Malaysia and China: Comparative Advantages In Selected Manufacturing Goods

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1. Introduction

China has been a member of WTO since December 2001. Since then, China's exports and imports grew tremendously and their growth rates have been notably higher than many other countries. During the years 2004 and 2005 for example, China's exports grew by 35 per cent and 28 per cent respectively (WTO homepage). The corresponding figures for Malaysia for the two years were 21 per cent and 11 per cent respectively. This greater integration of China's economy with the world has raised concerns among some developing countries such as Malaysia on whether China would become a competitor to Malaysia especially in the manufacturing exports.

This paper aims to examine whether there has been a significant impact so far on Malaysia's trade pattern in general and its manufacturing exports in particular as a result of China's deeper integration with the world. Specifically, the study investigates on whether the comparative advantages of Malaysia in goods have altered significantly since China's entry into the WTO.

The paper is organised in the following. Section 2 provides a simple comparison on some key economic indicators of the Malaysian and the Chinese economies. Section 3 reviews some recent related empirical work. The framework of analysis is discussed in Section 4. Section 5 presents the findings of the present study. Concluding remarks are made in Section 6.

2. Overview of the Malaysian and Chinese economies

Table 1 provides some basic economic indicators of Malaysia and China. Malaysia is a small and open economy. The country has a population size of 25 million in 2005 and has a large trade sector (exports and imports combined) that was more than two times of its

gross domestic product during the period 2003 - 2005. The country's GDP per capita in 2005 was US\$5,134.

On the contrary, China is significantly larger than Malaysia in terms of population size. It has a population of 1,305 million people in 2005 and this is 52 times more than Malaysia's population during the same year. China's GDP per capita was US\$1,709 in 2005, only about one third of Malaysia's GDP per capita. China's trade sector has been growing in recent years. During the period 2003 -2005, the size of its trade sector was 64.5 per cent of its GDP. Comparing this figure with the Malaysian economy, the Malaysian economy is much more open (and therefore inevitably more dependent) to the world economy than the Chinese economy. In terms of the countries' shares in world total merchandise exports however, China has a bigger share of 7.3 per cent compared with Malaysia which has a share of only 1.3 per cent (WTO homepage).

Table 1 Key economic indicators, 2005

Country	Population (thousand)	<i>(c</i> urrent	GDP per capita (US\$)	ratio (2003-	Merchandise Exports	Merchandise Imports c.i.f. (US\$m)
Malaysia	25,347	130,143	5,134	217.6	140,949	114,602
China	1,304,500	2,228,862	1,709	64.5	761,954	660,003

Source: WTO homepage

Table 2 shows the contribution of agriculture, industry and services sectors in the two countries. Malaysia and China have rather similar economic structure in terms of economic activities under the three main sectors. Both countries' main economic activities are in the industry sector with Malaysia having a slightly higher percentage in this sector while China has a relatively higher percentage in the agricultural sector.

Table 2 Value added of agriculture, industries and services sectors in GDP (%), 2004

Country	Agriculture	Industry	Services
Malaysia	9	50	40
China	13	46	41

Source:World Development Indicators database, http://devdata.worldbank.org/data-query/

3. Previous studies on Malaysia's comparative advantages

There are a number of analyses made on Malaysia's comparative advantages in the manufacturing during the 1990s. Three studies are briefly reviewed here.

Amir (2000) examined Malaysia's export specialisation pattern during the period 1994 – 1998. The study indicated that there are emerging similarities in manufacturing export specialisation patterns among the ASEAN countries during the study period. As a result, increased competition on Malaysia's manufacturing exports is expected.

Tham (2001) provides a detailed review of past studies made on assessing the impact of China's rapid growth on exports of ASEAN. The study concludes that (i) Malaysia is expected to experience a continued decline in the export share of labour-intensive products such as clothing and apparel, (ii) Malaysia may still possess relatively high comparative advantage in high-technology products but the future of this sector is dependent on the capability in attracting sufficient inflow of FDI in this sector in the country, (iii) resource-based industries such as those that produce wood and wood products is likely to benefit from China's entry into the WTO as Malaysia has relatively high comparative advantage in this product group.

Tham and Loke (2001) examine Malaysia's competitiveness in selected industries for selected years during the period 1986 – 1996. Two indicators are used for revealed comparative advantage: net export to total trade ratio and world exports share. Three indicators are used for cost competitiveness: labour productivity, capital-labour intensity, salaries and wages per worker, and unit labour cost. The study concludes that as a whole, the Malaysian industries have not been very competitive. Only three industries exhibit both comparative advantage and cost competitiveness during the period studied: manufacture of wearing apparel, wood and cork products and furniture and fixtures.

4. Analytical framework

The focus of this paper is to conduct a simple exercise to examine whether the comparative advantages of Malaysia in goods have altered significantly since China's entry into the WTO. When a country is said to possess a comparative advantage in producing a particular commodity over another country, it means that this country can produce this commodity at lower opportunity costs than the latter can. To measure comparative advantage, information on autarkic prices (i.e. price levels where there is no trade between countries) is required. Obviously this is empirically impossible since prices prevailed in the statistics are those that are after trading. To solve this problem, Balassa (1965) provides a more realistic measure. He introduced an index based on the assumption that comparative advantage of a country is reflected or revealed in its trade pattern, yielding the term revealed comparative advantage (RCA). The index is the world export share (WES).

$$WES_{ij} = (X_{ij}/X_i) / (X_{wi}/X_w)$$

where X_{ij} : value of country i's export of commodity j;

X_i: value of country i's total exports;

 X_{wi} (M_{wi}): value of world exports of commodity j;

X_w: value of world exports

This index shows the extent of commodity specialisation in a country's exports relative to the share of that commodity in world exports. Its value can be of any positive values. A high value indicates comparative advantage of a country in the production of a particular good. If the WES of a country is greater than one, this means that the share of that commodity in this country's exports is higher than the world's average.

A selected number of product groups are chosen for computing the revealed comparative advantage (RCA) for Malaysia and comparison is made with RCA values for China in some products. The product groups chosen are mainly those that fall under the category of 'non-resource based' manufactured exports. Data is sourced from International Trade Statistics (http://www.intracen.org/tradstat) at SITC 3-digit level.

5. Analyses of the RCA values¹

5.1 Malaysia's overall export specialisation in non-resource-based manufacturing

Table 3 Malaysia's RCA in Non-Resource based Manufactures, 2001 - 2005								
Product Group	2001	2002	2003	2004	2005			
Manufactures of Machinery (except electrical)	1.47	1.60	1.39	1.51	1.11			
Manufactures of Electrical and Electronics	2.82	2.95	2.97	3.01	3.19			
Manufactures of Metal	0.43	0.41	0.49	0.52	0.54			
Textile, Clothing and Footwear	0.55	0.53	0.51	0.55	0.70			
Transport Equipment	0.05	0.05	0.05	0.07	0.11			

Results in Table 3 show that there has not been any significant change in the RCA pattern during this time period. Malaysia's RCA is higher than the world's average for manufactures of machinery (except electrical) and manufactures of electrical and electronics industries. RCA for manufactures of metal, manufactures of textile, clothing

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¹ This section draws largely from Mahani, Z.A. and Loke, W.H. (forthcoming), Revealed comparative advantage of Malaysian exports: the case for changing export composition, *Asian Economic Papers*.

and footwear, and manufactures of transport equipment are low at the world's standard during this period.

5.2 Electrical and electronic goods

Table 4 Malaysia's RCA in Electrical and Electronics Products, 1993 - 2005 (selected years)							
Product group	1993	1997	2001	2002	2003	2004	2005
761 - TELEVISION RECEIVERS	5.56	5.44	4.46	5.01	3.64	3.48	5.01
762 - RADIO BROADCAST RECEIVER	9.46	11.84	8.49	5.92	6.54	7.29	8.61
763 - SOUND/TV RECORDERS ETC	6.55	8.88	6.07	3.98	3.20	2.62	2.94
764 - TELECOMMS EQUIPMENT NES	2.21	2.22	2.02	1.69	1.66	1.64	2.08
771 - ELECT POWER TRANSM EQUIP	2.48	1.56	1.19	1.00	0.87	0.86	0.82
772 - ELECTRIC CIRCUIT EQUIPMT	1.41	1.86	2.04	2.21	2.38	2.82	3.66
773 - ELECTRICAL DISTRIB EQUIP	0.85	0.8	0.64	0.66	0.57	0.68	0.78
774 - MEDICAL ETC EL DIAG EQUI	0.02	0.05	0.12	0.14	0.13	0.26	0.19
775 - DOMESTIC EQUIPMENT	0.51	0.59	0.55	0.60	0.73	0.90	0.98
776 - VALVES/TRANSISTORS/ETC	6.05	5.81	4.67	5.82	6.10	7.46	5.86
778 - ELECTRICAL EQUIPMENT NES	0.56	0.7	0.93	0.95	0.92	1.02	1.13
Electrical and Electronics			2.82	2.95	2.97	3.01	3.19

Note: Data for years 1993, 2001 to 2005 are authors' own computations. Data for year 1997 was sourced from Amir (2000).

Although Malaysia's RCA index for electrical and electronics goods is still high relative to the world's standard during the period 2001 – 2005, it is actually loosing its comparative advantage in this industry when compared with the earlier period of 1990s. Almost all product groups in this industry have either recorded a decline in their RCA index or have very little increase. Among these product groups, the "SITC 763 - Sound/TV Recorders etc" product group has recorded the sharpest fall in the RCA index, from a peak of 8.9 in 2001 to only 2.9 in 2005. Another product group that experienced a significant decline in its RCA index is "SITC 762 – Radio Broadcast Receiver". Its RCA index was 11.8 in 1997 and fell to 8.6 in 2005. The declining pattern suggests that Malaysia's specialisation in this industry has gradually diminished over the years.

Two exceptions to the overall declining RCA index in the product group are observed. The RCA indices of "SITC 772 – Electric circuit equipment" and "SITC 778 – Electrical equipment n.e.s." have risen during this period.

Table 5 China's RCA in Electrical and Electronics Products, 2001- 2005								
Product group	2001	2002	2003	2004	2005			
761 - TELEVISION RECEIVERS	1.28	1.55	1.68	1.99	3.64			
762 - RADIO BROADCAST RECEIVER	3.62	3.61	3.40	2.69	2.77			
763 - SOUND/TV RECORDERS ETC	3.55	3.97	4.26	4.36	4.39			
764 - TELECOMMS EQUIPMENT NES	1.72	1.94	2.10	2.32	2.81			
771 - ELECT POWER TRANSM EQUIP	2.49	2.67	2.58	2.60	2.51			
772 - ELECTRIC CIRCUIT EQUIPMT	0.95	1.05	1.02	1.33	2.96			
773 - ELECTRICAL DISTRIB EQUIP	1.01	1.13	1.11	1.14	1.14			
774 - MEDICAL ETC EL DIAG EQUI	0.26	0.28	0.26	0.29	0.32			
775 - DOMESTIC EQUIPMENT	2.84	2.80	2.76	2.73	2.76			
776 - VALVES/TRANSISTORS/ETC	0.48	0.64	0.68	1.09	3.35			
778 - ELECTRICAL EQUIPMENT NES	1.70	1.67	1.61	1.58	1.51			
Electrical and Electronics	1.38	1.56	1.60	1.90	1.86			

As for China's RCA in this product group, its RCA values indicate that the country has developed comparative advantages in all the products with one exception of SITC 774 by the year 2005. The RCA patterns show rising trend in some of the products.

5.3 Manufactures of machinery (except electrical)

Table 6 Malaysia's RCA in Manufactures of Machinery (except Electrical)						
Product group	2001	2002	2003	2004	2005	
711 - STEAM GENERATING BOILERS	0.37	0.41	0.56	0.49	0.56	
712 - STEAM/VAPOUR TURBINES	0.21	0.32	0.14	0.38	0.25	
713 - INTERNAL COMBUST ENGINES	0.15	0.23	0.12	0.13	0.23	
714 - ENGINES NON-ELECTRIC NES	0.29	0.21	0.16	0.22	0.23	
716 - ROTATING ELECTR PLANT	0.75	0.84	0.67	0.49	0.54	
718 - POWER GENERATING EQU NES	0.03	0.05	0.12	0.09	0.11	
721 - AGRIC MACHINE EX TRACTR	0.09	0.07	0.08	0.08	0.13	
722 - TRACTORS	0.01	0.02	0.02	0.02	0.02	
723 - CIVIL ENGINEERING PLANT	0.12	0.10	0.18	0.18	0.17	
724 - TEXTILE/LEATHER MACHINRY	0.16	0.13	0.13	0.15	0.26	
725 - PAPER INDUSTRY MACHINERY	0.10	0.08	0.09	0.08	0.09	
726 - PRINTING INDUSTRY MACHNY	0.64	0.67	0.68	0.76	0.84	
727 - FOOD PROCESSING MACHINES	0.66	0.41	0.55	0.68	0.68	
728 - SPECIAL INDUST MACHN NES	0.43	0.46	0.49	0.49	0.58	
731 - MACH-TOOLS REMOVE MTRIAL	0.15	0.23	0.33	0.26	0.20	
733 - MTL M-TOOLS W/O MTL-RMVL	0.33	0.43	0.42	0.49	0.86	
735 - METAL MACHINE TOOL PARTS	0.17	0.29	0.24	0.23	0.71	
737 - METALWORKING MACHINE NES	0.24	0.26	0.21	0.24	0.38	
741 - INDUST HEAT/COOL EQUIPMT	1.03	0.82	0.91	0.98	1.26	
742 - PUMPS FOR LIQUIDS	0.07	0.06	0.06	0.06	0.11	
743 - FANS/FILTERS/GAS PUMPS	0.46	0.51	0.54	0.74	2.14	

744 - MECHANICAL HANDLING EQUI	0.18	0.15	0.21	0.29	0.37
745 - NON-ELECTR MACHINES NES	0.17	0.23	0.15	0.16	0.24
746 - BALL/ROLLER BEARINGS	0.49	0.47	0.48	0.47	0.54
747 - TAPS/COCKS/VALVES	0.17	0.16	0.15	0.22	0.55
748 - MECH TRANSMISSION EQUMNT	0.12	0.12	0.11	0.15	0.30
749 - NON-ELEC PARTS/ACC MACHN	0.57	0.54	0.52	0.57	0.61
751 - OFFICE MACHINES	1.18	0.71	0.67	0.75	0.73
752 - COMPUTER EQUIPMENT	2.97	3.35	3.16	4.33	0.11
759 - OFFICE EQUIP PARTS/ACCS.	4.14	5.27	4.33	4.69	12.58
Machinery (except electrical)	1.47	1.60	1.39	1.51	1.11

While the overall index is just above 1, which means that Malaysia's exports in this product group is slightly above the world's average, RCA values at disaggregated levels nevertheless indicate that Malaysia does not possess a comparative advantage in most of the product groups within this industry. The RCA index values are mostly below 1 for most of the product groups except for product groups 'SITC 741- Industrial heat/cool equipment", "SITC 743 – Fans/filters/gas pumps", "SITC 752 – Computer equipment" and "SITC 759 – Office equip parts/ accessories".

5.4 Manufactures of Textile, clothing and footwear

Table 7 Malaysia's RCA on Textile, Clothing and Fo	otwear				
Product group	2001	2002	2003	2004	2005
651 - TEXTILE YARN	1.01	1.05	0.99	1.03	1.40
652 - COTTON FABRICS, WOVEN	0.36	0.29	0.30	0.30	0.33
653 - MAN-MADE WOVEN FABRICS	0.70	0.51	0.50	0.61	0.67
654 - WOVEN TEXTILE FABRIC NES	0.02	0.02	0.02	0.02	0.02
655 - KNIT/CROCHET FABRICS	0.60	0.47	0.41	0.39	0.46
656 - TULLE/LACE/EMBR/TRIM ETC	0.10	0.12	0.09	0.11	0.12
657 - SPECIAL YARNS/FABRICS	0.16	0.17	0.19	0.30	0.36
658 - MADE-UP TEXTILE ARTICLES	0.09	0.09	0.10	0.11	0.14
831 - TRUNKS AND CASES	0.08	0.07	0.07	0.06	0.11
841 - MENS/BOYS WEAR, WOVEN	0.52	0.41	0.34	0.36	0.76
842 - WOMEN/GIRL CLOTHING WVEN	0.24	0.26	0.24	0.28	0.46
843 - MEN/BOY WEAR KNIT/CROCH	1.09	1.12	1.10	1.10	1.88
844 - WOMEN/GIRL WEAR KNIT/CRO	0.80	0.82	0.75	0.80	1.35
845 - ARTICLES OF APPAREL NES	0.37	0.37	0.30	0.29	0.37
846 - CLOTHING ACCESSORIES	0.50	0.46	0.52	0.50	0.57
848 - HEADGEAR/NON-TEXT CLOTHG	4.34	4.21	4.08	4.35	5.02
851 - FOOTWEAR	0.13	0.13	0.17	0.31	0.18
Textile, Clothing and Footwear	0.55	0.53	0.51	0.55	0.70

Table 7 shows that Malaysia does not possess a comparative advantage in the overall industry of textile, clothing and footwear. The country's export share has been less than the world's average for most of the product groups and is just about the same as the world's average for two product groups "SITC 651 – textile yarn" and "SITC 843 – Men/boy wear knit".

One exception is noted for the product group of "SITC 848 – Headgear/non-text clothing' where its RCA index was around 4 during the period 2001 - 2004 and reached 5 in 2005.

Table 8 China's RCA on selected Textile and Clothing products						
Product group	2001	2002	2003	2004		
655 - KNIT/CROCHET FABRICS	2.14	2.51	2.46	2.40		
842 - WOMEN/GIRL CLOTHING WVEN	4.13	4.57	4.35	4.23		
844 - WOMEN/GIRL WEAR KNIT/CRO	3.68	4.66	4.85	5.24		
848 - HEADGEAR/NON-TEXT CLOTHG	6.95	6.57	6.43	5.86		

On the contrary, RCA index computed for China shows that China possesses comparative advantage in this product group during the same period.

5.5 Manufactures of Metal

Table 9 Malaysia's RCA on Manufactures of Met	al_				
Product group	2001	2002	2003	2004	2005
671 – PIG IRON ETC FERRO ALLOY	0.40	0.47	0.52	0.35	0.09
672 - PRIMARY/PRODS IRON/STEEL	0.02	0.04	0.75	0.56	0.53
673 - FLAT ROLLED IRON/ST PROD	0.05	0.14	0.18	0.43	0.43
674 - ROLLED PLATED M-STEEL	0.45	0.40	0.48	0.47	0.43
675 - FLAT ROLLED ALLOY STEEL	0.09	0.09	0.11	0.13	0.20
676 - IRON/STEEL BARS/RODS/ETC	0.27	0.17	0.35	0.32	0.33
677 - IRON/STEEL RAILWAY MATL	0.05	0.16	0.04	0.03	0.06
678 - IRON/STEEL WIRE	0.41	0.40	0.77	0.98	1.00
679 - IRON/STEEL PIPE/TUBE/ETC	1.25	1.12	1.22	1.24	1.13
691 - IRON/STL/ALUM STRUCTURES	0.60	0.55	0.62	0.61	0.72
692 - METAL STORE/TRANSPT CONT	0.67	0.69	0.70	0.77	0.82
693 - WIRE PROD EXC INS ELECTR	1.03	0.80	0.78	0.84	1.24
694 - NAILS/SCREWS/NUTS/BOLTS	0.82	0.89	0.77	0.82	0.92

695 - HAND/MACHINE TOOLS	0.25	0.23	0.26	0.39	0.38
696 - CUTLERY	0.37	0.30	0.56	0.28	0.31
697 - BASE METAL H'HOLD EQUIPM	0.18	0.19	0.17	0.28	0.15
699 - BASE METAL MANUFAC NES	0.43	0.44	0.46	0.49	0.57
Manufactures of Metal	0.43	0.41	0.49	0.52	0.54

Malaysia does not have a comparative advantage in the manufactures of metal. Table 9 shows that the RCA values are mostly below 1 for most product groups. The exceptions are found in "SITC678 – Iron/Steel Wire", "SITC679 – Iron/Steel Pipe/Tube/etc" and "SITC693 – Wire Prod Excluding Instrumental Electrical".

5.6 Manufactures of Transport Equipment

Table 10 Malaysia's RCA on Manufactures of Transport Equipment							
Product group	2001	2002	2003	2004	2005		
781 - PASSENGER CARS ETC	0.01	0.02	0.01	0.02	0.03		
782 - GOODS/SERVICE VEHICLES	0.01	0.01	0.02	0.02	0.06		
783 - ROAD MOTOR VEHICLES NES	0.02	0.01	0.01	0.02	0.05		
784 - MOTOR VEH PARTS/ACCESS	0.07	0.07	0.09	0.10	0.14		
785 - MOTORCYCLES/CYCLES/ETC	0.45	0.42	0.44	0.53	0.59		
786 - TRAILERS/CARAVANS/ETC	0.25	0.27	0.14	0.30	0.31		
Transport Equipment	0.05	0.05	0.05	0.07	0.11		

Malaysia does not have any comparative advantage relative to the world in all these product groups throughout the period studied. These results indicate that the Malaysian government's active intervention and heavy protection in this industry since the 1980s when the first national car project PROTON was established has not been successful in creating an advantage in the country's automotive production in the world. The RCA indices in fact suggest that Malaysia has experienced a decline in its comparative advantage in all the product groups (except SITC 783 – Road motor vehicles n.e.s. and SITC 784 – motor vehicle parts/accessories) when the RCAs during the 2000s are compared with those in the early 1990s.

Table 11 China's RCA on Manufactures of Transport Equipment				
Product group	2001	2002	2003	2004
781 - PASSENGER CARS ETC	0.003	0.003	0.005	0.012
782 - GOODS/SERVICE VEHICLES	0.045	0.051	0.060	0.070
783 - ROAD MOTOR VEHICLES NES	0.088	0.061	0.041	0.057
784 - MOTOR VEH PARTS/ACCESS	0.230	0.245	0.235	0.321
785 - MOTORCYCLES/CYCLES/ETC	2.982	2.758	2.902	2.734
786 - TRAILERS/CARAVANS/ETC	5.611	4.680	5.116	4.628

In the case of China, an opposite trend is observed. Besides recording higher RCAs than Malaysia in all the product groups under the automotive industry (except for the SITC group 781(passenger cars etc.) in which China has a slightly lower RCA index value), China has comparative advantages in the production of SITC groups 785 (motorcycles/cycles/etc) and 786 (trailers/caravans/etc). Its world exports shares for SITC 785 and 786 were over 2 times and 4-5 times the world's averages respectively.

6. Concluding remarks

This paper provides a simple exercise to examine and compare Malaysia's comparative advantages in selected goods during the past few years with China. The world export shares index is used as an indicator of the two countries' revealed comparative advantages. The study as a whole shows that Malaysia's comparative advantages in many of the electrical and electronic manufactures (which are also mainly labour intensive manufactures) have been eroding over the years since the 1990s. This is not surprising in view of the structural change that the Malaysian economy has undergone in the past two decades during which labour shortage especially in the unskilled group has become a

constraint to the economy. Rising wages in the country relative to other developing countries including China, India, Vietnam and Cambodia causes Malaysia to gradually loose its comparative advantages in the production of labour intensive manufactures. The rising RCA values for China in the electrical and electronics manufactures indicating the country's comparative advantage during the same period is therefore expected.

Such a development should not raise too much concern if the lost in comparative advantages in these product groups are accompanied by a gain in comparative advantages in other product groups that require less labour input in their production, i.e. capital and skill-intensive manufactures. The findings in the present study however indicate that Malaysia has not been able to develop a clear comparative advantage in capital- and skill-intensive manufactures such as the manufactures of metal and transport equipment. China, on the contrary, has begun to acquire comparative advantages in the same product groups. This simple exercise does suggest that fears in the businesses that China's greater integration into the world economy will affect other developing countries such as Malaysia do seem to have some valid grounds for concerns. It is important for Malaysia to identify and develop its strengths so that China's growth can be a complement to Malaysia's future economic development.

It is also interesting to note that despite the heavy protection and extensive incentives given by the Malaysian government to the transport equipment industry, the industry has not been successful in developing a comparative advantage in this product group. This is a case that clearly suggests that industry that operates in the absence of healthy competition in the domestic market will find itself hard to be competitive in the international market.

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