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PATTERNS OF CANADA'S REVEALED COMPARATIVE ADVANTAGE IN THE UNITED STATES

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Abstract

This paper examines the competitiveness of Canada in the United States vis-a-vis 31 other major exporters to the U.S. based on revealed comparative advantage measure for the period 1985 to 1999. Canada is shown to have comparative advantage in a range of food and live animal for food, crude materials and mineral fuels. Canada has comparative disadvantage in manufactured goods. The patterns of Canada's revealed comparative advantage has remained fairly stable with a few exceptions.

1. Introduction

Trade and foreign investment play a particularly important role in Canada's economy. Trade is equivalent to about 80% of Canadian GDP. The United States is the single largest trading partner of Canada. Exports to the United States account for about 86 percents of total Canadian exports in 1999. Hence, Canada's export performance in the U.S. market is very

important for Canadian economy. Given that, we examine Canada's relative competitiveness vis-a-vis other major exporters to the U.S.. This paper derives the revealed comparative advantage (RCA) or the Balassa index (Balassa, 1965, 1966, 1977, 1979) of Canada in the U.S. market from 1985 to 1999 and examines how the comparative advantage has changed for Canada over that time span. It also examines what countries have become important competitors for Canada in the U.S. market.

We are interested in several patterns of RCA for Canada. The obvious one is to identify industries with comparative advantage and disadvantage and classify them accordingly. Second, we are interested in how Canada's comparative advantage has changed over time. Comparative advantage is dynamic in nature in that a nation may lose or gain comparative advantage in goods over time. We see if, overall, Canada's comparative advantage has remained stable or it has gone through fairly big changes. We also identify industries whose revealed comparative advantage has been stable and industries that have been going through changes across time periods under study. In other words, what specific industries are gaining comparative advantage and what industries are losing comparative advantage. Also of interest is whether Canada has generally become more sectorally specialized over time, i.e., RCA measure of industries with relatively high RCA becomes increasing high and that of relatively low RCA becomes increasingly low.

2. Revealed Comparative Advantage

Revealed comparative advantage measures a country's comparative advantage[1]. The revealed comparative advantage is based on observed trade patterns. For Canada, export-based revealed comparative advantage index in industry i is:

$$\frac{\text{share of industry } i \text{ in Canada's total exports}}{\text{share of industry } i \text{ in reference exporters's total exports}} \tag{1}$$

The index depends on a number of things; how broadly an industry is defined, how reference exporters are defined and how an export market is defined (U.S., world). An industry may be defined as 1,2 or 4-digit SITC. The references exporters may be all exporters in the world or a subset of them. The export market may be the whole world, a specific region such as EU or Asia, or even a single country. This study focuses on comparative advantage of Canada in the U.S. market against 31. major exporters to U.S. The RCA of Canada in US market is then:

$$\frac{\text{share of industry } i \text{ in Canada's total exports to U.S.}}{\text{share of industry } i \text{ in reference exporters's total exports to U.S.}} \tag{2}$$

Canada is said to have revealed comparative advantage in industry i when the index is greater than 1. In other words, if the Canada's share of i's exports in total Canadian exports relative to a reference exporter's share is bigger than 1, then Canada is said to have

[1] There are circumstances in which RCA does not measure comparative advantage. When tariffs, transportation costs and other distortions such as home biasedness exist, RCA do not reveal comparative advantage. When countries imports inputs to produce export goods, RCA can also lead to incorrect inference. For those reasons, RCA may be considered as a measure of competitiveness (Kravis and Lipsey, 1992).

revealed comparative advantage in sector i. RCA can be calculated based on imports rather than exports. We use export-based revealed comparative advantage.[2]

3. Data

In this paper we compare Canadian export performance in 1985 to 1999 to that of 31 exporters to the U.S..[3] These exporters are the largest rivals of Canada in US market. They can be grouped as following:

Europe (12): Germany, the United Kingdom, France, Italy, Ireland, Belgium, Switzerland, the Netherlands, Sweden, Spain, Norway, Finland

Asia (10): Hong Kong, Taiwan, Korea, Singapore (4 Asian Tigers), Malaysia, Thailand, Philippines, Indonesia (other Asian 4), Japan, China

Latin America (5): Mexico, Brazil, Venezuela, Colombia, Chile

Others (4): Israel, India, Australia, South Africa

We use the one and two-digit Standard International Trade Classification (SITC) to describe commodities. Table 1 describes commodities at one and two-digit SITC level.

Export data used in this analysis is from the Statistics Canada's World Trade Analyzer which provides annual trade flows (exports and imports) among countries

[2]For implications of using only exports and not imports data to calculate RCA, see Richardson and Zhang.

[3]So the reference countries consist of 32 exporters to the United States.

4. Regional (U.S.) revealed comparative advantage of Canada

In this section, we find RCA of Canada and other exporters competing in the U.S. market. We will use several terminologies to catagorize industries according to RCA[4]. Depending on how large the distance from 1 in RCA measure, we place each industry in one of the four groups according to RCA.

We use *high comparative advantage* to refer to industries with RCA over 2, *mild comparative advantage* for industries with RCA between 1 and 2. For industries with RCA measure less than 1, we use *mild comparative disadvantage* for RCA measure between 0.7 and 1 and finally, *high comparative disadvantage* for RCA measure less than 0.7.

Table 2 shows the Canada's revealed comparative advantage vis-a-vis the 31 countries in one and two-digit SITC level from 1985 to 1999. Canada's comparative advantage is most pronounced in some of primary products: Food and live animals for food (SITC 0), Crude materials, inedible, except fuels (SITC 2), and Mineral fuels, lubricant (SITC 3).[5] Comparative disadvantage is most pronounced in Manufactured goods classified chiefly by Material (SITC 6), Miscellaneous manufactured articles (SITC 8). In two-digit SITC, Canada has:

- high comparative advantage in all years in: live animal for food, feeding stuff for animal, oil seeds, pulp and waste paper, gas, electric current, fertilizers (manufactured), paper and paperboard

- high comparative advantage in most years in: meat, cereals, hides and (fur)skins,

[4]The revealed comparative advantage (RCA) is a regional revealed comparative advantage.

[5]Note that in two-digit SITC level, there are variatons.

metalliferous ores and metal scrap, cork and wood manufactures, non-ferrous metals

- mild comparative advantage in all years in: fish, fertilizers (crude), coal and coke, animal oils and fats, inorganic chemicals, road vehicles, artificial resins/plastic mat/cellulose esters

- mild comparative advantage in most years in: rubber manufactures, furniture and parts

- high comparative disadvantage in all years in: dairy product, vegetables and fruit, coffee and tea, organic chemicals, medicinal and pharmaceutical, leather, textile yarn and fabric, non-metallic mineral manufactures, machinery for particular industries, telecommunication apparatus, electrical machinery and appliances, all miscellaneous manufactured articles except furniture and parts

- high comparative disadvantage in most years in: beverages, textile fibres (except wool tops) and their wastes, chemical materials and products n.e.s.

- mild comparative disadvantage in most years in: crude animal and vegetable materials, manufactures of metals, Iron and steel.

Canada generally has revealed comparative disadvantage in manufactures. Except a few items such as inorganic chemicals, manufactured fertilizers and arfificial resin, Canada has comparative disadvantage in Chemical and related products (SITC 5). In SITC 6, five out of nine show comparative disadvantage. Only one in SITC 7 and SITC 8 shows comparative advantage.

5. Changes in RCA

Table 2 contains unweighted sectoral and intertemporal dispersion, and unweighted coefficient of correlation. The sectoral dispersion id the standard deviation of RCA across industries for the same year. The intertemporal dispersion is the standard deviation of RCA of an industry over time. At two-digit SITC level, sectoral and intertemporal patterns of RCA have been generally stable. Overall, Canada's RCA has not changed much over time. Virtually all 2-digit SITC industries show fairly stable RCA over the time periods. The coefficients of correlation between two consecutive years as well as the coefficients of correlation between 1985 and 1990, 1990 and 1994, 1994 and 1999 are also high. Industries with high RCA measure tends to continue to have high RCA, and vice versa. There are a few industries that went from comparative disadvantage to comparative advantage and vice versa.

- From disadvantage to advantage: miscellaneous edible products and preparations (SITC 09), Fixed vegetable oils and fats (SITC 42), Animal & vegetable oils and fats,processed & waxes (SITC 43), Furniture and parts thereof (SITC 82)

- From advantage to disadvantage: Crude rubber (SITC 23), Power generating machinery and equipment (SITC 71)

Yearly sectoral dispersion does not exhibit discernable trend over the whole time periods.[6] It fluctuates over time. If Canada has become more specialized in industries it has comparative advantage over time, then this would show up as an increasing sectoral

[6] There is a very small trend in dispersion.

dispersion. There has not been a noticable niche specialization or evening-out of Canada's comparative advantage over long term, but over a short term there has been a moderate evening-out and niche specialization.[7] Hence, generally speaking, on two-digit SITC level, Canada has maintained its comparative advantage over time in industries it has comparative advantage, but niche specialization has not happened in the long run.

Even though Canada's RCA has been relatively stable over time, Table 2 shows, however, some exceptions. For some industries RCA measure has been volatile over the time periods and for some industries there seems to be a trend. A number of industries exhibit increasing or decreasing RCA over a certain time periods.

6. Three-digit SITC level RCA patterns for Food and live animals (SITC 0), Beverages and tobacco (SITC 2), and Crude materials (SITC 3)

This section examine patterns of RCA for the industries in which Canada has revealed comparative advantage in more disaggregated level. We choose SITC 0, SITC 2 and SITC 3 for more detailed analysis. They are the industries in which Canada,s comparative advantage is most pronounced. We disaggregate them into 72 three-digit SITC industries as categorized in Table 3. Table 4 refines the patterns of revealed comparative advantage in the three one-digit industries. Using the mean as an indicator, Canada has high comparative advantage in 13 categories of SITC 0, 17 of SITC 2 and 3 of SITC 3, mild comparative advantage in

[7] Rchardson and Zhang find a moderate evening-out of U.S. comparative advantage between 1980 and 1995 across 34 two-digit SITC manufacturing sectors.

7 categories of SITC 0, 2 of SITC 2 and 2 of SITC 3.

At more disaggregated SITC level, sectoral and intertemporal patterns of RCA have also been generally stable. Overall, Canada's RCA has not changed much over time. Virtually all of 72 three-digit SITC industries show fairly stable RCA over the time periods. Within 72 three-digit SITC industries, RCA patten shows a mild evening-out. The degree of evening-out is higher than that of two-digit case. Niche specialization has not happened.

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Table 1

SITC	Category
0	**Food and live animals chiefly for food**
00	Live animals chiefly for food
01	Meat and meat preparations
02	Dairy products and birds'eggs
03	Fish, crustaceans, mollucs, preparations thereof
04	Cereals and cereal preparations
05	Vegetables and fruit
06	Sugar, sugar preparations and honey
07	Coffee, tea, cocoa, spices, manufactures thereof
08	Feed stuff for animals(not incl. unmilled cereals)
09	Miscellaneous edible products and preparations
1	**Beverage and tobacco**
11	Beverages
12	Tobacco and tobacco manufactures
2	**Crude materials, inedible, except fuels**
21	Hides, skins and fur skins, raw
22	Oil seeds and oleaginous fruit
23	Crude rubber (including synthetic and reclaimed)
24	Cork and wood
25	Pulp and waste paper
26	Textile fibres (except wool tops) and their wastes
27	Crude fertilizers and crude materials (excl.coal)
28	Metalliferous ores and metal scrap
29	Crude animal and vegetable materials,n.e.s.
3	**Mineral fuels, lubricants and related materials**
32	Coal, coke and briquettes
33	Petroleum, petroleum products and related materials
34	Gas, natural and manufactured
35	Electric current
4	**Animal and vegetable oils, fats, and waxes**
41	Animal oils and fats
42	Fixed vegetable oils and fats
43	Animal & vegetable oils and fats,processed & waxes
5	**Chemicals and related products, n.e.s.**
51	Organic chemicals
52	Inorganic chemicals
53	Dyeing, tanning and colouring materials
54	Medicinal and pharmaceutical products
55	Essential oils & perfume mat.;toilet-cleansing mat
56	Fertilizers, manufactured
58	Artificial resins, plastic mat.,cellulose esters/ethers
59	Chemical materials and products, n.e.s.

6	**Manufactured goods classified chiefly by material**
61	Leather, leather manuf., n.e.s. and dressed fur skins
62	Rubber manufactures, n.e.s.
63	Cork and wood manufactures (excl. furniture)
64	Paper, paperboard, arctic. of paper, paper-pulp/board
65	Textile yarn, fabrics, made-up art.,related products
66	Non-metallic mineral manufactures, n.e.s.
67	Iron and steel
68	Non-ferrous metals
69	Manufactures of metal, n.e.s.
7	**Machinery and transport equipment**
71	Power generating machinery and equipment
72	Machinery specialized for particular industries
73	Metalworking machinery
74	General industrial machinery & equipment,and parts
75	Office machines & automatic data processing equip.
76	Telecommunications & sound recording apparatus
77	Electrical machinery,apparatus & appliances n.e.s.
78	Road vehicles (incl. Air cushion vehicles
79	Other transport equipment
8	**Miscellaneous manufactured articles**
81	Sanitary, plumbing, heating, lighting fixtures
82	Furniture and parts thereof
83	Travel goods, handbags, brief-cases, purses, sheaths
84	Articles of apparel and clothing accessories
85	Footwear
87	Professional, scientific and controlling instruments
88	Photographic apparatus, optical goods, watches
89	Miscellaneous manufactured articles, n.e.s.

Table 2: One and two-digit SITC

SITC	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
sitc0	0.830	0.930	1.090	1.060	1.090	1.090	1.120	1.240	1.320	1.29
sitc1	0.610	0.630	0.660	0.560	0.580	0.700	0.850	0.920	1.110	0.72
sitc2	2.810	3.050	3.100	2.780	2.990	2.930	2.740	2.840	3.010	2.98
sitc3	1.310	1.490	1.720	1.630	1.450	1.520	1.690	2.290	1.860	1.78
sitc4	0.160	0.290	0.320	0.510	0.540	0.590	0.810	0.750	1.010	1.29
sitc5	0.950	0.970	1.010	1.020	1.020	0.980	0.910	0.900	0.920	0.98
sitc6	1.100	1.230	1.290	1.260	1.270	1.280	1.290	1.310	1.320	1.29
sitc7	1.030	0.980	0.940	0.970	0.980	0.930	0.930	0.890	0.890	0.89
sitc8	0.210	0.220	0.230	0.250	0.240	0.240	0.240	0.260	0.270	0.3
std. Dev.	0.782	0.843	0.865	0.751	0.795	0.770	0.705	0.806	0.769	0.763
sitc00	2.210	1.480	2.150	2.880	2.960	2.740	2.820	3.290	3.100	3.09
sitc01	1.830	2.080	2.010	1.780	1.930	1.780	1.670	1.800	2.110	2.33
sitc02	0.420	0.400	0.440	0.520	0.520	0.450	0.440	0.380	0.340	0.33
sitc03	1.270	1.470	1.560	1.360	1.370	1.380	1.350	1.260	1.230	1.16
sitc04	1.910	2.230	2.430	2.260	2.150	2.040	1.900	2.290	2.460	2.55
sitc05	0.260	0.300	0.350	0.330	0.330	0.310	0.310	0.300	0.360	0.38
sitc06	0.810	1.090	1.150	0.950	1.030	0.760	0.940	1.090	1.170	1.3
sitc07	0.120	0.180	0.240	0.210	0.220	0.340	0.360	0.440	0.510	0.44
sitc08	2.120	2.300	2.560	2.830	3.070	3.060	2.950	3.260	3.320	3.32
sitc09	0.880	0.810	0.740	0.760	0.840	0.840	1.160	1.480	1.490	1.45
sitc11	0.620	0.620	0.620	0.540	0.570	0.700	0.760	0.730	0.740	0.72
sitc12	0.550	0.780	1.180	0.740	0.710	0.810	1.480	1.880	2.590	0.71
sitc21	1.870	1.930	2.140	2.340	2.810	3.100	3.390	3.530	3.210	3.06
sitc22	2.880	2.430	2.210	2.920	3.390	3.110	2.870	2.720	3.520	3.78
sitc23	1.020	1.070	1.070	0.600	0.740	0.760	0.680	0.720	0.690	0.65
sitc24	4.160	4.490	4.660	4.410	4.420	4.170	4.140	4.170	4.320	4.2
sitc25	3.940	4.170	4.390	4.060	4.230	4.070	3.950	3.890	4.060	3.92
sitc26	0.530	0.590	0.580	0.500	0.490	0.790	0.750	0.790	0.440	0.49
sitc27	1.640	1.790	1.900	1.860	1.760	1.930	1.830	1.870	1.750	1.8
sitc28	2.370	2.500	2.210	1.830	2.470	2.610	2.230	2.490	2.480	2.49
sitc29	0.610	0.800	0.900	0.730	0.840	0.600	0.530	0.580	0.600	0.58
sitc32	1.800	2.220	2.420	1.330	1.190	2.200	2.000	1.810	1.630	1.49
sitc33	0.860	0.950	1.190	1.100	0.990	1.140	1.260	1.740	1.240	1.13
sitc34	4.010	4.210	4.530	4.330	4.500	4.100	4.220	4.430	4.570	4.39
sitc35	4.310	4.640	4.880	4.310	4.190	3.870	3.930	4.050	4.170	4.19
sitc41	2.050	1.030	1.120	1.750	1.120	1.440	1.630	1.990	1.750	1.69
sitc42	0.110	0.260	0.300	0.480	0.510	0.520	0.700	0.660	0.960	1.29
sitc43	0.220	0.190	0.220	0.570	0.760	0.930	1.300	1.180	1.130	1.23
sitc51	0.650	0.580	0.620	0.680	0.620	0.620	0.500	0.490	0.490	0.51
sitc52	1.420	1.490	1.790	1.710	2.040	1.740	1.640	1.540	1.570	1.69
sitc53	0.410	0.390	0.400	0.330	0.350	0.560	0.550	0.530	0.550	0.65
sitc54	0.190	0.220	0.250	0.230	0.170	0.200	0.200	0.230	0.230	0.3
sitc55	0.420	0.470	0.400	0.480	0.580	0.640	0.650	0.660	0.740	0.87
sitc56	3.500	3.640	3.880	3.770	3.780	3.530	3.700	3.920	3.770	3.73
sitc58	0.840	1.080	1.150	1.210	1.230	1.260	1.350	1.460	1.560	1.71
sitc59	0.590	0.710	0.710	0.550	0.600	0.560	0.670	0.750	0.710	0.64
sitc61	0.350	0.430	0.350	0.270	0.320	0.340	0.260	0.240	0.220	0.23

sitc62	1.210	1.330	1.200	0.710	0.800	1.130	1.310	1.380	1.420	1.39
sitc63	1.520	1.570	1.450	1.540	1.800	1.690	1.670	1.850	1.880	2.06
sitc64	3.230	3.500	3.620	3.390	3.530	3.420	3.510	3.340	3.260	3.18
sitc65	0.220	0.260	0.280	0.310	0.320	0.340	0.380	0.390	0.450	0.51
sitc66	0.280	0.300	0.290	0.370	0.330	0.360	0.350	0.350	0.360	0.38
sitc67	0.700	0.860	0.970	0.780	0.800	0.720	0.780	0.990	1.090	0.9
sitc68	1.550	1.800	1.890	1.960	2.020	1.990	2.080	2.370	2.460	2.42
sitc69	0.650	0.710	0.740	0.840	0.800	0.760	0.690	0.670	0.720	0.78
sitc71	1.090	1.060	1.000	0.990	0.960	0.820	0.730	0.660	0.730	0.68
sitc72	0.670	0.600	0.640	0.680	0.730	0.580	0.540	0.480	0.520	0.55
sitc73	0.340	0.300	0.290	0.250	0.340	0.340	0.340	0.410	0.350	0.4
sitc74	0.600	0.600	0.610	0.600	0.630	0.600	0.660	0.680	0.720	0.86
sitc75	0.470	0.390	0.420	0.390	0.360	0.370	0.400	0.370	0.340	0.38
sitc76	0.270	0.240	0.240	0.210	0.230	0.240	0.230	0.220	0.220	0.22
sitc77	0.310	0.310	0.310	0.380	0.420	0.570	0.580	0.450	0.350	0.32
sitc78	1.670	1.540	1.480	1.670	1.740	1.610	1.650	1.780	1.870	1.82
sitc79	0.690	1.020	1.150	0.830	1.120	1.010	1.080	0.890	0.810	1.04
sitc81	0.700	0.640	0.650	0.410	0.360	0.300	0.290	0.260	0.290	0.36
sitc82	0.930	0.940	0.920	1.030	1.070	1.300	1.180	1.180	1.230	1.32
sitc83	0.020	0.020	0.020	0.040	0.040	0.040	0.040	0.040	0.040	0.03
sitc84	0.070	0.080	0.080	0.090	0.060	0.070	0.080	0.090	0.110	0.13
sitc85	0.030	0.030	0.030	0.020	0.020	0.030	0.020	0.030	0.030	0.04
sitc87	0.420	0.450	0.460	0.380	0.490	0.350	0.380	0.420	0.380	0.44
sitc88	0.160	0.180	0.190	0.140	0.110	0.110	0.130	0.160	0.170	0.14
sitc89	0.240	0.260	0.250	0.350	0.320	0.310	0.310	0.310	0.330	0.35
std. Dev.	1.116	1.165	1.225	1.180	1.225	1.160	1.155	1.207	1.239	1.213
correlation		0.982	0.994	0.974	0.991	0.986	0.992	0.992	0.988	0.977
correlation						0.969				0.978

SITC	1995	1996	1997	1998	1999	mean	std. Dev.
sitc0	1.260	1.370	1.420	1.450	1.430	1.200	0.190
sitc1	0.660	0.640	0.610	0.630	0.610	0.700	0.150
sitc2	2.740	2.800	2.760	2.760	2.810	2.870	0.120
sitc3	1.790	1.620	1.790	1.950	1.640	1.700	0.230
sitc4	1.150	1.160	1.120	1.330	1.240	0.820	0.400
sitc5	1.030	0.960	0.950	0.880	0.810	0.950	0.060
sitc6	1.410	1.380	1.350	1.340	1.320	1.300	0.070
sitc7	0.860	0.860	0.860	0.860	0.900	0.920	0.050
sitc8	0.330	0.360	0.370	0.410	0.420	0.290	0.070
std. Dev.	0.702	0.705	0.712	0.724	0.710		
sitc00	2.790	3.650	3.510	3.540	2.980	2.880	0.580
sitc01	2.620	2.850	2.800	2.670	2.710	2.200	0.420
sitc02	0.360	0.430	0.580	0.660	0.690	0.460	0.110
sitc03	1.130	1.150	1.170	1.240	1.290	1.290	0.120
sitc04	2.450	2.420	2.560	2.480	2.510	2.310	0.220
sitc05	0.400	0.460	0.570	0.620	0.630	0.390	0.120
sitc06	0.960	0.910	1.060	1.260	1.290	1.050	0.170
sitc07	0.480	0.520	0.510	0.660	0.690	0.390	0.170
sitc08	3.220	3.310	3.420	3.390	3.280	3.030	0.410
sitc09	1.500	1.400	1.490	1.730	1.670	1.220	0.360
sitc11	0.660	0.670	0.630	0.630	0.610	0.650	0.060
sitc12	0.670	0.350	0.370	0.660	0.550	0.940	0.610
sitc21	2.770	2.810	2.770	2.440	2.280	2.700	0.520
sitc22	3.500	3.240	3.050	3.380	2.700	3.050	0.430
sitc23	0.460	0.560	0.720	0.790	0.870	0.760	0.180
sitc24	4.070	4.020	4.040	4.140	4.030	4.230	0.190
sitc25	3.810	3.690	3.780	3.780	3.750	3.970	0.200
sitc26	0.410	0.480	0.470	0.530	0.510	0.560	0.120
sitc27	1.710	1.740	1.550	1.730	1.670	1.770	0.100
sitc28	2.210	2.260	1.760	1.640	1.580	2.210	0.340
sitc29	0.610	0.710	0.800	0.860	0.900	0.710	0.130
sitc32	1.350	1.540	1.420	1.410	1.460	1.680	0.370
sitc33	1.270	1.120	1.210	1.250	0.890	1.160	0.210
sitc34	4.370	4.260	4.380	4.490	4.410	4.350	0.160
sitc35	4.100	4.150	4.450	4.560	4.500	4.290	0.280
sitc41	1.870	1.720	2.030	1.910	1.420	1.630	0.340
sitc42	1.110	1.080	0.980	1.210	1.170	0.760	0.380
sitc43	1.240	1.540	1.760	1.720	1.600	1.040	0.540
sitc51	0.620	0.480	0.420	0.370	0.330	0.530	0.110
sitc52	1.680	1.720	1.650	1.700	1.520	1.660	0.150
sitc53	0.820	0.900	0.970	0.950	0.970	0.620	0.240
sitc54	0.300	0.290	0.350	0.260	0.240	0.240	0.050
sitc55	0.920	0.970	0.980	0.990	1.010	0.720	0.220
sitc56	3.560	3.660	4.010	4.150	3.960	3.770	0.190
sitc58	1.880	1.840	1.970	1.950	1.940	1.500	0.370
sitc59	0.650	0.630	0.600	0.680	0.640	0.650	0.060
sitc61	0.210	0.230	0.260	0.250	0.220	0.280	0.060

sitc62	1.390	1.440	1.490	1.380	1.260	1.260	0.230
sitc63	2.210	2.160	2.330	2.670	2.760	1.940	0.410
sitc64	3.170	3.200	3.130	3.120	2.970	3.300	0.190
sitc65	0.560	0.620	0.630	0.660	0.650	0.440	0.150
sitc66	0.410	0.440	0.420	0.400	0.400	0.360	0.050
sitc67	0.990	0.920	0.930	0.810	0.900	0.880	0.110
sitc68	2.330	2.400	2.330	2.300	2.050	2.130	0.270
sitc69	0.800	0.840	0.880	0.960	0.930	0.780	0.090
sitc71	0.700	0.850	0.800	0.830	0.820	0.850	0.140
sitc72	0.600	0.640	0.640	0.620	0.640	0.610	0.070
sitc73	0.380	0.370	0.440	0.400	0.410	0.360	0.050
sitc74	0.830	0.800	0.800	0.860	0.860	0.710	0.110
sitc75	0.410	0.320	0.290	0.300	0.260	0.360	0.060
sitc76	0.240	0.340	0.360	0.360	0.440	0.270	0.070
sitc77	0.300	0.330	0.360	0.350	0.320	0.380	0.090
sitc78	1.820	1.750	1.750	1.720	1.760	1.710	0.110
sitc79	1.000	1.100	1.170	1.170	1.140	1.010	0.150
sitc81	0.430	0.440	0.490	0.480	0.460	0.440	0.140
sitc82	1.410	1.470	1.520	1.600	1.440	1.240	0.220
sitc83	0.040	0.040	0.050	0.050	0.060	0.040	0.010
sitc84	0.150	0.170	0.180	0.200	0.210	0.120	0.050
sitc85	0.040	0.040	0.050	0.050	0.050	0.030	0.010
sitc87	0.420	0.430	0.420	0.430	0.450	0.420	0.040
sitc88	0.150	0.160	0.160	0.160	0.160	0.150	0.020
sitc89	0.390	0.420	0.430	0.460	0.470	0.350	0.070
std. Dev.	1.168	1.181	1.197	1.208	1.151		
correlation	0.996	0.992	0.995	0.996	0.994		
correlation					0.973		

Table 3: Three -digit SITC

001	LIVE ANIMALS CHIEFLY FOR FOOD
011	MEAT,EDIBLE MEAT OFFALS, FRESH, CHILLED OR FROZEN
012	MEAT & EDIBLE OFFALS,SALTED,IN BRINE,DRIED/SMOKED
014	MEAT & EDIB.OFFALS,PREP./PRES.,FISH EXTRACTS
022	MILK AND CREAM
023	BUTTER
024	CHEESE AND CURD
025	EGGS AND YOLKS,FRESH,DRIED OR OTHERWISE PRESERVED
034	FISH,FRESH (LIVE OR DEAD),CHILLED OR FROZEN
035	FISH,DRIED,SALTED OR IN BRINE ; SMOKED FISH
036	CRUSTACEANS AND MOLLUSCS,FRESH,CHILLED,FROZEN ETC.
037	FISH,CRUSTACEANS AND MOLLUSCS,PREPAR. OR PRESERV.
041	WHEAT (INCLUDING SPELT) AND MESLIN, UNMILLED
042	RICE
043	BARLEY,UNMILLED
044	MAIZE (CORN),UNMILLED
045	CEREALS,UNMILLED (NO WHEAT,RICE,BARLEY OR MAIZE)
046	MEAL AND FLOUR OF WHEAT AND FLOUR OF MESLIN
047	OTHER CEREAL MEALS AND FLOURS
048	CEREAL PREPAR. & PREPS. OF FLOUR OF FRUITS OR VEG.
054	VEGETAB.,FRESH,CHILLED,FROZEN/PRES.;ROOTS,TUBERS
056	VEGETAB.,ROOTS & TUBERS,PREPARED/PRESERVED,N.E.S.
057	FRUIT & NUTS(NOT INCLUD. OIL NUTS),FRESH OR DRIED
058	FRUIT,PRESERVED,AND FRUIT PREPARATIONS
061	SUGAR AND HONEY
062	SUGAR CONFECTIONERY AND OTHER SUGAR PREPARATIONS
071	COFFEE AND COFFEE SUBSTITUTES
073	CHOCOLATE & OTHER FOOD PREPTNS. CONTAINING COCOA
074	TEA AND MATE
075	
081	FEED.STUFF FOR ANIMALS(NOT INCL.UNMILLED CEREALS)
091	
098	EDIBLE PRODUCTS AND PREPARATIONS N.E.S.
211	HIDES AND SKINS (EXCEPT FURSKINS), RAW
212	FURSKINS,RAW (INCLUD.ASTRAKHAN,CARACUL, ETC.)
222	OIL SEEDS AND OLEAGINOUS FRUIT,WHOLE OR BROKEN
223	OILS SEEDS AND OLEAGINOUS FRUIT, WHOLE OR BROKEN
232	NATURAL RUBBER LATEX; NAT.RUBBER & SIM.NAT.GUMS

233	SYNTH.RUBB.LAT.;SYNTH.RUBB.& RECLAIMED;WASTE SCRAP
244	CORK,NATURAL,RAW & WASTE (INCLUD.IN BLOCKS/SHEETS)
245	FUEL WOOD (EXCLUDING WOOD WASTE) AND WOOD CHARCOAL
246	PULPWOOD (INCLUDING CHIPS AND WOOD WASTE)
247	OTHER WOOD IN THE ROUGH OR ROUGHLY SQUARED
248	WOOD,SIMPLY WORKED,AND RAILWAY SLEEPERS OF WOOD
251	PULP AND WASTE PAPER
261	SILK
263	
264	JUTE & OTHER TEXTILE BAST FIBRES,NES,RAW/PROCESSED
265	
266	
268	WOOL AND OTHER ANIMAL HAIR (EXCLUDING WOOL TOPS)
269	OLD CLOTHING AND OTHER OLD TEXTILE ARTICLES; RAGS
271	
273	STONE,SAND AND GRAVEL
274	
277	NATURAL ABRASIVES,N.E.S (INCL.INDUSTRIAL DIAMONDS)
278	OTHER CRUDE MINERALS
281	IRON ORE AND CONCENTRATES
282	WASTE AND SCRAP METAL OF IRON OR STEEL
286	ORES AND CONCENTRATES OF URANIUM AND THORIUM
287	ORES AND CONCENTRATES OF BASE METALS, N.E.S.
288	NON-FERROUS BASE METAL WASTE AND SCRAP, N.E.S.
289	ORES & CONCENTRATES OF PRECIOUS METALS;WASTE,SCRAP
291	CRUDE ANIMAL MATERIALS,N.E.S.
292	CRUDE VEGETABLE MATERIALS, N.E.S.
322	COAL,LIGNITE AND PEAT
323	BRIQUETTES;COKE AND SEMI-COKE OF COAL,LIGNITE/PEAT
333	PETROL.OILS & CRUDE OILS OBT.FROM BITUMIN.MINERALS
334	PETROLEUM PRODUCTS,REFINED
335	RESIDUAL PETROLEUM PRODUCTS,NES.& RELAT.MATERIALS
341	
351	ELECTRIC CURRENT

Table 4: Revealed Comparative Advantage

SITC	1985	1986	1987	1988	1989	1990	1991	1992
OO1	2.208	1.477	2.152	2.884	2.965	2.735	2.824	3.293
O11	1.994	2.009	1.846	1.687	1.773	1.65	1.524	1.745
O12	3.31	3.713	3.894	3.968	3.341	3.362	3.445	3.287
O14	0.512	0.812	0.585	0.848	1.079	1.827	1.916	0.884
O22	2.079	1.95	2.133	2.444	1.535	1.314	1.62	1.134
O23	1.257	1.037	0.54	0.316	0.091	0.647	1.081	1.099
O24	0.116	0.104	0.116	0.153	0.131	0.129	0.126	0.107
O25	3.074	2.572	2.768	2.912	2.678	2.772	3.279	2.892
O34	2.235	2.441	2.245	2.177	2.08	2.275	2.33	1.972
O35	2.714	2.829	2.912	2.793	2.571	2.628	2.778	2.821
O36	0.917	0.934	0.891	0.725	0.684	0.822	0.675	0.744
O37	0.239	0.23	0.309	0.525	0.507	0.272	0.499	0.545
O41	4.314	4.314	4.269	4.313	4.188	4.31	4.314	4.313
O42	0	0	0	0.103	0	0.01	0.002	0.021
O43	4.298	4.305	4.305	4.304	4.298	4.138	3.728	4.262
O44	3.34	4.208	3.571	2.958	0.878	2.595	3.362	2.624
O45	0.648	1.556	2.85	3.214	3.177	2.685	1.401	2.262
O46	2.17	1.11	1.785	3.564	2.953	3.098	2.4	3.543
O47	3.551	4.091	3.985	3.531	1.376	1.339	2.444	1.819
O48	1.625	1.752	1.747	1.591	1.356	1.51	1.584	1.625
O54	0.718	0.579	0.709	0.665	0.775	0.588	0.587	0.599
O56	0.054	0.076	0.07	0.061	0.079	0.075	0.062	0.051
O57	0.222	0.285	0.313	0.288	0.13	0.204	0.191	0.184
O58	0.106	0.131	0.133	0.155	0.159	0.129	0.183	0.17
O61	0.942	1.199	1.256	1.092	1.124	0.741	1.041	1.292
O62	0.417	0.552	0.578	0.463	0.482	0.667	0.682	0.751
O71	0.019	0.077	0.113	0.093	0.092	0.162	0.159	0.207
O73	0.349	0.48	0.459	0.495	0.585	0.729	0.795	0.817
O74	0.787	0.821	0.711	0.162	0.131	0.056	0.089	0.111
O75	0.063	0.06	0.066	0.041	0.011	0.015	0.046	0.04
O81	2.124	2.137	2.268	2.625	2.771	2.91	2.818	3.066
O91	3.679	3.546	3.167	3.797	2.73	3.104	2.783	3.142
O98	0.871	0.741	0.639	0.681	0.739	0.77	1.098	1.381
211	3.264	3.053	2.54	2.779	2.79	2.771	3.215	3.36
212	1.297	1.28	1.689	1.721	2.305	3.139	3.288	3.215
222	1.201	1.054	0.927	2.104	2.355	1.918	2.349	2.079
223	3.836	3.262	3.016	3.238	3.826	3.793	3.216	3.108
232	0.005	0.003	0.002	0.007	0.007	0.139	0.024	0.004
233	2.474	2.303	2.296	1.874	1.79	1.676	1.763	1.745
244	0	0	0	1.378	2.738	2.92	3.198	2.749
245	2.41	1.369	2.14	2.305	1.352	2.643	2.492	3.26
246	4.049	3.913	4.091	4.266	4.263	4.129	3.142	2.541
247	4.24	4.207	4.219	4.137	4.154	4.099	4.131	4.199
248	4.16	4.184	4.12	4.092	3.984	3.976	3.975	3.941
251	3.941	3.874	3.882	3.766	3.815	3.877	3.773	3.663
261	0	0	0	0.028	0	0.007	0.003	0
263	0.017	0.002	0.009	0.02	0.008	0.012	0.038	0.362
264	0.094	0.143	0.138	0.648	0	0.373	0.302	0.389

SITC	1985	1986	1987	1988	1989	1990	1991	1992
265	2.724	2.946	2.719	2.969	1.883	2.652	2.465	2.102
266	0.945	0.926	0.938	0.847	0.885	1.17	1.088	0.987
268	0.03	0.034	0.029	0.026	0.012	0.014	0.023	0.049
269	0.372	0.419	0.397	0.675	0.427	0.836	1.065	0.354
271	0	0	0	0.243	0.322	0.685	0.26	0.088
273	1.892	2.39	2.255	2.513	2.117	2.432	2.039	2.154
274	2.208	1.328	1.389	1.419	1.551	2.006	2.05	2.213
277	0.042	0.038	0.12	0.522	0.188	0.175	0.223	0.165
278	1.661	2.066	1.909	1.895	1.714	1.887	1.752	1.844
281	3.678	3.447	3.373	2.92	3.314	3.294	2.789	3.408
282	3.271	3.95	3.691	3.933	3.868	3.881	3.827	2.961
286	2.103	2.565	3.112	2.493	1.929	0	0	0
287	0.846	0.603	0.396	0.354	0.662	1.326	0.889	0.961
288	2.64	2.526	2.344	2.315	2.557	2.972	2.668	2.81
289	3.489	3.501	3.483	2.932	2.899	2.398	1.169	1.411
291	1.001	1.075	1	0.847	0.89	0.637	0.514	0.586
292	0.527	0.676	0.751	0.639	0.731	0.565	0.511	0.538
322	2.13	2.273	2.805	2.714	2.426	2.793	2.585	2.663
323	0.775	0.888	0.744	0.244	0.293	0.884	0.486	0.378
333	0.936	1.027	1.193	1.149	0.978	0.96	1.25	1.705
334	0.626	0.586	0.692	0.792	0.718	1.446	1.074	1.436
335	1.276	1.7	1.591	1.223	1.675	2.694	2.077	1.981
341	4.013	3.914	4.003	4.015	4.055	3.906	4.033	4.168
351	4.314	4.314	4.314	3.993	3.782	3.686	3.755	3.809
std. Dev.	1.438	1.446	1.434	1.422	1.374	1.367	1.33	1.344
correlation		0.972348	0.980615	0.96096	0.937473	0.944939	0.961188	0.963735

SITC	1993	1994	1995	1996	1997	1998	1999	mean	std. Dev.
OO1	3.1	3.088	2.794	3.648	3.515	3.54	2.981	2.88	0.579
O11	1.994	2.276	2.563	2.937	2.804	2.622	2.698	2.141	0.469
O12	3.245	3.347	3.253	3.022	3.202	2.675	2.728	3.319	0.359
O14	1.163	1.438	2.044	1.982	1.879	1.718	1.783	1.365	0.547
O22	1.203	1.19	1.462	1.924	2.182	1.821	1.655	1.71	0.406
O23	2.469	1.034	0.229	0.475	2.54	1.895	2.404	1.141	0.828
O24	0.109	0.112	0.179	0.18	0.221	0.278	0.276	0.156	0.059
O25	2.019	1.676	2.397	2.588	2.661	2.288	2.692	2.618	0.403
O34	1.783	1.696	1.589	1.657	1.683	1.636	1.57	1.958	0.311
O35	2.811	2.825	3.004	2.887	2.866	2.984	2.6	2.801	0.129
O36	0.834	0.87	0.846	0.91	0.919	0.957	1.182	0.861	0.128
O37	0.493	0.524	0.588	0.609	0.615	0.688	0.725	0.491	0.158
O41	4.264	4.104	3.768	4.314	4.313	4.291	4.309	4.246	0.145
O42	0.049	0.016	0.038	0.031	0.015	0.047	0.039	0.025	0.028
O43	4.311	4.234	4.312	4.31	4.312	4.164	4.309	4.239	0.152
O44	3.199	2.997	2.604	2.779	1.975	1.36	1.598	2.67	0.893
O45	2.719	2.649	3.953	3.941	3.515	2.914	2.989	2.698	0.919
O46	3.998	4.077	3.928	3.799	3.978	4.007	3.964	3.225	0.945
O47	2.883	2.521	2.34	2.573	2.865	2.808	2.91	2.736	0.833
O48	1.66	1.64	1.695	1.806	1.918	2.007	2.159	1.712	0.201
O54	0.6	0.621	0.57	0.755	0.868	0.938	1.037	0.707	0.144
O56	0.072	0.111	0.097	0.169	0.224	0.303	0.385	0.126	0.101
O57	0.153	0.173	0.195	0.191	0.164	0.193	0.155	0.203	0.053
O58	0.284	0.345	0.414	0.403	0.578	0.427	0.446	0.271	0.152
O61	1.284	1.644	0.925	0.852	0.979	1.253	1.556	1.145	0.249
O62	0.851	0.87	0.931	0.971	1.07	1.132	1.026	0.763	0.235
O71	0.193	0.189	0.197	0.215	0.193	0.336	0.347	0.173	0.089
O73	0.946	1.044	1.308	1.305	1.35	1.366	1.481	0.901	0.387
O74	0.123	0.131	0.163	0.193	0.188	0.222	0.213	0.273	0.263
O75	0.188	0.118	0.173	0.15	0.127	0.146	0.178	0.095	0.062
O81	3.048	3.144	3.1	3.264	3.313	3.195	3.143	2.862	0.402
O91	2.406	3.648	3.892	3.369	2.76	2.799	3.058	3.192	0.449
O98	1.356	1.351	1.421	1.361	1.418	1.614	1.577	1.135	0.355
211	2.99	2.979	2.587	2.838	2.602	2.178	2.056	2.8	0.371
212	2.83	2.714	2.93	2.56	2.91	2.76	2.741	2.492	0.677
222	3.33	3.74	3.532	3.309	2.692	3.239	2.336	2.411	0.903
223	3.062	3.123	3.158	3.044	3.397	3.071	3.001	3.277	0.299
232	0.007	0.009	0.013	0.006	0.029	0.092	0.047	0.026	0.039
233	1.562	1.559	1.568	1.744	1.777	1.563	1.569	1.818	0.300
244	2.796	1.356	2.138	2.421	2.283	4.039	3.619	2.109	1.301
245	3.655	3.652	3.239	3.38	2.529	2.063	1.563	2.537	0.775
246	2.676	2.965	3.088	3.308	3.77	3.98	3.83	3.601	0.589
247	4.212	4.159	4.18	4.183	4.083	4.205	4.178	4.172	0.045
248	3.975	3.989	3.936	3.975	3.918	3.894	3.849	3.998	0.098
251	3.728	3.713	3.674	3.642	3.665	3.563	3.591	3.744	0.115
261	0	0	0.016	0.026	0	0.054	0	0.009	0.016
263	0.922	0.332	0.057	0.074	0.105	0.14	0.072	0.145	0.243
264	0.284	0.321	0.261	0.118	0.628	1.265	0.156	0.341	0.315

SITC	1993	1994	1995	1996	1997	1998	1999	mean	std. Dev.
265	1.824	1.37	2.23	2.501	2.511	2.817	2.713	2.428	0.459
266	0.501	0.589	0.469	0.573	0.535	0.497	0.448	0.76	0.250
268	0.04	0.037	0.074	0.07	0.048	0.078	0.079	0.043	0.023
269	0.109	0.14	0.207	0.204	0.264	0.387	0.549	0.427	0.263
271	0.163	0.219	0.161	0.545	0.518	0.475	0.771	0.297	0.250
273	2.151	2.253	2.134	2.06	2.164	2.038	2.03	2.175	0.168
274	2.581	2.972	3.028	2.515	2.219	1.754	1.392	2.042	0.568
277	0.075	0.083	0.107	0.078	0.064	0.089	0.082	0.137	0.120
278	1.686	1.72	1.484	1.792	1.426	1.679	1.651	1.745	0.165
281	3.223	3.077	3.106	3.015	2.691	2.507	2.329	3.078	0.375
282	2.897	3.23	3.103	3.146	2.618	2.316	1.734	3.228	0.658
286	0	0	0	0.747	0.017	0	0	0.864	1.194
287	0.758	0.967	0.703	0.836	0.335	0.231	0.348	0.681	0.305
288	2.796	2.682	2.401	2.428	2.552	2.542	2.409	2.576	0.187
289	1.457	1.106	0.804	0.908	1.106	2.002	2.165	2.055	1.001
291	0.57	0.593	0.632	0.76	0.899	0.968	1.06	0.802	0.199
292	0.546	0.539	0.582	0.689	0.748	0.785	0.829	0.644	0.107
322	1.997	2.073	2.244	2.308	2.089	2.025	1.987	2.341	0.301
323	0.511	0.423	0.285	0.442	0.35	0.355	0.402	0.497	0.218
333	1.19	1.094	1.247	1.087	1.175	1.234	0.962	1.146	0.190
334	0.971	0.963	1.101	1.113	1.106	0.987	0.013	0.908	0.359
335	2.026	2.211	2.433	2.35	2.356	1.848	1.572	1.934	0.431
341	4.193	4.162	4.21	4.204	4.238	4.227	4.223	4.104	0.117
351	3.826	3.967	3.957	4.099	4.307	4.301	4.308	4.049	0.243
std. Dev.	1.359	1.383	1.396	1.383	1.352	1.326	1.316		
correlation	0.964273	0.97122	0.97493	0.98729	0.9651	0.96844	0.978201		