



UNIVERSITI PUTRA MALAYSIA

***TRADE OPENNESS, GROWTH, INCOME INEQUALITY AND
ENVIRONMENT IN DEVELOPING AND OECD COUNTRIES***

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**TRADE OPENNESS, GROWTH, INCOME INEQUALITY AND
ENVIRONMENT IN DEVELOPING AND OECD COUNTRIES**

By

JAMILAH BINTI IDRIS

**Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in
Fulfilment of the Requirement for the degree of Doctor of Philosophy**

January 2015



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MY PARENTS

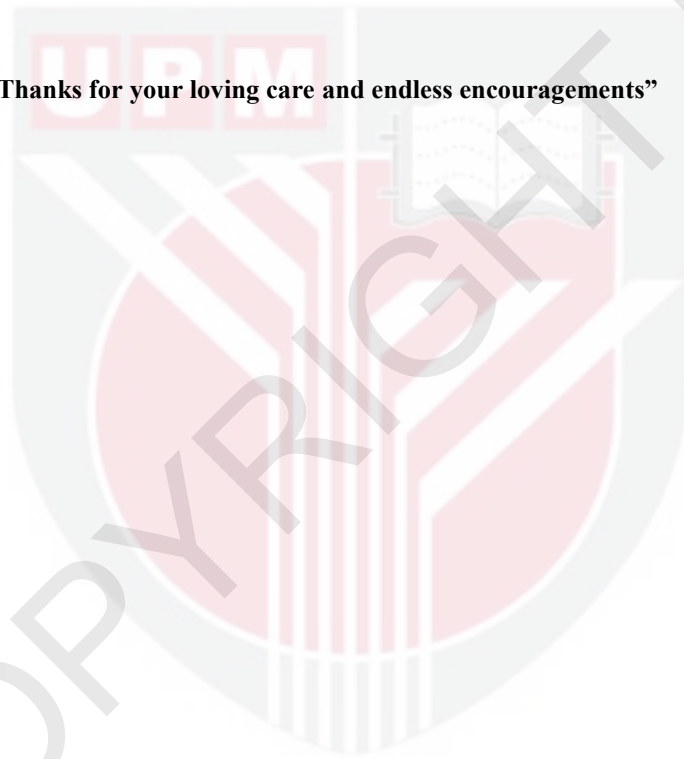
AND

MY BELOVED HUSBAND (MUHIDIN MAHMUD)

AND

CHILDREN (ADAM AND ADIVA)

“Thanks for your loving care and endless encouragements”



Abstract of the thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of requirement for the degree of Doctor of Philosophy

TRADE OPENNESS, GROWTH, INCOME INEQUALITY AND ENVIRONMENT IN DEVELOPING AND OECD COUNTRIES

By

JAMILAH BINTI IDRIS

January 2015

Chairman: Professor Zulkornain Bin Yusop, PhD
Faculty: Economics and Management

Trade openness can be very important for country's development and economic growth. Much of the debates have focused on the role of trade openness on growth even though it can also be related to income inequality and environment. The objective of this study is to investigate the relationship between trade openness, economic growth, income inequality and environment in a global perspective covering 87 selected countries, which is comprises the Organisation for Economic Co-operation and Development (OECD) and developing countries for the period 1977 to 2011. The first objective is to determine the impact of trade openness on economic growth, while the second objective is to analyse the relationship between trade openness and income inequality, and the third objective is to determine the impact of trade openness on environment. This study employs the system Generalized Method of Moments (GMM), a method popularized by Arellano and Bond (1991), and Blundell and Bond (1998). Our result suggests that trade openness has positive impact on economic growth in all countries (87), OECD and developing countries. Although trade openness is important for growth stimulation, opening up new markets and exposing domestic firms to international practices, trade can create the necessary conditions for poverty alleviation. Our study found that trade openness has improved income inequality in developing countries which support the Heckscher Ohlin theory except for OECD countries. Finally, our results suggest that openness along with the other variable such as economic growth, foreign direct investment and manufacturing value added do have positive impact on CO2 emission. Comprehensive environmental policies, legislation, and the role of institutions are important in order to manage the CO2 emission problem. Policy makers should also put more thought on promoting growth through trade but also how the benefit from the growth is well distributed across the population while keeping the environment clean and healthy.

Abstrak tesis yang dikemukakan kepada senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Doktor Falsafah.

**KETERBUKAAN PERDAGANGAN, PERTUMBUHAN,
KETIDAKSAMARATAAN PENDAPATAN DAN ALAM SEKITAR DI
NEGARA SEDANG MEMBANGUN DAN NEGARA OECD**

Oleh

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Keterbukaan perdagangan boleh menjadi sangat penting untuk pembangunan negara dan pertumbuhan ekonomi. Terdapat banyak perbincangan tertumpu kepada peranan keterbukaan perdagangan kepada pertumbuhan walaupun keterbukaan perdagangan juga boleh dikaitkan dengan ketidaksamarataan pendapatan dan alam sekitar. Objektif kajian ini adalah untuk mengenalpasti hubungan diantara keterbukaan ekonomi, pertumbuhan ekonomi, ketidaksamarataan pendapatan dan alam sekitar pada perspektif globalisasi yang merangkumi 87 negara-negara terpilih, yang dibahagikan kepada OECD dan negara-negara sedang membangun untuk tempoh 1977 hingga 2011. Objektif utama adalah untuk menentukan kesan keterbukaan ekonomi keatas pertumbuhan ekonomi, sementara objektif kedua adalah untuk menganalisa hubungan diantara keterbukaan perdagangan dan ketidaksamarataan pendapatan dan objektif ketiga adalah untuk menentukan kesan keterbukaan perdagangan terhadap alam sekitar. Kaedah sistem "Generalized Method of Moments (GMM) yang dipopularkan oleh Arellano dan Bond (1991) dan Blundell dan Bond (1998), telah digunakan dalam kajian ini. Hasil kajian mendapati keterbukaan ekonomi memberi kesan positif keatas pertumbuhan ekonomi di semua negara (87), OECD dan negara-negara sedang membangun. Walaupun keterbukaan perdagangan penting untuk menjana pertumbuhan, ia juga boleh menghasilkan keperluan bagi menghapuskan kemiskinan dengan membuka pasaran baru dan memperkenalkan firma dalaman kepada latihan antarabangsa, Kajian ini mendapati keterbukaan perdagangan memperbaiki ketidaksamarataan pendapatan di negara-negara sedang membangun kecuali negara OECD. Akhir sekali, hasil kajian mencadangkan keterbukaan bersama dengan pembolehubah yang lain seperti pertumbuhan ekonomi, pelaburan langsung asing dan perkilangan nilai tambah memberi kesan positif keatas pencemaran karbon dioksida. Polisi persekitaran yang komprehensif, pembentukan

undang-undang dan peranan institusi adalah penting untuk mengendalikan masalah pencemaran karbon dioksida. Pembuat polisi sepatutnya memikirkan tentang promosi untuk pertumbuhan melalui perdagangan dan juga bagaimana faedah pertumbuhan itu diagihkan sebaiknya dikalangan penduduk sementara alam sekitar terjaga bersih dan sihat.



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I certify that a Thesis Examination Committee has met on 27 January 2015 to conduct the final examination of Jamilah Binti Idris on her thesis entitled "Trade Openness, Growth, Income Inequality and Environment in Developing and OECD Countries" in accordance with the Universities and University Colleges Act 1971 and the Constitution of the Universiti Putra Malaysia [P.U.(A) 106] 15 March 1998. The Committee recommends that the student be awarded the Doctor of Philosophy.

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LIST OF ABBREVIATIONS

BMP	Black Market Premium
BOD	Biochemical Oxygen Demand (Organic Water Pollution)
CO ₂	CO ₂ Emission
EHII	Estimated Household Income Inequality
EKC	Environmental Kuznets Curve
FDI	Foreign Direct Investment
FGLS	Feasible Generalized Least Square
GATT	General Agreement on Tariffs and Trade
GCF	Gross Capital Formation
GDP	Gross Domestic Product Per Capita
GHG	Greenhouse Gases
GINI	Gini Coefficient Index
GLS	Generalized Least Square
GMM	Generalized Method of Moments
GOV	Government Expenditure
HC	Human Capital
ILO	International Labor Organization
IMF	International Monetary Funds
LDCs	Least Developing Countries
LSDV	Least Square Dummy Variable
MDGs	Millennium Development Goal
MNCs	Multinational Corporations
MVA	Manufacturing Value Added
NAFTA	North America Free Trade Agreements
OECD	Organizations for Economic Co-operation and Development
OLS	Ordinary Least Square
PHH	Pollution Haven Hypothesis
PPP	Purchasing Power Parity
R&D	Research and Development
RO	Real Openness
TFP	Total Factor Productivity
TO	Trade Openness
U	Unemployment
UN	United Nations
UNCTAD	United Nations Trade and Development Conference
UNEP	United Nations Environment Programme
UNFCC	United Nations Framework Convention on Climate Change
UNIDO	United Nations Industrial Development Organization
UNMS	United Nations Millennium Summit
UNSD	United Nations Statistics Division
US	United States
UTIP	University of Texas Income Project
WDI	World Development Indicators
WTO	World Trade Organizations

CHAPTER 1

BACKGROUND OF THE STUDY

1.1 Introduction

Openness in trade alludes to the degrees in which nations allow in trade with the other countries. It is incorporated the trading activities such as import and export and foreign direct investment (FDI). Open economies by and large more prominent business opportunities, in the meantime they additionally confront more prominent rivalry from organizations situated in different nations. Due to the trade openness, the country has seen rapid growth of the world economy in recent decades.

Some countries have opened their economies to take full advantage of the opportunities for economic development through trade. Integration into the world economy has proven a powerful means for countries to promote economic growth and development. Over the past 20 years, the growth of world trade has increased at the averaged 6 percent per year, twice as fast as world output (International Monetary Fund, 2001). Thus, joining of the world economy has raised living norms far and wide.

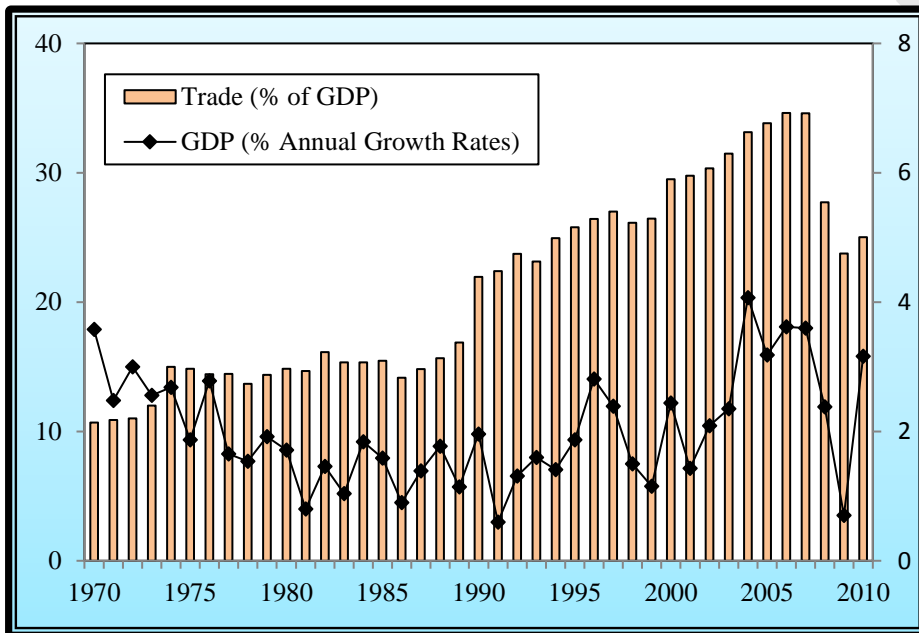
Nonetheless, the benefit of growth has been unevenly spread. Despite the fact that the normal worldwide salary in 2005 surpasses \$5,100 US every individual a year, 2.8 billion individuals (2 in 5) still make due on salaries of short of what two dollars a day. One every poor of the world's wealthiest persons acquire as much wage as the poorest 57%. Furthermore, the growing inequality between and within the countries hints no lessening (UNEP, 2005).

Most of the developing countries open their economies to international trade. Generally, advance has been extremely noteworthy for several of developing countries in Asia and, to a lesser extent, in Latin America. These nations have ended up successful of the fact that they decide to take part in worldwide trade, helping them to attract the bulk of foreign direct investment in developing countries.

Then again, advance has been less quick for some different nations, especially in low income countries such as Sub Saharan Africa and South Asia. In 2001, around 313 million individuals stayed poor in Sub Saharan Africa. The higher rates of economic growth are obliged to lift them up over the poverty line. These problems represent the greatest challenges to development (World Bank, 2005).

Figure 1.1 shows that the trade shares of GDP in developing countries are growing up since 1980 through to 2005. However, the GDP growth rates are fluctuating and opposite from the trade shares of GDP. This is also happen in OECD countries as shown in Figure 1.2. Clearly, higher (or lower) trade level does not necessarily lead to a higher (or lower) economic growth.

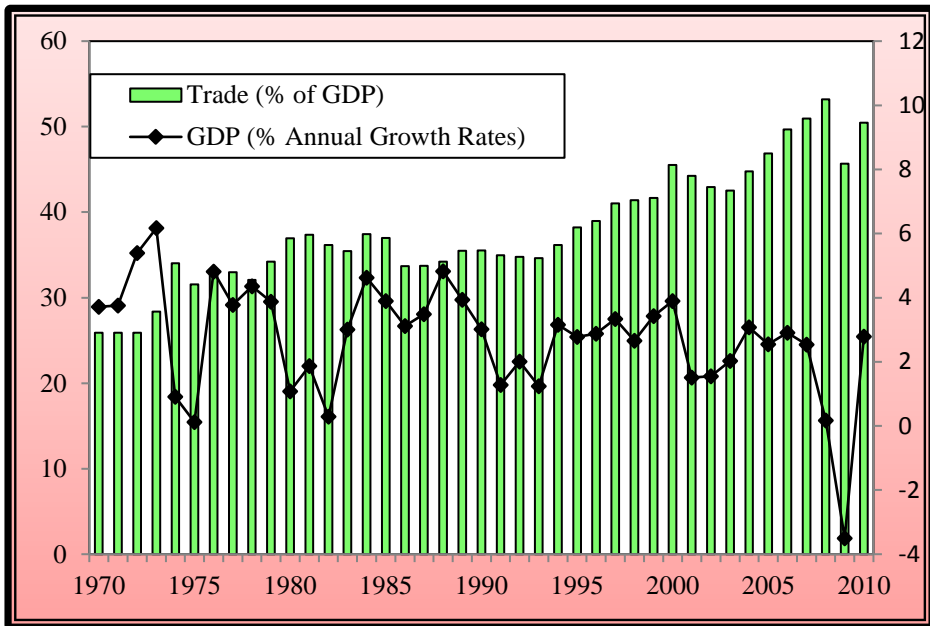
Figure 1.1: Trade and GDP in Developing Countries



Note: Trade is defined as an exports plus imports as a percentage of GDP.

Source: World Bank, World Development Indicators, available on-line.

Figure 1.2: Trade and GDP in OECD Countries



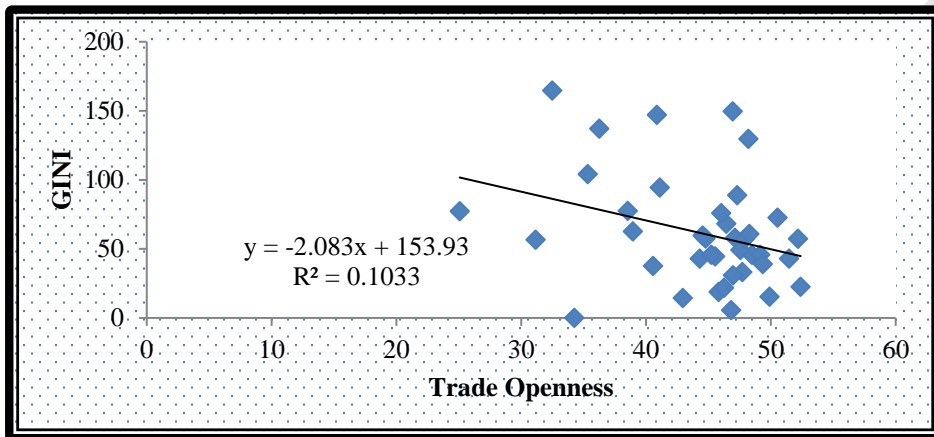
Note: Trade is defined as an exports plus imports as a percentage of GDP.
 Source: World Bank, World Development Indicators, available on-line.

By opening up new markets, presenting domestic firms to global practices, and bringing new investment and growth, trade can also be related to poverty alleviation. Then again, the social impacts associated with trade and investment can be distributed differently amongst countries and different groups within nations by income distribution and inequality. This is on account of openness can prompt transitional aggravations in the markets on which the poor operate.

Openness is likely to have major effects on the price of factors of production such as wages which are the most important for poverty elimination purposes. If the reform boosts the demand for labour-intensive products, it will increase the demand for labour and afterward either wages or employment, or both, will increment. Whether this will lessen relies on upon whether the poor are emphatically spoken to in the type of labour for which demand has expanded (Ben David et.al., 1994 in OECD, 2001).

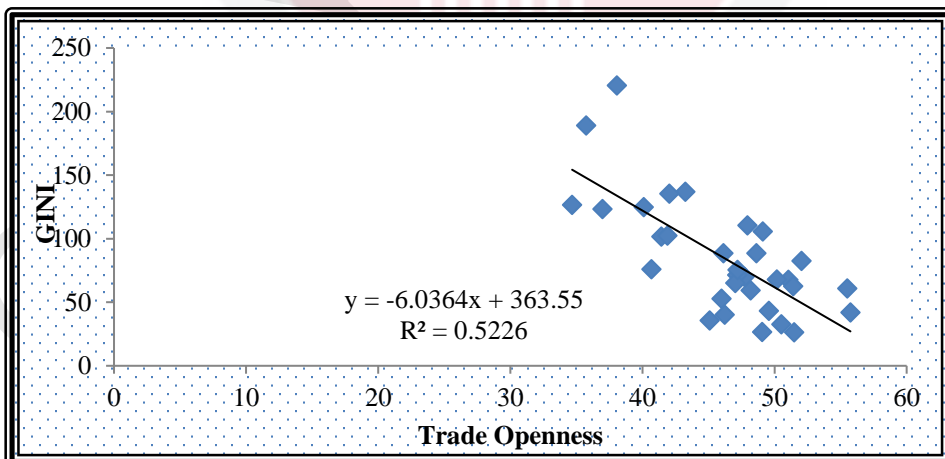
Figure 1.3, 1.4 and 1.5 shows that inequalities are (improved) negatively related to growth in developing countries. Meanwhile, figure 1.6, 1.7 and 1.8 shows that inequalities are also (improved) negatively related to growth in OECD countries.

Figure 1.3: Trade (% of GDP) and Gini Coefficient in 59 Developing Countries (1980)



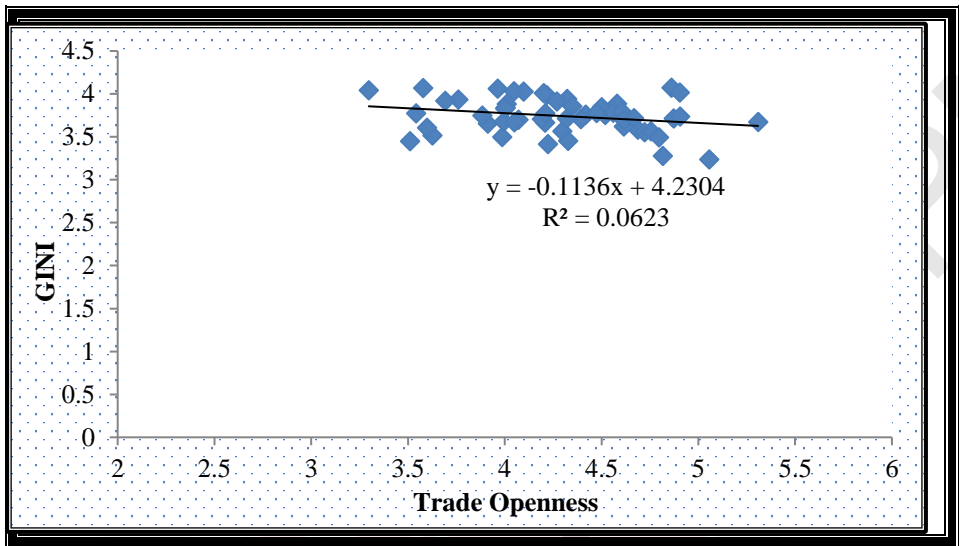
Source: Estimated Household Income Inequality, University of Texas Income Inequality Project.

Figure 1.4: Trade (% of GDP) and Gini Coefficient in 59 Developing Countries (1990)



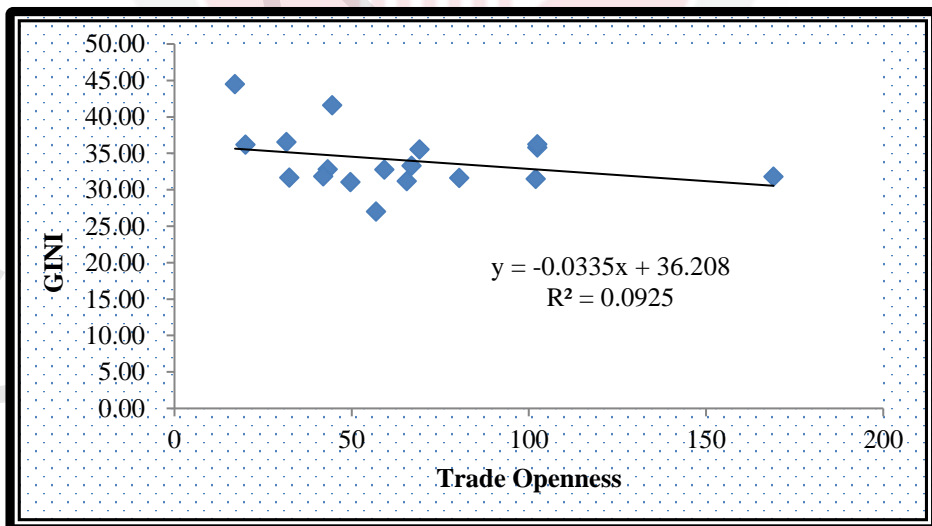
Source: Estimated Household Income Inequality, University of Texas Income Inequality Project.

Figure 1.5: Trade (% of GDP) and Gini Coefficient in 59 Developing Countries (2008)



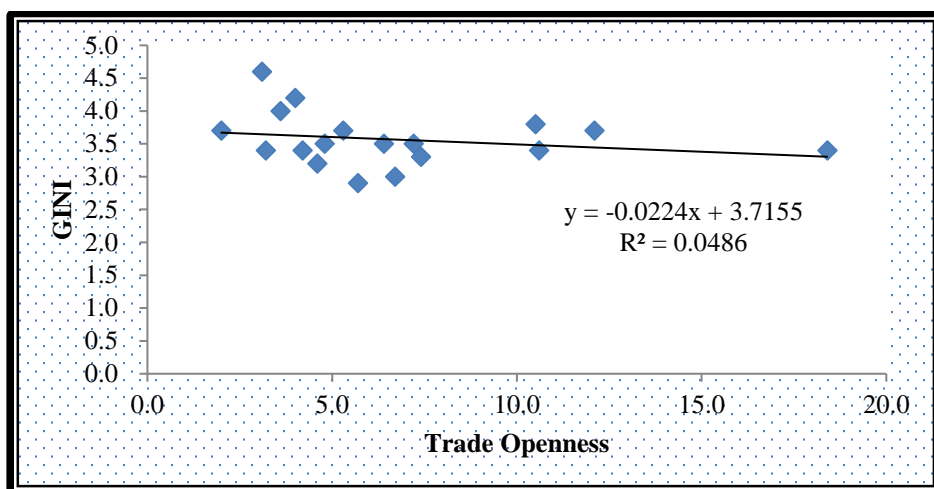
Source: Estimated Household Income Inequality, University of Texas Income Inequality Project.

Figure 1.6: Trade (% of GDP) and Gini Coefficient in OECD Countries (1980)



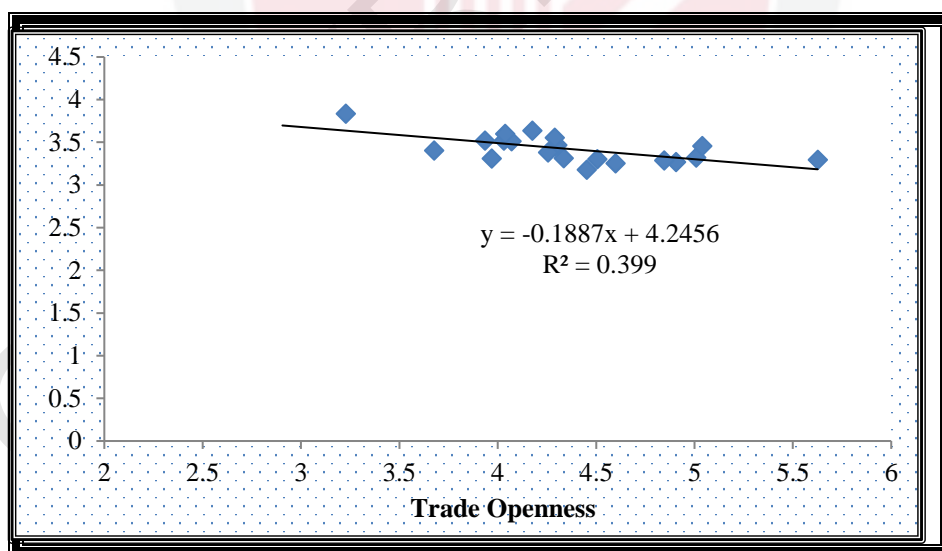
Source: Estimated Household Income Inequality, University of Texas Income Inequality Project

Figure 1.7: Trade (% of GDP) and Gini Coefficient in OECD Countries (1990)



Source: Estimated Household Income Inequality, University of Texas Income Inequality Project

Figure 1.8: Trade (% of GDP) and Gini Coefficient in OECD Countries (2008)

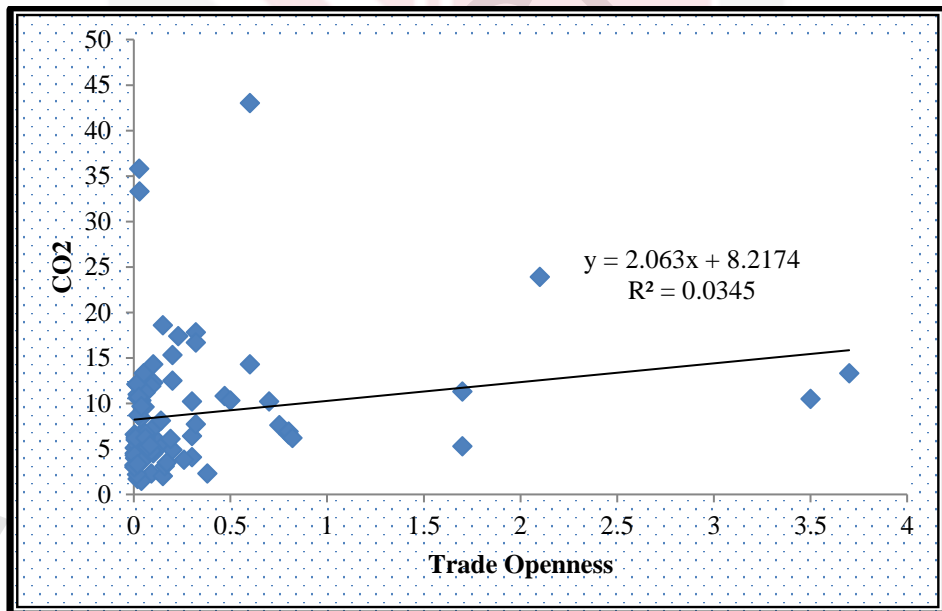


Source: Estimated Household Income Inequality, University of Texas Income Inequality Project.

Although trade is important to stimulate growth, it can also allow powerful global demand to deplete countries' natural resources and create increased pollution (OECD, 2001). Figure 1.9, 1.10 and 1.11 shows the CO2 emissions are positively related to growth in developing countries. The growth in international firm activities may worsen the environment in countries. This is because most of the economic activities are related to the environmental resources such as metals and minerals, soil, forests and fisheries. Many chemicals, organisms, wastes and other materials traded can have significant environmental impacts, and thus create pollution (UNEP, 2005).

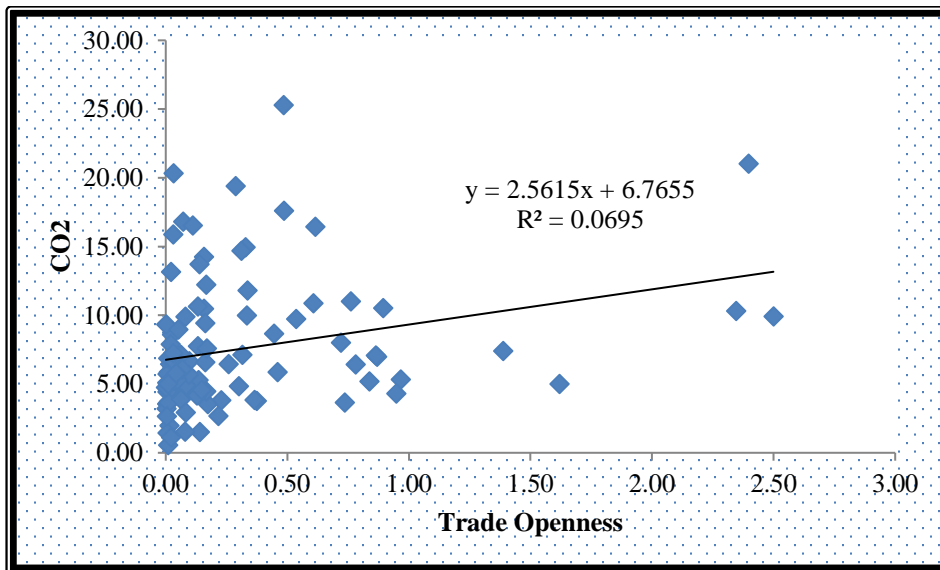
However, figure 1.12, 1.13 and 1.14 shows that CO2 emissions are negatively related to growth in OECD countries. Meaning that the pollution haven hypothesis (PHH) exist in less develop than develop nations. The migrations of dirty industry from develop to developing countries. High income country, where the environmental regulation are usually more stringent than low income country usually experience that openness does not affect the CO2 emission.

Figure 1.9: Trade (% of GDP) and CO2 Emission (Metric tons Per capita) in 59 Developing Countries (1980)



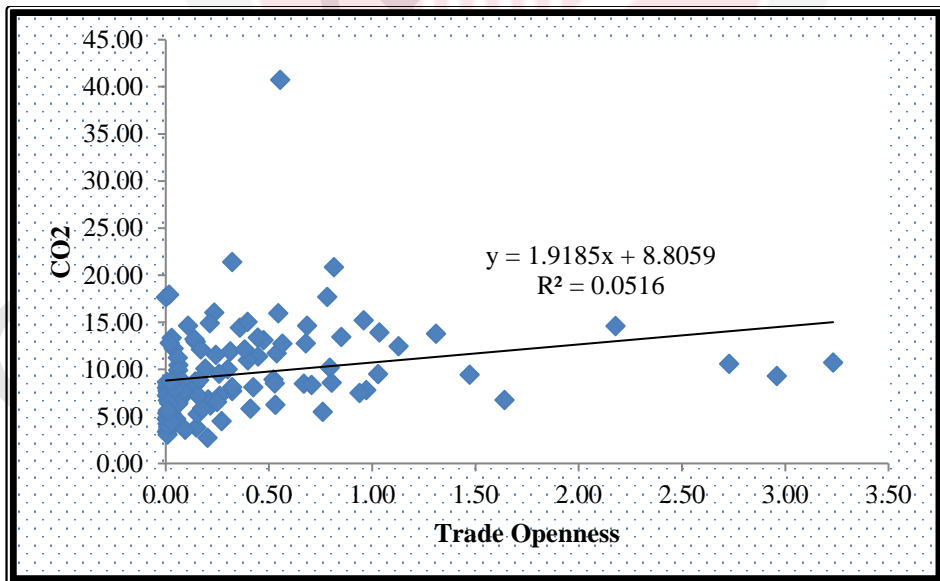
Source: United Nations Statistics Division (2012).

Figure 1.10: Trade (% of GDP) and CO2 Emission (Metric tons Per capita) in 59 Developing Countries (1990)



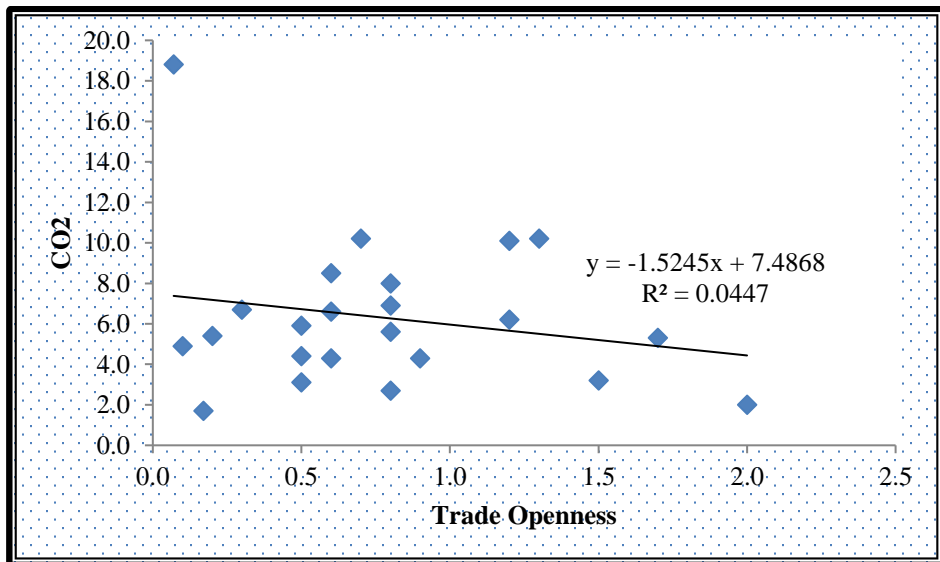
Source: United Nations Statistics Division (2012).

Figure 1.11: Trade (% of GDP) and CO2 Emission (Metric tons Per capita) in 59 Developing Countries (2008)



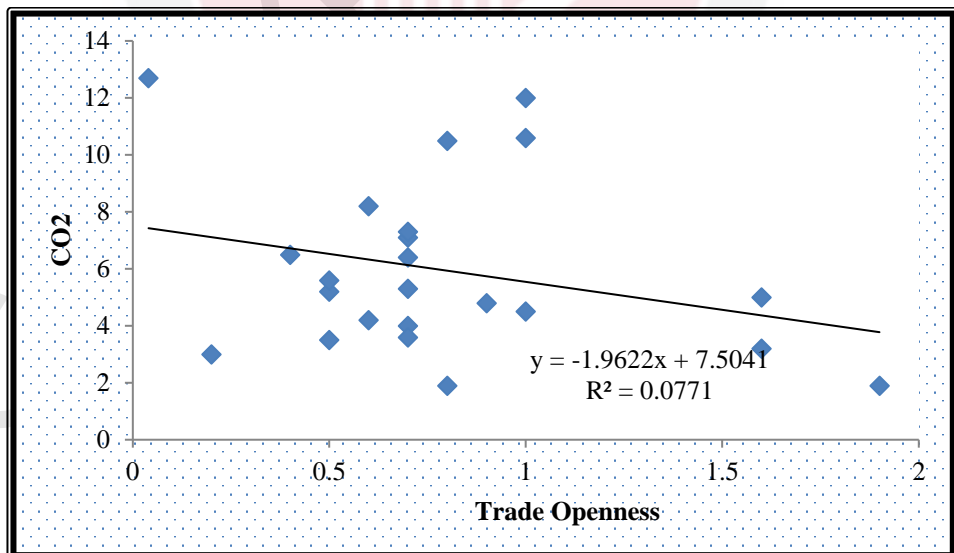
Source: United Nations Statistics Division (2012).

Figure 1.12: Trade (% of GDP) and CO2 Emission (Metric tons Per capita) in OECD Countries (1980)



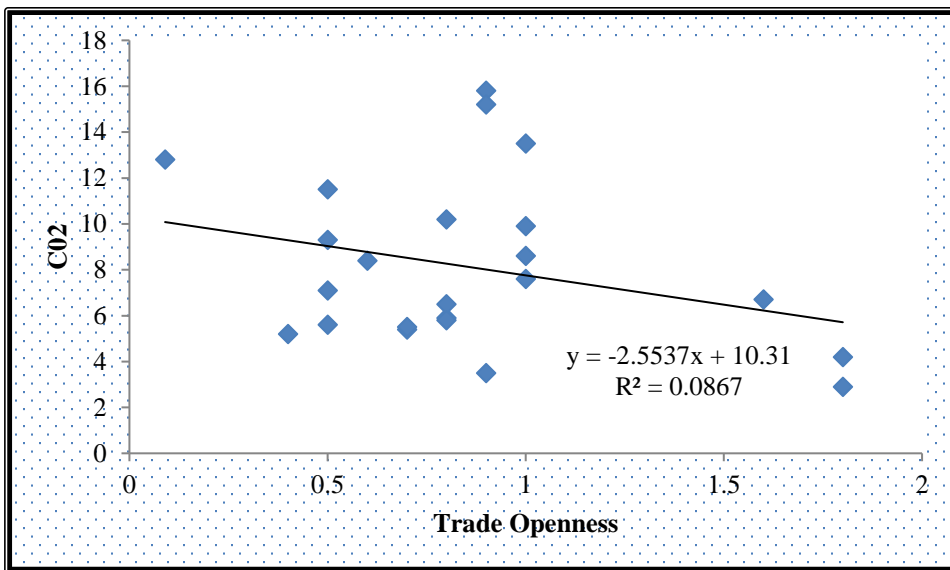
Source: United Nations Statistics Division (2012).

Figure 1.13: Trade (% of GDP) and CO2 Emission (Metric tons Per capita) in OECD Countries (1990)



Source: United Nations Statistics Division (2012).

Figure 1.14: Trade (% of GDP) and CO2 Emission (Metric tons Per capita) in OECD Countries (2008)



Source: United Nations Statistics Division (2012).

1.1 Problem Statement

Trade openness is important for growth. In the past decades, many countries have opening up their economies. Many active participants in international trade have experience success stories especially among developing countries. The high relationship or co-movement between level of trade (openness) and growth suggest the important impact of foreign sectors on economic growth. However, moving towards greater trade openness does not always lead to higher economic growth.

In this sense, the important studies on growth and trade liberalization by Rodriguez and Rodrik (1999), Sachs and Warner (1995), Edward (1998) and Frankel and Romer, (1999) are relevant, since they found a little empirical evidence to support the assertion that economic policies of liberalization are associated with economic growth. This view also supported by the World Bank (2002). However, study done by Jin (2000) finds that trade (openness) is not the main determinant of economic growth. Therefore, while conclusively identifying the effects of growth on trade still remain elusive for some time, it is possible for us to improve on many of the existing study.

International trade is a huge potential to stimulate growth. By opening up new markets, presenting domestic firms to worldwide practices, and bringing new investment and growth, trade can create the necessary conditions for poverty alleviation. Further trade liberalization in developing countries would help the poorest escape from extreme poverty. Economic growth is the most critical determinant and the fundamental condition for poverty reduction (Ames et al. 2002). The developing countries account a large number of poor people.

The population of the poor living on less than one dollar per day has increased from 474.4 million in 1987 to 552 million in the year 2000 (World Bank, 2003). One in every 5 persons, or some one billion persons, in these countries are desperately poor, living below the internationally accepted absolute poverty level of \$1 (1985 prices) per person day. Most of these absolutely poor are concentrated in sub-Sahara Africa and South Asia, and account for some 40-50 percent of population in several countries in these regions (Sud, 2006).

Eradicating poverty has become the international community's number one development objective. United Nations Millennium Summit (UNMS) has set a target to reduce the incidence of income-poverty in developing countries from 30 percent to 15 percent between 1990 and 2015. The problem is that further progress has stalled and the number of people living in poverty has remained at around 1.1 billion people in developing countries (WDI, 2005).

Rising inequality undermines growth and poverty reduction targets. With a specific end goal to meet the worldwide focuses for reducing poverty, it is essential to make pro-growth policies more distributional. It ought to spotlight on inequality at the national level, i.e. the distribution of income among people within a country.

The decreasing trend in income inequality in some developing countries (see Figure 1.3, 1.4 and 1.5 in page 6 and 7) appears to be consistent with the theorem of Stolper-Samuelson. The theorem implies that in a two country and two-factor framework. Increased trade openness (through tariff reduction) in a developing country where low-skilled labor is abundant would result in an increase in the wages of low-skilled workers and a reduction in the compensation of high-skilled workers, leading to a reduction in income inequality (Stolper and Samuelson, 1941).

Conversely, Barro (2000), Lundberg and Squire (2003) and Milanovic and Squire (2005) found that openness increases inequality. Inequality is higher in least developing countries where the average Estimated Household Income Inequality (EHII) index was around 45 percent in 1980 and reached almost 50 percent in 1999 (University of Texas Income Inequality Project).

Meanwhile, Edwards (1997), Ravallion (2001) and Dollar and Kraay (2002) found no significant relationship between trade globalization and inequality. Finding by Barro (2000) and Ravallion (2001) are different from Heckscher-Ohlin theory in developed countries. According to Heckscher-Ohlin theory, inequality increased in capital abundant country as a result of increased trade openness. Their study showed that trade openness appeared to experience decreased inequality with openness in developed countries.

Irrespective of this inequality trend, the estimated gini coefficients show high level of inequality in all developing countries as in indicated by the EHII used in this study (see Table A.1 in Appendix A). Meanwhile, the inequality trend in OECD countries shows decreasing number of inequality (see Table A.2 in Appendix A). Therefore, studying income inequality is important to ascertain whether trade promotes growth and whether such growths are distributed equally across the population.

Even though economic and social is important, we cannot ignore the environmental issue for development (Martinussen, 2004). Trade and the environment seem related to trade openness. The increasing trends in carbon dioxide have been accompanied by a rise in the average mean temperature of the earth or global warming. It also creates global issues such as ozone depletion and climate change. More significantly, this upward trend as shown in (Table B.1 in Appendix B) coupled with the setting of quantified international targets to reduce CO₂ emissions augment the important of examining the rhetoric in economic literature of a pollution haven existing in the countries that are less developed than developed nations.

1.2 Objective of the Study

Generally this study intends to examine the impact of trade on economic growth, income inequality and environment in 87 countries which is comprises OECD and developing countries, spanning years from 1977 to 2011. There are three objective of the study as follows:

- I. To examine the relationship between trade openness and economic growth.
- II. To analyse the relationship between trade openness on income inequality, and
- III. To determine the impact of trade openness on environment in develop and developing countries.

1.3 Significance of the Study

There are many existing studies to see the relationship between trade openness and growth. However, the paper which focused in current decades are still far less. In addition, developing and advanced (OECD) countries is divided in order to see the different angel and finding. In the growth equation model, conventionally, only foreign direct investment (FDI) is used as a proxy for private investment purposes.

However, this study are added Gross Capital Formation (GCF) in order to see the impact of domestic investment in the countries. This is because using capital formation measures were originally provides a true picture of investment and growth of the "real economy" in which goods and services are produced using tangible capital assets (United Nation, 2014).

Moreover, these studies are using two openness measurements. First is trade openness ratio (TO) usually represent by nominal exports plus nominal imports divided by nominal GDP. This is commonly used in the literature. The other trade measure is real openness. Real openness is defined as imports plus exports in US\$ relative to GDP in purchasing power parity US\$ (real GDP). Using real openness, trade can eliminates distortions due to cross-country differences in the relative price of nontradable goods. These alternative measures of trade openness used to see whether estimates for measures of both trade openness measurements may differ as predicted by Alcalá and Ciccone (2004).

In addition, these studies employ system GMM. The estimation using panel data has advantages over purely cross-sectional estimation. Moreover, working with panel data model helps to overcome unobserved country-specific effects and thereby reduce biases in the estimated coefficients.

In terms of income inequality, this study would be able to see how trade can improve the income distribution in developing countries. The availability of the data can improve the study of income inequality. New data set taken from University of Texas Income Inequality Project (UTIP) represents estimates of household income inequality. This is the first known data set with annually computed Gini coefficients.

From the new dataset, this could offer a new side, where the correlation between trade openness and income inequality may differ from previous studies. Furthermore, study trade openness and income inequality is important so that it could offer a new sight as how trade can impacts inequality and augurs rather well for the Millennium Development Goal on poverty reduction (United Nations, 2000).

Study the environmental is important to address the global issue such as the global warming recently. Importantly, the role of World Bank and development agencies is important to support the national environmental plan. The suggestion for developing countries is to develop the comprehensive environmental legislation and the role of institutions to implement this problem (World Bank, 2003).

1.4 Scope of the Study

Scope of this study is 59 developing countries and 28 OECD countries. The data will be covered from the 1977-2011. The choice of the countries is basically due to two considerations:

- 1) The country chosen is based on the availability of quantity and the quality of the data.
- 2) This study attempts to look at the OECD countries and developing countries in order to see the different finding in both countries.

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