

# An Updated Look at New Zealand's Comparative Advantage

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## Abstract

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This paper updates Ballingall and Briggs' 2002 analysis of New Zealand's revealed comparative advantage (RCA) in order to inform economic development policy. It extends Ballingall and Briggs by analysing merchandise exports in more detail and including services exports. New Zealand's exports continue to be concentrated in sectors with slower than average world growth. New Zealand's strongest revealed comparative advantage is still largely in processed and unprocessed products from the food and fibre sectors. The more detailed analysis also reveals a strong comparative advantage in a number of niche manufactures. The services analysis indicates a comparative advantage in certain services, for example tourism.

**JEL Classification:F14**

**Keywords: revealed comparative advantage, exports, industry policy**

## Executive Summary

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This paper updates the analysis of New Zealand's revealed comparative advantage and changes in New Zealand's exports relative to world exports published by Ballingall and Briggs in 2002. It extends Ballingall and Briggs by analysing merchandise exports in more detail, and including services exports.

Ballingall and Briggs analysed 'snapshots' of New Zealand's export structure in 1985 and 1999 and the changes between the two snapshot years. This paper focuses primarily on New Zealand's export structure in 2007 (the year before international trade patterns were affected by the global financial crisis) and how this has changed since 1999 (the end point of the Ballingall and Briggs analysis).

The updated analysis supports Ballingall and Briggs' findings in that New Zealand's strongest revealed comparative advantage is still largely in processed or unprocessed products sourced from the agriculture, horticulture, fishing or forestry industries.

New Zealand also has a high revealed comparative advantage in a variety of other manufactured products. Conducting the analysis at a lower level of disaggregation provides a sharper focus on the products with a high revealed comparative advantage and allows us to identify niche performers within broader categories that do not have an overall revealed comparative advantage.

By value, products with a revealed comparative advantage accounted for 86% of New Zealand's merchandise exports (excluding re-exports) in 2007. In 2007, New Zealand had a revealed comparative advantage (higher than average market share<sup>1</sup>) in more than 600 different products, including 387 non-food manufactures. These are the commodities where we have "punched above our weight" - where New Zealand's share of world trade is higher than our overall share of world trade.

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<sup>1</sup> The term "market share" has been used in this paper as shorthand for "share of world exports". It does not account for domestic supply of goods and services.

New Zealand gained and lost a revealed comparative advantage in more than 200 products between 1999 and 2007. This suggests that New Zealand exporters are continually responding to changing market demands and opportunities. It takes time to build a strong comparative advantage, however – just 24 products went from no comparative advantage in 1999 to a strong comparative advantage (RCA index over 500) in 2007 and only 15 of these were valued at over \$5m by 2007. This suggests that policy makers should take a long term perspective.

New Zealand's merchandise exports grew more slowly than world exports between 1999 and 2007 (as they did between 1985 and 1999). It was not alone in losing market share and in fact held its own relatively well compared to other OECD countries. The fall in OECD countries' share of world exports of goods reflects an increase in China's share of merchandise exports.

If exports of each product had grown at the same rate as world exports of that product between 1999 and 2007, New Zealand's exports would have been US\$561 million higher in 2007. But the additional US\$561 million would still have fallen short of what was required for New Zealand merchandise exports to grow as fast as world exports overall; to achieve this New Zealand's exports needed to be US\$3.2 billion higher in 2007.

This shortfall reflects the concentration of New Zealand's exports in sectors with slower than average world growth. By value, 69% of New Zealand's merchandise exports were of products that recorded slower than average world growth between 1999 and 2007. Just 20% of New Zealand's export value came from products where New Zealand had a comparative advantage in 2007 and world exports grew faster than average between 1999 and 2007.

Ballingall and Briggs recommended a focus on "potential stars" that are currently underachieving – losing market share in high growth markets – and also have a comparative advantage. If each of the products in this category had kept up with world growth, exports would have been US\$1.5 billion higher in 2007, just under half of the additional US\$3.2 billion needed for total New Zealand's exports to keep pace with total world exports between 1999 and 2007. If, however, they had matched the

growth of the “stars” (25.8% per annum overall rather than 6.8% per annum), they would have added over \$4 billion to New Zealand’s exports.

This paper extends the analysis to services exports, although this analysis is less detailed and less robust due to limited data. New Zealand’s exports of services grew more slowly than world exports of services. We have maintained a comparative advantage in travel exports (spending by business visitors, international students and other non-resident visitors in New Zealand) and personal, cultural and recreational services (including audiovisual services and education services provided abroad) between 2000 and 2007. The data does not allow us to drill down to detailed service types and identify niche performers as we did for goods exports.

The Ballingall and Briggs paper proposed a policy focus on the “potential stars” – products where New Zealand has a comparative advantage (existing strength), world exports are growing faster than average and New Zealand has been losing market share. We agree there is merit in building on existing strengths, and fast-growing world markets may signal opportunities for growth. However further work is warranted on, for example, why the “stars” have done so well and what has constrained the growth of the “potential stars”.

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# An Updated Look at New Zealand's Comparative Advantage

## 1. Introduction

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### 1.1. Policy context

The Government has set an ambitious goal to increase the ratio of exports to GDP from around 30% to 40% by 2025. This recognises that increasing exports and international linkages are critical to its key priority of “building a more competitive and productive economy”. Such connections are particularly important for a geographically small and remote country.

The small size of our domestic market constrains New Zealand businesses' growth. Selling goods and services overseas allows them to benefit from economies of scale and to specialise in areas where they have an advantage. International connections also allow them to access resources, knowledge and ideas that can boost innovation and productivity.

New Zealand's current exports to GDP ratio is about the OECD average, but well below similar-sized OECD economies. To increase our exports to 40% of GDP by 2025, the value of our exports will need to double in real terms. This will require a shift of resources towards goods and services for international markets and more internationally competitive businesses in both the commodity and high-value technology-based sectors (Ministry of Business, Innovation and Employment, 2012).

The OECD has advised that “productivity and economic growth depend crucially on a country's ability to transfer resources from businesses with low value added to those with high value added” and “to the extent that such businesses can repeat their



success in overseas markets, national output will grow faster still“. They also advise that “high value added businesses tend to exhibit one or more of the following characteristics”:

- “They have a unique long-term source of **competitive advantage** which is difficult for prospective competitors to replicate or overcome”
  - “They are successful serial innovators able to generate temporary spells of **competitive advantage** which are constantly refreshed by the continuous introduction of new products and/or services”
  - “They operate in **rapidly growing markets** in which demand tends to outpace supply and the rates of innovation, technological change, learning by doing and creation of economies of scale and scope are all rapid.”
- (OECD, 2007, p222)

Exports data allows us to analyse revealed comparative advantage (an indicator of competitive advantage, see concepts and definitions below) and the growth in the international market for export goods and services.

## 1.2. Background

Ballingall and Briggs’ 2002 paper highlighted New Zealand’s slower than average export growth between 1985 and 1999, and attributed this to the concentration of our export profile in products with slower than average world export growth. They also found that New Zealand’s comparative advantage remained largely in agricultural, horticultural and forestry-based products.

They recommended that more emphasis should be placed on improving efficiency and encouraging innovation in the industries in which we already have a comparative advantage, rather than searching for solutions in industries in which New Zealand will not be competitive. More specifically, they suggested a policy focus on lifting growth in those sectors where New Zealand has a comparative advantage and world exports are growing above average, but New Zealand’s exports are not yet growing as fast as world exports (i.e. not demand constrained).

This paper updates the Ballingall and Briggs analysis to help inform thinking about where industry policy might focus. It analyses New Zealand’s revealed comparative

advantage in the year ended December 2007 and changes in New Zealand's exports relative to world exports between the year ended December 1999 and the year ended December 2007. The 1999 starting point was chosen because it was the end point of the Ballingall and Briggs analysis and 2007 was chosen because it was the year before trade patterns were disrupted by the Global Financial Crisis. These two calendar years also approximate the two most recent peaks in the growth cycles<sup>2</sup> identified in Statistics New Zealand's *Productivity Statistics 2011* release (year ended March 2000 and year ended March 2008).

It focuses primarily on merchandise (goods) exports, because this has the most detailed data available on an internationally comparable basis. It does extend the analysis to include services exports, although this analysis is less detailed due to data availability limitations.

The analysis does not cover income from overseas investments, such as sales by overseas subsidiaries of New Zealand firms. To give an indication of relative magnitude, in the year ended December 2007, New Zealand revenue from overseas included:

- Merchandise exports valued at NZ\$36.0 billion
- Services exports valued at NZ\$12.8 billion
- Direct investment income valued at UNZ\$1.1 billion
- Total investment income valued at NZ\$6.4 billion<sup>3</sup>

### 1.3. Longer term context

This paper primarily takes a snapshot approach, drilling down to the most detailed data available to get an in-depth picture of New Zealand's exports for 2007 and comparing this with the findings for 1999. This approach has its limitations given the fluctuations in the demand and/or supply of some products from year to year, but it is not practical to undertake such an in-depth exercise for multiple years.

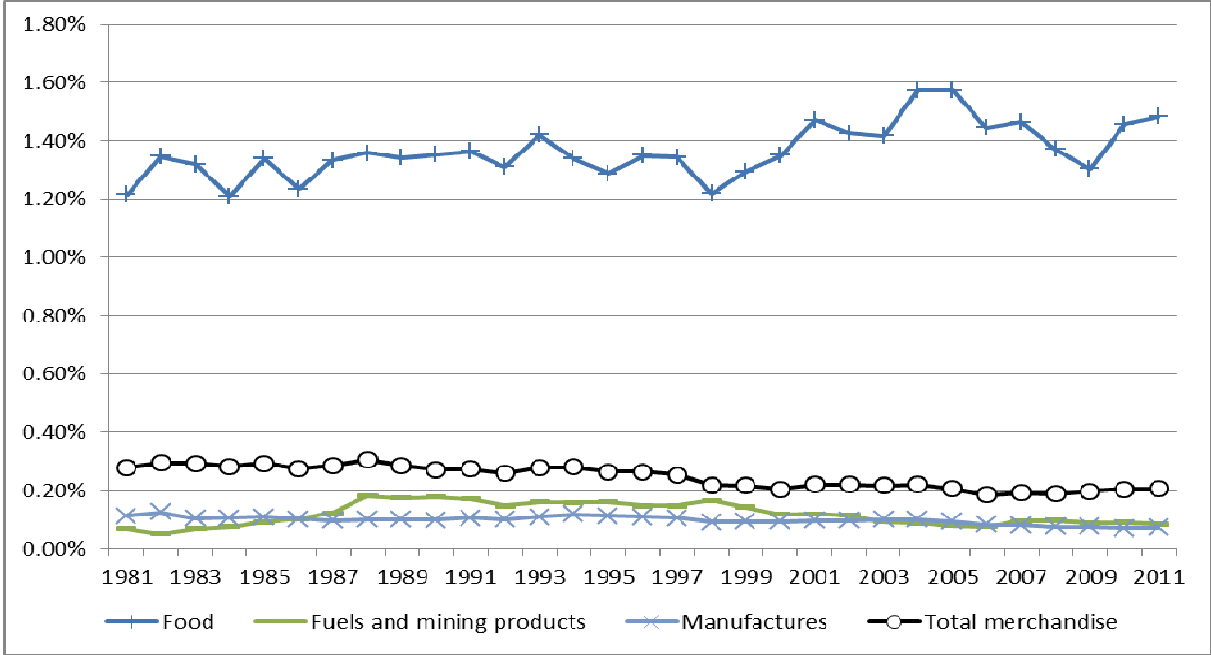
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<sup>2</sup> Peaks are determined using statistical techniques, and are chosen to represent high points in capacity utilisation of the economy.

<sup>3</sup> Extracted from Statistics New Zealand, Infoshare database on 22 June 2011

Figure 1 takes a very high level look at the findings over time for merchandise trade to provide some context to the detailed analysis. Values above the total merchandise share represent a revealed comparative advantage. New Zealand has a strong and enduring revealed comparative advantage in food (New Zealand's share of world exports is considerably higher than New Zealand's share of total merchandise exports), but does not have an overall advantage in "fuels and mining products" or manufactures. The food series also shows how the shares can fluctuate from year to year.

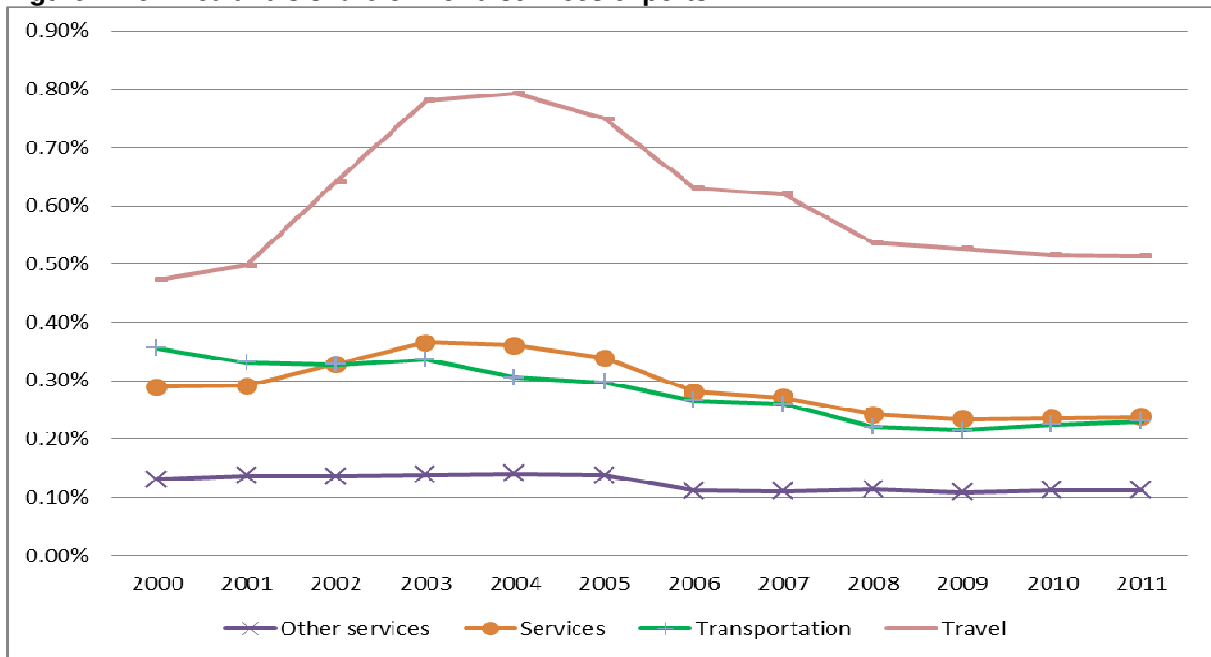
**Figure 1 New Zealand's share of world merchandise exports**



Source: World Trade Organisation statistical data sets

Figure 2 shows that New Zealand has a clear revealed comparative advantage in travel exports (spending by international tourists, students etc. in New Zealand), but New Zealand's market share has declined from its 2004 peak back to 2001 levels. New Zealand's share of world transportation services exports declined between 2000 and 2009, eroding an initial revealed comparative advantage.

**Figure 2 New Zealand's share of world services exports**



Source: World Trade Organisation statistical data sets

## 2. Methodology

### 2.1. Concepts and definitions

#### *Revealed comparative advantage*

The extent of the comparative advantage is measured by the Revealed Comparative Advantage (RCA) Index. The RCA Index is based on Balassa (1965), who suggested that “the commodity pattern of trade reflects relative costs as well as differences in non-price factors” and “comparative advantage would be expected to determine the structure of exports”. It is calculated as

$$RCA_{ik} = 100 * (X_{ik}/X_{wk}) / (X_i/X_w)$$

where X = exports

k = product or product category.

i = country (always New Zealand in our study)

w = world

This index is greater than 100, indicating that New Zealand has a comparative advantage, when New Zealand’s share of world exports for a particular product is

greater than New Zealand's share of total world exports (about 0.2% of world exports in 2007). Based on the definition used in NZIER (2009), products with an RCA index greater than 500 (about 1% of world exports in 2007) are considered to have a "high comparative advantage".

This formula is equivalent to:

$$RCA_{ik} = 100 * (X_{ik}/X_i) / (X_{wk}/X_w)$$

Therefore a ratio over 100 also means that the product's share of total New Zealand exports is greater than the product's share of world exports, suggesting New Zealand has specialised in that product more than the average country.

There have been criticisms of this measure, and a range of other measures have been considered to measure comparative advantage using trade data, but these alternative measures also have disadvantages and the Balassa index is still widely used.

For example, Balassa (1965) suggested that export-import ratios would also reflect relative advantages "under the assumption of uniformity in tastes and a uniform incidence of (import) duties in every industry within each country", but was concerned that these assumptions would not hold.

Similarly, Vollrath (1991) considered two measures that accounted for both relative import performance and relative export performance, but recommended the export-based Balassa Index (and another measure which roughly equates to the natural log of the Balassa Index) on the basis they are "less susceptible to policy-induced distortions which tend to be more pronounced on the import side". As pointed out by Fertő and Hubbard (2002, 5-6), however, the export based measures will be affected by the use of agricultural export subsidies, for example within the EU. And in the New Zealand context, policy-induced distortions are arguably less pronounced on the imports side than the exports side.

*Comparative advantage vs competitive advantage*

The RCA measure is simply a descriptor (which offers no explanation) of trading patterns whereas comparative and competitive advantage provide subtly different theories as to why the market share for a particular country might exist.

The early development of the principle of comparative advantage by Adam Smith and David Ricardo focussed on the gains from trade. Comparative advantage compares producers' opportunity cost of producing a product. The argument is that producers with different opportunity costs can benefit from trade by obtaining a product at a price that is lower than his or her opportunity cost. (Mankiw, 2004)

Comparative advantage calculations are relatively simple in the two-producer, two-product examples seen in the average introductory economics text book, but doing this calculation across multiple producers, multiple products, and multiple countries requires a wealth of data that is not feasible to collect.

In developing the RCA Index, Balassa (1965) argued that "comparative advantage would be expected to determine the structure of exports", but he also said that "the commodity pattern of trade reflects relative costs (comparative advantage) as well as differences in non-price factors".

Since that time, there has been an increased focus on the concept of "competitive advantage" rather than "comparative advantage".

Crocombe et al (1991) argued that "traditional comparative advantage arguments (which take an essentially static view of competition focusing on cost efficiency due to factor or scale advantages) are no longer sufficient to explain patterns of trade in the modern world". They cite Porter's finding that companies "gain and sustain competitive advantage through improvement, innovation and upgrading" and identified four broad determinants of competitive advantage – factor conditions; demand conditions; related and supporting industries; and firm strategy, structure and domestic rivalry.

It seems reasonable to assume that the structure of a country's exports as measured by the RCA index is in practice a function of all these factors, and to consider it as much an indicator of competitive advantage as comparative advantage.

### *Exports*

Exports statistics measure sales by resident firms and individuals to non-residents. They do not include sales by non-resident subsidiaries of resident firms. The net income earned by the New Zealand owners of overseas firms is included in investment income rather than exports in the Balance of Payment statement.

For example, if a New Zealand firm sets up a separate legal entity in another country to produce manufactured goods or provide services, the overseas entity will be seen as part of the overseas economy. Its sales will not be included in New Zealand's exports but the net income earned by the New Zealand owners will be included in investment income. If, however, employees of a New Zealand resident company provide education services in China (in person or by correspondence), or provide engineering services to overseas firms, this will be included in exports of services.

### *Level of processing*

Based on the concordance between the Standard International Trade Classification (SITC) and Statistics New Zealand's Level of Processing (LOP) classification, SITC sections 0-4 include processed and unprocessed **primary products** and SITC sections 5-8 include simply and elaborately transformed manufactures (together referred to as **non-food manufacturing**).

The distinction between **simply transformed** and **elaborately transformed manufactures** is also based on the LOP classification. Elaborately transformed manufactures are products with unique features which permit their identification as differentiated products on world markets, i.e. 'finished goods'. The corollary to this is that simply transformed manufactures are those which are not identifiable (or brandable), and are primarily processed goods which are traded as 'bulk' items, where typically the material itself is more important than the form or container it is being traded in.

## *High technology products*

High technology products have been defined based on the OECD High-Technology Products List (Hatzichronoglou, 1997). They include aerospace, armament, chemistry, computers, office machines, electronics, telecommunications, non-electrical machinery, pharmacy, and scientific instruments.

## 2.2. Data

### *Goods*

The analysis uses merchandise trade data for 1999 and 2007. Merchandise trade data in nominal US\$ was obtained from the UN COMTRADE database in February 2010.<sup>4</sup>

The international Harmonised System (HS) classification has been used for the detailed analysis. The most disaggregated (6 digit or HS6) data is more detailed than the SITC data used in the Ballingall and Briggs analysis. This allows us to “drill down” into more specific products to better understand what is driving the higher level findings and identify strong performers that have been “hidden” due to aggregation with other weaker performers.

The 1992 HS classification was used rather than more up-to-date versions of the classification to maximise the number of countries with data available on COMTRADE.

SITC rev 1 has been used in some places for comparability with the Ballingall and Briggs paper. SITC rev 3 has also been used as an intermediate step in calculating the level of processing and high technology products groupings.<sup>5</sup>

A number of adjustments were made to the merchandise trade data. These are outlined in Appendix 1.

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<sup>4</sup> The UN used currency conversion factors of 0.736762 (2007) and 0.529102 (1999) to convert the New Zealand dollar data to the US\$ in COMTRADE.

<sup>5</sup> Statistics New Zealand provided a concordance between SITC rev 4 and LOP. Conversion tables from HS 1992 to SITC rev 1, HS1992 to SITC rev 3, and SITC rev 3 to SITC rev 4 were accessed at <http://unstats.un.org/unsd/trade/conversions/HS%20Correlation%20and%20Conversion%20tables.htm>.



## Services

Exports of services data was obtained from the UN services trade database and Statistics New Zealand<sup>6</sup> in June 2011. This paper analyses services data for 2000 (the first year available in the UN database) and 2007.

At the time the data was extracted, 188 countries reported total services exports data in 2000 (the first year available) and 190 countries in 2007<sup>7</sup>. However, some countries only provided total exports of services data, while others provided more detailed information to varying degrees. Due to these data limitations, the services analysis is indicative only, but still reveals some interesting patterns.

## 3. Results

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### 3.1. Merchandise Trade – 2007

Table 1a indicates that, at the aggregate level, New Zealand has by far the strongest market share (and therefore the highest revealed comparative advantage) in food and live animals. It also indicates an overall revealed comparative advantage (market share above the overall average of 0.20%) in beverages and non-fuel crude materials.

However, the HS6 level analysis found that New Zealand has a revealed comparative advantage ( $RCA > 100$ ) in more than 600 HS6 level products overall, including 387 non-food manufactured products.

As expected, most of our export revenue is from products where we have a comparative advantage. The 625 products with a revealed comparative advantage at the HS6 level accounted for 86% of New Zealand's total exports by value. This is higher than the 78% in 1999 found by Ballingall and Briggs, although some of the difference may be due to aggregation bias as their analysis was at the more aggregated 4 digit SITC level.

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<sup>6</sup> The New Zealand data in the UN Services Trade database was out of date (the 2007 data was loaded to the database in August 2008), so I replaced it with Statistics NZ data converted to US\$.

<sup>7</sup> The countries that reported total exports of services in 2000 but not 2007 were Dem. Rep. of the Congo, Eritrea, Faeroe Isds, Malawi, Mauritania, Myanmar, Puerto Rico, Zimbabwe. Their combined exports were just US\$11m in 1999, so their omission is unlikely to influence the 2007 data significantly.

**Table 1a Revealed Comparative Advantage by SITC**

SITC Rev 1	Sum of NZ Exports excluding re-exports 2007 US\$000	Share of world trade (>0.2%=RCA)	US\$ value of HS6 codes with CA	% of value with CA at the HS6 level	Number of HS6 codes	Number of HS6 codes with CA
<i>Primary products - processed and unprocessed</i>						
0 Food and live animals	12,615,852	<b>1.87%</b>	12,512,442	99.2%	521	147
1 Beverages and tobacco	693,854	<b>0.67%</b>	654,288	94.3%	27	7
2 Crude materials, inedible, except fuels	2,864,741	<b>0.63%</b>	2,817,436	98.3%	371	73
3 Mineral fuels, lubricants and related materials	1,290,160	0.09%	214,637	16.6%	52	1
4 Animal and vegetable oils and fats	100,147	0.17%	98,137	98.0%	48	7
<i>Non-food manufactures</i>						
5 Chemicals	1,496,037	0.11%	1,145,740	76.6%	831	51
6 Manufactured goods classified chiefly by material	3,145,459	0.17%	2,730,262	86.8%	1472	156
7 Machinery and transport equipment	2,109,844	0.04%	1,274,544	60.4%	875	104
8 Miscellaneous manufactured articles	959,120	0.07%	499,344	52.1%	823	76
<i>Other (includes confidential items)</i>	532,257	0.09%	202,534	38.1%	18	3
Grand Total	25,807,472	0.20%	22,149,365	85.8%	5038	625

Table 1b (attached) lists the 221 HS4 products where New Zealand had a revealed comparative advantage (RCA index >100) in 2007. Of these, 70 HS4 level products had a high revealed comparative advantage (RCA index >500).

The HS6 analysis found 206 HS6 products where New Zealand had a high comparative advantage (RCA >500). These are listed in Table 1c (attached). Of these, 78 HS6 products fall within HS4 categories that do not have a high comparative advantage.

For example, we exported US\$33m of “machines for cleaning, sorting, grading eggs/fruit/etc” (HS 843360) = 7.09% of world exports, giving our third highest RCA Index of 3546. But our overall exports of “harvesting, produce cleaning and grading machinery” (HS 8433) accounted for just 0.34% of world exports, which gives a RCA index of 156 (a comparative advantage but not a high comparative advantage).

In some cases we have a high comparative advantage at the HS6 level but do not have a comparative advantage at all at the HS4 level. For example, we do not have an overall comparative advantage in “diodes, transistors, semi-conductors, etc.” (HS

8541). New Zealand exports of US\$80 million accounted for just 0.12% of the US\$67 billion of world exports. But at the HS6 level, we find that New Zealand exported US\$78 million worth of mounted piezo-electric crystals, which accounts for 1.53% of the US\$5.1 billion world exports of this more specific product.

This clearly demonstrates the value of conducting this analysis at a lower level of disaggregation – it allows us to identify niche performers within broader categories that at first glance seem less promising.

Even the HS6 level will sometimes be too aggregated for our purposes as it does not separate out all the products that are important for individual economies. For example, kiwifruit<sup>8</sup> and electric fence energisers<sup>9</sup> were not identified separately at the HS6 level in the 1992 version of the HS used in this paper.

In addition to uncovering niche exports where we do not have a comparative advantage at the more aggregated level, drilling down to the six digit level (HS6) provides a sharper focus on the products with a high comparative advantage. In the HS4 analysis, sheep and goat meat has the highest market share with 40.2% of world exports, and the next highest (a category that includes deer antler and velvet) accounted for 28% of world exports. However, the HS6 analysis reveals several products which account for more than 40% of world exports, including various sheep cuts (up to 60% of world exports); mussels (58%); and degreased, uncarded, uncombed shorn wool (47%).

The HS6 analysis also gives us a more detailed understanding of the products where we have a high comparative advantage. For example, the HS4 analysis identifies that we have a high comparative advantage in HS 1209 “Seed, fruit and spores, for sowing”, with 1.6% of world exports. But the HS6 analysis tells us we have a particularly high comparative advantage in clover seed (12.2% of world exports) and ryegrass seed (9.3% of world exports).

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<sup>8</sup> Fresh kiwifruit was combined with other fresh fruit in HS 081090 from 1988 until 1996, but separated out in the New Zealand HS classification as HS 0810900029.

<sup>9</sup> “Electric fence energisers” were identified separately at the HS6 level from 1996 to 2006 (as HS 081090), but prior to that “electric fence controllers” were combined with other products in HS 854380 and parts of electric fence controllers formed part of HS 854390 (although again identified at the HS10 level in the New Zealand HS classification).

Pulling all this together, New Zealand still has the strongest revealed comparative advantage in products based on the agriculture, horticulture, fishing or forestry industries (collectively referred to as “food and fibre” based products). These include:

- Dairy products, in particular milk protein concentrate, milk powder, casein and caseinates, albumin, butter, cheese, buttermilk
- Meat, including sheep cuts, frozen sheep and lamb carcasses, beef cuts and tongues, offal, venison
- Wool – including degreased, combed, yarn, greasy wool, carpet
- Live horses (note: the New Zealand data includes horses going overseas to race that may or may not be sold while overseas)
- A range of other animal based products – in particular deer velvet and antlers, sheep or lamb skins, fats, “ambergris, civet, musk, etc. for pharmaceutical use”
- Horticultural based products – including fresh fruit, clover and ryegrass seeds, frozen vegetables, onions, wine, honey, bulbs and corms
- Seafood – mussels, crayfish, frozen fish, shark, eels, oysters
- Various processed food products, in particular animal food, lactose/lactose syrup
- Wood products – wood pulp, logs, fibreboard, shaped wood, sawn timber.

A number of these primary-based products rely on relatively sophisticated innovation inputs such as research and development, technology and marketing skills. In New Zealand, dairy products are a good example, with innovation in production, processing, packaging, distribution and logistics.

New Zealand has also leveraged off its expertise in these areas to develop a high comparative advantage in certain elaborately transformed manufactures. These include “machines for cleaning, sorting, grading eggs/fruit/etc.”; dairy machinery; parts of milking machines and dairy machinery; “agricultural and bee-keeping plant nes”, germination plant; milking machines.

New Zealand has a high comparative advantage in a variety of manufactured products. Many of these manufactures are intermediate or capital goods mainly used

by businesses rather than households. Overall, manufactures with a revealed comparative advantage were valued at US\$5,649 million and elaborately transformed manufactures with a comparative advantage were valued at US\$2,510 million in 2007. High tech products with a revealed comparative advantage were valued at US\$334m in 2007 (1% of merchandise exports)<sup>10</sup>.

The manufactured products with a high comparative advantage (RCA>500) include:

- Several high tech products: numerically controlled machine tools to bend, fold, etc., metal; shuttle type looms nes for weaving fabric >30cm wide; mounted piezo-electric crystals; navigational instruments and appliances nes; therapeutic respiration apparatus; parts/accessories nes for optical/electric instruments; direction finding compasses; bulk penicillins or streptomycins and derivatives; fixed wing aircraft, unladen weight < 2,000 kg
- Other machinery, equipment and instruments, including super-heated water boilers; weighing machinery nes; weighing machinery having a capacity of 30-5000 kg; dish washing machines (domestic); producer, water and acetylene gas generator parts; drying machines, capacity <10 kg, except washer-drier; parts of machines for treating textile fabrics; hydraulic power engines/motors, except linear acting; pumps dispensing, lubricants in filling stations; parts of electronic valve & tubes, except cathode ray; electro-magnets nes and parts of magnetic devices; breathing appliances and gas masks; image projectors, except slide/microform
- Other elaborately transformed manufactures, including hot rolled bar/rod grooved iron or non-alloy steel in irregular coils; net/fencing, iron or steel <3mm wire, <100cm mesh, nes; lead foil of a thickness <2mm; tin articles nes; circular saw blades, working part of steel; baby carriages and parts thereof; sailboats, with or without auxiliary motor
- Other simply transformed manufactures, including unwrought aluminium; sodium hexafluoroaluminate (synthetic cryolite); ester gums; carboxylic acids (alcohol function only), derivatives; copper-zinc base alloys, unwrought; peptones, proteins and derivatives, nes, hide powder.

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<sup>10</sup> The high tech exports with a comparative advantage were all elaborately transformed manufactures, apart from HS 380830 Herbicides, sprouting and growth regulators and HS 380890 "Pesticides, rodenticides, nes, for retail sale", which are classified as a simply transformed manufacture.

Statistics New Zealand does not release the names of the exporters (or indeed any of its other respondents), but some of these products look familiar to keen readers of the business news. For example:

- Compac produces fruit automation and sorting equipment
- Rakon produces mounted piezo-crystals
- Fisher and Paykel Appliances produces dish washing machines and drying machines under 10kg
- Navman produces navigational instruments
- F&P healthcare produces respiratory humidifiers, which would be included under therapeutic respiration apparatus, and breathing appliances
- Phil&Ted’s produce baby carriages.

The above analysis shows it is important to drill down to a fine level of detail to understand comparative advantage. This is particularly the case for manufacturing where New Zealand’s comparative advantage is focused on niche products and less evident at the aggregate level. From now on, the analysis concentrates on HS6 level products.

**3.2. Changes in export structure between 1999 and 2007**

**3.2.1. Changes in comparative advantage**

Table 2a shows that we gained and lost a comparative advantage in a range of non-food manufactures as well as a smaller number of animal and food related products between 1999 and 2007. Overall, the number of products in which New Zealand lost a comparative advantage was similar to the number of products in which we gained a comparative advantage.

**Table 2a Number of HS6 codes losing or gaining a comparative advantage 1999 to 2007**

SITC Rev 1	HS6 codes losing CA	HS6 codes gaining CA	HS6 codes with CA in 2007
0 Food and live animals	21	28	147
1 Beverages and tobacco	1	3	7
2 Crude materials, inedible, except fuels	10	20	73
3 Mineral fuels, lubricants and related materials	4		1
4 Animal and vegetable oils and fats	1	1	7
5 Chemicals	29	18	51

6 Manufactured goods classified chiefly by material	82	69	156
7 Machinery and transport equipment	41	45	104
8 Miscellaneous manufactured articles	39	47	76
Other (includes confidential items)	1		3
Grand Total	229	231	625

Many of the products in which we gained a comparative advantage are not yet significant contributors to New Zealand's export earnings. Overall, there were 80 products where New Zealand gained a comparative advantage that had US\$5m or more exports (including re-exports) in 2007.

It generally takes time to develop a strong comparative advantage. There were just 15 products (a mix of primary products and manufactures) where New Zealand went from not having a comparative advantage (RCA index less than 100) in 1999 to having a strong comparative advantage (RCA index greater than 500), and had exports of US\$5m or more in 2007:

030619	Crustaceans nes, frozen, US\$15 m US exports in 2007
160290	Meat, meat offal and blood, prepared or preserved, nes US\$7 m US
230110	Flour or meal, pellet of meat or offal for animal feed US\$58 m
320300	Colouring matter of vegetable or animal origin US\$7 m
410130	Bovine hides, raw, nes US\$7 m
410429	Bovine and equine leather, tanned or retanned, nes US\$108 m
481140	Paper, coat/impregnated with wax/stearin/glycerol, nes US\$12 m
740321	Copper-zinc base alloys, unwrought US\$10m
800700	Tin articles nes US\$6m
841229	Hydraulic power engines/motors, except linear acting US\$39m
845190	Parts of machines for treating textile fabrics US\$16m
901410	Direction finding compasses US\$6m
901480	Navigational instruments and appliances nes US\$44m
902000	Breathing appliances and gas masks US\$17m
903300	Parts/accessories nes for optical/electric instrument US\$43m

There were 45 HS6 level products that lost a comparative advantage between 1999 and 2007 and were valued at more than US\$5m in either year.

Only seven of these products were primary products: Fish fillet or meat, fresh or chilled, not liver, roe; Strawberries, fresh; Scallops other than live, fresh or chilled; Milk and cream nes sweetened or concentrated; Grape wines, sparkling; Iron ore, concentrate, not iron pyrites, unagglomerated; Butanes, liquefied.

Some products lost their comparative advantage despite a nominal increase in exports between 1999 and 2007. For example we exported US\$42 million US of 853710 Electrical control and distribution boards, < 1kV in 2007 - 1.24% more than in 1999 - but world exports grew 16%, and the RCA Index fell from 204 to 77.

Several of these products lost what was in 1999 a high comparative advantage:

410512	Sheep or lamb skin leather, otherwise pre-tanned
441121	Fibreboard 0.5 - 0.8 g/cm <sup>2</sup> not worked/surface covered
410422	Bovine leather, otherwise pre-tanned except whole skins
270799	Coal tar distillation products nes
820232	Circular saw blades, working part other than steel
040299	Milk and cream nes sweetened or concentrated
761210	Aluminium containers, collapsible tubular
847690	Parts of automatic goods-vending machinery
030729	Scallops other than live, fresh or chilled

### **3.2.2. Gains in Market Share**

Overall New Zealand's merchandise exports grew more slowly than world exports and New Zealand's share declined from 21.4% in 1999 to 19.7% in 2007 (OECD, 2011)<sup>11</sup>. New Zealand's exports would have been US\$3.2 billion higher if they had grown as fast as world exports overall and maintained New Zealand's overall share of world trade.

New Zealand was not alone in losing market share and in fact more than held its own relative to other OECD countries. Overall, the 34 current OECD member countries' share of world exports of goods fell from 74.7% in 1999 to 62.2% in 2007.

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<sup>11</sup> OECD Stat database, Globalisation, Trade indicators, Macro trade indicators, Market share (goods), extracted 20 June 2011



This fall in OECD countries' share of world exports in part reflects an increase in China's share of merchandise exports from 3% in 1999 to 9% in 2007 as China emerged as a major exporter of manufactured products. As countries develop, their exports tend to grow faster than their GDP, resulting in an increased share of world exports.

New Zealand's overall fall in market share disguises increases in New Zealand's market share for a diverse range of products. Table 3a shows changes in market share, calculated by summing up the HS6 level changes in market share to the one digit SITC level. The gain in market share for a product has been calculated as New Zealand's actual change in exports for that product less the change that would have occurred if New Zealand exports of the product had grown at the same rate as world exports of that product.

This table shows that, if New Zealand exports of each HS6 product had grown at the same rate as world exports of that product (i.e. New Zealand maintained its share of world exports for each HS6 product), New Zealand's exports would have been US\$561 million higher than the value actually recorded in 2007. Or in other words, \$561 million of New Zealand's fall in market share was due to losing market share at the individual product level.

This loss of market share due to individual products not keeping pace with world exports was less than one fifth of the overall \$3.2 billion needed to maintain New Zealand's share of world exports overall. The remainder reflects the concentration of New Zealand's exports in sectors with slower than average world growth.

Overall New Zealand gained market share in food (milk products), beverages (wine) and mineral fuels (crude oil and coal), and lost market share in non-fuel crude materials and non-food manufactures. However, this hides a much more diverse picture at the individual product level.

**Table 3a Summarising the HS6 level changes in market share**

SITC Rev 1	Change in market share aggregated from HS6 level US\$000
0 Food and live animals	985,550
1 Beverages and tobacco	440,593
2 Crude materials, inedible, except fuels	-253,921
3 Mineral fuels, lubricants and related materials	247,618
4 Animal and vegetable oils and fats	12,686
5 Chemicals	-945,880
6 Manufactured goods classified chiefly by material	-687,660
7 Machinery and transport equipment	-245,481
8 Miscellaneous manufactured articles	-40,059
Other (includes confidential items)	-74,595
Grand Total	-561,150

There are some cases where we appear to have gained market share in one product at the expense of another within the same HS4 code. Sometimes this may be due to tariff and quota effects. Some appear to represent a move towards somewhat less refined products. For example, we:

- Gained market share of US\$836 million in unsweetened milk and cream powder < 1.5% fat, and lost market share of US\$107 million in sweetened milk and cream powder < 1.5% fat
- Gained market share of US\$64 million in frozen bovine cuts with bone in, and lost market share of US\$181 million in boneless frozen bovine cuts
- Gained market share of US\$52 million in degreased uncarded, uncombed shorn wool, and lost US\$89 million market share in greasy uncarded, uncombed shorn wool
- Gained US\$76 million market share in unwrought aluminium, not alloyed, and lost US\$129 million market share in unwrought aluminium, alloyed

Overall, the largest increases in market share were in:

- Dairy products – in particular milk and cream powder, “milk products nes” (partly offset by lower market shares for cheese and butter)
- Wine
- Processed food – with the largest increases in “malt extract and limited cocoa pastrycooks products”(HS 190190 – includes milk-based nutritional powder), “food preparations nes” (HS 210690), baby food, animal food

- Crude oil and refined petroleum
- Machinery, equipment and instruments, in particular motorboats without an outboard motor, piezo-electric crystals, computers and navigation instruments
- “Bovine and equine leather, tanned or retanned, nes”
- “Fibreboard 0.5 - 0.8 g/cm2 worked/surface covered”
- Coal
- Semi-chemical wood pulp
- Unwrought aluminium
- Frozen beef cuts with bone in
- Ferrous waste or scrap
- “Hot rolled bar, rod of iron/steel, in irregular coils”

### 3.2.3. Comparing world growth and New Zealand growth

Table 4a shows the differences between world growth and New Zealand exports growth at the 1 digit SITC level. At this level, New Zealand’s fastest growth was in beverages and tobacco exports, and this was well above the growth in world exports, mainly due to increased wine exports. New Zealand also recorded very fast growth in mineral fuel exports but world export growth was also strong – both crude oil and coal export values grew strongly.

New Zealand exports also grew slightly faster than world exports of food and live animals, machinery and transport equipment, and miscellaneous manufactures, and grew more slowly than world exports for other SITC groupings.

**Table 4a New Zealand and World export growth by 1 digit SITC**

SITC Rev 1	Sum of NZ Exports including re-exports 1999 US\$000	NZ Exports including re-exports CAGR %	Sum of NZ Exports including re-exports 2007 US\$000	"Consistent World" exports CAGR	NZ Growth minus (consistent) world growth %
0 Food and live animals	5,476,997	11.0%	12,643,863	9.4%	1.6%
1 Beverages and tobacco	119,783	24.7%	700,697	7.9%	16.8%
2 Crude materials, inedible, except fuels	1,685,370	6.9%	2,869,499	14.1%	-7.2%
3 Mineral fuels, lubricants and related materials	234,928	23.7%	1,291,891	21.3%	2.5%
4 Animal and vegetable oils and fats	79,243	3.0%	100,637	12.2%	-9.2%
5 Chemicals	925,372	6.6%	1,544,832	13.3%	-6.7%
6 Manufactured goods classified chiefly by material	1,765,567	7.8%	3,226,079	12.0%	-4.2%
7 Machinery and transport equipment	1,281,963	10.1%	2,762,138	9.7%	0.4%

8 Miscellaneous manufactured articles	575,495	10.2%	1,249,088	9.3%	0.8%
Other (includes confidential items)	328,987	6.4%	542,209	17.5%	-11.1%
Grand Total	12,473,705	10.1%	26,930,933	11.7%	-1.6%

Drilling down to the HS6 level identifies numerous products where New Zealand exports grew faster than world exports. The most rapid growth in percentage terms tends to be from a very low 1999 base. In a number of these cases, New Zealand did not yet have a revealed comparative advantage in 2007.

The following sections splits goods in which New Zealand has a comparative advantage into four categories, depending on whether world exports are growing faster or slower than average, whether New Zealand exports are growing faster or slower than world exports. Table 4b aggregates the HS6 results for each area.

The focus is on better understanding the performance of the products which had a comparative advantage in 2007. These products together accounted for 83% of exports in 2007. Overall the products with a comparative advantage in 2007 gained US\$1.7 billion market share, while we lost US\$2.3 billion market share in products where we did not have a comparative advantage in 2007.

**Table 4b Summary of HS6 results by area**

	2007 Value of exports (including re-exports) in each area	Percentage of total exports	cf 1999 result from Ballingall and Briggs (2002) <sup>12</sup>	Sum of NZ gain in market share US\$000
Area 1 Star performers – world exports grew faster than average, NZ exports grew even faster and RCA>100	3,932,146	14.6%	12.8%	1,929,067
Area 2 Potential stars – World exports grew faster than average, but NZ exports grew slower than world exports and RCA>100	1,531,484	5.7%	15.9%	-1,469,072
Area 3 Losers in slow growing markets - world exports grew slower than average, NZ exports even slower and RCA>100	7,246,254	26.9%	21.2%	-2,358,392
Area 4 – Winners in slow growing markets – world exports grew slower than average, but NZ exports grew faster and RCA>100	9,750,909	36.2%	27.9%	3,617,493
Total of the four areas	22,460,794	83.4%	77.8%	1,719,095
No comparative advantage	4,470,140	16.6%		-2,280,245
Total exports	26,930,933	100.0%		-561,150

<sup>12</sup> These numbers may not be strictly comparable since Ballingall and Briggs calculated the numbers at the 4 digit SITC level and this analysis is at the more detailed HS6 level.

This table shows that:

- New Zealand's star performers accounted for 15% of New Zealand's exports
- New Zealand's potential stars accounted for just 6% of exports, much lower than the 16% reported by Ballingall and Briggs for 1999. This group grew slowly (6% per annum compared to world growth of 16% world growth), but not as slowly as area 3
- 63% of New Zealand's exports were of products that had a comparative advantage and world exports grew slower than average, more than the 49% recorded by Ballingall and Briggs for 1999
- 27% of New Zealand's exports were of products with a comparative advantage that fell behind in slow growing markets (higher than the 21% reported by Ballingall and Briggs for 1999). If we had maintained our market share in these products, New Zealand exports would have been US\$2.4 billion higher
- 36% were of products where we gained market share in slow growing markets.

### 3.2.4. New Zealand's star performers

Ballingall and Briggs defined New Zealand's star performers as "sectors" where:

- New Zealand's exports have grown faster than world exports (and New Zealand has gained market share), and
- World exports have grown faster than average, and
- New Zealand has a revealed comparative advantage (RCA>100).

Table 5a summarises the coverage and performance of HS6 products that met these criteria.

**Table 5a New Zealand's star performers summary**

SITC Rev 1	Sum of NZ Exports including re-exports 1999 US\$000	NZ Exports including re-exports CAGR %	Sum of NZ Exports including re-exports 2007 US\$000
0 Food and live animals	304,683	24.5%	1,763,924
1 Beverages and tobacco	9,252	26.6%	60,922
2 Crude materials, inedible, except fuels	31,804	33.5%	320,379

3 Mineral fuels, lubricants and related materials	38,593	23.9%	214,637
4 Animal and vegetable oils and fats	258	40.3%	3,870
5 Chemicals	1,610	39.1%	22,620
6 Manufactured goods classified chiefly by material	60,975	33.9%	631,468
7 Machinery and transport equipment	102,154	23.6%	554,656
8 Miscellaneous manufactured articles	20,447	29.3%	159,405
Other (includes confidentialised items)	58,254	16.7%	200,266
Grand Total	628,028	25.8%	3,932,146

Of the 128 star performers at the HS6 level, just 44 are unprocessed or processed primary products, but together they account for US\$2.4 billion exports in 2007, including:

- 21 food and beverage products contributing US\$1.8 billion exports overall, the largest being: natural milk products nes US\$427 million; food preparations nes US\$351 million; sheep cuts, bone in, fresh or chilled US\$341 million; buttermilk, curdled milk, cream, kephir, etc. US\$151 million; sheep cuts, boneless, fresh or chilled US\$125 million; infant foods of cereals, flour, starch or milk, retail US\$104 million; communion wafers, rice paper, bakers wares nes US\$67 million; beverage waters, sweetened or flavoured US\$61 million; sauces nes, mixed condiments, mixed seasoning US\$57 million
- 13 different types of waste and scrap, valued collectively at US\$286 million
- US\$215 million of coal
- Sheep or lamb skins, raw, wool on, except Persian etc. valued at US\$27 million
- Live pure-bred breeding bovine animals valued at US\$9 million.

The remaining 84 manufactured goods account for US\$1.6 billion exports in 2007, so are smaller on average than the primary products listed above. They include:

- US\$64 million of high tech products, including parts of electrical machines and apparatus nes US\$26m; fixed wing aircraft, unladen weight < 2,000 kg US\$17m; telephonic apparatus, nes US\$11m
- US\$23 million of chemical products
- US\$309 million of mechanical machinery and equipment, including automatic washing machines, of a dry capacity < 10 kg US\$78 million; hydraulic power engines/motors, except linear acting US \$39 million; agricultural, bee-keeping plant nes, germination plant US\$36 million; machines for cleaning, sorting,

grading eggs/fruit/etc. US\$34 million; parts of refrigerating or freezing equipment US\$28 million; numerically controlled machine tools to bend, fold, etc., metal US\$21 million; lifting, handling, loading or unloading machinery nes US\$21 million

- US\$81 million of electrical machinery and equipment, including electrical apparatus for voltage > 1kV, nes US\$25 million; parts of electrical machines and apparatus nes US\$26 million
- US\$157 million of transport related equipment, including motorboats, other than outboard motorboats US\$93 million; rowing boats, canoes, pleasure boats except sail/power US\$22 million
- US\$84 million of instruments including: therapeutic respiration apparatus valued at US\$71 million
- Other manufactures including: fibreboard 0.5 - 0.8 g/cm<sup>2</sup> worked/surface covered US\$160 million; bovine and equine leather, tanned or retanned, nes US\$108 million; articles of iron or steel, nes US\$70 million; hot rolled bar/rod grooved iron or non-alloy steel in irregular coils US\$35 million; articles of aluminium, nes US\$33 million; electric lamps, lighting fittings, nes US\$27 million; hot rolled bar/rod, iron or non-alloy steel, coiled width <14mm diameter (HS07 721391) US\$27 million; lead refined unwrought US\$22 million; prefabricated buildings US\$21 million; made up articles (textile) nes, textile dress pattern US\$20 million; bars, rods and profiles, aluminium, not alloyed US\$20 million
- Unwrought gold valued at US\$199 million.

### **3.2.5. Potential star performers**

Ballingall and Briggs recommended a focus on these potential star performers that are currently underachieving in fast growing markets:

- World exports have grown faster than average
- But New Zealand's exports have not kept pace with the growth in world exports (New Zealand has lost market share); and
- New Zealand has a revealed comparative advantage.

The logic here is that this is a good place to start when deciding where the marginal impact of intervention might be greatest:

- Path dependence suggests we should build on existing strengths, which may be indicated by having a revealed comparative advantage.
- World demand is growing fast, so does not represent an obvious constraint on growth. These products have for some reason not captured all the potential benefits from this increase in world demand. There may be supply side constraints preventing New Zealand from capturing some of this growth, which may be amenable to intervention. (There could also be other reasons, including a decision to focus resources on an even better opportunity or being out-innovated by a competitor.)
- Potential deadweight losses are likely to be lower than focusing on products that are already stars and appear to be performing very well without any additional intervention.

As discussed in Section 4, however, this should be considered a starting point for further analysis on what was constraining the growth of New Zealand's exports and whether the constraint might be amenable to intervention.

Table 5b summarises the coverage and performance of these potential stars.

**Table 5b New Zealand's potential star performers summary**

SITC Rev 1	Sum of NZ Exports including re-exports 1999 US\$000	NZ Exports including re-exports CAGR %	Sum of NZ Exports including re-exports 2007 US\$000
0 Food and live animals	271,617	6.9%	464,611
1 Beverages and tobacco	13,914	12.4%	35,345
2 Crude materials, inedible, except fuels	15,461	6.0%	24,634
4 Animal and vegetable oils and fats	1,922	0.8%	2,048
5 Chemicals	206,484	6.1%	332,370
6 Manufactured goods classified chiefly by material	244,969	4.8%	357,364
7 Machinery and transport equipment	122,306	10.0%	262,647
8 Miscellaneous manufactured articles	26,934	8.7%	52,466
Grand Total	903,607	6.8%	1,531,484



The 80 products that meet all three criteria list includes 25 primary products with exports valued at US\$527 million in 2007, and 55 manufactures valued at US\$1.0 billion in 2007:

- US\$0.5 billion food and beverage products including: fresh cheese, unfermented whey cheese, curd US\$112 million; lactose and lactose syrup US\$70 million; molluscs and shellfish nes, prepared or preserved US\$51 million; vegetables, fresh or chilled nes US\$50 million; chocolate and other food preps containing cocoa, bars or containers over 2 kg US\$48 million; avocados, fresh or dried US\$35 million; alcoholic liqueurs nes US\$33 million
- Other primary products valued at US\$27 million; including bovine skins, whole, raw US\$24 million
- US\$332 million of chemicals including methyl alcohol (methanol) US\$146 million; albumins nes, albuminates & other albumin derivatives US\$117 million; washing and cleaning preparations, retail US\$52 million
- US\$263 million machinery and transport equipment including: electric conductors, 80-1,000 volts, no connectors US\$55 million; sailboats, with or without auxiliary motor US\$40 million; refrigerator/freezer chests/cabinets/showcases US\$27 million; combined refrigerator-freezers, two door US\$27 million; trailers nes for the transport of goods US\$23 million; machines to crush or grind stone, ores and minerals US\$23 million
- US\$410 million of other manufactured products, including panels, laminated wood, nes US\$50 million; hot rolled iron or non-alloy steel, coil, width >600mm, t <3mm thick, nes US\$44 million; plywood, all softwood, each ply < 6mm thick US\$36 million; toilet paper US\$33 million; sacks & bags (including cones) of polymers of ethylene US\$29 million; hot rolled iron or non-alloy steel, coil, width >600mm, t 3-4.75mm, nes US\$28 million; bars, rods and other profiles, aluminium alloyed US\$25 million; hot rolled iron or non-alloy steel, coil, width >600mm, t 4.75-10mm, nes US\$23 million.

If all of these products had kept up with world growth, exports would have been US\$1.5 billion higher in 2007, just under half of the additional US\$3.2 billion needed for New Zealand's exports to keep pace with world exports overall. If, however, this group of products had grown at the same rate as the star performers (25.8% per

annum), they would have been valued at \$5.7 billion, \$4.1 billion more than the export value actually recorded in 2007.

The size of the loss in market share gives some indication of the possible lost opportunity. Overall the largest losses in market share were recorded in:

- 290511 Methyl alcohol (methanol) -US\$264 million market share
- 350290 Albumins nes, albuminates & other albumin derivatives -US\$111 million
- 040229 Milk and cream powder sweetened < 1.5% fat -US\$107 million
- 170210 Lactose and lactose syrup -US\$91 million
- 441219 Plywood, all softwood, each ply < 6mm thick -US\$80 million
- 441299 Panels, laminated wood, nes -US\$75 million
- 760429 Bars, rods and other profiles, aluminium alloyed -US\$71 million
- 040610 Fresh cheese, unfermented whey cheese, curd -US\$52 million

**3.2.6. Losers in slow growing markets**

Table 5c lists those products where:

- World exports are growing more slowly than average (or declining)
- New Zealand exports are growing even more slowly than world exports (losing market share)
- New Zealand has a revealed comparative advantage.

In other words, we lost ground in these slow growing markets, and in some cases recorded a nominal decrease, despite having a (in some cases very strong) comparative advantage. If all these products had maintained their market share, New Zealand’s exports would have been US\$2,358 million higher in 2007.

Table 5c summarises the coverage and performance of the products that meet these criteria.

**Table 5c New Zealand's losers in slow growing markets**

SITC Rev 1	Sum of NZ Exports including re-exports 1999 US\$000	NZ Exports including re-exports CAGR %	Sum of NZ Exports including re-exports 2007 US\$000
0 Food and live animals	3,121,657	5.8%	4,903,075
2 Crude materials, inedible, except fuels	1,145,592	3.9%	1,556,300

4 Animal and vegetable oils and fats	33,981	-24.3%	3,666
5 Chemicals	297,302	1.2%	326,771
6 Manufactured goods classified chiefly by material	188,129	4.1%	258,511
7 Machinery and transport equipment	77,433	0.6%	81,222
8 Miscellaneous manufactured articles	76,925	5.1%	114,231
Other	1,685	4.9%	2,478
Grand Total	4,942,704	4.9%	7,246,254

Some of our key primary based exports can be found here. It includes 72 primary products valued at US\$6.5 billion and 56 manufactured products valued at US\$781 million:

- Horses, live except pure-bred breeding US\$82 million
- Meat valued at US\$2.2 billion, including bovine cuts boneless, frozen US\$915 million; sheep cuts, bone in, frozen US\$883 million; sheep cuts, boneless, frozen US\$321 million; lamb carcasses and half carcasses, frozen US\$44 million; sheep, goat, ass, mule, hinnie edible offal, frozen US\$30 million
- US\$402 million of seafood, including fish fillets, frozen US\$133 million; mussels, frozen, dried, salted or in brine US\$125 million; fish nes, fresh or chilled, whole US\$44 million; fish meat & mince, except liver, roe & fillets, frozen US\$34 million; hake, frozen, whole US\$25 million
- US\$1.7 billion of dairy products including butter and other fats and oils derived from milk US\$880 million; cheese except fresh, grated, processed or blue-veined US\$701 million; cheese processed, not grated or powdered US\$69 million; milk and cream not concentrated nor sweetened < 6% fat US\$20 million
- US\$555 million of other food products, including apples, fresh US\$265 million; onions and shallots, fresh or chilled US\$90 million; peas, frozen, uncooked steamed or boiled US\$33 million; ice cream and other edible ice US\$28 million; sweet corn, frozen, uncooked steamed or boiled US\$25 million; frozen vegetable mixtures, uncooked, boiled or steamed US\$25 million; flour or meal, pellet, fish, etc., for animal feed US\$22 million
- US\$1.6 billion of other primary products, including lumber, coniferous (softwood) thickness < 6 mm US\$544 million; logs, poles, coniferous not treated or painted US\$442 million; greasy shorn wool, not carded or combed US\$131 million; guts, bladders and stomachs of animals except fish US\$115 million; chem wood pulp, soda or sulphate, conifer, unbleached US\$72 million;

mechanical wood pulp US\$70 million; sheep or lamb skins, pickled, without wool US\$65 million; cut flowers and flower buds for bouquets, etc., fresh US\$30 million; seed, rye grass, for sowing US\$25 million

- US\$327 million chemical products including caseinates and other casein derivatives US\$250 million; herbicides, sprouting and growth regulators US\$32 million
- US\$81 million of machinery and transport equipment including electrical machines and apparatus, nes US\$32 million; US\$373 million of other manufactures, including instruments, appliances for medical, etc science, nes US\$77 million; paper, multi-ply, clay coated, nes US\$73 million; carpets of wool or fine animal hair, tufted US\$56 million; wood in chips, coniferous US\$38 million.

Again the loss of market share indicates the significance of the lost opportunity, although in this case it is more likely that resources might have been diverted to faster growing products. The top losses of market share were all primary products, apart from the caseinates and casein derivatives which are simply transformed manufactures:

080810	Apples, fresh -US\$307m
030420	Fish fillets, frozen -US\$236m
350190	Casein glues, caseinates and other casein derivatives -US\$210m
020230	Bovine cuts boneless, frozen -US\$181m
440320	Logs, poles, coniferous not treated or painted -US\$154m
030490	Fish meat & mince, except liver, roe & fillets, frozen -US\$99m
020442	Sheep cuts, bone in, frozen -US\$94m
510111	Greasy shorn wool, not carded or combed -US\$89m
040690	Cheese except fresh, grated, processed or blue-veined -US\$73m
470311	Chem wood pulp, soda or sulphate, conifer, unbleached -US\$65m
050400	Guts, bladders and stomachs of animals except fish -US\$63m
020443	Sheep cuts, boneless, frozen -US\$57m

### **3.2.7. Achievers in adversity - winners in slow growing markets**

Table 5d summarises the coverage and performance of those “achievers in adversity” where:

- World exports are growing more slowly than average
- New Zealand exports are growing faster than world exports (gaining market share)
- New Zealand has a revealed comparative advantage.

This area is arguably least amenable to intervention, as the products are already gaining market share in a slow growing or declining market.

**Table 5d New Zealand's winners in slow growing markets**

SITC Rev 1	Sum of NZ Exports including re-exports 1999 US\$000	NZ Exports including re-exports CAGR %	Sum of NZ Exports including re-exports 2007 US\$000
0 Food and live animals	1,668,629	15.8%	5,402,113
1 Beverages and tobacco	69,737	29.8%	561,775
2 Crude materials, inedible, except fuels	453,536	9.2%	918,707
4 Animal and vegetable oils and fats	39,546	10.6%	88,688
5 Chemicals	195,368	11.8%	476,166
6 Manufactured goods classified chiefly by material	536,254	13.8%	1,507,827
7 Machinery and transport equipment	106,026	22.5%	537,586
8 Miscellaneous manufactured articles	39,355	26.5%	258,047
Grand Total	3,108,451	15.4%	9,750,909

Overall this group did quite well (although not as well as the star performers), using their comparative advantage to grow 15.4% per annum overall, and just 60 of the 288 products grew slower than the overall world exports growth rate of 11.67%.

This group included:

- US\$5.4 billion food and live animals, including milk and cream powder unsweetened < 1.5% fat US\$2,041 million; milk powder < 1.5% fat US\$949 million; fruits, fresh nes US\$581 million; malt extract & limited cocoa pastry cooks products nes (includes milk-based nutritional powder) US\$262 million; meat and edible offal nes fresh, chilled or frozen US\$ 170 million; fish nes, frozen, whole US\$168 million; bovine cuts boneless, fresh or chilled US\$164 million
- US\$562 million beverages including grape wines nes, fortified wine or must, pack < 2l US\$539 million

- US\$1.0 billion other primary products including degreased shorn wool, not carded, combed or carbonized US\$322 million; chem wood pulp, soda or sulphate, conifer, bleached US\$229 million; coniferous wood continuously shaped along any edges US\$90 million; bovine, sheep and goat fats, raw or rendered US\$88 million; semi-chemical wood pulp US\$80 million; animal products and domestic animal carcass (non-food) US\$37 million; bulbs, tubers, corms, crowns and rhizomes, dormant US\$25 million; seed, vegetable, nes for sowing US\$23 million; whalebone, horns, etc. unworked or simply prepared nes US\$21 million
- Machinery and equipment valued at US\$538 million; including mounted piezo-electric crystals US\$78 million; dish washing machines (domestic) US\$64 million; Fishing vessels and factory ships US\$44 million; fixed wing aircraft, unladen weight 2,000-15,000 kg US\$42 million; electro-magnets nes and parts of magnetic devices US\$36 million; drying machines, capacity <10 kg, except washer-drier US\$25 million; machinery for treatment by temperature change nes US\$20 million
- Other manufactured products valued at US\$2.2 billion, including aluminium unwrought, not alloyed US\$877 million; casein US\$370 million; paper, kraftliner, unbleached, uncoated US\$82 million; yarn of carded wool, >85% wool, not retail US\$80 million; builder's joinery and carpentry of wood nes US\$66 million; navigational instruments and appliances nes US\$44 million; parts/accessories nes for optical/electric instrument US\$43 million; particle board of wood US\$41 million; bovine and equine leather, full or split grain, nes US\$41 million; paper, fluting, in rolls, semi-chemical, uncoated US\$37 million; veneer or ply sheet, coniferous (softwood) <6 mm thick US\$33 million; plastic articles for goods conveyance or packing nes US\$29 million; flat rolled iron or non-alloy steel, electro plate/zinc, width >600mm, nes US\$22 million; sheep or lamb skin leather, tanned or retanned, nes US\$20 million.

### 3.3. Exports of services

#### 3.3.1. 2007

Table 6a compares New Zealand services exports in the year ended December 2007 with 2007 “world” exports. As noted in the methodology section, countries report

service exports data at varying levels of detail. The derived unallocated services row gives an indication of the magnitude of the potential undercoverage of world exports at the individual service (one digit) level - at US\$51 billion it is less than 2% of total world services exports, but larger than the world exports of personal, cultural and recreational services. The number of reporting countries for each service type is provided to indicate where world exports might be undercovered and, therefore, the revealed comparative advantage may be overstated. This section should be considered, therefore, to be indicative rather than definitive.

**Table 6a Exports of services - 2007 benchmark**

	NZ Exports 2007 US\$m	World exports 2007 US\$m (incorporating updated NZ data)	NZ Share of world exports 2007	RCA Index 2007	Number of reporting countries 2007
1 Transportation	1,994	764,707	0.26%	99	174
2 Travel	5,451	936,385	0.58%	<b>222</b>	178
3 Communications services	190	101,353	0.19%	71	161
4 Construction services	7	84,774	0.01%	3	91
5 Insurance services	31	74,996	0.04%	16	146
6 Financial services	80	290,451	0.03%	10	121
7 Computer and information services	218	159,481	0.14%	52	108
8 Royalties and licence fees	140	188,915	0.07%	28	105
9 Other business services	968	810,593	0.12%	45	148
10 Personal, cultural, and recreational services	246	36,284	0.68%	<b>258</b>	99
11 Government services, n.i.e.	122	97,199	0.13%	48	151
Services not allocated (by deduction)	0	50,562			
Total EBOPS Services	9,448	3,595,701	0.26%	n/a	188

Table 6a suggests that New Zealand has a comparative advantage in travel services, which measures spending by non-residents in New Zealand (international students, international business visitors and other international tourists).

It also suggests we may have a comparative advantage in personal, cultural and recreational services, although this result might be overstated due to the low number of reporters included in the world exports number. This category includes audiovisual and other services related to the production of radio and television programmes, musical records and motion pictures (62% of this category in 2007), services associated with museums, sporting activities etc; and education services rendered abroad, by correspondence or in person.

We are close to having a comparative advantage overall in transportation services (RCA index = 96).

The data available for services exports does not allow us to drill down to very detailed service types to identify niche performers as we did for merchandise exports.<sup>13</sup> More detailed data is, however, available for travel services, “other business services” and personal, cultural and recreational services.

Table 6b shows the detailed data available for the travel services component.

**Table 6b Travel services breakdown**

	NZ Exports 2007 US\$m	World exports 2007 US\$m (incorporating updated NZ data)	NZ Share of world exports 2007	RCA Index 2007	Number of reporting countries 2007
2 Travel	5,451	936,385	0.58%	<b>222</b>	178
2.1 Business travel	594	84,127	0.71%	<b>269</b>	96
2.2 Personal travel	4,857	594,999	0.82%	<b>311</b>	117
Unallocated travel	0	257,259			
2.2.1 Health-related expenditure	9	6,271	0.14%	52	45
2.2.2 Education-related expenditure	1,126	41,135	2.74%	<b>1042</b>	54
2.2.3 Other personal travel	3,722	484,217	0.77%	<b>293</b>	80
Unallocated personal travel	0	63,377			

Table 6b suggests that New Zealand has a comparative advantage in both business and personal travel. The further breakdown of personal travel suggests we do not have a comparative advantage in health-related travel services, but may have a comparative advantage in education related travel (spending by international students in New Zealand) and other personal travel. However, the size of the unallocated world exports values and the relatively low number of countries reporting data at this level suggests the world exports numbers may be understated and the RCA indexes overstated.

<sup>13</sup> Section 3.1 showed that it is possible to not have a comparative advantage (have a comparative disadvantage) at the broad level, but still have subsectors with a strong comparative advantage (for example, we do not have a revealed comparative advantage for machinery and transport equipment exports overall, but do have a revealed comparative advantage for more than 100 different products within machinery and transport equipment).



Table 6c shows the breakdown of Other Business services. New Zealand does not have a revealed comparative advantage in any of these subcategories.

**Table 6c Other Business Services Breakdown**

	NZ Exports 2007 US\$m	World exports 2007 US\$m (incorporating updated NZ data)	NZ Share of world exports 2007	RCA Index 2007	Number of reporting countries 2007
9 Other business services	968	810,593	0.12%	45	148
9.1 Merchanting and other trade-related services	199	198,993	0.10%	38	70
9.2 Operational leasing services	7	22,825	0.03%	12	67
9.3 Miscellaneous business, professional, and technical services	762	487,848	0.16%	59	90
Unallocated other business services	0	100,927			
9.3.1 Legal, accounting, management consulting, and public relations	216	92,696	0.23%	89	66
9.3.2 Advertising, market research, and public opinion polling	57	33,436	0.17%	65	59
9.3.3 Research and development	77	50,951	0.15%	58	44
9.3.4 Architectural, engineering, and other technical services	100	64,251	0.15%	59	54
9.3.5 Agricultural, mining, and on-site processing services	2	14,022	0.02%	6	41
9.3.6 Other business services	309	176,346	0.18%	67	82
9.3.7 Services between related enterprises, n.i.e.		59,999	0.00%	0	30

Table 6d shows the breakdown of personal, cultural, and recreational services. The number of reporting countries is quite low, but the table suggests that we might have a comparative advantage in all these categories.

**Table 6d Personal, Cultural and Recreational Services Breakdown**

	NZ Exports 2007 US\$m	World exports 2007 US\$m (incorporating updated NZ data)	NZ Share of world exports 2007	RCA Index 2007	Number of reporting countries 2007
10 Personal, cultural, and recreational services	246	36,284	0.68%	<b>258</b>	99
10.1 Audiovisual and related services	151	27,682	0.55%	208	54
10.2 Other personal, cultural, and recreational services	55	8,724	0.63%	238	56
10.2.1 Education services provided offshore	29	1,898	1.51%	576	25
10.2.2 Health services		465			21
10.2.3 Other		39			39
10.2.2 Health services + 10.2.3 Other	11	151	7.32%	2787	

### **3.3.2. Comparing 2000 and 2007**

Table 6e analyses changes in New Zealand's exports of services vis-à-vis world exports of services for service types where there is New Zealand data available for both 2000 and 2007. The coverage of world exports has improved (more countries have reported detailed data) between 2000 and 2007, in some cases quite significantly. Where this is the case, the 2000 world exports value has probably been understated more than the 2007 value, and so the 2000 RCA Index has been overstated, and the world growth rate has been overstated.

Table 6e suggests we have continued to record a revealed comparative advantage in travel services (spending by non-residents in New Zealand), and an apparent comparative advantage in personal, cultural and recreational services. We have also grown closer to having a comparative advantage in transport exports.

It also suggests we have lost a former comparative advantage in some services, but the apparent comparative advantage in 2000 may have reflected significant undercoverage of world exports rather than a genuine comparative advantage.

Overall, New Zealand's service exports have grown more slowly than world service exports between 2000 and 2007 and, therefore, New Zealand has lost market share overall. However, some service types have grown faster than world exports of that service and gained market share. The most significant increase in market share was in travel services, where a 13.4% per annum growth rate was assisted by a 23% per annum increase in education related expenditure (spending in New Zealand by international students). There were also gains in market share in miscellaneous business, professional and technical services; government services not included elsewhere; and royalties and licence fees.

**Table 6e New Zealand's performance relative to world exports of services between 2000 and 2007**

	RCA Index 2007 (>100 means CA)	RCA Index 2007 (>100 means CA)	NZ Exports CAGR	World Exports CAGR	Number of reporting countries 2000	Number of reporting countries 2007
1 Transportation	94	99	7.2%	12.7%	173	174
2 Travel	<b>186</b>	<b>222</b>	13.4%	10.8%	175	178
2.1 Business travel	<b>426</b>	<b>269</b>	13.2%	21.4%	61	96
2.2 Personal travel	<b>699</b>	<b>311</b>	13.5%	27.6%	87	117
2.2.1 Health-related expenditure	116	52	7.9%	27.5%	18	45
2.2.2 Education-related expenditure	<b>3660</b>	<b>1042</b>	23.1%	36.0%	29	54
2.2.3 Other personal travel	<b>990</b>	<b>293</b>	11.5%	35.2%	47	80
3 Communications services	99	71	-0.3%	19.0%	132	161
4 Construction services	4	3	0.2%	18.0%	72	91
5 Insurance services	18	16	13.1%	15.9%	120	146
6 Financial services	14	10	16.5%	17.9%	95	121
7 Computer and information services	<b>102</b>	52	14.9%	25.0%	81	108
8 Royalties and licence fees	28	28	15.9%	13.6%	80	105
9 Other business services	51	45	15.0%	15.5%	134	148
9.1 Merchanting and other trade-related services	48	38	16.7%	17.3%	49	70
9.2 Operational leasing services	19	12	-3.5%	20.9%	47	67
9.3 Miscellaneous business, professional, and technical services	86	59	14.9%	19.8%	75	90
9.3.1 Legal, accounting, management consulting, and public relations	<b>194</b>	89	7.9%	27.1%	43	66
9.3.2 Advertising, market research, and public opinion polling	<b>121</b>	65	8.9%	24.1%	33	59
9.3.3 Research and development	98	58	10.8%	22.6%	19	44
9.3.4 Architectural, engineering, and other technical services	<b>100</b>	59	11.3%	22.6%	29	54
9.3.5 Agricultural, mining, and on-site processing services	21	6	-5.1%	35.6%	21	41
9.3.6 Other business services	<b>145</b>	67	33.0%	27.0%	55	82
9.3.7 Services between related enterprises, n.i.e.	n/a	n/a	n/a	27.4%	17	30
10 Personal, cultural, and recreational services	<b>183</b>	<b>258</b>	8.7%	8.2%	73	99
10.2.1 Education services provided offshore	1514	576	43.6%	30.4%	2	25
11 Government services, n.i.e.	63	48	12.7%	18.1%	137	151
Total EBOPS Services	100	n/a	11.5%	13.6%	187	188

Of the small number of services where we have recorded a revealed comparative advantage in 2007 and have data for 2000 as well as 2007:

- Personal, cultural, and recreational services, and its subsets Audiovisual and related services, education services and “other personal, cultural and recreational services” also appear to be stars (world export growth faster than average, NZ growth faster than world growth).
- Travel (tourism) is a winner in a slow growing market (world export growth slower than average, NZ growth faster than world growth).
- The data suggests that the subsets of travel all appear to be potential stars (world export growth faster than average, NZ growth slower than world growth). The world export growth is probably overstated due to increased coverage, however, and it is not possible that world trade for all these subsets grew faster than overall services exports when total travel exports did not.

#### 4. Discussion and potential future work

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The exports analysis in this paper identifies areas of revealed comparative advantage and exports growth for different products and services. Comparing the New Zealand export growth of products with their world export growth may also start to answer the question of where intervention has the best probability of success. However, a more comprehensive market analysis looking at the other drivers and inhibitors to growth for different sectors or products, and the other criteria (for example productivity) would be needed to fully answer this question.

Overall merchandise exports of the “star” products grew 25.8% per annum between 1999 and 2007 and gained market share of \$1.9 billion in a fast growing world market, but it is by no means certain that their past performance is an indicator of future growth. It would be interesting to investigate and learn from the reasons for their success and whether government intervention was a factor.

Ballingall and Briggs proposed a focus on the “potential stars” – products where we had a comparative advantage, where world exports are growing faster than average, but New Zealand has been losing market share. If they had grown as fast as the “stars” (25.8% per annum overall rather than 6.8% per annum), they would have added over \$4 billion to New Zealand’s merchandise exports, so there does appear

to be some opportunity there, but it is difficult to draw any firm policy conclusions without analysing what has constrained their growth.

There does seem to be some sense in building on existing strengths, while recognising and allowing for the potential development of new comparative advantages and application of existing capabilities to different types of products. Procter (2011) provided a useful reminder of the latter by noting that economic commentator John Bowring "...lamented that the foolish Germans wanted to make iron and steel instead of sticking to [their comparative advantage in] wheat and rye and buying their manufactures from Britain" (Landes, 1999, p. 315, cited in Procter, 2011).

There also seems to be some sense in looking at where world exports are growing fast and demand is less likely to be a constraint, particularly given that New Zealand's exports are currently skewed towards products with slower growing world exports. Slow growth in world demand may be less of a constraint for New Zealand than in countries accounting for a greater share of exports, but one might expect there would be more opportunities in faster growing markets.

But we should acknowledge that "winners in slow growing markets" have been important contributors to our overall export growth. New Zealand's exports of these products grew 15.4% per annum overall between 1999 and 2007, faster than total world exports growth, and gained market share of \$3.6 billion overall.

Drilling down to the HS4 level and then the HS6 level uncovered niche performers not evident in the more aggregated data. There could well be other niche performers masked by the aggregation which occurs even at the HS6 level. The data available for services exports does not allow us to drill down to very detailed service types, so it is even more likely that there are niche performers hidden in the services data.

As noted above, this is just one way of starting to look at where the Government might focus its efforts and not sufficient on its own to identify sectors of interest. Further work could usefully look at:

- Why the star performers have done so well – in particular those that went from no comparative advantage to a strong comparative advantage. What factors have helped them to succeed?
- Why the potential stars have not done so well. What factors have impeded their growth?
- Market analyses of individual sectors/products identified by this exercise along the lines of the Porter studies (see for example Crocombe et al, 1991).

Other potential further work could include:

- Updating the data used in this report to reflect the post-Global Economic Crisis environment and incorporating the more detailed services data available from the 2011 Census of International Trade in Services and Royalties
- Analysing the data through an industry sector lens rather than the product and service type lens used in this paper

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## Appendix 1 – Data Issues and adjustments

Different countries have reported data on COMTRADE in different years. The “world” total for all reporting countries is used in the benchmark analysis to maximise the accuracy of the analysis for that year. However, the “world” totals used to analyse change between 1999 and 2007 include only those countries that reported in both years, to ensure the change is not due to different countries reporting in each year.

Re-exports<sup>14</sup> have been removed from the exports data in the 2007 benchmark analysis because we are primarily interested in New Zealand produced goods. However, 1999 re-exports data is missing from COMTRADE for a number of countries (including New Zealand and Australia), so the comparisons between 1999 and 2007 use exports including re-exports.

At the time the data was extracted, the New Zealand data on COMTRADE had not been updated when confidentiality was lifted (confidential values returned to their “home” codes from the special confidentiality code within HS99) for items subject to 12 months or 24 months suppression.<sup>15</sup> The data for these items used in this paper has been adjusted as follows:

- For items subject to 12 months suppression, the New Zealand dollar value of exports for the year ended December 2007 (the COMTRADE reference year) from Statistics New Zealand’s Infoshare database has been converted to US\$ using the COMTRADE currency conversion factor of 0.736762, added back into their “home” HS codes, and subtracted from the confidential code in HS 99.
- A similar adjustment has been made for those items subject to 24 months suppression<sup>16</sup>. However, the New Zealand data for these items is still confidential back to July 2007. New Zealand data for the year ended June

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<sup>14</sup> New Zealand’s re-exports are defined as merchandise exports that were earlier imported into New Zealand and comprise less than 50 percent New Zealand content by value.

<sup>15</sup> Information about Statistics New Zealand’s trade confidentiality policy can be found at [http://www.stats.govt.nz/about\\_us/policies-and-guidelines/trade-confidentiality.aspx](http://www.stats.govt.nz/about_us/policies-and-guidelines/trade-confidentiality.aspx) ,

<sup>16</sup> This affects HS 1605901931 Mollusc preparations; mussels, crumbed or battered, packed other than in airtight cans or jars; 250700 Kaolin and other kaolinic clays; whether or not calcined; 270112 Coal; bituminous, whether or not pulverised, but not agglomerated

2007 has been used rather than the year ended December 2007 so that a full year of data is included.

- Data is still “missing” from its home code in the 2007 data (included in the confidentiality code within HS 99) for certain newsprint, crude wool grease and ethanol items that are confidential back to July 2005 in the New Zealand data<sup>17</sup>.

Statistics New Zealand has been working with the United Nations to resolve the data issues.

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<sup>17</sup> This affects HS1505000100 Animal fats and oils; wool grease, crude; 2207102100 Undenatured ethyl alcohol; of an alcoholic strength by volume of 80% vol. or higher, (other than rectified spirits of wine), for further manufacture; 2207102900 Undenatured ethyl alcohol; of an alcoholic strength by volume of 80% vol. or higher, other than rectified spirits of wine, not for further manufacture; 2207203900 Ethyl alcohol and other spirits; denatured, of any strength, n.e.c. in item no. 2207.20, other than for manufacture in a licensed manufacturing area; 3808300229 Herbicides; containing 2,4-dichlorophenoxyacetic acid and salts and esters thereof, put up in forms or packings for retail sale or as preparations or articles; 4801009011 Newsprint; (other than of fibres obtained essentially by a chemi-mechanical process, or of a weight per m<sup>2</sup> of more than 57g but not more than 65g), in rolls

## Appendix 2 – Detailed tables

**Table 2b HS4 Products with a comparative advantage (RCA Index>100) in 2007**

HS4	Description	NZ Exports excluding re-exports 2007 US\$000	NZ Share of World Trade 2007 (excluding re- exports, using world = all reporters)	RCA Index 2007 (using all reporters, excluding re- exports)
0204	Meat of sheep or goats, fresh, chilled or frozen	1,746,350	40.23%	20115
0507	Ivory, whalebone etc., unworked, simply worked, unshaped	20,978	27.64%	13821
3501	Casein, caseinates & casein derivatives, casein glues	620,554	25.31%	12658
0402	Milk and cream, concentrated or sweetened	2,998,101	20.17%	10086
0208	Meat, edible meat offal nes, fresh, chilled or frozen	170,169	18.22%	9110
3502	Albumins, albuminates and other albumin derivatives	116,567	17.02%	8510
0405	Butter and other fats and oils derived from milk	880,440	16.76%	8382
4701	Mechanical wood pulp	70,163	13.31%	6657
5101	Wool, not carded or combed	468,078	13.14%	6573
4102	Raw skins of sheep or lambs	102,497	11.32%	5663
0810	Fruits nes, fresh	594,494	11.20%	5601
0404	Whey, natural milk products nes	454,569	10.09%	5043
0202	Meat of bovine animals, frozen	987,615	9.91%	4957
5106	Yarn of carded wool, not retail	85,163	8.73%	4366
1502	Bovine, sheep and goat fats, raw or rendered	87,989	6.67%	3334
0510	Ambergris, civet, musk, etc. for pharmaceutical use	6,007	5.53%	2767
4705	Semi-chemical wood pulp	80,109	5.52%	2760
0506	Bones and horn-cores unworked or simply worked	7,662	5.10%	2553
0409	Honey, natural	40,096	4.58%	2291
0406	Cheese and curd	962,798	4.36%	2181
0101	Live horses, asses, mules and hinnies	95,755	4.25%	2123
2619	Waste, scale, dross, slag of iron or steel industry	11,994	4.20%	2101
0403	Buttermilk, cream, yogurt etc.	153,799	4.14%	2070
0504	Guts, bladders and stomachs of animals except fish	114,749	3.88%	1940
1901	Malt extract, flour, dairy preparations, low cocoa	368,555	3.87%	1935
4403	Wood in the rough or roughly squared	449,158	3.77%	1887
0808	Apples, pears and quinces, fresh	271,839	3.70%	1848
0511	Animal products nes, dead animals (non-food)	42,308	3.34%	1671
0206	Edible offal of domestic animals	114,203	3.30%	1651
0307	Molluscs	208,805	3.13%	1563
1603	Extracts, juices of meat, fish, aquatic invertebrates	5,076	3.08%	1540
0703	Onions, shallots, garlic, leeks, etc. fresh or chilled	90,714	2.41%	1207
8434	Milking machines and dairy machinery	36,318	2.24%	1119
2301	Flour etc. of meat, fish or offal for animal feed	80,210	2.20%	1102
0710	Vegetables (uncooked, steamed, boiled) frozen	95,590	2.07%	1036
2204	Grape wines(including fortified), alcoholic grape must	558,355	2.04%	1020
2104	Soups, broths and homogenized food preparations	44,868	1.97%	984
0303	Fish, frozen, whole	239,760	1.94%	972

1702	Sugars nes, lactose, fructose, glucose, maple syrup	72,148	1.94%	969
7601	Unwrought aluminium	912,373	1.91%	953
0508	Coral, shell, cuttle bone, etc., unworked, and waste	2,144	1.90%	952
8007	Tin articles nes	5,981	1.87%	936
2106	Food preparations, nes	342,799	1.69%	845
0601	Bulbs, tubers, corms, etc., chicory plant (non-food)	24,868	1.66%	831
4411	Fibreboard of wood or other ligneous materials	164,250	1.65%	824
4105	Sheep or lamb skin leather, without wool on	21,703	1.64%	819
4409	Wood continuously shaped along any edges	90,324	1.62%	809
1209	Seed, fruit and spores, for sowing	70,990	1.60%	799
4407	Wood sawn, chipped lengthwise, sliced or peeled	544,072	1.57%	785
9020	Breathing appliances and gas masks	16,450	1.55%	774
2847	Hydrogen peroxide, (including solidified with urea)	6,637	1.53%	763
3805	Gum, wood, sulphate turpentine, dipentene, etc.	1,471	1.47%	736
9033	Parts, accessories nes for opto-electric instruments	41,899	1.45%	725
4108	Chamois (including combination chamois) leather	1,823	1.40%	702
3203	Colouring matter of vegetable or animal origin	7,536	1.33%	667
4703	Chemical wood pulp, soda or sulphate, not dissolving	302,970	1.31%	654
5605	Metallised yarn	2,897	1.26%	631
0304	Fish fillets, fish meat, mince except liver, roe	173,705	1.23%	613
4103	Raw hides and skins except bovine, equine, sheep	5,820	1.18%	592
9019	Therapeutic appliances, nes	75,003	1.18%	589
0401	Milk and cream, neither concentrated nor sweetened	72,228	1.15%	573
1210	Hop cones, fresh or dried, lupulin	4,495	1.11%	557
2105	Ice cream and other edible ice	27,831	1.11%	554
2004	Vegetables nes, prepared, frozen	57,693	1.10%	548
4401	Fuel wood, wood in chips or particles, wood waste	44,630	1.07%	534
4101	Raw hides and skins of bovine, equine animals	49,188	1.06%	533
8715	Baby carriages and parts thereof	15,379	1.05%	526
3504	Peptones, proteins, derivatives, nes, hide powder	15,661	1.05%	524
8903	Yachts, pleasure, sports vessels, rowing boats, canoe	152,642	1.03%	518
0201	Meat of bovine animals, fresh or chilled	169,006	1.02%	509
5703	Carpets, tufted	70,569	0.99%	495
4408	Veneers and sheets for plywood etc. <6mm thick	33,560	0.98%	491
4302	Tanned, dressed furskins	16,512	0.96%	480
2522	Quicklime, slaked, hydraulic lime for construction etc.	6,545	0.92%	459
9008	Image projectors, photographic enlargers and reducers	3,712	0.92%	458
8436	Machinery for feedstuffs, poultry, beekeeping	44,290	0.92%	458
2103	Sauce, condiments, mixed seasoning and mustard	57,732	0.89%	446
4910	Calendars, printed	3,936	0.89%	446
9014	Navigational instruments, direction finding compasses	49,211	0.89%	445
3503	Gelatin & derivatives, isinglass, glues (animal) nes	8,014	0.89%	443
0709	Vegetables nes, fresh or chilled	78,528	0.88%	442
4804	Uncoated kraft paper and paperboard	99,204	0.87%	437
3803	Tall oil, whether or not refined	1,265	0.85%	426
0804	Dates, figs, pineapple, avocado, guava, fresh or dried	35,357	0.85%	423
5907	Textile fabric treated for theatrical backdrops, etc.	6,924	0.81%	406
4104	Bovine or equine leather, no hair, not chamois, paten	149,720	0.78%	388
4107	Leather of other animals, no hair, not chamois, paten	8,137	0.75%	373
0306	Crustaceans	105,860	0.73%	365
4206	Articles of gut, goldbeater's skins, bladders, tendon	229	0.72%	358
8002	Tin waste or scrap	1,309	0.71%	353

2905	Acyclic alcohols and their derivatives	146,305	0.69%	347
0302	Fish, fresh or chilled, whole	70,671	0.69%	346
1605	Crustaceans, molluscs, etc., prepared or preserved	51,169	0.69%	343
0811	Fruits and nuts, uncooked boiled or steamed, frozen	18,988	0.67%	333
5607	Twine, cordage, rope and cable	11,019	0.66%	331
8450	Household, laundry-type washing machine, washer-drier	87,621	0.66%	328
8423	Weighing machinery except balances sensitivity > 50 m	20,092	0.65%	323
7602	Aluminium waste or scrap	74,693	0.64%	322
8805	Aircraft launching gear, flight simulators	6,904	0.64%	321
8451	Machinery nes, to clean, iron, impregnate textiles	41,003	0.64%	320
4412	Plywood, veneered panels and similar laminated wood	85,050	0.64%	319
0410	Edible products of animal origin, nes	1,113	0.61%	306
8505	Electro and permanent magnets, equipment using magnet	36,859	0.60%	302
1704	Sugar confectionery, non-cocoa, white chocolate	43,238	0.59%	297
2007	Jams, jellies, marmalades, fruit, nut pastes, purees	12,695	0.59%	293
3806	Rosin and resin acids, and derivatives	7,496	0.58%	288
8202	Hand saws and blades for saws of all kinds	18,771	0.57%	285
2826	Fluorides and complex fluorine salts	4,001	0.57%	284
2202	Waters, non-alcoholic sweetened or flavoured beverage	66,965	0.57%	284
4803	Paper, household, sanitary, width > 36 centimetres	14,668	0.57%	283
1806	Chocolate and other foods containing cocoa	91,348	0.54%	272
3807	Wood tar, tar oils, creosote, naphtha, veg. pitches	445	0.53%	265
1602	Prepared or preserved meat, meat offal and blood, nes	55,772	0.53%	265
4410	Particle board, similar board, wood, ligneous materials	41,671	0.53%	263
5105	Wool and animal hair, carded or combed	10,774	0.52%	258
6506	Headgear, not felt, plaited, knit or crochet	9,149	0.51%	256
8412	Engines and motors, nes	55,393	0.51%	254
7316	Anchors, grapnels and parts thereof, of iron or steel	1,218	0.50%	251
7213	Hot rolled bar, rod of iron/steel, in irregular coils	62,868	0.50%	249
4418	Builders joinery and carpentry, of wood	69,346	0.49%	243
0104	Live sheep and goats	4,593	0.49%	243
1102	Cereal flours other than of wheat or meslin	2,181	0.48%	242
7611	Aluminium reservoirs, vats, tanks, etc., capacity >300	797	0.47%	237
0712	Vegetables, dried, not further prepared	9,351	0.47%	237
8304	Office equipment of base metal e.g. filing cabinet	991	0.47%	236
5103	Waste of wool or animal hair, except garnetted stock	484	0.47%	235
4707	Waste or scrap of paper or paperboard	36,470	0.46%	232
7801	Unwrought lead	25,292	0.46%	230
0713	Vegetables, leguminous dried, shelled	20,710	0.46%	229
7802	Lead waste or scrap	1,737	0.46%	228
4805	Uncoated paper and paperboard nes	38,939	0.46%	228
1905	Baked bread, pastry, wafers, rice paper, biscuits, et	84,731	0.45%	224
2309	Animal feed preparations, nes	68,319	0.45%	224
2617	Ores and concentrates, nes	627	0.44%	222
6901	Bricks, blocks and ceramic goods of siliceous earths	530	0.44%	221
1404	Vegetable products, nes	1,839	0.44%	219
0706	Carrots, turnips, beetroot, etc. fresh or chilled	4,802	0.44%	218
2507	Kaolin and other kaolinic clays	8,256	0.43%	213
0603	Cut flowers, dried flowers for bouquets, etc.,	29,984	0.42%	212
4404	Hoopwood, split poles, pile, pickets and stakes	772	0.42%	211
9704	Used postage and revenue stamps, first day covers, et	728	0.42%	209
7804	Lead plates, sheets, strip, foil, powders and flakes	2,159	0.41%	205

2701	Coal, briquettes, ovoids etc., made from coal	214,637	0.41%	205
0102	Live bovine animals	26,267	0.41%	204
2851	Inorganic compounds, liquid/compressed air, amalgams	1,522	0.41%	203
2005	Vegetables nes, prepared/preserved, not frozen/vinegar	30,527	0.40%	200
8422	Machinery for dish washing, bottle washing, filling	96,550	0.40%	199
2918	Carboxylic acids (additional oxygen function), derivs	19,977	0.40%	198
2501	Salt (sodium chloride) including solution, salt water	6,621	0.40%	198
9601	Worked ivory, other animal carving material	383	0.39%	197
7412	Copper pipe and tube fittings	14,942	0.39%	197
1504	Fish, marine mammal fat or oil not chemically modified	3,849	0.39%	195
0809	Stone fruit, fresh (apricot, cherry, plum, peach, etc.	12,896	0.39%	195
3210	Paints and varnishes nes, water pigments for leather	2,566	0.38%	192
5102	Fine or coarse animal hair, not carded or combed	648	0.38%	191
7118	Coin	1,234	0.38%	190
8463	Machine-tools (metal, carbides, etc.), no metal removal	7,273	0.38%	189
4821	Paper or paperboard labels including printed labels	15,069	0.37%	187
0106	Animals, live, except farm animals	2,478	0.37%	184
8462	Machine-tools for forging, die-stamping, bending meta	34,825	0.37%	184
1521	Veg waxes except triglycerides, insect wax, spermaceti	698	0.37%	183
0604	Foliage etc except flowers for ornamental purposes	4,836	0.36%	182
4817	Envelopes for mail, cards, writing compendiums, etc.	4,691	0.36%	181
7001	Glass cullet, waste or scrap, glass in the mass	986	0.36%	180
6306	Textile tarpaulin, sail, awning, tent, camping goods	9,336	0.35%	177
8535	Electrical apparatus for voltage over 1 kV	26,720	0.34%	169
8433	Harvesting, produce cleaning and grading machinery	49,686	0.34%	169
4303	Clothing, accessories and other articles of furskin	6,751	0.33%	165
4818	Household, sanitary, hospital paper articles, paper clothing	58,354	0.33%	164
4504	Agglomerated cork and articles thereof	2,583	0.32%	161
7108	Gold, unwrought, semi-manufactured, powder form	200,337	0.32%	161
4808	Paper, board corrugated creped embossed perforated nes	4,685	0.32%	159
1902	Pasta, couscous, etc.	17,253	0.32%	158
5601	Textile wadding and articles, textile flock, dust, nes	6,514	0.31%	157
0701	Potatoes, fresh or chilled	10,584	0.31%	157
7313	Wire for fencing, including barbed wire	505	0.31%	156
8546	Electrical insulators of any material	6,377	0.31%	156
0813	Fruit, dried, nes, dried fruit and nut mixtures	4,489	0.31%	154
7204	Ferrous waste or scrap, ingots or iron or steel	125,177	0.31%	154
6507	Parts for hats and headgear	409	0.31%	153
1604	Prepared or preserved fish, fish eggs, caviar	33,904	0.31%	153
5705	Carpets and textile floor coverings, nes	3,710	0.30%	152
3924	Plastic table, kitchen, household, toilet articles	29,201	0.30%	152
8418	Refrigerators, freezers and heat pumps nes	112,645	0.30%	151
6307	Made up articles nes, including dress patterns	20,337	0.30%	149
8405	Producer, water and acetylene gas generators	3,018	0.29%	145
7604	Aluminium bars, rods and profiles	47,098	0.29%	145
5702	Carpets, woven, not tufted, flocked	8,019	0.29%	144
9703	Original sculptures and statuary, in any material	5,890	0.28%	139
3402	Organic surface active agent, preparation, except soap	58,557	0.27%	136
5109	Yarn of wool or of fine animal hair, retail	615	0.27%	134
2201	Unsweetened beverage waters, ice and snow	7,772	0.27%	133

6811	Articles of asbestos-cement & cellulose fibre cement	2,397	0.26%	132
0205	Horse, ass, mule, hinny meat, fresh, chilled or froze	1,348	0.26%	130
5107	Yarn of combed wool, not retail	4,955	0.26%	129
4820	Office books, forms, exercise books, folders, binders	10,192	0.26%	129
9406	Prefabricated buildings	20,408	0.26%	129
3101	Animal or vegetable fertilizers, in packs >10 kg	943	0.25%	127
1904	Cereal food (roasted, swelled), cooked grain not maize	10,393	0.25%	125
7616	Articles of aluminium nes	32,997	0.25%	125
8474	Machinery to sort, screen, wash, etc. mineral products	41,383	0.25%	123
5608	Knotted netting of twine, etc., fishing and other nets	2,541	0.25%	123
2940	Sugars, chemically pure, their ethers, esters, salts	2,168	0.25%	123
3915	Waste, parings and scrap, of plastics	12,451	0.24%	122
3808	Insecticides, fungicides, herbicides etc. (retail)	43,203	0.24%	121
2403	Tobacco, tobacco substitute products nes	5,990	0.24%	120
2009	Fruit and vegetable juices, not fermented or spirited	33,276	0.24%	119
7326	Articles of iron or steel nes	84,756	0.24%	119
8435	Presses, crushers etc. for wine, fruit juice, beverage	1,013	0.24%	119
9402	Medical, dental, surgical, veterinary furniture, part	5,396	0.23%	117
2206	Fermented beverages nes (e.g. cider, perry, mead)	1,927	0.23%	116
3923	Containers, bobbins and packages, of plastics	86,586	0.23%	116
5602	Textile felt	2,275	0.23%	116
4810	Paper, board, clay, inorganic coated at least one side	74,337	0.23%	113
7324	Sanitary ware and parts thereof, of iron or steel	5,804	0.22%	112
5604	Rubber thread & cord, rubber & plastic coated fabrics	777	0.22%	112
7806	Articles of lead nes	745	0.22%	110
5609	Articles of yarn strip, twine, cordage, rope, nes	497	0.22%	108
7404	Copper, copper alloy, waste or scrap	38,942	0.22%	108
6309	Worn clothing and other worn articles	4,541	0.21%	106
4823	Paper and paper articles nes	10,639	0.20%	101

**Table 1c HS6 products with a high comparative advantage (RCA Index>500) in 2007**

High tech?	LOP 2 digit	HS92	HS description	NZ Exports excluding re-exports 2007 US\$000	NZ Share of World Trade 2007 (excluding re-exports, using world = all reporters)	RCA Index 2007 (using all reporters, excluding re-exports)
no	11	020442	Sheep cuts, bone in, frozen	883,177	60.04%	30025
no	11	030739	Mussels, frozen, dried, salted or in brine	124,708	57.53%	28768
no	11	020443	Sheep cuts, boneless, frozen	321,400	47.71%	23856
no	11	510121	Degreased shorn wool, not carded, combed or carbonize	321,943	47.35%	23680
no	11	020422	Sheep cuts, bone in, fresh or chilled	340,977	41.95%	20980
no	11	020423	Sheep cuts, boneless, fresh or chilled	125,437	41.09%	20548
no	11	020430	Lamb carcasses and half carcasses, frozen	43,677	38.82%	19413
no	11	020441	Sheep carcasses and half carcasses, frozen	19,568	38.39%	19199
no	12	040490	Natural milk products nes (milk protein concentrate)	426,554	36.22%	18111
no	11	410221	Sheep or lamb skins, pickled, without wool	65,483	33.19%	16595
no	12	040221	Milk and cream powder unsweetened < 1.5% fat	2,040,790	31.69%	15849
no	11	050790	Whalebone, horns, etc. unworked or simply prepared nes	20,978	30.13%	15068
no	21	350290	Albumins nes, albuminates & other albumin derivatives (includes milk albumin and whey protein concentrate)	116,566	27.64%	13819
no	11	020690	Sheep, goat, ass, mule, hinnie edible offal, frozen	30,048	27.37%	13689
no	21	350190	Casein glues, caseinates and other casein derivatives	250,351	25.81%	12905
no	12	510521	Combed wool in fragments	10,114	25.73%	12869
no	21	350110	Casein	370,202	24.99%	12497
no	11	020890	Meat and edible offal nes fresh, chilled or frozen	170,169	23.84%	11922
no	11	081090	Fruits, fresh nes	581,459	21.57%	10785
no	11	030621	Rock lobster and other sea crawfish not frozen		21.26%	10632
no	11	410229	Sheep or lamb skins, raw, except pickled, no wool	9,986	20.95%	10478
no	11	020220	Bovine cuts bone in, frozen	72,038	19.93%	9969
no	12	040500	Butter and other fats and oils derived from milk	880,440	16.76%	8382
no	12	040210	Milk powder < 1.5% fat	948,993	16.13%	8067
no	11	020621	Bovine tongues, frozen	32,057	15.43%	7714
no	21	510610	Yarn of carded wool, >85% wool, not retail	79,506	14.05%	7025
no	11	470100	Mechanical wood pulp	70,163	13.31%	6657
no	11	120922	Seed, clover, for sowing	11,914	12.20%	6100
no	11	020230	Bovine cuts boneless, frozen	914,908	9.80%	4903
no	12	230110	Flour or meal, pellet of meat or offal for animal fee	58,219	9.72%	4859
no	11	120925	Seed, rye grass, for sowing	25,216	9.33%	4666
no	21	410519	Sheep or lamb skin leather, tanned or retanned, nes	19,611	9.28%	4640
no	11	071040	Sweet corn, frozen, uncooked steamed or boiled	25,072	9.24%	4623
no	11	510129	Degreased wool nes, not carded, combed or carbonized	6,624	8.83%	4415
no	11	071021	Peas, frozen, uncooked steamed or boiled	33,379	8.74%	4371
no	12	040620	Cheese, grated or powdered, of all kinds	79,406	8.72%	4360
no	12	040390	Buttermilk, curdled milk, cream, kephir, etc.	151,458	8.42%	4212
no	11	010119	Horses, live except pure-bred breeding	81,222	8.40%	4199
no	11	050690	Bones and horn-cores unworked or simply worked nes		8.36%	4179
no	12	470311	Chemical wood pulp, soda or sulphate, conifer, unbleached	71,722	7.60%	3799
no	22	843360	Machines for cleaning, sorting, grading eggs/fruit/et	33,472	7.09%	3546



no	21	440810	Veneer or ply sheet, coniferous (softwood) <6 mm thick	33,379	6.98%	3492
no	11	030265	Dogfish and other sharks, fresh or chilled, whole	2,478	6.93%	3464
no	12	150200	Bovine, sheep and goat fats, raw or rendered	87,989	6.67%	3334
no	11	510119	Greasy wool (other than shorn) not carded or combed		6.66%	3331
no	11	030376	Eels, frozen, whole	3,133	6.63%	3317
no	12	170210	Lactose and lactose syrup	69,554	6.58%	3291
no	22	570310	Carpets of wool or fine animal hair, tufted	56,352	6.43%	3217
no	11	030710	Oysters	12,128	6.42%	3209
no	12	190190	Malt extract & limited cocoa pastry cooks products nes	261,862	6.40%	3201
no	11	030375	Dogfish and other sharks, frozen, whole		6.36%	3182
no	21	282630	Sodium hexafluoroaluminate (synthetic cryolite)	4,000	6.35%	3175
no	11	440320	Logs, poles, coniferous not treated or painted	442,290	6.07%	3033
no	11	051199	Animal products and domestic animal carcass (non-food)	36,660	5.81%	2905
no	12	200551	Beans, shelled, prepared/preserved, not frozen/vinegar	22,830	5.71%	2854
Hi tech	22	300310	Penicillins or streptomycins and derivatives, in bulk	10,073	5.65%	2823
no	11	051000	Ambergris, civet, musk, etc. for pharmaceutical use	6,007	5.53%	2767
no	12	470500	Semi-chemical wood pulp	80,109	5.52%	2760
no	11	510111	Greasy shorn wool, not carded or combed	131,368	5.08%	2543
no	11	080810	Apples, fresh	265,275	4.86%	2432
no	22	840220	Super-heated water boilers		4.74%	2372
no	12	440910	Coniferous wood continuously shaped along any edges	89,761	4.72%	2363
no	11	020629	Bovine edible offal, frozen except livers and tongues	39,483	4.69%	2346
no	12	040690	Cheese except fresh, grated, processed or blue-veined	700,611	4.68%	2338
no	11	020622	Bovine livers, frozen	8,989	4.67%	2337
no	11	030379	Fish nes, frozen, whole	162,598	4.64%	2320
no	12	040900	Honey, natural	40,096	4.58%	2291
no	12	151610	Animal fats, oils, fractions, hydrogenated, esterified	1,924	4.38%	2192
no	11	440121	Wood in chips, coniferous	37,938	4.22%	2108
no	11	261900	Waste, scale, dross, slag of iron or steel industry		4.20%	2101
no	22	820231	Circular saw blades, working part of steel	17,004	4.13%	2064
no	11	070310	Onions and shallots, fresh or chilled	90,112	4.11%	2054
no	22	630631	Sails, synthetic fibres	6,193	3.99%	1993
no	11	050400	Guts, bladders and stomachs of animals except fish	114,749	3.88%	1940
no	21	410429	Bovine and equine leather, tanned or retanned, nes	107,513	3.83%	1917
no	11	030378	Hake, frozen, whole	25,438	3.74%	1871
no	11	410210	Sheep or lamb skins, raw, wool on, except Persian etc.	24,489	3.72%	1862
no	11	071090	Frozen vegetable mixtures, uncooked, boiled or steamed	24,515	3.62%	1811
no	21	760110	Aluminium unwrought, not alloyed	876,688	3.58%	1791
Hi tech	22	901480	Navigational instruments and appliances nes	41,547	3.33%	1665
no	12	040630	Cheese processed, not grated or powdered	68,844	3.28%	1639
no	11	020450	Goat meat, fresh, chilled or frozen	4,522	3.24%	1622
no	12	190110	Infant foods of cereals, flour, starch or milk, retail	103,860	3.22%	1611
no	12	040610	Fresh cheese, unfermented whey cheese, curd	112,345	3.20%	1600
no	12	160290	Meat, meat offal and blood, prepared or preserved, ne	6,921	3.08%	1541
no	22	842389	Weighing machinery, nes	4,420	3.08%	1540
no	11	160300	Extracts, juices of meat, fish, aquatic invertebrates	5,076	3.08%	1540
no	22	600291	Knit, crochet fabric of wool or fine animal hair, nes	4,483	3.08%	1538
no	11	021020	Bovine meat salted, dried or smoked	6,068	3.07%	1536

no	21	350710	Rennet and concentrates thereof	3,404	3.06%	1533
no	12	410130	Bovine hides, raw, nes	7,457	3.04%	1518
no	11	030749	Cuttle fish, squid, frozen, dried, salted or in brine	63,028	3.03%	1517
no	21	481140	Paper, coat/impregnated with wax/stearin/glycerol, ne	12,204	3.02%	1508
no	22	721310	Hot rolled bar/rod grooved iron or non-alloy steel in irregular coils		2.98%	1490
no	22	780411	Lead foil of a thickness <2mm	2,124	2.96%	1480
no	11	080440	Avocados, fresh or dried	35,337	2.95%	1474
no	22	843420	Dairy machinery	17,632	2.94%	1472
no	11	030619	Crustaceans nes, frozen,	15,295	2.94%	1471
no	21	480510	Paper, fluting, in rolls, semi-chemical, uncoated	36,632	2.91%	1455
no	21	441129	Fibreboard 0.5 - 0.8 g/cm2 worked/surface covered	160,470	2.80%	1399
no	12	220421	Grape wines nes, fortified wine or must, pack < 2l	537,443	2.75%	1376
no	22	842382	Weighing machinery having a capacity of 30-5000 kg	6,464	2.52%	1259
no	22	560741	Binder or baler twine, of polyethylene, polypropylene	4,027	2.47%	1233
no	21	380630	Ester gums	6,287	2.38%	1191
no	11	030343	Skipjack, stripe-bellied bonito, frozen, whole	10,017	2.37%	1186
no	11	080910	Apricots, fresh	6,604	2.31%	1155
no	12	410110	Bovine skins, whole, raw	23,685	2.29%	1146
no	12	160250	Bovine meat, offal nes, not livers, prepared/preserve	45,418	2.25%	1127
no	11	030339	Flatfish except halibut, plaice or sole, frozen, whole	5,895	2.19%	1093
no	12	160590	Molluscs and shellfish nes, prepared or preserved	51,047	2.17%	1083
no	12	210410	Soups and broths and preparations thereof	39,796	2.14%	1072
no	11	030341	Tunas(albacore, longfin), frozen, whole	3,678	2.13%	1065
no	11	440310	Poles, treated or painted with preservatives	6,861	2.12%	1061
no	22	843490	Parts of milking machines and dairy machinery	15,618	2.12%	1059
no	21	480830	Paper, kraft, creped or crinkled, not corrugated, sac	3,796	2.06%	1032
no	21	441299	Panels, laminated wood, nes	49,937	2.05%	1027
no	11	410390	Raw hide/skins except bovine/equine/sheep/goat/reptile	5,820	2.05%	1024
no	12	440710	Lumber, coniferous (softwood) thickness < 6 mm	542,902	2.05%	1023
no	21	480411	Paper, Kraftliner, unbleached, uncoated	82,305	2.04%	1018
no	11	060110	Bulbs, tubers, corms, crowns and rhizomes, dormant	24,787	2.02%	1008
no	22	901920	Therapeutic respiration apparatus	70,463	2.01%	1007
no	11	081120	Raspberries, mulberries, etc. (uncooked, steam, boil),froze	12,417	2.01%	1005
no	21	430219	Tanned, dressed whole furs except lamb/mink/rabbit/hare	16,194	2.01%	1003
no	21	410790	Leather, of animals nes	8,137	1.98%	988
no	11	050800	Coral, seashell, cuttle bone, etc., unworked, powder, waste	2,144	1.90%	952
no	22	800700	Tin articles nes	5,981	1.87%	936
no	11	081040	Cranberries, bilberries, similar fruits, fresh	10,185	1.84%	922
no	22	842211	Dish washing machines (domestic)	63,453	1.82%	910
no	12	470321	Chemical wood pulp, soda or sulphate, conifer, bleached	228,598	1.78%	888
no	22	840590	Producer, water and acetylene gas generator parts	2,574	1.77%	885
no	12	210690	Food preparations nes	341,851	1.77%	883
no	22	843680	Agricultural, bee-keeping plant nes, germination plan	35,632	1.76%	878
no	11	070990	Vegetables, fresh or chilled nes	49,589	1.74%	872
no	11	510130	Carbonized wool, not carded or combed	2,337	1.72%	862
no	22	854099	Parts of electronic valve & tubes, except cathode ray	4,322	1.72%	861
no	12	150410	Fish-liver oils, fractions, not chemically modified	1,802	1.71%	854
no	11	030490	Fish meat & mince, except liver, roe & fillets, froze	33,465	1.70%	848
no	21	430220	Tanned or dressed furskin pieces (heads, tails, paws)	165	1.69%	846
no	12	160420	Fish prepared or preserved, except whole, in pieces	33,631	1.69%	845
no	21	291819	Carboxylic acids (alcohol function only), derivatives	18,249	1.67%	835
no	11	071310	Peas dried, shelled	18,762	1.66%	833

no	12	180620	Chocolate and other food preps containing cocoa, bars or containers over 2 kg	47,612	1.64%	820
no	12	040229	Milk and cream powder sweetened < 1.5% fat	8,056	1.64%	818
no	11	120929	Seed, forage plants, for sowing nes	6,111	1.63%	816
no	22	890391	Sailboats, with or without auxiliary motor	39,085	1.62%	809
no	11	081350	Mixtures of edible nuts, dried and preserved fruits	3,500	1.60%	802
no	22	850590	Electro-magnets nes and parts of magnetic devices	36,107	1.59%	795
no	22	902000	Breathing appliances and gas masks	16,450	1.55%	774
no	22	845121	Drying machines, capacity <10 kg, except washer-drier	24,693	1.55%	774
no	11	020130	Bovine cuts boneless, fresh or chilled	163,655	1.54%	769
no	22	845190	Parts of machines for treating textile fabrics	15,836	1.53%	767
Hi tech	22	854160	Mounted piezo-electric crystals	78,035	1.53%	767
no	21	450490	Articles of agglomerated cork	2,382	1.53%	766
no	22	430390	Articles of furskin except clothing and accessories	5,761	1.52%	763
no	11	030420	Fish fillets, frozen	133,297	1.50%	749
no	11	071022	Beans, frozen, uncooked steamed or boiled	4,564	1.49%	746
no	11	030269	Fish nes, fresh or chilled, whole	44,309	1.48%	741
Hi tech	22	903300	Parts/accessories nes for optical/electric instrument	41,899	1.45%	725
no	22	841229	Hydraulic power engines/motors, except linear acting	37,714	1.43%	715
no	21	481930	Sacks and bags, of paper, having a width > 40 cm	9,711	1.42%	712
Hi tech	22	901410	Direction finding compasses	4,991	1.41%	703
no	21	410800	Chamois (including combination chamois) leather	1,823	1.40%	702
no	21	510620	Yarn of carded, wool, <85% wool, not retail	5,657	1.38%	691
no	22	900830	Image projectors, except slide/microform	2,051	1.37%	686
no	21	320300	Colouring matter of vegetable or animal origin	7,536	1.33%	667
Hi tech	22	880220	Fixed wing aircraft, unladen weight < 2,000 kg	14,278	1.33%	667
no	22	841311	Pumps dispensing fuel, lubricants in filling stations	9,459	1.31%	656
no	11	010210	Bovine animals, live pure-bred breeding	9,435	1.30%	652
no	11	040120	Milk not concentrated nor sweetened 1-6% fat	48,544	1.27%	633
no	21	560500	Metallised yarn	2,897	1.26%	631
no	22	441890	Builder's joinery and carpentry of wood nes	65,475	1.23%	617
no	21	252210	Quicklime	6,518	1.23%	613
no	11	120999	Seed, fruits and spores for sowing, nes	3,710	1.20%	602
no	21	481091	Paper, multi-ply, clay coated, nes	73,261	1.20%	601
no	12	210390	Sauces nes, mixed condiments, mixed seasoning	56,848	1.20%	598
no	12	210420	Homogenised composite food preparations	5,072	1.19%	597
no	12	510510	Carded wool	286	1.19%	595
no	11	050590	Feathers, down, etc. of birds, except for stuffing	1,067	1.18%	592
no	11	051191	Fish, shellfish and crustaceans (non-food)	3,657	1.18%	592
no	11	040130	Milk and cream not concentrated nor sweetened < 6% fat		1.15%	574
no	11	020410	Lamb carcasses and half carcasses, fresh or chilled		1.14%	572
no	11	110419	Cereals, rolled or flaked grains nes	682	1.14%	568
no	11	010111	Horses, live pure-bred breeding	14,533	1.13%	565
no	12	190230	Pasta except uncooked or stuffed	15,823	1.13%	565
no	12	210500	Ice cream and other edible ice	27,831	1.11%	554
no	11	030380	Fish livers and roes, frozen	7,806	1.11%	553
no	12	200410	Potatoes, prepared, frozen	50,573	1.10%	552
no	12	152190	Beeswax, other insect waxes and spermaceti	698	1.10%	549
Hi tech	22	846221	Numerically controlled machine tools to bend, fold, etc, metal	20,692	1.10%	548
no	21	740321	Copper-zinc base alloys, unwrought	9,729	1.07%	537
no	21	481810	Toilet paper	32,493	1.07%	537
no	22	843410	Milking machines	3,069	1.07%	537
no	11	120991	Seed, vegetable, nes for sowing	22,532	1.07%	537
no	22	560110	Sanitary towels, diapers and similar articles	6,428	1.07%	535
no	22	871500	Baby carriages and parts thereof	15,379	1.05%	526
no	21	350400	Peptones, proteins and derivatives, nes, hide powder	15,661	1.05%	524

no	12	200490	Vegetables nes and mixtures, prepared, frozen	7,120	1.04%	520
no	22	844629	Shuttle type looms nes for weaving fabric >30cm wide	674	1.03%	517
no	22	731449	Net/fencing, iron or steel <3mm wire, <100cm mesh, nes	3,994	1.02%	508