MIDDLE-INCOME TRAP: FROM THE PERSPECTIVE OF ECONOMIC GROWTH

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DECLARATION

We hereby declare that:

(1) This undergraduate research project is the end result of our own work and that due acknowledgement has been given in the references to ALL sources of information be they printed, electronic, or personal.

(2) No portion of this research project has been submitted in support of any application for any other degree or qualification of this or any other university, or other institutes of learning.

(3) Equal contribution has been made by each group member in completing the research project.

(4) The word count of this research report is about 14,146 words.

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Terms

GDP	Gross Domestic Product
GNI	Gross National Income
HI	High-Income
LSDV	Least Square Dummy Variable
MI	Middle-Income
MIT	Middle-Income Trap
OLS	Ordinary Least Squares
PPP	Purchasing Power Parity
WDI	World Development Indicators
WGI	Worldwide Governance Indicator

Country

AFG	Afghanistan
ALB	Albania
DZA	Algeria
ASM	American Samoa
ADO	Andorra
AGO	Angola
ATG	Antigua and Barbuda
ARG	Argentina
ARM	Armenia
ABW	Aruba
AUS	Australia
AUT	Austria
AZE	Azerbaijan
BHS	Bahamas, The
BHR	Bahrain
BGD	Bangladesh
BRB	Barbados
BLR	Belarus
BEL	Belgium
BLZ	Belize
BEN	Benin
BMU	Bermuda
BTN	Bhutan
BOL	Bolivia

BIH	Bosnia and Herzegovina
BWA	Botswana
BRA	Brazil
BRN	Brunei
BGR	Bulgaria
BFA	Burkina Faso
BDI	Burundi
KHM	Cambodia
CMR	Cameroon
CAN	Canada
CPV	Cape Verde
CYM	Cayman Islands
CAF	Central African Republic
TCD	Chad
CHI	Channel Islands
CHL	Chile
CHN	China
COL	Colombia
COM	Comoros
ZAR	Congo, Dem. Rep.
COG	Congo, Rep.
CRI	Costa Rica
CIV	Cote d'Ivoire
HRV	Croatia
CUB	Cuba
CUW	Curacao
CYP	Cyprus
CZE	Czech Republic
DNK	Denmark
DJI	Djibouti
DMA	Dominica
DOM	Dominican Republic
ECU	Ecuador
EGY	Egypt, Arab Rep.
SLV	El Salvador
GNQ	Equatorial Guinea
ERI	Eritrea
EST	Estonia
ETH	Ethiopia
FRO	Faeroe Islands
FJI	Fiji
FIN	Finland
FRA	France

PYF	French Polynesia
GAB	Gabon
GMB	Gambia, The
GEO	Georgia
DEU	Germany
GHA	Ghana
GRC	Greece
GRL	Greenland
GRD	Grenada
GUM	Guam
GTM	Guatemala
GIN	Guinea
GNB	Guinea-Bissau
GUY	Guyana
HTI	Haiti
HND	Honduras
HKG	Hong Kong SAR, China
HUN	Hungary
ISL	Iceland
IND	India
IDN	Indonesia
IRN	Iran, Islamic Rep.
IRQ	Iraq
IRL	Ireland
IMY	Isle of Man
ISR	Israel
ITA	Italy
JAM	Jamaica
JPN	Japan
JOR	Jordan
KAZ	Kazakhstan
KEN	Kenya
KIR	Kiribati
PRK	Korea, Dem. Rep.
KOR	Korea, Rep.
KSV	Kosovo
KWT	Kuwait
KGZ	Kyrgyz Republic
LAO	Lao PDR
LVA	Latvia
LBN	Lebanon
LSO	Lesotho
LBR	Liberia

LBY	Libya
LIE	Liechtenstein
LTU	Lithuania
LUX	Luxembourg
MAC	Macao SAR, China
MKD	Macedonia, FYR
MDG	Madagascar
MWI	Malawi
MYS	Malaysia
MDV	Maldives
MLI	Mali
MLT	Malta
MHL	Marshall Islands
MRT	Mauritania
MUS	Mauritius
MEX	Mexico
FSM	Micronesia, Fed. Sts.
MDA	Moldova
MCO	Monaco
MNG	Mongolia
MNE	Montenegro
MAR	Morocco
MOZ	Mozambique
MMR	Myanmar
MNP	N. Mariana Islands
NAM	Namibia
NPL	Nepal
NLD	Netherlands
NCL	New Caledonia
NZL	New Zealand
NIC	Nicaragua
NER	Niger
NGA	Nigeria
NOR	Norway
OMN	Oman
PAK	Pakistan
PLW	Palau
PAN	Panama
PNG	Papua New Guinea
PRY	Paraguay
PER	Peru
PHL	Philippines
POL	Poland

PRT	Portugal
PRI	Puerto Rico
QAT	Qatar
ROM	Romania
RUS	Russian Federation
RWA	Rwanda
WSM	Samoa
SMR	San Marino
STP	Sao Tome and Principe
SAU	Saudi Arabia
SEN	Senegal
SRB	Serbia
SYC	Seychelles
SLE	Sierra Leone
SGP	Singapore
SXM	Sint Maarten (Dutch part)
SVK	Slovak Republic
SVN	Slovenia
SLB	Solomon Islands
SOM	Somalia
ZAF	South Africa
SSD	South Sudan
ESP	Spain
LKA	Sri Lanka
KNA	St. Kitts and Nevis
LCA	St. Lucia
MAF	St. Martin (French part)
VCT	St. Vincent and the Grenadines
SDN	Sudan
SUR	Suriname
SWZ	Swaziland
SWE	Sweden
CHE	Switzerland
SYR	Syrian Arab Republic
TWN	Taiwan, China
TJK	Tajikistan
TZA	Tanzania
THA	Thailand
TMP	Timor-Leste
TGO	Togo
TON	Tonga
TTO	Trinidad and Tobago
TUN	Tunisia

TUR	Turkey
TKM	Turkmenistan
TCA	Turks and Caicos Islands
TUV	Tuvalu
UGA	Uganda
UKR	Ukraine
ARE	United Arab Emirates
GBR	United Kingdom
USA	United States
URY	Uruguay
UZB	Uzbekistan
VUT	Vanuatu
VEN	Venezuela, RB
VNM	Vietnam
VIR	Virgin Islands (U.S.)
WBG	West Bank and Gaza
YEM	Yemen, Rep.
ZMB	Zambia
ZWE	Zimbabwe

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Middle-Income Trap: From the Perspective of Economic Growth

ABSTRACT

In this study, we aim to examine the relationship between economic growth and middle-income trap. We start by studying the definitions of middle-income trap given by various previous researchers. Then, we estimated the catch-up speed of a country in relative to the United States by using gap analysis. Results showed that there are a total of 47 countries with negative gap rates and 54 countries with positive gap rates. Subsequently, using graphical approach we identified that there are 31 countries are in the middle-income trap using the 9-grid analysis. We further identified the countries that are in the middle-income trap using empirical approach and found that there are 32 middle-income trap countries. Lastly, we determine the factors that affect the economic growth by using the panel data estimation. Result suggested that government effectiveness, financial development and country's openness to trade are important in improving a country's economic growth. Hence, we can conclude that in order to avoid falling into middle-income trap, the country must sustain long-run economic growth.

CHAPTER 1: INTRODUCTION

1.0 Introduction

What is middle-income trap? How do we examine middle-income trap? In general, middle-income trap is a phenomenon when a fast growing country that avoided the poverty trap and reached middle-income levels on a per capita basis, and subsequently unable to transition to high-income levels. Although the term "middle-income trap" is now being widely used and discussed among researchers and policymakers, however, there are still no exact theory to define the term "middle-income trap" and a specific approach to identify the presence of middle-income trap. The past researches are mainly done based on the theoretical approach, however, lately there are a few researchers had tried to examine the middle-income trap by using empirical studies such as catch-up index analysis and gap analysis but these method used are still unable to examine the existence of middle-income trap precisely.

East Asia is the fastest growing region in the world after the World War II (Fang, 2012), its economic development has been quite remarkable, but the high performance has not been uniform across the countries. Very few countries have moved from middle-income to high-income in a short span of time. So far only Japan, Macao and the Four Asian Tigers (Korea, Singapore, Taiwan and Hong Kong) have successfully passed through the middle-income economy and become high-income advanced economy at the end of 80s and the beginning of 90s (Carnovale, 2012). However, we have also seen a number of economies such as some Asian countries and Latin America countries, which had comparable expansion levels to the European countries, have made progress and improved their growth performance in recent years, but still remained trapped in the middle-income trap and failed to become high-income countries. Therefore, the study of the middle-income trap is of great importance and should not be neglected.

1.1 Research Background

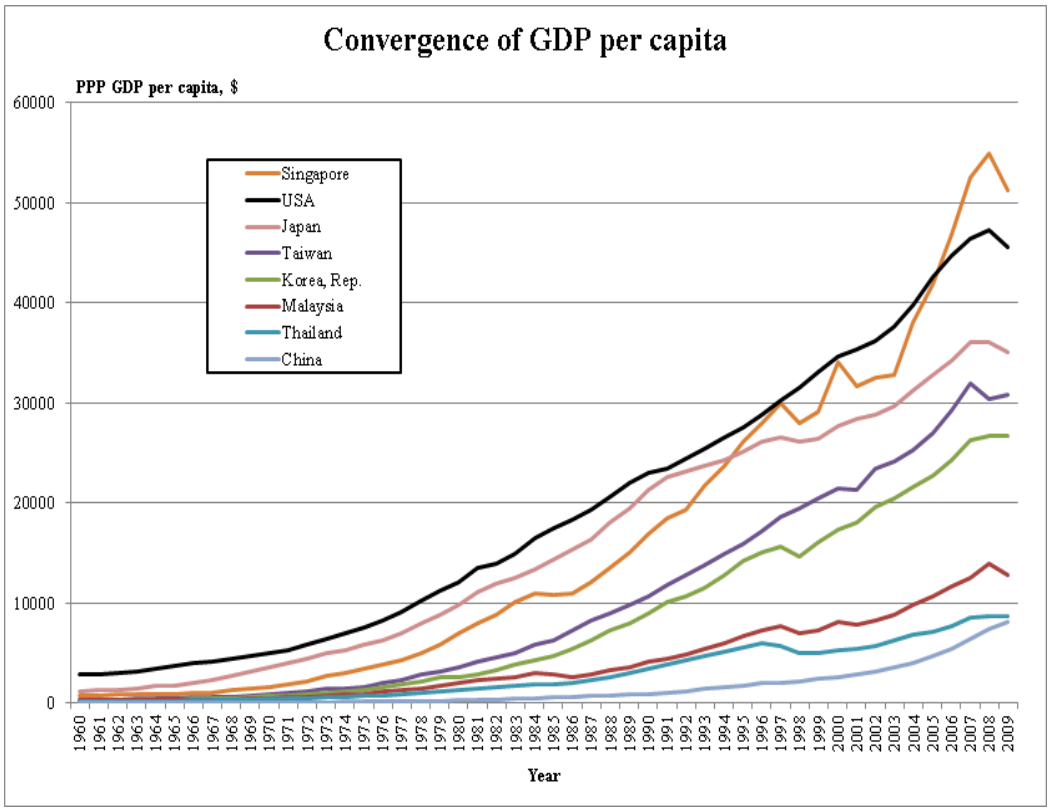
1.1.1 What is Middle-Income Trap?

In order to determine what "middle-income trap" is, first we need to know the classification of income. Under World Bank's income classification method, it divides economies into four income categories which are low-income country, lower-middle-income country, upper-middle-income country and high-income country based on gross national income (GNI) per capita with Atlas conversion factor. So what is middle-income trap? The word "trap" conventionally is used to describe an economic state of super-stable equilibrium that is beyond a comparative static equilibrium and cannot be changed by normal short-term outside forces (Fang, 2012). World Bank initially proposed the issue of "middle-income trap" in 2007, the report, An East Asian Renaissance: Ideas for Economic Growth. This report shows that middle-income countries have grown slower than either rich or poor countries. Since then middle-income trap have increasingly been discussed and studied among the economies.

Figure 1.1 illustrates Purchasing Power Parity (PPP) GDP per capita incomes of Asia middle-income countries (Four Asian Tigers, Japan, Malaysia, China and Thailand) as compared to the United States over 1960 to 2009. In a gradually rising economy, PPP GDP per capita raises constantly over the time, in other words, country experiencing a positive growth toward high-income levels. As shown in Figure 1.1, we have noticed that the Four Asian Tigers have been performing very well since the 1970's in transforming from the poor-income economies into high-income economies. The gap between the Four Asian Tigers in relative to the United States is very close as compared to Malaysia, Thailand and China. Among the Four Asian Tigers, Singapore is the only country that outperformed the U.S. since 2005. Even though the PPP GDP per capita of Singapore felt a little in the case of Global Financial Crisis in 2008 which severely affected the global economy, Singapore still remained performing better than the

United States. However, other middle-income countries (Malaysia, Thailand and China) do not pursue this trend. Instead, they are followed by periods of stagnation or are caught at low growth rate. The convergence of Malaysia, Thailand and China is much flatter and unable to move into high-income economies as compared to the Four Asian Tigers. They are caught in the so-called "middle-income trap".

Figure 1.1: Convergence of PPP GDP per capita from 1960-2009



Source: Authors' estimates

One of the reason for some countries do not grow faster than rich countries as would be expected is mainly due to they are not capable to compete with either low wage countries or high-skilled advanced countries, even though they have advantages on high returns to capital and multiple possibilities to introduce tried-and-true[1] technology improvements. However, middle-income trap has two possible outcomes. First, in the success story, growth will sustain at a lower rate as the economy reaches high-income. In

[1] Tested and proved by experience over time to be worthy, useful, effective and reliable.

contrary, growth stagnates, or even declines and the economy remained stuck in the middle-income phase of economy.

During the research, we realize that many researchers have interpreted and used the term quite differently to refer to the middle-income trap in different perspective. Some economists think there is no existing economic theory presented to explain the phenomena that related to the purported "middle-income trap", unlike the poverty trap theory. Besides, they also suppose that the middle-income trap theory lacks of empirical evidence to give a very concrete saying on the middle-income trap. However, we agree much to the middle-income trap concept and how it is termed by World Bank and various researchers such as Kharas and Kohli (2011), Ohno (2009), and Carnovale (2012). Therefore, in Chapter 2, we will look in depth on various definition and classification of the term "middle-income trap" made by the previous researchers.

1.1.2 Why Some Countries can Surpass Middle-Income after Post-World War II Era?

We have been hearing claims lately that this will be the Asian century or China will eclipse the United States economy in the near future, followed by India. But very few countries manage to sustain rapid growth for more than a decade. Therefore, World Bank conducts a study of the East Asian economy every four years to summarize the uniqueness of the development experiences, meanwhile to announce problems and challenges over the particular time frame. World Bank has identified five similarities among the countries that sustained a high growth in the post- World War II era and surpassed the middle-income level to become high-income country.

First, each country fully exploited the world economy by importing knowledge and exploiting demand globally, and some economies caught up-to-speed with global technology and innovation through foreign direct

investment (FDI) as it provides the comparative advantages to the economies. Second, these high growth economies maintained its macroeconomic stability by keeping prices steady even during high inflation and ensured the economy is growing faster than the public debt. For example, South Korea and China stabilized its prices in a timely manner when both were experiencing of high inflation. Third, sustained high investment and saving rates remained the first priority, even when reducing consumption, because macroeconomic stability led to a more favourable environment for saving. Moreover, some countries like Singapore have a mandatory saving program and policies to encourage saving. Forth, all high growth economies government allowed resource mobility in the market and did not stop the structural transformation. Hence, these economies were relied on decentralized markets and resources were allocated by market forces. Last but not least, these economies had a capable government. Political leaders were able to convince their citizens that delaying consumption today would allow for a better tomorrow. In order to prompt rapid growth, government should take an active role to promote privatization (Kim, Shim & Kim, 1995).

1.1.3 The Background of Middle-Income Trap Countries

Middle-income trap can be divided into lower middle-income trap and upper middle-income trap. Table 1.1 and Table 1.2 below list out the detailed information of which countries were in the lower middle-income trap and upper middle-income trap, based on regional basis in 2010 respectively. By referring to the Table 1.1 and Table 1.2, we can clearly know that 35 countries fall into the middle-income trap, 30 of them are in the lower middle-income trap and the remaining 5 are in the upper middle-income trap. Majority of the middle-income trap countries are from the Latin America constituting 13 countries out of 35 countries in the region.

Table 1.1: Economies in the lower-middle-income trap in 2010

Country	Region	2010 GDP per capita (1990 PPP $)	No. of years as LM until 2010	Average growth, % (2000-2010)	No. of years to reach $7,250
Philippines	Asia	3,054	34	2.5	35
Sri Lanka	Asia	5,459	28	4.3	7
Albania	Europe	4,392	37	4.8	11
Romania	Europe	4,507	49	4.1	12
Bolivia	Latin America	3,065	45	1.8	49
Brazil	Latin America	6,737	53	2.0	4
Colombia	Latin America	6,542	61	2.6	5
Dominican, Rep.	Latin America	4,802	38	2.8	15
Ecuador	Latin America	4,010	58	2.2	27
El Salvador	Latin America	2,818	47	0.4	251
Guatemala	Latin America	4,381	60	1.1	47
Jamaica	Latin America	3,484	56	-0.3	-
Panama	Latin America	7,146	56	2.4	1
Paraguay	Latin America	3,510	38	1.5	48
Peru	Latin America	5,733	61	4.2	6
Algeria	Middle East	3,552	42	2.2	34
Egypt	Middle East	3,936	31	3.0	21
Iran	Middle East	6,789	52	3.4	2
Jordan	Middle East	5,752	55	3.5	7
Lebanon	Middle East	5,061	58	4.1	10
Libya	Middle East	2,924	43	2.4	39
Morocco	Middle East	3,672	34	3.3	21
Tunisia	Middle East	6,389	39	3.5	4
Yemen, Rep.	Middle East	2,852	35	0.9	109
Botswana	Sub-Saharan Africa	4,858	28	1.7	24
Congo, Rep.	Sub-Saharan Africa	2,391	33	1.8	63
Gabon	Sub-Saharan Africa	3,858	56	0.0	-
Namibia	Sub-Saharan Africa	4,655	61	2.4	19
South Africa	Sub-Saharan Africa	4,725	61	2.0	23
Swaziland	Sub-Saharan Africa	3,270	41	2.2	37

Source: Abdon, Felipe and Kumar (2012)

Table 1.2: Economies in the upper-middle-income trap in 2010

Country	Region	2010 GDP per capita (1990 PPP $)	No. of years as LM	No. of years as UM until 2010	Average growth, % (2000-2010)	No. of years to reach $11,750
Malaysia	Asia	10,567	27	15	2.6	5
Uruguay	Latin America	10,934	112	15	3.3	3
Venezuela	Latin America	9,662	23	60	1.4	15
Syria	Middle East	8,717	46	15	1.7	18
Saudi Arabia	Middle East	8,396	20	32	0.9	37

Source: Abdon, Felipe and Kumar (2012)

We are interested to know whether the country background is related to the cause of middle-income trap. Therefore, we analyzed the countries'

background in term of major economic activity and skilled labor force on the ten selected countries (Venezuela, Brazil, Guatemala, Uruguay, Swaziland, South Africa, Iran, Tunisia, Romania, and Malaysia). These ten middle-income trap countries are randomly selected from the Table 1.1 and Table 1.2, with at least one country representing one region. From the observation made through our understanding, the ten selected middle-income trap countries have similar background as below: the main economic activities are in manufacturing sector and agricultural sector, however, the performance of the countries are not in a satisfactory level.

Theoretically, countries in different development stages boost up economic growth by focusing in different production networks, such as international division of labor with clear order and structure. First, what drove low-income country to growth? Low-income country usually starts with the primary sector in their large effort. In this stage, country desires for the utilization of raw materials from the earth such as agriculture and mining, as well as industries engaging in production or extraction of natural resources. Virtually, the main input for agricultural sector is labor due to labor-abundant where labor cost are relatively cheap and high labor productivity in low-income countries. Therefore, low-income countries are allowed to further develop their primary industry and exports agricultural products at relatively low prices in order to boost economic growth and gain competitive advantage against other developing countries.

As a country successfully moves into middle-income level, agricultural sector reaches a critical mass, domestic industries start to develop and shift from primary sector to secondary sector (manufacturing) where manufacturing, processing and construction lie within this sector. However, growth strategies for middle-income country to move into high-income are quite different as compared to low-income country's strategies. In order for a middle-income country to growth, it requires more capital intensive and skill intensive in manufacturing to move up the value chain and achieve higher value added products in the industries. Among the middle-income countries, most of the countries experienced slowdown in

economic growth and fail to proceed into high-income level. The general explanation for this situation is mainly due to middle-income countries cannot grow as easily as before because labor cost is higher and cost competitiveness declines, at the meantime, middle-income countries fails to expand technology and management capability. Over the time, most machinery and production in middle-income countries will still be highly dependent on high-income countries' technology and management. Thus, a large number of the competitive domestic firms continue to be managed by foreign countries.

In Table 1.3, it can be observed that those ten selected middle-income trap countries have focused their major economic activities mainly in primary sector (agriculture) and secondary sector (manufacturing) in the recent decades. Besides, the skilled labor force is relatively low for each country. The highest share of skilled labor force among the ten countries is Iran, which is 15.22% and the lowest share is Swaziland with only 1.38% of its total labor force. As mentioned above, in order for a middle-income country to promote a rapid growth, country should achieve high share of skilled labor of its total labor force. Therefore, in this analysis, we can conclude these ten selected countries are not able to proceed into high-income countries is due to low share of skilled labor and that is the reason why they fall into middle-income trap even though they have developed well in primary and secondary sectors. Accordingly, this challenge together with the uneven income distribution which stems from low job creation (Swaziland and Romania) that needed to be addressed in order to achieve sustain improvement in country's growth. Thus, to improve the labor market, reformation of tertiary education and establishment of new training programs is needed to produce more skilled labor in the country.

Table 1.3: Background of 10 middle-income trap countries

Country	Main Economic Activity	Skilled labor, % of labor force
Venezuela	Major in agricultural sector, well known for its petroleum wealth which account for roughly 95% of export earnings. [2]	10.80
Brazil	Country is blessed with abundant natural resources. [3]	4.66
Guatemala	Agricultural sector contributes one fourth of GDP and two-fifth of the country's exports. [4]	3.10
Uruguay	Agriculture production accounts more than half of the country's exports. [5]	7.67
Swaziland	75% of the populations are employed in subsistence farming, about 30% of the labor force is unemployed, characterized by widespread inequality, poverty. [6]	1.38
Namibia	Extraction and processing of minerals for export is the main economic activity where mining constitute 8% of total GDP and provide more than 50% of foreign exchange earnings. [7]	2.45
Iran	Oil and natural gas are the key exports. Petroleum comprised 80 percent of all exports in 2010. [8]	15.22
Tunisia	Majority of Tunisia's workers are engaged in farming. However, this sector only contributes less than 15% of the GDP. [9]	9.23
Romania	More than 50% of the population below the poverty line. Agriculture still comprise about one-third of employment, though its productivity and contribution to GDP remains at very low levels. [10]	10.80
Malaysia	Economic development is largely due to wealth of natural resources in agriculture, exports particularly of oil and gas, palm oil and rubber. [11]	6.35

1.2 Problem Statement

Over the years, middle-income trap has increasingly become a focus of discussion. Because falling into the middle-income trap may cause negative impacts to a

[2] South America: Venezuela (2013)
[3] South America: Brazil (2013)
[4] Guatemala Economy (n.d.)
[5] Uruguay (2007)
[6] African Economic Outlook (2012)
[7] Africa: Namibia (2013)
[8] Iran Export, Import & Trade (2012)
[9] Tunisia (2005)
[10] The European Social Fund in Romania, 2007-2013 (2012)
[11] East and Southeast: Malaysia (2013)

country which includes lacking of talent and innovation for the reason that middle-income country graduates are more attracted to work in abroad because they will be offered a higher wage from the high-income countries. Hence, the country will lose many skilled talents that are needed to create innovations to move the country up the value chain as people start to shift out from their own country. Countries such as Malaysia, workers have been leaving the country lured by higher pay. The starting pay for a graduate teacher in Malaysia is RM2,500 per month where Singapore pays RM6,196 and Hong Kong pays RM15,661 (Fong, 2010).

For that reason, many authors had raise up and discussed the issues on middle-income trap. Some also tried to investigate middle-income trap by using empirical studies, but they did not found any appropriate explanation and method in explaining the term "middle-income trap" as each method that has been conducted has its own limitations. Further, there are few literatures and researches discussed about the ways to assess as well as ways to get rid of middle-income trap. Due to the lack of researches, it is difficult to get appropriate explanation about the middle-income trap. In consequence, it is hard for policymakers to implement effective policies to counteract the middle-income trap so as to avoid it. As a result of relatively few studies and notifications about this issue, this offers a bleak picture to the importance of tackling the middle-income trap for better policy decision making.

Moreover, we realized that many researchers have interpreted the term "middle-income trap" quite differently and some held the word "trap" is improper as it suggests "conspiracy"[12]. Although there is no precise and exact definition of the middle-income trap, the works of previous researchers aid in giving direction for our research. Many researchers have written about the explanation of middle-income trap, why and which countries fall into middle-income trap. However, the explanation of middle-income trap is greatly depending on how we examine the economic growth performance of each country. Hence, in this study we will use the most recent available data with different criterion to re-examine the existence

[12] A theory that explains an event or set of circumstances as the result of a secret plot by usually powerful conspirators.

of middle-income trap. At the end of our study, we will give our own perspective on what middle-income trap is, does it exist and how do we determine it.

Our study is concerned on the following questions:

1. Does every country's economic growth performance catch-up with the economic leader?
2. Which country is engages in the middle-income trap?
3. Whether a country can be predetermined to be in the middle-income trap?
4. What is the average economic growth rate that a country must sustain in order to avoid middle-income trap?
5. What are the factors affects the countries' economic growth in order to avoid middle-income trap?

1.3 General Objectives

In this study, we aim to study the relationship between the economic growth and middle-income trap.

Specifically, our study intends to achieve these three specific goals as followed:

1. To observe the country's economic performance in relative to the economic leader.
2. To identify which country is in the middle-income trap.
3. To calculate the threshold number of years for a country to be in the middle-income trap.
4. To calculate the required average economic growth rate for a country to avoid middle-income trap.
5. To determine the factors that assists the country to escape middle-income trap.

1.4 Significance of the Study

To escape from middle-income trap, we must first identify the status of a country before knowing the country is in the trap or not. Therefore, our contribution in this research is to examine the two different analyses, which are gap and 9-grid analysis and threshold analysis. Gap and 9-grid analysis is used to identify how many countries fall into the middle-income trap and threshold analysis will provide the mathematical approach to determine the threshold years and hence to identify the country to be in the middle-income trap based on GNI per capita analysis (see Chapter 3), instead of GDP per capita analysis as used in the study of Abdon, Felipe and Kumar (2012). Our result shows the threshold years for a country to be in the middle-income trap are more than 25 years.

One way to avoid falling into middle-income trap and cross the middle-income segment smoothly is to grow fast enough. By using our threshold analysis, we are able to calculate the average growth rate per annum for a country to sustain in order to avoid falling into middle-income trap. Moreover, factors affecting a country's economic growth have been widely discussed in the theoretical framework and there is still lack of empirical approach to support the theory. Therefore, this study proposes an empirical approach by building growth model to further study and determines the factors that affect one country's growth rate and therefore assists the country to escape middle-income trap. In a nut shell, this analysis of middle-income trap can be a significant learning idea to aid the economists and researchers' knowledge and ways to examine the middle-income trap in the future. Hence, the outcome of this research is a source material that the future researchers can use it as a reference on the subject of middle-income trap.

CHAPTER 2: LITERATURE REVIEW

2.0 Introduction

The term "middle-income trap" was not widely discussed until the World Bank first raised the issue in the report of *An East Asian Renaissance: Ideas for Economic Growth* in 2007 by Gill and Kharas stating that "middle-income countries have grown less rapidly than either rich or poor countries. They are squeezed between poor countries that dominate in manufacturing and the rich country innovators that rule in industries experiencing technological change". In another report *Avoiding Middle-income Growth Traps* published by World Bank in 2012 stated since the 1950s, rapid growth has allowed many countries to reach middle-income status, but, very few countries have made the extra leap desired to become high-income economies. Relatively, many developing countries have become stuck in what has been entitled as the "middle-income trap", portrayed by "a sharp deceleration in growth and in the pace of productivity increase". Ever since the first report published by the World Bank, it helped to popularized the term and many researchers had come out with their own understanding on the term "middle-income trap". However, the past researches mainly summarizes the possible causes why at some point some countries are unable to move into the high-income group and statements that do not strictly discussed on the definitions of middle-income trap. Hence, the definitions are very vague and there are no specific criteria to announce whether a country is in the middle-income trap or not. Nevertheless, there is a common belief among the researchers where many middle-income trap countries struggle to sustain a rapid growth after achieving the middle-income status. In this chapter, we are going to discuss the literature review regarding middle-income trap. Appendix 2.1 provided the Cliff's notes version of this chapter.

2.1 Definitions of Middle-Income Trap

The idea of middle-income trap can be explained through the process of economic development where an economy firstly faces the vicious cycle of poverty. Then, the population increase will soon be offset by the growth of income per capita as it is diluted by the growth of population. Though the standard of living can be sustained at the optimal subsistence level, savings are hard to accumulate even if a technological advancement take place, but the trap cannot be defeated until there is a technological breakthrough (Hansen & Prescott, 2002).

The Asian Development Bank (2011) refers countries trapped in the middle-income trap as "the inability to compete with low-income, low-wage economies in manufacturing exports and with advanced economies in high-skill innovations…such countries are unable to speedily convert from resource and labor-driven growth with low cost of labor and capital, to productivity-driven growth".

According to Kharas and Kohli (2011), it is the inability to shift their growth strategies and the inability to rapidly adopt new growth strategies after they reached middle-income status. Thus, these middle-income countries cannot easily expand its traditional exports as before due to the wages are higher and cost competitiveness declines.

Kohli and Mukherjee (2011) addressed middle-income trap as a phenomenon where "many fast growing countries have stagnated upon searching middle-income status" as many middle-income countries face the difficulty to avoid stagnation in growth after a fast growing economy after reaching the middle-income status.

Ohno (2009) discussed that middle-income trap happens when a country is caught at the income with given resources and original advantages and cannot climb above that level. He believed that the true source for growth is the value

created by the domestic consumers and firms, and to attain higher income requires strong policy effort to enhance privatization.

A low-income country with abundant labor and scarce capital will have a comparative advantage and be competitive in labor-intensive industries while a high-income country with abundant capital and scarce labor will have a comparative advantage and be competitive in capital intensive industries. Hence, the most favorable industrial structure in a country is determined by its factor endowment which will make the country most competitive. In order to reach the advanced countries' income level for a developing country, it needs to promote its industrial upgrading to the same relative capital-intensity of the advanced countries (Lin & Treichel, 2012).

In the research of Fang (2012), numerous countries also indicated at particular middle-income phase, the economic growth tends to slowdown or even stagnate even after a period of high growth rates. He added countries at higher economic development gain through its comparative advantage in capital-intensive and technology-intensive industries while the countries at the lower economic development stages will gain through its comparative advantage in labor- intensive industries due to its prosperous labor resources and low labor cost. However, countries in the middle-income will gain less because they do not have comparative advantages in either portion.

Carnovale (2012) also stated that countries in the middle-income trap are no longer as competitive in low value-added industries because the labor-intensive jobs begin to move to lower-wage countries and economic growth tends to stagnate or decline. When an economy reaches middle-income levels on a per capita basis and is unable to transit into high-income, the economy will become trapped when they are unable to find new competitive advantage in a value-added activity.

At the meantime, some researchers propose that the word "trap" is inappropriate and it propose "conspiracy" where some economists think that there is no economic theory available that can explain the various phenomenal related to

the so called "middle-income trap" like the poverty trap or vicious circle of poverty theories (Fang, 2012). Moreover, the middle-income trap theory lacks of empirical evidence to address it as an economic issue. Additionally, economist Anderson (2011) also suggests that middle-income trap is not present after choosing 10 "middle-income countries" with a per capita income of $8,000 – $10,000 and 10 "lower-income countries" with a per capita income of $1,000 – $3,000 to compare their long term economic performance. However, Fang (2012) pointed out that his interpretation is not adequate to make such conclusion in his research.

Furthermore, Spence (2011) does not apply the word "trap" but interprets it as "middle-income transition" where an economy enters the growth process that happens when a country's per capita income falls into the range of $5,000 to $10,000. At this transition point, the industries that drove the growth in the early period start to become globally uncompetitive due to increasing wages. These labor-intensive sectors will move to lower-wage countries and be substituted by a new set of industries that are more capital, human capital and knowledge-intensive in order to generate value. However, according to Abdon et. al. (2012) the perception of middle-income trap is not completely pointless. It is factual that some countries that entered the middle-income group some time ago have not yet crossed the high-income bar, while some others did it in lesser years. Hence the issue on why some countries make this evolution more rapidly than others is an attention-grabbing and vital one.

2.2 Why do Countries Fall into Middle-Income Trap?

In the research of Kharas et. al. (2011), it stated only some countries can sustain high growth for more than a generation without changing strategies, needless to say even lesser able to maintain and experience high growth rates once they reach middle-income status. They believe that the middle-income country is likely to fall into middle-income trap if there are no innovations and product differentiation as it is very important to meet the needs of the market. Economists from Morgan

Stanley Asia performed a study through studying the world economic history by using the data set compiled by Maddison (2006) found that in history, the growth of an economy will slow down after a series of high growth. The turning point of the process approach when purchasing power parity based per capita GDP reaches $7,000.[13] According to the data, about 40 economies have managed to reach GDP per capita of $7,000 over the past 100 years or so. 31 out of these 40 economies' growth rate slowed in the years after reaching $7,000 income level.

Eichengreen, Park and Shin (2011) argues that growth slowdowns are basically productivity growth slowdowns whereby 85 percent of the slowdown in the rate of output growth can be explained by a slowdown in the rate of total factor productivity growth, much more than by any slowdown in physical capital accumulation. Therefore, middle-income traps are not simply the implication of decreasing marginal returns to investment in physical, as a simple neoclassical growth model[14] would suggest. The growth slowdowns could be explained based on a Lewis-type development process [15]. In that perspective, factors and advantages that create high growth during an initial phase of rapid development fade away when middle- and upper-middle-income levels are reached, thereby requiring new sources of growth to maintain sustained increases in per capita income.

During the initial phase of development, low-income countries can compete in global markets by producing labor-intensive, low-cost products using technologies imported from developed countries. Subsequently, these countries can achieve large productivity gain through a reallocation of labor from the low-productivity agricultural sectors to high-productivity manufacturing sectors. However, once these countries reach middle-income levels, the pool of underemployed rural workers drains and wages begin to rise, thereby reducing competitiveness. Productivity growth from sector reallocation and technology

[13] The US dollar here is defined as "Geary-Khamis dollar" (GK$). GK$ is a representative unit of currency which has the same purchasing power as US$ had in the US at the period of time. GK$ gives constant international comparison across countries.
[14] Neoclassical growth model explains the long run economic growth via productivity, capital accumulation, population growth, and technological progress.
[15] Lewis process is the point at which the excess labor in the subsistence sector is fully absorbed into the contemporary sector, leads to further capital accumulation which increases wages.

catch-up are eventually worn out, while increasing wages make labor-intensive exports less competitive on global markets, especially when other low-income countries become engaged in a phase of rapid growth. Consequently, growth slowdowns will meet with the point in the growth process where it is no longer able to boost productivity by transferring additional workers from agriculture to industry and the gains from importing foreign technology diminish radically whereby this analysis basically agrees that productivity slowdowns are a major cause of middle-income traps (Agenor, Canuto & Jelenic, 2012).

Numerous countries in Latin America and Middle East achieved middle-income status in the early of 1960s and 1970s, but, majority of them have remained there ever since. In the case of Brazil where it is the largest economy in Latin America, accounting 40% of total GDP of the region. They were one of the wealthiest developing countries with a per capita income of $1,700 (in 2007 dollars) due to its rich resource base. It grew persistently until 1978 when it reached $5,500 per capita, with average growth of almost 9.5% per annum; subsequently, Brazil entered a series of declination and stagnation. It did not recover its 1978 per capita income until 1995 and was wracked by macro instability again in the East Asian crisis. Not until the commodity boom which took place in 2006, Brazil once again outperformed its 1978 income. Brazil spent nearly 30 years without additional advancement in its average living standard after a century of growth. Although recent growth has improved, Brazil has not showed a trace of continuous rapid growth that assures its sustained convergence with advanced economies. Many countries in the Latin America who are similar to Brazil have a good run of 10 to 20 years but when growth fades, they tend to end up in what we called the “middle-income trap”. Hence, many countries in the region continue to be trapped in the middle-income country status and challenges on sustaining growth are rising from the changing structure of the world economy. If without diversification and structural upgrading, they will less likely to sustain growth and will be more exposed to the downside risk in the global economy (Lin et. al, 2012).

Conversely, many countries in the emerging Asia is now approaching that middle-income level of between $1,026 – $12,475 per capita because they have

been increasing the share of high-tech and manufacturing commodities in its exports and its economy. In 2010, China's economy accelerated became world's second largest economy with its GDP per capita, $4,382 reaching the upper-middle-income range as classified by World Bank and based on the Maddison Standard or the purchasing parity method, China went beyond the $7,000 point of economic slowdown. Thus, there is an increasing belief that the rest of the region will follow the path of Taiwan and South Korea which went from poor to rich in two decades. Yet, only a handful of countries have ever done that. Moreover, we can't exclude the possibility that emerging Asia will end up looking like Brazil, catching up with the developed economies very slowly or maybe not at all. There are already suggestions that income growth is slowing in countries such as Thailand and Indonesia in the report of *Emerging Asia Economics Focus* (William, 2011).

2.3 How to Avoid Middle-Income Trap?

In the paper of Kohli et. al. (2011) has discussed that many middle-income countries around the world find it difficult to avoid the stagnation in growth after a fast-growing economy reaches middle-income status. There are very few countries have been able to maintain robust growth after reaching middle-income status with Hong Kong (China), South Korea, Singapore and Taiwan as the notable example of success. Maintaining high growth after reaching middle-income status requires change in approach, transferring focus from low-wage, export-led manufacturing to knowledge and service-based economy with strong domestic demand. The economy must become more dependent on innovation and differentiation (Abdon et. al., 2012; Agenor et. al., 2012; Kharas et. al., 2011; Kohli et. al., 2011), but this cannot happen without investing in educational institution, skill-training programs and efficient financial systems to allocate resources, reliable public safety and pleasant living areas to attract mobile skilled workers and to prevent "brain drain". If countries cannot change their economic strategies and move up the value chain, they find themselves trapped in the middle, between poor countries that are globally competitive because of labor and input

costs are low and rich countries that have legal and financial base to permit for economic expansion through high-value innovations.

Kharas et. al. (2011) discussed to avoid middle-income trap, middle-income countries should focus on total factor productivity growth which requires major transformation in education regardless primary or tertiary education. According to them, it is proven that the basis for major technological advancement is a knowledge economy. Advanced secondary and tertiary education is required to equip the labor force with the skills to generate ideas and develop new technology to fit the changing world. Hence, some countries are already focusing on the productivity improvements that will ultimately be needed to lift them to high-income. The success of Japan, Korea and Singapore was linked to their very high spending on research and development. Consequently, countries like India and China who are catching up the economy are also spending a larger share of their income on research and development according to the report of *Emerging Asia Economics Focus* (William, 2011).

Woo (2009) also suggest that in order for an economy to successfully switch to knowledge-led growth, the country must get the microeconomic prices, framework institutions and macroeconomic balances right. Lin et. al. (2012) also reiterated that in order to escape middle-income trap requires investment in education, research and development, and physical infrastructure. They added that industrial advancement and diversification is vital to avoid further de-industrialization arising from the competitive force of the rise of China. Since 2000, the global economy has undergone a burst of convergence as developing countries have grown significantly faster than high-income countries resulting in the world economy to enter into a brand new era where there emerging market economies are the main drivers of global growth with China as the most important contributor.

In the report of *Emerging Asia Economics Focus* (2011), they mentioned that the productivity is rising so fast in the emerging Asia because they face competition from foreign firms. They tend to sell a high proportion of their output abroad where they compete with firms around the world. Under such immense

competitive pressure, the Asian companies are forced to raise its efficiency to stay competitive. This trend could be shown clearly after the 2007 global crisis recovery where the growth rate in the developing countries were twice as more than those in high-income countries. In other words, the dynamic growth of these emerging economies will stimulate a structural shift in the global economy by providing new opportunities for both high-income and developing countries. Consequently, in the long term, productivity growth is coupled with technological and structural changes, whereby productivity growth is associated with reducing cost of producing the same outputs using better knowledge and reallocating resources from low value-added industries to higher value-added industries (Lin et. al., 2012).

In the success story, since 1953, Korea's industrial structure changed substantially with the share of manufactures in GDP increasing from 9 percent to 30 percent in 1988, while the share of the agriculture and mining sector shrank at the same time. Korea's process of industrial upgrading reflected the country's shifting factor endowment structure from labor-intensive industries led to capital accumulation and an increase in the capital intensity of industries (Chang & Lin 2009). Successful industrial upgrading economies such as Korea, Taiwan, China and Japan used their advantage of backwardness to upgrade their technology and industries at a cost advantage, thus achieving a fast rate of structural change and economic growth. The advantage of backwardness refers to the fact that countries can benefit from the technological gap with the advanced countries by adopting and adapting a new technology or entering in an industry that is new to its economy, but mature in the advanced countries to engineer and sequential structural transformation from labor-.intensive industries to capital-intensive industries (Lin et. al., 2012).

Additionally, historical evidence shows that countries with a government who plays a pro-active role in supporting the individual firms in overcoming the coordination and externality problems in the process of their structural transformation can successfully transform its economy from agricultural to modern advanced economies (Lin et. al., 2012).

2.4 Graphical and Empirical Evidence of Middle-Income Trap

2.4.1 Gap Analysis

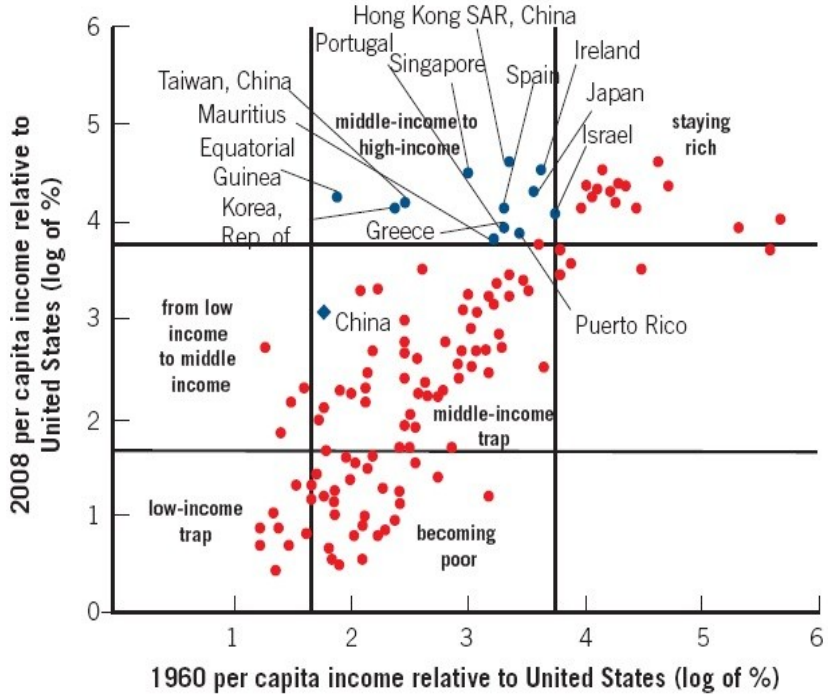
Abdon et. al. (2012) computed a measure of income gap as $\text{GAP} = 1 - (Y_i/Y_{US})$ to check whether the world is catching up to the world's leader (the United States) where Y_i represents the income per capita of country i, and Y_{US} represents the income per capita of the United States (in 2010). Therefore, $0 \leq \text{GAP} \leq 1$. A negative rate indicates that there is a reduction in the country's GAP with the United States, and a positive rate indicates that the country's GAP with the United States broaden during 1985-2010. They found 58 countries with a negative GAP rates (13 low-income, 19 lower-middle-income, 7 upper-middle-income, and 19 high-income) and 63 countries with positive GAP rates (27 low-incomes, 19 lower-middle-income, 7 upper-middle-income, and 10 high-income). The results show that Ireland, Taipei (China) and Korea closed the GAP the fastest, while the GAP between the United States and the United Arab Emirates and Switzerland broaden. Among non-high-income countries, China, Malaysia and Thailand closed the GAP the fastest. Nevertheless, this result casts some doubt on the idea that the world at large is catching up to the leader.

2.4.2 Grid Analysis

The World Bank (2012) estimates 101 middle-income economies by plotting each country's income per capita (adjusted for purchasing power) in relative to the United States, both in 1960 and in 2008, (Figure 2.1). Countries that had caught up with the United States would all be found in the top row of the cells. In fact, most countries that were middle-income in 1960 remained so in 2008 (middle cell of the figure). However, only 13 countries ran out of this middle-income trap and became high-income

economies in 2008 (top-middle of the figure) are Equatorial Guinea, Greece, Hong Kong (China), Ireland, Israel, Japan, Mauritius, Portugal, Puerto Rico, the Republic of Korea, Singapore, Spain and Taiwan (China). The forces of economic convergence are powerful, but not entirely powerful. Poor countries tend to grow faster than rich ones, largely because replication is easier than innovation. However, this does not represent every poor country in the past five has caught up, as shown in Figure 2.1.

Figure 2.1: Per Capita Income Relative to the United States, 1960 and 2008



Source: World Bank (2012)

2.4.3 Threshold Analysis

Besides, Abdon et. al. (2012) calculated the threshold number of years for a country to be in the middle-income trap in order to determine the minimum number of years that a country has to be in the middle-income group, hence, beyond this threshold, we can argue that the country is in the middle-income trap. They determine this number of years by examining the historical experience of the countries that graduated from lower to upper middle-income and from the latter to high-income. Result found that, a country is in

the lower middle-income trap if it has been a lower middle-income country for 28 or more years, and is in the upper middle-income trap if it has been an upper middle-income country 14 or more years. A country that becomes lower-middle-income has to achieve an average growth rate of per capita income of at least 4.7 percent per annum to avoid falling into the lower-middle-income trap, and a country that becomes upper-middle-income has to achieve an average growth rate of per capita income of at least 3.5 percent per annum to avoid falling into the upper-middle-income trap.

2.4.4 Solow Growth Model

According to Uwasu (2006), Robert Solow came up with the model – Solow Growth Model based on the observation of the United States data between 1950's and 1970's, he found that savings rates and input factor shares were almost constant, and per capita GDP growth rates were stable. The Solow growth model is simple, but provides significant implications for economic growth. The Solow growth model is also known as exogenous model. According to Blanchard (2009), the aggregate production function, $Y = f(K, N)$, where the aggregate output is the function of capital and labor. The function tells us how much output is produced for given amount of capital and labor. The state of technology determines how much output can be produced for a given quantity of capital and labor. A country with more advance technology will produce more output from the same quantities of capital and labor than an economy with primitive technology (Blanchard, 2009).

2.4.4.1 Growth and Government Effectiveness

According to Kaufmann, Kray and Mastruzzi, (2006), government effectiveness is "the excellence of public and civil service, the level of its independence from political control, the excellence of policy

formulation and implementation, and the credibility of the government's commitment to such policies." Kaufmann (2005) pointed out that that governance promotes growth and not the other way round, and claimed that "a country that improves its governance from a relatively low level to an average level could almost triple the per capita income of its population in the long term". In the research of Kurtz and Schrank (2007), it shows that there is a strong positive relationship between wealth and governance based on pooled analysis. Despite of the model estimated, GDP per capita maintains a substantively and statistically important relationship to government effectiveness.

2.4.4.2 Growth and Financial Development

FitzGerald (2006) stated that financial development involves the establishment and expansion of institutions, instruments and markets that hold up the investment and growth process of a country. Most of the recent studies seem to have suggested that financial development would have a substantial positive impact on economic growth (King and Levine, 1993; Levine, 1997; Oldedokun, 1996). However according to Zhang (2003), the pattern observed in the East Asia does not suggest a positive effect of financial development on economic growth because individual country estimates of basic multiple-regression growth models suggest that the predominant association between financial development and economic growth is insignificant or weakly negative. Additionally, the evidence of the fixed-effect panel estimates also indicates a picture that is consistent with that from the individual-country estimates, suggesting that there is no significant relationship between financial development and economic growth for the case in East Asia.

2.4.4.3 Growth and Country's Trade Openness

Openness in trade refers to the degree to which economies allow or have trade with other economies. The trading activities consist of import and export, foreign direct investment, borrowing and lending, and repatriation of funds abroad. Open economies normally have greater market opportunities, but also faces greater competition from businesses based in other countries. Although Krugman (1994), and Rodriguez and Rodrik (2001) argue that the effect of openness on growth is doubtful, Romer (1993), Grossman and Helpman (1991), and Barro and Sala-i-Martin (1995) among others, argue that countries that are more open have a better ability to catch up to with the technologies of the rest of the world. Sachs and Warner (1995) realized growth is positively related to an openness indicator based on a number of policies that affect international economic integration. Romalis (2007) uses the instrumental variables regression to test the relationship and result found that there is a strong positive relationship between openness and growth in spite of the measures of openness and growth used.

CHAPTER 3: METHODOLOGY

3.0 Introduction

In this chapter, we will discuss how each analysis is performed in explaining the middle-income trap based on several aspects and perspectives. We will be carrying out three different types of analysis, which are Gap and 9-Grid Analysis, Threshold Analysis and Growth Model. Secondary data is used for all the analysis on annual basis. The data and sample size used varies for all the analysis due to data availability issue.

3.1 Gap and 9-Grid Analyses

According to the World Bank's recent report – *China 2030* (2012), they commented that a large amount of countries that were middle-income in 1960 remained as it is in 2008; only 13 countries managed to escaped middle-income trap and transit into high-income economy in 2008. Although it showed that poor countries tend to grow faster than rich ones, but it does not signify that every poor country has caught up. In this report - China 2030, purchasing power parity (PPP) GDP per capita was used to identify the income status in the 9-grid analysis, while in general the World Bank uses GNI per capita (Atlas method)[16] for income classification. Therefore, we are going to re-examine the 9-grid analysis by using GNI per capita for a shorter period, which is three decades from 1982 to 2011. By performing this analysis, it will help us to identify which countries are stuck in the middle-income trap.

[16] GNI per capita is the sum of value added by all domestic producers, any product taxes not included in the valuation of output, and net receipts of primary income from abroad. It is normally converted to U.S. dollars at official exchange rates for comparisons among economies. Atlas method of conversion is used by the World Bank to smooth fluctuations in prices (inflation) and exchange rates between the countries and it will be revised annually.

Gap analysis is used to answer the question of whether the world is catching up to the economy leader based on catch-up index. The United States is chosen to represent a growth frontier. In order to become an advanced high-income economy, developing countries must grow at a quicker rate than the United States so that convergence will take place. We will compute the income gap using:

$$\text{Gap}_i = 1 - \left(\frac{Y_i}{Y_{US}}\right) \tag{3.1}$$

where Y_i denotes the PPP GDP per capita[17] of i-th country, Y_{US} denotes the PPP GDP per capita of the economy leader, the United States, and Y_i/Y_{US} is the catch-up index of i-th country. According to Athukorala and Woo (2011), they defined those countries with a catch-up index higher than 55 percent as high-income countries, those between 20 and 55 percent as middle-income countries, and those lower than 20 percent as low-income countries. In other words, those with a gap (absolute) lower than 45 percent as high-income countries, those between 45 and 80 percent as middle-income countries, and those higher than 80 percent as low-income countries. The value will be expressed in absolute value and the range is between 0 and 1. The gap value that approaching to 0 indicates the income distance between the United States and the country is close to each other, while the income distance is far apart when close to 1. Gap rate will calculate using:

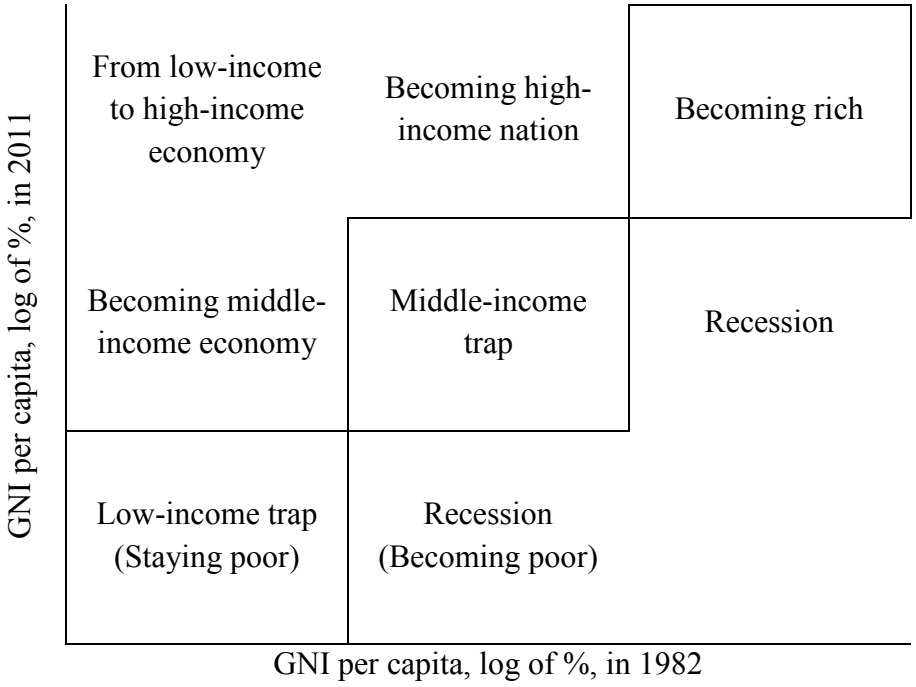
$$\text{Gap\_rate}_i = \ln\left(\frac{\text{Gap}_{i2011}}{\text{Gap}_{i1982}}\right) \tag{3.2}$$

A negative gap rate indicates that the country is performing better than the economic leader and the income gap has reduced, i.e. convergence, while positive gap rate indicating the country's gap is either remained or widened from economy leader, i.e. non-convergence, during 1982 – 2011.

[17] According to World Bank, GDP is the measure of the total output of goods and services for final use occurred within the country boundary, regardless of the allocation to domestic and foreign claims.

9-Grid analysis is a scatter plot analysis on observing the changes of a country's economy status between 1982 and 2011. The country's income status is classified using the latest income classifications by World Bank in 2011. Low-income economy has GNI per capita less than $1,025; lower-middle-income is between $1,026 and $4,075; upper-middle-income is between $4,076 and $12,475; and high-income is more than $12,476. The implication for this analysis is shown in Figure 3.1.

Figure 3.1: The Implication of 9-Grid Analysis



Source: Authors' illustration

Due to data availability issue, 106 countries are selected for Gap and 9-Grid analyses. The analysis time period is between 1982 and 2011, consisting of 30 years. The data is obtained from World Bank's World Development Indicators (WDI) Database.

3.2 Threshold Analysis

While conducting the research, two important questions arose. One, how long a country can stay in the middle-income group before it is considered as middle-

income trap? Two, what is the optimum growth rate a country should achieve in order to avoid middle-income trap? We will be using threshold analysis to answer both of these questions. Since there is no exact definition and theoretical approach on middle-income trap, we adopt a simple mathematical approach to determine the maximum number of years that a country can spend in the middle-income group by examining the historical experience of the countries that graduated from middle- to high-income economy. We can argue that the country is in the middle-income trap once they go beyond this threshold. In the research of Abdon, et. al. (2012), they have used PPP GDP per capita while performing this analysis. However, we will be using GNI per capita (Atlas method) to re-examine this analysis since the World Bank uses GNI per capita (Atlas method) to classify country's income status.

The threshold number of years is determined by the median number of years that the countries spent in the middle-income group before they successfully became high-income economies. With this number, we can easily identify which middle-income country is trapped in the middle-income trap and which is not. Furthermore, the required average income per capita growth rate can also be calculated once the threshold year is determined. Below is the formula:

$$g_Y = \left[\left(\frac{Y_{MaxMI}}{Y_{MinMI}}\right)^{(1/Year^*)} - 1\right] \times 100 \qquad (3.3)$$

where Y_{MaxMI} is the maximum income per capita for middle-income, Y_{MinMI} is the minimum income per capita for middle-income and $Year^*$ is the threshold number of years.

Besides, the estimated number of years needed for a country to transit into high-income level can be calculated by using the formula below:

$$Year_i = \frac{\ln(Y_{HI}/Y_{i2011})}{\ln(1 + \overline{g_Y})} \qquad (3.4)$$

where Y_{HI} is the minimum income per capita as high-income country, Y_{i2011} is the income per capita of i-th country in 2011 and $\overline{g_Y}$ is the average growth rate of i-th country from 2002 – 2011.

With the threshold number of years, we can calculate the number of years left before the middle-income country fall into the trap, then, we can compute the average growth rate needed for the country to sustain in order to avoid the middle-income trap, which derived from Equation 3.4.

$$\Delta Year_i = \frac{\ln(Y_{HI}/Y_{i2011})}{\ln(1 + g_Y{}^*)}$$

$$\Delta Year_i \cdot \ln(1 + g_Y{}^*) = \ln\left(\frac{Y_{HI}}{Y_{i2011}}\right)$$

$$(1 + g_Y{}^*)^{\Delta Year_i} = \frac{Y_{HI}}{Y_{i2011}}$$

$$g_Y{}^* = \sqrt[\Delta Year_i]{\frac{Y_{HI}}{Y_{i2011}}} - 1 \qquad (3.5)$$

84 countries are used for this analysis after excluding the low-income countries in 2011 as our main concern is on middle- and high-income countries. The data used is GNI per capita with Atlas conversion method which obtained from World Bank's Worldwide Development Indicators (WDI) Database.

3.3 Growth Model

9-Grid analysis and Threshold analysis allow us to identify the middle-income trap countries by using graphical and mathematical approach. Meanwhile, most of the previous researchers had theoretically discussed the reason why a country will trap in the middle-income group; however, none of the previous researchers had

used empirical approach in explaining the factor(s) that lead to middle-income trap through economic growth as a medium. In this study, we are going to use classical growth model to answer our last objective, which is to determine the factor(s) that assists a country to escape from middle-income trap.

In our study, we will be using short balanced panel data[18]. The country selection is based on the common middle-income trap countries that identified by 9-Grid analysis and Threshold analysis. The sample period is selected given the data availability constraints.

Consider that the neoclassical growth model, which also known as Cobb-Douglas production function, is as followed:

$$y = K^{\alpha} A N^{1-\alpha} \tag{3.6}$$

where y is the total output of the country, A is the technological progress, K is the capital accumulation and N is the population. It is assumed that the population growth will increase at a constant rate, thus, the function can be rewrite for output per capita.

$$\frac{y}{N} = \left(\frac{K}{N}\right)^{\alpha} A^{1-\alpha} \tag{3.7}$$

A country's technological progress, which leads to permanent growth, can vary due to different factors that contribute to it. In this study, we are concern on the impact of government effectiveness, financial development and country's openness to trade. Therefore, we derived technological progress as the function of initial technology in a country compounded with several factors, as shown in following equation:

$$A = A_0 e^{\beta_1 WGI + \beta_2 FD + \beta_3 OPE} \tag{3.8}$$

[18] Short balanced panel is the balance panel data has the number of observations (cross-sectional data) greater than the number of time periods (time series data).

By substituting Equation 3.8 into Equation 3.7, then differentiate the logged output per capita against time (t) and country (i) gives us the real output per capita growth rate.

$$\frac{y}{N} = \left(\frac{K}{N}\right)^{\alpha} \left(A_0 e^{\beta_1 WGI + \beta_2 FD + \beta_3 OPE}\right)^{1-\alpha}$$

$$\ln\left(\frac{y}{N}\right)_{it} = \left[(1-\alpha)\ln A_0 + \alpha \ln\left(\frac{K}{N}\right)\right] + (1-\alpha)(\beta_1 WGI_{it} + \beta_2 FD_{it} + \beta_3 OPE_{it})$$

$$g_{y,\ it} = \gamma_0 + \gamma_1 WGI_{it} + \gamma_2 FD_{it} + \gamma_3 OPE_{it} + \varepsilon_i + u_{it} \qquad (3.9)$$

where intercept represented by $\gamma_0 = \left[(1-\alpha)\ln A_0 + \alpha \ln\left(\frac{K}{N}\right)\right]$, individual slope for each independent variable represented by $\gamma_x = (1-\alpha)(\beta_x)$ when x = 1, 2 and 3, cross-sectional data differentiated by $i = 1, 2, \cdots, 28$ and time-series data of $t = 1996, 1997, \cdots, 2008$.

Table 3.1: Definition of Variables

Acronyms	Definition of Variables	Source
g_y	Growth rate of GNI per capita between year t and year t-5	WDI
FD	Financial development (Ratio of M2-to-GDP as proxy)	WDI
OPE	Country's openness to trade (Openness at 2005 constant prices)	PWT 7.1
WGI	Government effectiveness (Total percentile rank of WGI)	WGI

Note: All data used are yearly data. PWT is the acronyms for Penn World Table published by Center for International Comparisons at the University of Pennsylvania (CICUP). WDI is the acronyms for World Development Indicators published by World Bank. WGI is the acronyms for Worldwide Governance Indicators published by World Bank.

The data for the Worldwide Governance Indicators (WGI) [19] was initiated at 1996. Before year 2000, the data was reported every alternate year; however after year 2000, data are reported yearly. Yet, for year 1997 and 1999 there are no data available. So we will assume data for 1996 to be 1997 and data for 1998 to be 1999, suppose the percentile rank for each component in WGI is the same for both year.

[19] WGI is the aggregate and individual governance indicator reported from 1996-2011 for 215 economies in six dimension of governance: (1) Voice and accountability, (2) Political stability and absence of violence, (3) Government effectiveness, (4) Regulatory quality, (5) Rule of law, and (6) Control of corruption

According to existing literature, the expected signs of government effectiveness, financial development and country's openness to trade are expected to have positive relationships with economy growth. We will use panel data estimations, which are pooled ordinary least square[20], fixed effect least squared dummy variable (LSDV)[21] and random effect[22] models, to regress the growth model. Poolibility test are carried out to test the null hypothesis of pooled OLS is better than fixed effect model. Also, cross-sectional random effect model are regressed and Hausman test are carried out to test the null hypothesis of random effect model is better than fixed effect model. All tests, including individual t-test, will be conducted at the significance level of 10%, 5% and 1% with decision rule that rejecting null hypothesis when the p-value of each test is less than the significance level.

[20] Pooled OLS model states that the characteristics for given observation are constant over time. It is assumed that there is homogeneity among the observations, and intercept and coefficient values are same.

[21] Fixed effect model is the panel regression model that able to take into account of different characteristics from different observations with dummy variable.

[22] Random effect model is to examine the individual's characteristics for each observation based on random error terms.

CHAPTER 4: RESULTS AND INTERPRETATION

4.0 Introduction

In this chapter, we are going to discuss the results in three different aspects and to link these analyses to our main study – middle-income trap. Firstly, we will observe the economic performance of each country in relative to the United States by using catch-up index and discuss the growth of income using the 9-grid analysis. Second, threshold analysis is used to suggest the threshold years for a country to be in middle-income trap and to calculate the average economic growth rate in order to avoid middle-income trap. Third, growth model is used to examine and explicate the factor(s) that assists a country to escape middle-income trap.

4.1 Gap and 9-Grid Analyses

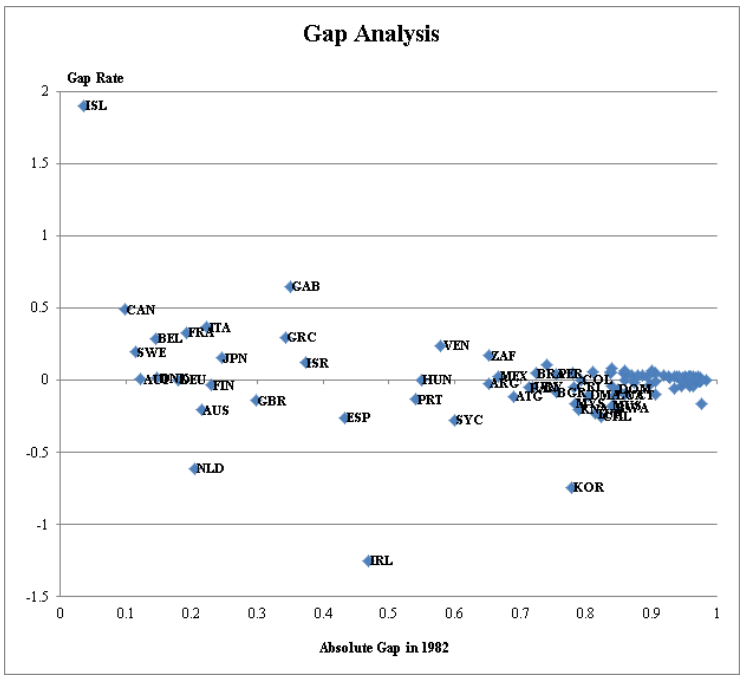
When we talk about middle-income trap, the main concern is whether the countries are catching up, in other words, whether the absolute income gap between a country's income per capita is declining in relative to the economic leader, the United States. Among the high-income economy, Norway, Kuwait, Singapore, Hong Kong (China) and Switzerland had surpassed the income per capita of the United States in 2000, 2003, 2004, 2008 and 2010, respectively. The catch-up hypothesis states that GDP per capita of most countries will approach or even overtake the leader when there is technology transmission.

We had computed a measure to identify the income gap and results are shown in Figure 4.1[23] and Figure 4.2[24]. Figure 4.1 illustrates the rate at which the income gap changed during the period between 1982 and 2011 against the (absolute) gap in 1982 for the world and Figure 4.2 shows the rate at which the

[23] Figure 4.1 contains 101 countries after excluding the United States and those countries' GDP per capita higher than the United States in 2011, i.e. Norway, Singapore, Hong Kong (China) and Switzerland.
[24] Figure 4.2 contains 79 non-high-income countries.

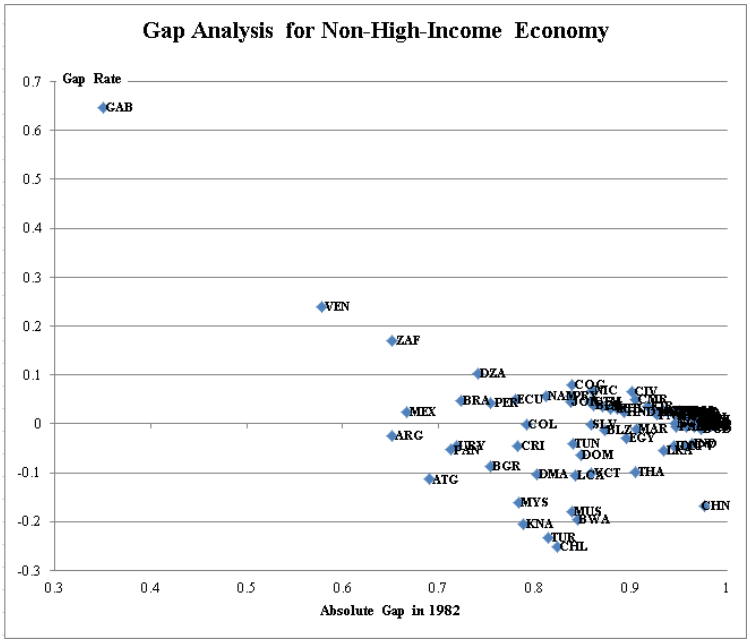
income gap changed during the period between 1982 and 2011 against the (absolute) gap for the non-high-income countries.

Figure 4.1: Initial (1982) income gap relative to the United States and its convergence within after 30 years (2011)



Source: Authors' calculations

Figure 4.2: Initial (1982) income gap relative to the United States and its convergence within after 30 years (2011) for non-high-income economy in 2011



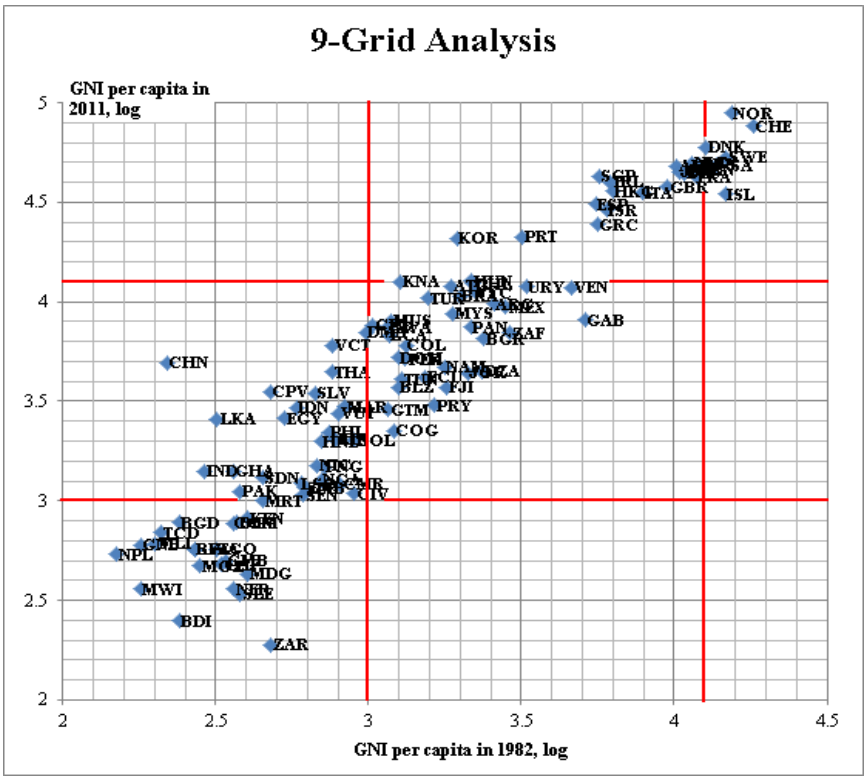
Source: Authors' calculations

The question on whether the (absolute) income gap is diminishing remains inconclusive after tabulating the graph. However, our result tallies with the research done by Abdon et. al. (2012). Our result showed that the gap of many countries has declined and are unable to catch up to the United States income level especially the non-high-income countries. There are a total of 47 countries with negative gap rates and 54 countries with positive gap rates. From the observation, we found that Ireland (IRL), Korea (KOR) and Netherlands (NLD) closed the gap the fastest, conversely the gap between the United States and Iceland (ISL) and Canada (CAN) widened. It is essential to observe that in 2011, 79 out of 101 countries have incomes below 40 percent than of the United States. Additionally, among the non-high-income countries, Chile (CHL), Turkey (TUR), St. Kitts and Nevis (KNA), Mauritius (MUS), Botswana (BWA), China (CHN) and Malaysia (MYS) closed the gap fastest. On contrary, the income gap for Gabon (GAB), Venezuela (VEN) and South Africa (ZAF) deviated far away from the United States due to the slowdown of economic growth of these countries during 1982 – 2011. Besides, we found that there is a significant number of countries with the gap of 0.90 (refer to Figure 4.2) or higher (i.e. income per capita is at most 10 percent of the United States) in 2011. As a result, the idea of the majority countries in the world is catching up to the leader is uncertainty.

In this research, one of our interests is to know which countries are in the middle-income trap; hence we used the grid analysis to identify it. Figure 4.3[25] shows the changes in country of country's income level during the period 1982 – 2011. Figure 4.4 is a close up view of the centre grid in Figure 4.3 which represents the countries that falls into the middle-income trap. Additionally, Figure 4.5 will show the relationship between the economic growth and the income of middle-income trap countries.[26]

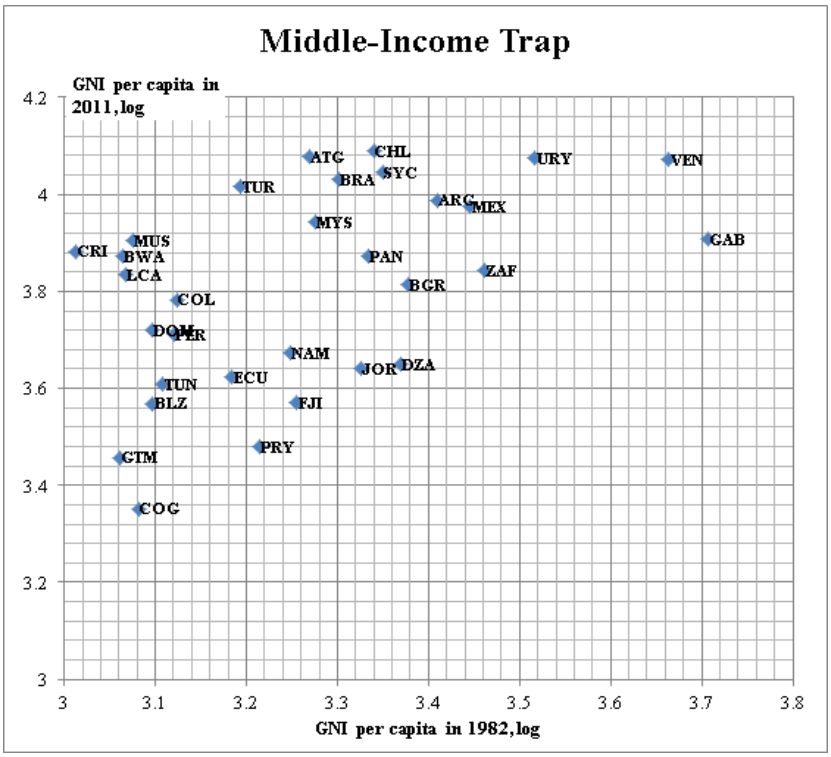
[25] Figure 4.3 contains 101 with different income level of income.
[26] Figure 4.4 and 4.5 contains 31 middle-income trap countries.

Figure 4.3: The changes in country's income during the period 1982 – 2011



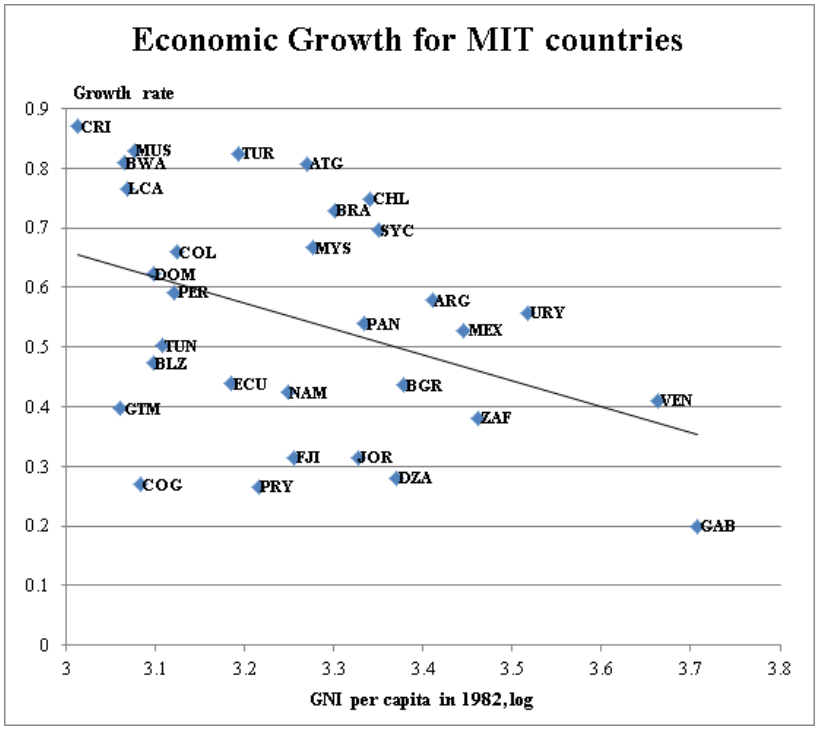
Source: Authors' calculations

Figure 4.4: A closer view on center grid of Figure 4.3 (Middle-income trap countries)



Source: Authors' calculations

Figure 4.5: The relationship between the economic growth and the income of middle-income trap countries



Source: Authors' calculations

There are 6 countries (shown in top right grid of Figure 4.3), which are Denmark, Iceland, Norway, Sweden, Switzerland and the United States, have been staying rich and become richer since 1982. Of the 52 middle-income economies in 1980s that we have estimated, only 21 became high-income by 2011 (shown in top centre grid of Figure 4.3), which are Australia, Austria, Belgium, Canada, Finland, France, Germany, Greece, Hong Kong (China), Hungary, Ireland, Israel, Italy, Japan, Korea, Netherlands, Portugal, Singapore, Spain, St. Kitts and Nevis, and United Kingdom. Besides, 27 out of 48 poor countries in 1982 became middle-income economies (shown in left centre grid of Figure 4.3), but this does not imply all of the poor countries in three decades ago have caught up.

As shown in Figure 4.5, the growth rate of middle-income countries are decelerating when it is about to reach high-income status. This phenomenon happened because of the inability to sustain economy growth. For a country to climb up the income ladder, one must a sustainable economy growth. The main

reason for a country to be stuck in the middle-income trap is because it is too expensive for them to compete with those in high-income nation and too weak to compete with those in low-income economies.

4.2 Threshold Analysis

By depending on theoretical and graphical approaches itself are insufficient in explaining what is middle-income trap as most of it only summarizes the probable reasons on why at some point some countries are unable to make it into the high-income economy. By examining the historical experience of the countries that graduated from middle- to high-income economy, we have determined the minimum number of years that a country can stay in the middle-income group, and beyond this threshold, it can be argued that the country is in the middle-income trap.

Table 4.1: Economies that successful graduated become high-income from middle-income after 1962

Country	Region	Year turned MI	Year turned HI	No of years as MI	Average growth, %
Hong Kong, China	Asia	1971	1990	19	13.05
Japan	Asia	1966	1986	20	12.92
Korea	Asia	1978	2003	25	9.30
Singapore	Asia	1971	1991	20	12.29
Austria	Europe	1962	1987	25	10.18
Greece	Europe	1967	1996	29	8.53
Hungary	Europe	1975	2008	33	7.32
Italy	Europe	1963	1988	25	10.68
Portugal	Europe	1971	2003	32	7.86
Spain	Europe	1969	1991	22	11.30
St. Kitts & Nevis	Latin America	1980	2008	28	8.97
Saudi Arabia	Middle East	1971	1980	9	29.27

Source: Authors' estimates

By excluding the low-income groups from our countries list in 2011, of 84 countries, only 28 countries[27] have graduated from middle-income to high-income since 1980. Of these 28 countries, we further divide them into two groups: (i) 12 countries that became middle-income country after 1962 (refer to Table 4.1); and (ii) 16 countries that became middle-income before 1962 (refer to Appendix 4.1).

From Table 4.1, we note that majority of the economies that successfully graduated from middle-income to high-income status after 1962 are European and Asian countries. The time span for these 12 countries to be in the middle-income status ranges from 9 years (Saudi Arabia) to more than 30 years (Hungary and Portugal). Japan is the first country that led the growth in Asia even though they spent 20 years in the middle-income status. Likewise, Korea, Singapore and Hong Kong (China) also spent similar time span in this income status before achieving high-income economy.

In addition, we have determined the threshold number of years for a country to be in the middle-income trap is more than 25 years by using the median number of years of the countries that have graduated from the middle-income group (countries in Table 4.1). This implied that if a country has been in middle-income group for more than 25 years, we can say the country has fallen into the middle-income trap. Besides, by knowing the threshold year, it allows us to calculate the required average income per capita growth to avoid the middle-income trap. A country must sustain an average income per capita growth of at least 10.51 percent per annum and stay less than 25 years to avoid middle-income trap once it reaches an income per capita of $1,025 (Atlas method), i.e. the middle-income threshold.

As a result, the economic growth of the Asian economies (Japan, Singapore and Hong Kong, China) stand out among all the other regions where they only spent about 20 years in the middle-income group with income per capita growth of over 12 percent per annum on average. Setting Saudi Arabia aside, who

[27] Some countries may have gone through the same stage of transition before this time period, but they are not considered due to data availability. For instance, the United States, Australia and France were middle-income countries in 1962; however there is no data prior to 1962. Thus, we are unable to identify exactly at which year they became middle-income economy.

only spent 9 years in the middle-income group, most of the countries spent more than the threshold years and grew less than the threshold income growth rate before entering into high-income group.

After identifying the 56 middle-income countries in 2011 using GNI per capita (Atlas conversion), we can now identify who is in the middle-income trap. Table 4.2 lists down the countries that are in the middle-income trap in 2011 and Table 4.3 lists the middle-income countries that are not in the middle-income trap in 2011. Result shown that 24 out of 56 are in the middle-income level and 32 out of 56 countries are in the middle-income trap, however 8 out of 32 of them have the potential to escape in, at most 5 years (Malaysia, Turkey, Antigua & Barbuda, Brazil, Chile, Uruguay, Venezuela, Seychelles). Besides, we also found a significant numbers of countries such as Kiribati, El Salvador, Honduras, Nicaragua, Egypt, Papa New Guinea, Morocco and Cote d'Ivoire are in the risk of trap in the middle-income if they are growing at their current speed.

Table 4.2: Economies in the middle-income trap in 2011

Country	Region	GNI per capita in 2011, $USD	No of years in MI until 2011	Avg. growth, % (2002-2011)	Estimated years turn HI
Fiji	Asia	3,720	36	5.53	23
Malaysia	Asia	8,770	34	9.16	5
Bulgaria***	Europe	6,530	> 29	13.28	6
Turkey	Europe	10,410	36	11.04	2
Antigua & Barbuda**	Latin America	11,940	> 32	2.94	2
Argentina	Latin America	9,740	47	3.32	8
Belize	Latin America	3,710	32	1.86	66
Brazil	Latin America	10,720	36	11.81	2
Chile	Latin America	12,280	39	9.46	1
Colombia	Latin America	6,070	32	9.62	8
Costa Rica	Latin America	7,640	35	6.80	8
Dominica	Latin America	7,030	27	5.59	11
Dominican Republic	Latin America	5,240	32	6.86	14
Ecuador	Latin America	4,200	32	11.13	11
Guatemala	Latin America	2,870	32	5.47	28
Mexico	Latin America	9,420	37	5.47	6
Panama	Latin America	7,470	37	7.05	8
Paraguay	Latin America	3,020	32	8.66	18
Peru	Latin America	5,150	31	9.56	10
St. Lucia***	Latin America	6,820	> 29	4.94	13
St. Vincent & the	Latin America	6,070	26	5.74	13

Grenadines					
Uruguay	Latin America	11,860	38	5.95	1
Venezuela*	Latin America	11,820	> 49	9.48	1
Algeria	Middle East	4,470	35	9.79	11
Jordan	Middle East	4,380	34	8.67	13
Tunisia	Middle East	4,070	32	5.79	20
Botswana	Sub-Saharan Africa	7,470	25	8.11	7
Gabon	Sub-Saharan Africa	8,080	37	8.92	6
Mauritius	Sub-Saharan Africa	8,040	32	7.26	7
Namibia***	Sub-Saharan Africa	4,700	> 29	9.11	12
Seychelles	Sub-Saharan Africa	11,130	33	4.11	3
South Africa	Sub-Saharan Africa	6,960	38	9.00	7

Note: The countries were in the middle-income prior to 1962*; 1979** and 1982***
Source: Authors' estimates

The finding in Table 4.2 indicates that the middle-income trap mainly happens in countries in the Latin American and African region. Furthermore, all of these countries, except Saint Vincent and the Grenadines, and Botswana, have already stuck in the middle-income for over three decades. Venezuela and Argentina are the extreme case because both of them had stayed in this income group for almost five decades. Few countries are expected to leave the middle-income trap in the next few years if they are able to keep up with the pace of their recent economic growth performance. Nevertheless, most of the countries are likely to stay for a longer time, or might not able to leave, if their growth performance remains poor. This trend brings about the question on why some countries are not able to escape the middle-income trap is because these countries are unable to grow sufficiently fast enough to sustain growth for a long period.

Table 4.3: Middle-income countries

Country	**Region**	**GNI per capita in 2011, $**	**No of years in M until 2011**	**No of years before fall into MIT**	**Avg. growth needed before fall into MIT, %**	**Avg. growth, % (2002-2011)**	**Estimated years turn HI**
China	Asia	4,940	9	16	5.96	15.97	7
India	Asia	1,410	3	22	10.42	11.20	21
Indonesia	Asia	2,940	7	18	8.36	14.94	11
Kiribati	Asia	2,030	18	7	29.61	4.08	46
Pakistan	Asia	1,120	1	24	10.56	8.47	30
Papua New Guinea	Asia	1,480	18	7	35.60	9.90	23
Philippines	Asia	2,210	16	9	21.20	7.54	24

Sri Lanka	Asia	2,580	7	18	9.15	11.34	15
Thailand	Asia	4,440	23	2	67.62	8.59	13
Bolivia	Latin America	2,020	6	19	10.06	7.44	26
El Salvador	Latin America	3,480	19	6	23.71	4.63	29
Honduras	Latin America	1,980	9	16	12.19	6.63	29
Nicaragua	Latin America	1,510	7	18	12.45	4.43	49
Egypt	Middle East	2,600	15	10	16.98	5.77	28
Morocco	Middle East	2,970	20	5	33.25	8.11	19
Cameroon	Sub-Saharan Africa	1,210	4	21	11.75	7.18	34
Congo, Rep.	Sub-Saharan Africa	2,250	5	20	8.94	12.73	15
Cote d'Ivoire	Sub-Saharan Africa	1,090	3	22	11.72	5.80	44
Ghana	Sub-Saharan Africa	1,410	3	22	10.42	15.48	16
Lesotho	Sub-Saharan Africa	1,220	3	22	11.15	9.33	27
Nigeria	Sub-Saharan Africa	1,280	3	22	10.90	13.86	18
Senegal	Sub-Saharan Africa	1,070	1	24	10.78	7.41	35
Sudan	Sub-Saharan Africa	1,310	3	22	10.79	13.20	19
Zambia	Sub-Saharan Africa	1,160	2	23	10.88	12.88	20

Source: Authors' estimates

Thailand has been in middle-income group for over 20 years and the country must grow at an average rate of 65 percent per annum, in order to avoid middle-income trap in the next few years. This is unlikely to happen hence there is a great possibility for them to be in the middle-income trap. Countries such as Kiribati, El Salvador, Honduras, Nicaragua, Egypt and Cote d'Ivoire may fall into the trap if they keep growing at an average growth of 4 to 7 percent, and they will not graduate to high-income in the next 3 to 4 decades.

In summary, we can conclude that for a country to be trap in the middle-income status does not matter with whether the country is resource-rich or not, but mainly due to the country's inability to sustain high growth and productivity in long period.

4.3 Growth Model

In this study, we are concern on what is the factor(s) that will affect the economic growth, which will give a significant impact in explaining middle-income trap. Based on 9-Grid and Threshold analysis, we had extracted the overlapped middle-income trap countries as the sample for the model regression. A balanced panel was used consisting of 28 countries as cross-sectional series and the time period of 13 years (1996 to 2008), which give a total of 364 observations. Pooled ordinary least square, fixed effect least squared dummy variable (refer Appendix 4.2 for cross-sectional dummy variable) and random effect models were regressed. The estimation results are shown in Table 4.4.

Table 4.4: Panel data estimation results

	Pooled OLS Model	**Fixed Effect Model**	**Random Effect Model**
Dependent variable	GY	GY	GY
Constant	0.174644	-1.252567	0.123450
	(0.0017)***	(0.0000)***	(0.0785)*
FD	0.084079	0.489534	0.071917
	(0.3226)	(0.0067)***	(0.4712)
OPE	-0.007607	0.924302	0.029813
	(0.8904)	(0.0000)***	(0.6587)
WGI	4.63E-05	0.001509	0.000133
	(0.7951)	(0.0041)***	(0.5448)
R-squared	0.006300	0.216604	Weighted
			0.008270
			Unweighted
			0.003253
Poolibility Test		3.310891	
(F-test)		(0.0000)***	
Hausman Test			39.936995
(χ^2 test)			(0.0000)***

Note: P-value in parentheses. *Significant at 10%; **significant at 5%; ***significant at 1%. For Eviews output for Pooled OLS, fixed effect model, poolibility test, random effect model and Hausman test, please refer to Appendix 4.3, Appendix 4.4, Appendix 4.5, Appendix 4.6 and Appendix 4.7, respectively.

In order to choose the best estimation for the panel data, poolibility and Hausman tests were performed. The null hypothesis of poolibility test was rejected at significance level of 0.01 implied that the intercept term for each individual country is different and suggesting fixed effect model is better than pooled OLS estimation. Besides, we also rejected the null hypothesis of Hausman test signified that random effect model is inconsistent and inefficient. The results implied that the fixed effect model is more suitable than random effect model. Overall, both tests showed that fixed effect model is the best suitable method in estimating the growth model.

The R-squared obtained from fixed effect model is the highest among the others; this implies the fixed effect model can explain much better on how financial development, government effectiveness and country's openness to trade impact the economic growth than pooled OLS and random effect model.

By referring to the third column in Table 4.4, financial development, government effectiveness and country's openness to trade are statistically highly significant with positive signs. The positive relationships between economic growth and every independent variable are consistent with most of the previous studies, such as Levine (1997), Kurtz and Schrank (2007), and Romalis (2007), which supports that any improvement in these factors will has positive impact in promoting a country's growth.

Based on Equation 3.4 (refer to Chapter 3), the equation gives us two implications. First, given the speed of catching up the high-income threshold, there is a negative relationship between the average growth rate and the estimated year needed for a country to transit from middle- to high-income economy. Second, the required average growth rate for a country to avoid or escape middle-income trap can be known once the number of years left for a country to stay in the middle-income group is given. Nonetheless, we are more concerned on the first implication in explaining the middle-income trap. A well-developed financial system, improvement in governance and high involvement in open economy will surge the economic growth, which then help to reduce the number of years needed for a country to transit from middle- to high-income economy.

CHAPTER 5: CONCLUSION

5.1 Summary

Though there is lack of researches done regarding on middle-income trap, we did not end our research by re-examining the previous methods used on middle-income trap, but proceeded further to find out the answers to the questions that we have risen in our study: does every country's economic growth performance catch-up with the economic leader, can a country be predetermined to be in the middle-income trap, what is the average economic growth rate that a country must sustains, and also the factors affect the economic growth in order to avoid middle-income trap.

In order to know whether a middle-income country is growing, we first estimated the catch-up speed of a country in relative to economic leader (the United States) by using gap analysis. Then, we proceed by identifying which countries are in the middle-income trap using the grid analysis and used the extracted middle-income trap countries as our sample size to determine the threshold year for a country to be in the middle-income trap using GNI per capita (Atlas conversion). At the meantime, we also computed the average growth rate per annum for middle-income countries to sustain growth in order to avoid falling into the middle-income trap. Lastly, we extracted the overlapped middle-income trap countries obtained from the grid analysis and threshold analysis as the sample for model regression. Using this model, we then test for the factors of economic growth with government effectiveness, financial development and country openness as the independent variables.

Result from gap analysis shows that there are a total of 47 countries with negative gap rates and 54 countries with positive gap rates. Also, we found that there is a significant number of countries with the gap of 0.90 or higher (i.e. income per capita is at most 10 percent of the United States) in 2011. Hence, the idea of the world at large is catching up to the leader is uncertainty. Additionally,

we also able to identify that there are 31 countries are in the middle-income trap by using our 9-grid analysis. Furthermore, threshold analysis result shows that there are 56 middle-income trap countries. The analysis also implicates that for a country to be in the middle-income trap are more than 25 years, and has to attain an average growth rate of at least 10.51% per annum to avoid falling into middle-income trap.

Lastly, we had applied the panel estimation to regress the growth model in our research. We used government effectiveness, financial development and countries' trade openness as the main independent variables when we test for the factors of economic growth. The sample size has been used in the growth model is 28 middle-income trap countries, which represent the overlapped middle-income trap countries from 9-grid analysis (31 countries) and Threshold analysis (32 countries). We found that there are highly significant and positive relationships between all these three variables with the country's economic growth. This signifies that our results are consistent with the past researches such as Kaufmann (2005), Levine (1997), and Romalis (2007), which suggest that government effectiveness, financial development and countries' trade openness, are the important factors in improving countries' economic growth, consequently avoid from falling into middle-income trap. Although our study may suffer from several limitations, yet it can still be serves as a guideline for future researchers in similar area of study.

5.2 Implications of the Study

In this paper, we are focusing on how economic growth is related to middle-income trap. Besides providing theoretical, graphical and mathematical definitions, we also used growth model to explain middle-income trap. Firstly, we theoretically discussed that middle-income trap happened is due to the country unable to sustain high growth and could not achieve competitive advantage as compared with low- and high-income economies, which caused growth slowdown. Then, Gap and 9-Grid analysis provided a graphical explanation about this trap.

The results showed that although many poor countries managed to turn into middle-income nation in 30 years, nevertheless there are also a handful of poor countries are unable to catch up and remain staying poor. There is 31 countries stuck in the middle for 30 years and evidence showed that their growths are slowing down.

Above and beyond, Threshold analysis gives the mathematical definition of middle-income trap. Based on the result, a country should not spend more than 25 years in middle-income group and must sustain growth at least 10.51 percent per annum in order to avoid middle-income trap. Lastly, we used growth model to examine the factor that affect economic growth, in which assists the country to escape middle-income trap. Result found that financial development, government effectiveness and country's openness to trade are important in order to avoid middle-income trap.

According to our empirical result, we signified that government effectiveness, financial development and countries' trade openness act as important variables to boost a country's economic growth. Thus, the role of these three variables should be given a greater concern by all researchers and economists. First and foremost, according to Kurtz and Schrank (2007), it shows that there is a strong positive relationship between wealth and governance based on pooled analysis. Regardless of the model estimated, GDP per capita maintains a substantively and statistically important relationship to government effectiveness. Besides, Brewer, Choi and Walker (2007) suggested that, in order to achieve high level of government effectiveness, a country should achieve high level of political participation, fight corruption and improve political accountability. [28] They commented that a decline in political participation tends to reduce the government effectiveness as it weakens civil society.

Next, financial development also plays an important role in promoting economic growth in a country since our empirical result shows that it is highly significant and positive relationship with economic growth. A well-developed and

[28] Political accountability is the responsibility or obligation of government officials to act in the best interests of society or face consequences.

sound financial system can be achieved by high level of economic freedom. In the paper of Hafer (2012), he provided evidence that having higher level of economic freedom, countries can experience greater financial development. According to Gwartney and Lawson (2003), the Economic Freedom of the World reports have presented an index that measures the consistency of a nation's policies and institutions with economic freedom, which it taken in account of personal choice, voluntary exchange, freedom to compete, and protection of person and property.

Lastly, countries' trade openness also cannot be neglected in boosting a country's economic growth. This is because according to Romer (1993), Grossman and Helpman (1991) and Barro and Sala-i-Martin (1995) and others, they argue that countries that are more open have a greater ability to catch up to the technologies of the rest of the world. In order for a developing country to increase openness and in turn to raise country's growth is to implement a reduction in developed world tariffs[29] (Romalis, 2007).

As a result, middle-income trap countries should focus more on these three variables which are government effectiveness, financial development and countries' trade openness in order to give a helping in fighting this issue and also to maintain a competitive environment for international trade to increase the country's economic growth performance, which will then help the countries to grow fast enough to cross the middle-income segment.

5.3 Limitations

We have encountered a few limitations while conducting our study. Majority of these problems arise due to data availability where it is either there are many missing years and incomplete data or the data have not been submitted to the data banks for various countries.

[29] A tariff is a tax imposed on an imported or exported goods.

As told in the econometric context, the sample size used in a research must be large enough in order to reduce the econometric analysis errors and so to have a precise empirical analysis result. However, due to the arising problem- missing years, we are unable to collect a long period of time span for all 214 countries to estimate our model. Thus the time period used in the growth model is only 13 years (1996 -2008) which are considered as small.

Before constructing our model, we have obtained a handful of literatures commenting on the importance of skilled labor and value added industries in improving a country's economic growth (International Labor Office Geneva, 2010; Sultan, 2008) as economic growth is very crucial in helping a country to escape from middle-income trap. However, we are unable to obtained data for skilled labor and value added industry because of missing and incomplete data as our data are all extracted from Penn World Table and World Bank due to its ease in accessibility.

Apart from that, due to the "freshness" of the topic, there are very few researches have been done to provide us more guidance; needless to say that majority of the published journals are only available through subscription. Therefore, we can only obtain the understanding of middle-income trap based on the limited studies.

As a result, the limitations as mentioned above will affect the credibility of our research outcome significantly. Thus, we hope the future researchers will raise the concern on our problems in order to produce a more worthy research while contributing in this area of study.

5.4 Recommendations for Future Research

Our recommendations are based on our limitations mentioned earlier. It is recommended that future researcher to include high skilled workers and value added either through internal and external sources in order to widen the scope of

research and produce a more precise result. Based on theoretically approach, the demand for highly skilled workers and higher levels of educational attainment is expected to increase productive workforce, producing more efficiently higher standard of goods and services, which in turn forms the basis for faster economic growth and escape form middle-income trap. Besides that, regression result also show that growth rate of industry value added can contribute more than the growth rate (Baygan, 2004; International Labor Office Geneva, 2004; Sultan, 2008).

In terms of time period limitation, it is advisable that future researches conduct their research from different and more integrated database. A more integrated database allows researchers to collect more data for analysis. With this, researchers can obtain data with more selection, instead of depending on Penn world table and World Bank data only.

Furthermore, we only started our observation from 1996 in our model, thus, we suggest that future researches to take into account the years as early as 1960 if data could be obtained in order to increase the sample size and to have a clearer picture on the observation which makes the research much more credible and reliable.

Lastly, as the attention for middle-income trap have been increasing and many policymakers are trying to come out with a solution for this economic issue, how about low-income trap? Countries trapped in the low-income level should be treated too as the economies of the world have been catching up beside them. So, we suggest to the future researchers to conduct study on low-income trap as well because this category of countries should not be neglected.

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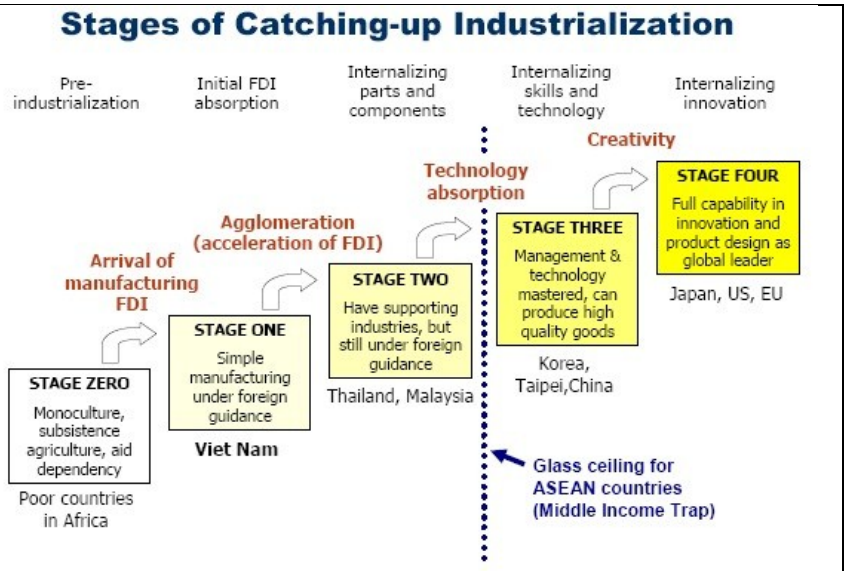
APPENDICES

Appendix 2.1: Summary of Literature Reviews

"American Economic Review" by Hansen & Prescott (2002)	• In the process of economic development, an economy initially faces the vicious cycle of poverty. Its per capita growth can be soon offset by population increases and its per capita income can be diluted by the growth of the population. The standard of living can be maintained at a subsistence level at best and savings are hard to accumulate even if a technological advancement in the traditional sense occurs, the trap cannot be overcome until there is a revolutionary technological and institutional breakthrough. (Hansen and Prescott, 2002)
"Asia 2050: Realizing the Asian Century. Manila: Asian Development Bank" by Asian Development Bank (2011)	• Refers to countries "unable to compete with low-income, low-wage economies in manufactured exports and with advanced economies in high-skill innovations…such countries cannot make a timely transition from resource-driven growth, with low cost labor and capital, to productivity-driven growth."
"What is Middle-Income Trap, Why do countries fall into it, and How can it be avoided?" by Kharas & Kohli (2011)	What is MIT? • Unable to compete with either low wage economies or highly skilled advanced economies. o Why some poor countries do not grow faster than rich countries as would be expected, given their advantages of high returns to capital and multiple possibilities to introduce tried-and-true technology improvements (Gill and Kharas, 2008) o There is also a MIT in which countries that avoided the poverty trap and grew to middle-income levels subsequently stagnate and fail to grow to advanced-country levels. o Many middle-income countries have bursts of growth followed by periods of stagnation or even decline, or are stuck at low growth rates – their GDP per capita gyrates up and down. Why do countries fall into MIT? • Few countries can sustain high growth for more than a generation without changing strategies and even fewer continue to experience high growth rates once they reach middle-income status. E.g. Brazil o After a century growth, Brazil spent nearly 30 years without further improvement in its average living standard. Although recent growth improved, Brazil has not showed a record of sustained fast growth that assures its sustained convergence with advanced economies. • The inability of most countries to shift their growth strategies after they achieved middle-income status is that they are unable to rapidly adopt new growth strategies soon after they reached middle-income status. • Growth strategies in middle-income countries: supply side, growth tends to be more capital intensive and skill intensive in manufacturing (moving up the value chain) and heavily oriented towards service. • In middle-income countries, traditional exports cannot be as easily expanded as before because wages are higher and cost competitiveness declines. • Innovation and product differentiation to meet the needs of the market become more important in middle-income countries. • To avoid being trapped, middle-income countries need to develop modern and more agile institutions for property rights, capital markets, successful venture capital, competition, and a critical mass of highly skilled people to grow through innovations as affluent countries do.

	How to avoid MIT?
	• Middle-income countries must start to specialize in production. They need to develop national and global champions in specific niche areas.
	• Growth based on total factor productivity
	  o An emphasis on total factor productivity growth in middle-income countries has required major changes in education from primary to tertiary education.
	  o The knowledge economy has proven to be a source of major technological progress.
	• The education must be re-tuned for a knowledge and innovation economy. Advanced secondary and tertiary education is required to equip the labour force with the skills to generate ideas that will shape and develop new technology to fit the changing world.

"Potential Costs to Asia of the MIT" by Kohli & Mukherjee (2011)	• Historically, many fast-growing countries have stagnated upon searching middle-income status, a phenomenon known as the MIT. • This article quantifies possible opportunity cost of Asian countries falling into or staying in the MIT rather than sustaining or emulating current successes. • Many middle-income countries around the world find it difficult to avoid stagnation in growth after a fast-growing economy reaches middle-income status. This stagnation termed MIT. • Very few countries have been able to maintain robust growth after reaching middle-income status, with HK, Korea, Spore and Taiwan the notable example of success. • Maintaining high growth after reaching middle-income status has required a change in approach, shifting focus from low-wage, export-led manufacturing to a knowledge- and services-based society with strong domestic demand and a large middle class. • The economy must become more dependent on innovation and differentiation, but this cannot happen without developing advanced educational institutions, skill-training programs and social safety nets, efficient financial systems to allocate resources, reliable public safety and pleasant living areas to attract mobile skilled workers and prevent a "brain drain", affordable housing, sufficient and wise investment, elimination of corruption and in appropriate regulations, and free information flows (Kohli et. Al., 2011) • If countries cannot change their economic strategies and move up the value chain, they find themselves stuck in the middle, between rich countries that have the legal and financial base to allow for economic growth thru high-value innovations and poor countries that are globally competitive because labour and other input costs are low.
"Overcoming a MIT and Sustaining Growth: Prospects of Vietnam's Development in the Context of the Regional and the Global Economy" by Ohno (2011)	• MIT is a trap occurs when a country is stuck at the income dictated by given resources and initial advantages, and cannot rise beyond that level. • The true source of growth is value creation by domestic citizens and firms. • Middle-income can be reached by liberalization, integration and privatization. But attaining higher income requires strong policy effort to enhance private dynamism.

	
"Learning from China's Rise to Escape the MIT: A New Structural Economics Approach to Latin America" by Lin & Treichel (2012)	• Countries in Latin America and the Caribbean are caught in a middle-income trap due to their inability to structurally upgrade from low value-added to high value-added products. • Require investments in education, research and development, and physical infrastructure. • Industrial upgrading and diversification would be essential to avoid further de-industrialization arising from the competitive pressures of the rise of China, broaden the base for economic growth, and create the basis for further sustained reduction in unemployment, poverty and income inequality. • Since 2000, the world economy has experienced a burst of convergence, as developing countries have grown substantially faster than high-income countries. As a result, the world economy has entered a new era in which emerging market economies are the main drivers of global growth. This trend was reinforced after the 2007 global crisis by a recovery that has been characterized by a two-speed pattern, with growth rates in developing countries that have been more than twice those in high-income countries. • The dynamic growth of these emerging economies will engender tectonic shifts in the global economy that will provide new opportunities for both high-income countries and developing countries o For high-income countries, the growth of emerging economies will expand markets for their technology- and capital-intensive capital goods, intermediate goods, and services exports. o For those developing countries that are major producers of agricultural and natural resource commodities, higher consumption and production levels will continue to support adequate prices for commodities and thus help their exports. o Developing countries that are competitive in labor-intensive manufacturing are likely to benefit from higher demand for these goods in the new growth poles. • Since 2000, Latin America has achieved major progress in macroeconomic stabilization and structural reforms, leading to a period of sustained growth, declining poverty, and reduced inequality. • Yet, many countries in the region remain trapped in a middle-income country status and challenges to sustained growth are emerging from the changing structure of the world economy. • In the past two centuries, some countries have been able to catch up with the leading economies (such as Germany, France, and the United States in the late 19th century, and the Nordic countries, Japan and the East Asian Tigers in the 20th century).

	• A low-income country with abundant labor or natural resources and scarce capital will have a comparative advantage and be competitive in labor-intensive or resource-intensive industries. • A high-income country with abundant capital and scarce labor will have a comparative advantage and be competitive in capital-intensive industries. • Therefore, the optimal industrial structure in a country, which will make the country most competitive, is endogenously determined by its endowment structure. • For a developing country to reach the advanced countries' income level, it needs to upgrade its industrial structure to the same relative capital-intensity of the advanced countries. • Without diversification and structural upgrading, Latin America is less likely to sustain growth and is more exposed to downside risks in the global economy Successful industrial upgrading in East Asia • Korea o Since 1953, Korea's industrial structure changed substantially with the share of manufactures in GDP increasing from 9 percent to 30 percent in 1988, while the share of the agriculture and mining sectors shrank at the same time o The industrial upgrading of Korea since 1962 is often described as a good example of Flying Geese catch up in that Korea imitated countries that were more advanced (the lead geese such as Japan) using the advantage of backwardness. o Korea's process of industrial upgrading reflected the country's shifting factor endowment structure: The success of labor-intensive industries led to capital accumulation and an increase in the capital intensity of industries (Lin and Chang 2009). o Like Japan, learning and capacity-building played a very significant role in Korea's growth process. • These economies (South Korea, Taiwan, China and Japan) used their advantage of backwardness to upgrade their technology and industries at a cost advantage, thus achieving a fast rate of structural change and economic growth. o The advantage of backwardness refers to the fact that countries can benefit from the technological/industrial gap with the advanced countries by adopting and adapting a new technology or entering in an industry that is new to its economy, but mature in the advanced countries to engineer a sequential structural transformation from labor-intensive industries (i.e. wood manufactures and clothing) to capital-intensive industries (i.e. machinery and transport equipment). • How to promote economic growth has been a main topic for economic discourse and research since the publication of Adam Smith's The Wealth of Nations in 1776. • Theories and empirical evidence show that market mechanisms, supported by free and fair competition among market participants, are essential for valuing the basic ingredients for production (factor endowments), providing the right price signals, and implementing an appropriate incentive system for the efficient allocation of resources. • Market mechanisms alone, however, may not be sufficient. The government has a potential role to play in helping firms overcome the various information, coordination, and externality problems, which inevitably arise in the process of structural change inherent in modern economic growth. • Historical evidence shows that all countries that have successfully transformed from agrarian economies to modern advanced economies had governments that played a pro-active role in assisting individual firms in overcoming the coordination and externality problems in the process of their structural transformation.

"Is there a "MIT"? Theories, experiences and relevance to China" by Fang (2012)	• The empirical experiences of many countries also indicate that at specific middle-income stages, economic with high rates of growth tend to encounter economic slowdown or even stagnant. • In 2007, World Bank raises the issue of a "MIT" for the first time in the report of An East Asian Renaissance: Ideas of Economic Growth. • The report shows that "middle-income countries have grown less rapidly than either rich or poor countries." (p5) • Since then, the concept of the MIT has increasingly been discussed among economists. • However, many researchers disagree on the use of the concept of MIT. i. Some researchers hold that the word "trap" is improper, because it suggests "conspiracy". ii. Some economists think that unlike the poverty trap or the vicious circle of poverty theories, there is no economic theory available that can explain the many phenomena related to the so-called MIT. iii. The MIT theory lacks empirical evidence. • Countries at higher economic development stages obviously gain from globalization due to their comparative advantages in capital-intensive and technology-intensive industries. • At lower economic development stages also gain from globalization given their comparative advantages in labour-intensive industries as a result of their rich labour resources and low labour costs. • Those middle-income countries in between, however, gain less from globalization because they do not have comparative advantages in either aspect. ✓ Morgan Stanley Asia/Pacific economist conducted a study through studying world economic history; they find that, according to history, the growth of an economy will slow down after some years of high growth. The turning point of the process comes when purchasing power parity based per capita GDP reaches US$7000, (Wang et. Al., 2009) ✓ Based on the purchasing power parity method and the dollar value in 2005, when the per capita income reaches US$17000, the galloping economy would normally encounter an obvious slowdown, with its average annual economic growth rate generally declining by 2 percentage point, (Eichengreen et al., 2009) ✓ Investment bank economist Jonathan Anderson (2011) choose 10 "middle-income countries" with a per capita income of US$8,000-10,000 & 10 "lower-income countries" with a per capita income of US$1,000-3,000 and compares their long term economic performance. o Jonathan suggests middle-income trap does not exist. However his interpretation is not adequate to make such conclusion. • Policy suggestions for China cope with the challenges of the MIT: i. To maintain total factor productivity growth ii. To accumulate human capital through education and training
"Developing Countries and the Middle-income Trap: Predetermined to fall?" by Carnovale (2012)	• No longer as competitive in low value-added industries • Labor intensive jobs begin to move to lower wage countries and economic growth tends to stagnate or decline • When an economy reaches middle-income levels on a per capita basis and is unable to transition into high income. • Economies become trapped when they are unable to find a new competitive advantage in a higher value added activity.
"Tracking the Middle-income trap: What is it, Who is in it, and why?" by Abdon, Felipe & Kumar (2012	• The research classified 124 countries which have consistent data for 1950-2010. In 2010, o 40 low income countries in the world o 52 middle-income countries ▪ 38 lower middle-income ▪ 14 upper middle-income

	○ 32 high income countries • Some countries in the lower-middle-income trap will most likely leave it in the next few years if they maintain their recent income per capita growth performance. • Most of the countries will likely remain there for a long time (and a few might never be able to leave) if their lackluster growth performance of recent years persists. • A country is in the lower-middle-income trap if it has been a lower-middle-income country for 28 or more years. And it is in the upper-middle-income trap if it has been an upper-middle-income country 14 or more years. • Some countries are not able to escape the trap is the same as that of why some countries are not able to grow fast enough and sustain growth for a long period. • Compared exports of countries in MIT with countries that graduated: ○ Result: countries that made into upper middle-income group have more diversified, sophisticated and non-standard EX basket at the time were about to jump than those in MIT today. ○ Countries have attained upper middle-income status had more opportunities for structural transformation at time of transition than those in lower MIT. ○ Countries in upper MIT are less diversified, EX more standard products, had fewer opportunities for further structural transformation than countries made to high income. • An important debate has arisen around the observation that some countries that managed to cross the middle-income bar some time ago have not yet been able to make it into the high-income group ○ Some authors claim these countries are in a "middle-income trap" • Spence (2011) refers to the middle-income transition as countries in the $5,000-$10,000 per capita income range, "at this point, the industries that drove the growth in the early period start to become globally uncompetitive due to rising wages. These labour-intensive sectors move to lower-wage countries and are replaced by a new set of industries that are more capital-, human capital-, and knowledge-intensive in the way they create value" • Gill and Kharas (2007). The idea that middle-income countries have to do something different if they are to prosper is consistent with the finding that middle-income countries have grown less rapidly than either rich or poor countries, and this accounts for the lack of economic convergence in the twentieth century world. Middle-income countries, it is argued, are squeezed between the low-wage poor-country competitors that dominate in mature industries and the rich-country innovators that dominate in industries undergoing rapid technological change. • Ohno (2009). A large number of countries that receive too little manufacturing FDI stay at stage zero. Even after reaching the first stage, climbing up the ladders becomes increasingly difficult. Another group of countries are stuck in the second stage because they fail to upgrade human capital. It is noteworthy that none of the ASEAN countries, including Thailand and Malaysia, has succeeded in breaking through the invisible 'glass ceiling' in manufacturing between the second and the third stage. A majority of Latin American countries remain middle-income even though they had achieved relatively high-income as early as in the nineteenth century. This phenomenon can be collectively called the middle-income trap. • Eichengreen et al. (2011) conclude that countries undergo a reduction in the growth rate of GDP by at least 2 percentage points (i.e., slow down) when per-capita incomes reach about $17,000. They also find that high growth slows down when the share of employment in manufacturing is 23 percent; and when per capita income of the late-developing country reaches 57 percent that of the technological frontier. China's income per capita in 2007 was about $8,500, Brazil's $9,600, and India's about $3,800. The authors

	conclude that these countries' growth rates will unavoidably have to decline as per capita income reaches the estimated threshold. Hence the possibility of ending up stuck in the middle-income trap. • All these statements are not, strictly speaking, definitions of the middle-income trap, they are summaries of the plausible reasons why at some point some countries seem not to make it into the high-income group.
"Avoiding Middle-Income Growth Traps" by Agénor, Canuto & Jelenic (2012)	• Since the 1950s, rapid growth has allowed a significant number of countries to reach middle-income status; yet, very few have made the additional leap needed to become high-income economies. Rather, many developing countries have become caught in what has been called a middle-income trap, characterized by a sharp deceleration in growth and in the pace of productivity increases. • This note provides an analytical characterization of "middle-income traps" as stable, low-growth economic equilibria where talent is misallocated and innovation stagnates. • To counteract middle-income traps, there are a number of public policies that governments can pursue, such as improving access to advanced infrastructure, enhancing the protection of property rights, and reforming labor markets to reduce rigidities—all implemented within a context where technological learning and research and development (R&D) are central to enhancing innovation. • Such policies not only explain why some economies — particularly in East Asia — were able to avoid the middle-income trap, but are also instructive for other developing countries seeking to move up the income ladder and reach high-income status. • In the postwar era, many countries have managed to fairly rapidly reach middle-income status, but few have gone on to become high-income economies. Rather, after an initial period of rapid ascent, many countries have experienced a sharp slowdown in growth and productivity, falling into what has been called a "middle-income trap." • Using regression and standard growth accounting techniques, this analysis (Eichengreen, Park & Shin 2011) argues that growth slowdowns are essentially productivity growth slowdowns, whereby 85 percent of the slowdown in the rate of output growth can be explained by a slowdown in the rate of total factor productivity growth — much more than by any slowdown in physical capital accumulation. Therefore, middle-income traps are not simply the natural implication of decreasing marginal returns to investment in physical capital, as a simple neoclassical growth model would suggest • A common explanation of growth slowdowns is based on a Lewis-type development process (Canuto, 2011; Eichengreen, Park & Shin, 2011; and World Bank, 2012). In that perspective, factors and advantages that generate high growth during an initial phase of rapid development disappear when middle- and upper-middle-income levels are reached, thereby requiring new sources of growth to maintain sustained increases in per capita income. • During an initial phase of development, low income countries can compete in international markets by producing labor-intensive, low-cost products using technologies imported from abroad. These countries can achieve large productivity gains initially through a reallocation of labor from the low-productivity agricultural sectors to high-productivity manufacturing sectors — or to modern services. • However, once these countries reach middle-income levels, the pool of underemployed rural workers drains and wages begin to rise, thereby eroding competitiveness. Productivity growth from sectorial reallocation and technology catch-up are eventually exhausted, while rising wages make labor-intensive exports less competitive on world markets — precisely at the time when other low-income countries become engaged in a phase of rapid growth. • Accordingly, growth slowdowns coincide with the point in the growth

	process where it is no longer possible to boost productivity by shifting additional workers from agriculture to industry and where the gains from importing foreign technology diminish significantly. • Although this analysis fundamentally agrees that productivity slowdowns are a major cause of middle-income traps, it differs from the existing literature in terms of the reasons why productivity growth may weaken and what type of public policies can help avoid such slow-growth equilibrium.
"Can Asia avoid the MIT?" by Emerging Asia Economics Focus (2011)	• Many middle-income countries struggle to sustain rapid growth. • Root of the problem is a failure to raise productivity once the easy gains that come when workers move out of agriculture have dried up. • Some countries are already focusing on the productivity improvements that will ultimately be needed to lift them to high income. o E.g. India & China already spend a larger share of their income on R&D • Many countries have a good run of 10 to 20 years but then growth fades and they end up in what is sometimes called the "MIT". • Much of emerging Asia is now approaching that middle-income level of between $5,000-$10,000 per person. • The increasing-common belief the rest of the region will follow the path of Taiwan & Korea which went from poor to being rich in 2 generations. But only a handful of countries have ever done that. • We can't exclude the possibility that emerging Asia will end up looking more like Brazil, catching up with the developed economies very slowly or maybe not at all. • There are already suggestions that income growth is slowing in countries such as Thailand & Indonesia. • The success of Japan, Korea and Singapore was linked to their very high spending on R&D. o Most of emerging Asia still lags behind most of Latin America. E.g Indonesia barely spends anything on R&D at all. • The productivity is rising so fast in emerging Asia because they face competition from foreign firms, and they also tend to sell a high proportion of their output abroad, where they compete with firms around the world. Therefore, Asian companies are under immense competitive pressure to raise efficiency.

Appendix 4.1: Economies that successful graduated become high-income from middle-income after 1962

Country Name	Region	Year turned MI	Year turned HI	No of years in M	Average growth, %
Australia	Asia	< 1962	1987	> 25	-
Hong Kong (China)	Asia	1971	1990	19	13.05
Japan	Asia	1966	1986	20	12.92
Korea	Asia	1978	2003	25	9.30
Singapore	Asia	1971	1991	20	12.29
Austria	Europe	1962	1987	25	10.18
Belgium	Europe	< 1962	1980	> 18	-
Denmark	Europe	< 1970	1979	> 9	-
Finland	Europe	< 1962	1986	> 24	-
France	Europe	< 1962	1987	> 25	-
Germany	Europe	< 1972	1987	> 15	-
Greece	Europe	1967	1996	29	8.53
Hungary	Europe	1975	2008	33	7.32
Iceland	Europe	< 1962	1979	> 17	-
Ireland	Europe	< 1972	1991	> 19	-
Italy	Europe	1963	1988	25	10.68
Luxembourg	Europe	< 1962	1980	> 18	-
Netherlands	Europe	< 1962	1987	> 25	-
Norway	Europe	< 1962	1979	> 17	-
Portugal	Europe	1971	2003	32	7.86
Spain	Europe	1969	1991	22	11.30
Sweden	Europe	< 1962	1979	> 17	-
United Kingdom	Europe	< 1970	1988	> 18	-
St. Kitts and Nevis	Latin America & Caribbean	1980	2008	28	8.97
Israel	Middle East & North Africa	< 1962	1992	> 30	-
Saudi Arabia	Middle East & North Africa	1971	1980	9	29.27
Canada	North America	< 1962	1984	> 22	-
United States	North America	< 1962	1980	> 18	-

Source: Authors' calculations

Appendix 4.2: Country's name and its cross-sectional ID

Country	ID	Cross-sectional ID	Fixed Effect LSDV Model Representative
Algeria	DZA	1	Base Category
Argentina	ARG	2	D2
Belize	BLZ	3	D3
Botswana	BWA	4	D4
Brazil	BRA	5	D5
Bulgaria	BGR	6	D6
Chile	CHL	7	D7
Colombia	COL	8	D8
Costa Rica	CRI	9	D9
Dominican Republic	DOM	10	D10
Ecuador	ECU	11	D11
Fiji	FJI	12	D12
Gabon	GAB	13	D13
Guatemala	GTM	14	D14
Jordan	JOR	15	D15
Malaysia	MYS	16	D16
Mauritius	MUS	17	D17
Mexico	MEX	18	D18
Namibia	NAM	19	D19
Panama	PAN	20	D20
Paraguay	PRY	21	D21
Peru	PER	22	D22
South Africa	ZAF	23	D23
St Lucia	LCA	24	D24
Tunisia	TUN	25	D25
Turkey	TUR	26	D26
Uruguay	URY	27	D27
Venezuela	VEN	28	D28

Appendix 4.3: Pooled OLS Model

Dependent Variable: GY
Method: Panel Least Squares
Date: 03/07/13 Time: 22:58
Sample: 1996 2008
Periods included: 13
Cross-sections included: 28
Total panel (balanced) observations: 364

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.174644	0.055320	3.156943	0.0017
FD	0.084079	0.084889	0.990461	0.3226
OPE	-0.007607	0.055177	-0.137862	0.8904
WGI	4.63E-05	0.000178	0.259878	0.7951

R-squared	0.006300	Mean dependent var	0.224950
Adjusted R-squared	-0.001981	S.D. dependent var	0.309294
S.E. of regression	0.309600	Akaike info criterion	0.503857
Sum squared resid	34.50678	Schwarz criterion	0.546683
Log likelihood	-87.70200	Hannan-Quinn criter.	0.520878
F-statistic	0.760827	Durbin-Watson stat	0.242393
Prob(F-statistic)	0.516666		

Appendix 4.4: Fixed Effect Model

Dependent Variable: GY
Method: Panel Least Squares
Date: 03/07/13 Time: 23:00
Sample: 1996 2008
Periods included: 13
Cross-sections included: 28
Total panel (balanced) observations: 364

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.252567	0.235492	-5.318937	0.0000
FD	0.489534	0.179370	2.729190	0.0067
OPE	0.924302	0.186483	4.956486	0.0000
WGI	0.001509	0.000522	2.890690	0.0041

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.216604	Mean dependent var	0.224950
Adjusted R-squared	0.146027	S.D. dependent var	0.309294
S.E. of regression	0.285820	Akaike info criterion	0.414413
Sum squared resid	27.20388	Schwarz criterion	0.746313
Log likelihood	-44.42310	Hannan-Quinn criter.	0.546328
F-statistic	3.069071	Durbin-Watson stat	0.320042
Prob(F-statistic)	0.000000		

Appendix 4.5: Poolibility Test

Redundant Fixed Effects Tests
Equation: Untitled
Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	3.310891	(27,333)	0.0000
Cross-section Chi-square	86.557809	27	0.0000

Appendix 4.6: Random Effect Model

Dependent Variable: GY
Method: Panel EGLS (Cross-section random effects)
Date: 03/07/13 Time: 23:01
Sample: 1996 2008
Periods included: 13
Cross-sections included: 28
Total panel (balanced) observations: 364
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.123450	0.069968	1.764370	0.0785
FD	0.071917	0.099701	0.721323	0.4712
OPE	0.029813	0.067441	0.442055	0.6587
WGI	0.000133	0.000219	0.605930	0.5449

Effects Specification	S.D.	Rho
Cross-section random	0.079245	0.0714
Idiosyncratic random	0.285820	0.9286

Weighted Statistics

R-squared	0.008270	Mean dependent var	0.159091
Adjusted R-squared	0.000006	S.D. dependent var	0.300126
S.E. of regression	0.300125	Sum squared resid	32.42711
F-statistic	1.000696	Durbin-Watson stat	0.255779
Prob(F-statistic)	0.392585		

Unweighted Statistics

R-squared	0.003253	Mean dependent var	0.224950
Sum squared resid	34.61261	Durbin-Watson stat	0.239628

Appendix 4.7: Hausman Test

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	39.936995	3	0.0000

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
FD	0.489534	0.071917	0.022233	0.0051
OPE	0.924302	0.029813	0.030228	0.0000
WGI	0.001509	0.000133	0.000000	0.0037