

REVEALED COMPARATIVE ADVANTAGE OF MALAYSIAN MANUFACTURING: MALAYSIA AND SINGAPORE

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ABSTRACT

This paper analyses the evolution of trade patterns of Malaysian export specialisation to Singapore by estimating revealed comparative advantage (RCA) indices over time. The study provides an in-depth analysis of shifting export specialization at the SITC 3-digit product category level and links this analysis to Malaysian export potential to Singapore. We use the RCA framework to analyze the extent of export competition between Malaysia and the rest of the world to Singapore over the period from 2000 to 2009. We worked with data covering all manufacturing industries belonging to SITC 6, 7 and 8. The results indicate that Malaysia competitiveness shifted from agro-based industry to semi-manufactured products, especially iron, steel and zinc. These findings are useful for policy consideration in identifying product specialization for enhancing competitiveness and promoting economic growth.

Keywords: Revealed Comparative Advantage; Export Specialization; Export Competition.

JEL Classification Codes: F14

INTRODUCTION

Malaysia is an open economy like most other economies in the world. Thus, trade is very important for the sustenance of her economy and the structure of the economy depends on magnitude and direction of trade. Traditional trade theory of Heckscher-Ohlin (HO) postulates that factor endowment plays a major role in determining the competitiveness of the country. In this context, along with the structural change that has taken place during the last three decades, Malaysia has shifted her competitiveness from agriculture to manufacturing. Study by Nik Maheran and Haslina (2006) suggests that during the past two decades there is substantial change in the patterns of export share and export merchandise among Malaysia as exporters of primary commodities, labor-intensive goods as well as technology or capital-intensive manufacturers to the world market. They argue that the change in export value was contributed mainly from structural effect that came about from the specialization of highly value added product (SITC 776, 759) and highly demanded product (US and Singapore market).

During the last ten years Malaysia has embarked on trade liberalization at the multilateral, regional, and bilateral levels in order to increase her competitiveness. Malaysia's trading partners consists of selected few countries and regions such as the United States, Organization for Economic Co-operation and Development (OECD) economies and Singapore. Singapore, being a traditional trade partner for Malaysia ever since the formation of Malaysia in 1960, still holds a prominent role for Malaysia's transformation in the near future. The biggest role play by Singapore is due to her function as a transport channel to a third country (Mahani and Wai 2008). This role is expected to continue to be significant even though the share of total export from Malaysia to Singapore is consistently reduced from 18per cent in 2000 to about 15per cent in 2008.

Despite embarking on export diversification strategies since in the early 1990s, those traditional partners continue to dominate the export share of the country. Recently, as reported in the Tenth Malaysia Plan (2011-2015) the composition and direction of trade remained unchanged during the 2006 to 2010 period (Economic Planning Unit, 2010a). A few challenges that are faced by Malaysia include the low end value of export and the dichotomy in the manufacturing sector (Mahani and Wai 2008). Besides that, the export sector is also dependent on low-level technology without much innovation or creation of new technology that produce new competitive edge.

Malaysia now is at a critical stage towards moving into a high income country. Malaysia transformation into a high income country will depend very much on her ability to restructure the economy to be one that is highly competitive and sustainable. As stated in the Tenth Malaysia Plan (2011-2005), Government will focus its resources towards prioritizing specific National Key Economic Areas (NKEAs) as part of the strategy towards greater specialization. This will involve specialization not only in terms of sector but also subsector levels. This path towards greater specialization is consistent with the path as exemplified by countries such as Korea and Taiwan. In addition to the requirement to be competitive for economic transformation, Malaysia also need to increase her competitiveness to be able to compete with her old and new rivals. It is expected that in a post-crisis environment Malaysia will face a direct competition for the same market from developed countries as well as from emerging big economies such as China and India.

It is imperative that the competitiveness of manufacturing sector and its subsector be assessed as an initial stage to put specialization strategy at the centre stage. Thus, the objective of this study is to evaluate the competitiveness of Malaysia export to her trading partner Singapore for the last ten years. This paper is organized into 5 sections. The next section will provide summary of Malaysia's economic transformation and export pattern for the period from 2000 to 2009. Section 3 discusses past literature on trade competitiveness focusing on revealed comparative advantages and subsequently followed by explanation about method and data employed for this study in Section 4. Section 5 will present findings and discussion of some policy implication that can be derived from the findings.

MALAYSIA'S ECONOMY AND TRADE PATTERN

The success story of Malaysia's transformation from an agrarian-based economy to the middle income economy with a strong hold in the manufacturing sector is well recorded in the literature (Surtahman and Ishak 2009; Amir 2000; and Mahani and Wai 2008). This transformation is clearly reflected from share contribution of the national income as depicted in FIGURE 1 below. The share of agriculture dropped from about one fifth of the production in 1980 to less than one tenth in 2010. The manufacturing sector, on the other hand, has made a momentous growth from less than one fifth to more than a quarter in the same period (insert FIGURE 1 here).

Malaysia has enjoyed a strong growth for the past three decades but the momentum of growth slow down since the Asian Financial crisis (EPU 2010a). These are reflected by the annual growth rate of 9.2 per cent for 1991-1997 while for 2001-2009 the rate is only 4.3 per cent. With this slowdown, the manufacturing share of GDP is projected to drop to the lowest level since in the 1990s to 26.7 per cent in 2010 from 30.9 per cent in 2006. Manufacturing, especially E&E, continued to dominate exports. Asian economies, especially China, have grown in importance as export destinations. Export is expected to remain an important contribution for economic growth and is projected to grow at 10.6 per cent per annum for the next five years from 2011 to 2015. This growth will mainly be comprised of manufactured products growing at 10.8 per cent per annum, and accounting for 78.8 per cent of total exports in 2015. Exports of the agricultural and mining sectors are expected to grow by 11.0 per cent and 9.4 per cent per annum respectively, driven largely by higher export prices.

In term of subsector disaggregation of the total gross export of manufacturing goods, electronic and electrical products continued to dominate with contribution ranges from 72.5 per cent in 2000 to 57.3 per cent in 2009. This subsector recorded a decline of 1.0 per cent in from 2000 to 2003, increased at 10.41 per cent for 2004 to 2006 and declined again at 6.4 per cent from 2007 to 2009. Other subsectors that have emerged in important for the past ten years are textiles, manufacture of metal and petroleum products with contribution of about 5 per cent each to total gross export.

As shown in FIGURE 2, the trend of Malaysian share of export to Singapore by three commodity groups namely manufactured goods classified chiefly by material (SITC 6), machinery and transport equipment (SITC 7) and miscellaneous manufactured articles (SITC 8) has underwent changes for the last 10 years from 2000 to 2009. The share of Malaysian export of manufactured goods classified chiefly by materials and machinery and transport equipment to Singapore which stood at about 13 per cent had increased tremendously to reach about 40 per cent in 2009. The same pattern is recorded for other two commodities from about 19 per cent to 30 per cent and 10 per cent to 27 per cent, respectively. In terms of relative importance between the three commodity groups, prior to 2009, machinery and transport equipment used to have the bigger share contribution to total export to Singapore. Starting from 2009, it has been replaced by manufactured goods classified chiefly by materials as the largest share of export.

REVEALED COMPARATIVE ADVANTAGES

An increase in global competition requires Malaysia to examine where its comparative advantage lies. Comparative advantage refers to the ability of a country to produce goods at lower cost than the other countries and thus should specialize in producing the good in which it has a comparative advantage. In the literature, several studies have been undertaken using the “concept of revealed comparative advantage” developed by Balassa (1965) to measure competitiveness of country’s particular sectors and majority of these studies use data on export shares. Various approaches are undertaken to study revealed comparative advantages (RCA), some of which use RCA to identify competitiveness of a particular sector’s export to another country. Some of these studies have combined RCA with other methods and indices to identify country’s competitiveness against other competitors.

Batra and Khan (2005) used RCA, at both the sector and product level, to identify the pattern of RCA for India and China. By using Balassa's (1965) index for the two and six digit level of Harmonized System (HS) classification, the study finds that the pattern of comparative advantage varies at different levels of commodity disaggregation. In analyzing comparative advantage according to factor intensity, the study shows large similarities in the structure of comparative advantage for India and China. Both, India and China enjoy comparative advantage for labour and resource intensive sectors in the global market. However, no evidence is found on the structural shift for the manufacturing sector as a whole for both countries except for sectors within manufacturing. In an earlier study, Yue (2001) studies the change in China export patterns. Employing RCA index, the study reveals how China exports pattern have changed in accordance to its comparative advantage and that there are apparent differences in export patterns between the coastal regions and the interiors in China.

Bender and Li (2002) analyze the structural performance and shift of exports and RCA of the East Asian and Latin American regions over the period 1981-1997. The study is carried out to examine the existence of changes in the export pattern among different regions and whether the changes were related to shifts in comparative advantage. Ferto and Hubbard (2002) investigate the competitiveness of Hungarian agriculture in comparison with European Union by using four indices of RCA. All four indices revealed that Hungary has RCA for 11 of the 22 product groups. Another study that focused on agriculture sector has been undertaken by Serin and Civan (2008). The study analyses the competitiveness of Turkey’s fruit juice, olive oil and tomato industries in relation to EU market over the period 1995 to 2004. The study uses the revealed comparative advantage (RCA) and the comparative export performance (CEP) index. The findings suggest that Turkey has a comparative advantage in the fruit juice and olive oil sectors, but not in the tomato sector. Seyoum (2007) examine developing countries' comparative advantages in selected services for the period 1998-2003 such as business, financial, transport and travel services in relation to that of the rest of the world. The study uses three indices of RCA and the findings show that there exist strong comparative advantages for many developing countries in transport, and travel services while financial and business services can be improved. However, it appears that their comparative advantages have weakened over the years due to trade liberalisation and insufficient preparations. The study also find no evident of any fundamental shift in the structure of their comparative advantages.

Many studies have assessed the competitiveness of Malaysian commodity exports, namely Palm Oil (Fatimah and Roslan, 1988, Mohamad, Fatimah, Abdul Aziz, 1992), Cocoa and rubber (Md Nasir, Mohd Ghazali, Othman, 1993) and all Malaysian manufacturing product (Amir 2000) as reported by Nik Maheran and Haslina (2006). Amir (2000) calculate RCA index to examine Malaysia’s export specialization pattern between 1994 and 1998. From his findings, he observes that even though the overall electronic and electrical manufacturers retained their importance in the manufacturing sector, the sliding down in the RCA index in some product groups in this category (e.g., “Office Machines” and “Radio Broadcast Receiver”) suggest that rising competition resulting from regionalization (AFTA) and globalization is eroding Malaysia’s strong position. In a more recent study, Mahani and Wai (2008) analyze RCA for Malaysia in selected manufacturing goods between 2001 and 2005. Their result indicates that the overall RCA index for machinery (except electrical) was slightly above 1 and showing a small indication of a falling pattern. They conclude that the share of manufacturers of machinery goods in the country’s exports was slightly above the world’s average. Within the subsector, Malaysia does not possess a comparative advantage in most of the product groups. RCA indices for textile, clothing, and footwear indicate that the country has no comparative advantage in these three industries. The country’s export share

was less than the world's average for most of the product groups. In addition, Malaysia does not have a comparative advantage for the manufacturing of metal as well.

METHOD AND DATA

The RCA can measure changes in comparative advantage. In theory, it provides an index measure of changes in comparative advantage. Balassa's (1965, 1979, 1986) has come out with the RCA index that compares the export of a given sector in a country with the export share of that sector in the world market. Competitiveness measured by RCA will denote the "underlying competitiveness", measured by comparative advantage. Consequently, if a product is described as competitive, it means that it has a revealed comparative advantage. To analyze the shift in export specialization pattern of Malaysian manufacturing, we use standard Balassa (1965) RCA index:

$$RCA_{ij} = \frac{x_{ij}/x_{jt}}{w_{ij}/w_t}$$

Where RCA_{ij} is revealed comparative advantage of country j 's commodity i in the world market, X_{ij} is export value commodity i from country j , X_{jt} is total export value from country j , W_i is world export value commodity i and W_t is total world export value. $RCA_{ij} > 1$ indicates country j has a comparative advantage in production of i ; the greater the index, the stronger the advantage. $RCA_{ij} < 1$ indicates that country j has a comparative disadvantage in production of i ; the smaller the index, the greater the disadvantage.

The raw data has been collected online from the UN COMTRADE database. The data structure is classified based on Rev. 3 Standard International Trade Classification (SITC) at the 3-digit level for each commodity. The classification is recommended by the United Nations to be an Economic Analysis of Trade Classification. Under this classification, each of the number of goods is designed by the first-digit section, the second-digit division, the third-digit group and the last two digits of the subgroup. In this study the data used is at this level covering all manufacturing industries belonging to SITC 6, 7 and 8 during the period from 2000 to 2009.

EMPIRICAL RESULTS AND INTERPRETATION

In the RCA indices for manufactured goods classified chiefly by material, there are only 11 out of 52 subsectors that have a comparative advantage in production for all the years and 15 subsectors which have a comparative advantage only for one or two years (details are shown in Appendix 1). Almost all subsectors in this industry either recorded a decline in their RCA index or a minimal increase. Among these subsectors, the "SITC 612-Manufact. leather etc. nes" subsector has recorded the sharpest fall in the RCA index, from a peak of 12.35 in 2003 to only 1.51 in 2009 with almost 88 per cent drop. There are, however, three exceptions to the overall declining RCA index in the subsector. These include "SITC 674-Flat-rolled plated iron", "SITC 686-Zinc" and "SITC 687-Tin" subsectors, which rose extremely high during this period. These three subsectors have a comparative disadvantage in 2000 and then shift to comparative advantage in 2009.

The RCA indices for another group, namely Machinery and Transport Equipment, display the same pattern of changes. This group consists of Transport Equipment which is one of the bigger contributors of Malaysian manufacturing export other than electrical and electronic in 2009. During the 2000 to 2009 period, this subsector has consistently recorded a positive growth despite the downturn of about 3 per cent for the overall manufacturing export from 2006 to 2009.

Based on the indices calculated, there are only 6 out of 48 subsectors which have a comparative advantage in production for the all years and 17 subsectors have a comparative advantage only for several years (details are shown in Appendix 2). Almost all subsectors in this industry either recorded a decline in their RCA index or a minimal increase. It is interesting to note that the "SITC 712-Steam turbines" subsector has recorded the highest rise in RCA index, from only 0.3 in 2003 to a peak of 30.89 in 2009. It's increased more than 100 per cent. For "SITC 721-Agric. machines, ex. tractor" subsector, the RCA pattern are changes from comparative advantage at beginning, and then switch to comparative disadvantage in

2009. Several subsectors have shown some improvement. Such subsectors are “SITC 726-Printing, bookbinding machines”, “SITC 741-Heating, cooling equip, part” and “SITC 772-Elec. switch. relay. circuit”.

The subsectors under Miscellaneous Manufactured Articles have also experience trends recorded in the first two group during the period under study. There are only 6 out of 31 subsectors that have a comparative advantage in production for the all years and 10 subsectors have a comparative advantage only for several years. Almost all subsectors in this industry either recorded a decline in their RCA index or increased minimally. Among these subsectors, the “SITC 812-Plumbing, sanitary, eqpt. etc” and “SITC 893-Articles, nes, of plastics” subsectors show an increase in their RCA indices, which tripled its average RCA index values from 1.62 to 6.36 in 2009 and from 2.18 to 5.91 in 2009 respectively.

In looking at the relative importance in terms of RCA indices over the 10 year period, it is obvious that, the ranking of the subsectors within each of the three groups has shifted tremendously. TABLE 1 shows a summary of this ranking for the highest 25 product from these groups (insert TABLE 1 here).

The RCA trends confirm the dominance of wood and wood products, textile and clothing, and manufactures of machinery (except electrical). The RCA patterns show that “SITC 612-Manufact. leather etc. nes” subsector are the highest contribution for Malaysia’s comparative advantage during 2000-06, but has disappeared in 2009. For the “SITC 635-Wood manufactures, nes” and “SITC 642-Paper, paperboard, cut etc.” subsectors, they have comparative advantage during 2000-06 within top 5 ranking, then drop to 7th and 14th ranking respectively in 2009. For “SITC 655-Knit. crochet. fabric nes” subsector, its comparative advantage is the highest at the beginning, then drop to 22nd ranking in 2006 and lastly rises to 11th ranking in 2009. This RCA pattern are similar to “SITC 634-Veneers, plywood, etc.” subsector. It ranks second highest at the beginning, then drops to 12th and 17th ranking in 2003 and 2006 respectively. But for 2009 it has risen to 10th ranking. The “SITC 712-Steam turbines” subsector has recorded the highest in RCA index in 2009. Previously, this subsector’s contribution is negligent and become 8th ranking in 2006. The “SITC 812-Plumbing, sanitary, eqpt. etc” and “SITC 893-Articles, nes, of plastics” subsectors have shown the same pattern of improvement over time. Their rankings jump up to 3rd and 5th ranking in 2009 from 23rd and 12th in 2000, respectively.

CONCLUSIONS

The challenges from economic downturn and the need to put Malaysia into a high income economy have put requirement for improvement in the nation’s export competition as one of the main items of focus. Despite the heightening shift in policy towards greater specialization and market specialization, the countries direction of trade for the last three decades continues to be concentrated to the traditional partners, of which Singapore is one of them. In order to face the challenges, the trend in comparative advantages of manufacturing products exported by Malaysia to Singapore is analyzed in this study based on RCA indices for three main groups SITC 6, 7 and 8 for the period from 2000 to 2009. The results indicate that Malaysia has both lost and gain in her comparative advantage to trade with Singapore, and this loss/gain depends on the product subsectors. In the overall, the SITC 6 which has its based from agricultural resources has lost its dominance in the top 25 ranking of RCA indices. The emerging subsectors in 2009 are from the SITC 8 semi-manufactured products from iron, steels and zinc, as well as from textiles. What can be gathered from this short analysis is that, to be competitive, Malaysia needs to pay particular attention to the development of these subsectors in the effort to strengthen export competitiveness to Singapore.

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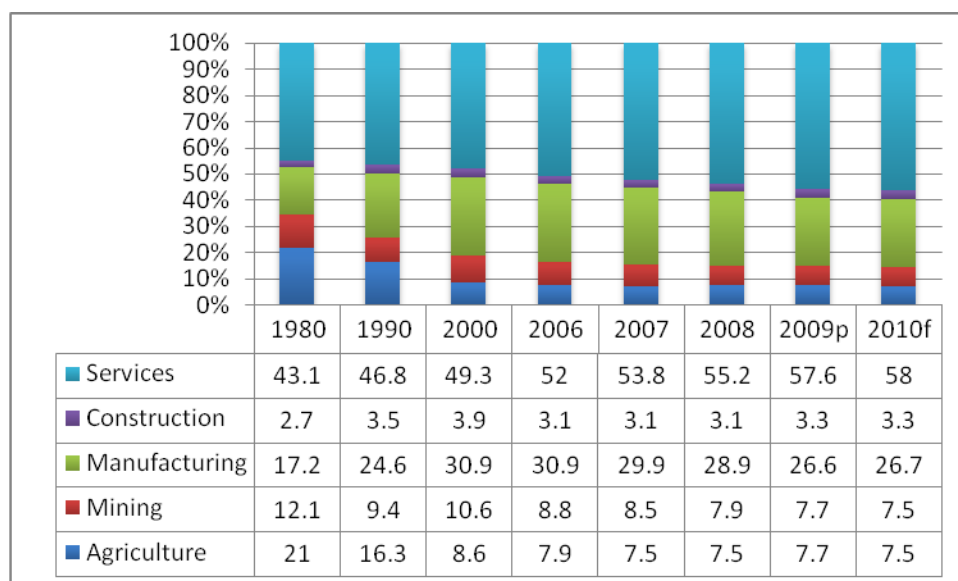
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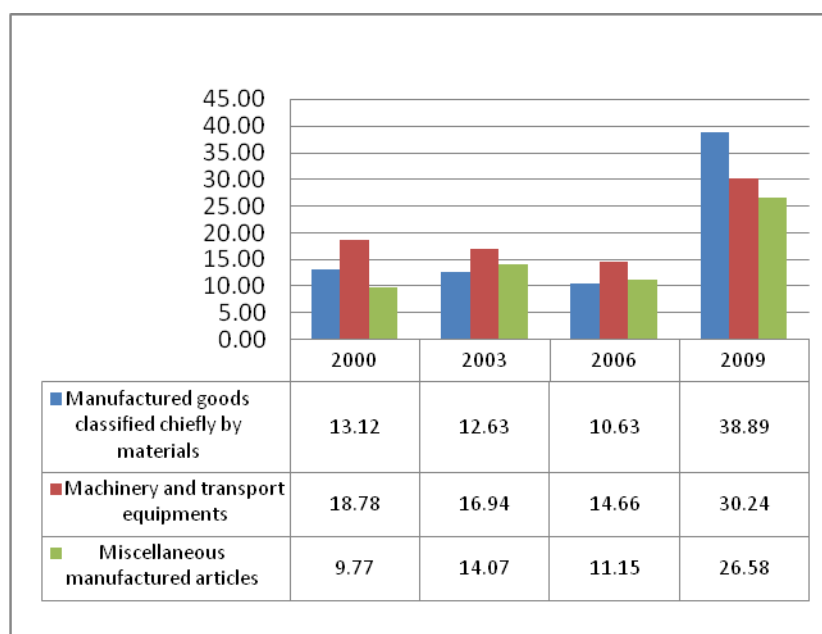
FIGURE 1: Structure of Production, 1980-2010 (per cent of GDP)



Note: p refers to preliminary and f refers to forecast

Source: Economic Planning Unit (2010b)

FIGURE 2: Share of Malaysia's Export to Singapore by Commodity Group (per cent), 2000-2009



Note: Refers to share of export from Malaysia to Total World Export to Singapore by commodity group
 Source: Calculated by the authors based on UN COMTRADE database.

TABLE 1 : RCA Ranking of Malaysian Manufacturing Products (list the top 25)

Ranking	2000		2003		2006		2009	
	SITC Code	RCA	SITC Code	RCA	SITC Code	RCA	SITC Code	RCA
1	612	7.40	612	12.35	612	7.08	712	30.89
2	634	2.56	721	4.46	635	3.80	674	15.02
3	642	2.32	642	3.06	642	3.29	812	6.36
4	635	2.31	635	3.04	726	3.19	686	6.25
5	655	2.23	655	2.56	721	3.05	893	5.91
6	821	2.21	761	2.55	893	2.64	687	3.13
7	897	2.20	821	2.24	763	2.53	635	3.06
8	759	1.89	893	2.23	712	2.40	699	2.99
9	811	1.89	897	2.08	692	2.30	662	2.96
10	721	1.87	722	2.03	812	2.09	634	2.84
11	761	1.81	776	1.82	897	2.02	655	2.83
12	893	1.67	634	1.79	761	1.96	761	2.74
13	873	1.55	898	1.70	895	1.87	678	2.67
14	662	1.52	692	1.62	821	1.82	642	2.57
15	776	1.47	812	1.57	693	1.76	682	2.55
16	691	1.45	773	1.56	898	1.70	821	2.48
17	693	1.42	763	1.53	634	1.70	786	2.46
18	751	1.37	759	1.47	776	1.66	661	2.30

Ranking	2000		2003		2006		2009	
	SITC Code	RCA	SITC Code	RCA	SITC Code	RCA	SITC Code	RCA
19	684	1.29	684	1.45	663	1.61	751	2.08
20	696	1.26	691	1.44	661	1.49	726	2.03
21	764	1.24	694	1.44	759	1.49	663	1.97
22	682	1.22	693	1.38	655	1.49	692	1.93
23	812	1.19	895	1.38	892	1.44	851	1.92
24	895	1.18	772	1.30	741	1.43	675	1.89
25	848	1.16	851	1.14	699	1.39	724	1.87

Source: Calculated by the authors based on UN COMTRADE database.

APPENDIX 1 : RCA Indices for Manufactured Goods Classified Chiefly by Material (Data in bold is more than or equal to 1)

No of products	Product group	2000	2003	2006	2009
1	611-Leather	0.16	0.21	0.26	0.20
2	612-Manufact. leather etc. nes	7.40	12.35	7.08	1.51
3	613-Furskins, tanned, dressed	0.12	0.01	0.02	0.00
4	621-Materials of rubber	0.69	0.99	0.77	0.84
5	625-Rubber tyres, tubes, etc.	0.34	0.17	0.29	0.65
6	629-Articles of rubber, nes	0.72	0.58	0.80	0.76
7	633-Cork manufactures	0.42	0.15	0.05	0.04
8	634-Veneers, plywood, etc.	2.56	1.79	1.70	2.84
9	635-Wood manufactures, nes	2.31	3.04	3.80	3.06
10	641-Paper and paperboard	0.50	0.57	0.55	0.56
11	642-Paper, paperboard, cut etc.	2.32	3.06	3.29	2.57
12	651-Textile yarn	0.76	0.96	0.38	1.51
13	652-Cotton fabrics, woven	0.43	0.32	0.08	0.14
14	653-Fabrics, man-made fibres	0.29	0.13	0.56	0.56
15	654-Oth. textile fabric, woven	0.00	0.01	0.00	0.03
16	655-Knit. crochet. fabric nes	2.23	2.56	1.49	2.83
17	656-Tulle, lace, embroidery. etc	0.32	0.57	0.39	0.39
18	657-Special yarn, txtl. fabric	0.30	0.43	0.47	0.80
19	658-Textile articles nes	0.46	0.40	0.53	0.96
20	659-Floor covering, etc	0.12	0.27	0.42	0.06
21	661-Lime, cement, constr. matrl	0.84	0.87	1.49	2.30
22	662-Clay, refrct. constr. matrl	1.52	1.02	0.42	2.96
23	663-Mineral manufactures, nes	1.07	1.05	1.61	1.97
24	664-Glass	0.66	0.69	0.74	1.58
25	665-Glassware	0.91	0.94	1.31	1.67
26	666-Pottery	0.40	0.33	0.13	0.44
27	667-Pearls, precious stones	0.06	0.00	0.04	0.02
28	671-Pig iron, spiegeleisn, etc	0.16	0.09	0.16	0.07

No of products	Product group	2000	2003	2006	2009
29	672-Ingots etc. iron or steel	0.10	0.27	0.24	0.76
30	673-Flat-rolled iron etc	0.19	0.19	0.09	0.84
31	674-Flat-rolled plated iron	0.93	0.77	1.19	15.02
32	675-Flat-rolled, alloy steel	0.17	0.33	0.77	1.89
33	676-Iron, stl. bar, shapes etc	0.42	0.90	0.37	0.77
34	677-Railway track iron, steel	0.04	0.31	0.16	0.24
35	678-Wire of iron or steel	0.59	0.56	0.94	2.67
36	679-Tubes, pipes, etc. iron, stl	0.73	0.64	0.62	1.35
37	681-Silver, platinum, etc	0.01	0.00	0.00	0.00
38	682-Copper	1.22	0.89	0.73	2.55
39	683-Nickel	0.01	0.01	0.00	0.00
40	684-Aluminium	1.29	1.45	0.73	0.99
41	685-Lead	0.90	0.58	0.03	0.03
42	686-Zinc	0.12	0.32	0.88	6.25
43	687-Tin	0.31	0.61	0.53	3.13
44	689-Misc. non-ferr. base metal	0.01	0.00	0.07	0.25
45	691-Metallic structures nes	1.45	1.44	1.20	1.24
46	692-Containers, storage, trnsp	1.02	1.62	2.30	1.93
47	693-Wire products excl. elect	1.42	1.38	1.76	1.61
48	694-Nails, screws, nuts, etc	1.00	1.44	1.04	1.26
49	695-Tools	0.43	0.74	0.75	0.91
50	696-Cutlery	1.26	0.58	0.84	1.42
51	697-Household equipment, nes	0.59	0.50	0.49	1.43
52	699-Manufacts. base metal, nes	1.06	1.03	1.39	2.99

Source: Calculated by the authors based on UN COMTRADE database.

APPENDIX 2 : RCA Indices for Machinery and Transport Equipment (Data in bold is more than or equal to 1)

No of products	Product group	2000	2003	2006	2009
1	711-Steam gener. boilers, etc	0.20	0.26	0.37	0.30
2	712-Steam turbines	0.57	0.30	2.40	30.89
3	713-Intrnl combus pstn engin	0.63	0.55	1.04	0.73
4	714-Engines, motors non-elect	0.09	0.38	0.13	0.07
5	716-Rotating electric plant	0.85	0.52	0.75	0.19
6	718-Oth. powr. genrtng. machnry	0.48	0.70	0.20	0.16
7	721-Agric. machines, ex. tractr	1.87	4.46	3.05	0.61
8	722-Tractors	0.53	2.03	1.06	0.74
9	723-Civil engineering equipt	0.23	0.35	0.32	0.44
10	724-Textile, leather machines	0.19	0.29	0.42	1.87
11	725-Paper, pulp mill machines	0.13	0.32	0.24	0.21
12	726-Printng, bookbindng machs	0.41	0.63	3.19	2.03
13	727-Food-process. mch. non dom	0.31	0.65	0.58	0.94

No of products	Product group	2000	2003	2006	2009
14	728-Oth. mach, pts, spcl indust	0.28	0.48	0.57	0.47
15	731-Metal removal work tools	0.14	0.68	0.45	1.02
16	735-Parts, nes, for mach-tools	0.12	0.18	0.17	1.11
17	737-Metal working machnry nes	0.10	0.18	0.26	0.58
18	741-Heatng, coolng equip, part	0.78	0.95	1.43	1.05
19	742-Pumps for liquids, parts	0.10	0.19	0.13	0.13
20	743-Pumps nes, centrifugs etc	0.34	0.22	0.64	0.38
21	744-Mechanical handlng equip	0.44	0.37	0.41	0.24
22	745-Oth. nonelec mch, tool, nes	0.77	0.59	0.44	0.50
23	746-Ball or roller bearings	0.42	0.30	0.43	0.34
24	747-Taps, cocks, valves, etc	0.22	0.29	0.29	0.38
25	748-Transmissions shafts etc	0.22	0.14	0.15	0.27
26	749-Non-elect mach. parts, etc	0.54	1.04	1.01	0.92
27	751-Office machines	1.37	0.39	0.39	2.08
28	752-Automatc. data proc equip	0.87	0.67	0.81	1.16
29	759-Parts, for office machins	1.89	1.47	1.49	1.82
30	761-Television receivers etc	1.81	2.55	1.96	2.74
31	763-Sound recorder, phonogrph	1.04	1.53	2.53	1.52
32	764-Telecomm. equip. parts nes	1.24	1.08	1.33	1.06
33	771-Elect power machny. parts	0.75	0.80	0.55	0.68
34	772-Elec. switch. relay. circuit	0.96	1.30	1.15	1.27
35	773-Electr distribt. eqpt nes	1.04	1.56	1.37	1.68
36	774-Electro-medcl, xray equip	0.08	0.31	0.13	0.15
37	775-Dom. elec, non-elec. equipt	0.46	0.60	0.55	0.43
38	776-Transistors, valves, etc	1.47	1.82	1.66	1.57
39	778-Electric. mach. appart. nes	1.00	0.85	0.57	0.93
40	781-Pass. motor vechls. ex. bus	0.08	0.02	0.08	0.08
41	782-Goods, spcl transport veh	0.02	0.01	0.02	0.02
42	783-Road motor vehicles nes	0.96	0.13	0.42	0.09
43	784-Parts, tractors, motor veh	0.22	0.24	0.69	0.72
44	785-Cycles, motorcycles etc	0.71	0.56	0.13	1.16
45	786-Trailers, semi-trailr, etc	0.10	0.13	0.36	2.46
46	791-Railway vehicles. equipnt	0.01	0.01	0.04	0.07
47	792-Aircraft, assoctd. equipnt	0.30	0.10	0.20	0.35
48	793-Ship, boat, float. structrs	0.02	0.09	0.56	1.21

Source: Calculated by the authors based on UN COMTRADE database.

APPENDIX 3: RCA Indices for Miscellaneous Manufactured Articles (Data in bold is more than or equal to 1)

No of products	Product group	2000	2003	2006	2009
1	811-Prefabricated buildings	1.89	0.46	0.58	0.40
2	812-Plumbng, sanitary, eqpt. etc	1.19	1.57	2.09	6.36
3	813-Lightng fixtures etc. nes	0.75	0.76	0.09	0.70
4	821-Furniture, cushions, etc	2.21	2.24	1.82	2.48
5	831-Trunk, suit-cases, bag, etc	0.13	0.11	0.12	0.12
6	841-Mens, boys clothng, x-knit	0.31	0.16	0.15	0.86
7	842-Women, girl clothng, x-knit	0.27	0.08	0.05	0.37
8	843-Mens, boys clothng, knit	0.53	0.33	0.28	1.23
9	844-Women, girls clothng, knit	0.38	0.25	0.12	0.96
10	845-Othr. textile apparel, nes	0.41	0.29	0.23	1.17
11	846-Clothing accessrs, fabric	0.71	0.74	0.91	0.82
12	848-Clothng, nontxtl; headgear	1.16	0.68	1.24	1.48
13	851-Footwear	1.07	1.14	1.06	1.92
14	871-Optical instruments, nes	0.09	0.08	0.17	0.44
15	872-Medical instruments, nes	0.11	0.23	0.35	0.33
16	873-Meters, counters, nes	1.55	0.60	0.82	0.65
17	874-Measure, control instrmnt	0.20	0.95	0.44	0.40
18	881-Photograph appar. etc. nes	0.19	0.55	0.22	1.59
19	882-Photo. cinematogrph. suppl	0.24	0.37	0.36	0.63
20	883-Cine. film exposd. develpd	0.00	0.04	0.01	0.00
21	884-Optical goods nes	0.19	0.30	0.47	1.41
22	885-Watches and clocks	0.93	0.98	1.06	0.40
23	891-Arms and ammunition	0.04	0.00	0.07	0.00
24	892-Printed matter	0.99	1.02	1.44	0.71
25	893-Articles, nes, of plastics	1.67	2.23	2.64	5.91
26	894-Baby carriage, toys, games	0.14	0.23	0.15	0.23
27	895-Office, stationery suppl	1.18	1.38	1.87	1.27
28	896-Works of art, antique etc	0.04	0.06	0.05	0.04
29	897-Gold, silverware, jewl nes	2.20	2.08	2.02	1.49
30	898-Musical instruments, etc	0.34	1.70	1.70	1.53
31	899-Misc manufctrd goods nes	0.37	0.18	0.24	0.33

Source: Calculated by the authors based on UN COMTRADE database.