

The Comparative Advantage of Malaysia Manufactured Exports

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Abstract: This paper analyses the changes of trade pattern for Malaysia's exports by calculating reveal comparative advantage (RCA) indices over time. This study is based on 144 manufactures comparative advantage in the world and Vietnam market. It classifies 144 kinds of manufactures by technology level into five general groups and nine small groups, which cover the majority of Malaysia's manufactured goods. This paper undertakes an analysis of the comparative advantage of Malaysia manufactured goods from 2010 to 2015. The results indicate that most of the products with comparative advantage in the world market are high technology products, particularly E&E products and process industries products. In term of Vietnam market, agriculture-based products and process industries are more dominance. However, Malaysia manufactured products competitiveness in Vietnam market have shifted from low technology products to medium technology products which indicates the same pattern with the world.

Keywords: Malaysia, Manufactured goods, Exports, Comparative advantage, RCA index, Vietnam

INTRODUCTION

Malaysia as an open and integrated economy is experiencing impacts from the global slowdown through trade. The slowdown of Malaysia's trading partners directly influencing their demand for Malaysian exports. As a result, it will limit the demand for Malaysia's exports from these countries. Thus, comparative advantage is very important in order to sustain and stabilize overseas market demand. With the challenging economic environment, the comparative advantage of country's exports is the primary influence on the country's export demand.

As stated in the Eleventh Malaysia Plan, the manufacturing sector will transition towards more high-value, diverse and complex products, driven by three catalytic subsectors, namely chemicals, E&E and machinery equipment (M&E) as well as industries with high potential growth such as medical devices and aerospace. Therefore, it is very important for Malaysia to identify the comparative advantage of manufactured goods that can increase Malaysia's export demand in the near future.

This paper focuses on the analysis of the comparative advantage of Malaysia manufactured goods from 2010 to 2015, not only within the world market but also in the potential market specifically Vietnam. In this study, Vietnam has been chosen as a potential market for Malaysia's exports of manufactured goods. For the past five years Malaysia's exports to Vietnam recorded a positive growth. The emerging position of Vietnam as the destination of

choice for global manufacturers of cars, electric and electronics, and industrial parts is undeniable. This is a proof that the manufacturing and supporting industries not only have a bright future but also play vital roles in the well-being of the economy.

The development of supporting industries in Vietnam suggests new trends and opportunities for industrial development in late developing economies. The development of global production and technologies lead to new chances for building supporting industries, as well as an overall industry. While developing economies have to compete to attract FDI, Malaysian manufacturers and service provider could compete to enter new developing economies to sell technologies, set up production bases and gain the advantage of being a forerunner.

As one of the most vibrant economies in Asia with a large market for capital goods and a growing domestic market for consumer goods, Vietnam has a various opportunity for Malaysia's export demand.

OVERVIEW OF VIETNAM ECONOMIES

Vietnam is one of the most trade-dependent economy in the ASEAN bloc and the country relies heavily on exports to drive economic growth. Vietnam's industrial sectors and its markets for industrial equipment have been growing rapidly in the last few years. This is largely driven by increased foreign direct investment in manufacturing, combined with the Vietnam government's desire to move beyond labour intensive/light manufacturing into more value-

added/technology-intensive industries, creating demand for higher-end manufacturing technologies. While competition from Western is fierce, Malaysian industrial equipment companies struggling their way via unofficial channel to gain a strong reputation for quality, technology and the most important point is affordable price.

In the last few years, the Vietnam government has championed a number of high-profile investments in key sectors such as petrochemical refining, power generation, and heavy industry which have bolstered demand for a wide range of industrial products. For example, the government hopes to reduce reliance on the export of commodities, and instead encourage more onshore processing including downstream manufacturing and packaging of food, chemicals and plastics. The country's three major refinery investments which are at various stages of developments are good examples of this trend.

In recent years, Vietnam has also successfully attracted a number of major multinational investors in electronics, pharmaceuticals and consumer goods sectors, and this is attracting networks of suppliers and services companies that are generating demand for precision manufacturing equipment, testing instrumentation and other sophisticated industrial tools and inputs. Recent investments from major multinationals include Nokia, Kyocera Mita, and an expansion of Samsung's existing facility. While much of this investment is geared toward export oriented sectors, a number of firms are also eyeing Vietnam's domestic market for both durable and consumer goods production, with companies like Honda, Yamaha, Hyundai and others expanding their Vietnam production.

Opportunities for Malaysian supplies to expand into Vietnam are growing, accessed through multiple procurement channels. Firstly, through strong relationship between ASEAN's members, Malaysian industrial equipment suppliers would be well served to track the major investments by multinational manufacturers. Secondly, there is a growing network of industrial product distribution companies that are actively looking to represent foreign products. Many have established after-sales service and maintenance capabilities with growing sophistication and integration know-how.

Despite or perhaps because of global economic uncertainties, 2013 saw continued movement among Asian regional manufactures toward Vietnam, identically Japan waves of investment in supporting industry. While selling into these supply chains can be challenging, their increased interest in Vietnam will further support a growing base of support companies, suppliers, materials and service companies. To accommodate these growing investments, Vietnam

continues expanding and developing several industrial zones, such as Amata and Long Duc in Dong Nai and the Vietnam-Singapore Investment Parks, and others in Haiphong, Da Nang and Can Tho, with major investments in the pipeline from Thai, Korean and Japanese firms, among others. Malaysian manufacturers somehow have a larger area for improvement in the sector.

REVEALED COMPARATIVE ADVANTAGES

Growing global competition urges Malaysia to identify products that have comparative advantage. Comparative advantage is the ability of a country to offer goods at lower cost than the other countries and thus should concentrate in making the good in which it has a comparative advantage. Some studies have been done based on the concept of Revealed Comparative Advantage introduced by Balassa (1965).

Zhao Chunming [1] used RCA to study the pattern of China's manufactured exports in the world and Vietnam market from 2002 to 2009 based on 144 kinds of manufactures which categorised by technology level. The study found that types of China manufactured products with comparative advantage in both world and US markets are increasing. Most of the products with the comparative advantage are low technology products and the comparative advantage for China medium technology products has improved, but the RCA indices are low. It also indicates that China manufactured exports are having high comparative advantage in the world market compared with US market.

Another study that focused on China manufactured sector has been undertaken by Kirit Vaidya and David Bennet (2007). They used RCA index for 27 product groups, representing high, medium and low technology sectors in order to know which China's comparative advantage in manufacturing has shifted towards high-technology sectors between 1987 and 2005. The study found that while China maintains its competitiveness in low-tech labour intensive products, it has gained comparative advantage in selected medium-tech sectors and the high-tech telecommunications and automatic data processing equipment sectors.

Kulapa Supongpan Kuldilok, P.J Dawson and John Lingard [2] analysed the export competitiveness of the canned tuna export industry in Thailand for 1996-2006. They used RCA for both major exporters in the world market and competitors in individual export markets. The findings shows that Thailand has comparative advantages in all major export markets, these have remained stable in the USA, the Middle East, Japan and Canada but have fallen substantially in Australia.

As for the Malaysian commodity exports, there are many studies have assessed the pattern of comparative advantage in exports. One of the study is Z. Noor Aini and P. Ahmad Fauzi [3] who analysed the comparative advantage of wood products in the European market. The study found that high comparative advantage products are the secondary processing products and mechanized mass market products. The revealed comparative advantage is very rely on the quantity traded, a high quantity did not indicate the high comparative advantage. There are many factors influencing the comparative advantage such as abundant resources, communication and technology, production cost and demand pattern.

Nik Maheran and Haslina [4] analysed export competitiveness of Malaysian E&E products. The study used the Constant Market Share (CMS) and RCA to analyse the extent of the export competition between Malaysia and other competitor economies. RCA results showed that Malaysia's E&E products was highly perform only in the US market for almost all SITC. Indonesia has monopolized the Singapore market and Hong Kong was dominated by China. Malaysia's E&E exports to the world generally has comparative advantage over other competitors namely Indonesia, Thailand and China.

Another study that focused on Malaysia manufactured exports has been undertaken by Mawar Murni [6]. The study provides analysis of shifting export specialization to Singapore by estimating RCA indices over time. As a result, they found that Malaysia competitiveness shifted from agro-based industry to

$$RCA_{ij} = \frac{(X_{ij}/X_{it})}{(X_{nj}/X_{nt})}$$

Or general expression of RCA (using Malaysia as the example)

$$RCA = \frac{\text{Malaysia export of commodity } i / \text{Malaysia export of all commodities}}{\text{World import of commodity } i / \text{World import of all commodities}}$$

In this case, Regional Revealed Comparative Advantage (RRCA) also will be used to calculate Malaysia export's comparative advantage in Vietnam market. RRCA concentrates on a particular commodity's comparative advantage in the major trade partner's market, which is analyzed in the same way as RCA. The determination of comparative advantage is based on the figure of RCA. If the number is more than 1, the comparative advantage is obtained; if not, it is of comparative disadvantage.

DATA COLLECTION

All data will be obtained from UN Comtrade database (Standard International Trade Classification (SITC), Rev 4). This study will be analysed the data starting 2010 until 2015.

semi-manufactured products especially iron, steel and zinc.

DESIGN/METHODOLOGY

This study is based on 144 manufacture's comparative advantage in the world market and Vietnam, displaying the distribution and variation range for the comparative advantage of Malaysia manufactures at different technology level in 2010-2015 with the RCA index. It will be based on the categorization Sanjaya Lall [5] used to analyse the competitiveness of developing countries manufactured goods. This paper classifies 144 manufactured goods by five technology level such as resource based products, low technology products, medium technology products and high technology products.

These 144 manufactured goods will be used RCA index, introduced by Balassa (1965, 1977). RCA have been used to help assess a country's export potential. The RCA indicates whether a country is in the process of extending the products in which it has a trade potential, as opposed to situations in which the number of products that can be competitively exported is static. It can also provide useful information about potential trade prospects with new partners.

The index is illustrated as a commodity's export share of all commodities in one country divided by a commodity's export share of all commodities in the world. For example, if a country has 10% of the world market in computers, whereas its share of world exports of all products is 2%, the RCA for computers is 5%. If x represents exports, the index for country i commodity j is calculated as follows:

SCOPE AND CATEGORIZATION OF MANUFACTURED PRODUCTS

The categorization is based on Sanjaya Lall [5] used to analyse the competitiveness of developing countries manufactured goods, this study classifies 144 kinds of manufactures by technology level into five general groups and nine sub-groups which cover most of Malaysia's manufactured exports. The detail categorization is given in Table 1.

Resource based products (RB)

This product category tends to be simple and labour intensive (e.g. simple food or leather processing), but there are segments using capital, scale and skill-intensive technologies (e.g. petroleum refining or modern processed foods). Since competitive

advantages in these products arises generally from the local availability of natural resources, they do not raise important issues for competitiveness. However, the segments with skill and intensive technologies do raise important competitiveness issues. There are two sub-groups under this category, Agriculture-based products (RB1) and Others (RB2).

Low technology products (LT)

This product category tends to have stable, well-diffused technologies. The technologies are primarily embodied in the capital equipment; the low end of the range has relatively simple skill requirements. Many traded products are undifferentiated and compete on price, thus labour cost tend to be a major element of cost in competitiveness. Scale economies and barriers to entry are generally low. The final market grows slowly, with income elasticities below unity. However, there are exceptions to these features. There are particular low technology products in high quality segments where brand names, skills, design and technological sophistication are very important, even if technology intensity does not reach the level of other categories. Products of major interest to developing countries tend to be in lower quality segments and are really based on simple technologies and price rather than quality competition. There are two sub-groups in this category, Textiles, Garment, and Footwear (LT1) and Other LT products (LT2). LT1 consist of 20 types of product and LT2, 24 types. LT1

products have undergone massive relocation from rich to poor countries, with assembly operations shifting to low wage sites, complex design and manufacturing functions retained in advanced countries. This relocation has been the engine of export growth in this industry.

Medium technology products (MT)

This category comprising the bulk of skill and scale-intensive technologies in capital goods and intermediate products, are the centre of industrial activity of industrial activity in mature economies. They tend to have complex technologies, with moderately high levels of R&D, advanced skill needs and lengthy learning periods. There are three sub-groups in this category, Automotive Products (MT1), are of particular export interest to newly industrialising countries, particularly in East Asia and Latin America. Process Industries (MT2), mainly chemicals and basic metals which are different in their technological features from Engineering Products (MT3). Process industries have stable and undifferentiated products, often with large scale facilities and considerable technological effort in improving equipment and optimising complex process. Engineering industries emphasise product design and development. MT1 products consist of 5 types of products, MT2 products (17 types) and MT3 products (30 types).

Table 1: Technological classification of exports

Classification	Types	Representative products
PM products	7	Copper, iron, zinc
RB products	23	
Agriculture-based products (RB1)	7	Beverages, wood, vegetable oils
Other resources based products (RB2)	16	Petroleum/rubber products, cement, cut gems, glass
LT products	44	
Textile, garment & footwear (LT1)	20	Textile fabrics, clothing, headgear, leather manufactures, travel goods
Other LT products (LT2)	24	Pottery, furniture, jewellery, toys, plastic products
MT products	52	
Automotive products (MT1)	5	Passenger vehicles and parts, commercial vehicles, motorcycles and parts
Process industries, mainly chemicals and basic metals (MT2)	17	Synthetic fibres, chemicals and paints, fertilizers, pipes/tubes
Engineering products (MT3)	30	Engines, industrial machinery, pumps, ships, watches
HT products	18	
E&E products (HT1)	11	Office/data processing/ telecommunications equipment. Turbines, power generating equipment
Other HT products (HT2)	7	Pharmaceuticals, aerospace, optical/measuring instruments

High technology products (HT)

HT products have advanced and fast-changing technologies, with high R&D investments and prime emphasis on product design. The most advanced technologies requires sophisticated technology infrastructures, high levels of specialised technical skills and close interactions between firms, as well as between firms and universities or research institutions. However, some products like electronics have labour intensive final assembly, and their high value-to-weight ratios make it economical to place this stage in low wage areas. These products lead in new international integrated production systems which different processes

are separated and located by MNC's according to fine differences in production costs. This category has been divided into two sub-groups particularly Electronic and Electrical (E&E) products (HT1) and Other High-Tech products (HT2). HT1 comprised 11 types of products and HT2, 7 types of products.

**ANALYSIS ON THE COMPARATIVE
ADVANTAGE OF MALAYSIA
MANUFACTURED EXPORTS
RCA for Malaysia Manufactures In the World
Market**

Table 2: Summary of RCA based on Product Category

	RCA					
	2010	2011	2012	2013	2014	2015
PM	0.7	0.9	3.0	1.5	1.3	1.7
RB						
RB1	1.3	1.3	1.4	1.3	1.2	1.1
RB2	0.4	0.4	0.4	0.4	0.2	0.3
LT						
LT1	0.5	0.6	0.6	0.6	0.6	0.5
LT2	0.9	0.9	0.9	0.9	0.8	0.7
MT						
MT1	0.1	0.1	0.1	0.1	0.1	0.1
MT2	1.1	1.1	1.1	1.1	1.2	1.1
MT3	0.5	0.5	0.5	0.5	0.5	0.6
HT						
HT1	2.4	2.3	2.2	2.2	2.2	2.1
HT2	0.7	0.7	0.8	0.7	0.7	0.7

Table 2 shows the RCA for Malaysia's manufactured products by product category in the world. There are no significant changes in RCA pattern during 2010 until 2015. Malaysia's RCA is higher than

the world's average for HT1, PM, RB1 and MT2. However, RB2, LT, MT1, MT3 and HT2 are low at the world standard during this period.

Table 3: RCA for E&E products (HT1)

SITC Code	Commodity	RCA					
		2010	2011	2012	2013	2014	2015
HT1		2.36	2.30	2.18	2.20	2.20	2.09
776	Thermionic, cold cathode or photo-cathode valves and tubes,(diodes, transistors and similar semiconductor devices	4.22	4.95	4.74	4.76	5.06	4.53
759	Parts and accessories for machines	5.63	3.69	3.36	3.45	2.69	2.51
761	Monitors and projectors, not incorporating television reception apparatus	3.22	3.27	2.96	3.30	2.66	2.21
752	ADP machines and units thereof; magnetic or optical readers, machines for transcribing data onto data media in coded form and machines for processing such data	2.69	2.28	2.16	2.09	1.84	1.94
751	Office machines	0.98	1.07	1.08	0.92	1.02	1.57
778	Electrical machinery and apparatus	0.96	0.96	1.02	1.07	1.18	1.23
764	Telecommunications equipment	0.81	0.87	0.87	0.80	0.89	0.79
774	Electrodiagnostic apparatus for medical, surgical, dental or veterinary purposes, and radiological apparatus	0.32	0.43	0.46	0.42	0.67	0.77
771	Electric power machinery and parts thereof	0.55	0.52	0.73	0.73	0.67	0.63
718	Power-generating machinery and parts thereof	0.14	0.15	0.15	0.18	0.14	0.26
716	Rotating electric plant and parts thereof	0.23	0.21	0.21	0.19	0.19	0.19

Even though Malaysia's RCA index for E&E products is still in high comparative advantage during 2010-2015, however, it is actually losing its in this industry compared with the earlier period of 2000s. Among E&E products, there are 6 products that recorded high comparative advantage ($RCA > 1$), particularly semiconductor devices (SITC 776), parts and accessories for machines (SITC 759), monitors and projectors (SITC 761), ADP machines (SITC 752), office machines (SITC 751) and electrical machinery and apparatus (SITC 778). These products accounted

for 54.5% of all products in this category. RCA for semiconductor devices sustained at the same level with an average index of 4.71. RCA for office machines and electrical machinery are showing increasing trend. These two products started with RCA index below than 1 ($RCA < 1$) in 2010 and slowly exceeded 1 for the past five years. On the other hand, RCA for parts and accessories machines as well as ADP machines is shrinking. The decreasing pattern shows that Malaysia's specialisation in this industry has slowly contracted over the years.

Table 4: RCA for Primary manufactured (PM)

SITC Code	Commodity	2010	2011	2012	2013	2014	2015
		RCA	RCA	RCA	RCA	RCA	RCA
PM		0.74	0.93	2.97	1.49	1.33	1.69
687	Tin	8.69	10.35	1.75	9.46	9.57	15.14
683	Nickel	0.04	0.01	0.08	0.20	2.19	5.75
685	Lead	1.11	1.55	3.64	3.53	1.80	3.12
686	Zinc	0.85	1.06	5.59	1.43	0.76	1.68
682	Copper	0.81	0.92	0.82	2.08	1.39	1.51
684	Aluminium	0.60	0.95	0.90	1.16	1.15	1.12
681	Silver, platinum and other metals of the platinum group	0.03	0.03	0.10	0.07	0.13	0.38

Malaysia's RCA in this product group indicates that the country has developed comparative

advantages in all products except for silver, platinum and other metal (SITC 681).

Table 5: RCA for Agriculture-based products (RB1)

SITC Code	Commodity	RCA					
		2010	2011	2012	2013	2014	2015
RB1		1.30	1.29	1.44	1.34	1.16	1.07
634	Veneers, plywood, particle board, and other wood, worked	5.34	5.13	5.10	4.95	4.37	4.12
621	Materials of rubber (e.g., pastes, plates, sheets, rods, thread, tubes, of rubber)	5.66	5.62	6.92	5.85	4.15	3.00
635	Wood manufactures	1.39	1.41	1.46	1.34	1.25	1.26
629	Articles of rubber	0.78	0.77	0.82	0.81	0.80	0.83
625	Rubber tyres, interchangeable tyre treads, tyre flaps and inner tubes for wheels of all kinds	0.19	0.21	0.22	0.24	0.30	0.33
641	Paper and paperboard	0.24	0.25	0.26	0.26	0.24	0.29
633	Cork manufactures	0.01	0.01	0.02	0.01	0.01	0.00

There are three products that recorded high comparative advantages in RB1 namely veneers, plywood, particle board, and other wood (SITC 634), materials of rubber (SITC 621) and wood manufactures

(SITC 635). However, articles of rubber (SITC 629) and rubber tyres (SITC 625) are showing increasing pattern which indicates the potential of the products.

Table 6: RCA for Process industries, mainly chemicals and basic metals (MT2)

SITC Code	Commodity	RCA					
		2010	2011	2012	2013	2014	2015
MT2		1.05	1.11	1.13	1.12	1.18	1.13
512	Alcohols, phenols, phenol-alcohols, and their derivatives	4.26	4.52	4.59	4.35	4.83	5.14
513	Carboxylic acids and their derivatives	2.17	2.14	2.22	2.18	2.44	2.39
572	Polymers of styrene, in primary forms	2.08	2.30	2.22	1.74	1.73	2.00
554	Soap, cleansing and polishing preparations	1.37	1.58	1.50	1.48	1.61	1.66
679	Tubes, pipes and hollow profiles, and tube or pipe fittings, of iron or steel	0.80	0.85	1.05	0.98	1.37	1.19
882	Photographic and cinematographic supplies	0.52	0.57	0.61	0.73	1.26	1.17
582	Plates, sheets, film, foil and strip, of plastics	0.87	0.94	0.94	0.97	1.04	1.01
598	Miscellaneous chemical products	0.85	0.84	0.85	1.10	0.97	0.99
533	Pigments, paints, varnishes and related materials	0.67	0.67	0.79	0.85	0.86	0.91
591	Insecticides, rodenticides, fungicides, herbicides, anti-sprouting products and plant-growth regulators, disinfectants and similar products	0.75	0.63	0.81	0.86	0.77	0.70
562	Fertilizers (other than those of group 272)	0.64	0.64	0.64	0.86	0.77	0.66
671	Pig-iron, spiegeleisen, sponge iron, iron or steel granules and powders and ferro-alloys	0.51	0.55	0.77	0.50	0.59	0.51
553	Perfumery, cosmetic or toilet preparations (excluding soaps)	0.34	0.31	0.30	0.28	0.28	0.30
786	Trailers and semi-trailers; other vehicles, not mechanically-propelled; specially designed and equipped transport containers	0.30	0.29	0.34	0.32	0.34	0.26
672	Ingots and other primary forms, of iron or steel; semi-finished products of iron or steel	0.78	1.10	0.80	0.26	0.18	0.17
583	Monofilament	0.84	0.20	0.23	0.18	0.17	0.11
791	Railway vehicles (including hover trains) and associated equipment	0.06	0.01	0.05	0.06	0.03	0.02

As per table above, RCA for process industries experienced moderate rise during the period of 2010-2015. Alcohols, phenol and their derivatives (SITC 512) registered high comparative advantage during the period. This shows the high specialization of Malaysia's export economy to this product. Other products that also shows high comparative advantage are carboxylic acids and their derivatives (SITC 513), polymers of

styrene (SITC 572), soap, cleansing and polishing preparations (SITC 554), tubes, pipes and hollow profiles (SITC 679), photographic and cinematographic supplies (SITC 882) and plates, sheets and film of plastics (SITC 582).

RRCA for Malaysia Manufactures in Vietnam Market

Table 7: Summary of RRCA based on Product Category

	RCA					
	2010	2011	2012	2013	2014	2015
PM	0.8	1.2	1.2	1.1	2.0	1.7
RB						
RB1	1.3	1.6	1.3	1.4	1.5	1.5
RB2	1.1	0.9	1.5	1.0	1.0	0.8
LT						
LT1	0.3	0.4	0.4	0.3	0.3	0.3
LT2	1.4	0.7	0.7	0.6	0.5	0.6
MT						
MT1	0.1	0.1	0.2	0.2	0.2	0.2
MT2	1.8	1.8	1.4	1.2	1.4	1.5
MT3	0.6	0.8	0.7	0.7	0.7	0.9
HT						
HT1	1.1	1.2	1.2	1.1	1.0	0.8
HT2	0.4	0.4	0.3	0.8	2.3	1.3

The table shows the distribution of Malaysia's RRCA manufactured products category in the Vietnam market. According to the table, there are four products

categories registered high comparative advantage above 1 particularly PM, RB1, MT2 and HT2. On the

contrary, RRCA for MT3, RB2, HT1, LT2, LT1 and MT1 are relatively low.

Table 8: RRCA for Primary manufactured (PM) in Vietnam market

Commodity Code	Commodity	RCA					
		2010	2011	2012	2013	2014	2015
PM		0.8	1.2	1.2	1.1	2.0	1.7
687	Tin	17.8	8.8	14.1	5.8	6.1	7.2
684	Aluminium	1.3	2.0	2.1	1.4	4.0	2.7
686	Zinc	0.1	0.2	1.2	0.8	0.8	0.9
685	Lead	0.4	0.2	0.0	0.0	0.1	0.6
682	Copper	0.3	0.7	0.5	1.0	0.5	0.5
683	Nickel	1.3	0.7	0.0	0.0	0.1	0.2
681	Silver, platinum and other metals of the platinum group	0.0	0.0	0.0	0.0	0.0	0.0

The primary manufactured in Vietnam market started with the RRCA index very close to 1 in 2010, fluctuated until 2015. There are two products recorded high competitive advantage in this industry, namely tin (SITC 687) and aluminium (SITC 684). High competitive advantage in these two products can be

explained by the efforts stipulating the electronics manufacturing and development pace of the country, Vietnam also import more metals from Malaysia. Which can be the main contributor to the increase is the rising demand in tin and aluminium.

Table 9: RRCA for Agriculture-based products (RB1) in Vietnam market

Commodity Code	Commodity	RCA					
		2010	2011	2012	2013	2014	2015
RB1		1.34	1.64	1.34	1.37	1.45	1.55
635	Wood manufactures, n.e.s.	7.91	10.24	11.58	13.20	15.19	18.78
634	Veneers, plywood, particle board, and other wood, worked, n.e.s.	3.04	3.27	2.59	3.49	4.25	3.75
621	Materials of rubber (e.g., pastes, plates, sheets, rods, thread, tubes, of rubber)	3.97	5.73	3.67	2.54	1.80	1.70
625	Rubber tyres, interchangeable tyre treads, tyre flaps and inner tubes for wheels of all kinds	0.54	0.62	0.72	0.60	0.46	1.34
641	Paper and paperboard	0.65	0.77	0.77	0.86	0.91	1.02
629	Articles of rubber, n.e.s.	0.48	0.57	0.62	0.48	0.57	0.59
633	Cork manufactures	0.00	0.00	0.00	0.00	0.00	0.00

The distribution of RRCA for agriculture-based products in Vietnam is showing moderate rise with the average index of 1.45. There are 5 out of 7 products have high competitive advantage particularly,

wood manufactures (SITC 635), veneers, plywood, particle board and other wood (SITC 634), materials of rubber (SITC 621), rubber tyres (SITC 625) as well as paper and paper board (SITC 633).

Table 10: RRCA for Process industries, mainly chemicals and basic metals (MT2) in Vietnam Market

Commodity Code	Commodity	RCA					
		2010	2011	2012	2013	2014	2015
	MT2	1.83	1.82	1.37	1.18	1.42	1.53
512	Alcohols, phenols and their derivatives	3.49	2.91	3.26	4.65	5.70	7.99
572	Polymers of styrene, in primary forms	3.16	4.50	4.89	4.09	4.34	5.53
554	Soap, cleansing and polishing preparations	2.24	4.38	4.52	4.27	5.12	4.87
533	Pigments, paints, varnishes and related materials	1.90	2.03	2.29	2.35	2.58	2.92
553	Perfumery, cosmetic or toilet preparations (excluding soaps)	4.16	3.34	3.24	3.27	3.17	2.72
882	Photographic and cinematographic supplies	1.13	1.69	1.16	1.41	1.55	2.39
513	Carboxylic acids and their derivatives	1.93	1.65	1.67	1.39	1.72	1.95
598	Miscellaneous chemical products	0.67	0.66	0.72	0.75	1.05	1.72
591	Insecticides, rodenticides, fungicides, herbicides, anti-sprouting products and plant-growth regulators	0.17	0.57	0.47	0.33	0.57	0.84
562	Fertilizers	0.46	0.33	0.16	0.18	0.18	0.71
671	Pig-iron, spiegeleisen, sponge iron, iron or steel granules and powders and ferro-alloys	0.01	0.03	0.18	0.08	0.55	0.62
582	Plates, sheets, film, foil and strip, of plastics	0.99	0.72	0.55	0.62	0.62	0.60
583	Monofilament of which any cross-sectional dimension of plastics	0.52	1.05	0.41	0.28	1.24	0.37
679	Tubes, pipes and hollow profiles	1.58	0.36	1.42	0.29	0.71	0.30
672	Ingots and other primary forms, of iron or steel; semi-finished products of iron or steel	4.49	8.56	2.10	0.00	0.00	0.25
791	Railway vehicles (including hovertrains) and associated equipment	0.13	0.04	0.30	0.35	0.20	0.05
786	Trailers and semi-trailers specially designed and equipped transport containers	1.16	0.42	0.66	0.29	0.13	0.02

The table shows that RCA for process industries has mixed performance, experienced fluctuate and moderate increase for the period of 2010-2015. Alcohols, phenols and their derivatives (SITC 512) and polymer of styrene (SITC 572) have shown the same pattern of improvement starting 2011 until 2015. Other products that also recorded high comparative advantages are soap, cleansing and polishing preparations (SITC 554), pigments, paints and

varnishes (SITC 533), perfumery and cosmetics (SITC 553), photographic and cinematographic supplies (SITC 882), carboxylic acids and their derivatives (SITC 513) as well as miscellaneous chemical products (SITC 598). The demand for these products were driven mainly by increased pressure among Vietnam-based suppliers to meet higher quality necessities and tighter product specifications by the country's rising electronics, petrochemical and processing industries.

Table 11: RCA for Other High-tech products (HT2) in Vietnam market

Commodity Code	Commodity	RCA					
		2010	2011	2012	2013	2014	2015
	HT2	0.44	0.41	0.31	0.76	2.26	1.30
871	Optical instruments and apparatus	0.17	0.06	0.91	7.83	38.56	23.61
525	Radioactive and associated materials	0.91	0.20	0.01	4.22	10.64	8.88
874	Measuring, checking, analysing and controlling instruments and apparatus	0.74	0.89	0.79	1.37	1.45	1.67
792	Aircraft and associated equipment; spacecraft (including satellites) and spacecraft launch vehicles; parts thereof	0.15	0.08	0.13	0.20	0.73	0.75
541	Medicinal and pharmaceutical products	0.16	0.22	0.28	0.30	0.34	0.32
881	Photographic apparatus and equipment	1.37	0.65	0.03	0.04	0.10	0.03
712	Steam turbines and other vapour turbines and parts thereof	0.01	0.00	0.00	0.00	0.01	0.00

RCA for other high-technology products indicates improving pattern from comparative disadvantage to comparative advantage for 2010 until 2015. There are 3 out of 7 products have high comparative advantages within the period. The three products are optical instruments and apparatus (SITC 871), radioactive and associated materials (SITC 525) as well as measuring, checking, analysing and controlling instruments (SITC 874).

Distribution and changes of Malaysia manufactures comparative advantage in the world market

In 2010, 30 out of 144 kinds of Malaysia's manufactured exports have comparative advantage ($RCA > 1$), accounting for 20.8% of total manufactured products. Apart from that, 15 kinds of low comparative advantage ($1 < RCA \leq 2$), 4 kinds of high comparative advantage ($2 < RCA \leq 3$) and 11 kinds of very high comparative advantage ($RCA > 3$). According to the table, most of the products that have comparative advantage in 2010 were dominated by LT products, followed by MT, HT, RB and PM products. It also shows that 48.4% of the products have low comparative advantage while 36.6% of the products have very high comparative advantage.

In 2015, the comparative advantage of Malaysia's exports change considerably. There are 43 out of 144 kinds of Malaysia's manufactured exports have comparative advantage ($RCA > 1$) which contributed 30% of total manufactured products. Compared with 2010, products with low comparative advantage ($1 < RCA \leq 2$) increased to 29 products while products with very high comparative advantage ($RCA > 3$) decreased to 8 products. Products with high comparative advantage ($2 < RCA \leq 3$) also increased to 6 in 2015 from 4 products in 2010. The table shows 14 products were from MT products and followed by LT, HT, PM and RB products. However, only 18.6% of the products have very high comparative advantage and 67.4% of the products have low comparative advantage.

Generally, the distribution of RCA indicates Malaysia competitiveness shifted from low technology products to medium technology products. Most of the Malaysia's manufactured products have low comparative advantage and products that have very high comparative advantage is lessening.

Table 12: Distribution of RCA for Malaysia's manufactures in the world market

Year	Category	RCA > 1	1 < RCA ≤ 2	2 < RCA ≤ 3	RCA > 3
2010	7 kinds of PM	2	-	-	2
	52 kinds of MT	8	3	3	2
	44 kinds of LT	11	10	-	1
	23 kinds of RB	3	1	-	2
	18 kinds of HT	6	1	1	4
	Total		30	15	4
2015	7 kinds of PM	6	3	-	3
	52 kinds of MT	14	11	1	2
	44 kinds of LT	11	8	2	1
	23 kinds of RB	4	2	1	1
	18 kinds of HT	8	5	2	1
	Total		43	29	6

Distribution and changes of Malaysia manufactures comparative advantage in Vietnam market

In 2010, among 144 kinds of Malaysia manufactured exports to the Vietnam, 44 have comparative advantage ($RRCA > 1$), which accounted 30.6% of total manufactured exports. These products comprise 24 products with low comparative advantage ($1 < RRCA \leq 2$), 15 products with very high comparative advantage ($RRCA > 3$) and 5 products for high comparative advantage ($2 < RRCA \leq 3$). LT and MT products were the major products at Vietnam market which contributed 38.6% and 30% to the high comparative advantage products.

The comparative advantage for Malaysia exports changed significantly in 2015. Products with high comparative advantage decreased by 15.8% to 38 products. These products comprise 20 of low comparative advantage ($1 < RRCA \leq 2$), 7 of high comparative advantage ($2 < RRCA \leq 3$) and 11 from very high comparative advantage ($RRCA > 3$). Malaysia manufactured products competitiveness in Vietnam market shifted from low technology products to medium technology products which indicates the same pattern with the world market.

Table 13: Distribution of RRCA for Malaysia's manufactures in Vietnam market

Year	Category	RRCA > 1	1 < RRCA ≤ 2	2 < RRCA ≤ 3	RRCA > 3
2010	7 kinds of PM	3	2	-	1
	18 kinds of HT	4	2	-	2
	23 kinds of RB	7	3	1	3
	44 kinds of LT	17	10	3	4
	52 kinds of MT	13	7	1	5
	Total	44	24	5	15
2015	7 kinds of PM	2	0	1	1
	18 kinds of HT	6	3	-	3
	23 kinds of RB	11	7	-	4
	44 kinds of LT	-	-	-	-
	52 kinds of MT	19	10	6	3
	Total	38	20	7	11

CONCLUSION

In summary, RCA results show that Malaysia have high comparative advantage in E&E products in the world. However, E&E exports performance ratio is shrinking over the years. The decreasing pattern shows that Malaysia's specialisation in this industry has slowly declined. Other product category that indicates high comparative advantage are agriculture-based products, and process industries products.

In term of distribution of RCA, Malaysia's products competitiveness has switch from low technology products to medium technology products. It shows that most of manufactured products have transition towards more high-value, diverse and complex products driven by process industry products especially chemicals and machinery.

On the other hand, there are three manufactured product category that are doing good in Vietnam market. These products are agriculture-based products, process industries products and other high-technology products such as optical equipment.

In term of distribution of RRCA for Malaysia's manufactures in Vietnam market, it shows that products competitiveness in Vietnam market shifted from low technology products to medium technology products which indicates the same pattern with the world market. However, it also indicates that Malaysia has lost its dominance in low technology products for Vietnam market in 2015. This situation was due to major changes in Vietnam economies. With an aim to become industrialized country by 2020, Vietnam's manufacturing industry has been undergoing major changes as a result of government initiatives, WTO commitments and industrial liberalization. Due to improving business climate, increased trade and investment cooperation, low labour cost and Vietnam is expected to emerge as a major manufacturing hub in the ASEAN region.

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