THE DETERMINANTS OF INTRA INDUSTRY TRADE IN MANUFACTURING INDUSTRY BETWEEN MALAYSIA AND ITS' TRADING PARTNERS; HONG KONG, JAPAN, KOREA, SINGAPORE AND UNITED STATES

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ABSTRACT

The Determinants of Intra Industry Trade in Manufacturing Industry between Malaysia and its' Trading Partners; Hong Kong, Japan, Korea, Singapore and United States

By

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This paper attempts to study the intra industry trade in manufacturing industry between Malaysia and its' trading partners; Hong Kong, Japan, Korea, Singapore and United States from 1990 to 2009. Our empirical results show that the large portion of manufacturing goods trade between Malaysia and its trading partners is two-way trade, also known as intra industry trade. The IIT index was calculated using Grubel-Lloyd Index and further being disentangled into horizontal-IIT and vertical IIT using ±25 percent threshold. The findings show that VIIT is greater compared to HIIT. As for estimation, we adopted pooled-OLS to find the relationship between aggregate IIT with average GDP, market difference, income difference, foreign direct investment, labor force and geographical distance. Calculation of aggregate of IIT is based on Michaely (1960). We find a positive relationship between market size and aggregate IIT as expected and is statistically significant.

Keywords: Hong Kong, Japan, Korea, Singapore, United States, intra-industry trade (IIT), SITC Rev.3, pooled-OLS

JEL classification: F14, F43, L11, L70
ABSTRAK

Penentu Perdagangan Intra Industri dalam Industri Perkilangan antara Malaysia dan Rakan Dagangan Utamanya iaitu Hong Kong, Jepun, Korea, Singapura dan Amerika Syarikat

Oleh

Sharifah Azrin-Azalea

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CHAPTER 1: INTRODUCTION

1.1 Introduction

Since 1957, Malaysia has endeavoured several development policies to transform its economy from highly depending on resource-based and low productivity primary industry to high value-added manufacturing industry. Import-substitution was Malaysia's initial development strategy, which emphasized on production of consumer goods, intermediate inputs, non-durable goods and others. However, due to small market size compounded with limited resources of domestic investment, this industrial strategy has little impact on economic development in Malaysia. Realizing the constraints, the government has shifted to export promotion strategy since late 1960. Under this policy measure, the government began to give emphasize on luring the inflow of foreign direct investment (FDI) to Malaysia, especially in lucrative sector such as machinery and transportation equipment (M&TE) and electrical and electronics (E&E) product.

A study by Lonik (2006) shows that export growth is a major source of economic growth in the case of Malaysia. The export-promoting strategy received attention due to the success of Japan and East Asian economies (Look East Policy) during the 1970s and 1980s. In addition, Sulaiman and Saad (2009) in their study prove that there is a positive relationship between export and economic growth in the long run and short run.

Malaysia is now positioning itself together with other major players of global trade activities. According to a joint study group report on Japan-Malaysia
Economic Partnership (2003), Japan and Malaysia have been engaging in strong bilateral trading and investment linkages for a long time. This happens when Tun Mahathir came out with the ‘Look East Policy’ of Malaysia and promoting direct investment of Japanese firms in Malaysia. In addition, Malaysia-Japan Economic Partnership Agreement (MJEPA) was commenced in 2005\(^1\). It consists of a free trade agreement (FTA) component and bilateral economic cooperation.

The agreement allows Malaysia to maintain and expand its Japanese market share for Malaysian exports through preferential tariff treatment and technical collaboration. This cooperation helps to promote the growth of new sectors such as high-tech industries, services, manufacturing and ICT and multimedia. MITI reported that Malaysia’s total trade with Japan showed an impressive growth from RM60.2 billion in 1994 to RM 136.9 billion in 2008. Thus, Japan is the third largest trading partner as at July 2010.

Apart from Japan, Republic of Korea is also one of the Malaysian largest trading partners. The Star Online (2010) stated that the Republic of Korea and Malaysia had established a diplomatic relations on 23\(^{rd}\) February 1960. The two countries have been cooperating especially in trade and investment since then. Institute of Strategic and International Studies Malaysia (ISIS) (2009) said that there is a remarkable increased in trade volume between Malaysia and Korea.

Malaysia deals with Korea through ASEAN-Korea Free Trade Area (AKFTA). Malaysia’s trade with Korea reported to show a positive result in the last

\(^1\) This information was gathered from Ministry of International Trade and Industry. Malaysia Web site, www.miti.gov.my
ten years. The total trade rises from RM16.3 billion in 1996 to RM47.2 billion in 2006\(^2\). This FTA helps to strengthen and extend current economic integration and assists in building capacity by sharing of available resources and expertise.

On the other hand, trade pattern study of Malaysia is found to be concentrated more on discussion in classical trade theory. With rapid accumulation of capital in FDI, we expect that the nature of export activity of Malaysia is no more confined to one-way or classical description of trade activity. This scenario is being highlighted in the new trade theory developed by economists such as Helpman and Krugman (1989).

In his study, Bergoeing and Kehoe (1999) stated that the traditional theories failed to explain some of the most significant facts about post World War II trade data. Thus, the new trade theory was designed to account for three major facts that are the ratio of trade to GDP has increased, trade has become more concentrated among industrialized countries and trade among industrialized countries is largely intra industry trade (IIT). Nonetheless, the study of new trade theory is not well-documented in Malaysia.

1.2 Background of Malaysian Economy

The Malaysian economy has traced a rapid transformation since Independence in 1957. Referring to Abdullah and Muhammad (2008), in the 1960s, Malaysia adopted an import-substitution strategy as to reduce dependency on primary sector.

At the time, the economy was heavily dependent on two primary commodities that were rubber and tin. Therefore, the economic trend shifted from primary sector to industrialization. The focus is on the production of consumer goods for the home market. The shift was to simultaneously diversify the economy and to create job opportunities for the rising numbers of population.

But in 1970s, the economic trend for the country had been diverted to export-promotion strategy. The changes were due to the saturated small domestic market, which somewhat limiting the economy-of-scale. This was then being promoted through the implementation of New Economic Policy (1970-1990). This was the period where manufacturing sector experienced the fastest growing sector and beat the agricultural sector. The electrical and electronic (E&E) products played an increasing dominant role. Based on Ariff (1998), this sector also said to play a key role in the modernization of the Malaysian economy. Many export processing zones in which the multinational corporations (MNCs) have played a significant role.

Therefore, the introduction of Industrial Master Plan 1 (IMP1) in 1986 as said to accelerate the growth of manufacturing sector in ensuring a continued rapid expansion of the economy and to provide a basic for realizing the New Economic Policy (NEP). IMP1 also focused in promoting the opportunities for the maximum and efficient utilization of the nation's abundantly endowed natural resource. It also wanted to build up the foundation towards an advanced industrial country. In other words, Malaysia tries to liberalize the manufacturing sector by encouraging more FDI.
Then, in 1996, Tun Mahathir launched the Industrial Master Plan 2 (IMP2) that focused on global competition. The plan envisioned building a manufacturing plus plus economy to help push Malaysian economy. It was emphasizing in shifting Malaysia current orientation from being purely export-driven to one based on global orientation, cluster development, development and management of human resource, technology acquisition, physical infrastructure and non-fiscal incentives. Therefore, the plan was to increased participation of Malaysian-owned companies in a broad range of manufacturing activities.

Apparently, major export destinations for Malaysia are the major import sources as well. From Table 1-1 Malaysia’s Major Export Destinations, we can see how these countries closely related to Malaysia. Besides, the major product trading is on electrical and electronic goods (E&E). Therefore, we are able to grasp the existence of IIT. Tang, Liao et al. (2009) define IIT as the two-way trade of goods falling under the same industry classification.

![Figure 1-1 Exports by Major Products](image-url)
In other words, it is an international trade within industries instead of between industries. Because it stimulates innovation and promotes economies of scale, it has found to be more beneficial compared to inter-industry trade. In addition, IIT is more convenient because factors of production switch only within industries rather than from one industry to another.

According Yusoff (2005), the direction of Malaysia’s trade follows closely with the sources of foreign direct investments in the country, especially in the manufacturing sector. These foreign firms are investing in Malaysia’s manufacturing sector and subsequently these firms exported back either to its own country or other nations. United States, Japan, Singapore, Taiwan, South Korea and Hong Kong are amongst the investors in Malaysia.
Table 1-1 Malaysia’s Major Export Destinations

<table>
<thead>
<tr>
<th>Export Destination</th>
<th>Value (RM billion)</th>
<th>Share (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Singapore</td>
<td>48,635</td>
<td>13.1</td>
</tr>
<tr>
<td>United States of America</td>
<td>36,012</td>
<td>9.7</td>
</tr>
<tr>
<td>Japan</td>
<td>37,126</td>
<td>10</td>
</tr>
<tr>
<td>Korea</td>
<td>14,479</td>
<td>3.9</td>
</tr>
<tr>
<td>India</td>
<td>11,880</td>
<td>3.2</td>
</tr>
<tr>
<td>Taiwan</td>
<td>11,509</td>
<td>3.1</td>
</tr>
</tbody>
</table>

Source: The Malaysian Economy in Brief 2010, Department of Statistics, Malaysia

Table 1-2 Malaysia’s Major Import Sources

<table>
<thead>
<tr>
<th>Import Sources</th>
<th>Value (RM billion)</th>
<th>Share (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>38,642</td>
<td>12.8</td>
</tr>
<tr>
<td>Japan</td>
<td>38,038</td>
<td>12.6</td>
</tr>
<tr>
<td>Singapore</td>
<td>34,717</td>
<td>11.5</td>
</tr>
<tr>
<td>United States of America</td>
<td>32,302</td>
<td>10.7</td>
</tr>
<tr>
<td>Taiwan</td>
<td>13,585</td>
<td>4.5</td>
</tr>
<tr>
<td>Korea</td>
<td>16,604</td>
<td>5.5</td>
</tr>
</tbody>
</table>

Source: The Malaysian Economy in Brief 2010, Department of Statistics, Malaysia

1.3 Problem Statement

There is a gap in understanding trade activities in Malaysia in this century. Previous study on trade pattern in Malaysia emphasized mostly on classical trade theory. Not much study on new trade theory being documented. Despite the trade development in Malaysia, it is to believe that the trade pattern is no longer to be one-way or classical description of trade activities. The new trade theory or in modern trade theory is designed to explain the failure of more traditional theories to explain trade activities. Therefore, this study is filling the gap in understanding the modern description of trade activity in Malaysia.
Brulhart (2008) stated that the global IIT accounted in 1962 to 2006 was 44 percent (3-digit) level of statistical aggregation. This shows that there is a steady growth in global IIT since the early 1960s. The figure implies a process of worldwide structural convergence where economies are becoming more similar over time in terms of their sectoral compositions. In a study carried by Devadason and Chai (2009) on changing patterns of trade in Malaysia finds that the patterns of trade began to change in the nineties. Moreover, in 1993, half of Malaysian trade in manufactures with its trading partners fall under IIT type.

Historically, Balassa (1986) and Grubel and Lloyd (1971) were among the earliest to identify the significance of two-way trade particularly between developed countries. However, theory of comparative advantage by David Ricardo had long highlighted the idea on countries should completely specialize in goods which they have a comparative cost advantage. Yet, the existence of IIT appears to be incompatible with the models of comparative advantage (Carbaugh, 2008, p.81). Moreover, Carbaugh (2008, p.81) also noted that the Ricardian and Heckscher-Ohlin models stated that a country would not simultaneously export and import the same product.

In relation to that, Menon, Greenaway et al. (1999) stated that the work on the determinants of IIT only being discovered in 1980s. The study was on the determinants of IIT in the context of Australia-United Kingdom trade. Tang, Liao et al. (2009) also had undergone empirical study on the determinants of IIT in Chinese manufacturing by considering the country’s and industry’s characteristics synchronously. This is important especially for emerging economies to understand
what determines trade between countries as to utilize and maximize the factors and resources available.

According to Economic Report 2009/2010 published by Ministry of Finance Malaysia, manufacturing sector accounted against GDP is 13.0 percent (RM133,445 million). The figure dropped from 13.8 percent in 2008/2009 (RM161,368 million). Arip et al. (2010) later suggest that for Malaysia to stabilize its export earnings, it needs to diversify its export commodities in the long run. In other words, Malaysia should not focus on the same production of commodity. This is because Product Life Cycle (PLC) theory suggests that country should be more dynamic, in other words, diversify as to maintain its competitive index.

So far, we are unable to clearly see where Malaysia competitiveness is particularly in competing with other countries, i.e. under vertically-differentiated product, Malaysia imports product from Singapore because Singapore is producing a high quality product and on the other hand, Malaysia exports to Singapore because of its production of low quality product. Therefore, in this study, we are going to trace the patterns of IIT; horizontally- and vertically-differentiated.

Overall, Malaysia is still far behind when it comes to documentation in relation to IIT. Therefore, Malaysia is still lacking in understanding of patterns and determinants of IIT. So, this paper analyzes the determinants of IIT between Malaysia with five trading partners namely United States (US), Japan, Korea, Hong Kong and Singapore. These countries provide an opportunity to improve our understandings the determinants of IIT in Malaysia particularly in manufacturing industry.
1.4 Objectives of the study

1.4.1 General Objective

The main objective of this study is to examine the determinant of IIT in manufacturing industry between Malaysia and United States (US), Japan, Korea, Hong Kong and Singapore.

1.4.2 Specific Objectives

There are three specific objectives in studying the determinant of IIT in manufacturing industry between Malaysia and United States (US), Japan, Korea, Hong Kong and Singapore. Those objectives are;

• To study the trend of IIT between Malaysia and United States (US), Japan, Korea, Hong Kong and Singapore in manufacturing sector.
• To categorize the horizontal and vertical IIT towards manufacturing sector between Malaysia and United States (US), Japan, Korea, Hong Kong and Singapore.
• To identify whether market size, foreign direct investment (FDI), human capital and geographical distance influence the determinants of IIT between Malaysia and United States (US), Japan, Korea, Hong Kong and Singapore.

1.4.3 Rational of the Study

Over the years, we are able to see an impressive business environment particularly for Malaysian trade activities. Total exports and total imports are found to be increasing over the years; although Malaysia was significantly distressed by the world crisis in 2008-2009. IIT involves flows of goods with similar factor
endowments. In this case, manufactured goods (i.e. electrical and electronics goods), which Malaysia exports and also imports from other nations.

Therefore, this paper is essential as it studies the trading activities between developing country like Malaysia and its’ trading nations namely Malaysia and United States (US), Japan, Korea, Hong Kong and Singapore in a view of modern theory. These countries provide an opportunity to improve our understandings of IIT. This is because there is still lacking of studies on IIT in Malaysia and the documentation of IIT as well.

Apart from that, this study also gives insights to Malaysia and its’ trading partners, especially relating to international trade and factors attaching to it such as reasons for the concentration of manufacturing production or the localization of production. Thus, these countries will know factors that influence trade relationship, hence attract more in the future with more prospective countries.

1.4.4 Scope of the Study

This research emphasizes on examining the IIT between Malaysia with China, Japan, United States and Singapore. Therefore, the population for this study is Malaysia, United States (US), Japan, Korea, Hong Kong and Singapore. As for this research, focuses on commodity in manufacturing industry as it is one of the important industries in Malaysia.
CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This section elaborates the development of intra industry trade (IIT) over the years. Back then, IIT was assumed to occur between developed industrialized economies with similar factor endowments and capital-labour ratios. On the other hand, developing countries typically engage in inter-industry trade by exporting labour-intensive resource based products in exchange for final manufactured goods. This trend however is not applicable in today’s world, where developed and developing nations are heavily engaged in intra industry trade due to various reasons. There will be either involvement in horizontal or vertical IIT. There are various factors are caused to these connection. Each country is found to have its own reasons why they prefer intra industry trade rather that inter-industry trade.

2.2 The Traditional Trade Theory

2.2.1 Comparative Advantage Theory

The theory of comparative advantage was developed by David Ricardo in the early 19th century. The Ricardian model of trade is designed to promote the benefits of free trade where it shows the mutual gains from trade and specialization. It happens although one of the countries is more efficient in the production of both goods (Mankiw, 2007, p.55). For an instance, whether one country has higher wages or lower productivity, the competitive wage rates that prevail in a country ensure that every country will specialize in the good in which it has a comparative advantage.
Ricardo (1821) stressed the key element of the theory, where goods are more mobile across international boundaries than the resources (land, labour, and capital). According to Ruffin (1999), this assumption represents the theory of intra-industry trade. The theory of comparative advantage gives an introduction to a methodology which is applied in the expansion of many other trade theories known today. Despite that, the Ricardian trade model was unable to explain how trade impacts the income distribution within a country or what determines comparative advantage (Ruffin, 1999). Therefore, Heckscher-Ohlin trade theory came into picture.

2.2.2 Heckscher and Ohlin Theory

According to Hill (2008), factor endowments theory was developed in the 1920s by Swedish economies Eli Heckscher and Bertil Ohlin. Both gave different explanation of comparative advantage where they argue that comparative advantage occurs from differences in national factor endowments such as land, labour and capital. In other words, different nations possess different factor endowments.

This theory assumes that countries will export goods that make intensive use of factors which are locally rich and import goods that make intensive use of factors that are locally insufficient. Moreover, this theory describes a world in which every country faces the same technological frontiers and has productive factors with the same qualities (Ruffin, 1999). The only difference between countries is in terms of the availability of factors of production. Hence, the Heckscher-Ohlin theory attempts to explain the pattern if international trade that is happening in the world economy.
2.2.3 The New Trade Theory

In 1970s, the new trade theory was introduced when a number of economists (e.g. Krugman (1979)) found out that the ability of firms to attain economies of scale have some important implications for international trade (Hill, 2008). This theory highlighted two points: First, through trade a nation can increase product variety and decrease average costs of those products due to economies of scale. Second, the world trade in certain products may be dominated by countries whose firms were first movers in their production because global market may only be able to support a small number of enterprises (Hill, 2008).

Basically, the important implication of this theory is that it suggests that nations may benefit from trade even when their resource endowments or technology are not different. This theory also explains that through trade, it allows a nation to specialize in the production of certain products, achieving economies of scale and reducing production costs. At the same time, a country will buy products that it does not produced from another country who is specializing in the production of the products.

Overall, consumers are enjoying the advantage of international trade because their choices are diversified in both nations. The producers also better off because of the economies of scale because the average costs of producing the products being reduced. Besides, Hill (2008) also noted that this theory suggests that trade increases the specialization of production within an industry (IIT), raises the product variety available to consumers and at the same time reduction in average prices.
2.3 Intra Industry Trade (IIT) Defined

According to Castillo (2003), Balassa (1986) was the pioneer for the concepts of inter- and intra industry trade. The concepts were founded while concerning on international trade problems after World War II. These concepts have been evolved since then. Marrewijk (2003) stated in ‘Intra industry trade’ that the phenomenon of IIT first received attention in 1960s. The study was carried out by Verdoorn (1960) and Balassa (1986) on the increased trade flows among European countries.

According to Carbaugh (2008, p.81) IIT is a two-way trade in similar commodity. It happens when a country simultaneously imports and exports similar types of goods and services. For instance, this study focus on manufacturing sector because statistics by Ministry of International Trade and Industry (MITI) shows that Malaysia is heavily exporting and importing electrical and electronic goods to its’ major trading partners over the years.

It differs from inter-industry trade because it is not directly based on comparative advantage. Inter-industry trade is based on inter-industry specialization where each nation specializes in a particular industry with a comparative advantage. Here, the resources are said to be moving geographically to the industry with lowest comparative costs (Carbaugh, 2008, p.81). The new trade theory suggests that economies of scale and monopolistic competition supports intra industry trade because of additional incentives for specialization. Thus, it leads to increase in productivity while reducing production costs.

There are two types of IIT namely; horizontal IIT and vertical IIT. According to Chang (2009), horizontal IIT (HIIT) refers to trade in similar products but with
different characteristics or attributes. Meanwhile, vertical IIT (VIIT) is when trade happens in similar products of different qualities and intra-firm, fragmentation.

Chang (2009), Menon, Greenaway et al. (1999) and Al-Malawi (2005) suggest the importance and techniques to decompose IIT to HIIT and VIIT. This is significant because the determinants for each type differs accordingly. By decomposing them, we will get better understanding on the intra industry phenomenon.

2.4 Literature on Measurement of Intra Industry Trade

2.4.1 Grubel-Lloyd (G-L) Index

Although Verdoorn (1960) and Balassa (1966) were among the earliest to measure the intra industry trade since its’ first received introduction, Grubel and Lloyd (1971) index of intra industry trade somewhat produced the most prominent work in this field. Both had provided the definitive empirical study on the importance of IIT and its’ measurement based on Marrewijk (2003). The Grubel-Lloyd index varies between zero (which indicates pure inter-industry trade) and one (which indicates pure IIT). This index is very easy to compute because it only need the value of exports and imports of each country which classified by industry.

2.4.2 Aquino Index

Grubel-Lloyd index shortcoming, i.e. downward biased measure of intra-industry trade due to imbalance in total trade leads to Aquino Index. It was established in 1978. The objective was to solve the problem when applying Grubel-Lloyd index. He suggested replacing the absolute values of imports and exports in the formulation with the exports and imports in each industry as a fraction of total exports and