

CHANGING COMPARATIVE ADVANTAGE IN EAST ASIAN ECONOMIES

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ABSTRACT

Whether there is a systematic shift of comparative advantage in East Asian economies has generated some heated debate. The purpose of this study is to clarify this confusion with updated export data from 10 selected East Asian economies to the US market. The Balassa's "revealed comparative advantage" (RCA) indices were computed and compared by the Spearman's rank coefficients. The result shows that significant changes in comparative advantage have occurred in East Asian Economies since 1980s. In particular, Korea, Taiwan and Singapore all have taken over some Japan's export shares in the US market while Singapore and Hong Kong have faced with stronger competition from Malaysia and Indonesia respectively.

INTRODUCTION

Conventional wisdom has it that there is a systematic shift of comparative advantage for the most standardised, labour-intensive manufactures from Japan to the Old Newly Industrialising Economies (NIEs), and then to the New NIEs and so on [3;4]. However, using data from 1966 to 1986 on all manufactures at the three-digit SITC level (88 groups), Chow showed that the export structures in the Old NIEs were similar to that of Japan only in the period before the first oil crisis [2]. Thereafter, their export structures became less similar to that of Japan. That is, while Japan's export structure shifted from light manufactures to low-tech-intensive heavy manufactures and then to high-tech-intensive heavy manufacture, the Old NIEs only replicated Japan's export path up the early 1970s when Japan was predominantly exporting low-tech-intensive industries. Thereafter, Japan enjoyed more dynamic growth than that of the Old NIEs.

Lutz, using data from 1968 to 1982 for selected three-digit manufactured products, also found that the suggested shifts in comparative advantage from the Old NIEs to other developing countries did not occur [5]. Would there be any significant changes in comparative advantage in East Asian economies since 1980s after New NIEs switched from import substitution to outward orientation, Emerging NIEs opened up and competed in the world market, and the Japanese yen appreciated sharply following the Plaza Accord in 1985? The purposes of this study is to re-examine the changing comparative advantage in East Asian economies with updated export data.

In the next section, ten selected East Asian economies' relative export performances in the US market will be reviewed. To further analyse the relative trade performances and competitiveness, section 3 discusses the methodology of calculating and comparing the

“revealed comparative advantage” (RCA) indices. The results and implications on whether there were shifts in comparative advantage among these selected East Asian economies are shown in section 4. Some concluding remarks are given in the last section.

EXPORT PERFORMANCES IN THE US MARKET

In this study, export data from 10 selected East Asian economies to the US market were used to examine the possible shifts in comparative advantage due to the importance of US market to the selected economies [6]. Table 1 shows the relative share of US imports by selected East Asian Economy by sector between 1980 and 1994. During this period, Japan’s overall share of US imports increased from 13.7 percent in 1980 to 18.5 percent in 1990 and then decreased to 16.9 percent in 1994. Except chemicals and related products, her export market shares in manufactured goods were taken over by China, Hong Kong, Indonesia in manufactured goods classified chiefly by material (e.g. textile yarn and leather); by Singapore, Taiwan, Korea, China, Hong Kong, Malaysia and Thailand in machinery and transport equipment; by China, Hong Kong, Indonesia, and Thailand in miscellaneous manufactured articles (mainly in apparel, clothing and footwear).

Starting from 1990, with exception of Hong Kong, Old NIEs’ market shares in SITC section 6 and 8 were also replaced by New and Emerging NIEs. Hong Kong’s export performances in the US market were different from other Old NIEs due to her re-export of Chinese manufactured products. The changes in primary sectors and mineral fuels were small and less systematic except that the US decreased her animal and vegetable oils imports from Malaysia and Philippines and increased her food and live animals imports from Thailand.

METHODOLOGY

To further examine whether there were shifts in comparative advantage among these selected East Asian economies, this study computed Balassa's "revealed comparative advantage" (RCA) indices on all the common products exported to the US market at the three-digit SITC level (the number of common products between Japan and each of other selected economies varies from 200 to 210). The Balassa's RCA index in each product j of country i is formulated as $RCA_{ij} = (X_{ij} / X_i) / (C_j / W)$ [1]. Where W is total US imports, C_j is total US imports of product j ; X_i is total US imports from country i ; and X_{ij} is US imports of the product j from country i . It shows the export competitiveness of product j from country i .

The degree of association between two series of RCAs can be compared by the Spearman's Rank Correlation Coefficient which is given by $r_s = 1 - 6 \sum_{i=1}^n d_{R_i}^2 / n(n^2 - 1)$. Where

$$d_{R_i}^2 = \left(R_{RCA_x} - R_{RCA_y} \right)^2, R_{RCA_x} \text{ is the rank of the } RCA_x \text{ and } R_{RCA_y} \text{ is the rank of the } RCA_y.$$

The Spearman's rank coefficient would equal 1 if there is a perfect positive association between two series of RCAs. The higher the Spearman's rank coefficient, the stronger the competition for export market between the two countries compared. The high Spearman's rank coefficient also indicates that the follower country catches up quickly resulting in faster shifts in comparative advantage. At the other extreme, the Spearman's rank coefficient would equal -1 if there is a perfect negative association between two series of RCAs. The higher the negative Spearman's rank coefficient, the stronger the complementarity of these two countries in supplying products to the export market. If there is no relationship, the coefficient of rank correlation would be 0.

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The Spearman's rank coefficients of the RCA indices between each of selected East Asian economies and Japan and Singapore respectively are shown in Table 2 and 3.

Table 2 shows that Korea, Taiwan and Singapore all have significant but varying degree of positive association with Japan's export pattern over the years studied. To some extent, they were competing with Japan and have taken over Japan's export share in the US market. In the entire period, they followed quite closely the dynamic change of industrialisation and export performance in Japan.

It is also noted that, to a lesser degree, even Malaysia was competing with Japan's export in the US market after mid-1980s. Hong Kong's export pattern were more similar with those of Japan in the first half of 1980s, but thereafter the similarity decreased because Hong Kong's export pattern was influenced by re-exporting Chinese products after 1986. The negative coefficients between Indonesia and Japan imply that Indonesia's exports are more complementary than competitive with Japan's exports in the US market. Up to 1994, Thailand, Philippines and China were not in competition with Japan yet.

The Spearman's rank indices in Table 3 indicates that while Singapore is still way ahead of Thailand, Philippines, Indonesia and China, she has faced with stronger competition from Malaysia. In order to examine the extent to which the export patterns in each of the selected East Asian economies have become more similar to that of Japan, the Spearman's Rank coefficients between the RCA indices of the selected East Asian economies in 1994 and the indices of Japan's RCA in each previous year are also presented in Table 4. It shows that, although Korea, Taiwan, Singapore and Malaysia followed Japan's export pattern throughout the years, the 1994 export patterns in Korea, Taiwan and Malaysia were more similar to those of Japan in early 1980s.

In this aspect, Singapore's export pattern in 1994 was as similar with those of Japan's exports in 1980s and in 1990s. It implies that there were not many changes in Japan's export

pattern from 1980 to 1994 and this is confirmed by Table 5 which shows the Spearman's Rank correlation coefficients of RCA indices between 1994 and the previous year in selected East Asian economies. The more different the Spearman's Rank correlation coefficients, the more rapid the dynamic changes of industrialisation and export pattern. It indicates that Japan and Hong Kong have changed the least in the export pattern between 1980 to 1994. In contrast, Indonesia, China, Thailand, Philippines, Malaysia and Korea have made rapid changes in their export pattern.

CONCLUSIONS

Although the conventional wisdom that the comparative advantage of Japan has systematically shifted to the Old NIEs and then to other developing economies was challenged by some previous studies when using data before mid-1980s, it is supported by the empirical results from this study when more recent data were used. Since 1980, Korea, Taiwan and Singapore have been competing with Japan in the US market while Singapore and Hong Kong have faced with stronger competition from Malaysia and Indonesia respectively.

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Table 1: Share of US Imports by Selected East Asian Economy

Area	Year	SITC Section										Total
		0	1	2	3	4	5	6	7	8	9	
Japan	1980	1.85%	0.40%	0.39%	0.06%	1.19%	9.57%	18.60%	34.94%	14.43%	12.76%	13.72%
	1990	1.31%	0.77%	1.02%	0.15%	1.93%	10.79%	11.61%	33.25%	11.43%	12.54%	18.46%
	1994	1.24%	0.71%	1.04%	0.34%	1.43%	11.54%	8.91%	28.41%	8.83%	14.64%	16.93%
Singapore	1980	0.49%	0.02%	1.67%	0.19%	0.41%	0.05%	0.55%	2.43%	1.14%	2.26%	1.03%
	1990	0.74%	0.14%	0.67%	0.71%	0.72%	1.82%	0.27%	4.03%	1.70%	1.02%	2.29%
	1994	0.71%	0.06%	0.24%	0.54%	0.05%	1.62%	0.21%	4.42%	1.31%	1.26%	2.51%
Hong Kong	1980	0.52%	0.06%	0.21%	0.00%	0.08%	0.44%	1.37%	1.83%	15.54%	1.36%	2.20%
	1990	1.16%	0.15%	0.37%	0.00%	0.20%	0.69%	1.94%	1.90%	17.09%	0.36%	3.95%
	1994	0.92%	0.38%	0.25%	0.00%	0.15%	0.50%	2.44%	2.55%	19.73%	0.42%	5.01%
Taiwan	1980	1.30%	0.03%	0.14%	0.00%	0.05%	0.74%	3.30%	3.12%	17.21%	0.14%	2.99%
	1990	1.45%	0.07%	0.64%	0.00%	0.22%	1.42%	5.16%	4.30%	12.11%	2.04%	4.66%
	1994	1.14%	0.11%	0.58%	0.00%	0.25%	1.05%	4.60%	4.41%	6.94%	1.99%	3.99%
Korea	1980	0.89%	0.98%	0.06%	0.00%	0.09%	0.42%	3.56%	2.06%	9.44%	0.59%	2.00%
	1990	0.91%	0.15%	0.34%	0.02%	0.00%	1.20%	3.77%	3.96%	10.36%	0.06%	3.97%
	1994	0.57%	0.17%	0.75%	0.28%	0.00%	1.07%	2.71%	3.84%	4.02%	0.05%	2.94%
Malaysia	1980	0.14%	0.01%	1.95%	1.09%	21.91%	0.11%	0.70%	1.09%	0.24%	0.44%	0.93%
	1990	0.48%	0.00%	0.99%	0.45%	13.30%	0.10%	0.34%	1.54%	1.07%	0.07%	1.01%
	1994	0.30%	0.01%	1.18%	0.13%	13.07%	0.45%	0.49%	2.94%	1.51%	0.20%	1.80%
Indonesia	1980	1.78%	0.30%	4.10%	5.41%	4.28%	0.17%	0.04%	0.00%	0.53%	0.12%	2.21%
	1990	1.36%	0.18%	3.26%	1.54%	4.41%	0.09%	0.87%	0.02%	2.01%	0.01%	0.81%
	1994	1.74%	0.20%	3.49%	1.11%	4.20%	0.14%	0.98%	0.27%	2.45%	0.00%	0.94%
Philippines	1980	2.55%	0.29%	1.00%	0.00%	41.44%	0.08%	0.57%	0.07%	1.18%	12.63%	0.70%
	1990	1.54%	0.10%	0.14%	0.01%	16.66%	0.11%	0.21%	0.23%	0.90%	10.45%	0.64%
	1994	1.07%	0.07%	0.14%	0.01%	16.01%	0.06%	0.17%	0.36%	0.84%	12.75%	0.74%
Thailand	1980	0.91%	0.34%	1.41%	0.00%	0.01%	0.01%	0.95%	0.14%	0.48%	1.38%	0.35%
	1990	4.27%	0.28%	0.77%	0.14%	0.05%	0.06%	0.92%	0.80%	2.21%	0.41%	1.07%
	1994	6.12%	0.55%	1.38%	0.17%	0.06%	0.12%	1.05%	1.03%	2.52%	0.27%	1.36%
China	1980	0.41%	0.07%	1.38%	0.18%	0.39%	1.37%	0.75%	0.01%	1.78%	0.09%	0.46%
	1990	1.84%	0.21%	1.43%	1.10%	0.10%	1.40%	1.67%	0.25%	2.94%	0.01%	1.13%
	1994	1.71%	0.26%	1.21%	0.60%	0.19%	1.79%	3.01%	1.54%	10.51%	0.18%	3.16%
World	1980	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
	1990	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
	1994	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Source: Statistics Canada, "World Trade Database, 1980 - 1994 on CD-ROM". 1996

Table 2: Spearman's Rank Correlation Coefficients of RCA Indices Between Selected East Asian Economies and Japan

Year	Singapore / Japan	Hong Kong / Japan	Korea / Japan	Taiwan / Japan	Malaysia / Japan	Indonesia / Japan	Thailand / Japan	Philippines/ Japan	China / Japan
1980	0.2723***	0.1647**	0.4684***	0.4300***	0.1035	-0.2430***	-0.1754**	-0.0941	-0.1146*
1981	0.1956***	0.2072***	0.4533***	0.3922***	0.1189*	-0.2800***	-0.1865***	-0.1230*	-0.0916
1982	0.2625***	0.2399***	0.5047***	0.3929***	0.1377*	-0.1796**	-0.1911***	-0.0898	-0.0487
1983	0.2864***	0.2438***	0.4694***	0.4245***	0.1190*	-0.2335***	-0.1755**	-0.1290*	-0.0515
1984	0.2876***	0.2687***	0.4778***	0.4011***	0.1543**	-0.1943***	-0.2155***	-0.1388*	-0.0267
1985	0.2594***	0.2208***	0.4775***	0.4320***	0.2023***	-0.1702**	-0.1815***	-0.0799	-0.0671
1986	0.2842***	0.1914***	0.4617***	0.4411***	0.1235*	-0.2009***	-0.1323*	-0.1219*	-0.1597**
1987	0.3020***	0.1542**	0.4529***	0.4226***	0.1576**	-0.1707**	-0.1162*	-0.0851	-0.1537**
1988	0.3142***	0.1350*	0.4622***	0.4114***	0.1751**	-0.1193*	-0.0778	-0.0531	-0.0071
1989	0.3686***	0.1176*	0.4275***	0.4152***	0.1968***	-0.1381*	-0.0201	-0.1085	0.0014
1990	0.3589***	0.1351*	0.4390***	0.4052***	0.2143***	-0.1932***	0.0078	-0.0306	0.0232
1991	0.3307***	0.1646**	0.4378***	0.4053***	0.2282***	-0.2036***	0.0121	-0.0592	0.0775
1992	0.2917***	0.1496**	0.4396***	0.4016***	0.2211***	-0.1919***	0.0030	-0.0654	0.0575
1993	0.3252***	0.1708**	0.3932***	0.4378***	0.2270***	-0.1536**	-0.0477	-0.0520	0.0613
1994	0.2599***	0.1384**	0.4307***	0.4019***	0.2178***	-0.1040	-0.0252	-0.0358	0.1267*

Note: ***Significant at the 1 percent level; **Significant at the 5 percent level; *Significant at the 10 percent level

Source: Computed by The Author.

Table 3: Spearman's Correlation Coefficients of RCA indices Between Selected East Asian Economies and Singapore in the US market.

Year	Malaysia / Singapore	Thailand / Singapore	Philippines / Singapore	Indonesia / Singapore	China / Singapore
1980	0.3869***	0.0707	-0.0704	0.0306	-0.1459
1981	0.3361***	0.1511	-0.0657	0.0068	-0.1783
1982	0.3061***	0.0219	-0.0929	0.0385	-0.2269*
1983	0.3326**	-0.0551	-0.0002	-0.0908	-0.3039**
1984	0.3159**	-0.1243	-0.0110	-0.0356	-0.3425***
1985	0.3331**	-0.1000	-0.0773	-0.0839	-0.4041***
1986	0.2513*	-0.1484	-0.1449	-0.1914	-0.3201**
1987	0.2594*	-0.0927	-0.1176	-0.1499	-0.3568***
1988	0.2214*	-0.1428	-0.0969	-0.1992	-0.3248**
1989	0.3227**	-0.0014	-0.0118	-0.1987	-0.2766**
1990	0.3025**	-0.0077	-0.0355	-0.1821	-0.2310*
1991	0.3262**	-0.0024	-0.0708	-0.1860	-0.2510*
1992	0.3331**	-0.0180	-0.0930	-0.1352	-0.1968
1993	0.3278**	-0.0308	-0.1142	-0.1383	-0.0967
1994	0.3709***	-0.0625	-0.1268	-0.2064	-0.0817

Note: ***Significant at the 1 percent level; **Significant at the 5 percent level; *Significant at the 10 percent level

Source: Computed by Lim Dye Chang and Poa Tiong Siaw.

Table 4: Spearman's Rank Correlation Coefficients of RCA Indices Between Selected East Asian Economies in 1994 and Japan in the Specific Year

Year	Singapore / Japan	Hong Kong / Japan	Korea / Japan	Taiwan / Japan	Malaysia / Japan	Indonesia / Japan	Thailand / Japan	Philippines/ Japan	China / Japan
1980	0.2714***	0.0196	0.5410***	0.5610***	0.3143***	0.0638	0.1499**	0.1309*	0.2648***
1981	0.2952***	0.0517	0.5424***	0.5462***	0.3119***	0.0343	0.1326*	0.1308*	0.2558***
1982	0.2744***	0.1060	0.5432***	0.5396***	0.2908***	0.0562	0.1390**	0.1314	0.2198***
1983	0.2887***	0.1004	0.5439***	0.5202***	0.2706***	0.0219	0.1200*	0.1157	0.2109***
1984	0.2907***	0.1468**	0.5417***	0.5052***	0.2557***	-0.0131	0.1041	0.1214*	0.1830
1985	0.2969***	0.1128	0.5330***	0.4970***	0.2409***	-0.0137	0.0886	0.0817	0.1883
1986	0.2879***	0.0842	0.5289***	0.4693***	0.2181***	-0.0394	0.0593	0.0688	0.1726**
1987	0.2866***	0.0633	0.4953***	0.4510***	0.2159***	-0.0827	0.0427	0.0593	0.1358**
1988	0.2903***	0.0855	0.5105***	0.4626***	0.2396***	-0.0530	0.0618	0.0493	0.1534**
1989	0.2895***	0.0762	0.4848***	0.4466***	0.2466***	-0.0742	0.0368	0.0272	0.1277*
1990	0.2901***	0.0917	0.4813***	0.4604***	0.2540***	-0.0725	0.0391	0.0169	0.1410**
1991	0.2970***	0.1237*	0.4764***	0.4579***	0.2554***	-0.0861	0.0341	0.0193	0.1455**
1992	0.2811***	0.1468**	0.4818***	0.4379***	0.2409***	-0.1011	0.0262	-0.0126	0.1426**
1993	0.2865***	0.1662**	0.4844***	0.4389***	0.2227***	-0.1061	0.0074	-0.0291	0.1349*
1994	0.2599***	0.1384**	0.4307***	0.4019***	0.2178***	-0.1040	-0.0252	-0.0358	0.1267*

Note: ***Significant at the 1 percent level; **Significant at the 5 percent level; *Significant at the 10 percent level

Source: Computed by The Author.

Table 5: Spearman's Rank Correlation Coefficients of RCA Indices Between 1994 and the Specific Year in Selected East Asian Economies

Year	Japan	Singapore	Hong Kong	Korea	Taiwan	Malaysia	Indonesia	Thailand	Philippines	China
1980	0.8546***	0.6579***	0.8516***	0.6306***	0.7889***	0.5701***	0.4835***	0.5658***	0.5661***	0.5268***
1981	0.8531***	0.6612***	0.8549***	0.6597***	0.7601***	0.5596***	0.4808***	0.5787***	0.5483***	0.5469***
1982	0.8570***	0.6824***	0.8563***	0.6954***	0.7760***	0.6253***	0.4835***	0.5102***	0.5400***	0.5599***
1983	0.8661***	0.6624***	0.8695***	0.7422***	0.8096***	0.6397***	0.5395***	0.5720***	0.5289***	0.5355***
1984	0.8769***	0.7015***	0.8767***	0.7211***	0.8212***	0.6558***	0.5423***	0.5594***	0.5868***	0.5374***
1985	0.8822***	0.7373***	0.8822***	0.7702***	0.8444***	0.6224***	0.6331***	0.6095***	0.6237***	0.5623***
1986	0.8972***	0.7133***	0.8965***	0.7904***	0.8440***	0.6476***	0.6212***	0.6785***	0.6944***	0.5496***
1987	0.9205***	0.7625***	0.9219***	0.7839***	0.8512***	0.6875***	0.6553***	0.7376***	0.6749***	0.5584***
1988	0.9558***	0.7966***	0.9553***	0.8086***	0.9059***	0.7328***	0.7108***	0.7975***	0.7616***	0.7277***
1989	0.9604***	0.7967***	0.9565***	0.8381***	0.9199***	0.7772***	0.7266***	0.8702***	0.6943***	0.7268***
1990	0.9657***	0.8176***	0.9696***	0.8735***	0.9337***	0.7879***	0.7158***	0.9034***	0.8078***	0.7626***
1991	0.9637***	0.8198***	0.9696***	0.8599***	0.9466***	0.7654***	0.7828***	0.9074***	0.8675***	0.8144***
1992	0.9701***	0.8711***	0.9689***	0.9267***	0.9627***	0.8472***	0.8484***	0.9218***	0.8961***	0.8640***
1993	0.9801***	0.8755***	0.9844***	0.9107***	0.9736***	0.9087***	0.8789***	0.9141***	0.9416***	0.9382***

Note: ***Significant at the 1 percent level; **Significant at the 5 percent level; *Significant at the 10 percent level

Source: Computed by The Author.