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An application of the natural trading partner hypothesis to New Zealand-ASEAN trade

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Abstract

The agreement establishing the ASEAN, Australia and New Zealand Free Trade Area (AANZFTA) entered into force in 2010. Full economic impacts of the agreement will not be known until 2020 when 99% of existing tariffs will be phased out in major markets among signatory nations. Using pre-agreement data, this research applies the natural trading partner hypothesis to make an ex-ante assessment of the agreement from New Zealand's perspective. Estimates of key indices show that the results are mixed and the overall welfare gains to New Zealand, if any, are likely to be small.

The contribution to this research by Chris Nees was made while he was a student at Massey University. Any views, opinions, findings and conclusions in this article do not necessarily represent, and should not be reported as, those of the New Zealand Treasury.

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1. Introduction

In his pioneering research, Jacob Viner (1950) was the first to elucidate that customs unions are likely to have an ambiguous effect on the welfare of both individual nations and the world because of their trade creating and diverting effects and therefore can be seen as favorable by both free traders and protectionists. Wonnacott and Lutz (1989) subsequently coined the term “natural trading partners” in the context of free trade areas (FTAs) where trade creation is likely to be large and trade diversion small. The authors then provide a number of criteria which if met may suggest *ex ante*, if a FTA is more likely to be welfare improving than reducing. This research reviews statistical criteria surrounding natural trading partners (NTP) hypothesis and applies it to the ASEAN, Australia and New Zealand Free Trade Area (AANZFTA) agreement. We investigate underlying trade patterns between the countries and their potential welfare implications. Out of twelve member nations covered by AANZFTA agreement, New Zealand (NZ) and Australia has been trading freely since 1983 because of Closer Economic Relations (CER) agreement; as are the ten ASEAN nations. After Australia, ASEAN (Association for Southeast Asian Nations) is NZ’s closest significant export market, but not vice-versa. As such AANZFTA is regarded especially important to NZ and the research will focus on the ASEAN-New Zealand trading aspect of the agreement from a NZ perspective. Additionally, because ASEAN5 (Singapore, Indonesia, Malaysia, Thailand and the Philippines) have accounted for more than 85% of NZ-ASEAN trade as well as data on the remainder members (Cambodia, Vietnam, Laos, Brunei and Myanmar) is considered less reliable, this analysis will focus on trade patterns between New Zealand and the ASEAN5.

The remainder of the paper is structured as follows. The next section reviews literature on the NTP hypothesis. In section 3, empirical analysis is undertaken to assess if NZ and ASEAN can be considered NTPs using the criteria of the hypothesis outlined in the literature. This includes a look at existing tariffs (2009) in place between the countries, and the calculation of trade intensity, complementarity and revealed comparative advantage indices. Section 4 concludes.

2. Literature Review

Wonnacott and Lutz (1989) provided a number of criteria which if met may suggest *ex ante*, if a FTA is more likely to be welfare improving than reducing. Firstly, if potential members are already major trading partners, they suggest a FTA would simply reinforce underlying trade patterns between the countries, and lead to less artificial trade diversion than might occur if the countries did not trade together to a large extent. This is essentially the volume of trade argument made by earlier authors like Lipsey (1960, p. 508), where less trade with non-members simply means there is less trade to divert. Also considered is the issue of whether or not it is preferable for FTA members to be complementary or competitive with respect to the type of goods produced and exported. Wonnacott and Lutz suggest it would be necessary for members’ exports to match the imports of the other, so that the trade structures of the economies would complement each other and gains can be made from specialization in sectors where a comparative advantage exists. This is likely to mean significant trade creation between the partners, but it would necessary to consider to what extent it will be at the expense of diverting trade from other sources.

Michaely (2004) uses the NTP hypothesis to suggest the relative size of trade between those nations in the proposed FTA is important for judging whether or not the FTA is likely to be successful. Defining relative size as “the ratio of the (home) countries imports from the partner to its aggregate imports”, the greater this ratio the smaller is the potential for trade

diversion as this implies a lower proportion of trade with other nations. Michaely suggests a series of indices that can be used to give some ex ante judgment as to whether or not potential members of a FTA can be considered natural trading partners. These indices are used in the empirical section of this paper (section 3) and their underlying methods are stated in the Appendix section.

Pitigala (2005) uses the trade volume, geographic proximity and complementarity criteria from the NTP hypothesis to assess whether or not the proposed South Asian Free Trade Area (SAFTA) can be considered a 'natural' trading agreement. Pitigala makes use of revealed comparative advantage (RCA) indices for each country to identify in which product groups (at 4 digit level) they can be considered efficient producers, and then compares these groups with the import structure of the South Asian countries to assess complementarity. Pitigala supplements RCA index with a complementarity index (at 4 digit level), to assess the degree to which export structures of South Asian nations match the imports of the region. On the whole, Pitigala concludes that the South Asian countries can only be moderately classified as NTPs and regional liberalisation may not provide significant benefits in terms of trade creation.

Bhagwati and Panagariya (1996) are two of the most prominent objectors to the idea of NTP being a predictor of a FTA's success. They argue that the volume of trade criterion from the NTP hypothesis where the potential members undertake a large amount of trade, importing country stands to lose a significant amount of tariff revenue which increases the larger is the initial (pre-FTA) volume of trade between the two nations. They suggest this natural trading partner criterion is therefore incorrect. Schiff (1999) offered a rescue to NTP hypothesis by "defining natural trading partners as a situation characterized by complementarity in trade rather than by substitutability." Schiff suggests the home country is more likely to experience a welfare gain if the partner country is large (economically) as the partner is more likely to be an efficient producer of a greater range of the home country's imports at world prices. Also if the partner continues to maintain tariffs on outside nations, the home country is likely to experience an improvement in its terms of trade by exporting at the higher tariff inclusive price. Schiff's argument bodes well for NZ in its trade with ASEAN.

3. Data, estimation results and interpretations

We employ three commonly used indices in order to look at broad trends in trading patterns between the countries concerned, which are; trade intensity, complementarity and revealed comparative advantage indices.¹ As stated earlier, the purpose here is to employ pre-FTA data and appeal to NTP hypothesis to make an ex-ante assessment of the agreement from a NZ perspective. We accessed annual data over 1994-2010 from UNCOMTRADE covering commodity trade only. We noted NZ already had bilateral FTAs with Singapore, Thailand and Malaysia before AANZFTA entered into force in 2010 and used an earlier ending date (2004) for calculating some of the indices.

As outlined in the literature, the NTP hypothesis posits that countries will experience larger gains from FTA, the higher are their tariff rates prior to the agreement. Table 1 shows the overall average MFN tariff rates in NZ and the ASEAN5, and also the split over agricultural and industrial products. Although averages do conceal some tariff peaks on certain products, these tariffs are considered relatively low by the WTO. Using the NTP hypothesis, (even before evaluating important indices that are reported in the end section),

¹ These indices are also used by Pitigala, N. (2005), Michaely, M. (2004), Yeats, A. (1998)

this suggests the removal of remaining barriers to trade among these countries is less likely to bring significant welfare gains to each nation. Tariffs however, remain relatively higher on agricultural products— a potential source of gain to NZ as agriculture accounts for a large share of her merchandise exports.

Table 1: Weighted average applied MFN tariff levels in the ASEAN5 and NZ, 2009

Country	Total	Agricultural (WTO_HS_Aggri)	Industrial (WTO_HS_Indus)
New Zealand	2.29%	2.3%	2.29%
Indonesia	4.96%	5.88%	4.89%
Malaysia	4.31%	3.87%	4.35%
Philippines	5.19%	9.74%	4.69%
Singapore	0%	0%	0%
Thailand	4.78%	12.63%	4.44%

Source: UNCTAD TRAINS database

3.1 Trade intensity index (TII)

The TII can assess if potential FTA members are NTPs through the volume of trade criteria, suggesting if the countries have an intensive trading relationship, a FTA would simply reinforce the underlying trade patterns and provide less scope for welfare reducing trade diversion (Pitigala 2005; p.12). We calculate and then plot these TII's of NZ exports to ASEAN5 in Figure 1 below (we evaluate the indices from a NZ perspective)) and that of ASEAN5 exports to NZ (Figure 2) in the appendix table.

Figure 1: New Zealand's trade intensity with the ASEAN5

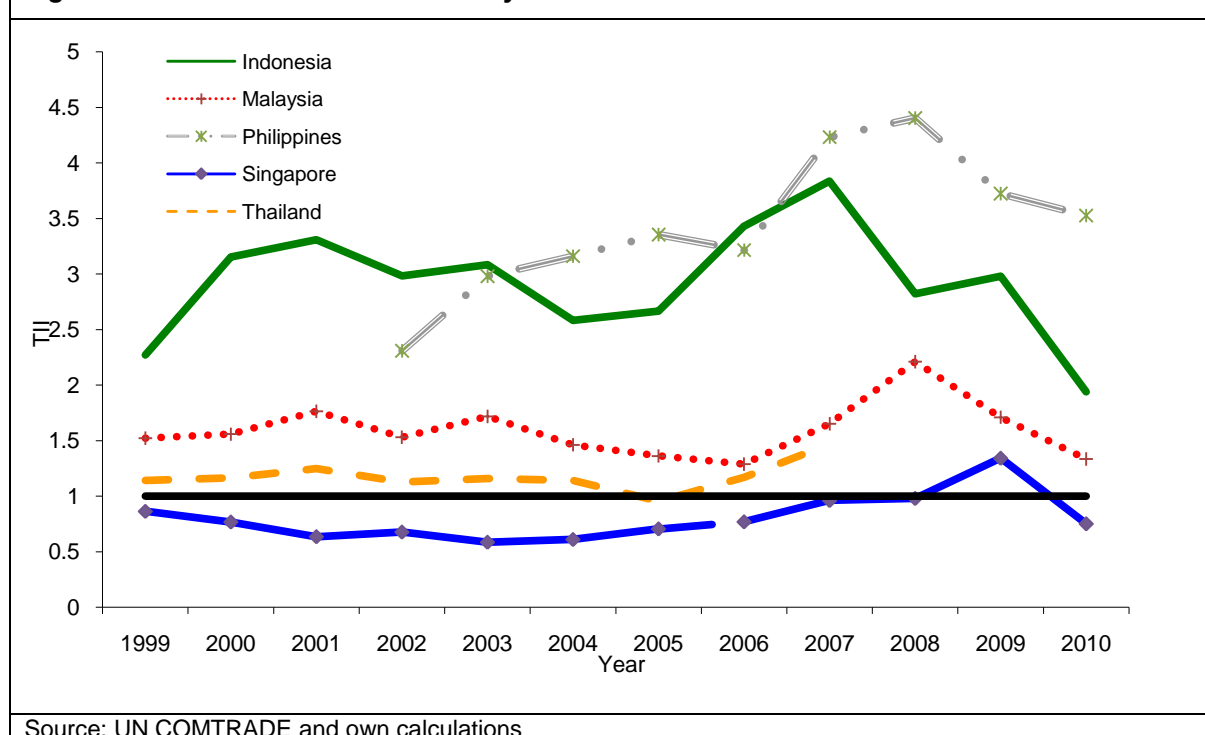


Figure 1 shows strong trade intensity with most ASEAN5 members but there is no distinct upward trend. Index with highest intensity partners, Indonesia and the Philippines has shown highest variability. It is interesting to note that the TII with Singapore has remained static despite being the first ASEAN member to sign a bilateral FTA in 2001. Figure 2 (in Table section) by contrast, shows a moderate upward trend in these trade intensities from ASEAN5 to NZ, but retained high variability across member countries. At a country level, the Philippines does not exhibit have an 'intensive' exporting relationship with NZ, but not vice versa. Singapore has exported to NZ more than would be expected given NZ's share of world imports and this intensity has been increasing since the signing of the 2001 FTA.

Clearly on its own this index is not enough to conclude that a FTA will necessarily be welfare enhancing for NZ (or ASEAN5). Observed data only suggests that trade between NZ and the ASEAN5 has been increasing on its own accord, and a FTA could potentially reinforce this trading pattern, rather than lead to significant trade diversion.

3.2 Complementarity index

The complementarity index developed by Drysdale (1969) can be used to give an indication of how closely one country's export composition matches another country's import composition. The index ranges between zero and infinity with an index greater than unity suggesting trade complementarity exists between the countries surveyed- a higher value indicating there will be significant trade creation after the formation of the FTA. The index was calculated using the formula in appendix A.2 to show pre-FTA trends. These complementarities are reported in Table 2 (between NZ and ASEAN5 nations) and Table 3 (between ASEAN5 nations and NZ). Trade data was aggregated into twelve broad groupings based on Statistics New Zealand classifications as shown in Table 5.

Relatively low and constant complementarities over time in Table 2 suggest that the export structure of NZ does not closely fit the import structure of Singapore, Thailand and Malaysia. With Indonesia and the Philippines these indices are higher to suggest complementarity since 2000, but none of these are appreciably greater than unity. Overall, there does not appear to be a conclusive case for complementarity from the Table. By contrast, the indices shown in Table 3 provide a somewhat brighter picture for the complementarity of ASEAN5-NZ trade. This is especially true between Singaporean, Malaysian and Philippine exports and NZ imports but, there does not appear to be any rising trend in complementarity.

Overall, these results suggest a relatively small degree of complementarity between the export and import structures of NZ and ASEAN5. It is interesting to observe that while exports from Singapore and Malaysia appear to be complementary with the imports of NZ, the reverse does not occur. Given these relatively mixed results suggesting complementarity between NZ and some ASEAN5 members while not others, there does not appear to be a particularly strong case for suggesting these countries are natural trading partners.

3.3 Revealed comparative advantage indices

While complementarity is an important criterion of the natural trading partner hypothesis, the literature suggests the partners must also be competitive world producers of these commodities in order to lessen the risk of trade being diverted to a higher cost source. The revealed comparative advantage (RCA) index, developed by Balassa (1965) is a commonly used method of analysing one nation's export structure relative to the structure of world exports and can point to commodity groups in which a country has a comparative

advantage. These indices were estimated for the 2004 year using the formula stated in Appendix A.3 and the results reported in Table 4. The commodity groupings employed were kept same as in the complementarity indices above and reported in Table 5.

Broadly, the RCA results conform to what one might expect – New Zealand's RCA's lie in agricultural products, (especially dairy), forestry and seafood, while ASEAN5 maintains RCA's in manufactured goods such as electronics, fuels and textiles. There are also groupings in which some ASEAN5 members share common comparative advantage (RCA's > 100) such as forestry and forestry products, seafood and other agriculture. More disaggregated data would be necessary to further determine in which subgroups each country has a RCA. Those commodities in which countries have differing RCA's provide potential for gains from trade creation as nations can specialize in products they produce at globally competitive prices. The groupings where RCA's are overlapping make countries less likely to be NTPs as there is less opportunity for specialization.

Given that we now know the broad commodity groups in which NZ and the ASEAN5 have a comparative advantage, we strive to match these groupings with major imports for the countries concerned. Table 6 shows the importance of each grouping calculated as the average share of national imports. Manufactures such as machinery and transport, fuels and chemicals, metal articles/crude materials and electronics/other manufactures represent major import shares for all the surveyed countries. With the exception of machinery and transport, a number of ASEAN5 members have RCA's in these product groups, suggesting they are efficient world producers. Under NTP hypothesis, this points to a lesser probability of NZ facing welfare losses from trade diversion and potentially greater gains for NZ and ASEAN from trade creation after the formation of a FTA. Machinery and transport provides some scope for trade diversion as all nations are major importers but none are competitive producers at world prices at this level of aggregation.

Textiles, clothing and footwear (TCF) are also important imported products for NZ and given that Thailand and Indonesia are competitive world producers of this grouping, a FTA is less likely to divert NZ's TCF imports to an inefficient source. Agricultural products on the other hand, have accounted for a relatively small share of total imports, with the exception of the other agriculture category. Thus despite NZ's RCA's in these products, large gains from trade creation after a FTA may not occur. Forestry and forestry products is a potential area where NZ could gain from a FTA as an efficient world producer. This is a relatively significant import for Thailand, the Philippines and Indonesia that NZ could take advantage of while minimizing losses from trade diversion for the importing nations.

Overall the RCA evidence is relatively mixed on the trade creation and diversion effects resulting from a FTA between New Zealand and ASEAN. While further study at a more disaggregated level would be useful, one can point to the relatively low number of categories where the RCA's of New Zealand and ASEAN5 overlap as a positive sign for trade creation.

On the basis of the above indicators, it seems reasonable to classify NZ and ASEAN5 as being moderately natural trading partners. All have provided relatively mixed results about the trading relationship, suggesting above 'normal' trade volumes between NZ and some ASEAN5 members while not others and trade complementarity only to a moderate extent. The RCA analysis points to NZ and ASEAN5 maintaining comparative advantages in differing product groups, however those groups in which NZ has RCA's did not necessarily account for large import shares of ASEAN5. The already relatively low tariffs on NZ-ASEAN5 trade suggest gains from a FTA would be modest, compared to a situation with high tariffs. While these factors may not suggest overly sizeable gains from the proposed FTA, they do indicate it is more likely to be welfare enhancing than reducing. Despite the mixed results, the prospects for trade diversion are lowered by these results especially the low

external tariffs maintained by most potential members, and the wide range of product categories in which they maintain a comparative advantage.

4. Conclusion

Conflicting outcomes of trade creation and diversion from FTAs means their overall welfare impacts in general are uncertain. In an attempt to provide some structure to this uncertainty, the natural trading partner (NTP) hypothesis outlines a number of criteria that if met are expected to make FTAs more likely to be welfare improving than reducing. In this research we did an empirical analysis of the NTP hypothesis applied to the NZ-ASEAN5 trade as part of AANZFTA agreement operating since 2010. In general, results obtained do not provide strong evidence that NZ and ASEAN5 are NTPs based on trade intensity indices, complementarity indices, RCA analysis and an examination of existing tariffs in effect between these countries. There are exceptions to this conclusion, such as NZ's relative trade intensity and complementarity with Indonesia and the Philippines, and ASEAN members holding a comparative advantage in products forming a large part of NZ's imports. In the end, making an ex ante judgment on net welfare effect from the agreement remains far from conclusive. Nevertheless by undertaking this analysis of trade patterns, the natural trading partner hypothesis has allowed us to make some useful inferences now about the likely shape of NZ-ASEAN trade at least in the short term rather than wait until year 2020 when full implementation of the AANZFTA agreement takes effect.

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Tables and Figures

Table 2: Trade complementarity between New Zealand and ASEAN5 nations

	Singapore	Thailand	Indonesia	Philippines	Malaysia
1994	0.60	0.74	0.74	NA	0.70
1995	0.59	0.72	0.81	NA	0.68
1996	0.58	0.76	0.84	1.03	0.74
1997	0.59	0.82	0.78	1.05	0.74
1998	0.58	0.89	0.85	1.00	0.73
1999	0.56	0.73	0.91	0.87	0.67
2000	0.57	0.77	1.10	1.19	0.74
2001	0.59	0.80	1.16	1.32	0.82
2002	0.59	NA	1.04	1.02	0.76
2003	0.58	0.73	1.05	1.02	0.74
2004	0.57	NA	1.13	0.99	0.78

Source: UNCOMTRADE

Note: Entries reflect complementarity between New Zealand exports and each ASEAN5 member's imports.

Table 3: Trade complementarity between ASEAN5 nations and New Zealand

	Singapore	Thailand	Indonesia	Philippines	Malaysia
1994	1.09	0.94	0.89	NA	1.04
1995	1.09	0.96	0.91	NA	1.05
1996	1.10	0.97	0.92	1.04	1.06
1997	1.09	0.96	0.85	1.06	1.06
1998	1.07	0.97	0.81	1.02	1.02
1999	1.06	0.95	0.94	1.04	1.05
2000	1.05	0.97	1.01	1.03	1.05
2001	1.01	0.95	1.00	1.02	1.03
2002	1.00	NA	0.99	1.00	1.02
2003	1.00	0.97	0.97	1.02	1.02
2004	1.00	NA	0.93	0.77	1.02

Source: UNCOMTRADE

Note: Figures reflect complementarity between each ASEAN5 member's exports and New Zealand imports.

Table 4: RCA indices for New Zealand and the ASEAN5 in 2004

Product group	RCA indices					
	New Zealand	Thailand	Philippines	Malaysia	Indonesia	Singapore
Dairy	3273	26	37	16	22	16
Meat	1956	178	1	3	3	1
Fruit and vegetables	552	153	176	16	52	8
Other agriculture	245	128	60	149	215	31
Seafood	604	632	155	67	396	33
Forestry products	334	63	24	113	317	14
TCF	33	123	70	37	237	26
Machinery & transport	29	83	78	75	28	83
Fuels and chemicals	18	37	17	112	162	137
Metal articles/ crude materials	77	82	34	47	101	34
Electronics/other manufactures	31	128	90	154	78	166
Miscellaneous	109	83	1030	38	7	97

Source: UNCOMTRADE

Note: TCF covers textiles, clothing and footwear.
 Italicized entries indicate a comparative advantage (RCA>100).

Table 5: Commodity groups and HS codes

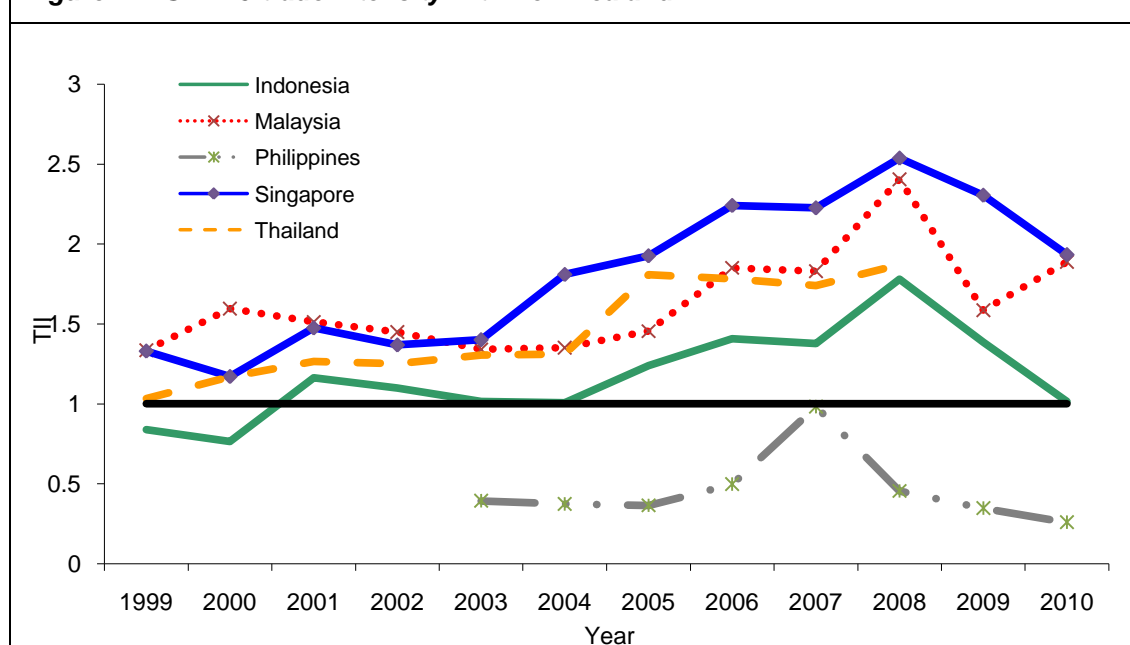
Commodity:	HS(1992) Codes:
Meat and meat products	02, 1601, 1602, 0504
Dairy products	0401, 0402, 0403, 0405, 0406, 2105, 3501, 3502
Fruit and vegetables	07, 08, 14, 20
Other agriculture	01, 0407, 0408, 0409, 0410, 0501, 0502, 0503, 0505, 0506, 0507, 0508, 0509, 0510, 0511, 06, 09, 10, 11, 12, 13, 15, 17, 18, 19, 22, 2101, 2102, 2103, 2104, 2106, 23, 24, 41, 42, 43, 51
Seafood	03, 1603, 1604, 1605
Forestry and forestry products	44, 45, 47, 48
Textiles, clothing and footwear (TCF)	50, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65
Machinery and transport	84, 86, 87, 88, 89
Fuels and chemicals	27, 28, 29, 31, 32, 3503, 3504, 3505, 3506, 3507, 36, 38
Metal articles and crude materials	25, 26, 68, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 83
Electronic and other manufactured goods	30, 33, 34, 37, 39, 40, 46, 49, 66, 67, 69, 70, 82, 85, 90, 91, 92, 94, 95
Miscellaneous	99, 97, 96, 93

Table 6: Commodity groups as a percentage of total merchandise imports for ASEAN5 and New Zealand

	Thailand	Philippines	Malaysia	Indonesia	Singapore	New Zealand
Dairy	0.51%	1.12%	0.45%	0.67%	0.23%	0.18%
Meat	0.01%	0.40%	0.26%	0.13%	0.25%	0.37%
Fruit and vegetables	0.22%	0.40%	0.62%	0.72%	0.58%	1.45%
Other agriculture	3.75%	6.15%	3.87%	9.89%	2.88%	6.67%
Seafood	1.34%	0.19%	0.42%	0.09%	0.46%	0.33%
Forestry/forestry products	2.52%	2.16%	1.76%	3.38%	1.02%	3.09%
TCF	3.53%	4.08%	2.07%	6.37%	2.76%	6.18%
Machinery and transport	23.76%	19.68%	21.51%	26.26%	25.52%	32.00%
Fuels and chemicals	16.37%	13.94%	8.00%	26.19%	14.54%	13.74%
Metal articles/crude materials	14.10%	7.23%	10.03%	10.45%	6.28%	6.85%
Miscellaneous	1.60%	0.33%	2.17%	0.31%	1.28%	0.55%
Electronics/other manufactures	32.28%	44.31%	48.83%	15.53%	44.16%	28.58%

Source: UNCOMTRADE

Note: Calculated on the basis of average import shares over the 1994-2004 period.

Figure 2: ASEAN5 trade intensity with New Zealand

Source: UN COMTRADE and own calculations

Note: This shows the intensity of ASEAN5 member's exports to New Zealand.

Appendix

A.1 Trade intensity index

The TII is defined as the home country's (i) exports to a foreign country j as a proportion of total home country exports divided by the foreign countries imports as a proportion of world imports (net of home country imports). This is set out in the formula below:

$$TII_{ij} = \left[\frac{X_{ij}}{X_i} \right] / \left[\frac{M_j}{(M_w - M_i)} \right]$$

TII_{ij} is the trade intensity index for home country i's exports to partner country j.

(X_{ij} / X_i) is the value of country i's exports sent to country j as a proportion of country i's total exports.

$[M_j / (M_w - M_i)]$ is country j's total imports divided by world imports net of country i's imports.

An index value greater than one suggests country i exports to country j more than would be expected given j's share of world imports, while an index less than one suggests these countries trade less than would be expected.

A.2 Complementarity index

The index is calculated by finding the product of each commodity's (k) share in country i's exports and j's imports weighted by the inverse of their shares in world trade, and then summing the result together over k commodities. The weighting is used because country j would be more likely to buy commodity k from country i if the rest of the world is exporting very little of this product.²

$$ITC_{ij} = \sum_k \frac{X_{iw}^k}{X_{iw}} * \frac{M_{ww} - M_{iw}}{M_{ww}^k - M_{iw}^k} * \frac{M_{jw}^k}{M_{jw}}$$

ITC_{ij} is the trade complementarity index between country i and j,

$\frac{X_{iw}^k}{X_{iw}}$ is country i's share of world exports in commodity k,

$\frac{M_{ww} - M_{iw}}{M_{ww}^k - M_{iw}^k}$ is total world imports net of country i's total imports divided by world imports of commodity k net of country i's imports of k,

$\frac{M_{jw}^k}{M_{jw}}$ is the share of commodity k in country j's total imports.

² Pitigala, N. (2005), p37

A.3 Revealed comparative advantage (RCA) index

The index is calculated with the following formula;

$$IRCA_{ik} = \frac{(X_i^k / X_w^k)}{(X_i / X_w)}$$

$IRCA_{ik}$ is the index of revealed comparative advantage for country i in commodity k;

X_i^k / X_w^k is the ratio of country i's exports of commodity k to world exports of commodity k;

X_i / X_w is the ratio of country i's total exports to total world exports.

The resulting figure is then multiplied by 100, where a commodity with an RCA index greater than 100 suggests a country has a comparative advantage in the production of this product (greater than average specialization in the product), while an index less than 100 points to a comparative disadvantage (less than average specialization in the product). An RCA equal to 100 suggests neither a comparative advantage nor disadvantage (an average level of specialization in the product relative to the rest of the world).