

Horizontal, Vertical and Marginal Intra-Industry International Trade and their Determinants: Evidence for New Zealand and Australia

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Abstract

This study analyses changing trade patterns between New Zealand and Australia in four parts. First, it uses time series to estimate the share of New Zealand's intra-industry trade with Australia between 1980 and 2012. Secondly, intra-industry trade intensities are computed for industries at the 3-digit SITC level. Thirdly, marginal intra-industry trade are identified. Some hypotheses are derived from trade theories for empirical tests. Finally, regression analysis is used to reveal the determinants of intra-industry trade between New Zealand and Australia. Policy conclusions are drawn from the analysis.

Key Words: International trade, intra-industry trade, regional economic integration, Philippines Trade, New Zealand Trade, FTAs, ASEAN, RCA Dynamic RCA

JEL Classification: F10, F02, F13, F14, F15

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Introduction

This study analyses the changing patterns and direction of trade between New Zealand and Australia. It extends my earlier work on the extent and determinants of New Zealand's intra-industry trade (IIT) with Australia, with regional groups like the EEC and with the Rest of the World. Using a „case study“ approach, this study differs from other work and fills a gap in the empirical literature on IIT in the context of economic integration between New Zealand and Australia.

A time series approach is used to estimate the share of IIT in New Zealand's total trade with Australia. Data used have been updated to include 1980-2012 time series from the UN Statistical Head Office, COMETRADE data base, IMF and World Bank

This paper is organized four parts. First, it uses time series to estimate the share of New Zealand's intra-industry trade with Australia between 1980 and 2012. Secondly, intra-industry trade intensities are computed for industries at the 3-digit SITC level. Thirdly, marginal intra-industry trade are identified. Some hypotheses are derived from trade theories for empirical tests. Finally, regression analysis is used to identify some selected country-specific determinants of intra-industry trade between New Zealand and Australia. Policy conclusions are drawn from the analysis.

Australia – New Zealand Trade: An Historical Perspective

New Zealand historically was dependent on the British market which accounted for about 60 percent of New Zealand's exports and about 50 percent of its imports in the early 1960s. This trade dependency on United Kingdom has changed since the early 1970s when Britain joined the EEC. Currently New Zealand's international trade is diversified with new trading partners including Australia, Japan, U.S., South Korea, China, India and others. In 1989 New Zealand became a founding member of the Asia-Pacific Economic Cooperation (APEC) forum whose membership account for about 70 percent of New Zealand Trade.

The Closer Economic Relations (CER) Agreement was established between these two nations in 1983. It was agreed that all tariff and non-tariff barriers be progressively liberalised and eliminated. In 1988, the CER was renegotiated with the provision to accelerate the time frame for trade liberalisation, including trade in services and investment.

Changes in the international economic and trading environments have had a significant impact on New Zealand trade patterns. It is argued that the loss of the traditional British markets, the relative decline in foreign demand for and prices of New Zealand traditional exports, the removal of trade barriers and growing need for competitive industrial development have brought about the need to a new look at the New Zealand trading patterns.

The world trade patterns have changed very markedly in the past few decades. International trade is no longer dominated by the nineteenth century Ricardian model of exchange of British cloth for Portuguese wine or the Heckscher Ohlin explanation of inter-industry trade patterns. One of the most important trends in the world trade has been the emergence and growth of intra-industry trade. Intra-industry trade (IIT) is defined as the simultaneous import and export of goods within the same industry.

Whilst high levels of IIT have been evident in OECD countries, New Zealand did not share this experience until the 1970's. A number of possible explanations can be identified as being pertinent with regard to New Zealand. These are: (a) New Zealand specialized in Agricultural products and developed a wide small scale industrial base; (b) Protected industry allowed growth of small, relatively efficient firms which supplied the domestic market; (c) New Zealand's long association with the 'safe' British market and the production of traditional commodities were not conducive to change; and (d) The implementation of government farm support policies tended to assist established, declining products rather than encourage new ventures.

The growth of intra-industry trade has attracted increased attention in the economic literature. A number of studies have discussed the conceptual and statistical problems involved in trying to measure IIT. Some of the notable works are those of Balassa (1963), Kojima (1964) Grubel and Lloyd (1975) and Aquino (1978). Kojima (1954) investigated the trade among advanced countries. Through dividing these countries into 3 groups, three types of trade characteristics are presented. The results showed that the most advanced countries (US, UK and EEC) maintained intense intra-industry trade in "almost all commodity categories". Japan and Canada maintained partial intra-industry trade, since they were not as developed as the first group. The third group, Australia and New Zealand, maintained inter-industry trade because they provided more primary products. Besides explaining intra-industry trade by citing Linder's (1961) demand theory, Kojima also proposed that comparative costs or economies of large-scale may be another explanation of intra-industry trade. Armington (1969) argued that one reason of intra-industry trade was that products

from different places were imperfect substitutes. Krugman (1979) developed an alternative model to explain intra-industry trade. He argued that economies of scale is a driven of intra-industry trade because which made the market imperfectly competitive.

Economists have also addressed questions which have important implications for economic policy. These issues revolve around the impact of trade liberalisation on the levels of intra-industry trade and the cost of adjustments following removal of trade barriers between trading partners.

The concept of intra-industry trade and the economic integration have been closely associated since the formation of the EEC in 1950s. Balassa (1966) provided evidence of intra-industry trade patterns following European integration. The major issues are: First, does trade liberalisation foster intra-industry trade? Second, are adjustment costs to trade liberalisation lower in industries characterised by high levels of IIT? Third, what are the determinants affecting the high degree of IIT? Fourth, what are the policy implications for resource reallocation and income distribution? From policy perspective, it is often argued that adjustment costs are lower when new trade is of intra-industry type because disruption is minimised when adjustment takes place within an industry. It is easier to transfer and adapt resources within industries than to switch them from one industry to another. Marvel and Ray (1987) argued on the basis of political economy that high levels of intra-industry trade needs less resistance to liberalising policies.

The experience of a free trade agreement between New Zealand and Australia provides an opportunity to examine whether trade liberalisation has promoted more intra-industry trade between these developed Pacific-rim countries. In this study the first issue will be examined and some discussions will be made on the second on the basis of the results. In order to discuss the first issue, one needs to compute the levels of IIT for a particular country. This, in turn, requires that one has to find an acceptable method of measurement, and also define what we mean by 'substitutes' and 'industry'. German and Danish lager beer are very close substitutes, but consumers identify them separately; automobiles have varying qualities of size, comfort, performance, economy, some being close substitutes, some widely differentiated. The problem is best illustrated by following the United Nations Standard Trade Classification (SITC) through a disaggregating process from 1-digit to 5-digit levels. It is generally recognized that the 3-digit level (in some cases 2-digit) is the most convenient one consistent with the traditional concept of industry (Grubel and Lloyd, 1975).

In this study IIT has been computed at the SITC 3-digit levels for individual industries for the years 2000 and 2012. A summary of values has also been computed for the years 1964 to 2012 between New Zealand and Australia. In addition, Marginal intra-industry trade is calculated to reveal the dynamic aspects of Changing trade patterns, furthermore. 3-digit summary values are also estimated and analysis presented.

Literature Review:

Measuring Intra-industry trade (IIT): the choice of technique

Intra-industry trade is defined as the simultaneous export and import of goods within the same industry. Inter-industry trade is the exchange of goods which belong to different industries. This is different from inter-industry trade, which involves countries exchanging the products for different industries.

A number of attempts have been made to find a suitable method of measuring intra-industry trade and these have been discussed at length in the literature. Grubel and Lloyd (1975) were the first economists to seek to measure the significance of intra-industry trade. They measured IIT as the proportion (percent) of a country's total trade (exports plus imports) in the products of a given industry which was matched or balanced, that is exports equal imports. In this study four measures have been selected and used. They are: (i) the Grubel and Lloyd measure at industry level (IITBi), (ii) the Grubel-Lloyd Weighted (IITB) Index, (iii) the Grubel-Lloyd adjusted (IITC) Index and (iv) the Aquino adjusted index. The summaries of the methodologies used are presented in Appendix 1.

As Hamilton and Kniest (1991) argued, although static indices of IIT, e.g. the most widely used Grubel-Lloyd index, dynamic index may be more informative. Since they first proposed a marginal IIT index, alternative dynamic indices have been developed. Brühlhart (2002) introduced the development of MIIT indices in details. The first measure is the Hamilton-Kniest Index, which captures the structure change in IIT trading though the ratio of first differences in exports and imports. However, it is undefined when either export or import decreases.

$$HK = \begin{cases} \frac{\Delta X}{\Delta M} & \text{for } \Delta M > \Delta X \geq 0 \\ \frac{\Delta M}{\Delta X} & \text{for } \Delta X > \Delta M \geq 0 \\ 1 & \text{for } \Delta X = \Delta M > 0 \\ \text{undefined} & \text{for } \Delta X < 0 \text{ or } \Delta M < 0 \end{cases}$$

Brühlhart (1994) proposed a Grubel-Lloyd style MIIT index.

$$B^A = 1 - \frac{|\Delta X - \Delta M|}{|\Delta X| + |\Delta M|}$$

Similar with Grubel-Lloyd index, when it is 0, marginal trade in the industry is completely inter-industry trade; when it is 1, which means total intra-industry trade. This index can be aggregated for all industries, like the Grubel-Lloyd index. Besides above MIIT indices, other MIIT indices are also be proposed, such as Thom & McDowell (1999) index, Annicchiarico & Quintieri (2000) index, and many others. However, as Brühlhart (2002) pointed out, different indices capture different aspects of the structure of trade changes, but no one measure can fully describe it.

The widely accepted Chamberlin-Heckscher-Ohlin model provided explanations for both inter-industry and intra-industry trade. Under this framework, inter-industry trade specialized in homogenous goods, and intra-industry trade specialized in horizontally differentiated goods. Greenaway and Milner (2002) argued that this view was misplaced. They argued that evidences supporting C-H-O model mis-measured horizontal IIT by total IIT, and vertical IIT was also an important part of international trade. They discussed the difference between horizontal IIT and vertical IIT: the horizontal IIT was based on the need of variety of goods and the economies scale. On the other hand, though vertical IIT was also based on the preference of variety, which comes from income difference.

Methodology and Hypotheses

Determinants of Intra-Industry International Trade: The intensity of IIT is likely to be determined by a host of causative factors such as: A. Country specific determinants (a) average levels of development of trading partners (b) development differential and income distribution of trading Partners (c) relative market size and market size differential (d) and geographical proximity. B. Industry Specific factors such as: (a) the Prevalence of Economies of scale (b) the degree of aggregation (c) the degree of product differentiation (d) human capital intensity (e) the technological innovation/factor intensity and (f) the dominance of multinationals. C. Policy specific factors: (a) Levels of protection, nominal and effective tariffs (b) Export incentives, exports, imports subsidy and (c) Commonwealth / other trade arrangements, FTAs. D. Institutional-specific determinants such as: (a) Communication, transports and trade links (b) Language, cultural and

religious ties. These causative factors seem to determine the intensity of modern trade flows between nations. Some testable hypotheses can be drawn.

Determinants of Intra-Industry International Trade (IIT): Selected Hypothesis

- (a) **Country Specific** derived from Linder's (1961) demand similarity thesis.
- Hypothesis 1: IIT is an increasing function of the average level of development (ALD_{jk}) of the trading partners, measured as the average per capita income of the two countries, i, home / reporting country and j, trading partner.

$$IIT_{jk} / .ALD_{jk} > 0$$
- Hypothesis 2: IIT is an increasing function of the average market size (AMS) of the partners, measured by average GDP.

$$ITT_{ik} / .AMS > 0$$
- Hypothesis 3: IIT is greater between countries whose tastes and demand patterns are similar.
- Hypothesis 4: IIT is a decreasing function of the level of development differential (LDD_{jk}) and market size differences (MSD) - i.e. absolute difference of per capita incomes and GDP of the trading partners

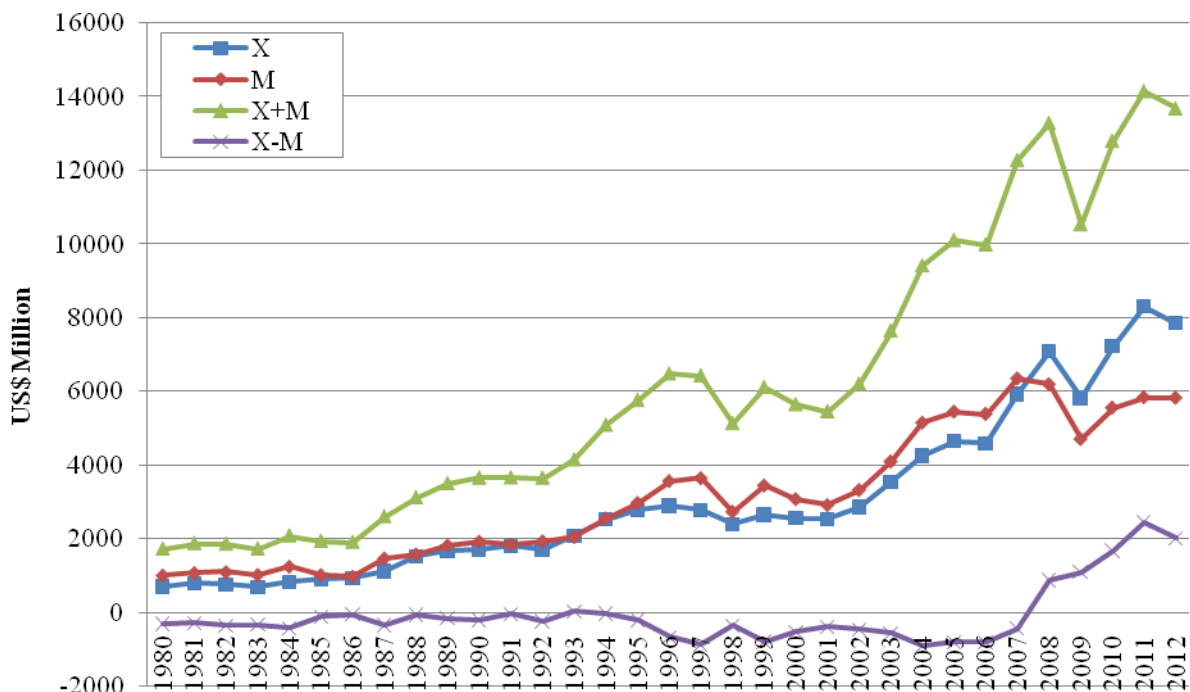
$$IIT_{jk} / .LDD_{jk} < 0$$
- (b) **Industry Specific** derived from Technological Gap Theory (Kravis, Hufbauer, Posner); Product Life Cycle (Vernon); Human Capital (Bhagwati, Keasing, Leontief); Economies of Scale (Grubel, Caves, Krugman)
- Hypothesis 5: IIT is a decreasing function of the level of disaggregation i.e. the greater the number of four and five digit SITC groups found in a given three digit group, the lower will be the IIT value.

$$IIT_i / .LDAG_i < 0$$
- Hypothesis 6: IIT is an increasing function of product differentiation. Proxy variables are - coefficient of variation in unit values of exports (PD_i) and advertising/sales ratios (SR_i)
- Hypothesis 7: IIT is an increasing function of technological innovation, measured by R and D expenditure (IRD_i) and investment/GDP ratio (RDN_i).
- Hypothesis 8: IIT is an increasing function of economies of scale, measured as value added per employee (ESC_i).
- Hypothesis 9: IIT is an increasing function of human capital intensity, measured as the ratio Wage Bill/Numbers Employed (WE_i).

- C. **Policy Specific** derived from Trade Barriers (Balassa, Grubel-Lloyd, Wannacott).
- Hypothesis 11: IIT is a decreasing function of nominal and effective tariffs measured as -
- (a) computed nominal tariff at three digit SITC (TNP_i)
 - (b) effective tariff at three digit SITC (ETW_i)
 - (c) tariff revenue/value of industry imports (TNW_i)
- D. **Institutional Specific** are derived from historical, geographical and cultural ties which have created a market.
- Hypothesis 12: IIT is an increasing function of similar culture and language.
- LNG_{jk} has a value of 1 or 0
- CUC_{jk} has a value of 1 or 0
- Hypothesis 13: IIT is a decreasing function of distance.
- $IIT / DIST_{jk} < 0$

Intra-Industry and Intra-Industry Trade: Evidence from New Zealand

Figure 1 NZ-Australia Trade, 1980-2012



Source: UN Comtrade Database. Author's calculation

Table 1a 2012 NZ-China IIT by Industry 3-digit summary values

Industry		Av- IITBi	Av- IITCi	Av- IITQi
0	Food & Live Animals	53.2	61.4	56.1
1	Beverage & Tobacco	47.4	100.0	84.6
2	Crude materials inedible except fuels	11.3	11.7	11.5
3	Mineral Fuels Lubricants & related materials	30.6	98.7	78.8
4	Animal & Vegetable Oils and fats	14.8	66.4	14.2
5	Chemicals	55.9	83.1	65.4
6	Manufactured Goods Classified chiefly by materials	65.5	67.6	64.8
7	Machinery & Transport equipment	58.3	59.5	58.8
8	Miscellaneous Manufactured Articles	57.7	58.1	57.7
9	Commodities & Transactions not classified	21.4	99.9	58.6

Table 1b 2000 NZ-China IIT by Industry 3-digit summary values

Industry		Av- IITBi	Av- IITCi	Av- IITQi
0	Food & Live Animals	43.5	44.0	43.4
1	Beverage & Tobacco	66.0	67.9	66.9
2	Crude materials inedible except fuels	8.7	10.6	8.7
3	Mineral Fuels Lubricants & related materials	34.2	49.8	28.6
4	Animal & Vegetable Oils and fats	20.9	81.7	29.4
5	Chemicals	47.9	68.2	50.5
6	Manufactured Goods Classified chiefly by materials	67.2	67.6	67.2
7	Machinery & Transport equipment	58.5	64.4	56.8
8	Miscellaneous Manufactured Articles	60.8	65.7	59.4
9	Commodities & Transactions not classified	0.0	0.0	0.0

Table 1c 1990 NZ-China IIT by Industry 3-digit summary values

Industry		Av- IITBi	Av- IITCi	Av- IITQi
0	Food & Live Animals	35.1	39.9	33.8
1	Beverage & Tobacco	54.4	98.1	81.1
2	Crude materials inedible except fuels	7.4	7.6	7.5
3	Mineral Fuels Lubricants & related materials	50.3	87.9	43.4
4	Animal & Vegetable Oils and fats	35.1	74.1	58.0
5	Chemicals	47.5	82.9	56.4
6	Manufactured Goods Classified chiefly by materials	55.2	56.6	54.9
7	Machinery & Transport equipment	57.3	71.3	56.8
8	Miscellaneous Manufactured Articles	63.5	71.6	64.5
9	Commodities & Transactions not classified	0.0	0.0	0.0

Source: UN Comtrade Database. Author's calculation

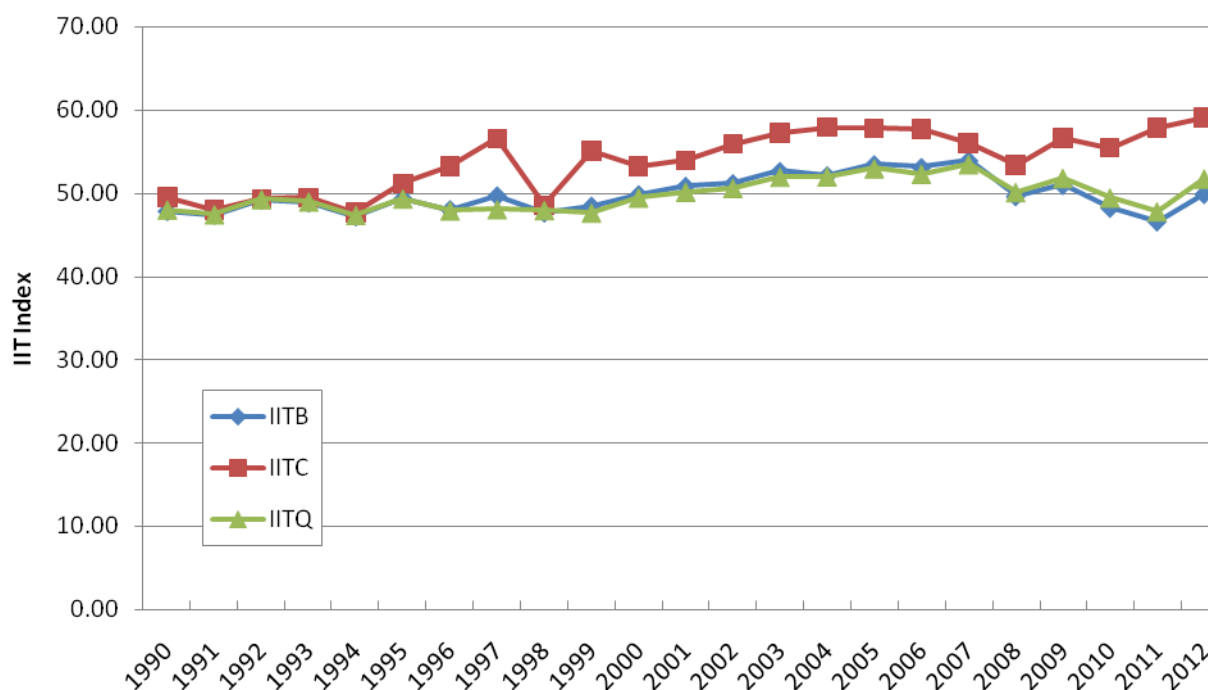
Figure 1 demonstrate exports, imports and total trade over time-increasing over the years.

Intra-industry trade at 3-digit SITC summary values for NZ-Australia IIT are presented in Tables 1a, 1b, and 1c respectively. Intra industry trade has strengthened in SITC 0 and 7, while it has reduced or stayed constant at the other 1 digit aggregations. These higher IIT index values are driven by the strong growth in intra-industry trade identified above in the Food and Live Animals industries (SITC 0).

The general upwards trend intra-industry trade as a proportion of New Zealand trade with Australia continue, with all three IIT measures exceeding 51% in 2012. This can be seen in Figure 2.

Figure 2 shows that the value of intra industry continues to rise steeply over the 1990-2012 period, although the value fell in 2008 as the economic recession deepened.

Figure 2 NZ-Australia Intra-industry Trade, 1990-2012



Source: UN Comtrade Database. Author's calculation

Figures 2 and Tables 2 show different measures of intra-industry trade through time between New Zealand-Australia for the years 1964 to 2012. The results show that in the past three decades intra-industry trade as a proportion of New Zealand trade with Australia has increased.

From 1964 to 1984, it varies between 11.23 percent to about 30 percent. From, 1981 to 1991, New Zealand IIT with Australia increased from 31 to 47.41 percent (different indices vary within the

range 36 percent to 50 percent). During 1991 to 2000 IIT seems to be steady except in the years 1997 and 1998 when there has been some decline. This may be due to the effects of Asian economic crisis. In 2000 NZ IIT reached 48.34 percent, (50 percent Aquino adjusted and 52 percent GL adjusted). Some observed facts concerning these three IIT indices are: (a) they move in the same direction, (b) the differences in their values in different years vary, they are substantial in some years, (c) the Grubel-Lloyd adjusted measure is higher than Aquino measure in most of the cases for both countries.

Table 2 continues the above analysis and shows different measures of long term intra-industry trade between New Zealand-Australia for the years 1964 to 2012.

Table 2 IIT Indices Across All Industries, Values at 3-Digit SITC, 1964-2012

	IITB	IITC	IITQ
1964	11.23	28.61	13.53
1965	11.81	31.03	15.08
1966	12.11	32.36	15.46
1967	13.29	29.5	17.21
1968	16.8	27.09	20.68
1969	17.6	28.5	20.28
1970	18.45	32.41	22.99
1971	18.78	32.45	23.37
1972	20.14	34.37	25.23
1973	19.84	36.72	24.73
1974	17.26	36.23	23.8
1975	17.84	32.17	22.51
1976	19.15	28.69	21.61
1977	20.44	28.16	22.76
1978	26.1	35.74	29.34
1979	28.93	39.17	31.91
1980	29.55	36.07	30.83
1981	30.81	36.4	32.25
1982	31.13	38.92	32.99
1983	31.94	40.25	33.72
1984	32.99	41.67	35.11
1985	37.52	40.79	37.28
1986	44.35	47.09	44.71
1987	43.67	51.7	45.18
1988	45.07	53.52	47.23
1989	47.54	52.12	48.69
1990	47.86	49.57	47.97
1991	47.42	47.98	47.39
1992	49.22	49.32	49.22

1993	48.91	49.45	48.95
1994	47.22	47.67	47.29
1995	49.38	51.17	49.30
1996	48.05	53.27	47.84
1997	49.69	56.57	47.99
1998	47.68	48.57	47.90
1999	48.47	55.09	47.59
2000	49.84	53.24	49.43
2001	50.85	53.96	50.13
2002	51.17	55.91	50.60
2003	52.62	57.27	51.94
2004	52.11	57.95	51.99
2005	53.43	57.80	52.97
2006	53.10	57.71	52.31
2007	53.91	55.97	53.48
2008	49.64	53.38	50.08
2009	50.97	56.59	51.80
2010	48.25	55.47	49.40
2011	46.60	57.81	47.73
2012	49.9	59.1	51.7

Source: UN Comtrade Database. Author's calculation

Four indices are used: Where-

- IIT_{Bi} - Grubel-Lloyd for each industry
- IIT_B - Grubel-Lloyd weighted average measure
- IIT_C - Grubel-Lloyd adjusted measure
- IITQ - Aquino adjusted measure

Observed characteristics of intra-industry trade indicators/indices

Intra-industry Trade (IIT) results show that three IIT indices used in this study move in the same direction. Grubel and Lloyd (GL) basic indicator show a relatively lower levels of IIT as compared with Aquino adjusted IIT indicator. GL adjusted measures in some cases demonstrate a higher levels of IIT than Aquino adjusted index and GL unadjusted measures.

Table 3 presents New Zealand's exports, imports, total trade and measured intra-industry trade at the 3-digit level across all industries (SITC 0-9) for the year 2012. IIT has also been calculated for 1990 but the results are not included here due to space constraints. (Tables are available on request from the author). The results show that a high magnitude of IIT exists in SITC 0-Food and Live Animals, Out of 32, industries 11 industries show high levels of IIT ranging from 47 percent to 93 percent in this category (average being 45 percent). SITC 1, Beverages and Tobacco, have only

three industries, showing above 50 percent IIT (average IIT in this category is 65 percent). Low levels of IIT are observed for SITC 2. SITC 3 and 4 have a few industries showing high and low values of IIT. SITC 525, 531, 532, 542, 513 579 show low levels of IIT and high inter-industry trade. A number of industries show high degree of IIT in this category, for example, Chemicals and related products show high intensity of IIT, particularly in SITC 554, 575, 581 and 582 and 592 (average IIT across these industries is about 46 percent). SITC 6, Manufactured Goods Classified by Material show high levels of IIT in many industries, value ranges from 50 percent to 96 percent (SITC 684 Aluminum). The average in this category is about 65 percent.

Table 3: New Zealand Intra-Industry Trade with the Australia at the 3-digit, SITC 2012.

SITC	Description	IITBi	Export (X) (000) US\$	Import (M) (000) US\$	Total Trade (X+M)	Trade balance (Xi-Mi)
001	Live Animals Other Than Animals Of Division 03	0.46	68816	20548	89364	48268
011	Meat Of Bovine Animals, Fresh, Chilled Or Frozen	0.84	13938	19190	33129	-5252
012	Meat, Other Than Of Bovine Animals, And Edible Offal, Fresh, Chilled Or Frozen	0.65	38513	18387	56901	20126
016	Meat And Edible Meat; Edible Flours And Meals Of Meat Or Meat Offal	0.08	134	3196	3330	-3062
017	Meat And Edible Meat Offal, Prepared Or Preserved N.E.S.	0.70	38265	20689	58953	17576
022	Milk And Cream And Milk Products Other Than Butter Or Cheese	0.76	72823	44614	117437	28210
023	Butter And Other Fats And Oils Derived From Milk	0.06	67283	2075	69358	65208
024	Cheese And Curd	0.15	182545	15262	197807	167283
025	Birds' Eggs And Egg Yolks, Fresh, Dried Or Otherwise Preserved, Sweetened Or Not; Egg Albumin	0.02	605	7	612	599
034	Fish, Fresh, Chilled Or Frozen	0.09	151381	7341	158722	144041
035	Fish, Dried, Slted R In Brine; Smkd Fish; Flours, Meals N Pellets R Fish, Fit F Human Consumptn	0.09	2178	106	2284	2072
036	Crustaceans Molluscs,Aqutc Invtbrts Frsh Ch Slted Etc	0.08	33598	1388	34986	32210
037	Fish, Crustaceans, Molluscs And Other Aquatic Invertebrates, Prepared Or Preserved, N.E.S.	0.16	38792	3275	42068	35517
041	Wheat (Including Spelt) And Meslin, Unmilled	0.00	5	151079	151084	-151074
042	Rice	0.01	60	17606	17666	-17545
043	Barley, Unmilled	0.00	0	3741	3741	-3741
044	Maize Unmilled	0.37	209	919	1129	-710
045	Cereals, Unmilled	0.01	124	25051	25175	-24928
046	Meal And Flour Of Wheat And Flour Of Meslin	0.01	24	4441	4465	-4417
047	Cereal Meals And Flours, N.E.S.	0.39	669	2761	3429	-2092
048	Cereal Preparations And Preparations Of Flour Or Starch Of Fruits Or Vegetables	0.84	131744	181143	312887	-49399
054	Vegetables; Roots, Tubers And Other Edible Vegetable Products, N.E.S.	0.18	89435	9107	98542	80327

056	Vegetables, Roots And Tubers, Prepared Or Preserved, N.E.S.	0.48	90652	28610	119262	62042
057	Fruit And Nuts	0.62	99612	45015	144627	54596
058	Fruit Preserved, And Fruit Preparations	0.82	44986	31179	76166	13807
059	Fruit Juices (Incl. Grape Must) And Vegetable Juices	0.91	17582	14749	32331	2832
061	Sugars, Molasses, And Honey	0.33	20544	104834	125378	-84290
062	Sugar Confectionery	0.81	57577	39494	97070	18083
071	Coffee And Coffee Substitutes	0.12	1889	29300	31190	-27411
072	Cocoa	0.07	59	1694	1753	-1636
073	Chocolate And Other Food Preparations Containing Cocoa, N.E.S.	0.76	71540	115791	187331	-44250
074	Tea And Mate	0.70	644	1183	1826	-539
075	Spices	0.43	576	2122	2698	-1546
081	Feeding Stuff For Animals (Not Including Unmilled Cereals)	0.53	45201	125340	170541	-80139
091	Margarine And Shortening	0.38	4080	17241	21320	-13161
098	Edible Products And Preparations, N.E.S.	0.77	359792	225192	584984	134601
Av IITBi and Totals		0.53	1745875	1333670	3079545	412205
111	Nonalcoholic Beverages, N.E.S.	0.73	90604	52160	142764	38444
112	Alcoholic Beverages	0.43	364718	98982	463700	265736
121	Tobacco, Unmanufactured; Tobacco Refuse	0.98	0	0	0	0
122	Tobacco, Manufactured (Whether Or Not Containing Tobacco Substitutes)	0.19	46410	4857	51267	41553
Av IITBi and Totals		0.47	501733	156000	657732	345733
211	Hides And Skins (Except Furskins), Raw	0.25	292	2065	2357	-1774
212	Furskins, Raw	0.00	17		17	17
222	Oil Seeds And Oleaginous Fruits	0.81	1131	1647	2778	-515
223	Oil Seeds And Oleaginous Fruits	0.58	845	2053	2898	-1208
231	Natural Rubber, Balata, Gutta-Percha, Guayule, Chicle And Similar Natural Gums	0.85	56	41	97	15
232	Synthetic Rubber; Reclaimed Rubber; Waste, Pairings And Scrap Of Unhardened Rubber	0.10	390	7070	7461	-6680
245	Fuel Wood (Excluding Wood Waste) And Wood Charcoal	0.00		213	213	-213
246	Wood In Chips Or Particles And Wood Waste	0.01	41	0	41	40
247	Wood In The Rough Or Roughly Squared	0.03	20	1421	1441	-1402
248	Wood, Simply Worked And Railway Sleepers Of Wood	0.06	195924	6540	202465	189384
251	Pulp And Waste Paper	0.00	48626	19	48646	48607
263	Cotton Textile Fibers	0.62	2	1	3	1
264	Jute And Other Textile Bast Fibers, N.E.S.	0.00		1	1	-1
265	Vegetable Textile Fibers (Other Than Cotton And Jute)	0.00		13	13	-13
266	Synthetic Fibers Suitable For Spinning	0.45	69	235	304	-166
267	Manmade Fibers, N.E.S. Suitable For Spinning And Waste Of Manmade Fibers	0.76	2	4	6	-1
268	Wool And Other Animal Hair (Including Wool Tops)	0.46	6260	1862	8122	4398
269	Worn Clothing And Other Worn Textile Articles; Rags	0.46	41	141	182	-99
272	Fertilizer, Crude, Except Those Of Division 56, (Imports Only)	0.70	144	268	413	-124
273	Stone, Sand And Gravel	0.20	1634	15110	16744	-13477

274	Sulfur And Unroasted Iron Pyrites	0.00		76	76	-76
277	Natural Abrasives, N.E.S. (Including Industrial Diamonds)	0.08	23	527	550	-504
278	Crude Minerals, N.E.S.	0.43	4658	16927	21585	-12269
281	Iron Ore And Concentrates	0.06	9094	264	9358	8830
282	Ferrous Waste And Scrap; Remelting Ingots Of Iron Or Steel	0.11	5467	326	5793	5140
283	Copper Ores And Concentrates; Copper Mattes; Cement Copper	0.00		0	0	0
285	Aluminum Ores And Concentrates (Including Alumina)	0.00	9	206199	206208	-206190
287	Ores And Concentrates Of Base Metals, N.E.S.	0.91	383	462	845	-78
288	Nonferrous Base Metal Waste And Scrap, N.E.S.	0.59	5126	2136	7261	2990
289	Ores And Concentrates Of Precious Metals	0.00		12049	12049	-12049
291	Crude Animal Materials, N.E.S.	0.70	8035	4329	12363	3706
292	Crude Vegetable Materials, N.E.S.	0.60	20279	8779	29058	11500
Av IITBi and Totals		0.11	308567	290779	599346	17788
321	Coal, Pulverized Or Not, But Not Agglomerated	0.00		1	1	-1
322	Briquettes, Lignite And Peat	0.69	220	415	635	-195
325	Coke And Semicoke	0.00		3401	3401	-3401
333	Petroleum Oils And Oils From Bituminous Minerals, Crude	0.25	1365174	198165	1563339	1167009
334	Petroleum Oils And Oils From Bituminous Minerals Residual Petroleum Products, N.E.S. And Related	0.77	126777	79788	206565	46990
335	Materials	0.09	46109	2186	48295	43922
342	Liquefied Propane And Butane	0.00	9471	6	9477	9465
343	Natural Gas, Whether Or Not Liquefied	0.00	2383		2383	2383
344	Petroleum Gases And Other Gaseous Hydrocarbons, N.E.S.	0.14	1147	89	1237	1058
Av IITBi and Totals		0.31	1551281	284052	1835333	1267229
411	Animal Oils And Fats	0.69	2446	1300	3746	1146
421	Fixed Vegetable Fats And Oils, Soft, Crude, Refined Or Fractionated	0.02	381	41490	41871	-41109
422	Fixed Vegetable Fats And Oils (Other Than Soft), Crude, Refined Or Fractionated	0.76	1561	953	2514	608
431	Animal Or Vegetable Fats And Oils Processed; Waxes And Inedible Mixtures	0.94	1250	1109	2358	141
Av IITBi and Totals		0.15	5637	44852	50489	-39215
511	Hydrocarbons, N.E.S. And Their Halogenated, Sulfonated, Nitrated Or Nitrosated Derivatives	0.07	16	434	450	-418
512	Alcohols, Phenols, Phenol-Alcohols And Their Derivatives	0.02	72	6522	6594	-6449
513	Carboxylic Acids And Anhydrides	0.96	2380	2190	4570	189
514	Nitrogen-Function Compounds	0.86	1945	1479	3424	466
515	Organo-Inorganic Compounds, Heterocyclic Compounds, Nucleic Acids And Their Salts	0.52	1695	4792	6487	-3097
516	Organic Chemicals, N.E.S.	0.52	1998	5642	7640	-3643
522	Inorganic Chemical Elements, Oxides And Halogen Salts	0.15	1738	21567	23305	-19828
523	Metallic Salts And Peroxysalts Of Inorganic Acids	0.24	1595	11721	13316	-10126
524	Inorganic Chemicals, N.E.S.; Organic And Inorganic Compounds Of Precious Metals	0.41	229	884	1113	-655
525	Radioactive And Associated Materials	0.01	3	1067	1070	-1064

531	Synthetic Organic Coloring Matter And Color Lakes And Preparations Based Thereon	0.42	1415	5271	6686	-3856
532	Dyeing And Tanning Extracts, And Synthetic Tanning Materials	0.04	33	1673	1706	-1640
533	Pigments, Paints, Varnishes And Related Materials Medicinal And Pharmaceutical Products, Other Than	0.57	35011	86922	121932	-51911
541	Medicaments (Of Group 542)	0.93	26557	30492	57049	-3935
542	Medicaments (Including Veterinary Medicaments)	0.49	56530	175714	232244	-119183
551	Essential Oils, Perfume And Flavor Materials Perfumery, Cosmetics, Or Toilet Preparations,	0.04	469	21137	21606	-20669
553	Excluding Soaps	0.63	32634	71793	104427	-39159
554	Soap, Cleansing And Polishing Preparations Fertilizers (Exports Include Group 272; Imports	0.87	61643	79347	140990	-17703
562	Exclude Group 272)	0.16	4050	47633	51683	-43582
571	Polymers Of Ethylene, In Primary Forms	0.25	2076	14278	16354	-12202
572	Polymers Of Styrene, In Primary Forms Polymers Of Vinyl Chloride Or Other Halogenated	0.29	261	1561	1822	-1300
573	Olefins, In Primary Forms	0.08	34	877	911	-843
574	Polyacetals, Other Polyethers And Epoxide Resins	0.43	3317	12218	15535	-8901
575	Plastics, N.E.S., In Primary Forms	0.19	4535	42400	46935	-37865
579	Waste, Parings And Scrap, Of Plastics	0.40	883	222	1105	662
581	Tubes, Pipes And Hoses Of Plastics	0.34	7083	34325	41407	-27242
582	Plates, Sheets, Film, Foil And Strip Of Plastics Monofilament With A Cross-Sectional Dimension	0.78	37008	57740	94748	-20731
583	Exceeding 1 Mm Insecticides, Fungicides, Herbicides, Plant Growth	0.42	529	1959	2488	-1431
591	Regulators, Etc Starches, Inulin And Wheat Gluten; Albuminoidal	0.65	106964	51126	158090	55839
592	Substances; Glues	0.72	40922	22918	63840	18004
593	Explosives And Pyrotechnic Products	0.02	70	7093	7163	-7023
597	Prepared Additives For Mineral Oils Etc.	0.02	215	17370	17585	-17154
598	Miscellaneous Chemical Products, N.E.S.	0.45	10848	37107	47955	-26259
Av IITBi and Totals		0.56	444758	877470	1322229	-432712
611	Leather Manufactures Of Leather Or Composition Leather,	0.02	14900	167	15066	14733
612	N.E.S.; Saddlery And Harness	0.99	364	369	733	-5
613	Furskins, Tanned Or Dressed Materials Of Rubber, Including Pastes, Plates, Sheets,	0.01	994	5	999	989
621	Rods, Thread, Tubes, Etc. Rubber Tires, Interchangeable Tire Treads, Tire Flaps	0.29	1624	9730	11353	-8106
625	And Inner Tubes For Wheels Of All Kinds	0.15	1770	22513	24283	-20744
629	Articles Of Rubber, N.E.S.	0.87	12961	9965	22925	2996
633	Cork Manufactures Veneers, Plywood, Particle Board, And Other Wood,	0.38	155	671	827	-516
634	Worked, N.E.S.	0.12	53741	3343	57084	50399
635	Wood Manufactures, N.E.S.	0.30	65872	11769	77641	54103
641	Paper And Paperboard Paper And Paperboard, Cut To Size Or Shape, And	0.85	127800	173964	301765	-46164
642	Articles Of Paper Or Paperboard	0.96	91322	99875	191196	-8553
651	Textile Yarn Cotton Fabrics, Woven (Not Including Narrow Or	0.42	34628	9209	43837	25419
652	Special Fabrics)	0.74	2221	1308	3530	913
653	Woven Fabrics Of Manmade Textile Materials	0.81	4607	6780	11387	-2173
654	Woven Fabrics Of Textile Materials	0.46	5800	1727	7527	4074

655	Knitted Or Crocheted Fabrics Tulles, Lace, Embroidery, Ribbons, Trimmings And	0.55	6825	2565	9390	4260
656	Other Small Wares Special Yarns, Special Textile Fabrics And Related	0.91	890	742	1632	148
657	Products Made-Up Articles, Wholly Or Chiefly Of Textile	0.95	14747	13342	28089	1405
658	Materials, N.E.S.	0.78	9518	14734	24252	-5216
659	Floor Coverings, Etc. Lime, Cement, And Fabricated Construction	0.57	96273	38077	134349	58196
661	Materials, Except Glass And Clay Materials Clay Construction Materials And Refractory	0.47	11117	3377	14494	7740
662	Construction Materials	0.09	869	18095	18964	-17226
663	Mineral Manufactures, N.E.S.	0.91	10431	12486	22917	-2055
664	Glass	0.27	3261	20680	23941	-17419
665	Glassware	0.14	1184	16313	17497	-15129
666	Pottery Pearls, Precious And Semiprecious Stones, Unworked	0.94	758	852	1610	-94
667	Or Worked Pig Iron And Spiegeleisen, Sponge Iron, Iron Or Steel	0.55	4190	11175	15365	-6985
671	Granules And Powders And Ferroalloys Iron Or Steel Ingots And Other Primary Forms, And	0.20	460	4240	4700	-3781
672	Semifinished Products Of Iron Or Steel Iron Or Nonalloy Steel Flat-Rolled Products, Not	0.03	12	930	943	-918
673	Clad, Plated Or Coated Iron And Nonalloy Steel Flat-Rolled Products, Clad,	0.64	55475	26064	81539	29411
674	Plated Or Coated	0.47	33539	10234	43773	23305
675	Alloy Steel Flat-Rolled Products Iron And Steel Bars, Rods, Angles, Shapes And	0.18	252	2480	2732	-2227
676	Sections, Including Sheet Piling Iron And Steel Rails And Railway Track Construction	0.97	64747	60572	125319	4174
677	Material	0.04	68	3094	3161	-3026
678	Iron And Steel Wire Iron And Steel Tubes, Pipes And Hollow Profiles,	0.67	2559	5082	7641	-2523
679	Fittings For Tubes And Pipes	0.52	11156	31540	42696	-20384
681	Silver, Platinum And Other Platinum Group Metals	0.18	102789	10117	112906	92672
682	Copper	0.47	24072	78474	102547	-54402
683	Nickel	0.03	5	267	271	-262
684	Aluminum	0.76	41400	67218	108618	-25818
685	Lead	0.56	580	1489	2069	-909
686	Zinc	0.00	34	18889	18924	-18855
687	Tin Miscellaneous Nonferrous Base Metals Employed In	0.00	1	807	808	-807
689	Metallurgy And Cermets Metal Structures And Parts, N.E.S., Of Iron, Steel Or	0.25	221	32	253	189
691	Aluminum	0.78	17579	27447	45026	-9868
692	Metal Containers For Storage Or Transport Wire Products (Excluding Insulated Electrical	0.75	16399	27452	43850	-11053
693	Wiring) And Fencing Grills Nails, Screws, Nuts, Bolts, Rivets And Similar	0.86	4105	5465	9570	-1360
694	Articles, Of Iron, Steel, Copper Or Aluminum	0.40	3998	16003	20001	-12005
695	Tools For Use In The Hand Or In Machines	0.72	21294	12057	33351	9237
696	Cutlery	0.81	1691	1156	2847	535
697	Household Equipment Of Base Metal, N.E.S.	0.66	13272	6512	19784	6760
699	Manufactures Of Base Metal, N.E.S.	0.96	78052	85306	163358	-7254

Av IITBi and Totals	0.65	1072581	1006761	2079342	65820
711 Steam Or Other Vapor Generating Boilers Thereof	0.19	1658	173	1831	1486
712 Steam Turbines And Other Vapor Turbines Internal Combustion Piston Engines And Parts	0.05	440	12	452	428
713 Thereof, N.E.S.	1.00	10538	10496	21034	42
714 Engines And Motors, Nonelectric	0.82	1313	1877	3190	-564
716 Rotating Electric Plant And Parts Thereof, N.E.S. Power Generating Machinery And Parts Thereof,	0.81	4156	6160	10316	-2004
718 N.E.S.	0.41	12805	3324	16129	9481
721 Agricultural Machinery (Excluding Tractors) And Parts Thereof	0.30	46434	8095	54530	38339
722 Tractors (Other Than Mechanical Handling Equipment)	0.20	1579	178	1757	1401
723 Civil Engineering And Contractors' Plant And Equipment	0.54	50615	18703	69317	31912
724 Textile And Leather Machinery, And Parts Thereof, N.E.S.	0.51	1114	3236	4350	-2122
725 Paper Mill And Pulp Mill Machinery, Paper Cutting Machines	0.96	1838	1981	3818	-143
726 Printing And Bookbinding Machinery, And Parts Thereof	0.86	3535	2643	6178	891
727 Food-Processing Machines (Excluding Domestic) Machinery And Equipment Specialized For Particular	0.60	14209	6067	20276	8142
728 Industries	0.80	35879	23863	59742	12016
731 Machine Tools Working By Removing Metal Or Other Material	0.80	3056	2042	5098	1014
733 Machine Tools For Working Metal, Sintered Metal Carbides Or Cermets	0.26	9997	1468	11465	8530
735 Parts And Accessories	0.98	1232	1181	2413	51
737 Metalworking Machinery	0.86	7228	5478	12705	1750
741 Heating And Cooling Equipment	0.31	124547	22865	147413	101682
742 Pumps For Liquids Pumps (Not For Liquids), Air Or Gas Compressors	0.93	19255	22188	41443	-2932
743 And Fans	0.90	20276	24923	45199	-4647
744 Mechanical Handling Equipment, And Parts Thereof, N.E.S.	0.48	63143	20167	83310	42975
745 Nonelectrical Machinery, Tools And Mechanical Apparatus	0.94	40342	35750	76092	4592
746 Ball Or Roller Bearings Taps, Cocks, Valves And Similar Appliances For	0.26	766	5023	5789	-4257
747 Pipes	0.73	10289	18092	28382	-7803
748 Transmission Shafts And Cranks Nonelectric Parts And Accessories Of Machinery,	0.86	6099	8093	14193	-1994
749 N.E.S.	0.76	2378	3896	6274	-1518
751 Office Machines Automatic Data Processing Machines And Units	0.79	3557	5396	8953	-1840
752 Thereof	0.52	25398	73113	98511	-47715
759 Parts And Accessories	0.88	9010	11581	20591	-2570
761 Tv Receivers	0.85	3920	5283	9202	-1363
762 Radio-Broadcast Receivers	0.52	218	614	832	-396
763 Sound Recorders Or Reproducers	0.92	4063	4789	8851	-726
764 Telecommunications Equipment	0.88	52244	41250	93494	10994
771 Electric Power Machinery Electrical Apparatus For Switching Or Protecting	0.60	35175	15230	50405	19945
772 Electrical Circuits	0.70	66880	36301	103181	30580

773	Equipment For Distributing Electricity, N.E.S. Electro-Diagnostic Apparatus For Medical, Surgical,	0.92	69907	60092	129999	9814
774	Dental Household Type Electrical And Nonelectrical	0.74	3330	5707	9037	-2377
775	Equipment, N.E.S.	0.81	49362	33810	83173	15552
776	Thermionic, Cold Cathode Or Photocathode Valve	0.43	15412	4163	19575	11249
778	Electrical Machinery And Apparatus, N.E.S.	0.59	64073	26583	90656	37491
781	Motor Cars And Other Motor Vehicles	0.12	16823	260810	277632	-243987
782	Motor Vehicles For The Transport Of Goods	0.40	22736	90637	113373	-67901
783	Road Motor Vehicles, N.E.S. Parts And Accessories For Tractors, Motor Cars And	0.71	1596	2873	4469	-1277
784	Other Motor Vehicles	0.84	34210	47191	81401	-12981
785	Motorcycles	0.46	9728	2936	12664	6792
786	Trailers And Semi-TrailersContainers	0.36	42143	9384	51527	32759
791	Railway Vehicles	0.33	2467	12477	14944	-10010
792	Aircraft And Associated Equipment	0.68	26669	13879	40548	12790
793	Ships, Boats And Floating Structures	0.78	28323	18161	46484	10162
Av IITBi and Totals		0.58	1081965	1040236	2122201	41729
811	Prefabricated Buildings Sanitary, Plumbing And Heating Fixtures And	0.28	6584	1070	7654	5514
812	Fittings, N.E.S.	0.14	379	5024	5403	-4646
813	Lighting Fixtures And Fittings, N.E.S.	0.84	17453	12613	30066	4839
821	Furniture And Parts Trunks, Suitcases, Vanity Cases, Binocular And	0.80	40938	27259	68196	13679
831	Camera Cases, Handbags, Wallets, Etc. Men'S Or Boys' Coats, Jackets, Suits, Trousers,	0.84	5959	4341	10301	1618
841	Shirts, Underwear Etc. Women'S Or Girls' Coats, Capes, Jackets, Suits,	0.10	30853	1704	32557	29149
842	Trousers, Dresses, Skirts, Underwear, Etc. Men'S Or Boys' Coats, Capes, Jackets, Suits, Blazers,	0.67	26470	13456	39926	13013
843	Trousers, Shirts, Etc. Women'S Or Girls' Coats, Capes, Jackets, Suits,	0.17	5358	513	5871	4845
844	Trousers, Dresses, Underwear, Etc. Articles Of Apparel, Of Textile Fabrics, Whether Or	0.33	22866	4548	27414	18319
845	Not Knitted Or Crocheted, N.E.S.	0.27	53427	8308	61735	45119
846	Clothing Accessories, Of Textile Fabrics	0.42	8264	2195	10459	6070
848	Articles Of Apparel And Clothing Accessories	0.63	7896	3616	11512	4279
851	Footwear	0.26	24198	3571	27768	20627
871	Optical Instruments And Apparatus, N.E.S.	0.49	1094	3350	4444	-2257
872	Instruments And Appliances	0.87	46046	60142	106188	-14096
873	Meters And Counters, N.E.S. Measuring, Checking, Analysing And Controlling	0.67	900	1775	2675	-875
874	Instruments And Apparatus, N.E.S.	0.95	31467	35124	66590	-3657
881	Photographic Apparatus And Equipment, N.E.S.	0.93	4087	4689	8776	-602
882	Photographic And Cinematographic Supplies	0.18	21697	2149	23846	19549
883	Cinematographic Film	0.15	17	1	19	16
884	Optical Goods, N.E.S.	0.29	4579	27458	32037	-22879
885	Watches And Clocks	0.76	2563	4207	6771	-1644
891	Arms And Ammunition	0.70	2683	5008	7691	-2326
892	Printed Matter	0.52	48241	136403	184644	-88162
893	Articles, N.E.S. Of Plastics	0.70	171065	92143	263208	78923
894	Baby Carriages, Toys, Games And Sporting Goods	0.40	17268	69154	86422	-51886

895	Office And Stationery Supplies, N.E.S.	0.71	1523	2746	4270	-1223
896	Works Of Art, Collectors' Pieces And Antiques	0.83	7973	5666	13638	2307
897	Jewelry	0.73	48641	28164	76805	20476
898	Musical Instruments	0.18	8812	89862	98675	-81050
899	Miscellaneous Manufactured Articles, N.E.S.	0.62	18244	40358	58602	-22114
Av IITBi and Totals		0.58	687544	696619	1384163	-9075
931	Special Transactions And Commodities Not Classified According To Kind	0.60	84192	36429	120621	47763
961	Coin (Other Than Gold Coin), Not Being Legal Tender	0.90	237	288	525	-51
971	Gold, Nonmonetary	0.11	450809	27460	478268	423349
Av IITBi and Totals		0.21	535238	64176	599414	471061

Source: UN Comtrade Database. Author's calculation

SITC 7 covers Machinery and Transport Equipment. A number of industries have high levels of IIT in this category as well. Telecommunication equipment and parts (SITC 764) Electrical Switches, fuses (772) show high IIT. High values range from 51 percent SITC 727 to above 90 percent in SITC 784, 786 and 792. On the industry side, New Zealand differs somewhat from other OECD nations. These two nations exchange different types of paper, carpets, screws, magazines, whiteware and tools; for example, within 3-digit SITC 729 (electrical apparatus), New Zealand tends to produce small electrical motors and switch gear, while Australia produces heavier dynamos and auto electrical equipment.

SITC 8 covers miscellaneous manufactured articles. There is also wide variation in IIT share across industries. For example, high IIT share in SITC 851 – „Footwear products“ and „Medical instruments“ SITC 872. Above 90 percent IIT are in SITC 844, 843 and 846 and 895. Textile and Apparel, men's and women's clothing and office equipment, stationary supplies and medical instruments seem to have further potential for growth in these industries. Telecommunication equipment and parts (SITC 764) Electrical Switches, fuses etc. (SITC 772) also have very high intra-industry trade.

New Zealand appears to have developed some unusual IIT relationships. Perhaps the most significant is the high level of IIT in SITC 0. In a sense, this indicates a marriage of the „old“ and „new“ trade. New Zealand continues to concentrate on her area of comparative advantage in food and food preparations, but has developed specific differentiation in a few products, processing them further. For example, 93 per cent of the trade with Australia in cereal products is IIT; the two countries exchange significant quantities of fruit and vegetables. A more familiar worldwide

phenomenon of IIT is the exchange of alcoholic beverages. New Zealand and Australia consume almost equal quantities of each other's beer and wine. In the era of protectionism, this would be regarded as a betrayal of loyalty to the domestic producer. Free traders regard it as a sign of increased consumer sovereignty (Bano and Lane 1995).

The New Zealand pattern of IIT is rather different from most of those hitherto examined for developed countries. It seems that, attempts to free up trade between the two nations, through NAFTA and CER, generated many conditions which are causative factors of intra-industry trade. The results support the propositions that IIT is likely to be more dominant in industries which have: a high degree of product differentiation, high capital intensity, rapid innovation, specific technology and economies of scale.

There are many other signs that Closer Economic Relations have begun to transform Trans-Tasman nations into a single 'domestic market' with regional specialisation. These two nations exchange different types of paper, carpets, screws, magazines, whiteware and tools; for example, within 3-digit SITC 729 (electrical apparatus), New Zealand tends to produce small electrical motors and switch gear, while Australia produces heavier dynamos and auto electrical equipment. Both countries are able to produce all types and in protected environment can do so. But the natural factors, coupled with the tariff free CER, has fostered trade generally, and IIT in particular, between the two countries.

As the discussed before, the HK table show the structure changes of intra-industry trade in each sector during 10 year period. For example, during the 1980 to 2012, the increases of export and import in industry "Miscellaneous manufactured articles" (SITC 8) are similar, because the HK index is 99.89%. It implies that the marginal trade in this period is almost intra-industry trade. On the other hand, the HK index for industry 3 (SITC) between 1980 and 2012 is only 5.65%, which means huge difference between increases of export and import. In other words, the marginal trade of industry 3 in this period is mainly inter-industry trade. Further, since the HK index is not defined when marginal export or import is negative.

Comparing the results of HK index and Ba index, the results are similar, the explanation of Ba index are also same as HK index. However, because Ba index doesn't have the limitation of HK index, those blanks in the first table are replaced by 0.

Table 4: The 10-Year Span Hamilton-Kniest MIIT Index of New Zealand-Australia in 1980-2012

HK	SITC 0	SITC 1	SITC 2	SITC 3	SITC 4	SITC 5	SITC 6	SITC 7	SITC 8	SITC 9
1990	0.75	0.36	0.63		0.17	0.53	0.90	0.73	0.58	
2000	0.76	0.64	0.15	0.06	0.04	0.75	0.78	0.72	1.00	0.05
2010	0.64	0.39	0.51		0.13	0.41	0.73	0.87	0.93	0.19
2012	0.95				0.10	0.93	0.16	0.20	0.63	

Source: UN COMTRADE Database. Author's Calculation.

Table 5: The 10-Year Span Brulhart MIIT Index of New Zealand-Australia in 1980-2012

Ba	SITC 0	SITC 1	SITC 2	SITC 3	SITC 4	SITC 5	SITC 6	SITC 7	SITC 8	SITC 9
1990	0.86	0.53	0.77	0.00	0.29	0.70	0.95	0.85	0.73	0.00
2000	0.86	0.78	0.26	0.11	0.08	0.86	0.88	0.84	1.00	0.10
2010	0.78	0.57	0.68	0.00	0.23	0.58	0.85	0.93	0.97	0.32
2012	0.97	0.00	0.00	0.00	0.17	0.97	0.28	0.33	0.77	0.95

Source: UN COMTRADE Database. Author's Calculation.

NEW ZEALAND'S IIT

Table 6 shows high and low degrees of IIT with Australia for the years 2012 and 2000. The estimates show high IIT in many industries in both years – however new industries have emerged in 2012 with high IIT intensities indicating product differentiation and technological advancements. The high level of IIT with Australia can be attributed to a number of country-specific factors including, its close geographical proximity, similar level of per capita income, similar level of development, similar consumer tastes, language, culture, institutional and political and transport links. (The theoretical arguments have been developed in the literature by Linder (1961), Grubel and Lloyd (1975), Gray (1973), Lancaster (1980), Krugman (1980), Balassa (1986), Marvel and Ray (1987), Bano (1991) and others). These results almost perfectly fit the theoretical profile outlined above. Correlation and regression results are reported in Appendix 3A and 3B.

Conclusions

The results of this study show that New Zealand's trade pattern has been changing over time. Inter-industry and intra-industry trade co-exist, but intra-industry trade as a proportion of total trade has been growing over the sample years 1980-2012. The results show that intra-industry trade has increased. IIT is highest with Australia. The results also suggest that bilateral trade flows between New Zealand and Australia have become more intense indicating trading relations are strengthening.

New Zealand and Australia seem to be „mutually dependent“ upon one another as a destination of their exports. The evidence seem to suggest that bilateral trade agreements (CER) and multilateral trade relations (APEC) have fostered trade generally, and IIT in particular. The results suggest that closer economic relations have positive impacts on New Zealand - Australia trade. The removal of trade barriers through bilateral, regional and multilateral negotiations has fostered intra-industry trade. Marginal Intra-industry trade demonstrates high degree of dynamic and structural changes in NZ-Australia trade patterns over time. There are some clear evidence that trade liberalisation does lead to greater structural adjustment in industries with low levels of intra-industry trade and less adjustments with high degree of IIT. The econometric results show that GDP, GDP per capita and market size are key country-specific factors.

These results may help to outline the effects of likely economic developments both in and between New Zealand –Australia and its Pacific-Asian trading partners. These findings also reveal that the intra-industry pattern stimulated by lowering barriers may differ from that conventionally established wisdom under protection regimes.

If closer ties between nations alter the composition of trade significantly, nations may need to adjust their policies towards closer economic relations. The readjustments taking place in Asia, the transition economies and the proposed Trans-Pacific Strategic Partnerships (TPP) will require further changes in world trading patterns and policy makers may consider the increasing part intra-industry trade is likely to play in the realignment of the world trading system.

Further questions to be addressed are:

1. What will be the future patterns of trade? Will intra-industry trade dominate inter-industry trade?
2. East Asia does not have formal customs union arrangements that are found in Europe and other regions. Does it matter?
3. APEC and East Asia do not have a collective trade policy whereas Europe has one. Does it matter?
4. Is comparative advantage shifting from traditional/natural sources?
5. Is the Flying Geese Model more applicable to explain the dynamic comparative advantage?
Can we apply this model in the case of South -Pacific nations? NZ-Australia being leaders

6. Is creation of comparative advantage in knowledge based industries the answer for future trading relations and increased prosperity for all nations?
7. The TPP will be potentially the largest regional group (aggrupation) of countries in the world. It includes the Pacific Rim countries of New Zealand, Singapore, Chile Brunei
8. (Current-original members), extended TPP will include the US, Japan, China, Canada, South Korea, Australia and Russia, plus some smaller but very dynamic economies from ASEAN member-countries, and the Latin American Mexico and Peru, among others. If it becomes a common market or free trade area (FTA), it will constitute the largest single such market in the world, dwarfing the EU, NAFTA, SAARC and ASEAN.

9. The potential benefits for any country from being part of the TPP are enormous. Take, as an example, the New Zealand dairy industry. A vast market that includes high-income countries like Japan, South Korea and the US, and rapidly-growing markets like China, will be opened up. It is a well-known fact that as peoples' incomes increase, they spend an increasing proportion on "quality food" like milk, cheese, beef and other dairy products. The downside, on the other hand, is that the same large market for dairy products will be available to other dairy-producing countries like the US, Australia and Argentina (assuming the last would be part of TPP). On the whole, however, the potential benefits for NZ, or at least for its dairy industry, from being part of TPP outweigh the costs.

Further comprehensive research should identify industry-specific and technology-specific determinants for high tech manufacturing and agricultural sectors.

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APPENDIX 1

Methodology

The purpose of this Appendix is to present the various methodologies used to measure the extent of intra-industry trade (IIT). A variety of measures have been proposed and discussed in the literature. For example, Balassa (1966), Grubel and Lloyd (1975), Aquino (1978 Greenaway and Milner (1981), Lloyd and Lee (2002) and others.

In 1975, Grubel and Lloyd defined IIT as the value of exports in an industry which is exactly matched by imports in the same industry. Its value is measured by:

$$G_i = (X_i + M_i) - |X_i - M_i| \quad (1)$$

Where G_i is the value of intra-industry trade and X_i and M_i are the values of exports and imports of industry 'i', or a given country for a given period.

Inter-industry trade is defined as:

$$S_i = |X_i - M_i| \quad (2)$$

If total trade is made up of intra-industry (G_i) and inter-industry (S_i) trade, IIT is clearly the value of total trade remaining when net trade $|X_i - M_i|$ has been accounted for.

To obtain an index which provides easy comparisons across countries and industries, values are expressed as percentages of each industry's (or country's) combined exports and imports. Inter-industry trade thus becomes:

$$BL_i = IT_i = \frac{|X_i - M_i|}{(X_i + M_i)} \times 100 \quad (3)$$

And intra-industry trade becomes:

$$ITT_{B_i} = \frac{(X_i + M_i) - |X_i - M_i|}{(X_i + M_i)} \times 100 \quad (4)$$

This measure is statistically pleasing as it provides a range from 0 to 100, with higher values representing higher levels of IIT. Grubel-Lloyd devised a summary measure to

calculate IIT across industries or countries at a given SITC product group levels of aggregation. The summary measure is a weighted average of IIT_i , the weight being the share of each industry in the country's total trade.

The Grubel-Lloyd summary measure is therefore:

$$IIT_B = \bar{B}_i = \frac{\sum_{i=1}^n (X_i + M_i) \sum_{i=1}^n |X_i - M_i|}{\sum_{i=1}^n (X_i + M_i)} \times 100 \quad (5)$$

where $IIT\bar{B}_i$ is the weighted average of the value of $IITB$ across industries, $i = 1 \dots n$, and n is the number of industries in the sample. $IIT\bar{B}_i$ is an accurate measure if there is balanced trade. However, if total trade (or the trade of that subset of industries we are measuring) is unbalanced, then the index is downward biased because the denominator is overstated. In such a situation the $IIT\bar{B}_i$ measure cannot attain its maximum value of 100%.

In order to avoid any bias introduced by unbalanced trade, the mean must be adjusted by removing this trade imbalance. In view of this Grubel and Lloyd devised the adjusted measure.

The Adjusted Measure is:

$$IIT_C = C_i = \frac{\sum_{i=1}^n (X_i + M_i) \sum_{i=1}^n |X_i - M_i|}{\sum_{i=1}^n (X_i + M_i) \left| \sum_{i=1}^n X_i - \sum_{i=1}^n M_i \right|} \times 100 \quad (6)$$

Note, C_i applies to aggregate trade flows only and does not have a counterpart at the level of an individual industry. In addition, when for all i either X_i exceeds M_i or falls short of it, $C_i = 100$, regardless of the size of these trade imbalances. (See Kol and Menness 1987, for detail).

AQUINO ADJUSTED MEASURE (1978)

Aquino argued that the adjustment should be made at each industry level rather than aggregate level. Aquino simulates balanced trade by calculating 'theoretical values' of exports and imports at the industry level:

$$X_i^e = \frac{0.5 \sum_{i=1}^n (X_i + M_i)}{\sum_{i=1}^n X_i} : M_i^e = M_i \frac{0.5 \sum_{i=1}^n (X_i + M_i)}{\sum_{i=1}^n M_i} \quad (7)$$

The derived values for exports (X_i^e) and imports (M_i^e) are applied to the Grubel-Lloyd measures in equations (4) and (5), to arrive at the corresponding measures IITQ_i at the industry level and IITQ for total trade.

The Aquino measure is:

$$IITQ = \frac{\sum_{i=1}^n (X_i + M_i) \sum_{i=1}^n |X_i^e - M_i^e|}{\sum_{i=1}^n (X_i + M_i)} \times 100 \quad (8)$$

Balassa Index:

$$\ddot{B}Li = \frac{1}{n} \sum_{i=1}^n \left[\frac{|X_i - M_i|}{X_i + M_i} \right] \quad (9)$$

$\ddot{B}Li$ is the Balassa measure of IIT, X_i and M_i are exports and imports of industry i .

This is unweighted average of the ratios $|X_i - M_i| / (X_i + M_i)$. It is, in fact a measure of inter-industry trade, IIT being residual. IIT increases as the value $\ddot{B}Li$ decreases, it varies from one to zero.

APPENDIX 2: Table 6

Table 6 New Zealand-Australia Intra Industry Trade by industry : 3-digit SITC, (High & Low IIT)					
2000			2012		
SITC	Description	IITBi	SITC	Description	IITBi
	High IITBi			High IITBi	
047	OTHER CEREAL MEAL,FLOURS	93.59	059	FRUIT, VEGETABLE JUICES	91.24
025	EGGS,BIRDS,YOLKS,ALBUMIN	90.14	048	SUGAR CONFECTIONERY	84.21
098	EDIBLE PROD.PREPRNTS,NES	84.80	011	FRUIT,PRESERVED,PREPARED	84.15
057	FRUIT,NUTS EXCL.OIL NUTS	82.02	058	MEAT,OFFL.PRPD,PRSVND,NES	81.87
058	FRUIT,PRESERVED,PREPARED	80.42	062	MILK AND CREAM	81.37
056	VEGETABLES,PRPD,PRSVND,NES	76.58	98	CEREAL PREPARATIONS	76.99
	CHOCOLATE,OTH.COCOA				
073	PREP	68.49	073	OTHER CEREAL MEAL,FLOURS	76.38
059	FRUIT, VEGETABLE JUICES	61.08	022	TEA AND MATE	75.98
062	SUGAR CONFECTIONERY	58.97	074	MAIZE UNMILLED	70.48
054	VEGETABLES	58.34	017	EDIBLE PROD.PREPRNTS,NES	70.19
022	MILK AND CREAM	55.95	012	FRUIT,NUTS EXCL.OIL NUTS	64.63
			057	VEGETABLES,PRPD,PRSVND,NES	62.25
			081	ANIMAL FEED STUFF	53.01
				CHOCOLATE,OTH.COCOA	
			056	PREP	47.98
			01	BOVINE MEAT	45.99
			075	LIVE ANIMALS	42.70
			047	VEGETABLES	39.00
	Low IITBi			Low IITBi	
011	BOVINE MEAT	47.21	061	SUGARS,MOLASSES,HONEY	32.77
081	ANIMAL FEED STUFF	45.14	054	VEGETABLES; ROOTS	18.48
048	CEREAL PREPARATIONS	45.00	037	FISH ETC.PREPD,PRSVND,NES	15.57
017	MEAT,OFFL.PRPD,PRSVND,NES	31.21	024	CHEESE AND CURD	15.43
037	FISH ETC.PREPD,PRSVND,NES	28.90	071	COFFEE,COFFEE SUBSTITUTE	12.12
001	LIVE ANIMALS	28.68	035	FISH,DRIED,SALTED,SMOKED	9.31
012	OTHER MEAT, MEAT OFFAL	23.66	034	FISH,FRESH,CHILLED,FROZN	9.25
	CRUSTACEANS,MOLLUSCS				
036	ETC	22.58	016	MEAT,ED.OFFL,DRY,SLT,SMK	8.04
				CRUSTACEANS,MOLLUSCS	
016	MEAT,ED.OFFL,DRY,SLT,SMK	20.83	036	ETC	7.93
072	COCOA	18.18	072	COCOA	6.70
	MARGARINE AND				
091	SHORTENING	18.00	023	BUTTER,OTHER FAT OF MILK	5.98
024	CHEESE AND CURD	12.69	025	EGGS,BIRDS,YOLKS,ALBUMIN	2.22
023	BUTTER,OTHER FAT OF MILK	11.93	046	MEAL AND FLOUR OF WHEAT	1.08
061	SUGARS,MOLASSES,HONEY	9.13	045	OTHER CEREALS, UNMILLED	0.98
075	SPICES	8.83	042	RICE	0.68
	MEAL,FLOUR OF				
046	WHEAT,MSLN	8.66	041	WHEAT, MESLIN, UNMILLED	0.01
074	TEA AND MATE	5.32	043	BARLEY, UNMILLED	0.00
044	MAIZE UNMILLED	3.85			
045	OTHER CEREALS, UNMILLED	3.04			
071	COFFEE,COFFEE SUBSTITUTE	1.70			
034	FISH,FRESH,CHILLED,FROZN	1.47			
122	High IITBi TOBACCO, MANUFACTURED	86.35	121	High IITBi TOBACCO,	98.01

Table 6 New Zealand-Australia Intra Industry Trade by industry : 3-digit SITC, (High & Low IIT)

2000			2012		
SITC	Description	IITBi	SITC	Description	IITBi
112	ALCOHOLIC BEVERAGES NON-	71.41	111	UNMANUFACTURED NON- ALCOHOL.BEVERAGE,NES	73.07
111	ALCOHOL.BEVERAGE,NES	51.03	112	ALCOHOLIC BEVERAGES	42.69
291	High IITBi CRUDE ANIMAL MATERLS.NES	89.79	287	High IITBi ORE,CONCENTR.BASE METALS	90.71
289	PREC.METAL ORES,CONCTRTS	84.65	231	NATURAL RUBBER, ETC.	85.07
288	NON-FERROUS WASTE,SCRAP	71.90	222	OILSEED(SFT.FIX VEG.OIL)	81.45
223	OILSEED(OTH.FIX.VEG.OIL)	66.56	267	MANMADE FIBERS	75.79
292	CRUDE VEG.MATERIALS, NES	66.25	291	CRUDE ANIMAL MATERLS.NES	70.02
272	FERTILIZERS, CRUDE	60.41	272	FERTILIZERS, CRUDE	69.96
			263	COTTON	61.97
			292	CRUDE VEG.MATERIALS, NES	60.42
			288	NON-FERROUS WASTE,SCRAP	58.83
266	Low IITBi SYNTHETIC FIBRES WORN	49.11	211	Low IITBi HIDES,SKINS(EX.FURS),RAW	24.74
269	CLOTHING,TEXTL.ARTL	42.11	273	STONE, SAND AND GRAVEL	19.51
278	OTHER CRUDE MINERALS	24.90	282	FERROUS WASTE AND SCRAP	11.27
277	NATURAL ABRASIVES, NES WOOD ROUGH,ROUGH	23.86	232	SYNTHETIC RUBBER, ETC.	10.46
247	SQUARED	23.36	277	NATURAL ABRASIVES, NES	8.42
267	OTHER MAN-MADE FIBRES	23.26	248	WOOD, SIMPLY WORKED	6.46
287	ORE,CONCENTR.BASE METALS	18.30	281	IRON ORE, CONCENTRATES WOOD ROUGH,ROUGH	5.64
268	WOOL, OTHER ANIMAL HAIR	12.15	247	SQUARED	2.71
282	FERROUS WASTE AND SCRAP	9.30	246	WOOD IN CHIPS, PARTICLES	0.83
273	STONE, SAND AND GRAVEL	8.87	251	PULP AND WASTE PAPER	0.08
222	OILSEED(SFT.FIX VEG.OIL)	7.21	285	ALUMINIUM ORE,CONCTR.ETC	0.01
211	HIDES,SKINS(EX.FURS),RAW	5.44	212	FURSKINS, RAW FUEL WOOD, WOOD	0.00
248	WOOD, SIMPLY WORKED	4.77	245	CHARCOAL	0.00
232	SYNTHETIC RUBBER, ETC.	1.95	264	TEXTILE BAST FIBERS	0.00
251	PULP AND WASTE PAPER	0.72	265	VEGETABLE TEXTILE FIBERS	0.00
			274	SULPHUR,UNRSTD.IRON PYRS	0.00
			283	COPPER ORES	0.00
			289	PREC.METAL ORES,CONCTRTS	0.00
333	High IITBi PETROLEUM OILS, CRUDE	64.37	334	High IITBi PETROLEUM PRODUCTS	77.25
322	BRIQUETTES,LIGNITE,PEAT	63.78	322	BRIQUETTES,LIGNITE,PEAT	69.31
334	Low IITBi PETROLEUM PRODUCTS	6.48	333	Low IITBi PETROLEUM OILS, CRUDE	25.35
335	RESIDUAL PETROL.PRODUCTS	3.18	344	PETROLEUM GASES, NES	14.44
			335	RESIDUAL PETROL.PRODUCTS	9.05
			342	LIQUEFIED PROPANE,BUTANE	0.13

Table 6 New Zealand-Australia Intra Industry Trade by industry : 3-digit SITC, (High & Low IIT)

2000			2012		
SITC	Description	IITBi	SITC	Description	IITBi
422	High IITBi FIXED VEG.FAT,OILS,OTHER	89.53	431	High IITBi ANIMAL,VEG.FATS,OILS,NES	94.04
431	ANIMAL,VEG.FATS,OILS,NES	59.18	422	FIXED VEG.FAT,OILS,OTHER	75.82
411	Low IITBi ANIMAL OILS AND FATS	35.82	411	Low IITBi ANIMAL OILS AND FATS	69.42
421	FIXED VEG.FAT,OILS, SOFT	0.75	421	FIXED VEG.FAT,OILS, SOFT	1.82
582	High IITBi PLASTIC PLATE,SHEETS,ETC OTHER CHEMICAL	94.59	513	High IITBi CARBOXYLIC ACIDS,DERIVTS	95.86
524	COMPOUNDS	92.60	541	MEDICINES,ETC.EXC.GRP542	93.10
554	SOAP,CLEANERS,POLISH,ETC	84.49	554	SOAP,CLEANERS,POLISH,ETC NITROGEN-	87.44
562	FERTILIZER,EXCEPT GRP272	69.54	514	FUNCT.COMPOUNDS	86.39
575	OTH.PLASTIC,PRIMARY FORM	66.61	582	PLASTIC PLATE,SHEETS,ETC	78.12
541	MEDICINES,ETC.EXC.GRP542 POLYACETAL,POLYCARBONA TE	62.24	592	STARCHES,INULIN,ETC.	71.80
574	56.75	591	INSECTICIDES, ETC.	64.68	
581	PLASTIC TUBE,PIPE,HOSE	55.48	553	PERFUMERY,COSMETICS,ETC.	62.50
516	OTHER ORGANIC CHEMICALS	54.88	533	PIGMENTS, PAINTS, ETC.	57.43
592	STARCHES,INULIN,ETC.	54.59	516	OTHER ORGANIC CHEMICALS ORGANO-INORGANIC COMPNDNS	52.31
			515	52.26	
			542	MEDICAMENTS	48.68
			598	MISC.CHEMICAL PRODTS.NES POLYACETAL,POLYCARBONA TE	45.24
			574	42.70	
			583	MONOFILAMENT OF PLASTICS	42.50
591	Low IITBi INSECTICIDES, ETC.	49.59	531	Low IITBi SYNTH.COLOURS,LAKES,ETC. OTHER CHEMICAL	42.32
593	EXPLOSIVES,PYROTECHNICS	49.28	524	COMPOUNDS	41.15
598	MISC.CHEMICAL PRODTS.NES	42.40	579	PLASTIC WASTE, SCRAP ETC	40.12
553	PERFUMERY,COSMETICS,ETC.	41.60	581	PLASTIC TUBE,PIPE,HOSE	34.21
512	ALCOHOL,PHENOL,ETC.DERIV	40.91	572	POLYMERS OF STYRENE	28.63
525	RADIO-ACTIVE MATERIALS ORGANO-INORGANIC COMPNDNS	38.69	571	POLYMERS OF ETHYLENE	25.39
515	NITROGEN-	35.04	523	METAL.SALTS,INORGAN.ACID	23.95
514	FUNCT.COMPOUNDS	33.47	575	OTH.PLASTIC,PRIMARY FORM	19.33
583	MONOFILAMENT OF PLASTICS	32.94	562	FERTILIZER,EXCEPT GRP272	15.67
533	PIGMENTS, PAINTS, ETC.	29.22	522	INORGANIC CHEM.ELEMENTS	14.92
597	PREPRD ADDITIVES,LIQUIDS	26.29	573	POLYMERS,VINYL CHLORIDE HYDROCARBONS,NES,DERIVT S	7.51
571	POLYMERS OF ETHYLENE	21.87	511	6.96	
551	ESSNTL.OIL,PERFUME,FLAVR	16.86	551	ESSNTL.OIL,PERFUME,FLAVR	4.34
542	MEDICAMENTS	16.28	532	DYEING,TANNING MATERIALS	3.87
572	POLYMERS OF STYRENE	15.80	597	PREPRD ADDITIVES,LIQUIDS	2.45
531	SYNTH.COLOURS,LAKES,ETC.	11.36	512	ALCOHOL,PHENOL,ETC.DERIV	2.19
573	POLYMERS,VINYL CHLORIDE	11.10	593	EXPLOSIVES,PYROTECHNICS	1.96

Table 6 New Zealand-Australia Intra Industry Trade by industry : 3-digit SITC, (High & Low IIT)

2000			2012		
SITC	Description	IITBi	SITC	Description	IITBi
579	PLASTIC WASTE, SCRAP ETC	5.87	525	RADIO-ACTIVE MATERIALS	0.50
522	INORGANIC CHEM.ELEMENTS	5.87			
513	CARBOXYLIC ACIDS,DERIVTS	3.75			
532	DYEING,TANNING MATERIALS	3.66			
523	METAL.SALTS,INORGAN.ACID	2.03			
511	HYDROCARBONS,NES,DERIVT S	0.86			
	High IITBi			High IITBi	
684	ALUMINIUM	96.71	612	MANUFACT.LEATHER ETC.NES	99.27
691	METALLIC STRUCTURES NES	95.96	676	IRON,STL.BAR,SHAPES ETC. MANUFACTS.BASE	96.67
696	CUTLERY	94.14	699	METAL,NES	95.56
695	TOOLS	90.79	642	PAPER,PAPERBOARD,CUT ETC	95.53
699	MANUFACTS.BASE METAL,NES	89.99	657	SPECIAL YARN,TXTL.FABRIC	95.00
612	MANUFACT.LEATHER ETC.NES	89.30	666	POTTERY MINERAL	94.16
693	WIRE PRODUCTS EXCL.ELECT	87.31	663	MANUFACTURES,NES	91.03
621	MATERIALS OF RUBBER	86.46	656	TULLE,LACE,EMBROIDRY.ETC	90.91
673	FLAT-ROLLED IRON ETC.	82.13	629	ARTICLES OF RUBBER, NES	86.93
674	FLAT-ROLLED PLATED IRON	81.96	693	WIRE PRODUCTS EXCL.ELECT	85.79
641	PAPER AND PAPERBOARD	78.44	641	PAPER AND PAPERBOARD	84.70
682	COPPER	78.08	696	CUTLERY	81.22
629	ARTICLES OF RUBBER, NES	75.82	653	FABRICS,MAN-MADE FIBRES	80.92
697	HOUSEHOLD EQUIPMENT,NES	73.38	658	TEXTILE ARTICLES NES	78.49
658	TEXTILE ARTICLES NES	72.04	691	METALLIC STRUCTURES NES	78.08
692	CONTAINERS,STORAGE,TRNSP	71.67	684	ALUMINIUM	76.23
633	CORK MANUFACTURES	71.45	692	CONTAINERS,STORAGE,TRNSP	74.79
654	OTH.TEXTILE FABRIC,WOVEN	65.30	652	COTTON FABRICS, WOVEN	74.13
656	TULLE,LACE,EMBROIDRY.ETC	64.78	695	TOOLS	72.30
665	GLASSWARE	64.59	678	WIRE OF IRON OR STEEL	66.98
613	FURSKINS,TANNED,DRESSED	63.09	697	HOUSEHOLD EQUIPMENT,NES	65.83
666	POTTERY	62.87	673	FLAT-ROLLED IRON ETC.	63.93
642	PAPER,PAPERBOARD,CUT ETC	61.81	659	FLOOR COVERINGS, ETC.	56.68
659	FLOOR COVERINGS, ETC.	61.01	685	LEAD	56.05
635	WOOD MANUFACTURES, NES	60.68	655	KNIT.CROCHET.FABRIC NES	54.63
663	MINERAL MANUFACTURES,NES	57.52	667	PEARLS,PRECIOUS STONES	54.54
625	RUBBER TYRES,TUBES,ETC.	57.26	679	TUBES,PIPES,ETC.IRON,STL	52.26
679	TUBES,PIPES,ETC.IRON,STL	54.56			
611	LEATHER	53.94			
652	COTTON FABRICS, WOVEN	52.34			
	Low IITBi			Low IITBi	
657	SPECIAL YARN,TXTL.FABRIC	49.86	682	COPPER	46.95
655	KNIT.CROCHET.FABRIC NES	44.63	674	FLAT-ROLLED PLATED IRON	46.76
651	TEXTILE YARN	41.11	661	LIME,CEMENT,CONSTR.MATR L	46.60
685	LEAD	39.85	654	OTH.TEXTILE FABRIC,WOVEN	45.88

Table 6 New Zealand-Australia Intra Industry Trade by industry : 3-digit SITC, (High & Low IIT)

2000			2012		
SITC	Description	IITBi	SITC	Description	IITBi
653	FABRICS,MAN-MADE FIBRES	30.70	651	TEXTILE YARN	42.01
634	VENEERS, PLYWOOD, ETC.	23.30	694	NAILS,SCREWS,NUTS,ETC.	39.98
681	SILVER,PLATINUM,ETC.	15.89	633	CORK MANUFACTURES	37.53
694	NAILS,SCREWS,NUTS,ETC.	15.23	635	WOOD MANUFACTURES, NES	30.32
675	FLAT-ROLLED, ALLOY STEEL	14.94	621	MATERIALS OF RUBBER	28.60
678	WIRE OF IRON OR STEEL	14.02	664	GLASS	27.24
664	GLASS	12.72	689	MISC.NON-FERR.BASE METAL	25.34
686	ZINC	12.36	671	PIG IRON,SPIEGELEISN,ETC	19.56
661	LIME,CEMENT,CONSTR.MATR L	10.55	675	FLAT-ROLLED, ALLOY STEEL	18.47
672	INGOTS ETC.IRON OR STEEL CLAY,REFRCT.CONSTR.MATR L	8.70	681	SILVER,PLATINUM,ETC.	17.92
662	L	7.50	625	RUBBER TYRES,TUBES,ETC.	14.58
689	MISC.NON-FERR.BASE METAL	7.09	665	GLASSWARE	13.54
676	IRON,STL.BAR,SHAPES ETC.	6.89	634	VENEERS, PLYWOOD, ETC. CLAY,REFRCT.CONSTR.MATR L	11.71
667	PEARLS,PRECIOUS STONES	3.15	662	L	9.16
677	RAILWAY TRACK IRON,STEEL	1.62	677	RAILWAY TRACK IRON,STEEL	4.29
687	TIN	0.61	683	NICKEL	3.46
			672	INGOTS ETC.IRON OR STEEL	2.63
			611	LEATHER	2.21
			613	FURSKINS,TANNED,DRESSED	1.07
			686	ZINC	0.36
	High IITBi			High IITBi	
792	AIRCRAFT,ASSOCTD.EQUIPNT	99.14	713	INTRNL COMBUS PSTN ENGIN	99.80
723	CIVIL ENGINEERING EQUIPT PARTS,TRACTORS,MOTOR VEH	98.40	735	PARTS,NES,FOR MACH-TOOLS	97.90
784	TAPS,COCKS,VALVES,ETC.	97.36	725	PAPER,PULP MILL MACHINES	96.25
747	TRAILERS,SEMI-TRAILR,ETC	96.94	745	OTH.NONELEC MCH,TOOL,NES	93.96
786	OTH.MACH,PTS,SPCL INDUST	96.77	742	PUMPS FOR LIQUIDS,PARTS	92.92
728	OTH.POWR.GENRTNG.MACHN RY	95.71	773	ELECTR DISTRIBT.EQPT NES SOUND	92.45
718	MECHANICAL HANDLNG EQUIP	95.33	763	RECORDER,PHONOGRPH	91.80
744	ELEC.SWITCH.RELAY.CIRCUT	92.25	743	PUMPS NES,CENTRIFUGS ETC	89.72
772	NON-ELECT MACH.PARTS,ETC	89.87	764	TELECOMM.EQUIP.PARTS NES	88.24
749		89.39	759	PARTS,FOR OFFICE MACHINS METALWORKING MACHNRY	87.52
785	CYCLES,MOTORCYCLES ETC.	89.27	737	NES	86.23
778	ELECTRIC.MACH.APPART.NES	89.16	748	TRANSMISSIONS SHAFTS ETC PRINTNG,BOOKBINDNG	85.95
745	OTH.NONELEC MCH,TOOL,NES	86.79	726	MACHS	85.57
773	ELECTR DISTRIBT.EQPT NES	86.50	761	TELEVISION RECEIVERS ETC PARTS,TRACTORS,MOTOR VEH	85.19
748	TRANSMISSIONS SHAFTS ETC	86.35	784	VEH	84.05
764	TELECOMM.EQUIP.PARTS NES ELECT POWER	79.34	714	ENGINES,MOTORS NON-ELECT	82.33
771	MACHNY.PARTS	79.14	775	DOM.ELEC,NON-ELEC.EQUIPT	81.30
735	PARTS,NES,FOR MACH-TOOLS PRINTNG,BOOKBINDNG	76.05	716	ROTATING ELECTRIC PLANT METAL REMOVAL WORK	80.57
726	MACHS	73.66	731	TOOLS	80.12

Table 6 New Zealand-Australia Intra Industry Trade by industry : 3-digit SITC, (High & Low IIT)

2000			2012		
SITC	Description	IITBi	SITC	Description	IITBi
711	STEAM GENER. BOILERS, ETC.	69.63	728	OTH. MACH, PTS, SPCL INDUST	79.89
759	PARTS, FOR OFFICE MACHINS	66.28	751	OFFICE MACHINES	79.45
725	PAPER, PULP MILL MACHINES	63.36	793	SHIP, BOAT, FLOAT. STRUCTRS	78.14
742	PUMPS FOR LIQUIDS, PARTS	62.43	749	NON-ELECT MACH. PARTS, ETC	75.81
743	PUMPS NES, CENTRIFUGS ETC	60.34	774	ELECTRO-MEDCL, XRAY EQUIP	73.70
793	SHIP, BOAT, FLOAT. STRUCTRS	55.60	747	TAPS, COCKS, VALVES, ETC.	72.51
775	DOM. ELEC, NON-ELEC. EQUIPT FOOD-PROCESS. MCH. NON	55.54	783	ROAD MOTOR VEHICLES NES	71.42
727	DOM	51.08	772	ELEC. SWITCH. RELAY. CIRCUIT	70.36
741	HEATNG, COOLNG EQUIP, PART	50.55	792	AIRCRAFT, ASSOCTD. EQUIPNT ELECT POWER	68.46
			771	MACHNY. PARTS FOOD-PROCESS. MCH. NON	60.43
			727	DOM	59.85
			778	ELECTRIC. MACH. APPART. NES	58.64
			723	CIVIL ENGINEERING EQUIPT RADIO-BROADCAST	53.96
			762	RECEIVER	52.36
	Low IITBi			Low IITBi	
733	MACH-TOOLS, METAL- WORKING	49.80	752	AUTOMATC. DATA PROC. EQUIP	51.56
714	ENGINES, MOTORS NON-ELECT	49.76	724	TEXTILE, LEATHER MACHINES MECHANICAL HANDLNG	51.21
721	AGRIC. MACHINES, EX. TRACTR	45.79	744	EQUIP	48.42
774	ELECTRO-MEDCL, XRAY EQUIP	44.58	785	CYCLES, MOTORCYCLES ETC.	46.37
724	TEXTILE, LEATHER MACHINES	43.81	776	TRANSISTORS, VALVES, ETC. OTH. POWR. GENRTNG. MACHN	42.53
713	INTRNL COMBUS PSTN ENGIN	40.51	718	RY	41.22
783	ROAD MOTOR VEHICLES NES SOUND	38.11	782	GOODS, SPCL TRANSPORT VEH	40.11
763	RECORDER, PHONOGRPH METALWORKING MACHNRY	35.62	786	TRAILERS, SEMI-TRAILR, ETC	36.42
737	NES METAL REMOVAL WORK	32.41	791	RAILWAY VEHICLES. EQUIPNT	33.02
731	TOOLS	29.37	741	HEATNG, COOLNG EQUIP, PART	31.02
751	OFFICE MACHINES	28.21	721	AGRIC. MACHINES, EX. TRACTR	29.69
776	TRANSISTORS, VALVES, ETC.	27.38	746	BALL OR ROLLER BEARINGS MACH-TOOLS, METAL-	26.46
716	ROTATING ELECTRIC PLANT	26.23	733	WORKING	25.60
782	GOODS, SPCL TRANSPORT VEH AUTOMATC. DATA	23.76	722	TRACTORS	20.27
752	PROC. EQUIP	21.47	711	STEAM GENER. BOILERS, ETC.	18.87
746	BALL OR ROLLER BEARINGS RADIO-BROADCAST	21.26	781	PASS. MOTOR VEHCLS. EX. BUS	12.12
762	RECEIVER	11.47	712	STEAM TURBINES	5.26
712	STEAM TURBINES	2.76			
791	RAILWAY VEHICLES. EQUIPNT	2.70			
781	PASS. MOTOR VEHCLS. EX. BUS	0.14			
	High IITBi			High IITBi	
845	OTHR. TEXTILE APPAREL, NES	99.27	874	MEASURE, CONTROL INSTRMNT	94.51

Table 6 New Zealand-Australia Intra Industry Trade by industry : 3-digit SITC, (High & Low IIT)

2000			2012		
SITC	Description	IITBi	SITC	Description	IITBi
846	CLOTHING ACCESSRS,FABRIC WOMEN,GIRLS	96.53	881	PHOTOGRAPH APPAR.ETC.NES	93.14
844	CLOTHNG.KNIT	95.28	872	MEDICAL INSTRUMENTS NES	86.73
895	OFFICE,STATIONERY SUPPLS MEASURE,CONTROL	94.69	831	TRUNK,SUIT-CASES,BAG,ETC	84.30
874	INSTRMNT	89.70	813	LIGHTNG FIXTURES ETC.NES	83.90
872	MEDICAL INSTRUMENTS NES	85.44	896	WORKS OF ART,ANTIQUE ETC	83.09
843	MENS,BOYS CLOTHING,KNIT	82.58	821	FURNITURE,CUSHIONS,ETC.	79.94
897	GOLD,SILVERWARE,JEWL NES WOMEN,GIRL	80.61	885	WATCHES AND CLOCKS	75.72
842	CLOTHNG,XKNIT	78.51	897	GOLD,SILVERWARE,JEWL NES	73.34
893	ARTICLES,NES,OF PLASTICS	76.67	895	OFFICE,STATIONERY SUPPLS	71.36
821	FURNITURE,CUSHIONS,ETC.	76.27	893	ARTICLES,NES,OF PLASTICS	70.02
813	LIGHTNG FIXTURES ETC.NES CLOTHNG,NONTXTL;HEADGE	76.13	891	ARMS AND AMMUNITION WOMEN,GIRL	69.76
848	AR	74.13	842	CLOTHNG,XKNIT	67.41
851	FOOTWEAR	69.92	873	METERS,COUNTERS,NES CLOTHNG,NONTXTL;HEADGE	67.30
831	TRUNK,SUIT-CASES,BAG,ETC MISC MANUFCTRD GOODS	69.60	848	AR	62.83
899	NES	62.10	899	MISC MANUFCTRD GOODS NES	62.26
811	PREFABRICATED BUILDINGS	61.93	892	PRINTED MATTER	52.25
841	MENS,BOYS CLOTHNG,X-KNIT	61.63	871	OPTICAL INSTRUMENTS,NES	49.22
896	WORKS OF ART,ANTIQUE ETC	50.30	846	CLOTHING ACCESSRS,FABRIC	41.97
	Low IITBi			Low IITBi	
891	ARMS AND AMMUNITION	49.32	894	BABY CARRIAGE,TOYS,GAMES	39.96
894	BABY		844	WOMEN,GIRLS CLOTHNG.KNIT	33.18
892	CARRIAGE,TOYS,GAMES	37.65	884	OPTICAL GOODS NES	28.59
873	PRINTED MATTER	31.47	811	PREFABRICATED BUILDINGS	27.96
871	METERS,COUNTERS,NES	28.81	845	OTHR.TEXTILE APPAREL,NES	26.91
812	OPTICAL INSTRUMENTS,NES	17.02	851	FOOTWEAR	25.72
812	PLUMBNG,SANITRY,EQPT.ETC	8.61	882	PHOTO.CINEMATOGRPH.SUPP L	18.02
898	MUSICAL INSTRUMENTS,ETC.	7.81	898	MUSICAL INSTRUMENTS,ETC.	17.86
883	CINE.FILM EXPOSD.DEVELPD	6.41	843	MENS,BOYS CLOTHING,KNIT	17.46
881	PHOTOGRAPH APPAR.ETC.NES	5.65	883	CINE.FILM EXPOSD.DEVELPD	14.57
885	WATCHES AND CLOCKS	4.13			
882	PHOTO.CINEMATOGRPH.SUPP L	3.73	812	PLUMBNG,SANITRY,EQPT.ETC	14.02
884	OPTICAL GOODS NES	0.65	841	MENS,BOYS CLOTHNG,X-KNIT	10.47
	High IITBi			High IITBi	
961	COIN NONGOLD NONCURRENT	66.67	961	COIN NONGOLD NONCURRENT	90.30
	Low IITBi			Low IITBi	
971	GOLD,NONMONTRY EXCL ORES	11.96	971	GOLD,NONMONTRY EXCL ORES	11.48
931	SPEC.TRANSACTION NOT CLASSD	0.61			

Source: UN COMTRADE Database. Own Estimations.

APPENDIX 3 A

Correlation

	<i>IITB</i>	<i>IITC</i>	<i>IITQ</i>
ald	0.77	0.82	0.78
ams	0.71	0.77	0.72
msd	0.53	0.57	0.54

To test the country specific factors, the following models are used for all three IIT indices. ALD is the indicator of development level, AMS is the indicator of average market size, and MSD stands for market size difference between the two countries.

$$\begin{aligned}
 IIT &= \alpha + \beta ALD + \varepsilon \\
 IIT &= \alpha + \beta AMS + \varepsilon \\
 IIT &= \alpha + \beta MSD + \varepsilon
 \end{aligned}$$

Where α is the constant coefficient, β is the coefficient for each regressors. The regressors for each year are defined as following:

$$\begin{aligned}
 ALD &= \frac{GDP/K_{NZ} + GDP/K_{AU}}{2} \\
 AMS &= \frac{GDP_{NZ} + GDP_{AU}}{2} \\
 MSD &= |GDP/K_{NZ} - GDP/K_{AU}|
 \end{aligned}$$

The regression results are summarized in the following table. The results for IITB, IITC and IITQ are consistent with each other, though the coefficients are slightly different. However, the key point here is the sign of coefficients of each indicator. The result implies that in the NZ-Australia case, IIT is positive related to development level, average market size and market size different. Therefore, the hypotheses one and two of country specific factors are supported by the NZ-Australia evidence, but the hypothesis 4 is denied by our result.

APPENDIX 3 B

Regression Results

Regressor	HT _B			HT _C			HT _Q		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
ALD	0.000977*** (0.0001)			0.000745*** (0.0001)			0.000876*** (0.0001)		
AMS		0.000059*** (0.000009)			0.0000457*** (0.00001)			0.000053*** (0.00001)	
MSD			0.00147*** (0.0004)			0.00113*** (0.0003)			0.00133*** (0.0003)
α	22.28*** (2.27)	25.66*** (2.19)	29.66*** (2.56)	33.42*** (1.45)	35.92*** (1.42)	39.01*** (1.78)	25.22*** (1.99)	28.28*** (1.92)	31.79*** (2.26)

Summary Statistics and Joint Tests

F-Statistics	66.53	47.95	17.33	95.08	68.80	21.21	69.72	50.19	18.10
SER	9.41	10.43	12.59	6.01	6.73	8.74	8.24	9.14	11.12
\bar{R}^2	0.59	0.50	0.26	0.67	0.59	0.31	0.60	0.51	0.27
N	47	48	47	47	48	47	47	48	47

Notes: *** significant at 0.1%, **significant at 0.5% and * significant at 1%