforms implemented under structural adjustment programmes in developing countries; lastly, the creation of trading blocs led to an intensification of agricultural trade among their members.

The increases in agricultural trade in the 1970s were followed by a dramatic fall of prices of most agricultural products during the 1980-1990 period. After 1988, this

negative trend came to a halt and prices have remained more stable since then. Between 1980 and 1990 international prices of agricultural commodities fell by about 35 percent, while those of manufactured products increased by 40 percent (Arcal and Maetz, 2000).

The growth rate of world agricultural trade decreased considerably in the period 1995-1999 (see Table 3.1). The sharp decrease was to some extent as a consequence of the financial crisis that hit some Asian countries in 1997 and in the following year. The financial crisis became the contagion that spread to other blocs, as they were becoming trade partner countries. In the period of crisis during which its members were experiencing an economic crisis, ASEAN suffered a loss of confidence such that its trade grew negatively by 4.98%.

Table 3.2 Export and Import Shares* (%) in World Agricultural Trade of Some Regional Trading Blocs 1965 – 1999

Exports	1965-1970	1971-1976	1977-1982	1983-1988	1989-1994	1995-1999
ASEAN	4.91	4.87	5.65	5.83	5.60	5.93
ANZCERTA	6.79	5.83	5.24	5.06	4.83	4.79
ASEAN-ANZCERTA	11.70	10.70	10.89	10.89	10.43	10.72
NAFTA	20.04	21.99	21.9	18.87	17.65	18.43
EU(15)	25.67	30.93	34.3	39.04	45.36	42.80
SAARC	3.30	2.13	1.90	1.76	1.43	1.72
Imports						
ASEAN	2.13	2.16	2.46	2.55	3.31	4.02
ANZCERTA	0.63	0.56	0.54	0.61	0.69	0.85
ASEAN-ANZCERTA	2.76	2.72	3.00	3.16	4.00	4.87
NAFTA	13.46	11.38	10.45	11.73	11.22	12.8
EU(15)	47.87	46.04	43.13	43.36	45.85	41.56
SAARC	3.01	1.90	1.29	1.49	1.11	1.67

Source: FAO Statistical Database, 2002

*Notes: * The shares (in per cent) are calculated from the value of trade in agricultural (000 US$) of specific trading blocs divided by the total value of world trade (000 US).*

In agricultural trade products, the EU countries have been responsible for the major shares in all periods from 1965 to 1999 (see Table 3.2). In the period 1965-1970 the EU accounted for 25.67% and in the 1995-1999 period, its share increased to 42.8% of total world exports. Concerning imports, the EU also accounted for the largest share of 47.87% in 1965-1970 and then slightly decreased to 41.56% of total world imports in 1995-1999. Meanwhile the ASEAN-ANZCERTA, as one group, has been

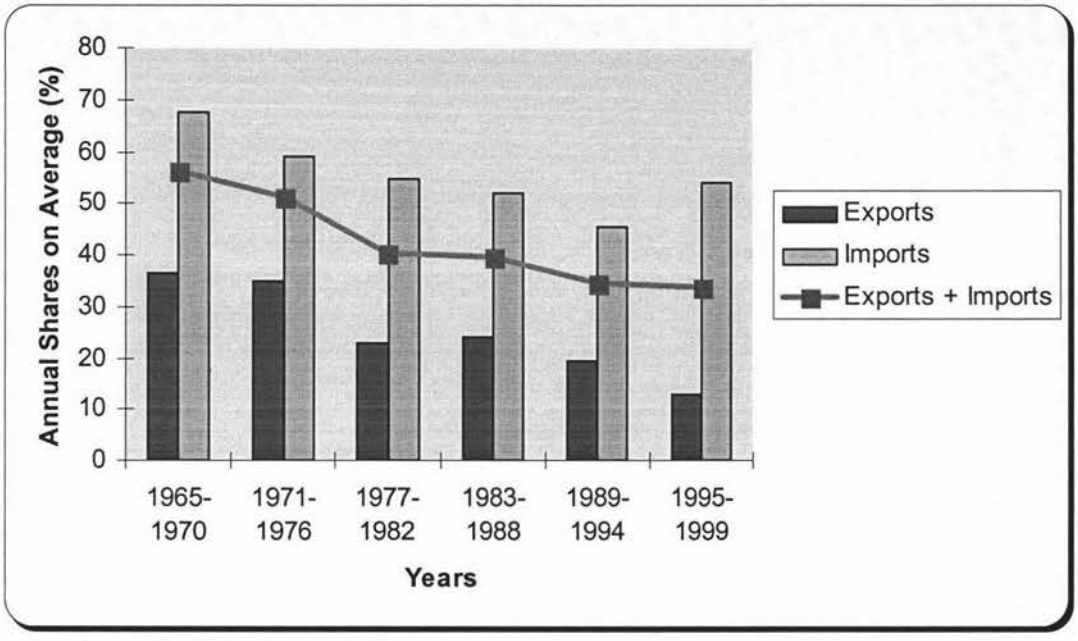
in the third position below NAFTA in the share of world exports and imports. The ASEAN-ANZCERTA had an export share of 11.7% in the period 1965-1970. The export share of ASEAN-ANZCERTA remained constant during the period of study and the share was 10.72% of total world exports in 1995-1999. On the import side, the share of the ASEAN-ANZCERTA was only 2.76% in 1965-1970 and 4.87% in 1995-1999.

During the period 1965-1999 ASEAN, ANZCERTA, NAFTA and SAARC experienced an export surplus in their international agricultural trade balances, but this was not the case of the EU which was always in deficit. This suggests that the EU is a large market only because its imports have always been greater than its exports. In the period 1995-1999, the shares of agricultural products of the trading blocs remained stable compared to the previous period 1989-1994. The 1997 Asian financial crisis did not affect the shares of all regional trading blocs. The Asian crisis had significant effects on the export and import growth rates of all trading blocs but not on their shares (see Table 3.1).

3.3.2 Trade Interaction between ASEAN and ANZCERTA as Groups

Trade among the ASEAN and ANZCERTA countries pre-dates any formal trade agreements. In agricultural products, ASEAN's export share of these products to the ANZCERTA countries tended to decrease from 1965 to 1999 (see Figure 3.1). In 1965-1970, ASEAN's export share was 36.54% of the annual average of total exports and it decreased gradually until 1995-1999, when it was 12.73% of total exports. The decline in ASEAN agricultural trade was because of the decrease inside the agricultural sectors in the economies of member countries and the corresponding increasing dominance of their manufacturing sectors. Meanwhile, ANZCERTA exports to the ASEAN countries (which is equal to ASEAN's imports) during the period 1965-1976 decreased from 67.57% in 1965-1970 to 59.20% in 1971-1976, since which time the share of agricultural products has remained unchanged.

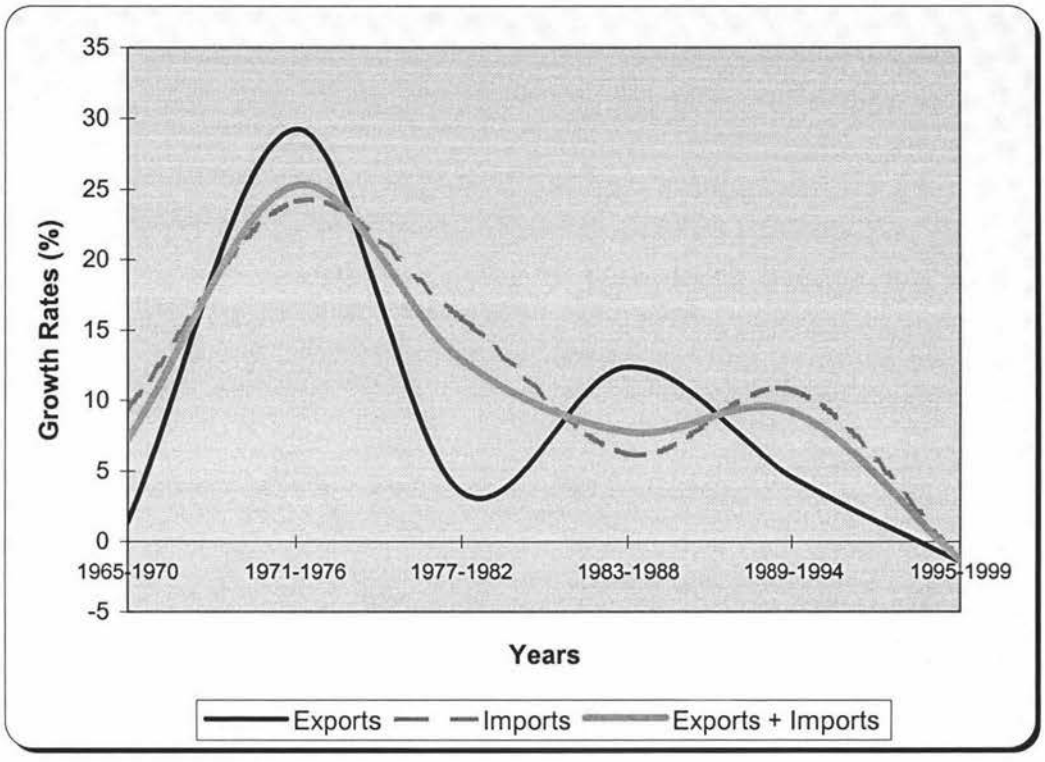
Figure 3.1 The Annual Shares (%) of ASEAN Agricultural Exports and Imports with ANZCERTA 1965-1999



Source: NAPES Database, 2002

The growth rates of exports of agricultural products between the ASEAN and ANZCERTA were unstable during the period 1965-1999 (as shown in Figure 3.2). The highest growth rate of ASEAN and ANZCERTA exports of these products was achieved in 1971-1976. In this period, exports of the ASEAN countries grew by 29.24% and ANZCERTA exports destined for the ASEAN countries were 24.15% on an annual average basis. The lowest growth rate of ASEAN and ANZCERTA trade of agricultural products was in 1995-1999. The decreasing growth rate in this period was because of the Asian financial crisis in 1997, when almost all ASEAN countries suffered as a result of the crisis.

Figure 3.2 The Growth Rates (%) of Agricultural Exports and Imports of ASEAN with ANZCERTA 1965-1999



Source: NAPES Database, 2002

The ASEAN agricultural products exported to ANZCERTA countries, described more specifically at the three-digit Standard Industrial Trade Classification (SITC) level, are in the order shown in Appendix C, Table C.1. The top ten ASEAN exports at the three-digit SITC are[3]: fresh and simply preserved fish (031)[4], tinned and prepared fish (032), shaped wood (243), cocoa (072), crude and synthetic rubber (231), vegetable oil (422), food preparations (099), animal feed stuff (081), prepared and preserved fruit (053) and coffee (071). The dominance of fresh and simply preserved fish (031) at the first position is shown by its share of 12.63%, while coffee (071) at the top ten position accounted for 3.30%.

On the other side, ASEAN agricultural imports from ANZCERTA (ANZCERTA exports to the ASEAN countries) were dominated by milk cream (022) which accounted for 21.31% of total ANZCERTA agricultural exports to the ASEAN

[3] The ranks of the top ten Indonesian and other countries' exports and imports of agricultural products are based on the annual average share of the products from 1990-1999.
[4] The three-digit-number in the bracket is the three-digit SITC code of the product (based on the SITC Revision One).

countries. In the second position of ANZCERTA agricultural exports was wheat (041) by 15.66%, followed by cotton (263), sugar and honey (061), live animals (001), fresh, chilled and frozen meat (011), fresh and dry fruit (051), cereal (048), fresh and simply preserved vegetables (054) and wool animal hair (262). The share of products, wool and animal hair (262) ranked 10th, was 3.44%. More details on these ranks can be found in Appendix C Table C.1.

3.3.3 Agricultural Trade Performance by Countries

This sub-section describes the agricultural trade performance by each country. In general, the international trade performances of the ASEAN and ANZCERTA countries were relatively similar in their growth rate movements in the period 1965-1999 (as shown in Table 3.3). The data on exports and imports are calculated from their total trade in agricultural products to the world.

Table 3.3 The Growth Rates (%) of Exports and Imports in Agricultural Products of the ASEAN and ANZCERTA Countries 1965–1999

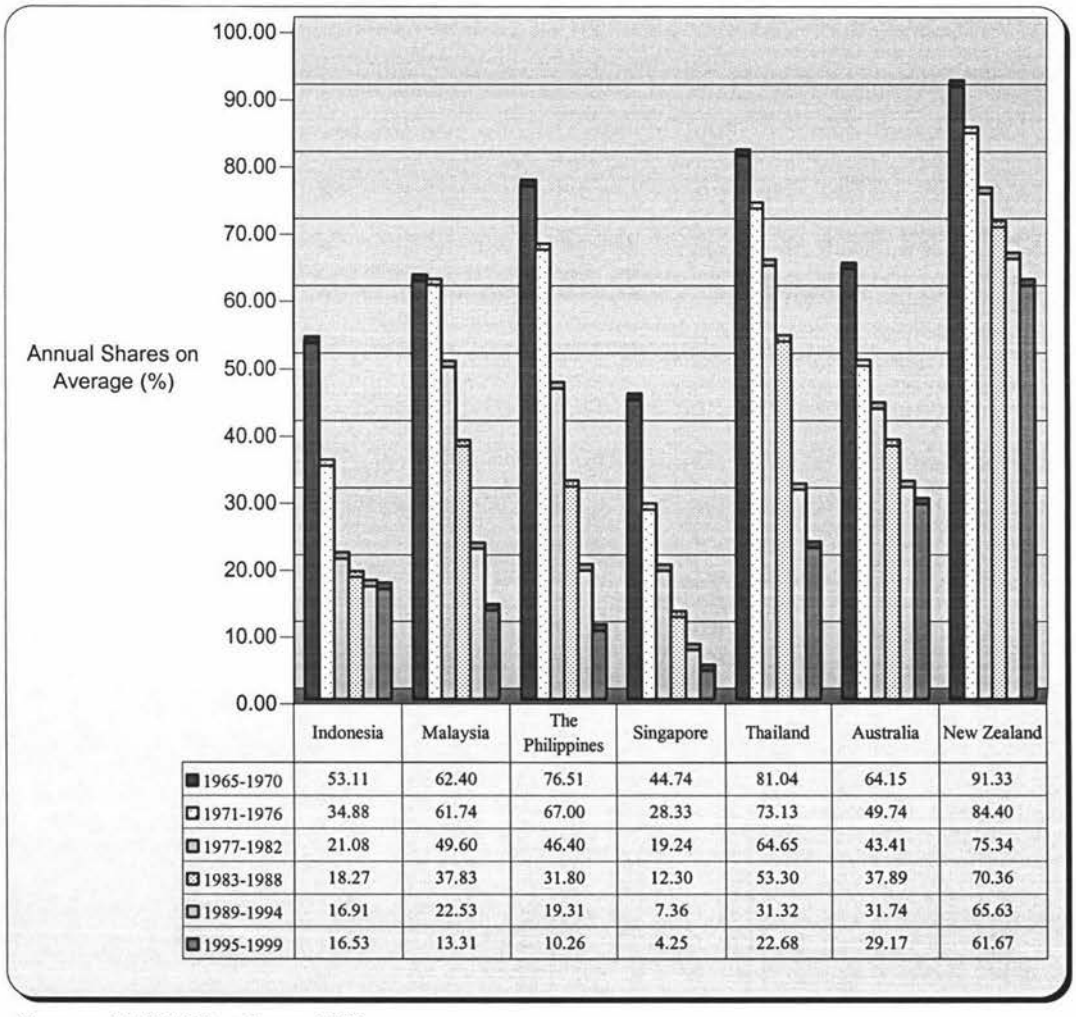
Exports	1965-1970	1971-1976	1977-1982	1983-1988	1989-1994	1995-1999
Indonesia	4.63	19.84	-2.60	10.07	10.33	-2.07
Malaysia	4.56	23.53	3.65	7.13	6.57	-11.98
The Philippines	0.26	16.67	-0.07	-3.19	3.23	-3.92
Singapore	7.12	13.64	13.90	10.75	10.52	-8.24
Thailand	-0.24	28.97	11.83	8.37	3.45	-4.22
ASEAN	2.85	21.81	5.46	7.44	6.62	-6.29
Australia	1.71	17.93	7.77	8.37	-0.33	2.98
New Zealand	1.09	12.00	9.83	5.32	0.45	-0.58
ANZCERTA	2.90	16.25	8.35	7.38	-0.09	1.87
Imports						
Indonesia	40.15	29.91	5.32	-1.50	14.04	-3.65
Malaysia	-0.26	18.25	12.19	4.52	8.68	-4.56
The Philippines	-3.73	14.88	14.07	5.01	10.13	2.05
Singapore	7.34	17.17	11.94	7.72	9.05	-4.88
Thailand	4.13	19.81	6.98	12.79	13.83	-2.12
ASEAN	6.28	20.16	10.10	5.38	10.71	-3.13
Australia	3.04	15.34	7.69	8.78	2.61	2.91
New Zealand	0.87	16.83	12.21	8.91	6.00	1.74
ANZCERTA	2.46	15.78	8.93	8.81	3.53	2.59

Source: FAO Statistical Database, 2002

Notes: The annual growth rate (%) in each period is calculated by using the formula of $T_t = T_0 (1 + r)^n$, where T_t and T_0 are trade values of the last and the first year of the period (in current prices), r is annual growth rate and n is the length of the period.

The highest growth rates of exports and imports of most ASEAN and ANZCERTA countries were in the period 1971-1976. Meanwhile, the lowest growth rates, especially for the ASEAN countries, apparently occurred in 1995-1999 as in this period the Asian financial crisis hit their economies. The ratios of export shares of agricultural products to the total products of each single country in the ASEAN and ANZCERTA regions showed relatively similar characteristics. In the period of study, it can bee seen that their export shares of agricultural products declined noticeably during 1965-1999 (see Table 3.4).

Table 3.4 Annual Shares (%) of Agricultural Exports to Total Exports of the ASEAN and ANZCERTA Countries 1965-1999



	Indonesia	Malaysia	The Philippines	Singapore	Thailand	Australia	New Zealand
1965-1970	53.11	62.40	76.51	44.74	81.04	64.15	91.33
1971-1976	34.88	61.74	67.00	28.33	73.13	49.74	84.40
1977-1982	21.08	49.60	46.40	19.24	64.65	43.41	75.34
1983-1988	18.27	37.83	31.80	12.30	53.30	37.89	70.36
1989-1994	16.91	22.53	19.31	7.36	31.32	31.74	65.63
1995-1999	16.53	13.31	10.26	4.25	22.68	29.17	61.67

Source: NAPES Database, 2002

The Agricultural Trade Performance of Indonesia

The growth rate of Indonesian exports of agricultural products was at its highest level in 1971-1976. In this period the growth rate was 19.84% on annual average compared to the previous period that was only 4.63% (see Table 3.3). The growth rate of Indonesian exports decreased sharply in 1977-1982 by 2.6%, but in the consecutive periods, 1983-1988 and 1989-1999, agricultural exports recovered rapidly by 10.07% and 10.33% respectively. The revival of agricultural exports faced a significant reversal in 1995-1999. The growth rate of exports of agricultural products declined to the lowest level of –2.07% in this period. This decrease in agricultural exports was because of the Asian financial crisis of 1997, in which the recovery of the Indonesian economy was relatively slower than that of other ASEAN countries which also suffered in the crisis.

The Indonesian exports in agricultural products decreased considerably from 1965 to 1999 (see Table 3.4). In the early period, 1965-1970, the share of Indonesian exports of these products was 53.11% and in 1995-1999 the share was just 16.53% of total Indonesian exports. Among the ASEAN and ANZCERTA countries, Indonesia's shares were relatively lower than those of other countries, with the exception of Singapore.

Export destinations of Indonesian agricultural products were, in the main, Japan, the USA and Singapore in the period 1965-1999 (see Appendix B Table B.1). Those three countries' markets absorbed 19.88%, 17.58% and 11.16% a year on average of Indonesian agricultural products respectively. In the period 1965-1979, Japan was the foremost Indonesian export destination, absorbing 26.04% of total Indonesian agricultural exports. Singapore was in the second position with 16.18% followed by the USA in the third position with 15.21% on annual average. Over the following periods, 1980-1989 and 1990-1999, the USA replaced Singapore as the second main destination, and Japan was still in the number one position. Meanwhile, Malaysia was in the top ten destinations of Indonesian agricultural exports by absorbing annually 2.37% in the period 1965-1999. The other countries in the ASEAN and ANZCERTA region, such as Thailand and Australia, were in the top twenty destinations by

absorbing 1.33% and 1.01% of Indonesian total agricultural exports on an annual average. However, the Philippines and New Zealand were out of the top twenty export destinations of Indonesian agricultural products, both of them absorbing less than 1% on annual average. A list of the main Indonesian export destinations of agricultural products is given in Appendix B Table B.1.

More specifically, as for types of agricultural products, the Indonesian agricultural products, which are described in greater detail at three-digit SITC, are in the following order (see Appendix C Table C.2). The top ten Indonesian exports at the three-digit SITC are: fresh and simply preserved fish (031), crude and synthetic rubber (231), vegetable oil (422), coffee (071), pulp and paper (251), shaped wood (243), cocoa (072), spices (075), processed animal and vegetable oil (431) and animal feeding stuff (081). Fresh and simply preserved fish (031) accounted for 20.30% and animal feeding stuff (081) accounted for 1.93% of total Indonesian agricultural exports. On the import side, Indonesian agricultural imports were dominated by cotton (263) whose share was 16.17%. The second position was taken by wheat (041) (accounted for 12.89%), followed by pulp (251), rice (042), animal feed (081), oil seeds (221) and sugar honey (061) (that accounted for 12.48%, 8.95%, 8.11%, 6.06% and 5.99%, respectively). More details on these ranks can be found in Appendix C Table C.2.

The Agricultural Trade Performance of Malaysia

In 1965-1970, the growth rate of Malaysian agricultural exports was 4.56% and then it increased sharply by 23.53% on annual average in 1971-1976 (see Table 3.3). In the next periods, its growth rates of exports decreased but were still positive. In the final period, 1995-1999, the performance of Malaysian agricultural exports showed a negative growth rate of 11.98%. This could be due to the Asian financial crisis.

Over the period of study, Malaysian agricultural products have constituted decreasing shares of total exports (as shown in Table 3.4). In 1965-1970, the share of Malaysian agricultural products was 63.40% which then decreased gradually in the following

periods. Finally, in the last period of study, the share of these products was just 13.31% of total Malaysian exports to the world.

Turning to export destinations, Japan was the largest market for Malaysian agricultural products, absorbing 16.12% on annual average in the period 1965-1999 (see Appendix B Table B.2). The second largest market for Malaysian agricultural products was Singapore (14.65%), followed by the Netherlands (6.27%). In the early period 1965-1980, Singapore was the biggest market for Malaysian agricultural products absorbing 21.36% on annual average, whilst Japan and the USA were the second and the third biggest markets absorbing 17.79% and 7.86% respectively. In the following period 1980-1989, the first position was taken by Japan (19.02%); Singapore became the second market (15.14%) and the third position was taken by the Netherlands (6.96%). In the period 1990-1999, the first and the second markets remained constant but at the third position, China replaced the Netherlands, absorbing 7.41% of Malaysian agricultural products. Meanwhile, other countries in the ASEAN and ANZCERTA regions were in the top twenty destinations such as Thailand, Australia and Indonesia with 2.18%, 2.053% and 0.927% on annual average, respectively, in the period 1965-1999. The other two countries, the Philippines and New Zealand were in the top twenty-five positions, absorbing 0.70% and 0.25% respectively, on annual average in the period 1965-1999.

The types of Malaysian agricultural products going to these destinations were largely similar to Indonesian agricultural products (see Appendix C Table C.3). The most popular exported agricultural product of Malaysia was vegetables (422), its share being 32.37% on an annual average basis in 1990-1999.The second and the third leading exports of agricultural products were shaped wood (243) and rough wood (242) accounting for 15.70% and 11.24% shares of total Malaysian agricultural products over the same period. On the import side, the most preferred agricultural product was sugar and honey (061) whose share was 7.00% on average of total Malaysian agricultural imports. Rubber (231) and maize (044) were in the next two positions at 6.69% and 6.61% on average respectively in the period 1990-1999.

The Agricultural Trade Performance of The Philippines

The growth rate of the Philippines' agricultural exports reached its highest level at 16.67% on an annual average basis in 1971-1976 (see Table 3.3). The Philippines agricultural exports declined over the next two periods, where the growth rates were –0.07% in 1977-1982 and –3.19% in 1983-1988. The Philippines' agricultural exports experienced a positive growth rate again in 1989-1994 at 3.23%, but after that the Asian financial crisis depressed the growth rate to a negative 3.92%.

The Philippines' exports of agricultural products showed a relatively higher share at 76.51% of its total exports, which was more than those of the other ASEAN countries such as Indonesia and Malaysia in 1965-1970 (see Table 3.4). This high export share then steadily decreased, finally, in the period 1995-1999, the share of agricultural products was just 10.26%, which was only marginally higher than that of its neighbouring countries such as Indonesia and Malaysia.

In respect of export destinations, the Philippines' top three agricultural product markets were the USA, Japan and the Netherlands in the period 1965-1999, with these three countries absorbing 32.04%, 24.91% and 9.89% of the Philippines' total agricultural exports on annual average, respectively (see Appendix B Table B.3). Most of the Philippines' trading partners in the ASEAN and ANZCERTA regions were in the top twenty positions. The Philippines' closest neighbouring countries such as Singapore, Indonesia and Malaysia were in the eleventh, twelfth and sixteenth positions absorbing its agricultural exports at the rates of 1.36%, 1.22% and 0.62% respectively, on average, in 1965-1999.

The Philippines' agricultural exports are mostly vegetable products (see Appendix C Table C.4 for more details). Vegetables (422), fresh fruit (051) and fresh fish (031) respectively accounted for 23.56%, 18.82% and 15.21% of agricultural exports of the Philippines on annual average in 1990-1999. In the same period, on the import side, the Philippines' agricultural imports were dominated by wheat (041), milk and cream (022) and animal feed (081) that accounted for 12.59%, 10.62% and 9.86% respectively.

The Agricultural Trade Performance of Singapore

Singapore has been well known as an entrepot country connecting the Asian countries, especially the ASEAN countries, to the rest of the world. Its export performance in agricultural products depends on its neighbouring countries as this country is not rich in natural resources but is rich in capital. In similar fashion to other ASEAN countries, the growth rate of Singapore's agricultural products reached its highest rate at 13.64% in 1971-1976 and the lowest rate was in 1995-1999, in which the growth rate was –8.24% (see Table 3.3). Singapore's export share of agricultural products decreased considerably in the period 1965-1999. In 1965-1970, its export share of agricultural products was 44.74% but then it dropped gradually and reached the level of 4.28% in 1995-1999 (see Table 3.4).

In 1965-1979, the three major importers of Singapore's agricultural products were the USA, the United Kingdom (UK) and Malaysia which absorbed 12.32%, 5.11% and 4.72% of Singapore's total agricultural exports on annual average, respectively (see Appendix B Table B.4). In the next two periods, 1980-1989 and 1990-1999, Japan, Hong Kong and China came up as the largest markets of Singapore's agricultural products. In 1990-1999 Japan, Hong Kong and China imported 16.00%, 7.22% and 5.26% of the total agricultural exports of Singapore on annual average. Malaysia and Australia were among the top ten export destinations of Singapore's products in 1980-1989. In 1990-1999, there were higher level of trade activities between Singapore and the neighbouring countries. In this period, not only were Malaysia and Australia among the top ten markets but the Philippines and Thailand also became major importers of Singapore's agricultural products.

Singapore's exports of agricultural products were more equally distributed than those of its neighbouring countries in the ASEAN and ANZCERTA regions. For example, Singapore's top ten export destinations absorbed less than 50% of total exports, compared to other countries in ASEAN and ANZCERTA whose top ten export destinations accounted for 60% to 80% of their total agricultural exports in 1995-1999 (see Appendix B Table B.4).

Singapore's exports of agricultural products were dominated by tobacco (122), rubber (231) and fresh fish (031). These three products had the shares of 19.00%, 10.79% and 9.33% on annual average, respectively, of total agricultural exports in 1990-1999. On the import side, the top three products imported in 1990-1999 were tobacco (122) at 12.88%, fresh fish (031) at 7.87% and alcohol and beverages at 7.58%. More details on Singapore's exported agricultural products can be found in Appendix C Table C.5.

The Agricultural Trade Performance of Thailand

Relating to export growth of agricultural products, Thai exports also showed a relatively similar movement of the growth rates to other ASEAN countries. The highest growth rate of its exports of agricultural products was achieved in the period 1971-1976 which was 28.97% and the lowest one was –4.22% in 1995-1999 (see Table 3.3). On the import side, similarly to the export activities, the growth rate of Thai imports reached its highest point at 19.81% in 1971-1976 and the lowest one was in the last period, 1995-1999, which was –2.12%.

The shares of Thai exports of agricultural products were the highest among the ASEAN members (see Table 3.4). In 1965-1970, the share reached 81.04% of Thai total exports and then dropped gradually over the following periods. The lowest share of agricultural products of Thai exports was in 1995-1999. In this period the share reached the level of 22.68%, but this share was still higher than those of other ASEAN countries in the same period.

Regarding the export destinations, in the period 1965-1979, Thai agricultural products were destined mostly for Japan, the Netherlands and Singapore which absorbed 24.94%, 10.94% and 7.80% of total agricultural exports on annual average, respectively (see Appendix B Table B.5). In the next period, 1980-1989, the USA was the third biggest market absorbing 10.58% of the total Thai agricultural products, but in 1990-1999 China was the third biggest market, importing 5.57% of the total Thai exports of agricultural products. Compared to other ASEAN member countries, Thailand is more closely integrated with its neighbouring countries. This is shown by

the fact that Malaysia, Singapore and Indonesia were in the top ten export destinations in 1965-1999.

Thai exports of agricultural products were mostly fresh fish (031), rice (042) and rubber (231). These products respectively accounted for 19.43%, 14.65% and 13.65% of total agricultural products. Meanwhile on the import side, the most popular agricultural products were fresh fish (031) (17.84%), cotton (263) (11.87%) and shaped wood (243) (9.92%) (see Appendix C Table C.6 for more details).

The Agricultural Trade Performance of Australia

Australia's agricultural export growth rate reached the highest level in 1971-1976. In this period the growth rate was 17.93%. The lowest level was in 1989-1994 at –0.33% (see Table 3.3). In contrast to the ASEAN countries, Australia's agricultural export growth rate increased to 2.98% over the period 1995-1999 and it seemed not to be affected by the Asian economic crisis. Also, its imports grew at 2.98% in 1995-1999. The share of Australia's exports of agricultural products decreased considerably from year to year. In the period 1965-1970, its agricultural export share was 64.15% of its total exports and finally in 1995-1999 it reached the level of 29.17% (see Table 3.4).

The main export destinations of Australia's agricultural products in 1965-1979 were Japan, the USA and the UK. These three countries imported 24.43%, 12.96% and 6.95% on average, respectively, of Australian agricultural products (see Appendix B Table B.6). Meanwhile, the only ASEAN country in the top ten destinations was Malaysia, which absorbed 2.47% of Australia's agricultural products in 1965-1979. In the next two periods, 1980-1989 and 1990-1999 the UK was replaced by China in the third position; the first and second positions remained unchanged. Singapore joined Malaysia among the top ten destinations in the period 1980-1989. In the period 1990-1999, Indonesia became the fifth biggest market by importing 4.84% and Malaysia was in the sixth position by importing 4.16% on average of Australia's total exports of agricultural products. Meanwhile, the closest neighbouring country, New Zealand, was in the tenth position, and absorbed 2.96% of Australia's total agricultural exports in 1990-1999.

Australian exports of agricultural products were dominated by livestock products such as fresh meat (011) and wool (262). These two products accounted for 18.45% and 17.53% respectively of total Australian exports of agricultural products in the period 1990-1999. On the import side, shaped wood (243), food (099) and fresh fish (031) accounted for 10.83%, 9.83% and 7.70% of imported agricultural products on annual average, respectively (see Appendix C Table C.7 for more details).

The Agricultural Trade Performance of New Zealand

The growth of New Zealand's agricultural exports reached the highest rate of 12% on annual average in 1971-1976 then dropped gradually in the following years. The lowest growth rate was –0.58% on average in 1995-1999 (see Table 3.3). Agricultural products dominated New Zealand's exports in the period 1965-1999. This can be seen in the share of agricultural products in New Zealand's trade. In the period 1965-1970 the share of agricultural products was 91.33% of total exports, which was the highest share compared with Australia and the ASEAN countries (see Table 3.4). The share of agricultural products then decreased considerably and reached the level of 61.67% on annual average in 1995-1999.

In 1965-1979, the three biggest importing countries of New Zealand agricultural products were the UK, the USA and Japan (see Appendix B Table B.7). These three countries absorbed 28.32%, 15.01% and 10.88% respectively of New Zealand's total agricultural exports on average. Meanwhile, Australia was in the fourth position absorbing 4.26% of New Zealand's agricultural exports. In the next two periods, 1980-1989 and 1990-1999, the formations of the biggest markets were changed, so that the USA and Japan were in the first and second positions and the UK was in third position. In these two periods, Australia was still in the fourth position as a major importing country of New Zealand's agricultural products. Meanwhile, other ASEAN countries such as Malaysia, the Philippines, Indonesia and Singapore were in the top twenty export destinations.

New Zealand exports of agricultural products, like Australian exports, were dominated by livestock products. Dried meat (012) and butter (023) accounted for the

highest shares at 22.92% and 12.44% respectively on annual average in the period 1990-1999. In the third place was fish (032), which accounted for 8.61% of the total agricultural exports of New Zealand. On the import side, the leading agricultural products imported by New Zealand were alcohol and beverages (112), food preparations (099) and fresh fruit (051) that accounted for 9.61%, 9.32% and 6.97% on average, respectively, in the period 1990-1999. More details of the composition of New Zealand's agricultural exports can be found in Appendix C Table C.8.

3.4 Concluding Discussion

ASEAN formed AFTA in 1992 in response to the low effects in launching the ASEAN PTA in 1976 and the increasing competition among other regional trading arrangements. ANZCERTA was signed in 1983 to set up a free trade area covering the two neighbouring countries, Australia and New Zealand. AFTA and ANZCERTA are outward-looking regional trading arrangements which have lowered external trade barriers vis-à-vis outside countries during the period of regional trade liberalization. The AFTA-ANZCERTA linkage was established in September 1995 to facilitate trade and investment flows between the two regions. The AFTA-ANZCERTA agreement is expected to give broader market access to each single country in the regions.

The international trade performances of the ASEAN and ANZCERTA countries were relatively similar in their growth rate movements in the period 1965-1999. The highest growth rates occurred in the period 1971-1976, while the lowest ones were in 1995-1999. The export shares of agricultural products to total products of each single country in both the ASEAN and ANZCERTA regions declined noticeably during 1965-1999.

CHAPTER 4
METHODOLOGY AND TECHNICAL DESIGN

4.1 Introduction

This chapter is divided into 7 sections. Section 4.2 develops gravity models that will be used to explain the bilateral trade flows between the Association of Southeast Asian Nations (ASEAN) and the Australia-New Zealand Closer Economic Relations Trade Agreement (ANZCERTA) countries. The model will be applied to the analysis of trade between individual countries in each group with individual countries in the other group. Section 4.3 describes intra-industry trade (IIT) analysis. This model basically investigates further the trade patterns between the two countries in the two regions. Section 4.4 additionally shows the Intensity of Trade (IOT) Index as an index to support the basic analysis of the gravity models. Section 4.5 briefly prepares the hypotheses used in the gravity models. Section 4.6 describes agricultural products that will be used and the data sources as well. Finally, section 4.7 ends this chapter with a concluding discussion.

4.2 The ASEAN-ANZCERTA Gravity Models

The gravity model describes the bilateral trade flows aggregated across goods from one country to another. The gravity model contains the following three categories of factors explaining exports: factors indicating the total potential supply of the exporting country in the world market, factors indicating the total potential demand of the importing country in the world market and factors of impediments to trade between the two countries concerned (Brocker and Rohweder, 1990; Rasksen, 1998). The first two categories of factors are usually called *mass* or *activity variables* such as Gross Domestic Products (GDP) and population, and the third category is referred to as the distance variables (Brocker and Rohweder, 1990).

The basic formulation of the gravity model that will be applied is a double log model upon a well-defined set of variables; which are the GDPs of the exporting and

importing countries, the populations of the exporting and importing countries and the distances between the exporting and importing countries. These defined variables are called the *basic gravity variables*. In addition to the basic gravity variables, the study will use the augmented gravity model by inserting time (trend), the real exchange rate and several dummy variables.

The time trend variable (TRND) is the autonomous growth variable that shows the growth rate of exports of agricultural products. The real exchange rate (RER) between countries *i* and *j* is defined in terms of foreign currency per unit of domestic currency. It is calculated as the annual average of the national currency unit of country *j* per US dollar divided by the annual average of the national currency unit of country *i* per US dollar (Matyas, Konya and Harris, 2000). An appreciation (depreciation) of domestic currency (country *i*) is represented by a rise (decrease) in the real exchange rate. Soloaga and Winters (2001) observed that the price effects in cross-section analysis data do not give any significant effects whether a currency fluctuates that is, is over-valued or under-valued. The exchange rate fluctuations can have a significant effect only when the time dimension is included. The study uses data from 1965 to 1999, so exchange rate as an explanatory variable will be applied in the model. The use of some dummy variables is important since one way to capture qualitative characteristics within an economic model is by using dummy variables (Griffiths, Hill and Judge, 1993). The dummy variables being used are LANGUAGE, ASEAN, ANZCERTA, AFTA-ANZCERTA and the Asian financial crisis (AFC).

The gravity model is defined econometrically, as follows:

$$\begin{aligned}\ln X_{ijt} = \alpha &+ \beta_0 TRND_t + \beta_1 \ln GDP_{it} + \beta_2 \ln GDP_{jt} + \beta_3 \ln POP_{it} + \beta_4 \ln POP_{jt} + \beta_5 \ln D_{ij} \\ &+ \beta_6 LANG_{ij} + \beta_7 ASEAN_{ijt} + \beta_8 ANZCERTA_{ijt} + \beta_9 AFTA\text{-}ANZCERTA_{ijt} \\ &+ \beta_{10} \ln RER_{ijt} + \beta_{11} AFC_t + \varepsilon_{ijt} \qquad (4.1a)\end{aligned}$$

for $i, j = 1, 2, \ldots, 7$ and $i \neq j$

$t = 1, 2, \ldots, 35$

The error term (ε_{ijt}) is supposed to satisfy the following requirements (equations 4.1b, 4.1c and 4.1d):

$$E(\varepsilon_{ijt}^2) = \sigma_{ij}^2 \qquad (4.1b)$$

for $i = 1, 2 \ldots..7$

$$E(\varepsilon_{ijt}\varepsilon_{ist}) = \sigma_{ij,is} \qquad (4.1c)$$

for $i = 1, 2 \ldots..7$ and $j \neq s$

$$\varepsilon_{ijt} = \rho_{ij}\varepsilon_{ij,t-1} + \nu_{ijt} \qquad (4.1d)$$

for $i = 1, 2 \ldots..7$

where: subscripts i and j refer to exporting and importing countries, respectively, 1 = Indonesia, 2 = Malaysia, 3 = the Philippines, 4 = Singapore, 5 = Thailand, 6 = Australia and 7 = New Zealand; t is time = 1, 2, ……35 (from 1965 to 1999); X_{ij} = US dollar value (in constant prices, 1987 = 100) of exports in agricultural products from country i to country j; TRND = the time (autonomous growth) variable; GDP_i and GDP_j = the gross domestic products of exporting country i and of importing country j; POP_i and POP_j = the population of countries i and j; D_{ij} = the geographical distance between the capital city of countries i and j; $LANG_{ij}$ = a binary variable taking the value of one if the two trading countries have a common or similar language, zero otherwise; ASEAN = a binary variable taking the value of one if trade is between countries after joining ASEAN in 1967, zero otherwise; ANZCERTA = a binary variable taking the value of one if trade is between Australia and New Zealand after the ANZCERTA agreement in 1983, zero otherwise; AFTA-ANZCERTA = a binary variable taking the value of one if trade is between the ASEAN and ANZCERTA countries after the agreement of AFTA and ANZCERTA in 1995, zero otherwise; RER_{ij} = the real exchange rate between country i and country j. AFC is a binary variable of the Asian financial crisis taking the value of one if the two countries are trading after the 1997 Asian financial crisis and zero otherwise. βs are parameters and ε_{ij} = log normally distributed error terms.

The variable GDP_i reflects the potential supply of the exporting country, and GDP_j captures the import demand of the importing country. A high level of income (GDP)

in the exporting country indicates a high level of production that increases the ability to export. Larger countries, in respect of their GDP, are expected to export more than small countries because, the former tend to innovate more, have more advanced infrastructures and have more liberal trade policies that facilitate their trade. Meanwhile, a high level of income in the importing country indicates the higher ability to import. Both GDP_i and GDP_j are expected to influence the export flows positively.

The population variable in the exporting country can influence trade flows positively or negatively, depending on whether the country exports less when it is big (the absorption effect exists) or whether a big country exports more (economies of scale exist). Similarly, the population of importing country has also an ambiguous sign for the same reasoning. Following Hellvin and Nilsson (2000), on the negative side, it is asserted that a large population also points towards a large domestic market, a higher level of self-sufficiency and less need to trade (trade-inhibiting). On the positive side, a large population fosters division of labour and implies the occurrence of economies of scale in the production process and opportunities and therefore creates a desire to trade with a greater variety of products (trade-enhancing). According to those different effects of the population size, in the first case the expected sign of the coefficient of population is negative and in the second one it is positive.

The distance variable D_{ij} reflects the proxy of all possible transportation costs. In the typical gravity equation, it is interpreted as the cost, insurance and freight (c.i.f)/free on board (f.o.b) factor[1] (Bergstrand, 1989; Thursby and Thursby, 1987). D_{ij} is expected to influence trade flows negatively. The dummy variables, ASEAN, ANZCERTA and AFTA-ANZCERTA denote the trade agreements that apply to the countries in the sample. The coefficients of these regional agreements are expected to have positive signs. This is because a regional trading arrangement contains a reduction of barriers to trade such as tariffs and non-tariff barriers that leads to

[1] FOB price represents the price at the border of the exporting country, including the value of the commodity, all transport expenditure until the shipping point, as well as all the fees for the commodity to be loaded aboard. CIF price represents the price at the border of the importing country, including both component elements of FOB price and the cost of insurance and that of international transport.

enlargement of trade flows. Therefore, from the trading arrangements the trade flows are expected to increase between the member countries. The language variable (LANG) indicates that the participating countries have a common - or the same - language. The RER variable denotes the real exchange rate between country *i* and country *j*. According to the RER's definition, the RER shows the level of international competitiveness that is the higher (lower) the value of RER the lower (higher) the level of competitiveness[2]. The variable AFC is used to capture the influence of the Asian financial crisis in 1997 on the trade flows among countries; the AFC variable is expected to affect the trade flows negatively.

In analysing the trade patterns between the ASEAN and ANZCERTA countries, the deductive method is used. Initially, all variables, which are hypothesised to determine trade between countries in the gravity models, will be used. Then the estimation moves to the specific models by omitting the insignificant variables starting from the most insignificant variable to the least significant one. The reason behind this is that different countries have different characteristics in the variables affecting their own trade, so that it is essential to find out the main determinants for each single country specifically.

The study will use pooled cross-section time-series observations and apply a cross-sectionally correlated and timewise autoregressive model, the disturbances of which are assumed to exhibit heteroskedasticity, cross-sectional dependence (or mutual correlation) and autocorrelation (Kmenta, 1986, p. 622):

1. Heteroskedasticity means that for the cross-sectional observations there is no constancy of the error variance or $E(\varepsilon_{ijt}^2) = \sigma_{ij}^2$. Heteroskedasticity commonly occurs in observations that use cross-sectional data (Kmenta, 1986; Griffiths et al., 1993). Since the present study incorporates trade data from countries at different levels of economic development (i.e. the ASEAN and ANZCERTA countries) heteroskedasticity could possibly exist.
2. Cross-sectional dependence or mutual correlation means that the error terms are mutually correlated or $E(\varepsilon_{ijt}\varepsilon_{ist}) = \sigma_{ij,is}$. Cross-sectional dependence is an

[2] As is shown before, the RER is defined as the value of foreign currency in term of domestic currency.

appropriate assumption for the model as long as the cross-sectional units (the ASEAN and ANZCERTA member countries) were not randomly selected (Kmenta, 1986, p. 625).

3. Autocorrelation means that error terms corresponding to different observations are correlated or $\varepsilon_{ijt} = \rho_{ij}\varepsilon_{ij,t-1} + \nu_{ijt}$. Autocorrelation exists frequently in observations that use time-series data (Kmenta, 1986; Griffiths et al., 1993). This assumption is reasonable since the effects of the explanatory variables on total agricultural exports (dependent variable) are likely to exist not only in the current period but also in the subsequent periods.

The SHAZAM econometric software will be employed in estimating the regression equations. The gravity equations will be applied to each country's trade flows with its six trading partners.

4.3 Intra-Industry Trade (IIT)

Intra-industry trade (IIT) analysis is used to investigate further the pattern of trade between the ASEAN and ANZCERTA countries. The descriptive analysis will be used to study the trade patterns in agricultural products of those countries. In using the IIT analysis, the IIT Index level of the trading countries will be explained to show the existing trade patterns among the countries. In addition, the kinds of agricultural products at the three-digit level of the Standard Industrial Trade Classification (SITC) category that perform the intra-industry trade patterns will be presented.

In the empirical literature in intra-industry trade, the measurement technique most commonly used to identify the presence of intra-industry trade is the Grubel and Lloyd (GL) Index. The GL Index is defined as (Grubel and Lloyd, 1975):

$$GL = \left[1 - \frac{|X_t - M_t|}{(X_t + M_t)}\right] \bullet 100 \qquad (4.2)$$

where, X_t and M_t are export and import values at time t for a particular country. The value of the index is between 0 and 100. When either the export value or the import value is zero, there is no trade overlap in a particular industry in bilateral trade between countries i and j and so the whole trade is inter-industry. The GL index is equal to 100 when exports and imports are equal (X=M, i.e. X-M=0); there is a complete matching of exports and imports and therefore the whole trade is intra-industry trade.

Grubel and Lloyd (1975) suggested that to obtain further explanation of international trade flows the trade data must be disaggregated so that exports and imports are not included in the same aggregate. Moreover, they said that it would be useful to examine the trade data at an industry level. In addition, Brulhart and Elliott (1998) gave a suggestion as how to minimize the aggregation problem by applying a narrow industry definition or by disaggregating trade data.

The levels of aggregation of internationally traded goods are defined in terms of the SITC (Bergstrand, 1983). Intra-industry trade is measured usually at the three-digit level of the SITC as product groups defined at this level of aggregation are generally thought to accord as closely as possible to an economic definition of an industry (Grimwade, 1989; Greenaway and Milner, 1993). Further, at this level the factor substitutability is greater within than between industries and there are consistent differences in input requirements at these digit-level industries (Greenway and Milner, 1993; Brulhart and Elliott, 1998). Bergstrand (1983) suggested that intra-industry trade should be measured as a proportion of the country's bilateral trade, that is the country's trade with each trading partner. For trading blocs, for example, he suggested that it should be estimated with respect to each pair of member countries.

4.4 Intensity of Trade (IOT) Index

The Intensity of Trade (IOT) Index is going to be used to support the gravity models, particularly regarding the presence of regional trading arrangements in the gravity models. The IOT Index measures the level of intensity of trade between the two trading countries and concentrates on the variations in bilateral trade levels. In symbolic terms, this takes the form (Drysdale and Garnaut, 1995):

$$IOT_{ij} = \frac{\left[\frac{X_{ij}}{X_i}\right]}{\left[\frac{M_j}{M_w - M_i}\right]} \tag{4.3}$$

where, X_{ij} is export value of country i to country j; X_i is total exports of country i; M_j is total imports of country j; M_i is total imports of country i and M_w is world total imports. An interpretation of this index is that the value of 1 indicates that one country exports to another country at the same level that the other imports from the rest of the world. A greater value of the IOT Index means the bilateral trade relationship is more intensive between the two trading countries; otherwise the bilateral trade is less intensive.

In respect of the presence of regional trading arrangements, the IOT Index overcomes the limitation of intra-bloc trade shares as measures of trade diversion by dividing the intra-regional trade share by the share of the region to total world trade (Frankel, 1997 cited in *Asian Development Bank*, 2002). If the ratio is one, the intra-regional trade share is the same as the trade share of the region with the world. In this case, the regional trading arrangement has a neutral effect on trade. If the trade intensity index is greater (less) than one, then there is trade diversion (creation) as a result of the regional trading arrangement (*Asian Development Bank*, 2002).

4.5 Hypotheses

The hypothesised signs of the parameters of the gravity models are:

- The value of β_0 is expected to be positive. The time variable (TRND) will show the autonomous growth rate of trade flows between the trading countries, that is expected to be positive along time.
- The values of β_1, β_2, β_3, and β_4 are expected to be positive. The GDP and the population of the trading countries have substantial effects on the agricultural trade patterns between the ASEAN and ANZCERTA countries. The larger the GDP of the trading countries the larger the trade flows are likely to be. Similarly, large populations in both countries will promote trade between them.
- The value of β_5 is expected to be negative. This is because distance becomes an impediment to agricultural trade between these two-region countries.
- The value of β_6 is expected to be positive since the similarity of language fosters trade transactions between the countries.
- The trading arrangements (ASEAN, ANZCERTA, and AFTA-ANZCERTA) that exist inside the regions will promote agricultural trade flows, so that β_7, β_8, and β_9 are expected to be positive.
- The value of β_{10} is expected to be negative as the domestic currency appreciation, which corresponds to a rise in the real exchange rate, gives the negative effects on agricultural trade flows between them. The real exchange rate shows the level of competitiveness of a particular country.
- The value of β_{11} is expected to be negative because the Asian financial crisis would have caused the agricultural trade flows in these two regions to deteriorate.

4.6 Data

4.6.1 Definition of Data

In this study, the definitions of agricultural products[3] refer to the following items in one, two and three-digit levels of SITC. Agricultural products and their descriptions are prepared as follows (NAPES Database, 2002):

Agricultural products at one and two-digits (SITC) levels

0	Food and Live Animals
1	Beverages and Tobacco
4	Hides, Skins, Furs Undressed
22	Oil Seeds, Nuts, Kernels
23	Rubber Crude, Synthetic
24	Wood Lumber and Cork
25	Pulp and Waste Paper
26	Textile Fibres
29	Crude Animal, Veg. Materials NES

Agricultural products at three-digit (SITC) levels

001	Live Animals	081	Animal Feeding Stuff
011	Meat Fresh, Chilled, Frozen	091	Margarine, Shortening
012	Meat Dried, Salted, Smoked	099	Food Preparations NES
013	Meat Tinned NES or Prepared	111	Non-Alcoholic Beverages NES
022	Milk and Cream	112	Alcoholic Beverages
023	Butter	121	Tobacco Unmanufactured
024	Cheese and Curd	122	Tobacco Manufactures
025	Eggs	211	Hides, Skins, Undressed
031	Fish Fresh, Simply Preserved	212	Fur Skins Undressed
032	Fish etc. Tinned, Prepared	221	Oil Seeds, Nuts, Kernels
041	Wheat etc. Unmilled	231	Rubber Crude, Synthetic
042	Rice	241	Fuel Wood and Charcoal
043	Barley Unmilled	242	Wood Rough
044	Maize Unmilled	243	Wood Shaped
045	Cereals NES Unmilled	244	Cork Raw and Waste
046	Wheat etc. Meal or Flour	251	Pulp and Waste Paper
047	Meal and Flour Non-Wheat	261	Silk
048	Cereal etc. Preparations	262	Wool and Animal Hair
051	Fruit Fresh, Nuts Fresh, Dry	263	Cotton
052	Dried Fruit	264	Jute
053	Fruit Preserved, Prepared	265	Veg. Fibre excl. Cotton Jute
054	Veg. etc. Fresh, Simply Preserved	266	Synthetic, Regenerated Fibre
055	Veg. Etc. Preserved, Prepared	267	Waste of Textile Fabrics

[3] The agricultural products data being used in the present study are based on the SITC Revision 1 (NAPES Database, 2002).

Agricultural products at three-digit (SITC) levels (*Continued*)

061	Sugar and Honey	291	Crude Animal Materials NES
062	Sugar Preparations NonChocolate	292	Crude Veg. Materials NES
071	Coffee	411	Animal Oils and Fats
072	Cocoa	421	Fixed Vegetable Oil, Soft
073	Chocolate and Products	422	Fixed Vegetable Oil, Non-Soft
074	Tea and Mate	431	Processed Animal, Veg Oil, etc.
075	Spices		

For the gravity analysis, the export data used are total agricultural products. Annual figures covering the 1965 to 1999 period were used. For intra-industry analysis, the study will start from broader products (total agricultural products) to a more specific one by three-digit SITC. The export data of agricultural products from country *i* to country *j* and the GDPs of countries *i* and *j* are in thousands of US dollars. The export data and GDPs are valued in constant prices (1987 = 100). The populations of countries *i* and *j* are in thousands of people. The distance between countries *i* and *j* is in kilometres and is measured as the distance between the capital city of country *i* and country *j*.

4.6.2 Sources of Data

The sources of data are: (1) National Asia Pacific Economic and Scientific (NAPES) Database (as the main source); (2) Penn World Table (PWT) 6.0; (3) Jon Haveman's International Trade Data[4]; (4) ASEAN Secretariat. The data from the NAPES Database are total exports of agricultural products and exports of agricultural products at the three-digit SITC category of each single country, the GDPs of the exporting and importing countries, the population and the GDP deflator. The distance of any pair of capital cities and national language data are from John Haveman's international trade data. The exchange rate data are from Alan Heston, Robert Summers and Bettina Aten, PWT 6.0. The rest of the data are from the ASEAN Secretariat and Food and Agriculture Organisation (FAO) Statistical Database.

[4] This data source of Haveman's International Trade Data can be found at http://www.macalester.edu/research/economics/PAGE/HAVEMAN/Trade.Resources/TradeData.html

4.7 Concluding Discussion

The gravity models will be applied to explain the bilateral trade flows between the ASEAN and ANZCERTA countries in agricultural trade. The basic formulation of the gravity models that will be applied is the double log model upon a well-defined set of basic variables and augmented dummy variables. The deductive method will be used in analysing the bilateral trade patterns. The study will use the pooled cross-section time-series gravity regressions.

The Intra-industry trade (IIT) analysis will be used as it investigates further the patterns of trade in agricultural products of the ASEAN and ANZCERTA countries. In addition, the Intensity of Trade (IOT) Index basically enriches gravity models in explaining the trade patterns between the two countries in the two regions. The IIT Index that will be used to identify the presence of intra-industry trade is the Grubel and Lloyd Index.

CHAPTER 5
EMPIRICAL RESULTS AND DISCUSSION

5.1 Introduction

This chapter presents the empirical results of an examination of the trade patterns of the Association of Southeast Asian Nations (ASEAN) and Australia-New Zealand Closer Economic Relations Trade Agreement (ANZCERTA) countries using gravity models. Section 5.2 presents the general remarks of the gravity models starting from the general gravity models, which use all selected variables as detailed in chapter 4, to the specific gravity models which are created by omitting nonsignificant variables sequentially. The detailed discussion of country-specific gravity models for each single country is presented in section 5.3. The presence of regional trading arrangements is also discussed in section 5.4 to identify their position in fostering agricultural trade. Section 5.5 explains the intra-industry trade patterns that are part of the agricultural trade patterns between the ASEAN and ANZCERTA countries. Lastly, section 5.6 ends this chapter by presenting a concluding discussion.

5.2 The General Remarks

In analysing the trade patterns between the ASEAN and ANZCERTA countries, the gravity models generally use the selected variables that are hypothesised to determine trade among the countries included in the models. Then, secondly, the study moves to the specific gravity models by omitting sequentially the insignificant variables starting from the most insignificant variable to the least significant one. The logic behind this is that, as different countries have different characteristics, so it is necessary to apply the variables for each single country individually. Table 5.1 presents the coefficient estimates and *t*-statistics of regressions of the general and specific gravity models when equation (4.1a), as explained in Chapter 4, is estimated for the trade flows of the ASEAN and ANZCERTA countries.

Table 5.1 The Summary of Regressions of The General and Specific Gravity Models

	Indonesia		Malaysia		The Philippines		Singapore		Thailand		Australia		New Zealand	
	General	Specific	General	Specific	General	Specific	General	Specific	General	Specific	General	Specific	General	Specific
TREND	0.059		-0.047		0.026		-0.146[b]	-0.157[a]	-0.046		0.032		0.003	
	(0.39)		(-0.33)		(0.14)		(-2.13)	(-2.72)	(-0.63)		(0.60)		(0.12)	
GDPX	0.420		1.570[b]	1.451[b]	4.525[a]	3.927[a]	1.963[a]	2.026[a]	0.323		-0.961		-0.151	
	(0.43)		(2.16)	(2.02)	(4.22)	(4.27)	(2.52)	(2.83)	(0.435)		(-1.15)		(-0.23)	
GDPM	1.665[a]	1.780[a]	1.723[a]	1.722[a]	1.812[a]	1.345[a]	1.446[a]	1.320[a]	0.506[a]	0.586[a]	0.423[b]		1.307[a]	0.942[a]
	(8.51)	(11.88)	(10.89)	(10.96)	(4.32)	(9.29)	(7.51)	(8.01)	(2.35)	(2.42)	(2.10)		(4.88)	(9.89)
POPX	-3.904		-2.426	-4.181[b]	-6.203	-4.361[a]	-0.637		1.999	1.593[b]	2.964	4.327[a]	1.969	
	(-0.48)		(-0.44)	(-2.22)	(-0.80)	(-3.33)	(-0.79)		(0.87)	(2.20)	(0.90)	(8.69)	(0.70)	
POPM	-0.949[a]	-1.003[a]	-0.712[a]	-0.718[a]	-1.446[a]	-0.840[a]	-1.050[a]	-0.926[a]	-0.465[a]	-0.471[a]	-0.468[a]	-0.311[a]	-0.085	
	(-4.35)	(-4.708)	(-3.76)	(-3.93)	(-3.16)	(-6.59)	(-4.35)	(-3.81)	(-4.89)	(-4.22)	(-3.79)	(-3.86)	(-0.44)	
DIST	-1.539[a]	-1.412[a]	-1.331[a]	-1.341[a]	-2.001[a]	-1.715[a]	-0.976[a]	-0.458[a]	-2.505[a]	-2.493[a]	0.625[b]		0.767[c]	
	(-3.72)	(-4.04)	(-5.56)	(-5.74)	(-4.33)	(-8.23)	(-3.42)	(-2.59)	(-14.14)	(-12.24)	(2.34)		(1.71)	
LANG	-0.403		-4.406[a]	-4.398[a]	-0.583		0.906				0.591[c]		0.899[a]	1.171[a]
	(-1.11)		(-7.70)	(-7.78)	(-0.79)		(1.14)				(1.78)		(4.13)	(4.24)
ASEAN	1.590[a]	1.799[a]	-0.255[b]	-0.244[c]	-0.339		0.656[a]	0.660[a]	-0.426[a]	-0.418[a]				
	(4.25)	(5.56)	(-1.87)	(-1.75)	(-0.67)		(3.55)	(3.67)	(-2.44)	(-2.50)				
ANZCERTA											0.082		-0.203[c]	
											(0.62)		(-1.81)	
AFTA-ANZERTA	0.122		-0.089		-0.052		0.044		0.268		0.145		-0.006	
	(0.50)		(-0.59)		(-0.22)		(0.27)		(1.47)		(1.37)		(-0.06)	
RER	0.036		-0.590[a]	-0.588[a]	-0.240[c]		-0.262[a]	-0.227[b]	-0.218[a]	-0.166[a]	-0.223[a]	-0.142[a]	0.149[c]	
	(0.55)		(-7.01)	(-7.01)	(-1.77)		(-2.67)	(-2.29)	(-3.82)	(-2.41)	(-3.35)	(-2.49)	(1.64)	
AFC	-0.226		-0.223		-0.135		-0.271[c]	-0.269[c]	0.011		-0.026		-0.157	
	(-0.93)		(-1.48)		(-0.55)		(-1.64)	(-1.77)	(0.56)		(-0.25)		(-1.27)	
Constant	38.923	-2.006	-4.594	13.548	-3.343	-13.124	-23.348	-31.647	0.348	8.143	-8.058	-27.091	-31.749	-6.396
	(0.44)	(-0.73)	(-0.09)	(1.87)	(0.05)	(-2.64)	(-1.58)	(-2.90)	(-0.01)	(1.37)	(-0.25)	(-5.83)	(-1.45)	(-3.83)
R^2	0.9260	0.9351	0.9555	0.9533	0.7746	0.8929	0.9638	0.9655	0.9660	0.9452	0.9895	0.9838	0.9868	0.9821
DW	2.0499	2.0628	1.9846	2.0143	2.0251	2.0114	1.7615	1.7901	1.9881	2.1013	1.9143	1.9799	1.7627	1.8946
F-Stat	758.29	1942.58	601.21	772.64	531.12	1260.13	691.05	872.378	1489.98	1382.89	1967.93	4208.94	1836.51	4139.80
N-Obs	210		210		210		210		210		210		210	

Notes: Numbers in the parentheses are t-statistics

[a] - Significant at the 1% level
[b] - Significant at the 5% level
[c] - Significant at the 10% level
R^2 : Coefficient of determination
DW : Durbin-Watson Value
F-Stat : F-Statistics
N-Obs : Number of Observations
GDPX : GDP of exporting countries
GDPM : GDP of importing countries
POPX : Population of exporting countries
POPM : Population of importing countries
Dist : Distance
LANG : Language
AFTA-ANZCERTA: AFTA-ANZCERTA Relationship
RER : Real exchange rates
AFC : 1997 Asian financial crisis

The original trade flow variables of the gravity models, such as the Gross Domestic Product (GDP), the population and the distance have highly significant coefficients with expected signs in some countries. The impact of the variables on agricultural exports varies among the seven countries being studied. Since these variables are expressed in double log form their coefficients represent the estimated elasticity of bilateral trade flows with respect to the GDP of exporting and importing countries, the population of exporting and importing countries, the distance and the real exchange rate of their national currency, respectively.

The *F*-value and the coefficient of determination (R^2) of each country's general gravity equation are relatively high. These mean that the general gravity equations have a relatively high explanatory power. The values of the coefficient of determination range from 77.46% (for the Philippines) to 98.95% (for Australia). These values indicate that the variation of exports of each country in the ASEAN and ANZCERTA regions can be attributed to the chosen variables according to their respective R^2 values. For instance, the R^2 value of 92.60% for Indonesia indicates that the selected variables explain 92.60% of the variation of its agricultural exports. By applying the specific gravity models, the R^2 of the models increase for some countries and the others remain constant. In addition, by using the specific gravity models other diagnostic measures such as the Durbin-Watson value and *F*-statistic increase in most countries.

By using the specific gravity models, the number of the significant independent variables varies for the sample countries. In respect of the GDP variables of the exporting countries, the only countries that have statistically significant positive effects are Malaysia, the Philippines and Singapore. In these three countries, the GDP fostered agricultural exports; whilst in the other countries such as Indonesia, Thailand, Australia and New Zealand the GDP did not play a significant role in determining their agricultural exports. The variable representing the GDP of partner countries has the expected positive sign and is statistically significant in all countries except Australia. For those countries, the GDP of their trading partners impacted positively on their agricultural exports. This means the higher GDP of importing countries reflected the higher ability to import agricultural products.

For the population variable of the exporting countries, Malaysia and the Philippines have significant negative coefficients, while Thailand and Australia have positive significant effects. The absorption effect seems to exist for Malaysia and the Philippines, whilst the economies of scale seem to exist for Thailand and Australia. Meanwhile, the population of partner countries is significant and negative for all countries except for New Zealand. In these cases, the population size deterred the imports of agricultural products. The result shows that an increase in the population size leads to less reliance on foreign agricultural trade. Greater self-sufficiency is achieved with an increasing population size, thereby reducing trade flows between countries.

The distance variable, theoretically, has a negative sign since it is assumed to be a proxy for transportation costs, which deter flows of trade. The expected negative sign of the distance variable is found for the five ASEAN countries (Indonesia, Malaysia, the Philippines, Singapore and Thailand). The distance variable of these countries is statistically significant at α=5%. For the five ASEAN countries, the distance variable really means transportation costs that discourage their trade flows. So, the longer the distance between the two trading partners the less trade flows will be, which is in line with the gravity theory. Conversely, as regards the distance variable of Australia and New Zealand, this variable did not affect their agricultural exports significantly. This could be due to the more extensive use of technology in the agricultural sectors of these two countries compared to those of the five ASEAN countries.

The dummy variables have varying effects in determining agricultural exports of the sample countries. The similarity in language had a different effect in each country. This variable had a significant negative effect only on Malaysian agricultural exports, while, for New Zealand, the similarity in language gave a significant positive effect. For Australia, Indonesia, Philippines and Singapore the similarity in language did not play a significant role in influencing their agricultural exports.

The ASEAN dummy variable had different effects on trade flows for the five ASEAN members. The members that had positive effects are Indonesia and Singapore. Malaysia and Thailand had negative effects. Meanwhile, the Philippines did not have

any significant effect. The ANZCERTA dummy variable did not have any effects on trade flows for either Australia or New Zealand. This finding is parallel to the results obtained by Townsend and Ratnayake (1997), which also showed that ANZCERTA had no effect on their trade flows (in aggregate products). The joint AFTA-ANZCERTA variable did not have a significant impact on agricultural trade flows in the ASEAN and ANZCERTA regions either. This is probably due to the relatively new relationship and the limited volume of agricultural trade. As regards the Asian financial crisis variable, the only country that was affected negatively and significantly was Singapore. This is demonstrated by the negative coefficient of the crisis variable which is statistically significant at α=5%.

The real exchange rate had the expected negative sign. It had significant negative effects for some countries such as Malaysia, Singapore, Thailand and Australia. This means that the appreciation (depreciation) of their national currencies against foreign currencies (the national currencies of their trading partners) will decrease (increase) total agricultural exports of those negatively affected countries. For Indonesia, the Philippines and New Zealand the real exchange rates of their currencies did not have significant effects.

5.3 The Detailed Discussion of Country-Specific Gravity Models

5.3.1 Indonesia

As indicated in Table 5.1, the significant variables explaining 93.51% of the variation in Indonesian agricultural exports to the ASEAN and ANZCERTA countries are the GDP of partner countries (importing countries), the population of importing countries, the distance and the ASEAN dummy. The GDP of importing countries had the expected positive sign. Its magnitude was estimated be 1.780. This means that an increase of the GDP of importing countries by 1% leads to an increase of 1.78% in Indonesian agricultural exports. The higher income of partner countries indicates a higher demand and ability to import.

The population of the importing countries has an unexpected negative sign, indicating that it tends to be a deterrent factor to Indonesian agricultural exports. The estimated

parameter of –1.003 means that if there is an increase in the size of the population of partner countries by 1%, Indonesian exports will decrease by 1.003%. Self-sufficiency of the trading partners seems to improve with an increasing population size, thereby tending to reduce trade flows between Indonesia and its trading partners.

The distance variable is a significant factor and has the expected negative sign. This determinant really influenced Indonesian agricultural exports. As indicated in the gravity theory, distance is an impediment to trade and is used as a proxy for transportation cost. The longer the distance between Indonesia and its trading partners the less Indonesian agricultural exports will be, other things being the same.

The last variable affecting Indonesian agricultural exports is the ASEAN dummy variable. This variable has the significant coefficient of 1.799. The positive coefficient of the ASEAN variable implies the formation and membership of ASEAN contributed to increase Indonesian agricultural exports to the other countries in the sample by 504.36%[1] higher than pre-ASEAN years.

5.3.2 Malaysia

The significant variables which shaped Malaysian agricultural exports in the period 1965-1999 were the GDP of Malaysia, the GDP of importing countries, the population of Malaysia and its importing countries, the distance, the similarity of languages, the ASEAN dummy variable and the real exchange rate of Ringgit (the national currency of Malaysia) against the currencies of its trading partners (for more detail see Table 5.1).

On examining the results of the regression of the gravity model, it is indicated that there is a strong Malaysian income effect on agricultural trade, with the income elasticity at 1.45 and the parameter is significantly different from zero. This means that a 1% increase in the GDP of Malaysia would increase its exports by 1.45%. Also, the income effect of the importing countries is relatively stronger than that of the

[1] The interpretation of the coefficient of the dummy variables in this study for Indonesia and other countries is by taking a formula of (antilog of 'the coefficient' – 1)*100%. For instance, for ASEAN dummy of Indonesia is (antilog 1.799 – 1)*100% which is equal to 504.36%.

effect of the Malaysian GDP and is statistically significant at α=1%. Its elasticity is 1.72, which means that an increase in GDP of Malaysia's trading countries by 1% would increase Malaysian agricultural exports by 1.72%.

As is suggested by gravity theory, population could have either a positive effect or a negative effect. This depends on whether the ability to export reduces when the population size is large, in which case the absorption effect exists, or whether its larger size means greater exports. The negative coefficient of the Malaysian population means that the larger the size of its population the less will be its agricultural exports. In that case, the absorption effect is manifested. As far as possible, the country will try to maximise agricultural production in the home market to meet the growing demand from a growing population.

Meanwhile, the population size of Malaysia's trading partners has a negative coefficient and the estimated coefficient is significant at α=1%. The result shows that an increase in the population size of trading partners of Malaysia leads to less reliance on imports. Greater self-sufficiency is achieved with an increasing population size. People of the importing countries tend to be more self-sufficient which lessens agricultural imports from Malaysia.

The distance variable had a significant negative impact on Malaysian agricultural exports. This parameter is different from zero at α=1%. A 1% longer distance will lower Malaysia's exports by 1.34%. The dummy variables inserted in the Malaysian gravity model, such as the dummies of similarity in language and the ASEAN, have negative coefficients and they are significant at the 1 percent level of confidence. The negative coefficient of the similarity in language means that on the average Malaysian agricultural exports to countries with which it shares the similar language is only 98.77% of the amount to those countries with which it does not share a common language. The negative coefficient of the ASEAN variable means that the mean of Malaysia's agricultural exports was 21.65% lower for the period of ASEAN membership than in pre-ASEAN years.

In respect of price competitiveness, represented by the real exchange rates of Ringgit, it seems appreciation of the Ringgit reduces Malaysia's exports of agricultural products. The level of competitiveness of Malaysia's agricultural exports decreases if the real exchange rate of Ringgit increases. As the real exchange rate of its currency increases by 1%, its ability to export is reduced by around 0.59%.

5.3.3 The Philippines

The variables of the gravity model that determined the Philippines' agricultural exports as summarised in Table 5.1 are: the GDP of the Philippines, the GDP of its importing countries, the population of the Philippines, the population of its importing countries and the distance. All variables are statistically significant at α=1%. The GDP of the Philippines had its expected positive sign. It shows that a larger GDP implies increased ability to produce, and therefore a higher ability to export. The parameter value of 3.927 measures its income elasticity: that is, for example, a 1% increase in its GDP will cause an increase in its agricultural exports by 3.927%. The GDP of its importing countries has its expected sign and has an elasticity of 1.34. Its positive sign means that the demand of its trading partners increases with an increase in their incomes.

For the Philippines, the larger the size of its population the less will be its agricultural exports, which is shown by the negative parameter of the population variable. In this case, the absorption effect seems to be manifested. A similar characteristic also was evidenced in its partners' populations, which have a negative sign. It confirms that their population is trade inhibiting, since a larger population size means a higher degree of self-sufficiency and less need to import.

The last significant variable affecting the Philippines' agricultural exports is the distance. The distance variable has its expected negative sign. Its negative sign means that the distance is an impediment to trade, because the geographical distance between the Philippines and its trading partners will impact negatively on its agricultural exports. A 1% increase in the distance between the Philippines and its trading partners will decrease the Philippines' agricultural exports by 1.71%.

5.3.4 Singapore

The factors that influenced Singapore's agricultural exports significantly are presented in Table 5.1. These variables are time trend, the GDP of Singapore, the GDP of importing countries, the population of importing countries, the geographical distance, the ASEAN dummy variable, the real exchange rate of the Singaporean dollar and the Asian financial crisis. All determinants are significantly different from zero at least at the 5% confidence level. Out of the seven countries being studied during the period 1965-1999, only Singapore had a significant trend in agricultural exports. The time trend showed that Singapore's agricultural exports decreased annually at the rate of 16% during the period of study.

Similarly to that which occurred in respect of the agricultural trade of Indonesia, Malaysia and the Philippines, the GDPs of Singapore and its importing partners have the expected positive signs. The higher level of Singapore's GDP reflects its greater ability to produce more and therefore to export more. The estimated income elasticity of Singapore is 2.03, which is greater than that of the income elasticity of its partners at 1.32. But, it should be interpreted with caution as an indicator of Singapore's ability to export. As an island, Singapore is an active entrepot country, whereby it both imports intensively raw commodities and then re-exports them as finished products and acts as a transit point of export and import activities for many countries, including the ASEAN and ANZCERTA countries.

The population variable of the importing countries shows a negative sign, which means that the higher level of their GDP the less they import from Singapore. The distance variable has the expected negative sign, which means the farther the distance between Singapore and its trading partners the more its agricultural exports will decrease. The coefficient of -0.4578 implies that, if the distance increases by 1% the total agricultural exports will reduce by 0.46%.

Turning to the ASEAN and Asian financial crisis dummy variables, these two variables affected Singapore's agricultural exports significantly. The ASEAN dummy variable had a positive effect, so the parameter of 0.660 means that the mean of

Singapore's agricultural exports was 93.47% higher for the period of ASEAN membership than in pre-ASEAN years. The Asian financial crisis variable, however, has a negative effect. It is estimated that the mean of Singapore's agricultural exports was 23.58% lower than its exports before the 1997 Asian financial crisis.

The real exchange rate of Singapore's dollar had an expected negative sign. If the Singapore dollar appreciates by 1% its agricultural exports will decrease by 0.23%. The price competitiveness through the Singapore dollar was reflected in its agricultural exports.

5.3.5 Thailand

The significant determinants of Thai agricultural exports are summarized in Table 5.1. Unlike the other four ASEAN members earlier reviewed, the GDP of Thailand did not come up as a significant variable in shaping its agricultural exports. The significant effect comes from its partners' GDP. This variable had a positive effect and the coefficient is significant at α=1%. An increase of 1% in its partners' GDP increases Thai agricultural exports by 0.59%.

In contrast to the Philippines, an increase in the population of Thailand boosts its agricultural exports significantly, which is evidenced by the positive parameter. If there is an increase in Thai population by 1%, Thai agricultural exports will increase by 1.59%. The population variable perhaps indicates economies of scale existing in the agricultural production process in this country. A large population endorses a high degree of division of labour, and this may promote greater efficiency and more exports. Additionally, Thai exports are affected negatively by the size of its trading partners' populations. It suggests that a relatively large population of its trading partners indicates a large domestic market in the partner country with a higher level of self-sufficiency that tends to be trade inhibiting.

The distance variable had a negative effect on Thai agricultural exports because the distance is a deterrent factor to exports. If there is an increase in the distance by 1% between Thailand and its trading partners, the corresponding reduction in Thai

agricultural exports will be 2.49%. The ASEAN variable impacted negatively on Thai agricultural exports. As shown in Table 5.1, the coefficient of the ASEAN dummy means that the mean of Thai agricultural exports was 34.16% lower for the period of ASEAN membership than in pre-ASEAN years. The ASEAN membership did not contribute to increase Thai agricultural exports to the other ASEAN member countries.

The real exchange rate of Baht, Thai currency, had expected negative sign. The real exchange rate of Baht encouraged Thai agricultural exports, as the price competitiveness was manifested in Thai agricultural exports. The appreciation of the Thai-Baht by 1% causes a decrease in Thai agricultural exports of 0.17%.

5.3.6 Australia

Noticeably, the number of selected variables determining Australia's agricultural exports is less than those of the five ASEAN members. The significant variables are the population of Australia, the population of its importing countries and the real exchange rate of the Australian dollar, which are significant at α=1% (see Table 5.1). The population of Australia had a positive effect on its agricultural exports. If its population increases by 1%, then its agricultural exports increase by 4.33%. The characteristic of the Australian population is that a large number can create division of labour and implies the existence of economies of scale in the agricultural sector. This, therefore, creates an ability to trade with a greater variety of agricultural products.

In respect of the population of importing countries, this determinant had a negative effect. An increase of 1% in the population size of its trading partners will cause a decrease in Australian exports of agricultural products of 0.31%. The last variable that affected Australian exports is the real exchange rate of the Australian dollar. If the Australian dollar appreciated by 1%, its agricultural exports decreased by 0.14%. An increase in price competitiveness, in respect of the Australian dollar, engendered an increase in Australian agricultural exports to the sample countries.

5.3.7 New Zealand

The two selected explanatory variables of New Zealand's agricultural exports are indicated in Table 5.1. The GDP of importing countries and the similarity in language are statistically significant at α=1%. Income of importing countries has a positive effect on New Zealand agricultural exports: a 1% increase in income of the trading partners induces 0.94% increase in New Zealand's agricultural exports. In addition, this significant variable shows that the five ASEAN countries and Australia are significant markets for New Zealand's agricultural exports.

Another variable is the similarity of language. This dummy variable influenced New Zealand's agricultural exports positively. On the average, New Zealand agricultural exports to countries with a similar language were 222.52% higher than the amount to countries with dissimilar language. This is linked to New Zealand's trade relationship with its closest neighbour country, Australia where English is also the official language. Australia has been the main destination of New Zealand's exports particularly in agricultural products.

5.4 The Essence of Regional Trading Arrangements in the Gravity Models

As the results reported in Table 5.1 indicate, the ASEAN and ANZCERTA regional agreements did not have significant effects on the trade patterns of some of the member countries over the period of study. In the estimated specific gravity models, the ANZCERTA dummy variable did not have any significant effect on the trade patterns between Australia and New Zealand. ASEAN had significantly positive effects only in the agricultural trade of Indonesia and Singapore, and significantly negative effects in agricultural exports of Malaysia and Thailand. The agreement between AFTA and ANZCERTA, which started in 1995, did not have significant effects on the respective member countries. The negligible impact of those regional trading arrangements on agricultural trade could be attributed to the fact that volumes of agricultural trade may be driven by factors other than regional trading arrangements.

Table 5.2 Intensity of Trade (IOT) Index of Regional Trading Arrangements in Agricultural Products 1965-1999

	1965-1999	1965-1974	1975-1984	1985-1994	1995-1999
ASEAN	5.02	5.84	5.62	4.26	3.67
ANZCERTA	3.67	2.02	3.14	4.81	5.80
ASEAN-ANZCERTA	2.39	1.85	2.43	2.63	2.92
APEC	1.72	1.65	1.69	1.79	1.81
EU	1.60	1.44	1.64	1.66	1.72
NAFTA	1.90	1.65	1.58	2.14	2.58
SAARC	3.73	2.44	3.44	4.31	5.74

Source: Calculated from NAPES Database, 2002

The statistical non-significance of the regional trading arrangements in ASEAN and ANZCERTA agricultural trade could further be explained by examining the Intensity of Trade (IOT) Index of the ASEAN and ANZCERTA countries. The IOT Indices of both ASEAN and ANZCERTA were always greater than one in the period 1965-1999 (see Table 5.2). If the IOT Index is one, the intra-regional trade share is the same as the trade share of the region with the world, as a whole, in which case the regional trading arrangements have a neutral effect on trade. If the IOT Index is greater (less) than one, then there is trade diversion (creation) as a result of the regional trading arrangements (*Asian Development Bank*, 2002). These mean that, generally, there is trade diversion in the ASEAN and ANZCERTA regions. The phenomenon of trade diversion also occurred in other regional trading arrangements such as the European Union (EU), North American Free Trade Area (NAFTA), Asia Pacific Economic Cooperation (APEC) and South Asian Association for Regional Cooperation (SAARC).

In the case of the AFTA, De Simone (cited in Krueger, 1999) has proposed that trade diversion arose because of two main factors: *first*, the relatively similar factor endowments and the low level of output and trade complementarity of the countries involved before the formation of the trading arrangement; and *second*, large differences in costs of production between member countries and the rest of the world. So, it appears that this regional trade agreement has much greater potential for trade diversion and it affects negatively the welfare of its members.

5.5 Intra-Industry Trade (IIT) Analysis.

This section explains the agricultural intra-industry trade patterns of the ASEAN and ANZCERTA countries. As discussed in Chapter 2, the IIT is defined as simultaneous export and import of products that belong to the same industry and commonly refers to differentiated products. The Intra Industry Trade (IIT) Index used in this analysis refers to the Grubel-Lloyd (GL) Index as defined in Chapter 4.

In the following sub-section, the analysis will be focused on the IIT indices to show the patterns of trade in agricultural products, which could be classified as either intra-industry trade patterns or inter-industry trade patterns. In addition, the figures of the kinds of agricultural products of each country which have a relatively higher IIT index will be presented.

5.5.1 Agricultural IIT of Indonesia

As shown in Table 5.3, the IIT Indices of agricultural products of Indonesia with the six trading partners are relatively low. With reference to the classification by Qasmi and Fausti (2001)[2], the IIT of Indonesian agricultural products could be viewed as *strong inter-industry* trade tendencies not *intra-industry* trade. The only increase in its IIT Index is in its trade with Malaysia in the period 1991-1999 which can be viewed as *weak inter-industry* trade. During this period the IIT of Indonesia in agricultural trade with Malaysia increased from 3.78 in 1981-1990 to 36.03 in 1991-1999. Comparatively, Indonesian IIT with six ASEAN and ANZCERTA partners is relatively low on average than with the rest of the world. Generally speaking, the pattern of Indonesian IIT with its trading partners increased gradually from 1965 to 1999 with all six partners and the rest of the world but it is still in the lowest IIT classification, with *strong inter-industry* trade.

[2] The types of IIT are classified into four categories: (1) strong inter-industry trade tendencies, if the GL Indices are between 0 and 25; (2) weak inter-industry trade tendencies if the GL Indices are between 25 and 50; (3) weak intra industry trade tendencies if the GL Indices are between 50 and 75; and (4) strong intra-industry trade tendencies if the GL indices are between 75 and 100 (Qasmi and Fausti, 2001, p. 260).

Table 5.3 Agricultural Intra-Industry Trade of Indonesia with Its Trading Partners 1965-1999

Partners	1965-1980	1981-1990	1991-1999
Malaysia	1.75	3.78	36.03
The Philippines	0.35	5.43	14.25
Singapore	1.62	5.98	10.28
Thailand	0.08	2.50	4.39
Australia	0.58	2.04	3.94
New Zealand	0.16	0.09	1.53
World	6.34	13.96	21.19

Source: Calculated from NAPES Database, 2002
Note: The IIT indices are on the annual average values.

At the three-digit-level of classification, Indonesian agricultural products were integrated relatively more with Malaysian, Singaporean and Australian industries (see Appendix D Table D.1). In trade with Malaysia, the highest Indonesian IIT products are: food preparations (099), crude and synthetic rubber (231), cereal (048), animal feeding stuff (081), chocolate (073) and preserved food (053). The highest IIT Index is for food preparations which has an index value of 73.03.

Out of all Indonesian three-digit level agricultural exports to Singapore, six products have IIT Indices of more than 50: cereal (048), food preparations (099) synthetic and regenerated fibre (266), oil seeds, nuts and kernels (221), fixed vegetable oil (422) and tinned and prepared fish (032). Cereal has the highest IIT Index of 80.55. Other relatively high IIT products were traded with Australia. There are 5 products that have an IIT Index of more than 50: crude vegetable materials (292), sugar preparations-non chocolate (062), processed animal and vegetable oil (431), preserved and prepared fruits (053) and oils seeds, nuts and kernels (221). Meanwhile, Indonesian agricultural exports in the three-digit products with the Philippines, Thailand and New Zealand are mostly in the strong inter-industry trade.

5.5.2 Agricultural IIT of Malaysia

The IIT in respect of Malaysia's agricultural exports is similar to the IIT of Indonesia which is classified as *strong inter-industry trade*. The Malaysia's IIT increased during the period 1965-1999. Malaysian IIT Index increased gradually in respect of all

trading countries and the world. The biggest increase in the period 1991-1999 were in trade with Indonesia and the world as a whole, in which the IIT Index reached 29.43 and 26.72 respectively (see Table 5.4).

Table 5.4 Agricultural Intra-Industry Trade of Malaysia with Its Trading Partners 1965-1999

Partners	1965-1980	1981-1990	1991-1999
Indonesia	2.82	17.78	29.43
The Philippines	5.43	17.80	19.22
Singapore	6.46	8.70	10.38
Thailand	2.27	4.70	7.32
Australia	0.65	1.70	4.77
New Zealand	1.24	2.29	3.06
World	11.72	15.52	26.72

Source: Calculated from NAPES Database, 2002
Note: The IIT indices are on the annual average values.

From the features of Malaysia's IIT Index in trade with Indonesia, it can be said generally that the trade relations within the same industries in these two countries are higher than those of other trading partners. The Malaysian IIT Index with the world also increased significantly from 15.52 in 1981-1990 to 26.72 in 1991-1999.

At the three-digit level, agricultural intra-industry trade between Malaysia and Indonesia is quite high as eleven of the traded products have IIT Indices of more than 50 (see Appendix D Table D.2). Those products are preserved and prepared fruit (053), chocolate (073), oil seeds, nuts and kernels (221), food preparations (099), cereal (048), preserved and prepared vegetables (055), animal feeding stuff (081), tinned and prepared fish (032), fresh and simply preserved vegetables (054), fresh, dry fruit and nuts (051) and crude and synthetic rubber (231). Out of these products, preserved and prepared fruit have the highest IIT Index of 73.34 and crude and synthetic rubber an IIT Index of 50.22. Malaysian exports to Singapore and Australia are relatively similar in terms of their intra-industry component. In trading with both of these countries, there are 7 products that have the IIT Indices of more than 50. With Singapore, Malaysian products have the highest IIT index of 68.44 in textiles (267) and with Australia the highest IIT index of 78.59 is in food preparations (099).

In trade with the Philippines, there are five products that have IIT Indices of more than 50 with the highest IIT of these products being cereal at 65.12. In trade with Thailand, there are only four products that have IIT Indices of more than 50, of which the highest index is 59.74 in respect of spices (075). Finally, all the Malaysian products traded with New Zealand are of the inter-industry trade. More details on the IIT Index of Malaysian agricultural products at the three-digit level can be found in Appendix D Table D.2.

5.5.3 Agricultural IIT of the Philippines

The IIT Index of the Philippines' agricultural exports to its trading partners were relatively low in the period 1965-1999. Much of its trade is *inter-industry*. From Table 5.5, it can be seen that the higher levels of the IIT Index of the Philippines in all periods were in its trade with Singapore, with the average level was at 17.28 in 1981-1990 and then increased to 26.67 in 1991-1999. The Philippines' IIT Index with the world also increased gradually but there was no movement towards a very high level. It reached 23.01 in 1991-1999, as *inter-industry trade* remained strong.

Table 5.5 Agricultural Intra-Industry Trade of the Philippines with Its Trading Partners 1965-1999

Partners	1965-1980	1981-1990	1991-1999
Indonesia	2.07	2.99	13.15
Malaysia	2.95	11.43	18.27
Singapore	3.23	17.28	26.67
Thailand	0.22	1.91	7.08
Australia	2.97	2.69	3.47
New Zealand	0.68	1.31	2.13
World	8.05	17.22	23.01

Source: Calculated from NAPES Database, 2002

Note: The IIT indices are on the annual average values.

The Philippines' agricultural trade with its 6 trading partners are mostly of an *inter-industry* nature, with only one or two of the traded agricultural products having an IIT Index of more than 50 (see Appendix D Table D.3). The only exception is in trade with Singapore with eight products with an IIT index of more than 50. Those products are fresh and simply preserved fish (031), crude and synthetic rubber (231), fresh and

simply preserved vegetables (054), food preparations (099), preserved and prepared fruit (053), crude vegetable materials (292), cocoa (072), and preserved and prepared vegetables (055). Out of these products, the highest IIT index of 74.71 is in respect of fresh and simply preserved fish.

5.5.4 Agricultural IIT of Singapore

The IIT Index of Singapore with its trading partners was higher than those of other countries within ASEAN and even than those of Australia and New Zealand. Its IIT Index in agricultural products increased from 1965-1980 to 1981-1990. For example, its IIT with Malaysia grew phenomenally from 4.39 in 1965-1980 to 21.68 over 1981-1990 and then again to 37.22 in the last period (as shown in Table 5.6).

Table 5.6 Agricultural Intra-Industry Trade of Singapore with Its Trading Partners 1965-1999

Partners	1965-1980	1981-1990	1991-1999
Malaysia	4.39	21.68	37.22
The Philippines	5.57	20.16	23.90
Thailand	5.53	13.37	23.79
Australia	3.34	9.12	16.60
New Zealand	1.89	6.52	9.72
World	6.83	73.41	76.81

Source: Calculated from NAPES Database, 2002
Note: The IIT indices are on the annual average values.

With respect to the world, the IIT Index of Singapore also showed the same pattern and even here, the IIT rose from a *strong inter-industry pattern* of trade by 1965-1980 to what was the beginning of *intra industry trade* in 1981-1990. The pattern changed to exhibit *strong intra-industry trade* tendencies in the last period. The high level of Singapore's IIT Index must have been due in part to the level of its entrepot trade.

At the three-digit SITC level, Singaporean exports have a large number of high IIT products with Malaysia. Computations reported in Appendix D Table D.4 show that the IIT Index is in the range of 50.00 to 85.66. The top ten products, from the highest IIT Index to the lowest, are: fresh and simply preserved vegetables (054), tinned and prepared fish (032), sugar preparations-non chocolate (062), preserved and prepared

fruit (053), animal oils and fats (411), fresh fruit, fresh and dry nuts (051), spices (075), fresh and simply preserved fish (031), food preparations (099), alcoholic beverages (112). In addition, the 22nd product is unmilled barley (043), which has an IIT Index of 50.89, while the highest product, fresh and simply preserved vegetables, has an IIT Index of 85.66.

The numbers of products with the IIT Index of more than 50 in Singapore's trade with the Philippines, Australia, Thailand and New Zealand are 9, 8, 7 and 6 respectively. The highest IIT Index in trade with the Philippines is preserved and prepared fruit (053) at 74.71 of the IIT Index. In trade with Australia and Thailand, the highest IIT Indices were in food preparations (099) at 79.31 and 84.38 respectively. Lastly, with New Zealand, the highest IIT Index is 80.29 in respect of alcoholic beverages (112).

5.5.5 Agricultural IIT of Thailand

The IIT of Thailand in agricultural products with its trading partners could be said to be the lowest grade among the ASEAN and ANZCERTA countries. Comparatively, it is only with Singapore that Thailand had some intra-industry trade. In their mutual trade, the IIT Index increased from 1.48 in 1965-1980 to 13.09 in 1981-1990 but then decreased slightly to 12.67 in the last period (as shown in Table 5.7). There was also a gradual improvement in Thai IIT Index at the world level, but that did not change its largely *inter-industry trade* to an *intra-industry trade* during the period of study.

Table 5.7 Agricultural Intra-Industry Trade of Thailand with Its Trading Partners 1965-1999

Partners	1965-1980	1981-1990	1991-1999
Indonesia	0.34	1.97	5.00
Malaysia	2.55	6.13	6.49
The Philippines	0.32	2.39	6.23
Singapore	1.48	13.09	12.67
Australia	2.28	7.71	9.18
New Zealand	0.64	6.61	9.25
World	8.35	18.04	24.71

Source: Calculated from NAPES Database, 2002
Note: The IIT indices are on the annual average values.

At the three-digit SITC level, Thai trade in agricultural products is mostly of an inter-industry nature. This can be seen from the number of its exports with an IIT Index of more than 50 (see Appendix D Table D.5 for more details). The number of products that have an IIT Index of more than 50 in trade with Singapore, Indonesia, New Zealand, and Malaysia, are 3, 2, 2 and 1 respectively. In its trade with the Philippines, there are no products that have the IIT Index values of more than 50. In contrast to this, in its trade with Australia, Thailand has 5 agricultural products with an IIT index of more than 50. These products are: spices (075), sugar and honey (061), cereal (048), tinned and prepared meat (013) and crude vegetables (292). From these 5 products, spices (075) have an IIT Index of 82.40.

5.5.6 Agricultural IIT of Australia

The features of Australian IIT with its trading partners were not very different from those of the ASEAN countries with Australian trade being largely *inter-industry*. Only with New Zealand did Australia have higher IIT Indices. In trade with New Zealand, Australia's inter-industry trade was weak, particularly in the periods 1981-1990 and 1991-1999 (see Table 5.8). Meanwhile, at the world level, its IIT Index remained constant, and it had strong *inter-industry trade* level.

Table 5.8 Agricultural Intra-Industry Trade of Australia with Its Trading Partners 1965-1999

Partners	1965-1980	1981-1990	1991-1999
Indonesia	0.91	2.16	4.69
Malaysia	1.29	2.30	5.14
The Philippines	3.00	2.55	3.54
Singapore	2.04	8.28	15.11
Thailand	3.28	8.00	10.31
New Zealand	21.04	29.88	37.03
World	9.41	15.30	22.50

Source: Calculated from NAPES Database, 2002
Note: The IIT indices are on the annual average values.

At the three-digit SITC level, Australian exports show relatively higher intra-industry trade patterns than other countries in the ASEAN and ANZCERTA regions. Australia has a large number of products that have IIT Indices of more than 50. An even

stronger intra-industry trade pattern of Australia was in its trade with New Zealand. As was argued by Matthews (1998), the relatively higher level of Australian IIT with New Zealand in agricultural products is due to a number of factors including its close proximity and similar taste/culture and the relatively high degree of integration in trade.

There were seventeen products at the three-digit SITC level with an IIT Index of more than 50 in agricultural trade between Australia and New Zealand. The highest IIT Index of 90.81 is in food preparations (099) and the lowest, which is close to 50, is in crude vegetables (292) with an IIT Index of 51.37. The other trading partners, ranked in terms of their IIT indices from the highest to the lowest, are Singapore with 9 products, Malaysia with 8 products, Indonesia with 7 products, Thailand with 6 products and the Philippines which has only 3 products. A more complete picture of Australian trade patterns at the three-digit SITC levels can be seen in Appendix D Table D.6.

5.5.7 Agricultural IIT of New Zealand

As is shown in Table 5.9, agricultural trade between New Zealand and its trading partners is largely *inter-industry trade* with the exception of its trade with Australia with which it had IIT of noticeable proportions. During the period of study, New Zealand's IIT at the world level was also relatively low, with a value of 15.96 in the final period.

Table 5.9 Agricultural Intra-Industry Trade of New Zealand with Its Trading Partners 1965-1999

Partners	1965-1980	1981-1990	1991-1999
Indonesia	0.16	0.17	4.36
Malaysia	1.26	2.51	2.39
The Philippines	0.67	1.19	2.53
Singapore	1.96	5.52	8.13
Thailand	0.79	4.54	13.35
Australia	21.23	29.55	35.76
World	6.76	10.97	15.96

`Source: Calculated from NAPES Database, 2002
Note: The IIT indices are on the annual average values.

A closer examination of New Zealand's agricultural trade at the three-digit level confirms that Australia is its IIT trade partner of significance. Some fifteen products in its trade with Australia have an IIT Index of more than 50 (for details see Appendix D Table D.7). The highest IIT product is preserved and prepared fruit (053) with an index value of 89.47, and the lowest IIT product is manufactured tobacco (122) with an index of 53.49. New Zealand's agricultural trade with other countries in the ASEAN and ANZCERTA region was largely of an *inter-industry* nature. This reflects the different economic structures of the economies in question vis-à-vis New Zealand.

5.6 Concluding Discussion

The original trade flow variables of the gravity models, such as the GDP, the population and the distance have highly significant coefficients with expected signs in some countries. The impact of the variables varies among the seven countries being studied. In respect of the distance as a determinant in the gravity models, in particular, this variable had a negative significant effect on all five ASEAN countries. But for Australia and New Zealand's agricultural trade this variable seemed to be insignificant.

Not all regional agreements being selected as explanatory variables had significant effects on the trade patterns between the ASEAN and ANZCERTA countries in agricultural products. In the specific gravity models, the ANZCERTA dummy variable did not significantly affect the trade patterns between Australia and New Zealand. ASEAN had significantly positive effects only on the agricultural trade of Indonesia and Singapore and had significantly negative effects on the agricultural products of Malaysia and Thailand. Meanwhile, the variable of the AFTA-ANZCERTA relationship did not have significant effects on the respective member countries at that time, on either ASEAN or ANZCERTA countries.

The features of the five ASEAN countries' IIT with their trading partners were classified as *strong inter-industry trade*. The IIT of Australia and New Zealand were not different from those of the five ASEAN countries, which were classified as *strong inter-industry* trade as well. The only higher IIT of Australia was in its trade with

New Zealand. In trading with New Zealand, the IIT pattern of Australia seems to be in the *weak inter-industry trade*.

CHAPTER 6

SUMMARY, CONCLUSION, POLICY IMPLICATIONS AND SUGGESTIONS FOR FURTHER RESEARCH

6.1 Summary

Using trade data for the period 1965-1999, this study has estimated some equations of the gravity models to identify the major determinants of agricultural trade within and between the Association of Southeast Asian Nations (ASEAN) and the Australia-New Zealand Closer Economic Relations Trade Agreement (ANZCERTA) economies. These variables turn out to be the incomes of exporting and importing countries, the populations of exporting and importing countries, the geographical distance and some other defined determinants as detailed in Table 6.

Table 6 The Plots of the Main Determinants of the ASEAN and ANZCERTA Trade Patterns in Agricultural Products 1965-1999

Determinants	Indonesia	Malaysia	The Philippines	Singapore	Thailand	Australia	New Zealand
GDPX		••	••	••			
GDPM	••	••	••	••	••		••
POPX		•	•		••	••	
POPM	•	•	•	•	•	•	
DIST	•	•	•	•	•	•	
LANG		•					••
ASEAN	••	•		••	•		
ANZCERTA							
AFTA-ANZCERTA							
RER		•		•	•	•	
AFC				•			
TREND				•			

Notes: *•• gives positive effect • gives negative effect*

GDPX: GDP of exporting countries *Dist : Distance*

GDPM: GDP of importing countries *Lang: similarity of language*

POPX: Population of exporting countries *RER : Real exchange rate*

POPM: Population of importing countries *AFC: Asian financial crisis*

The incomes of the ASEAN exporting countries such as Malaysia, the Philippines and Singapore were found to be positively correlated with their agricultural exports.

However, the incomes of Indonesia, Thailand, Australia and New Zealand did not seem to contribute significantly to their agricultural exports.

The incomes of most importing countries also had a significant effect on the agricultural trade of the five ASEAN countries and New Zealand. This determinant showed a higher ability of those affected countries to import. An exception was the income of the importers from Australia. In general, the estimation shows that agricultural trade of the ASEAN and ANZCERTA countries is more sensitive to the GDPs of the trading partners than to their own.

The populations of some exporting countries have had significant effects on their agricultural exports. The possible reasons for this have been enunciated in Chapter 5. A large population may encourage and enable more specialised production methods, and the resulting division of labour may reduce costs of production. On the other hand, the populations of Malaysia and the Philippines seemed to be trade-inhibiting; their populations and agricultural exports were found to be negatively correlated. A possible explanation for this could be that a larger domestic demand absorbed more of what was being produced, leaving no exportable surplus.

The population of importing countries tended to be trade-inhibiting to the five ASEAN countries. Australia also experienced the negative effect of partner countries' populations. However, the populations of importing countries did not have a significant effect on the agricultural exports of New Zealand. A large population in the ASEAN countries tends to form a large market that either absorbs agricultural products domestically or becomes self-sufficient.

Geographical distance was found to be an impediment to trade for all five ASEAN countries, but not for Australia and New Zealand. For Australia and New Zealand, the distance was found to be less important and it did not seem to affect their agricultural exports significantly. This may be because these countries produce and export more technology-intensive and high-quality products which can be priced to cover transport costs.

Additional variables were introduced, such as the real exchange rate and time trend and other variables in the form of dummies into the gravity models, to test if there were other influences affecting the exports of agricultural products of the countries in question. These dummy variables were similarity in language, ASEAN, ANZCERTA, AFTA-ANZCERTA and the Asian financial crisis. The similarity in language did not seem to play a significant role in influencing agricultural trade among the countries in the ASEAN and ANZCERTA regions, except for Malaysia and New Zealand. This variable has a significant negative effect on Malaysian agricultural exports. Conversely, a positive effect of similarity of language was observed for New Zealand. As such, New Zealand agricultural exports destined for Australia, which has the same language, benefited more from this factor than did New Zealand's exports to the ASEAN countries.

Not all regional agreements selected as explanatory variables indicated significant effects on the trade patterns of the ASEAN and ANZCERTA countries during the period of study. The ANZCERTA variable did not affect significantly the trade patterns between Australia and New Zealand in agricultural products. The ASEAN variable had a significantly positive effect only on Indonesia and Singapore, and a significantly negative effect on Malaysia and Thailand. The variable of the AFTA and ANZCERTA relationship, which started in 1995, had no significant effects on the member countries of ASEAN and ANZCERTA.

The real exchange rate variable, which is defined in terms of foreign currency per unit of domestic currency, had a negative significant effect on Malaysia, Singapore, Thailand and Australia. The level of competitiveness, which is represented by the real exchange rate, was a contributing factor in respect of agricultural exports. Over the period 1965-1999, the only country that showed a significant time trend in respect of export flows was Singapore, which was negative.

The Asian financial crisis variable did not seem to have a significant effect on agricultural trade of most of the affected ASEAN countries or on those of Australia and New Zealand. However, the 1997 Asian financial crisis impacted significantly on

agricultural exports of Singapore which were considerably reduced according to the findings of the gravity model.

The Intra-industry Trade (IIT) Index of agricultural products of the five ASEAN countries is relatively low. The IIT of the countries (Indonesia, Malaysia, the Philippines and Thailand) in agricultural products could be classified as *strong inter - industry trade* not *intra - industry trade* patterns. As an exception, the IIT Index of Singapore with its trading partners (the world) was relatively higher than were of those other countries in ASEAN and even higher compared to those of Australia and New Zealand. In addition, the features of Australia and New Zealand's IIT with their trading partners were not different from those of the five ASEAN countries, where their IIT are classified as *strong inter-industry trade* as well. The only higher IIT Index of Australia was in its trade with New Zealand which is classified as *weak inter-industry trade*, as is New Zealand's IIT in agricultural trade with Australia.

6.2 Conclusion

This study has examined the empirical validity of the gravity model for the ASEAN and ANZCERTA countries. The results of the gravity models used in this study suggest that mostly the income and the population of importing countries determined agricultural exports among the ASEAN and ANZCERTA countries. The incomes of importing countries had a positive influence on agricultural trade showing a great ability to import. Meanwhile, the population of importing countries had a negative effect on such trade demonstrating an absorption effect and less need to trade (trade-inhibiting). The positive effect of importing countries' incomes was greater than the negative effect of their population. This is because the elasticity in respect of incomes of importing countries was always greater than that of population of importing countries.

Geographical distance, as one of the main variables in the gravity model, was found not to always be as an impediment to trade. Distance is an impediment to trade for all five ASEAN countries, but not an important factor for Australia and New Zealand. This may be because these two countries have better-developed agricultural sectors, compared to the ASEAN countries, that could produce and export more technology-

intensive and high-quality products, which can be priced to cover transport costs. These inherent characteristics in the agricultural sectors of Australia and New Zealand could be coming from their long heritage relationships with some European countries, which have already had well-developed agricultural sectors.

It is found that the Asian financial crisis did not have a negative influence on agricultural trade of most countries in the sample, except Singapore. This could be due to the agricultural production process that involves high local content. The high local content of agricultural products foster agricultural exports since the prices of the inputs are not influenced by the volatility of the exchange rates. These conditions are different from those of the manufactured products, which are likely to have high import-content.

The regional trading arrangements ANZCERTA and AFTA-ANZCERTA did not seem to promote agricultural trade among the member countries, while ASEAN had a significant effect only on some of its member countries. The lack of significance of those regional trading arrangement variables is probably due to the propensity for those trading agreements to have much greater potential for trade diversion than for trade creation as shown by the Intensity of Trade (IOT) Index.

From the Grubel-Lloyd (G-L) Index analysis, it is found that the agricultural trade among the sample countries can be classified as *inter-industry* not *intra-industry*. The trade patterns of the ASEAN and ANZCERTA countries with their trading partners, in either the regions of ASEAN and ANZCERTA or the rest of the world, increased gradually from 1965 to 1999 but were still in the lowest IIT classification as *strong inter-industry trade.*

6.3 Policy Implications for the ASEAN and ANZCERTA Countries

As the empirical results corroborate, size of economies and distance are the main determinants of agricultural trade. The higher ability of the ASEAN and ANZCERTA countries to import (because of positive significant effects of income of importing countries) should increase the level of their agricultural trade. The bilateral trade

agreements or multilateral agreements in agricultural sectors under the AFTA-ANZCERTA relationship must be the better way to realise intensive trade between the countries in the two regions, regarding particularly the efforts to reduce transaction costs between them.

In the process of the formation of regional trading arrangements, agricultural products have been mostly excluded. This also occurs in the ASEAN and ANZCERTA agreements. The lack of significance of ASEAN, ANZCERTA, and the relationship between AFTA and ANZCERTA could be due primarily to the exclusion of agricultural products from - and/or their incomplete inclusion in these two regional trading arrangements. Hence, a more comprehensive approach to the inclusion of agricultural products in these agreements could make them more effective in achieving their objectives.

There is a tendency of higher trade diversion within these two regions, which is shown partly by the trade-inhibiting characteristics of populations of importing countries (as presented in Table 6) and partly by the high IOT Index. Extensive trade in more differentiated products could resolve the presence of trade diversion so that the consumers in the two regions could meet their preference in specific products. Furthermore, trade in differentiated agricultural products will be increasing regardless of natural factors, such as climate and weather, which are commonly inherent in the supply and demand of agricultural products especially in the ASEAN countries.

6.4 Suggestions for Further Research

Most of the previous research using gravity models was conducted on exports and imports in aggregate products, particularly in manufactured products rather than in more specific products such as agricultural products. The present study focused only in agricultural trade between two neighbouring regional trading groups, ASEAN and ANZCERTA. There is still a lack of studies in agricultural products incorporating a larger number of regional trading arrangements, particularly larger regional trading arrangements such as the European Union (EU) and the North American Free Trade Area (NAFTA). It would be highly enlightening to perform studies in agricultural

trade encompassing countries in a larger number of regional trading arrangements. It should be noted that, as each country as a member of specific regional trading arrangement has its own characteristics in either economic or non-economic aspects, the gravity models are firmly applied to each single country with all its trading partners. This method would provide more empirical and specific results with respect to international trade patterns.

The present study investigated the effect of regional trading arrangements such as ASEAN, ANZCERTA and AFTA-ANZCERTA just as dummy variables without applying further the trade diversion and trade creation effects inclusively in the model. The inclusion of these two effects regarding the existence of regional trading arrangements will give further empirical and statistical explanations of how the regional trading arrangements create welfare effects for the member countries.

Studies on the IIT of agricultural products have been limited, as most studies have focused on manufactured products. This is due to industrial products, which are commonly easier to differentiate than agricultural products, being naturally more homogenous. There are an increasingly important intra-industry trade and specialisation patterns appearing in agricultural products. Thus, the policy and welfare implications of such trade should also be incorporated in the model of analysis. This is particularly important in respect of the effects of international competition, the effects of establishing regional trading blocs and the role of government intervention. More empirical work on the effects of determinants of intra-industry trade in agricultural products would also be of interest.

REFERENCES*

Aitken, N. D. (1973). The effect of the EEC and EFTA on European trade: A temporal cross-section analysis. *American Economic Review, 5*, pp. 881-892.

American Law Institute. (1990). *Restatement of the law: The foreign relations law of the United States*. St Paul, Minnesota: American Law Institute Publishers.

Anderson, J. E. (1979). A theoretical foundation for the gravity equation. *American Economic Review. Vol. 69*, pp. 106-116.

Anderson, K., and Norheim, H. (1993). Is world trade becoming more regionalised? *Review of International Economics*, 2, pp. 91-109.

Angkor Agenda. (2000). *Report of the high-level task force on the AFTA-CER free trade area*. Author.

Arcal, Y. F. L., and Maetz, M. (2000). Trends in world and agricultural trade. in *FAO Multilateral trade negotiations on Agriculture: A resource manual*. Rome: Author.

ASEAN Secretariat (2002a). *Bangkok Declaration*.

_____. (2002b). *Agreement on the Common Effective Preferential Tariff (CEPT) Scheme for the ASEAN Free Trade Area (AFTA).*

_____. (2002c). *Framework for the AFTA-CER closer economic partnership*.

_____. (2002d). *AFTA Tariff Database: Common Effective Preferential Tariff (CEPT) Reduction*.

* The form of the references is based on Emerson (ed.). (2000). *Writing guidelines for business students*. (2nd ed.). New Zealand: Massey University.

Asian Development Bank (ADB). (2002). *Asian development outlook 2002*. Author.

Balassa, B., and Bauwens, L. (1987). Intra-industry specialisation in a multi-country and multi-industry framework. *The Economic Journal, Vol. 97*, pp. 923-939.

Baldwin, R. E. (1997). The causes of regionalism. *The World Economy, No. 20*, p. 865-888.

Bayoumi, T., and Eichengreen, B. (1995). Is regionalism simply a diversion? Evidence from the evolution of the EC and EFTA. *NBER Working Paper No. 5283.*

Bergstend, C. F. (1997). Open regionalism. *Working Papers* 97-3, the Institute for International Economics (IIE).

Bergstrand, J. H. (1983). Measurement and determinants of intra-industry international trade. In Tharakan, P.K.M (ed.). *Intra-industry trade: Empirical and methodological aspects*. Amsterdam: North-Holland.

_____. (1985). The gravity model in international trade: Some microeconomic foundations and empirical evidence. *Review of Economics and Statistics, 67 (4),* pp. 549-556.

_____. (1989). The generalized gravity equation, monopolistic competition and the factor-proportions theory in international trade. *Review of Economics and Statistics, 71 (1)*, pp. 143-153.

Bhagwati, J. (1993). Regionalism and multilateralism: An overview. In De Mello, J., and Panagariya, A. (eds.). (1993). *New dimensions in regional integration.* Cambridge: Cambridge University Press.

Bhagwati, J. N., Panagariya, A., and Srinivasan, T.N. (1998). *Lectures on international trade.* (2nd ed.). Cambridge, Massachusetts, London: The MIT Press.

Bhalla, A. S., and Bhalla, P. (1997). *Regional blocs: Building blocks or stumbling blocks?* London: Macmillan Press Ltd.

Brada, J. C., and Mendez, J. A. (1983). Regional Economic integration and the volume of intra-regional trade: A comparison of developed and developing country experience. *KYKLOS, 36*, pp. 92-105.

Brocker, J., and Rohweder, H. C. (1990). Barriers to international trade: Methods of measurement and empirical evidence. *The Annals of Regional Science, Vol. 24*, pp. 289-305.

Brulhart, M. (1994). Marginal intra-industry trade: Measurement and relevance for the patterns of industrial adjustment. *Weltwirtschaftliches Archive. Vol. 130*, pp. 600-613.

Brulhart, M., and Elliot, R. J. R. (1998). Adjustment to the European single market: Inferences from intra-industry trade patterns. *Journal of Economic Studies. Vol. 25 No. 3*, pp. 225-247.

Burfisher, M. E. (2001). *Agricultural policy reform in the WTO: Challenges for analysts*. Seminar Paper presented at the 4th Annual Conference on Global Economic Analysis, Purdue University, June 27-26, 2001.

Centre for International Economics (CIE). (2000). *Economic benefits from an AFTA-CER free trade area: Year 2000 study*. Canberra and Sidney: Author.

Chacoliades, M. (1990). *International economics*. Singapore: McGraw-Hill Publishing Company.

Christodoulou, M. (1992). Intra-industry trade in agrofood sectors: The Case of the EEC meat market. *Applied Economics, Vol. 24*, pp. 875-884.

Clark, X., and Tavares, J. (2000). A quantitative approach using the gravity equation. *Development Discussion Papers*, Central American Project Series. Harvard Institute for International Development. Harvard University.

Copeland, L. S. (1995). *Exchange rates and international finance.* (2nd ed.). Great Britain: Addison-Wesley Publishing Co.

Cornett, A. P., and Iversen, S. P. (1998). The Baltic state in an European and Baltic perspective: Trade and transition in the Baltic rim. *Materials of the Conference "Global-Local Interplay in the Baltic sea region".* Estonia, 1998.

Dam, K. W. (1963). Regional economic arrangements and the GATT: The legacy of a misconception. *University of Chicago Law Review*, 30 (4), pp. 615-665.

Davis, D. R. (2000). Understanding international trade patterns: Advances of the 1990s. *Working Papers*. Department of Economics, Columbia University.

Deardorff, A V. (1998). Pattern of trade and growth across cones. *RSIE Discussion Paper No. 443*, University of Michigan.

Dell'Aquila, C., Sarker, R., and Meilke, K. D. (1999). Regionalism and trade in agrifood products. *Working Paper No. 99-5*. International Agricultural Trade and Consortium.

DeMelo, J., Panagariya, A., and Rodrik, D. (1993). In DeMello, J., and Panagariya, A. (eds.). (1993). *New dimensions in regional integration*. Cambridge: Cambridge University Press.

Department of Foreign Affairs and Trade (DFAT) Australia. (1997). *Closer economic relations: Background guide to the Australia New Zealand economic relationship*. Australia: Author.

_____. (2002). *AFTA – CER*. Australia: Author.

DeRosa, D. A. (1995). Regional trading arrangements among developing countries: The ASEAN example. *Research Report 103.* Washington, DC: International Food Policy Research Institute.

DeSimone, F. A. N. (1996). Regional integration arrangements: AFTA from a comparative perspective. In Ariff, M. et al. (1996). *AFTA in the changing international economy*. Singapore: Institute of South East Asian Studies.

Drysdale, P., and Garnaut, R. (1995). Trade intensities and the analysis of bilateral trade flows in a many-country world: A survey. In Garnaut, R., Drysdale, P., and Kunkel, J. (eds.). (1995). *Asia Pacific regionalism: Readings in international economic relations*. Sydney: HarperEducational Publisher.

Emerson, L. (ed.). (2000). *Writing guidelines for business students*. (2nd ed.). New Zealand: Massey University.

Evenett, S. J., and Keller, W. (2002). On the theories explaining the success of the gravity equation. *Journal of Political Economy, Vol. 110, No. 2*, pp. 281-316.

Feenstra, R. C., Markusen, J. A., and Rose, A. K. (2001). Using the gravity equation to differentiate among alternative theories of trade. *Canadian Journal of Economics, 34 (2)*. pp. 430 -- 447

Food and Agriculture Organisation (FAO). (2002). *FAO Statistical Database.*

Frankel, J. A. (1997). *Regional trading blocs: In the world economic system.* Washington, DC: Institute for International Economics.

Frankel, J. A., Stein, E., and Wei, S. (1993). Continental trading blocs: Are they nature or super-natural? *NBER Working Paper 4588*

Frankel, J. A., and Wei, S. J. (1998). Open regionalism in a world of continental trade blocs. *IMF Working Papers*. WP/98/10.

Gandolfo, G. (1998). *International trade theory and policy*. Germany: Springer-Heidelberg.

Garnaut, R. (1994). Open regionalism: Its analytic basic and relevance to the international system. *Journal of Asian Economics, Vol. 5 No. 2.*

Greenway, D., and Milner, C. (1986). *The economics of intra-industry trade*. Basil Blackwell.

_____. (1993). On the measurement of intra-industry trade. *The Economic Journal, 93*, pp. 900-908.

Griffiths, W., Hill, R. C., and Judge, G. G. (1993). *Learning and practicing econometrics*. Canada : John Wiley and Sons, Inc.

Grimwade, N. (1989). *International trade: New patterns of trade, production and investment*. London: Routledge.

Grubel, H. G., and Lloyd, P. J. (1975). *Intra-industry trade: The theory and measurement of international trade in differentiated products*. London: The Macmillan Press, Ltd.

Hamilton, C., and Kniest, P. (1991). Trade liberalisation, structural adjustment and intra-industry trade: A note. *Weltwirtschaftliches Archiv (Review of World Economics). Band 127*, pp. 356-367.

Hathaway, D. E. (1987). *Agriculture and the GATT: Rewriting the rules*. Washington, D.C.: Institute for International Economics.

Haveman, J., and Hummels, D. (2001). Alternative hypothesis and the volume of trade: The gravity equation and the extent of specialization. *Federal Trade Commission Papers*.

Haveman, J. (2002). *Jon Haveman's international trade data*. Retrieved January, 2002 from http://www.macalester.edu/research/economics/PAGE/HAVEMAN/Trade.Resources/TradeData.html

Helpman, E. (1987). Imperfect competition and international trade: Evidence from fourteen industrial countries. *Journal of Japanese and International Economics, 1*, pp. 62-81.

_____. (1998). The structure of foreign trade. *NBER Working Paper Series. No. 6752.*

Helpman, E., and Krugman, P. (1985). *Market structure and foreign trade: Increasing returns, imperfect competition, and the international economy.* Cambridge, MA, England: The MIT Press.

Hellvin, L. (1994). Intra-industry trade in Asia. *International Economic Journal. Vol. 8, Number 4.*

Hellvin, L., and Nilsson, L. (2000). *Trade flows between trading blocs: The case of the EU's trade with Asia and NAFTA*. Sweden: Ministry of Foreign Affairs.

Heston, A., Summers, R., and Aten, B. (2001). *Penn World Table (PWT) 6.0*. Centre for International Comparisons at the University of Pennsylvania (CICUP).

Hirschberg, J. G., Sheldon, I. M., and Dayton, J. R. (1994). An analysis of bilateral intra-industry trade in the food processing sector. *Journal of Applied Economics, Vo. 26*, pp. 159-167.

Jensen, P. E. (2000). Analysis of bilateral trade patterns with panel data. *Review of International Economics, Vol 8 (1)*, pp. 86-99.

Josling, T. (1993). Multilateralism: A constraint on unilateralism and regionalism in agricultural trade. *American Journal of Agricultural Economics*, *75*, p. 803-809.

Kalirajan, K. (1999). Stochastic varying coefficients gravity model: An application in trade analysis. *Journal of Applied Statistics, Vol. 26, No. 2*, pp. 185-193.

Kemp, M. C., and Wan, Jr. (1976). An elementary proposition concerning the formation of Customs Unions. *Journal of International Economics*, *6,* pp. 95-98.

Kim, K. S. (1994). Economic integration in the Asian Pacific: Issues and prospects. *Working Paper Series No. 210.* the Kellogg Institute for International Studies, University of Notre Dame.

Kmenta, J. (1986). *Elements of econometrics*. (2^{nd}). New York: Macmillan Publishing Company.

Krueger, A. O. (1999). Are preferential trading arrangements trade-liberalizing or protectionist? *The Journal of Economic Perspectives*, *Vol. 13, Number 4*, pp. 105-124.

Krugman, P. (1981). Intra-industry specialisation and the gains from trade. *Journal of Political Economy*, *Vol. 89*, pp. 959-973.

_____. (1992). Scale economies, product differentiation, and the patterns of trade. In Grossman, G.M. (ed.). (1992). *Imperfect competition and international trade.* Cambridge, MA, England: The MIT Press.

_____. (1993). *Regionalism versus multilateralism: Analytical notes.* In DeMello, J., and Panagariya, A. (eds.) (1993). *New dimensions in regional integration.* Cambridge: Cambridge University Press.

Lawrence, R. Z. (1996). Regionalism, multilateralism, and deeper integration. Washinton, DC: The Brookings Institution.

Linnemann, H. (1966). *An econometric study of international trade flows*. North Holland, Amsterdam.

Lloyd, P. J. (1996). Should AFTA and CER link? In Ariff, M. et al. (1996). *AFTA in the changing international economy*. Singapore: Institute of South East Asian Studies.

MacCharles, D.C. (1987). *Trade among multinationals: Intra-industry trade and national competitiveness*. New York: Croom Helm, Ltd.

MacLaren, D., and Josling, T. (1999). Competition policy and international agricultural trade. *Working Paper No. 99-7*, International Agricultural Trade Research Consortium.

Markusen, J. R. (1986). Explaining the volume of trade: An ecletic approach. *American Economic Review, Vol. 76 Issue 5*, pp. 1002.

Markusen, J. R., and Wigle, M. (1990). Explaining the volume of north-south trade. *The Economic Journal, Vol. 100*, pp. 1206-1215.

Markusen, J. R. et al. (1995). *International trade: Theory and evidence*. New York, USA: McGraw-Hill, Inc.

Martinez-Zarzoso, I., and Nowak-Lehman, F. (2001). Augmented gravity model: An empirical application to Mercosur-European Union trade flows. *Discussion Papers. DB Nr. 77*. Ibero-America Institute for Economic Research.

Matthews, K. (1998). Intra-industry trade: An Australian panel study. *Journal of Economic Studies, Vol. 25 (2)*, pp. 84-97

Matyas, L. (1997). Proper econometric specification of the gravity model. *World Economy, Vol. 20, Issue 3*, pp. 363-368.

Matyas, L., Konya, L., and Harris, M.N. (2000). Modelling export activity of eleven APEC countries. *Melbourne Institute Working Paper No. 5/00.* The University of Melbourne, Australia.

McCorriston, S., and Sheldon, I. M. (1991). Intra-industry trade and specialization in processed agricultural products: The case of the US and the EC. *Review of Agricultural Economics, Vol. 13, No. 2*, pp. 173 – 184

Mcmillan, J. (1993). Does regional integration foster open trade? Economic theory and GATT's article XXIV. In Anderson, K., and Blackhurst, R. (1993). *Regional integration and the world trading system.* London: Harvester Wheatsheaf.

Meilke, K. D., and Sarker, R. (1997). Four cases studies of agri-food CVDs and a proposal for reforming national administered protection agencies. *Agricultural Economics*, 17, pp. 147-164.

Murshed, S. M. (2001). Patterns of East Asian trade and intra-industry trade in manufactures. *Journal of the Asia Pacific Economy, 6 (1)*, pp. 99-123

NAPES. (2002). *NAPES Database.* ANU.

Oguledo, V. I., and Macphee, C. R. (1994). Gravity models: A reformulation and application to discriminatory trade arrangements. *Applied Economics, Vol. 26*, pp. 107-120.

Page, S. (2000). *Regionalism among developing countries.* London: Macmillan Press Ltd.

Plummer, M. G. (1996). The ASEAN Free Trade Area: Backwards or forwards. *CAS Discussion Paper No. 5*. Centre for Asian Studies.

Pomfret, R. (1993). *International trade: An introduction to theory and policy.* Cambridge, Massachusetts, USA: Blackwell Publishers.

Poon, J. P., and Pandit, K. (1996). Pacific trade and regionalization, 1965-1990. *The international Trade Journal, Vol. 10, No. 2*, pp. 199-221.

Porojan, A. (2000). Trade flows and spatial effects: The gravity model revisited. *Discussion Papers*. UK: University of Derby.

Qasmi, B. A., and Fausti, S. W. (2001). NAFTA intra-industry trade in agricultural food products. *Agribusiness, Vol. 17 (2)*, pp. 255-271.

Rae, A. N., Chatterjee, S., and Shakur, S. (2001).A bold millennium round: some signposts for trade and welfare gains from comprehensive multi-sector reforms. *Discussion Paper No. 01-03*. New Zealand: Dept. of Applied and International Economics, Massey University.

Rasksen, J. (1998). *African export: A gravity model approach*. Seminar of International Trade, Environment and Development.

Richardson, M. (1995). On the interpretation of the Kemp/Wan theorem. *Oxford Economic Papers*, 47, pp. 696-703.

Sager, M. A. (1997). Regional trade agreements: Their role and the economic impact on trade flows. *The World Economy, Vol. 20, Issue 2.*

Sanso, M., Cuairan, R., and Sanz, F. (1993). Bilateral Trade Flows, the Gravity Equation, and Functional Form. *The Review of Economics and Statisitics, 75 (2)*, pp. 266-275.

Sanz, F., and Gil, M. (2001). An assessment of the agricultural trade impact of Spain's integration into the EU. *Canadian Journal of Agricultural Economics, 49 (1)*, pp. 53-69.

Sattinger, M. (1978). Trade flows and differences between countries. *Atlantic Economic Journal, 6*, pp. 20-22.

Soloaga, I., and Winters, L. A. (2001). Regionalism in the nineties: What effect on trade. *North American Journal of Economics and Finance. Vol. 12, Issue 1.*

Stone, J. A., and Lee, H. (1995). Determinants of intra-industry trade: A longitudinal, cross-country analysis. *Weltwirtschaftliches Archiv (Review of World Economics), Band 131*, pp. 67-84.

Tharakan, P. K. M. (1985). Empirical analyses of the commodity composition of trade. In Greenway, D. (ed.). (1985). *Current issues in international trade: Theory and policy*. London: Macmillan.

Tharakan, P. K. M., and Kol, J. (1989). *Intra-industry trade: Theory, evidence and extensions*. London: The Macmillan Press, Ltd.

Tinbergen, J. (1962). *Shaping the world economy: Suggestion for an international economic policy*. New York: The Twentieth Century Fund.

Thursby, J. G., and Thursby, M. C. (1987). Bilateral trade flows, the linder hypothesis and exchange risk. *Review of Economics and Statistics*, Vol. 69, Issue 3, pp. 488-495.

Tichy, G. (1992). Theoretical and empirical considerations on the dimensions of an optimum integration area in Europe. *Aussenwirtschaft*, 47, pp. 107-137.

Townsend, B., and Ratnayake, R. (1997). The impact of closer economic relations on trade patterns: An application of the gravity model to New Zealand. *Working Paper Series*. Department of Economics, the University of Auckland.

Viner, J. (1950). *The customs union issue*. Carnegie Endowment for International Peace.

White, K. J. (1997). *Shazam, the econometrics computer program, version 8: User's reference manual*. New York: McGraw-Hill.

Wong, K. (1997). *International trade in goods and factor mobility*. (2nd.). Cambridge, MA, England: The MIT Press.

Appendix A: Common Effective Preferential Tariff (CEPT) Reduction of the Five ASEAN Countries in Some Agricultural Products

Table A.1 Common Effective Preferential Tariff Reduction for Live Animals (HS 1-5) in %

	1996	1997	1998	1999	2000	2001	2002	2003
Indonesia	14.55	14.48	11.91	10.87	8.53	7.92	6.35	4.44
Malaysia	3.17	2.93	2.71	2.40	2.04	1.74	1.38	1.04
The Philippines	12.18	11.69	7.79	7.05	6.77	5.53	5.36	3.81
Singapore	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Thailand	20.79	20.79	16.49	16.49	1.25	12.25	8.41	4.62
ASEAN	8.35	8.25	6.58	6.26	4.92	4.64	3.54	2.27

Source: AFTA Tariff Database, 2002d

Table A.2 Common Effective Preferential Tariff Reduction for Vegetable Products (HS 6-14) in %

	1996	1997	1998	1999	2000	2001	2002	2003
Indonesia	9.51	9.3.0	8.11	7.17	6.48	5.95	5.27	4.29
Malaysia	1.11	1.07	1.01	0.93	0.82	0.76	0.68	0.60
The Philippines	12.23	11.51	8.45	7.61	5.44	4.44	4.27	3.52
Singapore	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Thailand	19.08	19.08	14.89	14.86	11.21	10.94	7.69	4.50
ASEAN	6.46	6.35	5.12	4.83	3.87	3.61	2.87	2.10

Source: AFTA Tariff Database, 2002d

Table A.3 Common Effective Preferential Tariff Reduction for Fats and Oils (HS 15) in %

	1996	1997	1998	1999	2000	2001	2002	2003
Indonesia	7.93	6.62	5.43	5.20	4.74	4.74	4.63	4.63
Malaysia	1.50	1.49	1.47	1.44	1.38	1.38	1.38	1.38
The Philippines	13.00	12.06	6.22	5.44	3.88	3.88	3.66	3.19
Singapore	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Thailand	15.42	12.89	9.42	7.65	5.31	5.31	4.42	4.16
ASEAN	5.78	5.00	3.76	3.3	2.64	2.64	2.43	2.35

Source: AFTA Tariff Database, 2002d

Table A.4 Common Effective Preferential Tariff Reduction for Prepared Foodstuff (HS 16-24) in %

	1996	1997	1998	1999	2000	2001	2002	2003
Indonesia	19.24	18.12	15.3	13.98	11.2	10.38	7.93	4.89
Malaysia	5.09	4.50	3.90	3.25	2.60	2.55	2.49	2.27
The Philippines	15.39	13.98	12.05	9.27	8.42	6.92	5.50	4.03
Singapore	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Thailand	22.71	22.71	17.96	17.96	13.33	13.33	9.05	4.91
ASEAN	10.13	9.63	7.99	7.32	5.78	5.47	4.17	2.71

Source: AFTA Tariff Database, 2002d

Table A.5 Common Effective Preferential Tariff Reduction for Hides and Leathers (HS 41-43) in %

	1996	1997	1998	1999	2000	2001	2002	2003
Indonesia	9.15	7.61	6.06	4.68	3.03	0.03	2.93	2.82
Malaysia	4.94	4.24	2.78	2.55	2.31	2.31	2.31	2.31
The Philippines	15.40	12.60	10.71	9.24	6.33	5.05	5.05	3.59
Singapore	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Thailand	11.33	9.91	7.93	6.63	5.07	5.07	4.49	4.19
ASEAN	7.04	5.99	4.81	4.08	3.06	2.88	2.74	2.46

Source: AFTA Tariff Database, 2002d

Table A.6 Common Effective Preferential Tariff Reduction for Wood and Wood Articles (HS 44-46) in %

	1996	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
Indonesia	13.02	13.02	11.10	9.30	7.54	6.46	5.38	4.30
Malaysia	13.72	12.36	11.25	9.10	6.98	6.13	5.12	4.94
The Philippines	12.99	12.27	9.70	8.14	6.35	5.44	4.73	3.88
Singapore	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Thailand	13.41	13.41	11.6	11.6	8.48	8.48	6.33	4.18
ASEAN	12.93	11.83	10.6	8.75	6.67	5.92	4.92	4.58

Source: AFTA Tariff Database, 2002d

Appendix B: The Major Export Destinations of the Five ASEAN Countries and ANZCERTA Countries in Agricultural Products 1965-1999

Table B.1 Indonesia's Agricultural Exports to The Major Destinations in 1965-1999 (in %)

Rank	Destination	1965-1999	Destination	1965-1980	Destination	1981-1990	Destination	1991-1999
1	Japan	19.876	Japan	26.035	Japan	19.600	Japan	17.510
2	USA	17.584	Singapore	16.183	USA	19.567	USA	17.479
3	Singapore	11.156	USA	15.207	Singapore	12.474	Netherlands	8.742
4	Netherlands	8.140	Germany	7.236	Netherlands	8.302	Singapore	8.388
5	Germany	5.612	Netherlands	6.450	Germany	6.991	China	4.569
6	Korea	3.699	Korea	6.254	Taiwan	2.952	Germany	4.201
7	Taiwan	2.917	Taiwan	4.418	Italy	2.806	Malaysia	3.719
8	China	2.628	Italy	3.051	Hong Kong	0.568	Korea	3.599
9	Italy	2.514	UK	1.480	UK	2.087	India	2.999
10	Malaysia	2.368	Hong Kong	1.344	Korea	1.962	Taiwan	2.286
	Top 10	76.494		87.658		77.309		73.492
11	Hong Kong	0.084	France	1.097	France	1.465	Italy	2.135
12	UK	1.835	Australia	0.971	Spain	1.168	Hong Kong	2.123
13	India	1.774	Denmark	0.920	Australia	1.028	Thailand	1.962
14	Thailand	1.331	Pakistan	0.880	Belgium-L	1.028	UK	1.843
15	Spain	1.258	Malaysia	0.852	Malaysia	1.021	Spain	1.587
16	France	1.153	Belgium-L	0.843	Thailand	1.002	Belgium-L	1.234
17	Belgium-L	1.095	Spain	0.574	China	0.897	Canada	1.140
18	Australia	1.008	Canada	0.496	Canada	0.830	Pakistan	1.128
19	Pakistan	0.979	India	0.360	Pakistan	0.779	Australia	1.013
20	Canada	0.919	Thailand	0.222	India	0.582	France	1.007
	Top 20	87.930		94.873		87.109		88.664
21	Poland	0.511	China	0.178	Poland	0.437	Poland	0.693
22	Mexico	0.462	Poland	0.163	Mexico	0.391	Mexico	0.633
23	Philippines	0.382	Mexico	0.138	Philippines	0.234	Philippines	0.604
24	Denmark	0.323	New Zealand	0.093	New Zealand	0.161	Denmark	0.169
25	New Zealand	0.113	Sweden	0.086	Denmark	0.158	Sweden	0.111
	Top 25	89.721		95.531		88.490		90.874

Source: Calculated from NAPES Database, 2002
The calculation is conducted by calculating annually (on average) the share of Indonesian export to a given country divided by total Indonesian export.
Belgium-L, the UK and the USA stand for Belgium-Luxemburg, the United Kingdom and the United States of America, respectively.

Table B.2 Malayisa's Agricultural Exports to The Major Destinations in 1965-1999 (in %)

Rank	Destination	1965-1999	Destination	1965-1980	Destination	1981-1990	Destination	1991-1999
1	Japan	16.120	Singapore	21.355	Japan	19.022	Japan	13.278
2	Singapore	14.651	Japan	17.792	Singapore	15.138	Singapore	11.440
3	Netherlands	6.267	USA	7.860	Netherlands	6.960	China	7.407
4	USA	5.433	UK	6.466	Korea	6.452	Netherlands	6.113
5	China	5.145	Netherlands	5.433	USA	5.377	Pakistan	5.387
6	Korea	5.109	Germany	4.293	India	5.151	India	5.176
7	India	4.595	Korea	3.016	Taiwan	4.195	Korea	5.014
8	Taiwan	3.665	China	2.814	China	3.414	USA	4.441
9	Pakistan	3.580	Italy	2.587	Germany	3.029	Taiwan	3.912
10	UK	3.251	France	2.373	UK	2.840	Thailand	3.420
	Top 10	67.816		73.989		71.578		65.588
11	Germany	2.818	India	2.271	Pakistan	2.694	Hong Kong	3.389
12	Thailand	2.184	Taiwan	2.170	Australia	2.220	UK	2.183
13	Hong Kong	2.157	Australia	1.938	Italy	1.748	Germany	2.035
14	Australia	2.053	Spain	1.443	Thailand	1.497	Australia	1.978
15	Italy	1.793	Canada	1.155	France	1.318	Turkey	1.510
16	France	1.254	Hong Kong	1.000	Belgium-L	1.226	Italy	1.488
17	Belgium-L	1.163	Belgium-L	0.866	Hong Kong	1.150	Indonesia	1.329
18	Turkey	1.055	Pakistan	0.861	Spain	0.883	Belgium-L	1.244
19	Indonesia	0.927	Thailand	0.464	Indonesia	0.871	Philippines	1.194
20	Spain	0.899	Turkey	0.335	Turkey	0.852	France	0.730
	Top 20	84.119		86.492		86.037		82.668
21	Philippines	0.702	New Zealand	0.280	Canada	0.835	Spain	0.679
22	Canada	0.678	Philippines	0.278	Philippines	0.276	Brunei	0.533
23	Brunei	0.371	Brunei	0.190	Brunei	0.256	Canada	0.361
24	New Zealand	0.247	Indonesia	0.080	New Zealand	0.222	New Zealand	0.250
25	Ireland	0.049	Ireland	0.065	Ireland	0.043	Ireland	0.046
	Top 25	86.166		87.385		87.669		84.537

Source: Calculated from NAPES Database, 2002

The calculation is conducted by calculating annually (on average) the share of Malaysia' export to a given country divided by total Malaysia's export.

Belgium-L, the UK and the USA stand for Belgium-Luxemburg, the United Kingdom and the United States of America, respectively.

Table B.3 The Philippines' Agricultural Exports to The Major Destinations in 1965-1999 (in %)

Rank	Destination	1965-1999	Destination	1965-1980	Destination	1981-1990	Destination	1991-1999
1	USA	32.039	USA	38.073	USA	29.689	USA	28.266
2	Japan	24.906	Japan	25.056	Japan	23.489	Japan	26.011
3	Netherlands	9.889	Netherlands	10.649	Netherlands	9.542	Netherlands	9.459
4	Germany	4.645	Germany	4.108	Germany	5.883	Hong Kong	4.141
5	Korea	2.866	Korea	1.999	UK	4.093	Germany	4.071
6	UK	2.830	UK	1.766	Korea	2.620	Korea	3.924
7	Hong Kong	2.269	France	1.738	France	1.988	UK	2.745
8	Taiwan	1.799	Taiwan	1.625	Hong Kong	1.944	Taiwan	1.884
9	France	1.620	Indonesia	0.171	Taiwan	1.895	Canada	1.711
10	Canada	1.324	Italy	0.901	Singapore	1.575	Singapore	1.629
	Top 10	84.187		86.086		82.718		83.841
11	Singapore	1.316	Australia	0.900	Canada	1.558	Indonesia	1.252
12	Indonesia	1.223	Singapore	0.757	Indonesia	1.247	France	1.180
13	Australia	0.971	Canada	0.711	Australia	1.160	Malaysia	1.055
14	Spain	0.839	Spain	0.681	Spain	1.091	Australia	0.872
15	Italy	0.827	Hong Kong	0.633	Italy	0.874	Belgium-L	0.790
16	Malaysia	0.621	Sweden	0.532	Denmark	0.403	Spain	0.77
17	Belgium-L	0.457	Denmark	0.500	Malaysia	0.362	Italy	0.712
18	Denmark	0.413	Malaysia	0.410	Belgium-L	0.347	Thailand	0.700
19	Sweden	0.325	Belgium-L	0.215	New Zealand	0.277	Mexico	0.353
20	Thailand	0.310	Thailand	0.115	Mexico	0.266	Denmark	0.337
	Top 20	91.489		91.540		90.303		91.862
21	New Zealand	0.236	New Zealand	0.107	Sweden	0.255	New Zealand	0.324
22	Mexico	0.218	Switzerland	0.088	India	0.217	Switzerland	0.250
23	Switzerland	0.143	India	0.040	Thailand	0.084	Sweden	0.185
24	India	0.119	Mexico	0.034	Switzerland	0.082	Ireland	0.128
25	Ireland	0.065	Ireland	0.014	Ireland	0.049	India	0.110
	Top 25	92.270		91.823		90.990		92.859

Source: Calculated from NAPES Database, 2002

The calculation is conducted by calculating annually (on average) the share of the Philippines' export to a given country divided by total Philippines' export.

Belgium-L, the UK and the USA stand for Belgium-Luxemburg, the United Kingdom and the United States of America, respectively.

Table B.4 Singapore's Agricultural Exports to The Major Destinations in 1965-1999 (in %)

Rank	Destination	1965-1999	Destination	1965-1980	Destination	1981-1990	Destination	1991-1999
1	Japan	11.097	USA	12.318	USA	9.044	Japan	16.00
2	USA	7.914	UK	5.111	Japan	8.638	Hong Kong	7.223
3	Hong Kong	5.161	Malaysia	4.719	Hong Kong	4.603	China	5.261
4	China	4.419	Japan	4.656	China	4.216	USA	4.975
5	Korea	3.508	France	4.137	Taiwan	3.858	Korea	4.881
6	Malaysia	3.410	Germany	3.588	Malaysia	3.279	Taiwan	3.417
7	Taiwan	3.254	Korea	3.049	Germany	3.200	Malaysia	2.887
8	Germany	2.611	Netherlands	3.032	ndia	2.956	Australia	2.451
9	Netherlands	2.525	China	2.964	Netherlands	2.741	Philippines	2.404
10	Australia	2.457	Italy	2.767	Australia	2.562	Thailand	2.283
	Top 10	46.356		46.341		45.097		51.782
11	UK	2.197	Australia	2.305	Brunei	2.559	Netherlands	2.121
12	India	2.169	Canada	2.063	Korea	1.969	Brunei	2.089
13	Brunei	2.060	Taiwan	1.955	France	1.809	India	1.747
14	France	1.868	India	1.814	UK	1.751	Germany	1.705
15	Thailand	1.653	Spain	1.705	Italy	1.385	Indonesia	1.683
16	Italy	1.536	Hong Kong	1.697	Thailand	1.230	UK	1.150
17	Philippines	1.426	Brunei	1.211	Canada	1.157	Italy	1.067
18	Indonesia	1.197	Belgium-L	1.048	Belgium-L	0.995	France	0.836
19	Canada	1.125	Thailand	0.995	Spain	0.971	Sri Lanka	0.678
20	Spain	0.988	Mexico	0.778	Indonesia	0.950	Spain	0.661
	Top 20	62.575		61.912		59.873		65.519
21	Belgium-L	0.816	Sri Lanka	0.620	Philippines	0.909	Canada	0.656
22	Sri Lanka	0.666	Indonesia	0.564	Sri Lanka	0.679	Belgium-L	0.570
23	New Zealand	0.543	New Zealand	0.507	New Zealand	0.608	New Zealand	0.512
24	Mexico	0.280	Philippines	0.185	Mexico	0.245	Mexico	0.070
25	Ireland	0.030	Ireland	0.030	Ireland	0.016	Ireland	0.040
	Top 25	64.910		63.818		62.330		67.367

Source: Calculated from NAPES Database, 2002

The calculation is conducted by calculating annually (on average) the share of Singapore's export to a given country divided by Singapore's total export. Belgium-L, the UK and the USA stand for Belgium-Luxemburg, the United Kingdom and the United States of America, respectively.

Table B.5 Thai Agricultural Exports to The Major Destinations in 1965-1999 (in %)

Rank	Destination	1965-1999	Destination	1965-1980	Destination	1981-1990	Destination	1991-1999
1	Japan	23.605	Japan	24.937	Japan	20.548	Japan	24.892
2	USA	13.032	Netherlands	10.941	Netherlands	11.036	USA	16.041
3	Netherlands	7.611	Singapore	7.792	USA	10.580	China	5.568
4	China	4.856	Malaysia	6.955	Malaysia	5.33	Netherlands	5.086
5	Malaysia	4.770	Hong Kong	5.649	Singapore	5.047	Hong Kong	4.237
6	Singapore	4.582	USA	5.295	China	4.843	Malaysia	3.990
7	Hong Kong	4.140	Indonesia	4.269	Hong Kong	3.299	Singapore	3.620
8	Indonesia	2.838	Taiwan	3.719	Germany	2.776	Indonesia	3.299
9	Korea	2.562	Germany	2.641	Korea	2.688	Korea	2.865
10	Germany	2.523	China	1.718	UK	1.913	Germany	2.365
	Top 10	70.519		73.916		68.060		71.963
11	Taiwan	2.219	Belgium-L	1.543	Taiwan	1.651	Taiwan	2.178
12	UK	1.940	France	1.429	France	1.591	UK	2.103
13	France	1.749	India	1.313	Italy	1.398	Canada	1.998
14	Australia	1.562	UK	1.277	Indonesia	1.329	Australia	1.947
15	Canada	1.493	Italy	1.231	Australia	1.312	France	1.904
16	Italy	1.263	Philippines	0.931	India	1.139	Spain	1.385
17	Spain	1.059	Korea	0.920	Canada	1.074	Italy	1.200
18	India	0.842	Sri Lanka	0.872	Spain	0.748	Philippines	0.712
19	Belgium-L	0.730	Laos	0.420	Belgium-L	0.698	India	0.582
20	Philippines	0.692	Australia	0.420	Philippines	0.549	Belgium-L	0.563
	Top 20	84.068		84.272		79.549		86.535
21	Sri Lanka	0.426	Spain	0.325	Sri Lanka	0.425	Switzerland	0.527
22	Switzerland	0.406	Canada	0.210	Switzerland	0.304	Laos	0.344
23	Laos	0.307	Poland	0.126	Laos	0.185	Sri Lanka	0.326
24	New Zealand	0.198	Switzerland	0.104	New Zealand	0.168	New Zealand	0.243
25	Poland	0.156	New Zealand	0.066	Poland	0.152	Poland	0.164
	Top 25	85.561		85.103		80.783		88.139

Source: Calculated from NAPES Database, 2002

The calculation is conducted by calculating annually (on average) the share of Thai export to a given country divided by total Thai export.

Belgium-L, the UK and the USA stand for Belgium-Luxemburg, the United Kingdom and the United States of America, respectively.

Table B.6 Australia's Agricultural Exports to The Major Destinations in 1965-1999 (in %)

Rank	Destination	1965-1999	Destination	1965-1980	Destination	1981-1990	Destination	1991-1999
1	Japan	22.618	Japan	23.432	Japan	20.856	Japan	23.561
2	USA	10.041	USA	12.196	USA	10.828	USA	8.130
3	China	5.543	UK	6.950	China	5.450	China	6.461
4	Korea	4.390	France	4.140	Korea	4.400	Korea	5.769
5	UK	3.578	China	4.119	Italy	3.859	Indonesia	4.839
6	Italy	3.488	Italy	3.236	Taiwan	3.226	Malysia	4.155
7	Malysia	3.391	Canada	2.928	Malysia	3.117	Taiwan	4.063
8	Taiwan	3.196	Germany	2.927	France	3.062	Hong Kong	3.499
9	France	2.813	Malysia	2.474	Germany	2.470	Italy	3.338
10	Indonesia	2.725	Korea	2.047	Singapore	2.167	New Zealand	2.964
	Top 10	61.783		64.449		59.435		66.779
11	Germany	2.531	Singapore	1.774	UK	1.970	UK	2.882
12	Hong Kong	2.385	Taiwan	1.688	Canada	1.913	Singapore	2.357
13	Canada	2.227	Hong Kong	1.321	Hong Kong	1.784	Germany	2.346
14	Singapore	2.149	PNG	1.254	New Zealand	1.580	Philippines	2.110
15	New Zealand	2.019	India	1.166	Indonesia	1.537	Canada	2.065
16	Philippines	1.321	Belgium-L	1.142	PNG	0.129	Thailand	1.920
17	India	1.207	New Zealand	1.021	India	1.033	France	1.827
18	Thailand	1.068	Indonesia	0.777	Philippines	0.759	India	1.373
19	PNG	1.063	Philippines	0.705	Belgium-L	0.749	Turkey	0.788
20	Belgium-L	0.693	Pakistan	0.494	Spain	0.721	PNG	0.766
	Top 20	78.446		75.791		71.610		85.213
21	Spain	0.635	Sweden	0.481	Thailand	0.561	Spain	0.709
22	Turkey	0.517	Spain	0.393	Pakistan	0.477	Netherlands	0.498
23	Pakistan	0.465	Netherlands	0.366	Turkey	0.407	Pakistan	0.439
24	Netherlands	0.432	Thailand	0.320	Netherlands	0.398	Belgium-L	0.382
25	Sweden	0.295	Turkey	0.208	Sweden	0.231	Switzerland	0.270
	Top 25	80.79		77.559		73.684		87.511

Source: Calculated from NAPES Database, 2002

The calculation is conducted by calculating annually (on average) the share of Australia's export to a given country divided by total Australian export.

Belgium-L, PNG, the UK and the USA stand for Belgium-Luxemburg, Papua New Guniea, the United Kingdom and the United States of America, respectively.

Table B.7 New Zealand's Agricultural Exports to The Major Destinations in 1965-1999 (in %)

Rank	Destination	1965-1999	Destination	1965-1980	Destination	1981-1990	Destination	1991-1999
1	UK	13.999	UK	28.315	USA	14.602	USA	12.170
2	Japan	13.630	USA	15.01	Japan	14.102	Japan	14.510
3	USA	13.543	Japan	10.883	UK	12.514	UK	8.738
4	Australia	7.066	Australia	4.256	Australia	7.205	Australia	8.204
5	Korea	3.477	France	3.158	China	3.250	Korea	5.157
6	Germany	2.937	Germany	3.024	Germany	2.773	China	3.446
7	China	2.929	Canada	2.754	Korea	2.666	Taiwan	3.340
8	Taiwan	2.298	Netherlands	0.267	France	2.123	Germany	3.013
9	Belgium-L	2.104	Italy	2.124	Italy	2.112	Hong Kong	2.680
10	France	2.066	Belgium-L	1.798	Canada	2.061	Malaysia	2.532
	Top 10	64.049		71.589		63.408		63.79
11	Canada	0.038	Greece	1.525	Belgium-L	1.884	Belgium-L	2.390
12	Malaysia	1.938	Philippines	1.334	Taiwan	1.773	Canada	1.708
13	Hong Kong	1.810	China	1.249	Malaysia	1.647	France	1.548
14	Italy	1.793	Malaysia	1.039	Netherlands	1.489	Indonesia	1.544
15	Philippines	1.362	Korea	0.919	Hong Kong	1.232	Philippines	1.515
16	Netherlands	1.313	Singapore	0.887	Indonesia	1.232	Italy	1.427
17	Indonesia	1.240	Taiwan	0.748	Philippines	1.160	Singapore	1.384
18	Singapore	1.197	Hong Kong	0.735	Singapore	1.123	Mexico	1.369
19	Mexico	1.020	Indonesia	0.560	Mexico	0.992	Thailand	0.339
20	Thailand	0.921	Spain	0.467	Spain	0.856	Netherlands	0.774
	Top 20	76.681		81.052		76.796		77.788
21	Greece	0.794	Thailand	0.390	Greece	0.832	India	0.703
22	Spain	0.677	Mexico	0.269	Thailand	0.654	Spain	0.647
23	India	0.567	Sweden	0.207	India	0.614	Greece	0.448
24	PNG	0.308	India	0.186	PNG	0.373	PNG	0.334
25	Sweden	0.224	PNG	0.147	Sweden	0.160	Sweden	0.277
	Top 25	79.251		82.251		79.429		80.197

Source: Calculated from NAPES Database, 2002

The calculation is conducted by calculating annually (on average) the share of New Zealand's export to a given country divided by New Zealand's total export.

Belgium-L, PNG, the UK and the USA stand for Belgium-Luxemburg, Papua New Guniea, the United Kingdom and the United States of America, respectively.

Appendix C: The Top Ten ASEAN and ANZCERTA Countries' Exports and Imports in 3-Digit SITC Agricultural Products

Table C.1 The Top Ten ASEAN and ANZCERTA Exports and Imports on 3-Digit SITC in Agricultural Products (1990-1999)

Exports ASEAN to ANZCERTA		Exports ANZCERTA to ASEAN	
SITC	Share %)	SITC	Share (%)
031 FISH FRESH SIMPLY PRESVD	12.63	022 MILK CREAM	21.31
032 FISH ETC TINNED PREPARED	11.90	041 WHEAT ETC. UNMILL	15.66
243 WOOD SHAPED	11.45	263 COTTON	9.91
072 COCOA	10.53	061 SUGAR HONEY	7.77
231 RUBBER CRUDE SYNTH	7.60	001 LIVE ANIMALS	5.46
422 FIXED VEG OIL NONSOFT	7.25	011 MEAT FRSH CHILLD FROZN	5.17
099 FOOD PREPS NES	4.05	051 FRUIT FRSH NUTS FRSH DRY	4.08
081 ANIMAL FEED STUFF	4.01	048 CEREAL ETC. PREPS	3.66
053 FRUIT PRSRVD PREPD	3.56	054 VEG ETC FRSH SMPLY PRSVD	3.50
071 COFFEE	3.30	262 WOOL ANIMAL HAIR	3.44

Source: Calculated from NAPES Database, 2002

Table C.2 The Top Ten Indonesian Exports to and Imports from the World in 3-Digit SITC in Agricultural Products (1990-1999)

Exports		Imports	
3 Digit Products	Share (%)	3 Digit Products	Share (%)
031 FISH FRESH	20.30	263 COTTON	16.17
231 RUBBER	18.67	041 WHEAT ETC	12.89
422 FIXED VEG	15.89	251 PULP WASTE	12.48
071 COFFEE	7.41	042 RICE	8.95
251 PULP WASTE	4.46	081 ANIMAL FEED	8.11
243 WOOD SHAPED	4.30	221 OIL SEEDS	6.06
072 COCOA	4.25	061 SUGAR HONEY	5.99
075 SPICES	2.98	266 SYNTH REGEN	4.47
431 PROCESD	2.67	231 RUBBER	2.92
081 ANIMAL FEED	1.93	022 MILK CREAM	2.40

Source: Calculated from NAPES Database, 2002

Table C.3 The Top Ten Malaysian Exports to and Imports from the World in 3-Digit SITC in Agricultural Products (1990-1999)

Exports		Imports	
3 Digit Products	**Share (%)**	**3 Digit Products**	**Share (%)**
422 FIXED VEG	32.37	061 SUGAR HONEY	7.00
243 WOOD SHAPED	15.70	231 RUBBER	6.69
242 WOOD ROUGH	11.24	044 MAIZE	6.61
231 RUBBER	11.19	022 MILK CREAM	6.50
431 PROCESD	7.96	031 FISH FRESH	5.82
072 COCOA	2.42	081 ANIMAL FEED	5.67
031 FISH FRESH	2.15	041 WHEAT ETC.	5.21
001 LIVE ANIMAL	1.98	054 VEG. ETC.	5.17
048 CEREAL ETC.	1.50	048 CEREAL ETC.	4.42
081 ANIMAL FEED	1.25	221 OIL SEEDS	4.40

Source: Calculated from NAPES Database, 2002

Table C.4 The Top Ten The Philippines Exports to and Imports from the World in 3-Digit SITC in Agricultural Products (1990-1999)

Exports		Imports	
3 Digit Products	**Share (%)**	**3 Digit Products**	**Share (%)**
422 FIXED VEG.	23.56	041 WHEAT ETC.	12.59
051 FRUIT FRSH	18.82	022 MILK CREAM	10.62
031 FISH FRESH	15.21	081 ANIMAL FEED	9.86
053 FRUIT	9.49	042 RICE	5.70
032 FISH ETC.	6.65	122 TOBACCO	5.26
061 SUGAR HONEY	5.01	048 CEREAL ETC.	4.54
292 CRUDE VEG.	3.43	266 SYNTH REGEN	3.98
081 ANIMAL FEED	2.75	263 COTTON	3.53
251 PULP WASTE	1.50	251 PULP WASTE	3.28
121 TOBACCO	1.43	121 TOBACCO	3.16

Source: Calculated from NAPES Database, 2002

Table C.5 The Top Ten Singaporean Exports to and Imports from the World in 3-Digit SITC in Agricultural Products (1990-1999)

Exports		Imports	
3 Digit Products	**Share (%)**	**3 Digit Products**	**Share (%)**
122 TOBACCO	19.00	122 TOBACCO	12.88
231 RUBBER	10.79	031 FISH FRESH	7.87
031 FISH FRESH	9.33	112 ALC. BEVERAGES	7.58
112 ALC BEVRGS	8.55	231 RUBBER	6.33
075 SPICES	4.13	051 FRUIT FRSH	5.50
431 PROCESD	3.86	001 LIVE ANIMALS	3.81
243 WOOD SHAPED	3.61	054 VEG ETC.	3.50
072 COCOA	3.43	011 MEAT FRSH	3.31
292 CRUDE VEG.	3.27	422 FIXED VEG.	3.20
048 CEREAL ETC.	3.10	431 PROCESD	3.04

Source: Calculated from NAPES Database, 2002

Table C.6 The Top Ten Thai Exports to and Imports from the World in 3-Digit SITC in Agricultural Products (1990-1999)

Exports		Imports	
3 Digit Products	**Share (%)**	**3 Digit Products**	**Share (%)**
031 FISH FRESH	19.43	031 FISH FRESH	17.84
042 RICE	14.65	263 COTTON	11.87
231 RUBBER	13.65	243 WOOD SHAPED	9.92
032 FISH ETC.	13.39	081 ANIMAL FEED	9.46
061 SUGAR HONEY	7.37	251 PULP WASTE	6.41
054 VEG ETC.	6.16	022 MILK CREAM	5.24
053 FRUIT	4.92	242 WOOD ROUGH	5.00
011 MEAT FRSH	3.54	211 HIDES SKINS	3.52
081 ANIMAL FEED	2.03	112 ALC BEVRGS	3.27
055 VEG. ETC.	1.82	048 CEREAL ETC.	2.84

Source: Calculated from NAPES Database, 2002

Table C.7 The Top Ten Australian Exports to and Imports from the World in 3-Digit SITC in Agricultural Products (1990-1999)

Exports		Imports	
3 Digit Products	**Share (%)**	**3 Digit Products**	**Share (%)**
011 MEAT FRSH	18.45	243 WOOD SHAPED	10.83
262 WOOL ANIMAL	17.53	099 FOOD PREPS.	9.83
041 WHEAT ETC.	10.41	031 FISH FRESH	7.70
061 SUGAR HONEY	6.77	112 ALC. BEVRGS.	7.30
263 COTTON	5.03	032 FISH ETC.	4.83
031 FISH FRESH	4.30	071 COFFEE	4.07
022 MILK CREAM	3.78	048 CEREAL ETC.	3.53
112 ALC. BEVRGS.	3.10	251 PULP WASTE	3.49
001 LIVE ANIMALS	2.63	053 FRUIT	3.20
043 BARLEY	2.60	051 FRUIT FRSH	2.91

Source: Calculated from NAPES Database, 2002

Table C.8 The Top Ten New Zealand's Exports to and Imports from the World in 3-Digit SITC in Agricultural Products (1990-1999)

Exports		Imports	
3 Digit Products	**Share (%)**	**3 Digit Products**	**Share (%)**
012 MEAT DRIED	22.92	112 ALC. BEVRGS.	9.61
023 BUTTER	12.44	099 FOOD PREPS	9.32
032 FISH ETC.	8.61	051 FRUIT FRSH	6.97
263 COTTON	8.38	048 CEREAL ETC.	6.27
052 DRIED FRUIT	6.94	061 SUGAR HONEY	6.13
024 CHEESE CURD	6.89	053 FRUIT	4.17
025 EGGS	5.29	081 ANIMAL FEED	4.08
243 WOOD SHAPED	4.62	041 WHEAT ETC.	3.67
244 CORK RAW	3.77	054 VEG ETC.	2.84
261 SILK	3.29	073 CHOC.	2.66

Source: Calculated from NAPES Database, 2002

Appendix D: The Top Ten ASEAN and ANZCERTA Countries' Intra-Industry Trade (IIT) With Their Trading Partners in 3-Digit SITC Agricultural Products

Table D.1 Top Ten Indonesian IIT with Its Trading Partners in 3-Digit SITC Agricultural Products (1990-1999)

Malaysia		Philippines		Singapore		Thailand		Australia		New Zealand	
SITC	IIT	SITC	IIT	SITC	IIT	SITC	IIT	SITC	IIT	SITC	IIT
099	73.03	292	60.08	048	80.55	251	50.17	292	71.56	292	52.49
231	63.72	048	51.50	099	69.14	292	43.77	062	58.66	048	33.59
048	61.01	062	48.65	276	66.31	001	41.41	431	54.43	055	30.43
081	59.28	081	41.72	266	63.44	081	37.23	053	51.62	053	28.79
073	55.55	099	32.63	221	52.99	431	35.95	221	50.78	031	24.24
053	53.50	044	26.56	422	52.19	062	32.72	075	47.62	243	21.57
422	46.28	055	25.07	032	51.65	099	30.19	111	46.06	091	21.13
032	45.82	061	22.28	022	49.83	048	27.77	048	45.55	051	16.30
055	45.70	054	20.65	024	39.47	075	27.60	055	43.43	075	15.71
263	42.47	121	18.94	112	39.40	266	26.19	241	37.08	431	15.62

Source: Calculated from NAPES Database, 2002

Table D.2 Top Ten Malaysian IIT with Its Trading Partners in 3-Digit SITC Agricultural Products (1990-1999)

Indonesia		Philippines		Singapore		Thailand		Australia		New Zealand	
SITC	IIT	SITC	IIT	SITC	IIT	SITC	IIT	SITC	IIT	SITC	IIT
053	73.34	048	65.12	267	68.44	075	59.74	099	78.59	032	41.21
073	71.55	054	60.26	081	65.56	055	57.65	055	76.89	062	38.29
221	71.34	081	56.02	251	61.23	267	50.61	091	64.31	243	38.01
099	68.01	099	52.42	266	54.67	001	50.16	111	63.47	055	34.20
048	65.94	112	50.72	023	53.89	266	49.64	075	58.83	052	32.21
055	64.43	053	44.55	052	53.80	071	48.51	062	55.37	061	31.26
081	61.79	055	42.07	048	52.24	291	45.99	031	51.32	091	30.41
032	55.96	122	41.53	263	47.23	211	45.68	048	44.74	112	27.94
054	54.80	292	38.50	112	47.00	111	44.46	241	42.82	099	23.59
051	53.64	422	37.39	291	46.67	099	43.91	292	40.43	073	23.27

Source: Calculated from NAPES Database, 2002

Table D.3 Top Ten The Philippines' IIT with Its Trading Partners in 3-Digit SITC Agricultural Products (1990-1999)

Indonesia		Malaysia		Singapore		Thailand		Australia		New Zealand	
SITC	IIT	SITC	IIT	SITC	IIT	SITC	IIT	SITC	IIT	SITC	IIT
292	70.19	048	62.82	031	74.71	431	56.42	053	74.19	051	54.85
062	56.38	099	56.26	231	70.11	292	52.68	099	72.40	062	36.59
099	45.17	292	53.02	054	63.73	153	42.93	051	48.92	291	33.29
053	34.58	081	48.20	099	60.96	062	31.00	055	47.20	053	24.84
054	31.88	422	45.54	053	55.89	081	29.44	112	45.43	032	23.36
048	31.73	054	29.79	292	52.27	048	24.71	031	41.95	112	21.50
081	26.81	055	26.03	072	51.04	291	24.23	291	38.31	055	20.62
431	23.95	431	24.18	055	50.96	072	23.92	062	36.50	099	20.30
044	23.52	112	22.15	422	49.70	051	18.75	267	34.55	292	16.11
061	22.18	075	19.69	051	45.77	267	18.33	052	29.56	045	10.00

Source: Calculated from NAPES Database, 2002

Table D.4 Top Ten Singaporean IIT with Its Trading Partners in 3-Digit SITC Agricultural Products (1990-1999)

Malaysia		Philippines		Thailand		Australia		New Zealand	
SITC	IIT	SITC	IIT	SITC	IIT	SITC	IIT	SITC	IIT
054	85.66	053	74.71	099	84.38	099	79.31	112	80.29
032	80.15	231	73.36	292	75.79	031	76.80	292	78.14
062	79.23	054	68.74	051	67.33	292	71.24	431	68.63
053	75.72	032	62.92	048	61.36	111	70.90	099	62.70
411	74.87	062	58.87	422	57.06	291	64.76	243	61.79
051	73.37	292	57.11	243	55.52	148	61.66	053	57.94
075	73.10	099	53.59	031	53.58	122	57.73	048	46.98
031	72.62	267	53.48	075	48.31	055	52.30	061	46.66
099	70.79	024	50.04	022	44.87	091	48.04	291	45.09
112	69.83	055	45.80	291	43.79	081	47.98	062	43.88

Source: Calculated from NAPES Database, 2002

Table D.5 Top Ten Thai IIT with Its Trading Partners in 3-Digit SITC Agricultural Products (1990-1999)

Indonesia		Malaysia		Philippines		Singapore		Australia		New Zealand	
SITC	IIT	SITC	IIT	SITC	IIT	SITC	IIT	SITC	IIT	SITC	IIT
292	52.67	292	75.84	292	47.31	048	72.61	075	82.40	054	68.58
099	50.38	266	47.91	053	45.72	422	64.14	061	59.27	112	51.66
032	48.44	031	46.02	062	44.02	112	60.86	048	57.92	291	49.73
332	47.10	081	41.98	051	41.43	081	49.31	013	52.75	081	40.58
081	45.73	422	39.30	081	38.88	099	48.94	292	51.15	031	40.11
251	43.28	075	31.94	072	23.30	292	48.82	051	49.35	061	24.85
266	30.16	267	31.68	291	21.81	411	44.52	431	42.76	292	24.16
075	25.79	048	31.33	048	20.55	072	44.25	422	41.34	047	17.03
001	25.73	046	30.05	112	20.23	243	37.15	054	38.33	075	15.91
055	22.19	251	29.12	032	17.50	031	33.36	031	34.54	048	15.27

Source: Calculated from NAPES Database, 2002

Table D.6 Top Ten Australian IIT with Its Trading Partners in 3-Digit SITC Agricultural Products (1990-1999)

Indonesia		Malaysia		Philippines		Singapore		Thailand		New Zealand	
SITC	IIT	SITC	IIT	SITC	IIT	SITC	IIT	SITC	IIT	SITC	IIT
099	84.00	099	89.21	099	71.90	091	86.77	431	85.87	099	90.81
292	72.78	055	76.01	053	70.42	292	84.84	292	77.36	053	88.18
053	61.32	291	75.10	111	54.91	099	79.96	051	73.10	011	81.64
055	60.49	091	74.40	051	49.35	291	76.68	075	61.38	051	72.58
048	60.27	292	58.18	055	48.25	111	71.43	048	58.07	013	71.84
111	59.08	111	57.18	112	45.10	031	68.54	061	54.59	422	71.54
431	54.45	062	53.90	075	39.60	048	58.13	243	49.75	431	70.93
062	47.66	221	52.65	052	39.34	243	53.03	422	41.92	054	69.45
051	46.08	031	48.91	062	38.85	221	51.18	054	37.22	062	67.82
241	40.06	048	47.51	291	38.29	074	43.63	031	36.89	112	61.11

Source: Calculated from NAPES Database, 2002

Table D.7 Top Ten New Zealand's IIT with Its Trading Partners in 3-Digit SITC Agricultural Products (1990-1999)

Indonesia		Malaysia		Philippines		Singapore		Thailand		Australia	
SITC	IIT	SITC	IIT	SITC	IIT	SITC	IIT	SITC	IIT	SITC	IIT
292	54.64	055	64.85	099	60.63	292	79.34	054	70.56	053	89.47
048	54.52	099	62.37	051	50.77	099	72.05	112	68.54	099	87.62
055	49.59	292	56.51	055	32.41	062	59.72	291	63.64	011	81.94
051	35.00	032	56.35	291	27.20	053	51.16	031	59.74	051	76.43
031	34.88	062	37.55	062	23.07	243	46.34	051	43.93	431	75.76
099	31.87	243	31.05	111	18.02	061	44.23	292	39.36	013	70.91
053	31.08	053	27.06	048	17.52	048	42.47	221	34.57	054	70.12
243	31.05	061	25.39	112	17.17	111	41.86	111	32.59	291	64.70
112	25.02	048	19.01	292	14.40	291	39.78	061	24.40	062	62.68
073	23.41	074	18.57	053	10.88	431	38.67	081	21.40	267	60.21

Source: Calculated from NAPES Database, 2002