A GRAVITY MODEL BETWEEN MALAYSIA AND SELECTED EUROPEAN COUNTRIES

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A GRAVITY MODEL BETWEEN MALAYSIA AND SELECTED EUROPEAN COUNTRIES

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ABSTRACT

This study applied the Gravity Model to estimate the factors influence the trade and assess the trade potential between Malaysia and selected major trading partners of the EU countries. The model was estimated with a sample of five selected EU countries: Germany, United Kingdom, Netherlands, Belgium and France. A panel data analysis was used to disentangle the time invariant country-specific effect, and to capture the relationship between the relevant variables across time. The findings showed that the random effect was preferred over the fixed effect specification in the Gravity Model. Additionally, the variables, namely the gross domestic product, gross domestic products per capita, distance, and exchange rate were found to be the significant determinants in the bilateral trade flows. The trade potential is also found yet to be explored fully. Based on these findings, various policy implications and recommendations are suggested.

Keywords: Gravity Model, Bilateral trade, GDP, Exchange rate and Panel data.

ABSTRAK

Kajian ini mengguna pakai Model Graviti untuk menganggarkan faktor mempengaruhi perdagangan dan menilai potensi perdagangan antara Malaysia dan rakan dagangan utama terpilih di negara-negara EU. Model ini dianggarkan dengan menggunakan sampel lima negara EU yang dipilih: Jerman, United Kingdom, Belanda, Belgium dan Perancis. Satu analisis data panel digunakan untuk menghuraikan kesan berubah khusus ke atas negara ketika itu, dan untuk menangkap hubungan antara pemboleh ubah yang berkaitan di seluruh masa. Dapatan kajian menunjukkan bahawa kesan rawak dipilih berbanding spesifikasi kesan yang tetap dalam Model Graviti. Selain itu, pembolehubah, iaitu keluaran dalam negara kasar, produk negara kasar per kapita, jarak, dan kadar pertukaran didapati penentu penting dalam aliran perdagangan dua hala. Potensi perdagangan juga didapati belum diterokai sepenuhnya. Berdasarkan penemuan ini, pelbagai implikasi dan cadangan dasar dicadangkan.

Kata kunci: Model gravity, Hubungan dua hala, KDNK, kadar tukaran dan panel data.

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NURUL HUMAIRA'AISHAH BT MOHD ALI
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ECSC	European Coal and Steel Community
EU	European Union
EUD	Euro Dollar
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GDPi	Gross Domestic Product per Capita
GNP	Gross Nation Product
J.E.C	Malaysia-Germany Joint Committee
MDBC	Malaysia Dutch Business Council
MFCCI	Malaysia French Chamber of Commerce and Industry
MGSC	Malaysia-German Chamber of Commerce and Industry
RM	Ringgit Malaysia
UBIFRANCE	France Trade Commission in Malaysia
UKTI	United Kingdom and Investment
UNCTAD	United Nation Conference on Trade and Development
US	United States

CHAPTER ONE

INTRODUCTION

1.0 Introduction

The European Union (EU) has been one of Malaysia's main trading partner besides the United States and the Republic of China. Malaysia's ranking of trading partner placed the EU in the third rank. Prior to the independence of Malaysia, the relationship between Malaysia and these countries was informal and unofficial. The EU colonial power came to Malaysia (then The Federation of Malaya) via the Portuguese, Dutch and the British since the colonial era in the 15^{th} century.

Malaysia and the EU had forged an official trade relation since 1980. This formal relationship was set off by the 1980 European Commission-Asian Agreement, which was signed by Malaysia and the EU. Despite the important role of the EU in Malaysian economy, there were limited working papers and journals analyzing the trade between Malaysia and the EU countries. Thus, an in-depth study of the bilateral trade between the EU-Malaysia is deemed interesting and vital.

This paper applied the Gravity Model to study the bilateral trade between Malaysia and the selected EU countries. The EU countries were selected based on the top 30 trading partners of Malaysia. As stated earlier the EU is Malaysia's third largest trading partner internationally. The EU has 28 single markets that represent 28 member countries.

1.1 Malaysia Economic Growth

Malaysia economic growth was influenced by internal and external factors. Any disturbance that happened within the country is deemed an internal factor. This includes the inflation, unemployment, government spending, annual budget and changes in policy; either fiscal policy or monetary policy variable. Any changes in these factors, will affect the domestic economic growth directly. Stability in monetary and fiscal policies is needed to ensure economic growth.

Analysis was done on existing data over the period of 1980 until 2013. The review of the 33 years data showed that Malaysian economic growth fluctuated constantly. Instability was part and parcel of the economy. When economic activities slowed down, it affected the economic growth. The Malaysia's economy will then experience negative growth rates due to low economic activities. This may cause some sectors within the economy to collapse due to the influenced of external economic factors or conditions.

In 1985, the economic collapse caused a decline in the commodity prices and affected the political stability in Malaysia. However, the situation was recovered by the implementation of the Malaysia Five year Plan, aimed to redevelop four sectors of the economy. It was a long term plan to rebuild the country's economy. The implementation of these policies did experience some lagging effect. The effectiveness of the steps taken in the 5- year plan can only be seen in 1988, when Malaysia experienced a 9.9% economic growth (MP-4: 1981-1985).

According to a study by Har *et al* (2000), the Asian financial crisis in 1997 happened due to a series of foreign disturbances. It was also affecting Malaysia's regional neighbors such as Thailand and Indonesia. The currency crisis occurred when the economy was attacked by the currency speculators of Ringgit, Baht and Rupiah. Due to this event, the value of the currency depreciated. Malaysia was also badly affected by the crisis. It was the worst crisis in the history of Malaysia economic growth with foreign linkages.

The crisis was resolved by pegging the Ringgit Malaysia (RM) to the US Dollar at RM3.80 per 1USD. This measure was necessary in order to stabilize the value of RM. During that particular time the government employed fixed exchange rate and the policy turned out successful. In the mid-1998, capital funds and property fund reversed points to revive the entire Malaysian economy.

In 2001, the financial crisis caused great instability in the economies among Malaysia's trading partners, and affected Malaysia's exports adversely. Hence, the sectors involved in export activity have to reduce production of goods and services. The government of Malaysia then launched two economic stimulus packages to reverse the economic cycle and lowered the interest rate to safeguard the growth of the Malaysian economy.

The economy was hit by another global financial crisis in 2008. The first stimulus package of RM7 billion was included in the 2009 budget. The second stimulus package was made on March 10, 2009 of RM60 billion presented by Deputy Prime Minister Datuk Seri Mohd Najib Tun Razak. An additional budget was offset the declining foreign economy (Economic Report 2009/10). The impact of the crisis was obvious in 2009.

Economic growth fell into a negative figure of -1.7%. Economic instability has happened before, in 2007 and 2008. The crisis was caused by the U.S. real estate crisis that affected both the share market and the commodity market, leading to a significant increase in the commodity prices. The U.S as a major economic player and a developed country, will affect small and developing countries like Malaysia. The banking sector was badly affected by this crisis due to lack of liquidity in loans and the highly inflationary food prices, as the US investors shift their funds from the regular New York Stock Exchange to the Chicago Board of Trade, trading in commodity futures. This event affected Malaysian prices and economic activities.

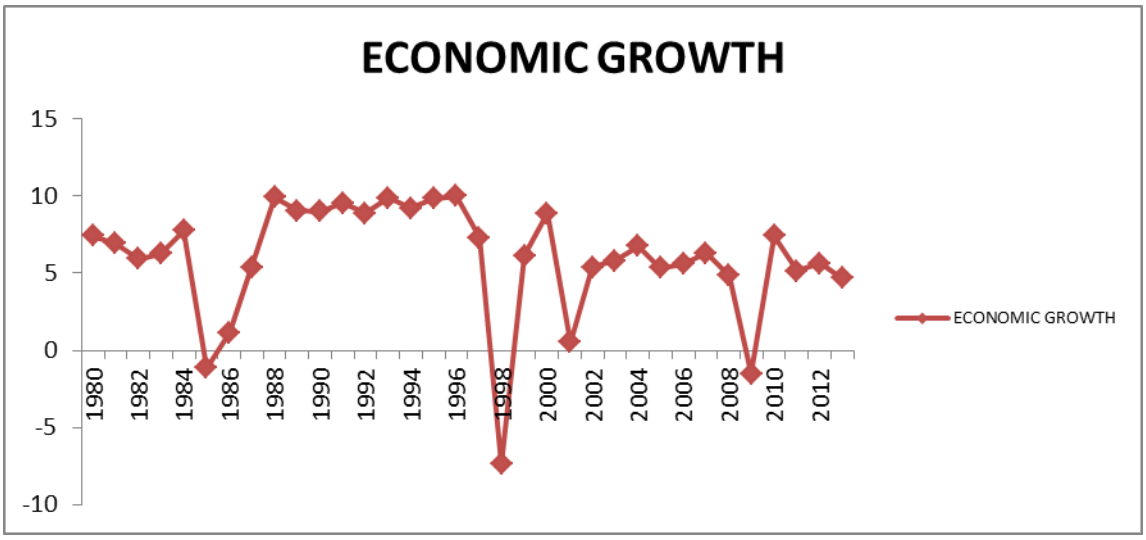

Figure 1.1 Trends *in Malaysia economic growth in 1980-2013*
Sources: Various Economic Reports by Ministry of Finance, Malaysia (1980-2013)

1.2 Malaysia Foreign Trade Overview

Malaysia as a part of ASEAN is categorized as developing open industrial country. Malaysia hopes to be a fully developed country by the year 2020. Generally, open economics involve measurement of trade activities, calculation of the openness, and the import plus export divided by the GDP; if the ratio is relatively high, the trading activity is very good. For Malaysia, the index of openness is 2.2 while the US scores less than 0.3. In terms of openness Malaysia ranks third place after Singapore and Japan.

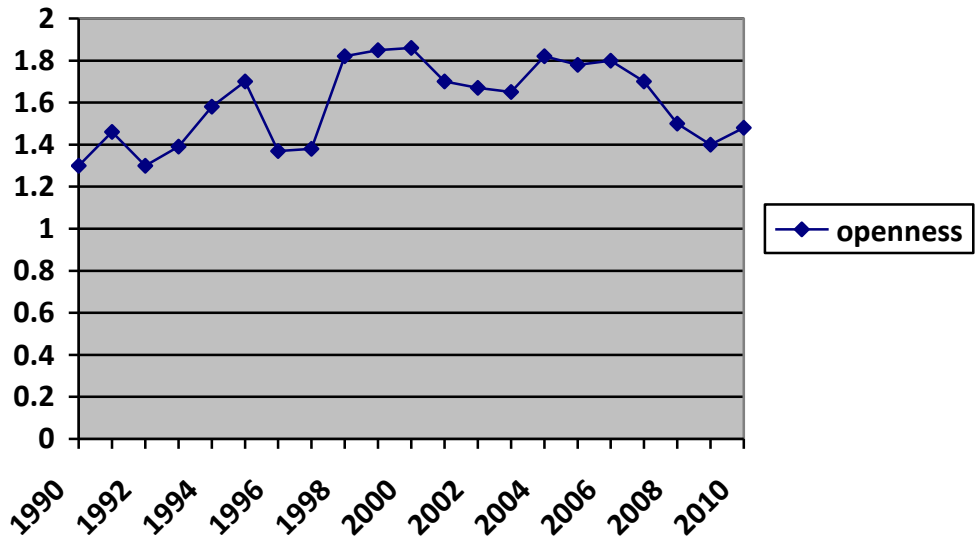

Figure 1.2: Trade *openness of Malaysian economy (1990-2010).*
Sources: Asia regional integration center based on direction of trade statistics and World Economic Outlook, International Monetary Fund.

The trade openness of Malaysia fluctuates over time, stochastic trend. But the trend is not below 1 and almost 2. Currently, the openness of Malaysia continues growing to almost at point 3.

Balance of payment, government budget deficits, trade policy and domestic political instability are the contributing factors to normal fluctuations in an open economy. In foreign trade, the trade policy will play an important role to protect domestic products and trade. While discussing foreign trading, it is vital to know all the government policies that have been used before.

The ranking of export, import, destination and origin of the Malaysian trades is:

I. Top 5 products exported from Malaysia: refined petroleum (10%), Petroleum gas (8.4%), palm oil (6.7%), integrated circuits (5.6%), and computers (5.1%).
II. Top 5 products imported from Malaysia: integrated circuits (9.7%), refined petroleum (9.0%), crude petroleum (4.4%), office machine parts (2.0%), and planes, helicopter and spacecraft (1.9%).
III. Top 5 export destination of Malaysia: Singapore (13%), Japan (12%), China (12%), United States (7.3%), and Thailand (5.1%).
IV. Top 5 import origins of Malaysia: China (16%), Singapore (14%), Japan (9.3%), Indonesia (6.1%), and Thailand (5.9%).

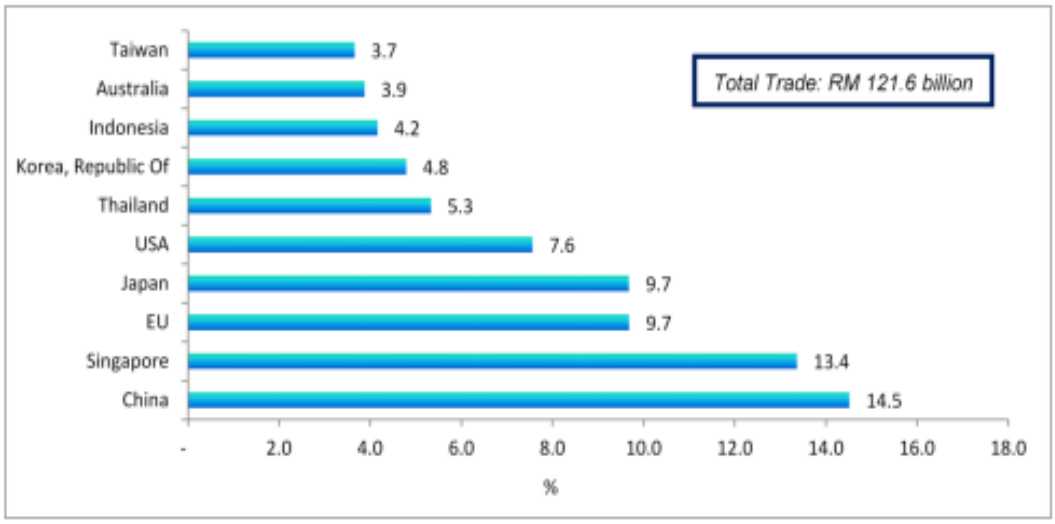

Figure 1.3 *Malaysia top trading partners, 2014*
Sources: Department of Statistics, Malaysia (2014)

Currently, the EU is in the third ranking of Malaysia top trading partner. The main trade between both countries are food and live animals, crude materials, mineral fuels, animals and vegetable oil, chemical products, manufactured goods, machinery and transport equipment, miscellaneous manufactured, and commodities and transportation. The machinery and transportation dominated the trade between Malaysia and the EU.

Malaysia's dominant trade is the industrial product, where the main exports are machinery and appliances; and the main imports is electrical equipment. According to EU-Malaysia Chamber of Commerce and Industry Overview of EU-Malaysia Trade, the export and import between both countries in industrial product accounted for more than 90% of the trade.

1.3 Background of International Economies

This section provides in-depth insight into the history of the Malaysian international economy. It is vital to note that few of the developments that occurred during the early period were a result of deliberate policies of the colonial era. The colonial power was only interested in the country's natural resources. Consequently, their action had brought drastic changes in the Malaysian economy. Meanwhile, major economic developments have been a result of international relationship and developments between Malaysia and other countries that "inadvertently" led to domestic changes.

The articles on Malaysia economic change history, illustrated the impact of international trade on Malaysia. The analysis started in 1800-1920 when the natural resources, then were tin and rubber. The boost leads to increase in the rubber and tin production. As a result, economic progress was affected. Prior to the colonial era, subsistence was applied broadly. Most of the Malay states were well endowed with natural resources and the appropriate conditions for rubber plantation. It was well positioned to seize the benefit from this surge in demand.

The boom in the production of the resource based mostly in tin and rubber along with the policies implemented by the British, has significant implications on Malaysia's social structure and became the foundation of the pluralistic society that exist today. The number of immigrants of Chinese and Indian continues to increase. This was because economic activities of the indigenous, while the Malay focused mainly on a subsistence economy.

A series of colonization took place. First the colonialist came from Portuguese, followed by the Dutch and later the English, staking claims on the richness of Malaysia (then the Federation of Malaya). During the initial British rule, many immigrants were brought over to work in Malaysia's tin industry and plantations. Malaysia gained its independence in August 1957. The journey to independence was not easy. The colonial masters were only interested in commodities such as tin, rubber and palm oil.

Political independence came in 1957 along with it was the freedom to explore new avenues of economic growth. In tracing the historical evolution of the Malaysian economy since Independence in 1957, it was noted that over the past five decades, the Malaysian economy has undergone profound structural changes.

Malaysia is strategically situated, its midway along the streets that linked China to India and the near East; Malacca, the center of the economy was perfectly located at a center for maritime trade. The Malacca city grew rapidly due to its strategic location, and within the next fifty year it had become a wealthy and powerful hub of international commerce. By the first decade of the sixteenth century Malacca was a bustling, cosmopolitan port and was able to attract hundreds of ships each year. The city was known worldwide as a center for trade, mainly from China and India.

In the early 1970s, the manufacturing sector began to assume an increasingly important role in the expansion of the Malaysian economy. Within the sector, the shift from labor-intensive export oriented industries to capital intensive took place in the 1980s, in line with national objectives. The 1990s witnessed an economy sustained through productivity and industrial upgrading to higher value-added industries with a focus on

information technology. At the same time, government policies were thrust to the development of a vibrant small and medium-scale (SME) industrial sector as the backbone of the country's economy.

The government plays an active role in the development planning to promote balanced economic growth and social progress. Malaysia is essentially a trade-oriented and open economy with exports and imports of goods and services accounting on average for over 176% of the national product (GNP) in the early years.

Historical facts have proven that Malaysia was an export oriented country endowed with natural resources, ever since the colonial was in power. Based on previous studies the importance of international trade was as follows:

I. The buying and selling of goods and services across national borders.
II. International trade today was rooted as the lower production costs of "developing" nations.
III. Even though many consumers prefer to buy less expensive goods, some international trade was fostered by a specialized industry that has developed due to national talent or tradition.
IV. One of the biggest components of international trade, in terms of volume and value of goods was oil.

Although Malaysia is a net exporter of oil, the significant and rapid hike in oil prices process has increased the government burden on oil subsidies to the domestic consumers.

Malaysia remained an important trading partner for the US. Malaysia was the US 10th largest trading partner and its 16th largest export market.

From the early 1980s through the mid-1990s, the economy experienced a period of broad diversification and sustained rapid growth with a growth ratio averaged at 8% annually. New foreign and domestic investment played significant roles in the transformation of Malaysia's economy.

Malaysia has successfully developed from a commodity-based economy to one focused on manufacturing. Today the government of Malaysia will seek to make the leap to a knowledge-based economy. Upon independence, Malaysia inherited an economy dominated by two commodities; rubber and tin. Malaysia is one of the world's largest exporters of semiconductor devices, electrical goods and appliances. The government has ambitious plans to make Malaysia a leading producer and developer of high-tech products, including computer software. Malaysia is a major destination for outsourcing by firms after China and India.

1.4 Trade with EU Countries

The European Union (EU) is a political and economic union comprises of 28 member states. The EU was established under the Maastrict Treaty in 1993 and has evolved from the European Coal and Steel Community (ECSC), and the European Economic Community (EEC) formed by six countries in 1957.

The member states of the EU are, Austria, Belgium, Bulgaria, Cyprus, Croatia, The Czech Republic, Denmark, Estonia, Finland, France, Germany. Greece, Hungary, Italy,

Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Republic of Ireland, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.

The EU is the largest economy in the world with 504 million consumers. With 7% of the world's population, the EU's trade with the rest of the world accounts for around 20% of global exports and imports. The EU is the world's biggest exporter and the second-biggest importer. Two thirds of EU countries' total trade was done with other EU countries.

All 28 member countries in the EU form a single market across the whole. The founders of the EU shared a coherent economic policy view with the treaty of Rome calling for a "single internal market with no obstacles to trade and strong competition, as well as for multilateral liberalization". Globally, Malaysia is EU 23rd largest trading partner and the second largest partner of the EU after Singapore in the ASEAN region.

Besides export and import of goods, the EU has considerably a high amount of share in Malaysia's Foreign Direct Investment (FDI). The EU becomes the second largest source of the FDI in 2014 after Japan. The manufactured industry, mainly attract the FDI from the EU. The inflows of FDI amount to almost half of the total inflows of FDI in Malaysia. United Nations Conference on Trade Development (UNCTAD) reported that Malaysia was in the top 20 countries that have highest inward FDI rates of return. Malaysia was on the 11th ranking with 17% of FDI return as reported in the Investment Report 2013. Due to the high return in FDI, this fact has turned Malaysia into a popular country for foreign investors.

Major export from Malaysia to the EU are electrical and electronic products, palm oil, chemicals and chemical product, rubber products, especially optical and scientific equipment while major export from EU to Malaysia are electrical and electronics products with some other machinery, appliances and parts, chemicals and chemical products, transport equipment as well as iron and steel products.

Zahidi and Nurhisham (2012) determined in their working paper that, a 1% change in European growth resulted in a 3.5% change in Malaysian export to Europe and inversely, imports from Europe to Malaysia respond to increases in Malaysia growth, rising 0.68% for every 1% increase in Malaysian growth. When the income of citizen increases, people tend to choose import products rather than local products. In other words, the taste of people will change due to increase in income, or what is called Utility Concept.

Malaysia exported two types of goods; intermediate and final goods, and both exported to the EU. The main products exported to the EU are E&E manufactures, particularly semiconductor, and computer and parts (Annual Report, 2011). However, Malaysia also exported other product such as commodity, resource-based product and others.

1.4.1 Trade with Germany

Alexander Stedtfeld (2012) stated in the Malaysian insider news that the bilateral trade between Germany and Malaysia was expected to grow annually at an average of 8-12% for the next few years. Alexander Stedtfeld is the Executive Director of Malaysia-

German Chamber of Commerce and Industry (MGCC). He also said that Malaysia will continue to register a trade surplus with sound export numbers while Germany will try to increase its export.

Trade with Germany and other European countries was nonetheless risky due to the Eurozone crisis. However, Alexander Stedtfeld stated that even though Germany is part of the Eurozone, but the economically German country is very different from other Eurozone countries because it has a very strong trade. Even though the uncertainty in Europe is high, the economies continue to grow in both countries.

Additionally, although the EU is in the sovereign debt crisis, MGSCC foresee that the bilateral trade will flourish. The continuous growth in trade expedites Germany's recovery from the Eurozone crisis. Germany has a niche in export machinery, motor vehicles and aircraft, hardware and pharmaceutical products. The export product from Germany is the import volume to Malaysia.

Germany interest to invest in Malaysia is due the availability of facilities in the Malaysian infrastructure, impressive government policies and the untapped skilled workforce to be explored. German companies are very conservative in term of investment. They will not simply invest, as they have certain strict criteria, and Malaysia fulfilled all the requirements, besides political and economic stability. MGCC was also continuously engaging with Malaysian companies; more than 30 business meetings were arranged by the chamber annually. This chamber is the backbone to Malaysia and Germany relations, and the bilateral trade between these two countries increased and they continue to opportunity to do more trade.

Germany is one of Malaysia's most important economic partners and it builds further upon it. The relations between Malaysia and Germany have a long history of engagement. The first Agreement was signed in 1960, namely the Investment Guarantee Agreement as they embarked on a strong economic partnership.

In order to strengthen their partnership, Malaysia-Germany Joint Committee (J.E.C) was established. The main objectives are to create more networking opportunities. J.E.C has also set up a forum for discussing issues and challenges faced by both sides. The MGSCC and J.E.C certainly become an important mechanism for intensifying economic relations between Malaysia and Germany, if both agreements are used effectively. The business relations focused on the private sector as the one sector that ultimately translates all government initiatives into business realities.

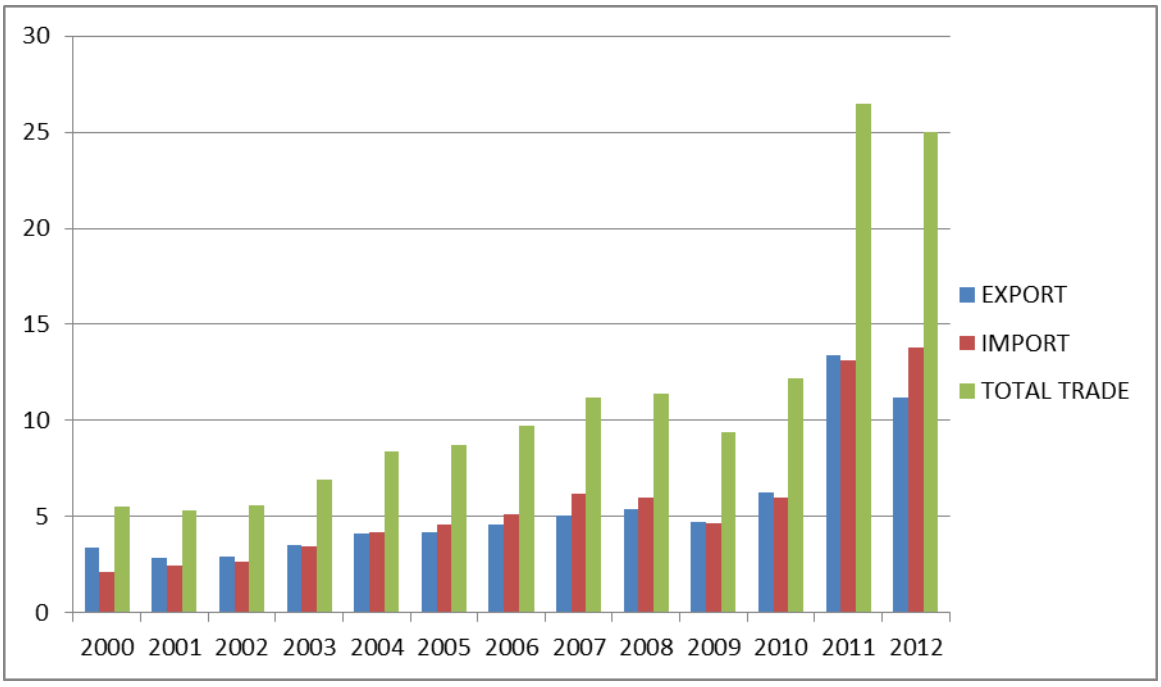

Figure 2.1 the *Total Trade between Malaysia and Germany, 2000- 2013*
Sources: Observatory of Economic Complexity (OECD)

According to the above figure, the volume trade is increasing. As mentioned in the paperwork presented in France, the engagement seems successful because the main objective was only to please a note that bilateral trade between Germany and Malaysia has increased. Germany is Malaysia's largest partner in the European Union and Malaysia 9th largest trading partner in the world.

Malaysia also hosted a number of large Germany companies, some of which have been in the country for over three decades. Germany was consistently on the top of the EU trading and has been among the sources of foreign investment in Malaysia. A big achievement of Germany in Malaysia, particularly between the years 2000 until 2005, Germany ranked as the 2nd largest foreign investor in Malaysia. Germany not only focus on bilateral trade but also on investment. Germany invested in the electrical and electronics sector, petroleum products, petrochemicals and chemical product sectors.

Currently, there are more than 300 companies with Germany interests in the manufacturing and non-manufacturing sectors in Malaysia. Siemens, Aesculap, BASF, Cognise, Continental, DaimlerChrysler and Robert Bosch are some of Germany's companies and have been expanding their investment in Malaysia. Recently, Infineon also became interested and has invested in the Malaysian electronics sector. This company is one of the largest electronics company in the world that based in Germany.

1.4.2 Trade with United Kingdom

United Kingdom and Investment (UKTI) main mission was to improve the important and longstanding relationship between the UK and Malaysia by expanding the trade and investment opportunities. The mission is similar to the Germany mission; to seek business opportunity and increase bilateral trade within these countries. However, trade and investment was not their only mission, they already expanded their mission to a wider area. They will work together on foreign policy, defense and security issues, encouraging people-to-people links and scientific, educational and environmental exchange.

The UKTI strives to highlight issues, in their attempt to boost the UK's reputation as a place of business, to establish commercial partnerships and to increase inward investment from Malaysia to the UK. To overcome these issues, several actions were taken by both countries:

1) Address the barriers to business
2) Effecting an ambitious EU-Malaysia Free-Trade Agreement
3) Work together with the Malaysian government in order to improve business links.

The striking advantage of trade with the UK is, they provide expertise, especially in the cyber network as most specialists are from the UK. On October 2013, the Malaysian Prime Minister went on an official visit to the UK, and stated that Malaysia hope that the good relations between Malaysia and UK could enhance the trade and investment between both countries.

The Prime Minister also said companies in the UK have expertise in cutting-edge technologies that could be shared with Malaysia. UK has a very strong security system; Malaysia gets its cyber security, border security and defense system from the UK expertise. Political and diplomatic, trade and investment, education and training, science, technology and environment and defense and security, are the main issues that have been discussed between both countries. To strengthen the bilateral trade between the countries, trade and investment alone should not be the main focus, others sectors must be given emphasized.

The attractiveness of Malaysia toward UK is as follows:

1) Malaysia is a member of the Commonwealth, thus Malaysian businesses and its people retain great trust and affection for Britain.
2) UK roughly estimated more than 70,000 Malaysian students attended UK's universities each year. In fact, many of UK universities have the highest number of Malaysian students compared to other countries.

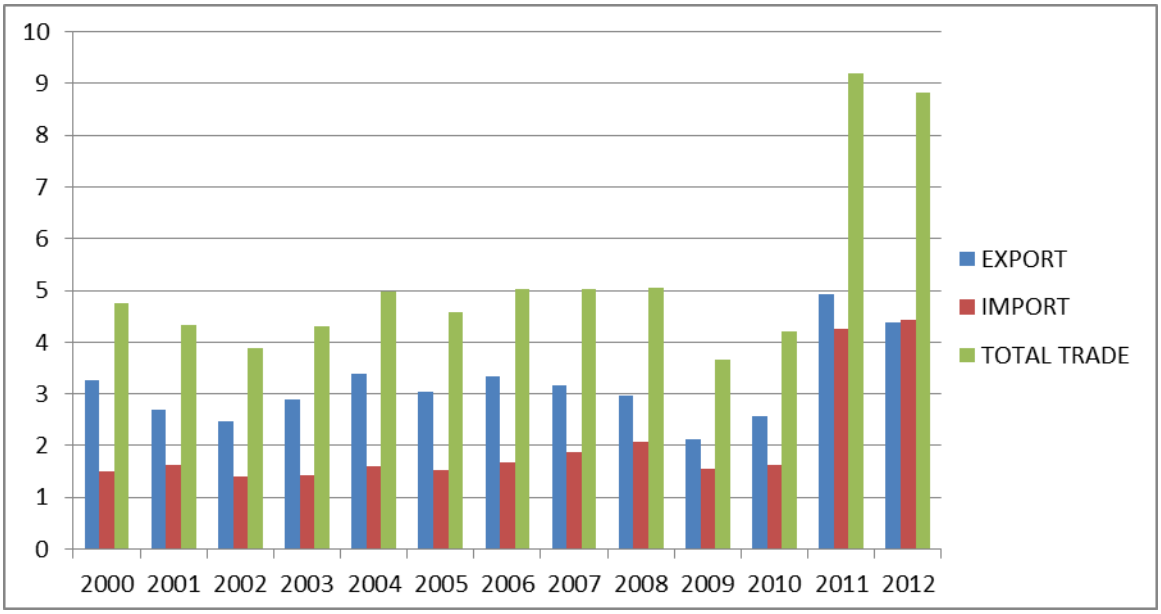

Figure 2.2 The *Total Trade between Malaysia and United Kingdom,2000- 2013*
Sources: Observatory of Economic Complexity (OECD)

The volume of EU country's trade patterns looks alike, they share the same region and in the Eurozone area. The bilateral trade between Malaysia and UK continue to grow due to four sections of economic:

1) Cyber network, especially in film and digital media. More recently, Pinewood Studio has just opened a state of the art facility in Southern Malaysia which is destined to be the creative hub of SE Asia.
2) In terms of education, there are several UK universities that have opened their branch in Malaysia such as Southampton, Reading and Newcastle. The syllabus oriented UK education is deemed in line with Malaysia's desire to improve its education level. The Government also plans to widen the education based on skills for the local industries especially in oil gas.

1.4.3 Trade with France

The formal relation between France and Malaysia started after the Independence Day in 1957. Each of the EU countries was closely linked to economic, educational and security relations in Malaysia. In terms of economics, the focus is on trade and investment, such as academic and security relations to strive the consolidate defense relations between the two countries. Currently the number of cooperation in defense has increased since the 1990s.

Trade with France continues to grow steadily with the guidance from UBIFRANCE. UBIFRANCE is the France Trade Commission in Malaysia that assists French companies searching for potential partners in Malaysia. UBIFRANCE act as an organizer for meetings between the two parties, and as an intermediate medium for entrepreneurs from France who wish to explore Malaysian economics.

Prior to any business collaboration, UBIFRANCE will take full responsibilities to guide France companies to enter any suit sector, provide advice and information regarding the Market access in Malaysia. Thus, facilitate France companies to develop its business locally. Currently, more than 10 France companies are based in Malaysia and there are four sectors of France expertise specialized in:

1) Infrastructure, transport and industry
2) Fashion, housing, health and sciences
3) Food and beverages
4) New technologies, innovation and services.

There is another organization that plays major role in forging the trade between France and Malaysia, which is The Malaysia French Chamber of Commerce and Industry (MFCCI), a nonprofit and self-funding organization. MFCCI was established in 1991. The main purpose of this organization is to develop strong relations between MFCCI members and Malaysian community especially in business. The function of MFCCI is similar to UBIFRANCE; to encourage, facilitate and support trade and investment between France and Malaysia.

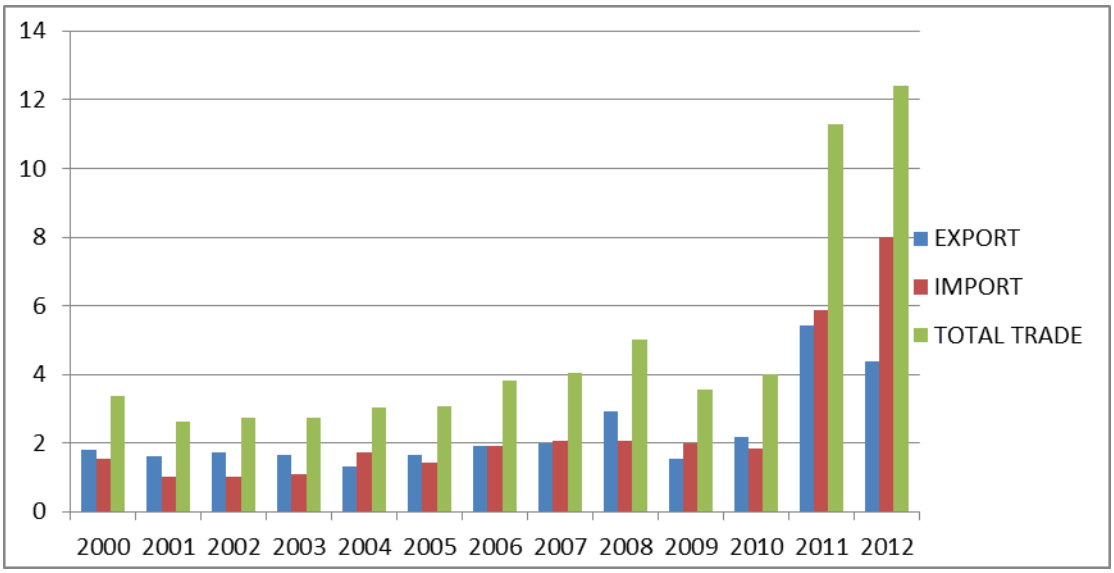

Figure 2.3 *The Total Trade between Malaysia and France, 2000- 2013*
Sources: Observatory of Economic Complexity (OECD)

Recent updates by MATRADE and UBIFRANCE in year 2012, reported bilateral trade between both countries was worth around 5.1billion euro; 2.9 billion euro was the import value and 2.2 billion euro was the export value. The complete information provided showed 40th supplier from Malaysia to France and 17th client from France. It

indicated clearly the number of supplier and client in Malaysia is much bigger than France.

Malaysia exported Electrical and Electronic products, Aircraft parts, rubber-based products and palm oil, and imported Aerospace, Mechanic and electrical equipment, industrial products and food products from France.

1.4.4 Trade with Netherlands.

In the newly independent Malaya, Netherlands was among the first few European countries that established formal diplomatic relation, and is considered as Malaysia traditional trading partners. That is why the Netherlands is the top ranking trading partner of Malaysia. Another interesting fact is, besides being among the first few EU countries that had diplomatic relation with Malaysia, the Netherlands is one of the 16 countries that first established diplomatic ties with Malaya in the beginning. After its independence in 1957, Malaysia started to have official relations with its colonial countries.

It is worthy to note that the historical linkages between Malaysia and Netherlands, contributed significantly towards what Malaysia has achieved at present. That is the advantage of the colonial era, when the Dutch and the Portuguese took over Malaysia; they bring in their economic systems. After Malaysia claimed its independence, the colonial countries becomes its trading partners due to the advantages of Malaysia especially its natural resources.

Netherlands and Malaysia shared many similarities; both countries practice monarchy as its parliamentary system. In fact, both countries also shared the same unique

lifestyle as both have multi-cultural and multi-region citizens. The Embassy of the Kingdom of the Netherlands in Malaysia stated Netherland does business in Malaysia in term of trade, investment, and other parties through the Malaysia Dutch Business Council (MDBC).

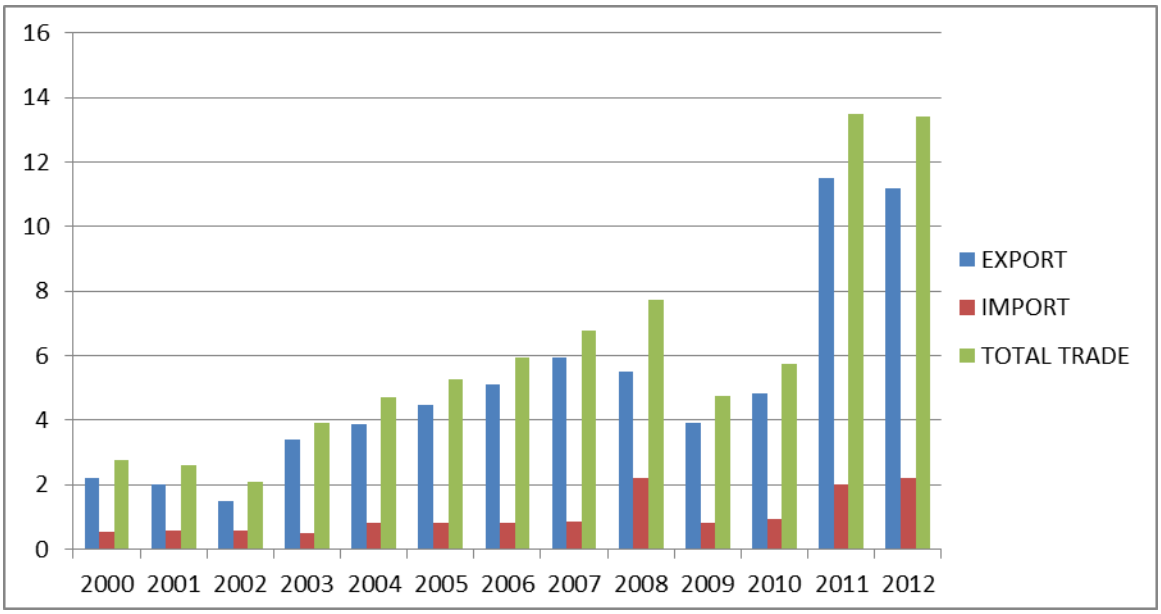

Figure 2.4: *The Total Trade between Malaysia and the Netherlands, 2000- 2013*
Sources: Observatory of Economic Complexity (OECD)

Netherlands was the 5th largest source of FDI in Malaysia during the year 2002 until 2006 as reported by MDBC, with a total investment of RM6.0 billion in 76 approved projects. The Netherlands, also known as Dutch operates more than 60 companies in Malaysia. Imports and export between Malaysia and Netherlands consist of electrical and electronics, petroleum, food product, and services sectors.

The most famous and notable Dutch companies are Shell, Dutch Lady, Unilever, Philips and ING bank. In fact, these products have the biggest market share in the

Malaysian economy as most products are preferred by consumers. Malaysia also invested a significant amount in the Netherlands by means of palm oil industry known as Unimills BN.

Netherlands specialized in agriculture sector with a great achievement as a modern and industrialized agricultural industry, and they are the world second largest exporter of agricultural products and food. As agriculture is an important sector in Malaysia, both countries may collaborate in order to strengthen each other industry.

1.4.5 Trade with Belgium

Belgium has an embassy in Malaysia (Kuala Lumpur) while Malaysia has an embassy in Brussels. The Belgian foreign trade agency represented by the Belgium Trade Department which handles Belgium bilateral trade with other countries. Daniel Dargent, one of the Belgian Ambassador visited Malaysia in 2014, said that Belgium seeks more importing opportunities from Malaysia especially palm oil as its food industry. Malaysia and Belgium have had good relations since the first year of Malaysian independence.

Belgium main interest in Malaysia is palm oil, as Belgian also has companies producing palm oil abroad in Indonesia and Africa. Malaysia has the most strategic location among all Asian countries. Besides higher productivity of worker, efficient logistics infrastructure and skilled workforce made Malaysia most preferable imported country of Belgium.

Belgium is keen on establishing partnerships with Malaysian companies to develop its halal food processes and Shariah-compliant investment in the country. The country is also keen on offering in the areas of food technology, clean technology,

logistics and healthcare to Malaysia. Belgium has a relatively large Muslim community, thus Halal Club Belgium was established which involved 120 Belgian companies in the sector of foods, cosmetics and services. Malaysia was already known as the halal gateway to the Muslim economies in Asian, Middle East and Africa.

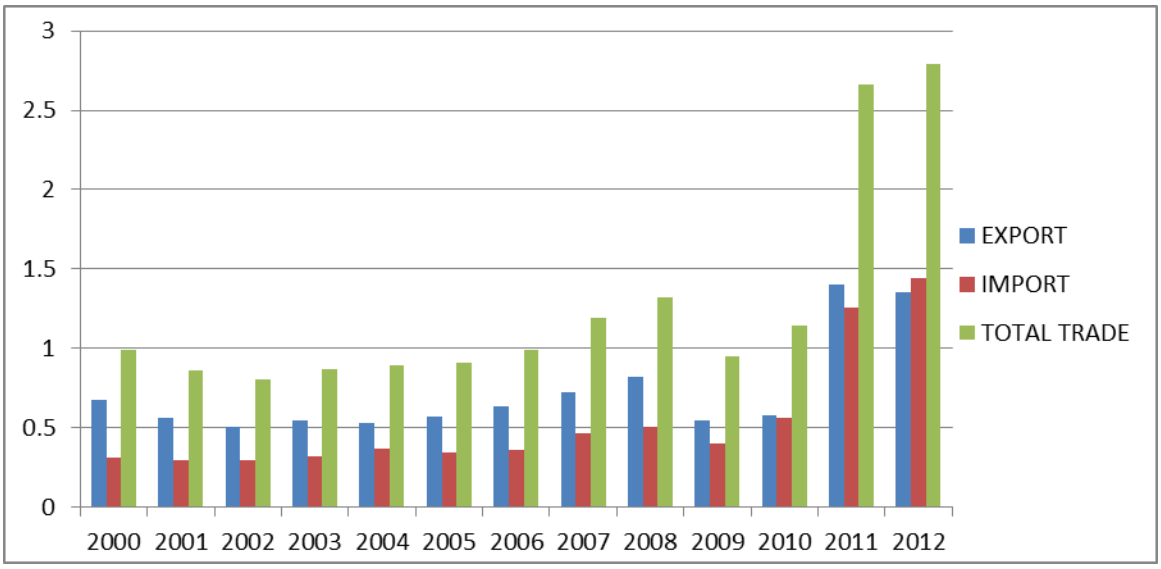

Figure 2.5: *The Total Trade between Malaysia and Belgium, 2000- 2013*
Sources: Observatory of Economic Complexity (OECD)

Malaysia's trade with Belgium is relatively small compared to other EU countries. From the year 2000 until 2010, the total trade was not more than 1.5billion. However the trend increased drastically with the total trade reached almost 3 billion. This was caused by the implemented project by Belgium in term of investment. A total of 27 Belgian manufacturing projects valued at USD595.4 million had been implemented and there were 42 manufacturing project in progress and have been approved. Their project was mainly in chemicals and chemical products, rubber products, food manufacturing and fabricated metal products.

1.5 Problem Statement

The EU is third in rank of Malaysia's major trading partners. It is consists of 28 member countries and each country has a single market and power market. Based on the data of top 30 trading partners of Malaysia, it showed that most member countries of the EU were in the ranking. The US and China as a single market with a power can beat the EU with 28 member countries.

To depend solely on the larger economic power is risky. While it is true to say that big economy will help the Malaysian economy, if the US or China's economy collapsed, Malaysia's economy will be badly affected too. The EU economy may also affect Malaysia, but the EU does not consist of one market only; it consists of 28 different markets. Each market has its own specialty and product. In fact, not all the EU market has a big portion of share in Malaysia market. The relevant authority needs to do more promotional programs to promote Malaysia to the EU countries.

Currently, China is a major market power, second only after the U.S. In fact China is seen as another Latin America. While the US economy is always fluctuating, China has steadily maintained its economic equilibrium. The EU is most unique among the market economy with the most market power in the global economy. Based on Malaysia experience, most of the past crisis originated from the US; thus, Malaysia should not depend heavily on the US economy. On a positive note, China experiences a steady growth and Malaysia has a strong diplomatic relation with China.

The EU is one of the Malaysia major trade partner and has a high volume of export and import records with Malaysia. In year 2009, the EU experienced sovereign debt crisis. Malaysia greatly suffered due to the recessions in the EU. All exports and imports decreased drastically in that year. Malaysia economics annual rate went down to -1.51%.

All countries are concerned with their rate of economic growth, including Malaysia. The Malaysian economy is an open economy. Malaysian's openness ranked third, after Japan and Singapore. Hence, trade activities would be important to the Malaysian economy. It is very important to study the direction of trade and the potentials of trade partners as Malaysia has diverse trade destination globally. In this study and analysis, Gravity Model is applied to calculate the trade potential and to explore more on Malaysia trade development and opportunities with the EU countries.

1.6 Research Questions

1) What are the major determinants of Malaysia-EU trade using Gravity Model?
2) What are the significant factors that influencing the trade between Malaysia and the EU?
3) Are there potentials and rooms for improving the Malaysia-EU trade?

1.7 Research Objectives

1) To identify significant factors influencing the levels of trade between Malaysia and selected EU states.

2) To estimate the maximum of potential trade between Malaysia and the selected EU states.

1.8 Scope of Study

The observational study of the Gravity Model concentrated on bilateral trade between Malaysia and selected EU countries which blanket the time of 2000 to 2010. This study was based on the panel data from the observatory of Economic Complexity and World Development Indicator. The study focused on the determinant of trade flows and trade potential of Gravity Model by using GDP, GDP per capita, the value of exports, population and exchange rate as the explanatory variables, and the value of exports as independent variable.

1.9 Significance of Study

The purpose of this study is to find out the determinant of trade that influence Malaysia and selected EU countries' trade and to evaluate the trade potential between these countries. In chapter four, the basic Gravity Model and the Augmented Gravity Model will be applied. This model determined by the GDP, Population, GDP per capita and Exchange rate bilateral between Malaysia and selected EU countries.

By applying the fixed effects, random effect and the pooled regression, these data will shows which model is the most appropriate for this case. In section two, based on the calculation of trade potential, the coefficient indicates that there was more considerable

room to trade. Malaysia and the selected EU countries have not fully utilized the trade potential; the actual trade was lower than the potential trade in the speed of convergence.

Bilateral trade between Malaysia and the selected EU countries increased with economic size and market size, which implied that the economic growth of individual economies strongly affected the trade relationship. Therefore stabilization policies and attractive business environment which contributed to high growth rate for the country were important issues for Malaysia's policy makers.

1.10 Organization of Thesis

This study is divided into five chapters. The first chapter comprises the background of the study, the problem statement, objectives of the study and the significance of the study. The second chapter reviews relevant and related conceptual, theoretical and empirical literature concerning the relationship between bilateral of Malaysia and EU using the Gravity Model. Chapter three explains the methodology used to achieve the research objectives. Chapter four presents the analysis of the empirical result. Lastly, chapter five discusses on the findings and offers recommendations and implication for future study.

CHAPTER TWO

LITERATURE REVIEWS

2.0 Introduction

How does one country be closely linked with other countries; everything through the trade channel. Developed and developing countries have their own policy to expand their trade by approaching other economic region. The issues such as trade liberalization, free trade area, trade agreement and trade barrier are often highlighted. The main question playing on the public mind; why do governments need to trade with other countries? What is the benefit of trade? How large are the trade flows between Malaysia and other countries?

This section will answer all those questions thoroughly, by going through the adopted theories and empirical analysis. The theory part consists of Classical Trade Theory, New Trade Theory and The Gravity Model. The empirical part will explain about past studies of trade in Malaysia with others and other countries trade policy.

2.1 Theoretical Reviews

2.1.1 Absolute and Comparative Advantage

Adam Smith was considered the father of the Trade Theory. He introduced the Absolute Advantage. He also wrote The Wealth of Nation; the famous book that's still being used to this day. The main idea in this book is comparing the nations to the

household. In the barter system, tailor makes a clothes and the shoemaker makes shoes. The tailor then exchanges clothes for shoes. Similarly, both countries will gain from barter system.

Countries specialized based on absolute advantage in producing any goods, and the excess in production should be exported to others, thus everyone will benefit in international trade (Lindert, 1991). However, Smith argument does not make sense, let say one country doesn't have any absolute advantage, it means that the country cannot participate in international trade.

Another argument by Smith is the basis of the free market. Market forces ensure the production of the goods and services. In terms of competition, producers will try to outsell their production, thus big competition will happen. This will bring down the prices; price tends to decrease due to high production whereby the supply exceeds the demand. For instance, there are a few producers in a certain production; the producers tend to increase the price. Hence, it will attract more firms to enter this industry and this inevitably will bring down the price. This is how Smith's idea works; there is no need for government intervention.

Smith also discussed the monopoly market and recognized it as a dangerous market. There is no competition in this type of market; the producer can make a lot of profit while disregard the consumer welfare. The monopoly producer ensures the market continued to be lack of stock, by never fulfilled the demand side. Producer sells the commodities above the natural price when the supply is less than demand.

With moral sentiments of the theory Smith quotes, “how selfish, so ever man may be supposed, there are evidently some principles in his nature which interest him in the fortune of others and render their happiness necessary to him though he derives nothing from it except the pleasure of seeing it”. As a conclusion, the Adam Smith main idea is in a competitive market, let the producer compete with each other naturally without any government intervention. He totally disagrees with the monopoly market and that moral sentiment should be inculcated among producers.

David Ricardo established the Fundamental Theory. The Principle of Comparative Analysis was introduced by him. This principle claimed that, “a nation is like a person, gains from trade by exporting the goods or services in which it has the least comparative analysis” (Lindert, 1991). The Ricardian Model explained the comparative advantage and comparative disadvantage. The main idea of Ricardian Model is the cost of production. The production could be lower or higher in one county compared to another country.

Comparative analysis apparently is the basis of international trade. Nevertheless, the Ricardian Model is incomplete and need to be improved. There are three scarcities:

1) The model assumes an extreme degree of specialization.
2) The prediction about each country will gain in trade without taking into consideration of the other effects such as income distribution within both countries.
3) The variety of resources among countries, the economies scale of the role, and intra industry trade are absent in Ricardian Model.

2.1.2 Hecksher-Ohlin Model

In the twentieth century, Eli Hecksher and Bertil Ohlin from Sweden were known as Swedish economists. They tried to modify several defects in the classical theory. In fact, Eli Hekcsher was the teacher of Bertil Ohlin. Both of them combined their idea and created an extension of the Ricardian Model. The influential theory of trade or better known as Factor Endowment or H-O Theory was introduced by them. Lindert (1991) claimed that exported countries main factor production used abundant intensively and imported countries lack of production factor use scarce intensively.

The equilibrium of mathematical model of international trade is the basis of the H-O Model and it was built based on Comparative Theory by David Ricardo. This model used factor endowment in each region to predict patterns of commerce. The profitability of goods is determined by the production and input costs. If the factor of production is locally abundant then the product will be cheaper as compared to the factor of production are locally scarce. The inputs were determined by endowment factors.

A country that has abundant capital and land, but scarce in labor will have a comparative advantage in production of goods that require lots of capital, and land but little labor. Thus, the price of goods will be low if capital and land are abundant. As a country main factor used in the production of rice, the price of rice will be low. Consequently, it can attract local consumption and export the product. If that country used labor-intensive, the price tends to be higher due to scarcity of labor. As a solution, the country is better off importing those goods.

In theory, H-O Model was built based on the Ricardian Model to fill the gaps in Ricardian Model. The Ricardian Model assumed there are differences in term of technologies. The labor productivity may be different depending on the technologies used in certain countries. H-O Model stated that there is no difference in production, the identical production of technology is everywhere, and there is no need to include in the model. The H-O Model removed technology variations of production and replaced it with capital endowment. The new model requires capital, labor and factor of endowment. The main assumption of the H-O Model stated the difference in the factors of endowment, that only the difference between any country and the rest is technology, and factors of production, supposed to be the same.

The reason behind the assumption is to investigate what impact to the trade if the proportion of production is different in the different countries. H-O does not state any specialization in any country like a Ricardian Model. Ricardian Model said there a specialization in any product within trade country and trade will leads to complete specification is existing.

The last argument between Ricardian and H-O Model is the loss and gain in the trade. Ricardian claimed that every country does trade will gain. In fact, H-O said not every country gain from trade, some of them will be lose but the net effect is still likely to be positive. The advantage of international trade can improve efficiency in economics, and the negative impact of international trade will cause a redistribution of income.

As a conclusion, the H-O Model teaches how changes in supply or demand in one market, can feed their way through the factor markets and trade the national markets and

influence both goods and factor markets, locally and abroad. Market everywhere is interconnected. The trade country will complete each other by fulfilling the demand and supply by certain countries. The international economic do not only feed the others market, but it has also fed the local market before exporting their goods.

2.1.3 New Trade Theory

The theory of classical indicated that, the country that has less resource such as natural resources tend to trade more. Similarly, the country that has more resources tends to trade less. Therefore, it is proven that classical theory failed to explain about big proportion of trade; the country that shared same endowment factors and the dominator of intra industry in developed countries. All those criteria prompted the establishment of a new theory, namely the New Trade Theory.

Krugman, Lancaster, Helpman, Markusen and many others are researchers for this theory in 1980s. The backbone of this theory is about the world trade, the economies of scale, imperfect competition and product differentiation should be taken into account. As mentioned before, the classical theory assumption was:

1) Constant return to scale
2) Perfect competition
3) Homogenous good.

The New Trade Theory highlighted 5 points that should be taken into consideration in doing the international trade. The first one, network effects due to economies of scale.

The country that has more production, will gain economies of scale, thus it can trade more. It is same in the comparative analysis. The countries specialize in a particular industry may gain economies of scale and then get benefit from network trade. The economies of scale can be marketed dominant, the first company that joined the industry, produce more goods and become more effective.

Consequently, the cost of production may be low and can lead the market or may be called as monopolistic competition. The last point is a growth of globalization; the developed economy, of course gained more from trade because it was already leading the market. The poorer and the developing must be struggling to be one of the developed countries, to enter and compete in the international market.

In this model, Paul Krugman one of the founder of this theory and awarded Nobel Prize (2008) claimed that the government intervention is needed in order to promote new industries. The government role is to protect the developing countries market. The developed cannot dominate the whole market that there is no space for developing countries to grow. The government should provide tariff, domestic subsidy and capital intensive.

There are pro and cons of government intervention. The problem of government intervention is likely due to less or poor information about the industry. Some of the industry really needs government intervention, due to lack of information that the company may be overlooked. However, too much dependency to government policy is unhealthy; a company will have no effort to promote its company by itself. In the long term, it will encourage inefficiency.

As a conclusion, the government intervention is still needed, but in an appropriate amount; not too much or too less. To achieve economies of scale, companies should be labor-intensive or capital intensive, and specialized in one product. The low cost of production, a big scale of production, the effective management of production and actively promote the goods of production will be lead to economies of scale.

2.1.4 Gravity Model

In recent year, to measure the trade performance and analyze the pattern of trade, the Gravity Model approach was used. Jan Tinbergen (1962) introduced this model during a seminar work. Gravity Model was derived from the Newton Theory. Newtonian theory discussed on gravitation and Tinbergen tried to use the same principle in term of trade. The main idea of gravity theory is to measure the size of bilateral trade within two countries that can be approximated.

According to Tinbergen, there are several causes that make domestic markets need some protection or called it as a tariff:

1) The income equality is not sufficient within trading countries. For that reason, developing countries need protections so it could return a better result.
2) Young industries that haven't yet reached their optimum size are quite hard to support. More incentives should be given to protect new industries and make them more competitive.
3) If there is no tariff, it is impossible to protect the vital industry in those countries.

4) In terms of mobility of capital and labor, it seems impossible to protect. Free trade doesn't necessarily always lead to an optimal allocation and adjustment of resources. Others alternative of measurement is needed.

Initially, Gravity Model presented an empirical work on the stability of the economics size, distance and the total trade. The difference in technology across the country brings out the Ricardian model, while the H-O model relies on the differences in factor endowment within countries. Both models were incapable to explain the Gravity Model. The extraordinary of Gravity Model is, it was able to explain the bilateral trade flows. There is a lot of theoretical work about the Gravity Model before Tinbergen explores details. Nowadays, to study trade flows, the Gravity Model is needed in order to measure the trade.

Subsequent researcher that attempted this model was Anderson (1979). He was given the basic theoretical of Gravity Model. Armington assumption built by him stated the differentiated of goods by their originating country, so that consumers may choose any goods based on preferences and have all the information about difference product. At the end of the day, the goods are traded; all countries' trade and there is a lot of foreign demand for local goods. Each country is interconnected. He defined the trade cost as an iceberg, whereby it will melt in transit country. Transport cost can reduce the cost of trade.

Bergstrand (1985 and 1989) criticized the Anderson work and try to disprove it by using monopolistic competition by Paul Krugman (1980), that the Gravity Model form of the direct impact of trade. This model tried to rebuild a new model based on Armington

assumption. The identical countries will trade differences goods due to different preferences of consumers. Firm location is endogenously determined and countries are specialized in the production of different sets of goods.

Deardoff (1998) stated this model can be built based on the expansion of trade in traditional factor of proportions. Other work by Eaton and Kortum (2002) studied the Gravity Model using Ricardion assumption. Helpman et al (2008) and Chaney (2008) acquire it from a theoretical model of international trade in differentiated goods with firm heterogeneity.

The basic equation of the Gravity Model:

$$\mathbf{X_{ij} = GS_iM_j\phi_{ij}}$$

$\mathbf{X_{ij}}$ = The value of money in export from i to j

$\mathbf{M_j}$= All importer-specific factors that make up the total importer's demand (such as the importing country's GDP)

$\mathbf{S_i}$= Specific factor of exporter (GDP), total supply amount.

G= Variable do not rely on i and j.

$\boldsymbol{\phi_{ij}}$ = The ease of exporter i to access of market j.

Others expression of Gravity Model as below:

$$F_{ij} = \frac{M_i M_j}{D_{ij}^2}$$

F_{ij} = The attraction of gravity

$M_i M_j$ = The mass of two objects

D_{ij}^2 = Distance

As acknowledged, Tinbergen was the first economists to attempt the basic of Gravity Model to analyze the flows of international trade in 1962. Many other researchers had followed up and tried to reconstruct this model in econometric series. Hence a lot of Econometrics model tried to explain this model. Another example is as follows:

$$T_{ij} = \mathrm{A}\frac{Y_i Y_j}{D_{ij}}$$

A = constant

T_{ij} = The number of trades from origin country, for this model, i represent an origin country and j as the destination country.

$Y_i Y_j$ = The economies size for two countries which is i and j (GDP or GNP)

D_{ij} = Distance between both countries.

2.1.5 Krugman Model

The first thought of Paul Krugman model was introduced in 1980. He introduced monopolistic competition in the framework. This section will provide a common level of information about the Krugman Model. The theory's assumptions are as follows:

1) Economies of scale
2) The producer can differentiate their product without any additional cost
3) The Utility function of the individual is same

4) The production function is only labor
5) Full employment
6) Firms maximize the profit
7) Free enter and exit the market

The production cost will be fixed and any additional goods will be classified as a constant marginal cost. If the production increases it will diminish the average cost. The equilibrium profit equal to zero due to the assumption of free enters and exit of the market. The assumption of Krugman just likes a competitive market without any competitor in light of the fact that the differentiated of the product without any cost does by the firm.

All products entered the market symmetrically into demand and supply at the equilibrium level. Each goods and products were produced by a single firm. Similar to monopolistic market, one firm produce one product; then that firm will do pricing decision and will decide on the level of production, while the utility of marginal income has no real effect.

Firms that have big scale of economics can produce and export more. Krugman also considered the transportation cost between countries in the fixed fraction. The elasticity between export demand and domestic demand must be equal. The wage on the home country should be higher since the home market is bigger. The country begins to export goods which have very strong demand by domestic consumers. That company is already stable and has a big portion of market power.

This section just provides a basic thought on earlier Krugman's model. It is just about basic assumption and of course it is far from the reality of the current market. Yet, that assumption still makes sense. In a few analysis or model, some of the variable will be assumed as a constant term. However, the model was already modified and the market is more competitive.

2.2 Empirical Studies

Geographical position and distance were considered as important determinants of bilateral trade, as determined by earlier studies made by Tinbergen (1962), Poyhonen (1963), Anderson (1979), Pagoulatos and Sorenson (1975), Caves (1981), Toh (1982) and Krugman (1997). In previous studies, Gravity Model was found to be successful when a geographic variable was included. Geographical variables are one of the endowment factors introduced by Heksher-Ohlin.

Kepaptsoglou et al (2010) made an empirical review on the Gravity Model that was introduced in 1960's. This model was intensively used because of its robust explanatory, better known as augmented variable power. Gravity Model is divided into three steps. The first step is the objectives and application; the main objective of this model is to identify either the target or the tool of trade. Target is the potential trade of trading countries, while the tool is the determinant of bilateral trade.

Most studies analyze the trade flows between regions or in a specific product. While other studies focused on the regional trade agreement in term of impact, currency union and the common market, as well as studies between the country of origin and the

European Union. Other works focused on the trade policy implications and determinant of bilateral trade, natural border, monetary union and the domino effect. There were also studies on the foreign direct investment, the origin of rules, transportation costs, theory of neutral partners, trade union rights, and democracy effect and export performance of some of the tools that determine the bilateral trade.

The second step is the parameter which represents the data and explanatory factors. Time series data, cross section data and panel data can be used to test the trade data. Most researchers prefer the panel data as it can explain and capture the relationship between variables and observe the individual effects between trading partners. Kepaptsoglou et al (2010) gave some example of dependent and explanatory variables, where the explanatory variables were divided into two groups:

1) The demand and supply factors that indicated the trading countries.
2) The policy that imposed on trade flows within the trading countries.

Commonly the geographic distance measured the transportation cost. Based on existing literature, the cost was associated with trade. The volume of trade might increase if there was a decrease in the cost. Most of the empirical studies found that the cost of transportation (distance) negatively correlated with trade. The result of studies by Balassa (1966), Balassa and Bauwens (1987), Stone and Lee (1995), and Clark and Stanley (2003) proved the negative relationship between trade and distance.

Frankel et al (1995) argued that the natural variables such as GDP, geographical size, the common language and border are not sufficient enough to explain the bilateral

trade in the American continent. In fact, this model does not function well into the natural variability of American. South Asian Association for Regional Cooperation (SAARC) need trade reformation to enhance trade among them, as shown by previous studies of Rajapakse and Arunatilake (1997) and Hassan (2001).

Egger (1999) estimated the potential for trade between Austria and other CEE countries, namely Hungary, Czech Republic, Slovak Republic, Poland and Slovenia. He found that CEE openness to exports would increase, without altering the bilateral degree of openness among other countries in the European Union.

Gravity Model has been used worldwide; the countries concerned test this model to trade patterns. This model has been proved successful. Through the import, export and total trade data, Radman (2003) found Bangladesh's trade is determined by the size of the economy, GNP per capita, distance and openness. That variable has been used to define the trade flows between Bangladesh and its major trading partners.

Blomqvist (2004) used this model to determine the trade flow in Singapore, and it showed that the GDP and distance can be explained by this model. It has a high degree of result empirically. Anaman and Al Kharussa (2003) claimed that population has a positive relationship and will influence the trade between Brunei and the EU countries.

Shaist et al (2013) investigated the bilateral trade flows of Pakistan using the Gravity Model approach. They found out that the GDP and the GDP per capita have a positive effect toward trade volume, while distance and dummy variable for cultural similarities negatively affect the volume trade. The Gravity Model gave a significant

contribution because after using the ratio of actual trade for predicting the trade, they realize that some partner has greater trade potential.

Nuno C.S. (2010) stated that the bilateral trade between the US and NAFTA, the EU and ASEAN has a negative relationship with the distance variable. In order to increase the trade volume, the transportation cost should be reduced. Nevertheless, the economic dimension, productivity and common border positively affect the bilateral trade. This paper also proved that the FDI was positively correlated with trade.

Mawar Murni Yunus and Mohd Adib (2012) found that the main determinant of Malaysia's export was GDP, GDP OIC, FDI, exchange rate, distance, and a border. Thus, there is a potential trade between Malaysia and OIC countries and there is considerable room for improvement in trade between these countries.

Surya B.T (2010) estimated the trade potential between Nepal and 19 trading partner countries using the Gravity Model. This model is able to explain the volume of trade between pairs of countries; a positive function of the size of the two countries and a negative function of the distance between them. The trade potential used the ratio of predicted trade to actual trade. 10 over 19 trading partners have exceeded the trade potential while the other nine showed some potential to do more trade. Nepal found their neighboring country, Bangladesh to have trade relation potential. Since it is a neighboring country, the transportation cost is low. Also Nepal will use trade promotion strategies.

Azer.D (2012) analyzed the Georgio trade data for export and import. The results were common as per other similar studies; the size of economies, GDP per capita and

common history were found positively correlated and significant in Georgio's trade. FDI was also positively correlated with trade. Ranjoy. B and Tathagata. B (2006) extended the analysis of Gravity Model to India. The results showed that the fluctuations in the second half of the twentieth century in relation to trade were around 43%. It was also found that India's trade responds less in proportionally to size and more in proportionally to distance. Colonial heritage is one important factor. Another significant fact was that India trades more with developed countries compare with developing countries. Finally, size of economies also influenced India's trade.

Nazia and Hafiz (2011) studied about the trade potential in the Gravity Model in Pakistan. They used coefficient to predict and measure the trade potential. They found that the highest trade potential was the big power in the world market, namely The Middle East, The Latin America, North America, The European Union and the Association of Southeast Asian Nations (ASEAN). This model also determined that the lowest trade potential of Pakistan was The Economic Cooperation Organization and South Asian Association for Regional Cooperation (SAARC). The main trade obstacle of Pakistan among neighboring countries is the political and social tensions. The fact was SAARC consist of India, which is Pakistan neighbor. Pakistan also faces the same trade problem with the EU and NAFTA; the political climate should be taken into consideration as a trade issue.

Trade agreement was frequently used as one of the explanatory variables by many authors. By using different trading agreements (PTAs), Clarete et al (2000) used the Gravity Model to test it in the Asia-Pacific Region. Cross Section and panel data were

used to determine the effects of the agreement. The main variables of Gravity Model such as GDP, distance and population were given consideration. The findings showed that the PTAs have significant value that contributed to the trade expansion either in the regional or global arena.

Boris and Vedram (2002) conducted a study in trade integration within the Southeast Europe (SEE) region. The main variables were trade openness ratio and trade concentration indices. The EU and Central European Free Trade Agreement (CEFTA) countries were major trade potential target for Croatia. This country should consider exploring further on trade relation with the SEE countries, and to take into consideration on the EU and CEFTA. These three regions have the biggest potential of trade since they share the same region.

The Gravity Model is favored by many authors around the world that even Bangladesh applied the model. The variables used were the panel data, and the analysis of trade between origin and major trading partner. Rehman (2003) indicated that size of economies, per capita gross national product (GNP) and the openness of the trading countries positively determined the Bangladesh trade.

Brodzicki (2009) utilized the Gravity Model for trade to investigate bilateral trade flows of Poland with 181 countries of its trade partners. The researcher used two equations in estimating the data. The basic model of gravity and the extended model of gravity, or better known as Augmented of Gravity Model, were applied by Nazia and Hafiz (2011) to estimate the Pakistan trade potential. The conclusion derived from this method not only was independent variables affected trade volumes, but economic

volatility such as exchange rate and economic transition should also be considered. These problems arose due to different values of currency, and it might affect the trade directly. Since Poland used the euro currency, it should take into account the currency volatility.

Maryanchyk (2005) used the Gravity Model to estimate two specifications of the model for Ukraine. The finding showed actual trade flows exceeded those predicted by the model. The main point was to find the potential trade country, especially in the EU. Ukraine should start to trade with small countries with small of economics scale. Once its economy has strengthened, Ukraine should focus and engage more trade with the major economic players like USA, Japan and other developed countries. Based on this journal, it was shown that in order to strengthen the economic relationship in worldwide economy, one country should engage in trade with either the small country or the big country.

Martinez-Zarzoso and Nowak-Lehman (2003) studied Gravity Model between Mercousar and European country to define the trade potential. A panel data analysis was used to disentangle the time invariant country-specific effects and capture the relationship between the relevant variables over time. They have chosen the income for countries, population, distance, infrastructure, income per capita differential and real exchange as the variables. By using Gravity Model, first result showed that the basic Gravity Model and the other model for Augmented Gravity Model. This paper tries to find the best model with the suitable variable for trade potential.

The results showed that infrastructure, income differences and exchange rates were the important determinant in the bilateral trade flows. Those variables were tested in the Augmented Gravity Model, an extended version of the basic Gravity Model.

Bestrand (1985) and Bestrand (1989) first introduced real exchange rate in the Gravity Model. However, as Sologa and Winter (1999) pointed out, the incorporation of price effects in a cross-section analysis did not give any information on whether a currency was over or under-valued. Only when the time dimension was considered in the analysis, exchange rate movements became relevant. Sologa and Winter (1999) also incorporated real exchange rate variables into the gravity equation.

Binh et al (2012) studies applied the Gravity Model to determine the bilateral trade between Vietnam and its trading partners. Using the same method, namely panel data, the result showed that economic size, market size of foreign partners, distance and culture have huge effects on bilateral trade between Vietnam and its trading partners. Similar studies were performed by Martinez-Zarzoso and Nowak-Lehman (2003), using the Augmented Gravity Model.

The Augmented Gravity Model will determine the vital variables that should be included in this model. As mentioned in chapter three, economic size represented the GDP and market size represented the population of a country. In the basic model, only three variables must be included, while the rest were classified as added variables in the basic Gravity Model or Augemented Gravity Model. This paper also agreed that the added variables were important variables as determinant in the bilateral trade between Vietnam and its trading partners.

By using an Augmented Model approach to measure trade potential between India and its traditional trading partners, a studied was conducted by Batra (2004). The study found that the regions and regional groupings have the maximum potential to trade with

India. The addition, variables significantly to the India trade potential was geographical, cultural and historical background.

There are two other reasons for employing the Speed Convergence method. Firstly, to find the determinant that influences bilateral trade flows, and secondly, to explore the trade potential between the origin and trade country. The trade potential could be overused or underused. Binh et al (2012) applied the method of Speed Convergence in order to get the trade potential in Vietnam.

Conclusion

Analysis of theoretical and empirical evidence is important in order to examine the Gravity Model. In addition, the data and methodology are vital in the quest to find the significance of study for each country. Most literatures suggested the importance of panel data in accessing the Gravity Model. However, studies on Gravity Model in Malaysia are nonexistence.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

An in-depth discussion on Gravity Model that based on the idea of Newton was presented in chapter two. It is interesting to note that economists were able to derive the Gravity Model from the physician's idea. As a matter of fact, this Gravity came from Universal Graviton of Newton's law department. The basic concept of the Gravity Model is, the volume of trade between two countries relies on their respective size and distance. How to measure economic size? Usually the economic size is depicted by GDP; GDP represents the economic size. Most of the researchers agreed that the distance is just a proxy for transportation cost.

3.1 Model Development

The Gravity Model examines the impact of the EU countries on Malaysian exports. Literature review illustrated that this model was widely used in order to examine bilateral trade. The general model explained the volume of trade in terms of the ratio of the product of the gross domestic product (GDP) of countries i and j to the distance between them:

$$Trade_{ij} = \mathrm{A}\frac{(GDP_i.GDP_j)}{\text{Distance}}$$

Bergen (1962) and Poyhonen (1963) pioneered the gravity concept in economics. They explained the utilization of Gravity Model to measure economic relationship.

Equation 1 is a primitive model and generally explains that the value of bilateral trade is directly related to the GDP of the trading partners, and inversely related to the distance between them. Taking the logarithm:

$$\ln trade_{ij} = \alpha_0 + \beta_1 ln(GDP_{it}) + \beta_2 ln(GDP_{jt}) - \beta_3 \ln(\text{Distance}_{ijt}) + \varepsilon_{ij}$$

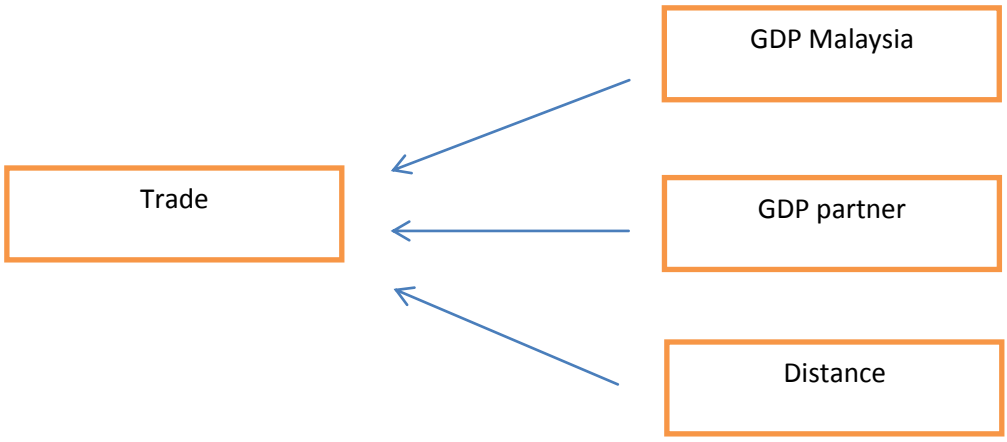

Figure 4.1: *The determinants of the basic Gravity Model.*

The basic Gravity Model illustrated in the graphical form, in fact, looks like the simple model derived from the macroeconomic model. The only difference is the distance. But it is not a simple matter, each variable represented economic indicator or as a proxy. They explain further on the operationally of variables.

The primitive or basic model was transformed into a log-linear form due to the big number of variables. Most variable were in numerical and not in percentage. The log linear form was widely used in analysis, and most researchers commonly used this form. Yet, the fundamental form has been further augmented by researchers. The main focus was on the bilateral variable; the extended variable might directly affect the trade.

This paper applied a variation of the Gravity Model by Krugman and Maurice (2005). The estimated model is as follows:

$$\ln trade_{ij} = \alpha_0 + \beta_1 ln(GDP_{it}) + \beta_2 ln(GDP_{jt}) + \beta_3 ln(GDPi_{it}) + \beta_4 ln(GDPi_{jt}) + \beta_5 \ln POP_{it} + \beta_6 \ln POP_{jt} + \beta_7 \quad ER_{ijt} + \beta_8 \ln DIS_{it} + \varepsilon_{ij}$$

α_0 = constant

β_1= estimated parameter

j=1,2…10

i= 1(Malaysia)

$trade_{ij}$ = Malaysia's trade with country j in year t.

GDP_{it} = Malaysia GDP in year t

GDP_{jt} = Country j GDP in year t

POP_{it} = Population of Malaysia in year t

POP_{jt} = Population of country j in year t

ER_{ijt} = Real exchange rate between Malaysia and country j in year t.

DIS_{it} = Distance in kilometers between Malaysia and country j.

ε_{ij} = Error term.

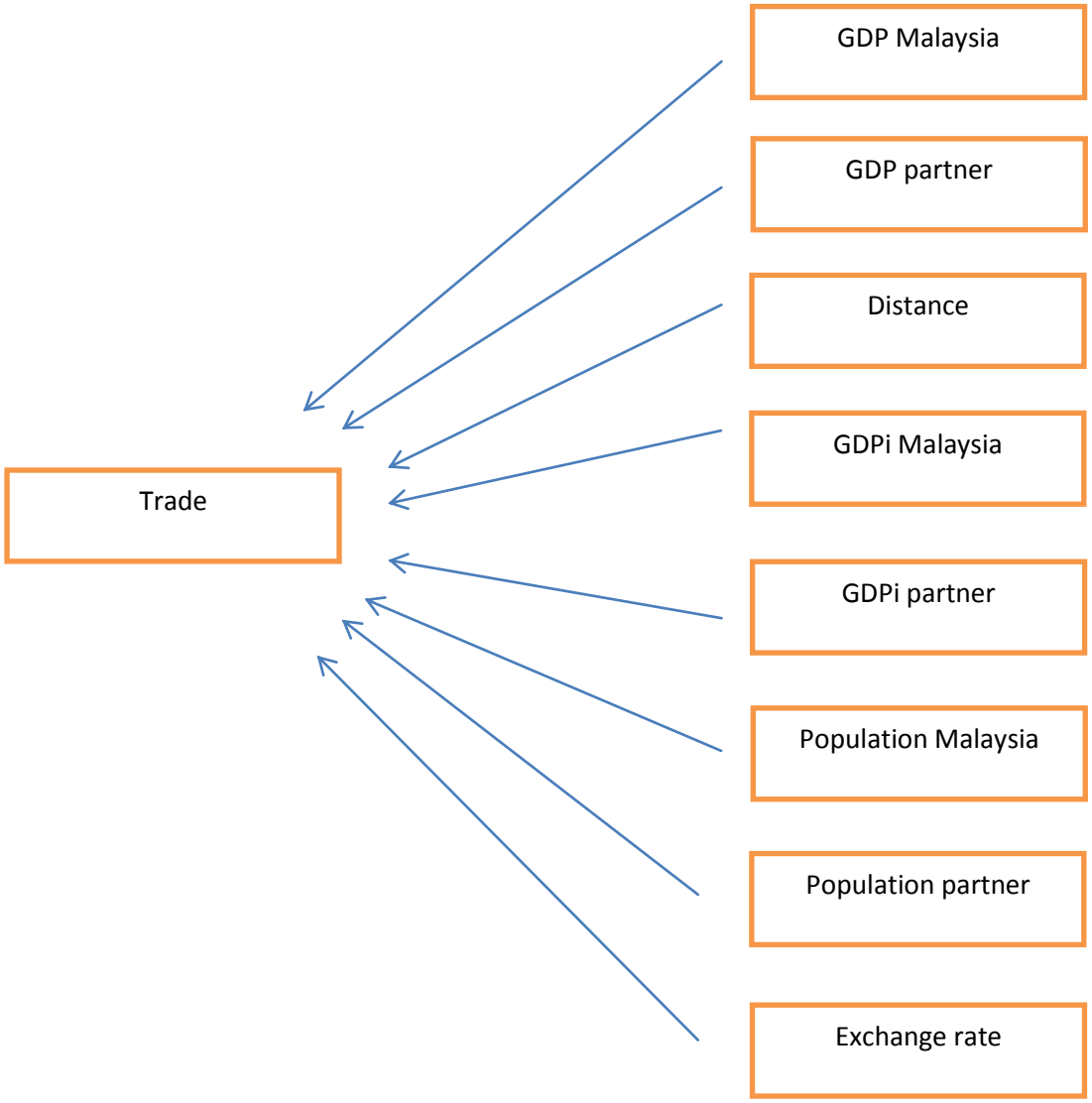

Figure 4.2: *The determinants of Augmented Gravity Model.*

The Augmented Gravity Model also illustrated the equation in graphical form. It has five additional variables; GDP per capita in both countries, population in both countries, and the exchange rate. These additions were suggested by many authors.

3.2 Panel Data Framework

In the initial stage of Gravity Model in trade, the model makes use of the cross-sectional data. Traditionally it is expressed as a single equation by estimating the trade flows within trading countries as a pair countries, but in a particular period. However, the panel data became popular and was widely used in the modern research. The advantage of the panel data is, it can deliver more useful information. The panel data are commonly used since it enable researcher to study a particular topic at multiple place in a certain time frame. A Fixed Effect Model and Random Effect Model are more outstanding in panel data approach.

3.2.1 Fixed Effect Model (FEM)

In the FEM analysis, the intercept in the regression is allowed to differ between individual units in recognition of the fact that each cross-sectional unit might have some special characteristic of its own. Thus, the model can be written as follows:

$$Y_{it} = \beta_{it} + \beta_2 X_{2it} + \beta_3 X_{3it} + u_{it}$$

The subscript $_i$ to the intercept term suggest that the intercepts across individuals are different, but that each individual intercepts does not vary over time. The FEM is appropriate in situations where the individual specific intercept might be correlated with one or more regressors (Gujarati, 2003). To take into account the differing intercepts, the use of the dummy variables is the most common practice, and therefore, the specification is known as the Least-squares Dummy Variable (LSDV) Model, which can be written as:

$$Y_{it} = \alpha_1 + \alpha_2 D_{2i} + \alpha_3 D_{3i} + \alpha_4 D_{4i} + \beta_2 X_{2it} + \beta_{3it} + u_{it}$$

However, there is a disadvantage to the LSDV in that; it consumes a number of degrees of freedom when the number of cross-sectional units is very large, since one has to introduce N dummies.

3.2.2 Random Effect Model (REM) or Error Components Model (ECM)

Proportionally to the FEM, the REM assumes that the intercept of an individual unit is a random draw from a much larger population with a constant mean (Gujarati, 2003). The individual intercepts were then expressed as a deviation from this constant mean value. The REM has an advantage over the FEM in that it was economical in terms of degrees of freedom, since there was no need to estimate N cross-sectional intercepts.

The REM is appropriate in situations where the random intercept of each cross-sectional unit is not correlated with the regressors. The basic idea is to start with the next equation. However, instead of treating β_{1i} as fixed, it is assumed to be a random variable with a mean value of $\beta_{1.}$ Then the value of the intercept for individual entity can be expressed as:

$$\beta_{1i} = \beta_1 + \varepsilon_i \text{ where } i=1,2,\ldots,n$$

The random error term is assumed to be distributed with a zero mean and constant variance:

Substitute into FEM equation

$$Y_{it} = \beta_1 + \beta_2 X_{2it} + \beta_3 X_{3it} + \varepsilon_i + u_{it}$$

$$= \beta_1 + \beta_2 X_{2it} + \beta_3 X_{3it} + w_{it}$$

The composite error term w_{it} consists of two components:

I. ε_i is the cross-sectional or individual-specific error component

II. u_{it} is the combined time series and cross-sectional component

Given that $\varepsilon_i \backsim (0, \sigma^2_\varepsilon)$, $X_{it} \backsim (0, \sigma^2_u)$, where the ε_i is independent of the X_{it} (Gujarati, 2003).

Generally, the FEM is held to be a robust method of estimating gravity equations, but it has the disadvantage of not being able to evaluate time-invariant effects, which are sometimes as important as time-varying effects. Therefore, for the panel projection of potential bilateral trade, researchers have often concentrated on the REM, which required the explanatory variables be independent of the ε_i and u_{it} for all cross-sections (i, j) and all time periods (t), as stated by Egger (2002). According to Ozdeser and Ertac (2010), if the intention is to estimate the impact of both time-variant and invariant variables in trade potential across different countries, then the REM is preferable than FEM.

3.3 Trade Potential

Maurel and Cheikbossian (1998) and Montanari (2005) calculated the trade potential in Eastern European countries. Since then, this method has been used intensively to define the trade potential in Gravity Model. This was done by applying the point estimated coefficient in the result of the data on the explanatory variables, to calculate the trade potential as predicted by the Gravity Model. The trade potential will

be compared to the actual trade, to check whether bilateral trade between two countries was underused or overused.

The point estimation showed the uncertainty in calculating the potential trade; therefore it should take into consideration the usefulness of point estimation method claimed by Egger (2002). The author also highlighted on the white noise residual using the existing method of calculating trade potential. The sign of underused or overused trade can be a misspecification in economics and may lead to misleading result. The criticisms by Egger (2002) on the calculating trade potential were proposed by Maurel and Cheikbossian (1998) and Montanari (2005), cannot be used in this analysis due to the white noise residual problem.

There is another option for calculating trade potential as proposed by Jakab et al (2001) that is using the concept of convergence. The concept of convergence replaced the point estimated coefficient method. He also provided a simple mathematical approach to define the trade potential, as follows:

Speed of convergence = (Average growth rate of potential trade/average growth rate of actual trade)*100-100

The model is negative and convergence when the average rate of potential lesser than the actual growth rate of trade, hence it represented an underused trade. The model becomes positive and divergence when the average rate of potential trade is greater than the actual growth rate of trade, thus represented an overused trade. Actual rate and potential rate played a vital role in the speed of convergence.

This model was more reliable than the method of point estimation, and Jakab et al (2001) stated this method has more efficiency prominent. The speed of convergence can exploit the structure of dynamic during the estimation. In addition, by using different methodologies in the panel data, such as pooled estimation, fixed effect and random effect, this convergence appeared quite robust in each test.

3.4 Sample Size

Annual data for the period of 2000-2012 was considered as the sample size. It will include the Malaysia's export to and import from all the other trading partners. The main trading partners of Malaysia are the United States, China, the European Union, Japan and Singapore. All these countries were selected based on Malaysia's data on its export and import activities.

3.5 Data

The data set contains annual trade flows, GDPs in trade partners, population, exchange rate and distance of Malaysia and the five selected countries in the EU. The data were obtained from the World Bank Development, indicator for the explanatory variable. Data trade was extracted from the Obsevartory of Economic Development (OECD). The trade data represented the data on Malaysian exports to the selected EU countries.

3.6 Operational Variables

3.6.1 Trade

Trade in goods and services between two countries will be identified as the dependent variable. Trade is the total amount of export and import between the origin country and exporter country, or between the origin country and importer country. The total trade is in value terms.

3.6.2 Gross Domestic Product (GDP)

GDP is a value of a country's overall output of goods and services at market prices. The basic calculation of GDP is as follows:

$$GDP = C + I + G + (X-M)$$

GDP and trade have a positive relationship; if the amount of GDP is high, then the trade will be higher as well. The GDP report will include information on inflation because it also measures the changes in prices and spending patterns. GDP was calculated based on the current and constant currency. The GDP is a proxy for economics size.

3.6.3 Population

Population refers to the total number of human element or unit in the particular area to be studied. Statistically, it is any finite or infinite aggregation of individuals. The total number of the population is also called the universe. The Population is a proxy to

measure the economic size or market size in the Gravity Model. The population represents the market size in this analysis.

3.6.4 Distance

Distance is a proxy of transportation cost. Head (2000) said the distance between two trading countries is often measured using the great circle formula; it takes into account the longitude and latitude of the capital or "economic center" of each country. The long distance is not only an indicator of the high transportation cost, it also correlated with the differences in culture, which can lead to retard the transfer of information and the establishment of trust. Based on previous studies, most of the researchers expect negative sign between distance and trade in the gravity equation. Therefore, in this analysis, the sign should be negative also.

3.6.5 Real Exchange Rate

The exchange rate represented the explanatory variable, also known as independent variable. The function of the independent variable is to influence the dependent variable in a direct or inverse way. Inflation is a proxy of price, but in this case the exchange rate has the same role as inflation, and it can also define purchasing power parity. The exchange rate works by computing the local currency per unit of foreign currency by adjusting the domestic and foreign inflation.

CHAPTER FOUR

RESULT AND DATA ANALYSIS

4.0 Introduction

This chapter discussed the estimating result of the study obtained through the Gravity Model. As usual gravity applied on the panel data that have the full information about the Malaysia's trade with the selected EU countries. Estimation of the time period t=2000-2012 and across six countries, including Malaysia, which implies 5 pairs of cross-observations data.

Chapter five is divided into three sections; the first section is on the Basic Gravity Model, the second section pertained to the Augmented Gravity Model while the last section is about Trade Potential. The difference between the Basic Gravity Model and the Augmented Gravity Model is in term of the number of variables. This study adopted the method as suggested by Nazia and Hafiz (2005). The main objective for choosing this method is to check the consistency of the results. The selected estimation may be changed due to the number of variables.

4.1 Basic Gravity Model

The estimation of the Basic Gravity Model in equation (1) is as follows:

$$\ln trade_{ij} = A + \beta_1 ln(GDP_i . GDP_j) - \beta_2 \ln(\text{Distance}_{ij}) + \varepsilon_{ij} \quad (1)$$

The estimation results of the bilateral trade between Malaysia and the selected EU countries using equation (1) were presented in Table 5.1. The first column showed the results following the Fixed Effect method as suggested by Cheng and Wall (2005). Results from the Pooled Estimation and Random Effect were reported in column two and three.

Table 4.1
The Basic Gravity Coefficient

Method	**Pool estimation**		**Fixed Effect**		**Random Effect**	
Variable	**Coefficient**	**P-value**	**Coefficient**	**P-value**	**Coefficient**	**P-value**
Constant	46.78244 (24.4273)	0.060 *	13.54687 (4.866513)	0.007***	48.12754 (116.5173)	0.68
Gdp_mas	.4320853 (.1856696)	0.023**	.9758671 (.2053833)	0.000***	.7800307 (.1757769)	0.000***
Gdp_partner	.5711042 (.0921047)	0.000***	-.3850193 (.3282017)	0.246	-.0406831 (.2684074)	0.88
Distance	-7.904895 (2.601583)	0.003***	___	___	-7.175146 (12.62607)	0.57

The result is as reported in Table 5.1 above. The Basic Gravity Model applied three tests panel analysis consisted of Pool Estimation, Fixed Effect and Random Effect. As reported above, the first explanation went to Pool Estimation. Both the traditional variables were also known as basic variables, the GDP for both countries and distance, were found to be significant.

In the first model, only two variables fulfilled the expected sign of GDP, Malaysia and distance; GDP, Malaysia was positive while the distance was negative. Balassa (1966), Balassa and Bowens (1987), Stone and Lee (1995), and Clark and Stanley (2003), found a negative relationship between trade and distance by empirical studies. Blomqvist (2004) and Shaista Khan et al (2013) found a positive relationship between GDP and trade.

Some expected signs were revealed in this test. As the GDP increased by 1%, it will cause Malaysia's bilateral trade to be increased by 0.57%. For 1 % increase in the GDPs in both countries, Malaysia will increase its trade by 0.432%, while the EU's trade will increase by 0.57%.

The coefficient of the distance indicated that as proxy transportation cost, the coefficient must be negative. A 1% increase in the distance will cause the decline of approximately 7.90% in bilateral trade between Malaysia and the selected EU countries. The cost of transportation will be the main obstruction. Hence, theoretically both variables have consistent result as per the hypothesis. The hypothesis is that Malaysia's trade has a positive relationship with the GDP, and a negative relationship with distance. Economic size has a direct impact to the trade, while transportation cost inversely related to the trade.

The Fixed Effect Model reported that distance was omitted due to the collinearity problem. The GDP of the EU was not able to explain the bilateral trade, but the coefficients indicated a negative relationship. When the EU's economic growth increased by 1%, the trade with Malaysia declined by 0.24%. Even though the GDP of the EU

cannot be one of the Malaysian trade determinants in term of the Basic Model, practically the trade volume was influenced by the GDP growth.

An increase of 1% in the GDP of Malaysia will cause the bilateral trade to increase by 0.97%. Hausman test was adopted to determine which test is most suitable and reliable for this model. The result showed that the probability of Chi-square is less than 0.05, thus indicated that the Fixed Effect is more reliable and is able to explain the entire significant variables. Hausman test was applied to the data to choose the best model.

Hausmen test was adopted to determine which test is most suitable and reliable for the first case which was the Basic Gravity Model, P-value =0.1895>0.05. Random effect was determined to be the best model. The P-value of the vce robust was 0.00.

4.2 Augmented Gravity Model

The estimation results of bilateral trade between Malaysia and selected EU countries using equation (2) were given in Table 5.2. The Pool Estimation results were displayed in the first column as per the method suggested by Cheng and Wall (2005). The results from Fixed Effect and Random Effect were reported in column two and three respectively:

$$\ln trade_{ij} = \alpha_0 + \beta_1 ln(GDP_{it}) + \beta_2 ln(GDP_{jt}) + \beta_3 ln(GDPi_{it}) + \beta_4 ln(GDPi_{jt}) + \beta_5 \ln POP_{it} + \beta_6 \ln POP_{jt} + \beta_7 \quad ER_{ijt} + \beta_8 \ln DIS_{it} + \varepsilon_{ij} \qquad (2)$$

Table 4.2
The Augmented Gravity Model Coefficient

Method	**Pool Estimation**		**Fixed Effect**		**Random Effect**	
Variable	**Coefficient**	**P-value**	**Coefficient**	**P-value**	**Coefficient**	**P-value**
Constant	-7.599734 (50.99298)	0.882	200.1478 (64.08388)	0.003***	-7.599734 (50.99298)	0.882
Gdp_mas	-1.768533 (1.310427)	0.183	-.3574758 (.9419548)	0.706	-1.768533 (1.310427)	0.177
Gdp_partner	2.066367 (.9074434)	0.027**	1.94035 (.6600192)	0.005***	2.066367 (.9074434)	0.023**
Gdpi_mas	5.643439 (4.447947)	0.210**	7.179621 (3.13864)	0.026**	5.643439 (4.447947)	0.205
Gdpi_partner	5.896097 (1.021627)	0.000***	-4.423316 (1.87776)	0.022**	5.896097 (1.021627)	0.00***
Population_mas	-.695491 (3.758035)	0.854	-4.51651 (2.771025)	0.109	-.695491 (3.758035)	0.853
Population_pnr	-1.227526 (.8968373)	0.177	-10.632 (2.772487)	0.000***	-1.227526 (.8968373)	0.171
Exchange rate	13.96696 (3.679669)	0.000***	10.00915 (2.648173)	0.000***	13.96696 (3.679669)	0.00***
Distance	9.15082 (1.488899)	0.000***	___	___	-9.15082 (1.488899)	0.00***

The Augmented Gravity Model equation tested using three estimation methods. The result was consistent with the Basic Gravity Model. The estimated coefficient fulfilled the expected sign, however some of the variables had unexpected sign except for distance case which was omitted due to the collinearity problem. Nevertheless, the magnitude of the coefficients in that estimation was slightly different. The Fixed Effect Model was the base of the estimation. The result of Pooled Estimation and Random Effect appeared alike, but a bit different in the p-value. This part explained the result of

the test, but the best test explanation along with the economic relations between the EU and Malaysia will be provided.

Pool Estimation and Random Effect showed that the GDP of Malaysia has a negative relationship with the bilateral trade, and since the p-value was not significant, the value cannot be explained. The Malaysian population and the population of the EU were also unable to explain the relationship between these two countries, as the number of the population represented the market size in the economy. The rest of the variables, such as GDP of EU, GDP per capita Malaysia, GDP per capita EU, the exchange rate and distance can be explained and the expected relationship was positive. However, for the GDP of the EU, a negative relationship was indicated by this model. This was due to the trade data that represented the export data of Malaysia in the EU; when the GDP of the EU increased by 1%, the trade will fall by 1.76%.

The best test for the second model is the Random Effect. The distance in the Random Effect showed a negative relationship. As the distance increase, the transportation cost will increase as well, and it will reduce the trade volume between the two countries.

The Malaysian GDP has a negative relationship with the bilateral trade. As trade data represented export data to selected EU country, if the GDP of Malaysia increases by 1%, the trade will fall about 1.76%, but this variable cannot explain the bilateral trade between the EU and Malaysia because the P-value is not significant.

The GDP partner has a positive relationship and is significant at level 5%. The GDP partner increase by 1%, the trade will increase by 2.06 %. The increment in the GDP partner will increase the trade in Malaysia as well. If a nation's income increased, logically its citizen tends to prefer an imported product over local product. Subsequently, the positive impact is, it will increase the Malaysian GDP as well as the export volumes.

The GDP per capita has the same relationship with the GDP; when Malaysian GDP per capita increased, the trade will increase as well. Similarly, if the GDP per capita partner increased, the trade volume will also increase. The Malaysian GDPi has a positive relationship with the trade; if the GDPi increase by 1%, Malaysian export will increase by 5.64 %. The GDPi partner has a positive trade relationship with Malaysia. A 1% increase in GDPi partner will increase the trade at 44%. If the Malaysian GDP per capita increases, people are more productive due to wage encouragement. As the wage increase, workers will be more motivated to work, thus the production level will increase. A higher production generally means that the producer tends to export more to the trade partners; consequently the trade volume will increase.

The GDPi partner has a positive relationship because the increase in the GDP per capita, motivates the workers as well. The welfare of the workers increases too. The production and the market of the product will increase, and people will export and import more. The volume of import that represents the Malaysia exports increase. People will have enough products and preferably a product produced by its own country. The excess of the production will be exported to other countries; it will increase the GDPi continuously.

Martinez and Nowak (2003) found that the population has a negative relationship and distance was omitted in the reported results. There were a few ways to solve the collinearity problem, namely the 2SLS. However, Martinez and Nowak (2003) did not perform the test. They did more regression to get different results.

If the population of the trading partner increased by 1%, then the trade will be decreased by 1.71%. The population is a reflection of the market size. The function of a population is significant to the GDPi. When the population increases, of course the number of workers will increase. The more workers in the market, the more products will be produced. There will be a variety of products, and consumers will generally prefer local product due to cheaper price compare with imported products. The increase number of the population will also give a positive impact to the origin country, but it has the inverse relationship with the partner country. The volume of partner country will drop, while the volume of import increased.

The exchange rate has a positive relationship with the trade volume. The exchange rate data refers to the EU dollar currencies. For instance, assuming RM1 equal to 0.25 Euro dollars; the increase in the exchange rate by 1% will cause an increase in the trade by 10%. If the exchange rates increase and the RM depreciate from RM1 to RM 1.25 to 0.25 Euro dollar. The volume of export trade might increase as well because the goods and services in Malaysia will be relatively cheaper, while the import will decrease. At the end of the day, RM will appreciate until it achieves equilibrium. The supply and demand of the global market have the power to influence the currency value.

Hausman test was applied to the data to choose the best model, and for the second case it is an Augmented Gravity Model, P-value =0.1895>0.05. Random effect is the best model. The P-value of the Vce robust is 0.0401.

4.3 Trade Potential

On the Trade Potential estimation, the results were obtained from the Augmented Gravity Model in equation (2) by applying the speed of convergence of the fixed model, in order to calculate the coefficient of Trade Potential between Malaysia and selected EU countries. To calculate the speed of convergence as the ratio value of the Trade Potential, the average growth rate of the potential was divided by the actual growth rate over the duration of the data studied that is thirteen years.

Table 4.3
The Trade Potential Coefficient

Country	**Trade potential**
Germany	-.6002927
France	-.2885648
United Kingdom	-1.772003
Netherlands	.0952728
Belgium	-1.641649

The result indicated that the Trade potential with the Netherlands is overused, while the rest of the country is underused. Obviously there is still a considerable room to

trade between Malaysia with Germany, France, United Kingdom and Belgium. The distance is not a matter of trade in this case because those countries are in the same region; hence the distance is relatively the same.

Based on some published articles or news on recent activities between Malaysia and selected EU countries, it seems both countries seek more opportunities to increase their trade volume. The trade potential with Germany was 6%, France about 2.8%, United Kingdom 17%, and Belgium at 16%. The top trading partner almost fulfills the need and maximized the trade. Belgium and United Kingdom need to have more trade agreement to increase the volume of trade. Each of the selected EU countries has different expertise and specialize market. Malaysia relies on this unique expertise and specialize market of each country. Chapter Two explained thoroughly the beginning of trade, the progress of trade, the performance of trade, and the goods and services that involved in each trade.

CHAPTER FIVE

CONCLUSION AND DISCUSSIONS

6.1 Summary and Discussions.

The main purpose of this analysis is to find out the factors influencing the level of trade between Malaysia and the selected EU countries using the Gravity Model, and to evaluate whether there are any potential for growth in trade between Malaysia and those countries. In this respect, a Gravity Model has been estimated with panel data and pooled, random, and fixed effect estimation over the period of twelve years from 2000 to 2012.

The main result indicated that the bilateral trade flows between Malaysia and selected EU countries were driven by economic size, market size, distance and exchange rate. Population and Malaysia's economic size, however, seem to have no effect on the bilateral trade between Malaysia and selected EU countries. The potential trade between Malaysia and most of the selected EU countries were underused with plenty of room to explore.

There were only four variables out of eight that were significant in this study. These variables directly affected the trade between Malaysia and the selected EU countries. The GDP of the EU countries and trade have a positive relationship. Since the trade represents an export trade of Malaysia to the EU countries, it clearly showed that the GDP of the EU countries will generate more trade for Malaysia. The EU countries will

stimulate the economic development in Malaysia through the trade channel. Malaysia and the EU classified their trade relation as traditional trading partners, thus there were numerous agreement signed between Malaysia and the EU. Bilateral trade between Malaysia and selected EU countries increased, according to the economic size and market size. This implied that the economic growth of individual economies will strongly affect trade relationship between countries. Malaysia's policy makers therefore, must consider important issues such as a stable and strong policy, and attractive business environment that contributed to a high growth rate of a country.

GDP per capita as a subset of GDP, is a smaller portion and has detailed information about income per capita of the citizen. The relationship between trade of Malaysia and GDP per capita of selected EU countries is positive. More attractive product must be produced in order to attract more trade among these countries.

Exchange rate as a proxy of currency and the relationship is positive. When the RM value depreciates, the import will increase. There is an inverse relationship because foreigners are more interested to buy more Malaysian products if it is cheaper than others. This is a natural phenomenon in economics and it does not need government intervention to stabilize the RM. The demand and supply, also known as the invisible hands will influence the RM value; to depreciate or appreciate. Bank Negara Malaysia (BNM) should manage the exchange rate movement efficiently in order to boost trade between Malaysia and selected EU countries.

Coefficient of distance is consistent with the expected sign. Distance and trade have a negative relationship as found by Tinbergen (1962). Other studies proved that distance

always represents inverse relationship. Nowadays, the distance is not an issue of trade; it's just a proxy of transportation cost. The cost becomes cheaper due to the variety of technologies in the transportation world. Since the Gravity Model itself represent the trade in the distance, to prove the consistency of the result is important, even if this variable is not reliable in the trade.

Malaysia has a positive trade with the EU countries; however, in general, it has not fully realized its trade potential with the selected EU countries. This finding is extremely important for the policy maker because exploiting these trade potentials are expected to contribute to the trade diversification for Malaysia. This is achieved by going into more bilateral trade agreement with individual and selected EU countries; both large countries and small countries that have trade potential such as Belgium. As stated in the previous chapter, the possibility for trade is huge as the trade between Malaysia and selected EU countries have not been fully exploited. The trade opportunity is vast in the industry of goods, service products and investment.

The EU is one of the traditional markets in Malaysian economic; however the government should focus and be alert if it has any new product or services that can be offered to the EU countries. The consumers' product preferences are diverse and are not rigid. More numbers of business lead to the consumers' needs being fulfilled. Germany, France, United Kingdom and Belgium as Malaysian trading partners, have huge potential to trade more products and services. Each country has its own specialization products and field of expertise; Malaysia will definitely benefit from having bilateral trade with these countries.

6.2 Recommendations

Future research may focus on the recession of the bilateral trade between Malaysia and the EU countries. Additionally, attention should be given to the tendency to trade intensively with a single market, as per the disaggregated data, such as data for trade of food types as well as electrical and electronics products. Also, more control variables can be included in the analysis, such as dummy variable and trade agreement. By applying the same method of analysis, a more comprehensive study that may cover the whole of the EU regions is possible.

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