DEINDUSTRIALIZATION:
A BLESS OR CURSE FOR MALAYSIA

LEE YONG HOONG

MASTER OF BUSINESS ADMINISTRATION
(CORPPORATE MANAGEMENT)

UNIVERSITI TUNKU ABDUL RAHMAN

FACULTY OF BUSINESS AND FINANCE

APRIL 2017

DEINDUSTRIALIZATION:
A BLESS OR CURSE FOR MALAYSIA

BY

LEE YONG HOONG

A research project submitted in partial fulfillment of the requirement for the degree of

MASTER OF BUSINESS ADMINISTRATION
(CORPPORATE MANAGEMENT)

UNIVERSITI TUNKU ABDUL RAHMAN

FACULTY OF BUSINESS AND FINANCE

APRIL 2017

DECLARATION

We hereby declare that:

(1) This postgraduate project is the end result of our own work and that due acknowledgment 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) The word count of this research report is 10,671 .

Name of Student:	Student ID:	Signature:
LEE YONG HOONG	15ABM08234	

Date: 12 April 2017

ACKNOWLEDGMENT

First of all, I would like to thank Universiti Tunku Abdul Rahman (UTAR) for giving me the opportunity to carry out this research.

Writing a quality thesis is a challenging task, it could not be done individually or solely without the help from others. This is because it requires a lot of studies on previous researches, gather of data, equip with various economy and statistical knowledge. Therefore, I would like to show my gratitude to my supervisor, Dr Wong Chin Yoong and other lecturers for their guidance and contribution throughout the whole research process. They have shared their wealthy knowledge and sacrificed their precious time in providing me valuable information on the research. When I faced difficulties in this research, Dr Wong did provide me with his precious opinions and ideas while guiding me to solve the problems and all of his support has really helped much in my project.

Besides, I would like to express my appreciation to my parents that have encouraged and supported me throughout the hardship of this research. Last but not least, a thousand thanks to our fellow classmates for the joy and fun that they have brought to me. Although I have gone through several obstacles during my research but I am grateful with the opinions and contributions from all of them.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Page

LIST OF ABBREVIATIONS

GDP	Gross Domestic Product
TB	Trade Balance
BRICS	Brazil, Russia, India, China and South Africa
EU	European Union
MNC	Multinational Corporation
R&D	Research & Development
OECD	Organization for Economic Co-operation and Development
ICT	Information and Communications Technology
OLS	Ordinary least square

Deindustrialization: A Bless or Curse for Malaysia

ABSTRACT

Deindustrialization is the phase of economic development in which the employment share in manufacturing will decline, while increase in services sectors. This study aims to examine the current states of Malaysia deindustrialization, and further to analyse whether Malaysia is facing premature deindustrialization. Firstly, this study started in study the conditions of Malaysia deindustrialization. I found that the manufacturing export and employment share is declining after 2000s, the performance of trade balance is resulting as poor, and Malaysia was over-reliance on low-skilled migrant workers and unable to self-sustaining of quality and quantity of human capital. Then, this study further studied the background of deindustrialization in worldwide by various previous researchers. Next, this study find the factors that affect Malaysia deindustrialization, result suggests that total population, GDP per capita, and the share of urban population to total population is important in improving the manufacturing share to GDP. Lastly, this study analyse whether Malaysia deindustrialize earlier before mature in industrial economics, results shows that Malaysia deindustrialize when achieving 30.94% in manufacturing share to GDP while the peak value is 40.47%. Hence, this study can conclude that Malaysia is experiencing negative deindustrialization, as well as facing premature deindustrialization.

CHAPTER 1: INTRODUCTION

1.0 Introduction

Industrialization as an engine of growth has been an important phase of development and supporting a country's economic development. Rodrik (2016) stated that it was the first industrial revolution in Europe and United States to sustain the productivity growth, resulting in the division of the world economy to differentiate into rich and poor countries. There is no exception could escape from industrialization when the country are started to developing their economics. Furthermore, some of the East Asia countries were also ready for industrialization that allowed to catch-up and convergence with the Western countries, such as the Republic of Korea, Taiwan, Japan, Singapore and China in the late 1980s (Palma, 2014; Rodrik, 2016). Furthermore, Rodrik (2016) also believe that future economy in the worldwide would be concerned on fostering the new manufacturer industries including those impoverished countries in sub-Saharan Africa and south Asia.

Most of the advanced economies have long moved into a new, post-industrial economy and the term of deindustrialization mainly refers to the experience of these advanced economies: there is a trend to looks at the employment share of manufacturing (Loke & Tham, 2011; Palma, 2014; Rodrik, 2016). Besides that, deindustrialization also can be examine by focusing on the trend of manufacturing share to GDP. When deindustrialization occurs, a country is trying to focus on the development on services sector, the government will re-allocate the resources to fostering the growth of services sector instead of manufacturing sectors. Therefore, some researcher stands in different views to argue that deindustrialization would have the opportunity to bring either positive or negative impact on economic growth and development, such as Rasiah (2011) believe that deindustrialization brings positive impact on United States' economic development while Palma (2014) stated that deindustrialization would bring long-term negative impact on economic growth.

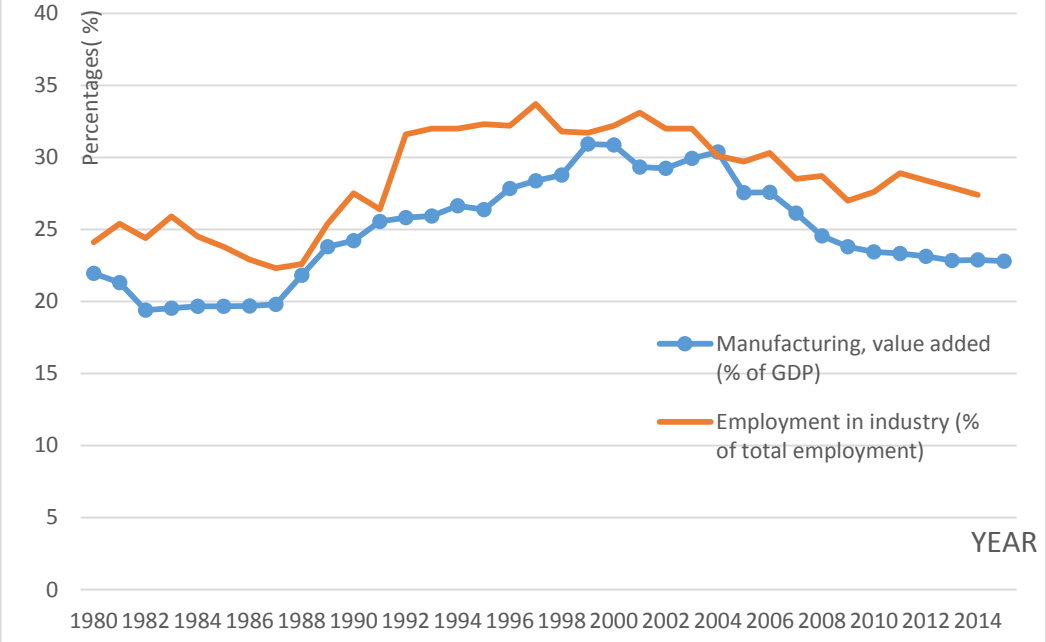
1.1 Research Background

Since its independence in 1957, Malaysia had achieved an impressive development of its manufacturing sector, and sooner becomes an important exporter for primary commodities, because Malaysia is rich with natural resources such as rubber and palm oil. Malaysia, then continue develop some manufacturing sector that are derived from its natural resource base, such as palm oil processing industry (Chang, 2012). Malaysia had also developed many manufacturing sector such as automobile and steel industry, as well as electrical and electronics industry when comes to 1980s. During the periods of 1960s, Malaysia became a developing country with middle income economy. During 1980s, manufacturing sectors had overtaken the agriculture sectors as the main economy activities to boost the economy in Malaysia. In the meantime, Malaysia economy are able to catch-up with other Four Asian Tigers (Hong Kong, the Republic of Korea, Singapore and Taiwan). Table 1.0 displays the manufacturing value-added share to GDP in Malaysia, from 1960 to 2015. The share of manufacturing value-added in Malaysia's gross domestic product (GDP) rose from 10.26% in 1960 and achieve the highest value of 30.94% in 1999, then started to drop and achieve 22.79% in 2015 (see Table 1.0). Figure 1.0 displays the manufacturing value added share to GDP and employment in manufacturing sectors, from 1980 to 2014. By referring to Figure 1.0, it allows me to observe the trend of manufacturing value-added to GDP and employment in manufacturing sectors in more easily and convenience way, over the period of 1980 until 2014.

From Figure 1.0, I can see that there is a trends of moving up of the manufacturing value-added share to GDP and employment in manufacturing sectors from 1980s to 1990s, in which Malaysia is industrialize during the periods of time, where manufacturing sectors had overtaken the agriculture sectors as the main activities to boost the Malaysia's economy. However, when entered into 2000s, the manufacturing value-added share and employment in manufacturing sectors were dropped consistently until 2014. As I know, Four Asian Tigers have successfully passed through the middle-income economy and become high-income

advanced economy (Carnovale, 2012), while Malaysia still stuck into middle-income trap (Goay, Lee, Low, Tan, & Wong, 2013). What is going on with Malaysia economy? Deindustrialization occurs when Malaysia transformed from manufacturing sectors to focus on services sectors in 2000s. After the analysis, there is an important question that comes to my mind: Is Malaysia facing negative deindustrialization? Deindustrialization is a process of the social and economic structural change by reduction and removal of resources for industrial activities, and shift to higher productivity activities, such as services sectors.

Figure 1.0: Value-added Manufacturing's Share to GDP and Employment, 1980-2014



Source: World Bank (2016).

Table 1.0: Manufacturing, value-added (% of GDP) in Malaysia, 1960-2015

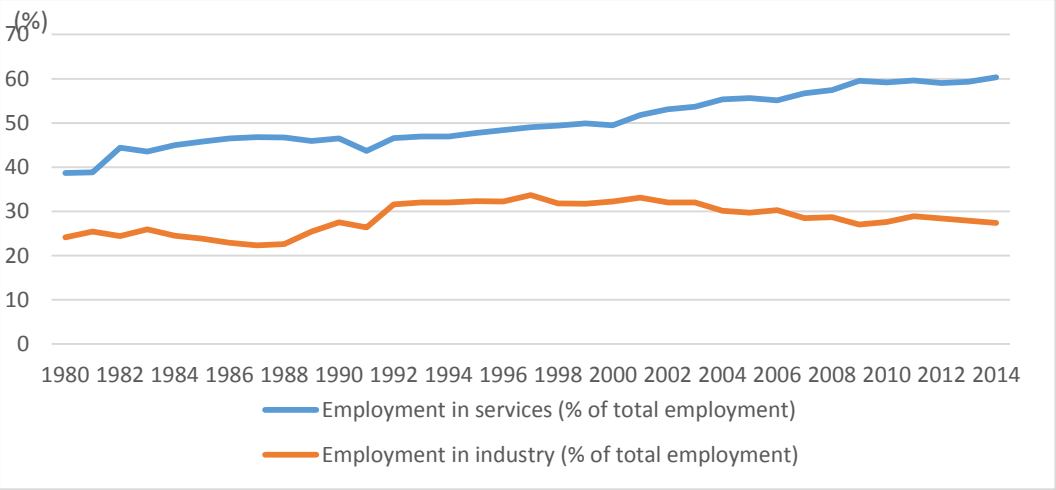
Year	Manufacturing, value-added (% of GDP)	Year	Manufacturing, value-added (% of GDP)
1960	10.26	1996	27.84
1965	10.20	1997	28.38
1970	13.76	1998	28.78
1975	18.72	1999	30.94
1980	21.95	2000	30.86
1981	21.30	2001	29.34
1982	19.40	2002	29.25
1983	19.53	2003	29.93
1984	19.66	2004	30.38
1985	19.67	2005	27.55
1986	19.68	2006	27.57
1987	19.80	2007	26.12
1988	21.82	2008	24.56
1989	23.80	2009	23.80
1990	24.22	2010	23.43
1991	25.55	2011	23.32
1992	25.82	2012	23.14
1993	25.93	2013	22.84
1994	26.64	2014	22.90
1995	26.38	2015	22.79

*Note: Answers are rounded off into two decimal points.
Source: World Bank (2016).

There is a phenomenon about domestic workers are more willing to get employed in services sector instead of manufacturing sector. Figure 1.1 displays the trends of employment in industry and services in Malaysia, from 1980 until 2014. By analysing the trend of employment from 1980 to 2014 (see Figure 1.1), during the period of 1980 to 2000, when Malaysia focusing on the development of manufacturing sector, I can see that the share of employment in industry is close to the line of employment in services, especially in 1990s. However, after the Asian

financial crisis, the employment in industry shows a trend fall while employment of services keep increase steadily. According to the World Trade Organization (2001), after the Asian financial crisis, the government has adopted measures to diversify the economy by further widening and deepening the industrial base, enhancing the contribution of the agriculture to GDP, and by fostering the development of the services sector. In addition, with the threatened by the China's economic growth, Malaysia decided to change their vision by focusing the development of services sector, thus implementation of the Eighth Malaysia Plan. Mohamad (2001) reviewed that during the Eighth Malaysia Plan, Malaysia will focused on the rapid development of technology, especially information and communications technology (ICT), increasing the supply of quality manpower that full with knowledge and skill, enhancing R&D efforts and focus on the development of growth sectors. The gap between the employment between industry and services sector is getting larger after 2000s.

Figure 1.1: Trend of employment in industry and services in Malaysia, 1980-2014



Source: World Bank (2016).

1.2 Research Problem

Deindustrialization can be separate into two difference categories: positive and negative deindustrialization. Othman (2011) and Rasiah (2011) explained that deindustrialization is considered positive if manufacturing's contribution toward GDP and trade performance remains strong. Oppositely, negative deindustrialization occurs when there is a trend fall of the trade performance and the contribution of manufacturing sector into GDP (Othman, 2011; Rasiah, 2011).

Table 1.1 displays the manufacturing trade balance in Malaysia, from 1965-2015. From Table 1.1, I can observed that Malaysia is experiencing negative trade balance throughout the year (from 1965 until 2015) indicates that import exceed exports for the value-added manufacturing goods. The data shows that Malaysia is experiencing the worst trade balance (TB) performance at the beginning 1965-1975. It's due to new entry for Malaysia to focus on the development of manufacturing sectors, they still rely heavily on the import from foreign countries. However, the condition turn positively when comes to 1980 until 2000, and achieve highest TB index values of -0.0266 in 2000 which also the brightness period for the Malaysia's economy. Afterward, the TB index turn worse until the values of -0.0291 in 2015. From the table 1.1, it shows that that the trade performance for manufacturing goods is poor functioning for economic growth, since there is negative values for all the times, from 1965 to 2015, in which the import exceeds export of manufacturing goods. It indicates that the government unable to generate huge profit from the manufacturing trade activities, it definitely an issue that government should concerned about. There is clearly a trends fall of the trade performance and the contribution of manufacturing sector into GDP for Malaysia.

Table 1.1: Manufacturing Trade Balance, Malaysia, 1965-2015

Year	Manufactures export (% of merchandise export)	Manufactures import (% of merchandise import)	Trade Performance
1965	5.2255	51.8332	-0.8168
1970	6.5467	56.9177	-0.7937
1975	17.2711	61.7310	-0.5628
1980	18.7543	66.5591	-0.5603
1985	27.1705	71.5974	-0.4498
1990	53.7753	82.1545	-0.2088
1995	74.7080	85.6686	-0.0683
2000	80.4329	84.8210	-0.0266
2005	74.6642	79.8719	-0.0337
2010	67.2040	74.2349	-0.0497
2015	66.9274	70.9364	-0.0291

*Note: Result are rounded off into four decimal points.
Formula adapted from: Rasiah (2011).
Formula used: (Export-Import)/(Export+Import).
Source: World Bank (2016).

By referring to Figure 1.0, I also can clearly see that the labour productivity is low, when there is dramatically increase of the manufacturing employment, there is only few improvement of the manufacturing value added to GDP. In 1991 and 1992, there are 26.4 % and 31.6% respectively for the manufacturing employment, however, there are only increase of 0.3% to 25.8% in 1992 for the manufacturing value added to GDP. Besides that, in 1996 and 1997, there are 32.2% and 33.7% respectively for the manufacturing employment, however, there are only increase of 0.5% to 28.4% in 1992 for the manufacturing value added to GDP. After 2000s, although the employment increase but the contribution of manufacturing value-added to GDP still decreasing. It might be due to there is lesser resources supported by the government and the higher proportion of low-skilled labour in manufacturing.

In addition, there is an issue that worried by Malaysia's government, in which they unable to self-sustaining on quality and quantity of human capital in

manufacturing sectors. Table 1.2 displays the share of employment in manufacturing and the share of migrant workers in Malaysia's manufacturing, from 1981 to 2008. Malaysia is over-reliance on low-skilled migrant workers to works in manufacturing (see Table 1.2), however, manufacturing sectors required technical skills and knowledge, such as science, mathematics and engineering knowledge. Therefore, the development of manufacturing sectors will be affected and slow down. According to the Human Development Social Protection and Labor Unit East Asia and Pacific Region (2013) reported that foreign workers come to Malaysia mainly from Indonesia, Nepal and Bangladesh, in recent years additional workers from Myanmar and Cambodia had been came to Malaysia in larger numbers. The conditions of Malaysia manufacturing sectors need to be more concerned by the government and citizens.

Loke & Tham (2011) found that these low-skilled labour will bring negative impact on labour productivity and slow down the automation, due to focusing on low value-added labour-intensive instead of high value-added capital and knowledge intensive industries. From Table 1.2, it shows that the increasing proportion of migrant workers in manufacturing also reflects that there is an issue that lack of domestic workers willing to work in manufacturing, leading to increasing the demand on migrant workers. Further, it will pull down the firm's initiatives to upgrade their technology. These development show that the manufacturing sector appears to be losing its shine, and warning that the Malaysian industrialization project may have stalled (Othman, 2011). Inability to shift low value-added labour-intensive to high value-added capital and knowledge intensive industries in manufacturing shows that Malaysia is experiencing negative deindustrialization.

Table 1.2: Share of Employment in Manufacturing and Share of Migrant workers in Malaysian Manufacturing, 1981-2008

Year	Share of Employment in Manufacturing (%)	Share of Migrant Workers in Manufacturing (%)
1981	25.4	1.0
1985	23.8	1.6
1990	27.5	2.0
1995	32.3	10.2
1996	32.2	14.1
1997	33.7	13.9
1998	31.8	13.6
1999	31.7	13.2
2000	32.2	14.1
2001	33.1	15.3
2002	32	16.2
2003	32	18.2
2004	30.1	20.5
2005	29.7	22.1
2006	30.3	23.8
2007	28.5	28.4
2008	28.7	26.9
2010	27.6	28.4
2011	28.9	36.9

Source: 1981-2011 of share of employment in manufacturing is extracted from World Bank (2016); 1981-2008 of share of migrant workers in manufacturing is extracted from Loke & Tham (2011); 2010 is extracted from Lai & Narayanan (2014); 2011 is extracted from Ismail & Yuliyusman (2014).

Table 1.3 displays the share of manufactured exports in total merchandise exports, share of hi-tech exports in total manufactured exports and per capita income. In the Electronic and Electrical sector, Malaysia has the strength to achieved competitiveness to gain certain market shares in the world. Malaysia was the third hi-tech exporter in the world, even is higher position than other Asia countries such as Korea (4), China (5) and Japan (16). As shown in Table 1.3, the share of hi-tech exports in total manufactured exports is 40%, shows that the export of hi-tech products is important for Malaysia to earn profit on it. However, the per capita income of $7,230 is lower compared to Korea ($19,830) and Japan ($37,870), but still higher than China ($3,590) and the Philippines ($1,790) even the Philippines was the largest hi-tech exporter.

According to Chang (2012), in the early 1960s, Malaysia had 2.6 times of per capita income more than Korea which is $215 and $82 respectively. Both countries are highly rely on the export of the natural resources (rubber and tin for Malaysia, and tungsten and fish for Korea). However the position has been exactly reversed when comes to 2009. The per capita income of Korea was 2.7 times higher than Malaysia, which is $19,830 and $7,230 respectively (see Table 1.3). Korea expert with their core technologies and organizational skills, and comes out with well-known brand such as Samsung, Hyundai and LG (Chang, 2012). However, Malaysia still relies heavily with foreign companies to support their core technologies and production organization. As I compared with Korea, I could clearly understands that Malaysia industrializers still have larger spaces for improvement. In reality, I can see that Malaysia often export the raw material to other countries in lower prices, due to Malaysia is rich with natural resources, then import the final goods with higher prices. This evidence shows that Malaysia is unable to capture the lucrative part of the value chain (Chang, 2012; Loke & Tham, 2011).

Table 1.3: Share of manufactured exports in total merchandise exports, share of hi-tech exports in total manufactured exports and per capita income

Ranking	Country Name	Share of hi-tech exports in total manufactured exports (%)	Share of manufactured exports in total merchandise exports (%)	Per capita income (Gross National Income in current US$)
1	the Philippines	66	86	1,790
2	Singapore	51	70	37,220
3	Malaysia	40	70	7,230
4	Korea	33	87	19,830
5	China	29	94	3,590
6	US	27	67	47,240
7	Ireland	26	86	44,310
8	Thailand	25	75	3,760
9	Hungary	24	80	12,980
10	Switzerland	23	90	56,370
11	the Netherlands	22	55	49,350
12	Finland	21	81	45,680
13	France	20	79	42,680
14	Mexico	19	76	8,920
15	UK	19	72	41,520
16	Japan	18	89	37,870
17	Sweden	16	76	48,930
18	Denmark	16	67	58,930
19	Israel	16	94	25,740
20	Canada	15	50	41,170

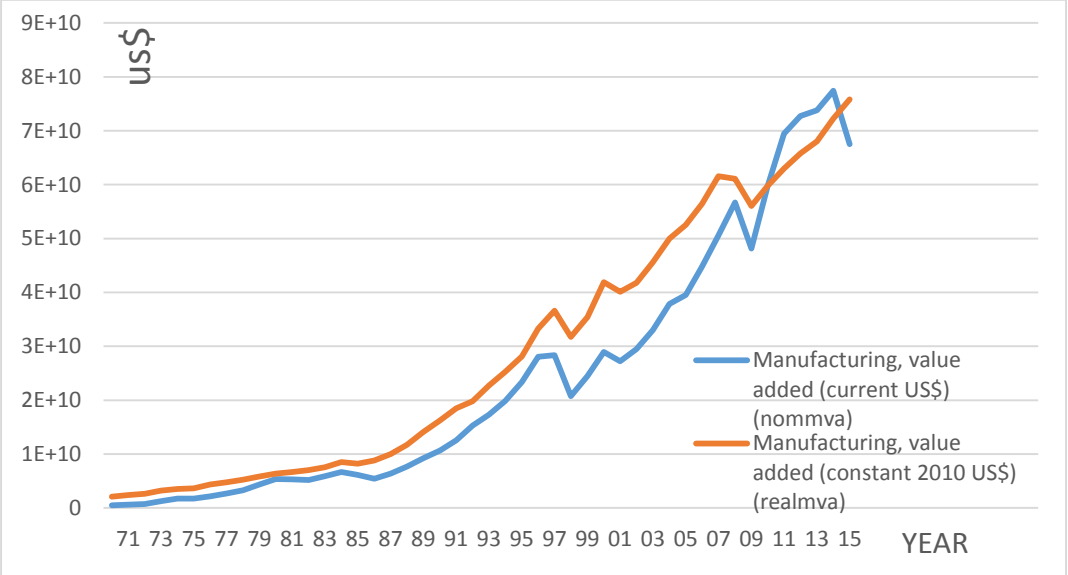
Adapted from: Chang (2012).

In automobile industry, Rasiah (2011) reported that the Malaysia's export value of automotive products rose from US$121 million in 1990 to US$369 million in 2000 and US$1,154 million in 2008. World Trade Organizations (2009) reported that Indonesia's export value rose from US$22 million in 1990 to US$369 million in 2000 and US$2,783 million in 2008 while Thailand's export value rose from US$108 million in 1990 to US$2,417 million in 2000 and US$16,227 million in 2008. As compared, I can clearly see that the manufacturer exports from Indonesia and Thailand have grown faster than Malaysia from the period 1990 until 2008.

Until here, I can see that Malaysia's manufacturing sector unable to increase the contribution to the country's GDP and the employment in manufacturing sectors, but both were dropping started from 2000. It was a painful harm to Malaysia economic growth and development. From here, one question appear in my mind: Is Malaysia facing premature deindustrialization?

To define whether a country is facing premature deindustrialization, theoretically, I can observe the manufacturing share in both employment and manufacturing value-added output (Palma, 2014 & Rodrik, 2016). From here, I will separate into two analysis, which I will focus on the share of employment in industry and services and analysis the trends. For the analysis of manufacturing value-added output, I will followed the ways that done by Rodrik (2016), which analyse the manufacturing value-added in terms of constant and prices to examine whether Malaysia is able to catch up with the movement of United States. I denoting them as nominal manufacturing value-added (nommva) for current prices, and real manufacturing value-added (realmva) for constant prices. Figure 1.2 displays the manufacturing value-added in current US$ and constant in 2010 US$, from 1970 until 2015. Regarding the results from Figure 1.2, I can see that Malaysia's performance is keep tracking for the movement of United States starts from the beginning. However, from 1995 until 2009, the gap between nommva and realmva is getting bigger, the performance of manufacturing is poor during the periods compared to United States. The situations turn positive when comes to 2010 until 2014, nommva is higher than realmva, it shows that Malaysia performance is greater than United States, in which United States is facing recession economics. And, nommva peaks much earlier than realmva in 2014, then dramatically drop in 2015, in the meantime realmva continue to rise and higher than nommva. It indicates that nommva might earlier decline and have not reach the peak point yet. Overall, I can see that Malaysia manufacturing still able to follow the footsteps of United Sates. There is some arguments said that the timing for Malaysia to enter into services economies is much earlier. Malaysia is not mature yet in industrialization; labour resources and infrastructure is need for improvement. Malaysia still have to concern on the development of the manufacturing as the engine of growth and economic development. Until this stage, I only able to said

Figure 1.2: Manufacturing value-added (current US$ and constant in 2010 US$), 1970-2015



Source: World Bank (2016).

that I suspects that Malaysia is facing premature deindustrialization based on theoretical explanations, however this statement cannot be proof without the empirically evidence with numerical values. Therefore, a statistically analysis is needed and will be presented in Chapter 3 and 4.

1.3 Research Questions

I had analysed and discussed the conditions of Malaysia's manufacturing sectors, I found that both the contribution of the manufacturing sectors to GDP and employment of manufacturing sectors is reducing after Malaysia decided to enter into services economic in 2000s. Therefore, I would like to extend to its extent by concerning to the following research questions:

1. What are the factors that contributes to the deindustrialization?

2. Is Malaysia facing premature deindustrialization?
3. Would deindustrialization bring positive impact to Malaysia economy?

1.4 Research Objectives

This study aims to study the state of deindustrialization in Malaysia. Response to the research questions, I would like to achieve three objectives throughout the study as followed:

1. To identify the major factors that contributes to the deindustrialization.
2. To empirically scrutinize of the state of deindustrialization in Malaysia.
3. To evaluate the implication of the state of deindustrialization on long term economic growth for Malaysia.

1.5 Significance of Study

The significances of this study are able to help the academics to better understanding on the trend factors and implications of the deindustrialization in Malaysia. Furthermore, this study also able to help the academics to react to the core problem by learned with worldwide experience to improve current state of deindustrialization in Malaysia. This study aims to examine the state of deindustrialization of Malaysia. Factors that affecting the industrialization have been widely discussed in the theoretical considerations, however there is lack of empirical evidence toward the premature deindustrialization. Therefore, I will calculate the peak value for industrialization as mature industrial economies, to examine whether Malaysia was deindustrialize earlier as facing premature deindustrialization.

1.6 Chapter Layout

The rest of the paper is organized as followed. The next section provides theoretical studies on explaining the deindustrialization by including the world experience. Moreover, section 3 would further analyses the model with independent variables of total population, GDP per capita and the share of urban population to total population. By making the analysis become rich and valid, this paper used the data that extracted from World Bank. Last but not least, the final section are going to presents the conclusion and policy implications.

CHAPTER 2 LITERATURE REVIEWS

2.0 Theoretical Considerations

The first use of the term on deindustrialization is toward Germany after the World War II (Cowie & Heathcott, 2003), which is an active process of victors stripping a vanquished nation of its industrial power. Deindustrialization may best be understood with hindsight as one episode in a long series of transformations within capitalism (Bluestone & Harrison, 1982). Based on their reports, the process of deindustrialization of America shows that plant closings and capital flight presented an immediate political crisis. Cowie & Heathcott (2003) said that many areas were hit hard by "deindustrialization" in the 1980s have recently experienced a renaissance of manufacturing, though often on different terms.

Deindustrialization occurs when the share contribution toward GDP shows a trend fall for manufacturing and value-added industry. According to Saegar (1997), the most common definition of deindustrialization is based on the share of manufacturing in total employment. There are two reasons in explaining the important of employment to define deindustrialization, instead of the manufacturing output. Firstly, the share of manufacturing employment is a common used indicator of the level of industrialization and economic development. Second, the share of employment reflect that the size of the manufacturing sector, and the perception of the public toward the manufacturing sectors. If the public has a positive expectation toward the manufacturing sector as an engine to drive the economic growth, they will likely to involve in the industrial activities. However, Palma (2014) argued that deindustrialization is likely to have significant negative long-term effects on growth and employment. Deindustrialization can be separated into two different categories: positive and negative deindustrialization. Othman (2011) and Rasiah (2011) explained that deindustrialization is considered positive if manufacturing's contribution toward GDP remains strong, and ability to shift low value-added

labour-intensive to high value-added capital and knowledge intensive industries in manufacturing. Oppositely, negative deindustrialization occurs when there is a trend fall of the contribution of manufacturing sector into GDP, and also lack of ability for the structural shift of the low value-added labour-intensive to high value-added capital and knowledge intensive industries in manufacturing (Othman, 2011; Rasiah, 2011). Othman (2011) strengthened the explanations of the deindustrialization by including the factors of rising of real income and share of employment in manufacturing sector. As per capita income rises during the economic development, the share of employment in manufacturing rises at the expense of agriculture. When the higher level of development is achieved, and per capita income achieve a peak value, the share of employment in services sector starts to rise at the expense of manufacturing.

When we said "deindustrialization", it is highly related to the terms of "structural change". Structural change has been considered by developing countries aim to 'catching up' with the economic movement by developed countries. Tregenna (2015) defined that structural change essentially refers to changes in sectoral composition of output and employment contributing to higher economic growth and increased utilisation of underutilised resources, especially labour. Catching up has two dimensions which are in addition to the structural change dimension which including diversification, product differentiation and technological improvements, and second is process dimension (Nubler, 2014). This refer to the pace and sustainability of change in which the high-performing processes are expressed in fast expansion of productive capacities and rapid productive transformation, absorbing technology and diversifying into a wide scope of different products and industries (Nubler, 2014). The process dimension of catching up is important in avoiding a middle-income trap. Tregenna (2014) said that the perspective of structural change is the key to the development process, and the need to shift the composition of the economy from lower to higher productivity activities in order to raise the economic growth. It included the shifting of labour as well as capital to invest in higher productivity economic activities.

The arguments on industrialization as the engine of growth and economic development were largely influenced by the implementation of government's

industrial policy. Young (1928) had discussed deeply to show why industrialization is playing an important role to drive increasing returns activities in the economics. Differentiation of the industrial policy provides manufacturing the opportunity to drive the increasing returns to support the economic growth and development. All successful industrializers have used industrial policy to develop the particular country's economics. Lavopa, Naude & Szirmai (2013) explore the analysis on the differentiation of the industrial policy and its economic development in BRICS[1]. China is the only country where the development of manufacturing sector contributes for a significant part of aggregate growth with its industrial policy[2], while Brazil, Russia and South Africa are facing deindustrialization. Rasiah (2011) argued that the shift towards services has been accompanied by continued improvements in productivity in a number of industries in the United States (positive deindustrialization) while it has declined in the United Kingdom (negative deindustrialization).

Targetti (2005) wrote that Kaldor developed four elements for the 'Law of the Manufacturing Sector as the Engine of Growth' which are increasing return in the manufacturing sector, Kaldor-Verdoorn Law, the agriculture-industry relationship, and internal-external market relations. Kaldor (1967) said that manufacturing industry is the engine of growth for every country to generate higher income returns. According to Targetti (2005), a simple explanation on Kaldor-Verdoorn Law is the higher the manufacturing output growth rate, the higher the manufacturing productivity growth rate. Kaldor (1975) was examine the agriculture-industry relationship, and Kaldor believed that there always a downward sloping curve for the growth of agriculture, and vice versa, an upward sloping curve for the growth of manufacturing sector. Lastly, for the internal-external market relations, Targetti (2005) mentioned that it is highly due to the global market conditions that having higher demand on manufacturing goods instead of agriculture commodities, such as automobile, steel, electric and

[1] BRICS includes Brazil, Russia, India, China and South Africa.

[2] China's industrial policy supported both foreign and domestic investment for technology catch-up.

electronics products. People tends to move into manufacturing sector to grab the opportunity to earn more income.

According to Fujimoto & Ohno (2006), they comes out with defining the stages of catching-up industrialization, in which there are four different stages. The first stage is simple manufacturing under foreign guidance. After that, the stage 2 is builds industrial agglomeration and supporting industries but still under foreign guidance. Next, it followed by stage 3 which is absorption of technical technology and master the management independently, and last but not least, the stage 4 is capacity of creativity and innovative in product design. Based on their findings, Vietnam is located only at stage 1, Thailand and Malaysia were both at stage 2. However, Korea and Taiwan were breakthrough the middle income trap and entered into stage 3. Finally, only Japan, the United States and EU countries able to achieved to reach until stage 4.

The discussion of the important of industrialization will not be completed without looking at the trade and the structural orientation of industries that has been promoted. Industrial development focuses on heavy and capital goods industries as an integral part necessary to produce final consumption goods manufacturing. Kalecki (1976) addressed that the heavy and capital goods industries that constitute machinery and equipment were critical complementary inputs for the development of other industries. Rasiah (2011) mentioned that Britain, the United States, Germany, Japan, the Republic of Korea and Taiwan very much enjoyed the development of both light manufacturing and complementary heavy industries, therefore, these countries able to enter into wider range of final goods industries. Light manufacturing goods such as textiles and garments also grew rapidly in these countries.

The focus on heavy industries behind import-substitution, failed in many countries because of a combination of a lack of scale and standard of import-substitution policies, such as Latin America and Philippines (Rasiah, 2011). However, the Republic of Korea successfully using the import-substitution for the promotion of export for heavy industries of steel, shipbuilding and cars, and machinery and steel (Rasiah, 2011), while Taiwan managed it in machinery and

metals, and electronics (Amsden & Chu, 2003). The Republic of Korea and Taiwan shows positive expansion both in services and manufacturing productivity has continued to rise. Hence, both of the countries are experienced positive deindustrialization.

In order to better growth of the manufacturing sector, education level is an important element that should be concerned on. Szirmai & Verspagen (2015) tested the relationship the manufacturing share and per capita growth on the level of education. They found that for manufacturing to acts as an engine of economic growth in developing countries, the higher level and high skill of human capital is necessary, and also provided that the particular countries have sufficient level of human capital support in manufacturing sectors. Universities is a critical component for Japan, Korea and Taiwan to stimulate knowledge. Rasiah (2011) mentioned that when participation in high value-added activities, whether through adding value to traditional industries or supporting new start-ups, it requires effective collaboration between universities and R&D lab and firms. For example, East Asian countries such as Japan, the Republic of Korea, and Taiwan have significantly large proportion of researchers doing the R&D for the development of industries, and they have faced positive deindustrialization. According to Aggarwal (2004), the quality of labour force is also the concern in the context on productivity measurement. Investors and MNCs tend to invest in a country that contains higher level of infrastructure and skilled human capital. From here, it was strengthened the important of high education and skill. Ho & Jorgensen (1999) used the JGF multisectoral model to analysis the quality of labour forces in the United States, they found that level of educational attainment can be contributed to the improvement of the labour quality in the United States.

2.1 Premature Deindustrialization

Previously, there are lot of researcher studied on Malaysia are facing negative deindustrialization (Loke & Tham, 2011, Othman, 2011 & Rasiah, 2011). However, I would like to further the study by examine whether Malaysia is also experiencing premature deindustrialization. Premature deindustrialization is refer to a particular country unable to capture the profit from manufacturing sectors but shift the industrial capacity to other higher productivity economic activities. As simple, Rodrik (2016) defined that countries are turning into service economies without having gone through a proper experience of industrialization, can be called as premature deindustrialization. This situation are more often happened in developing countries (Fang & Haraguchi, 2016). Palma (2014) addressed that OECD countries began deindustrializing in the late 1960s, while some high-income developing countries in East Asia (the Republic of Korea, Taiwan, Japan, Singapore and China) started deindustrializing in the late 1980s. Some Latin American countries and South Africa also began to deindustrialize despite their level of income per capita being far lower than other countries, this phenomenon can be labelled as premature deindustrialization (Palma, 2014). In fact, mainly to Asia, developing countries have experienced falling manufacturing shares in both employment and real value added, especially since the 1980s (Rodrik, 2016). Rodrik further provided two perspectives in which the shrinking of manufacturing in middle-income economies can be viewed as premature. Firstly, these countries are experiencing deindustrialization much earlier than the historical norms, as reflect, late industrializers able to deindustrialize at lower level of income, compared to early industrializers. Second perspectives is premature deindustrialization may harms on the countries' economic growth. As I know, manufacturing sectors requiring advance technology for the better production process, however, manufacturing has been employed significant quantities of low-skilled labour. It will indirectly effected those high-productivity sectors such as mining and finance, because manufacturing absorbed for large amount of labour. In addition, low-skilled labour equals low wages, manufacturing can substitute labour for technology, and it

remains stagnant of the technology. This situation is frequently happens in middle-income countries.

Chang (2012) mentioned that the rise of the China economy in recent years has increase the feeling that Malaysia is slowly caught up by China while they are unable to catch up with the more advanced economies especially manufacturing technologies. Finally, Malaysia may now be stuck in the middle-income trap. This phenomenon prompted the government to focus on the service sector as the new alternative engine of economies growth in Malaysia. This decision had been verified by what Rodrik (2016) said, Malaysia as a middle-income developing country are turning into the services economies without having a proper experience in industrialization. Therefore, Malaysia is suspected to experiencing premature deindustrialization.

2.2 Empirical evidence of premature deindustrialization

In this sub-topic, this study will focus on discussing the factor that contributes to the deindustrialization which is the first research question that mentioned in Chapter 1.3. Deindustrialization will directly impact on a country's manufacturing share to GDP, therefore, in order to examine the deindustrialization, the share of manufacturing sectors to GDP has been selected as dependent variable in the model. Furthermore, the total population, GDP per capita, and the share of urban population were selected as independent variables in the model. The relationships between dependent variables and each of the independent variables will be discussed at the following part.

2.2.1 Relationship between the share of manufacturing and the total population

Higher level of total population will bring positive impact on the share of manufacturing sectors to GDP, because there will be increase of the employment share in manufacturing. As mentioned in Chapter 2, according to Saegar (1997), the increase of the manufacturing employment reflect that the size of manufacturing sector is increasing and people are started to concerned on developing manufacturing sectors for economic growth. Thus, the contribution of manufacturing sector to GDP will increase.

There are two factors that contributes to the shift in employment from agriculture to manufacturing sectors, which can be explained through the demand and supply side. According to Rowthorn & Ramaswamy (1997), from the demand side, there is a theory of Engel's law which mean an individual spends on food will decline as his income rises. It means that when economies industrialize, people willing to spend more on manufactured product and services instead on food. From supply side, with an innovation in the agriculture production, it able to produce more food with fewer workers, leads to declining employment in agricultural sectors.

According to Matthew (2002), his report shows that there is positive relationship between the earnings from the share of manufacturing and total population in American. China and Malaysia have experience the increase of the employment share in manufacturing since 1980s (Kniivila, 2006). However, as discussed above, Rasiah (2011) argued that the manufacturing share to GDP is more rely on the government policies instead of total population and employment share. By referring to Figure 1, in the case of Malaysia, although there is large number of employment in manufacturing, however, the manufacturing share has no much increase for the time, due to the government policies that over-imported low-skilled migrant workers in manufacturing sectors.

2.2.2 Relationship between the share of manufacturing and GDP per capita

Logically, when there is increase of the GDP per capita, people will tend to consume the manufactured goods instead of agricultural commodities. The positive relationship between the manufacturing share to GDP and GDP per capita has been agreed by Singariya & Sinha (2015). The developing countries which have higher GDP per capita have higher manufacturing share to GDP, and relatively lower agricultural share to GDP. The total expenditure on manufactured goods increase when people has larger income elasticity, as compare to total expenditure on agricultural goods (Rowthorn & Ramaswamy, 1997; Szirmai & Verspagen, 2015). Singariya & Sinha (2015) addressed that this phenomenon is definitely applied to India. Kniivila (2006) said that the share of manufacturing in GDP is low when the income level is low, and there is minor contribution on economic growth. However, as discussed above, when per capita GDP reach to a certain level, the share of services sectors will rise at the expense of the manufacturing share (Othman, 2011). Therefore, I can said that there will be positive relationship between the manufacturing share and GDP per capita for developing countries, however, when comes to mature industrialization, they will started to deindustrialize and entered into services sector, it will shows negative relationship between them. My opinion has been supported by Dadush (2015) which said that the contribution of manufacturing sector to economic growth is reducing while services sector contributes more to GDP compared to the manufacturing sector.

2.2.3 Relationship between the share of manufacturing and the share of urban population

Urbanization is the phases of development where the peoples are shift from rural areas to urban areas, thus increase the proportion of people that living in urban areas. Kim (2005) said that industrialization and urbanization usually be treated as interdependent processes of economic development nowadays. However, Fei & Ranis (1961) reviewed that there is a process of development that identified industrialization and urbanization as a necessary condition for economy growth, in order to achieve higher level of welfare. Urbanization usually seen as a phases of economic development in Europe and Asia. Colosio (1979) reported that there are higher spending on agricultural commodities in rural areas, while urban areas are having higher expenditure cost to manufactured goods, in the case of Mexico. From here, I observed that there is a trend that urban consumers are more willing to consume the manufactured goods instead of agricultural commodities. It shows that there are positive relationship between the urbanization and industrialization.

In the different perspective, Gollin, Jedwab & Vollrath (2013) argued that there is not strong association between urbanization and industrialization, and even pointed that sometimes there are negative relationship between them. This situation might be common to apply to those impoverished countries such as sub-Saharan Africa, as they have experienced urbanization without transformation the economic activities from agricultural to manufacturing sectors. The income generate from natural resources still becoming the main sources for sub-Saharan Africa, even there are shifted population to urban areas. Chen, Li & Xi (2015) further agreed that low level of urbanization will not helping in increase the manufacturing share to GDP, but it will leading to the decline of the share of manufacturing sectors. However, Acemoglu, Johnson & Robinson (2005) said that many theories of development view urbanization and

industrialization as essentially synonymous and the connection between the two is so strong that urbanization rates are often used as a proxy for income per capita. With the support from the Acemoglu, Johnson & Robinson (2005), the share of urban population would still added in the model.

CHAPTER 3: DATA AND METHODOLOGY

3.0 The Model

With the support of the previous researchers which discussed in Chapter 2.2, I had include three independent variables into my model, which are total population, GDP per capita and the share of urban population to total popuation, in order to explain the manufacturing share to GDP. Although Gollin, Jedwab & Vollrath (2013) argued that there are no strongly impact of the share of urban population towards the manufacturing share to GDP. However, I would still including the share of urban population to total population to my model in this paper, due to Acemoglu, Johnson & Robinson (2005) said that urbanization rates are often used as a proxy for income per capita. The variation of the share of manufacturing to GDP still can be explained by the variation of share of urban population, thus the impact should not be neglected. Therefore, I decided to include the share of urban population to total population[3] into the equation.

To test the validity and reliability of each of the independent variables, I run t-test for all the independent variables. Equation as follows:

$$manshare_t = \varepsilon + \beta_1 \text{In } pop_t + \beta_2 (\text{In } pop_t)^2$$

$$manshare_t = \varepsilon + \beta_1 \text{In } y_t + \beta_2 (\text{In } y_t)^2$$

$$manshare_t = \varepsilon + \beta_1 \text{In } ub_t + \beta_2 (\text{In } ub_t)^2 \quad (3.1)$$

where *manshare* equal to the share of manufacturing to GDP, *y* equal to the GDP per capita, *ub* equal to the share urban population to total population, β equal the coefficient value and ε is the constant value.

[3] According to World Bank, urbanization development is reflected to the share of urban population to total population. We take the share of urban population as the measurement for Malaysia urbanization.

Next, to analyse the overall effect by all the independent variables toward dependent variable, I was formed the multiple linear regression model. I am interested to analyse the conditions of deindustrialization in recent periods. The multiple linear regression looks as follows:

$$manshare_t = \beta_0 + \beta_1 \ln pop_t + \beta_2 (\ln pop_t)^2 + \beta_3 \ln y_t + \beta_4 (\ln y_t)^2 + \beta_5 \ln ub_t +$$

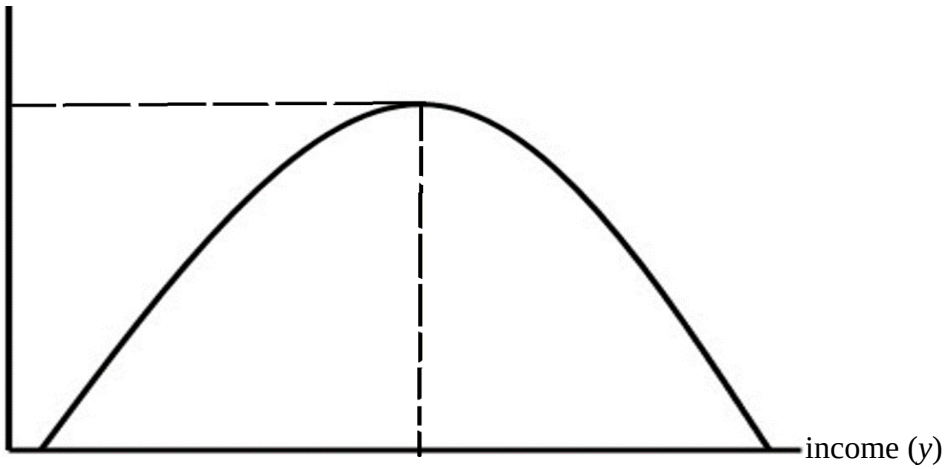
$$\beta_6 (\ln ub_t)^2 + \sum_T \varphi_T PER_T + \varepsilon_t , \quad (3.2)$$

where *manshare* denotes as manufacturing share to GDP, *pop* denotes as total population, *y* denotes as GDP per capita, and *ub* denotes as the share urban population to total population, β equal the coefficient value and ε is the constant value, with the time-series data of t = 1960, 1961, … , 2015. Furthermore, I use a basic specification that controls for the effect of demographic and income trends, with quadratic terms for log population, *pop*, GDP per capita, *y*, and the share of urban population to total population, *ub*. The analysis is done by analyse the trends over time, hence I had included the period dummies (PER_T) for the 1960s, 1970s, 1980s, 1990s, and 2000s+. The dummy variables of 2000s+ covers the period from 2000 through the final year in the sample, 2015. Period dummies are included to better capture the impact of independent variables on dependent variable over the different period of time. The estimated coefficients on these dummies (φ_T) allow me to gauge the effects of common shocks felt by manufacturing in each of the time periods, relative to the excluded, pre-1960 years (Rodrik, 2016).

According to existing literature by Colosio (1979), Matthew (2002), Singariya & Sinha (2015), the expected sign for the total population, GDP per capita, and the share of urban population are expected to have positive relationship with the share of manufacturing to GDP. All tests, including individual t-test with period dummies, will be conducted at the significance level of 10%, 5% and 1% with decision rule that rejecting null hypothesis when the p-value is less than the significance level. It will shows that there is significant relationship between the dependent variable (the share of manufacturing to GDP) and independent variables (total population, GDP per capita, and the share of urban population to total population).

Furthermore, I would like to know the highest value for the share of manufacturing to GDP as a function of income (in GDP per capita in 2010 US$) (see Figure 3.0) to examine whether Malaysia was deindustrialize earlier before reach the peak values of the manufacturing share to GDP. Figure 3.0 displays the inverted U-curve for the manufacturing shares, *manshare* as a function of income, *y* (in GDP per capita in 2010 US%).

Figure 3.0: Manufacturing shares as a function of income (in GDP per capita in 2010 US$)



Source: Rodrik (2016).

Then, using the value as baseline to check whether Malaysia deindustrialize before reach the peak values, if so, Malaysia is facing premature deindustrialization. In doing so, I using the equation (3.1) to do some simple calculation to find the value of the GDP per capita, as follows:

$manshare_t = \varepsilon + \beta_1 \text{In } y_t + \beta_2 (\text{In } y_t)^2$,

Let differentiate with $\frac{\text{d } manshare}{\text{d } In\ yt}$,

$\frac{\text{d } manshare}{\text{d } In\ yt} = \beta_1 + 2\ \beta_2 \text{ In } y_t = 0$

$\beta_1 + 2\ \beta_2 \text{ In } y_t = 0$

$(\text{In } y_t) = (\frac{\beta 1}{2\ \beta 2})$ (3.3)

where *manshare* equal to the share of manufacturing, *y* equal to the GDP per capita, β equal the coefficient value and ε is the constant value, with the time-series data of $t = 1960, 1961, \ldots, 2015$.

56 observation years are used for all the analysis which included from 1960 to 2015 as I am interested to analyse the states of Malaysia deindustrialization after the independence in 1957. All the data used are obtained from World Bank (2016).

3.1 Data

In this chapter, I had discussed how I am performing the multiple linear regression equation in explaining the deindustrialization in Malaysia since independence in 1957 until recent years, based on several aspects and perspectives. To complete the methodology test, as mentioned, I extract the data from World Bank (2016) in Excel form, 1960-2015. I used EViews in which a statistical, forecasting and modelling software to run the multiple linear regression model (3.1) and (3.2).

CHAPTER 4: RESULTS AND INTERPRETATION

4.0 The Findings

In this section, I am going to present and discuss the results computed from EViews. Firstly, I will observe the impact of each of the independent variables toward the share of manufacturing to GDP which refer to Model 1, Model 2, and Model 3. Next, I will discuss the overall effect by combining all the independent variables and results shown as Model 4. Model 5 without the variables of log of the share of urban population's square will also been discussed at following parts. Lastly, when I am talking about deindustrialization, my main concern is whether Malaysia facing premature deindustrialization. I will calculate the peak values for the share of manufacturing to GDP. Table 4.0 displays results of five different models.

A simple individual t-test has been done on the total population, GDP per capita and the urban population share. I found that the GDP per capita contribute the most in explaining the variation of the manufacturing share to GDP, since the R-square is the highest which is 0.884386. Then, followed by the total population with R-square of 0.868898 and the urban population share with R-square of 0.865427. The results is match with the existing literature by Othman (2011); Palma (2014); Rasiah (2011); and Rodrik (2016), the level of income per capita will strongly determine the manufacturing share to GDP, if a country deindustrialize before income per capita reach to a peak values, that particular country is considered as premature deindustrialization. The positive coefficient sign of log of total population and log of GDP per capita indicates that there are positive relationship toward the manufacturing share to GDP, while negative coefficient sign of log of urban population share indicates that there are negative relationship toward the manufacturing share to GDP. Besides that, I also found that all the variables are significance at significant level of 0.01, excluded log of urban population is not significance at all. It shows that the share of urban population should not be included

in the model, its tallies with Gollin, Jedwab & Vollrath (2013), in which there is no strong association between urbanization and manufacturing activities. However, urbanization rate as a proxy for income per capita, therefore I still included in my model. Model 1 until Model 3 has F-statistics with p-value of 0.0000 which is lesser than significant level of 0.05. It shows that all the three model are significant. A notice here is all the model has been selected together with Newey-West HAC. The purpose is to overcome the heteroskedasticity and autocorrelation problem that consistent occurs when I using the time series data.

Model 4 shows that the multiple linear regression contains with period dummies variables of 1960s, 1970s, 1980s, 1990s and 2000s+. From the results, the variables of log of total population, log of total population square, log of GDP per capita, Log of GDP per capita square, log of urban population share square, and five period dummy variables are significance at significant level of 0.1, while log of urban population share is significance at significant level of 0.01. It shows that all the variables used in the model are valid and reliable, there is significant relationship between all the independent variables and the manufacturing share to GDP with the decision making of rejecting the null hypotheses since the p-value is lesser than 0.1 and 0.01, respectively. Higher R-square of 0.957378 indicates that there are 95.74% of variation of the manufacturing share to GDP can be explained by the variation of log of total population, log of total population square, log of GDP per capita, log of GDP per capita square, log of urban population share, log of urban population share and period dummies variables of 1960s, 1970s, 1980s, 1990s, and 2000s+. It provides the confident to me in which the variables chosen is well-explain the manufacturing share to GDP. As mentioned above, R-square could easily increase if added more independent variables in the model, therefore adjusted R-square should be considered as well. For Model 4, the value of adjusted R-square is 0.947906. Therefore, I can said that the model is good to enough to explain the manufacturing share to GDP. Besides that, I also observed that there are impact equally of Malaysia deindustrialization's trend over time, which is from 1960 until 2015. Due to there are around 0.0711 and 0.0712 of p-value for all five period dummies variables which are 1960s, 1970s, 1980s, 1990s and 2000s+, although there are significant but p-value shows that not much differences between them.

Table 4.0: Results of five different models.

	(1)	(2)	(3)	(4)	(5)
In population	12.4159***			87.5547*	-11.3438
	(3.2894)			(47.1448)	(13.2574)
In population square	-0.8388***			-6.1570*	0.6926
	(0.2283)			(3.2470)	(0.9782)
In GDP per capita		2.7574***		7.0009*	4.9247
		(0.5979)		(3.5037)	(3.3338)
In GDP per capita square		-0.3553***		-0.9458**	-0.6918
		(0.0837)		(0.4596)	(0.4440)
In urban population share			-0.4058	9.4939***	1.9757
			(0.2501)	(3.4153)	(1.7347)
In urban population share square			-1.1998***	11.9423*	
			(0.352318)	(5.9665)	
constant	-45.6853***	-5.0884***	0.2279***		
	(11.8459)	(1.0618)	(0.0412)		
1960s				-322.0951*	37.8943
				(174.2652)	(39.0165)
1970s				-322.0778*	37.8871
				(174.2585)	(39.0178)
1980s				-322.1031*	37.8801
				(174.2705)	(39.0119)
1990s				-322.0388*	37.9643
				(174.2914)	(38.9915)
2000s+				-322.0438*	37.9678
				(174.2933)	(38.9907)
R-square	0.8689	0.8844	0.8654	0.9574	0.9492
Adjusted R-square	0.8640	0.8800	0.8603	0.9479	0.9392
Durbin-Watson stat	0.1801	0.1842	0.1700	1.1383	1.0918
F-statistics	175.6533	202.6744	170.4192		
Prob. (F-statistics)	0.0000	0.0000	0.0000		

Note: Standard error in parentheses. Level of significant: *99%; **95%, ***90%. All the models are selected with Newey-West HAC Standard Error & Covariance.

The coefficient sign of positive for log of total population indicates that there are positive relationship between the manufacturing share to GDP and log of total population. However, there are negative coefficient sign for log of total population square. The same situations also applied to log of GDP per capita (positive sign) and log of GDP per capita square (negative sign). This phenomenon shows that there are an upward sloping of the curve between the manufacturing share to GDP and total population and GDP per capita, until a certain level or reach the peak values, then the curve started to downward sloping, it is an inverted-U curve. The results is tally with Figure 3.0.

4.1 Has Malaysia Faced Premature Deindustrialization?

Back to my study topic, I would like to know whether deindustrialization is a bless or curse for Malaysia. To determine it, this study further proceed to examine whether Malaysia is facing premature deindustrialization. Premature deindustrialization means that Malaysia haven't reach the mature level in manufacturing sectors before entered into services sector. It brings no positive impact on Malaysia economy. Therefore, I am going to calculate the peak value for the manufacturing share to GDP to see that whether Malaysia is facing premature deindustrialization. By substituting the value shown at Table 4.0 into Equation 3.3, it looks as follows:

$manshare_t = \varepsilon + \beta_1 \ln y_t + \beta_2 (\ln y_t)^2$

$manshare_t = -322 + 7 \ln y_t + 0.9458 (\ln y_t)^2$

Let differentiate with $\frac{\partial manshare}{\partial In\ yt}$,

$\frac{d\, manshare}{d\, In\, yt}$ = 7 + 2(0.9458) In y_t = 0

In $y_t = \frac{7}{2(0.9548)}$

In y_t = 3.70

Next, I would like to get the exact values for y_t, therefore, I going to exponent both sides, and results shown as follows:

Exp(In y_t) = Exp (3.70)

= 40.47

From the calculation above, I found that the peak values is 40.47. However, throughout the year from 1960 until 2015, Malaysia only achieve the highest values of 30.94% for the manufacturing share to GDP in 1999, then started to deindustrialize in 2000. Malaysia deindustrialize earlier to enter into services sector before reach the peak value of 40.47%. Here, I have sufficient evidence to conclude that Malaysia is facing premature deindustrialization.

Additionally, I also trying to use the same equation of 3.3 to applied to the variable of total population. Results shown as follows:

$manshare_t$ = -322 + 87.55 In pop_t + 6.157 (In pop_t)^2

Let differentiate with $\frac{d\, manshare}{d\, In\, popt}$,

$\frac{d\, manshare}{d\, In\, popt}$ = 87.55 + 2(6.157) In pop_t = 0

In $pop_t = \frac{87.55}{2(6.157)}$

In pop_t = 7.11

Exp(In pop_t) = Exp (7.11)

= 1,224.15

The results indicates that once Malaysia has total population of 1,224.15, they able to maximize the share of manufacturing sectors and able to enter into services sector. However, there are no any literature studies that pointed out the peak value of total

population able to maximize the share of manufacturing sector. According to existing literature, the factor that affected the industrialization are more rely on the quality of workers, government industrial policy, income, and technology used. In addition, Malaysia policies that easy access of migrant workers into manufacturing sector has no bring any impact largely, therefore increase of Malaysia population will not effected the share of manufacturing to GDP. The results has shown no meaning at all.

From Table 4.0, I also found that both of the coefficient sign for log of urban population share and log of urban population share square are positive. It indicate that the curve is upward sloping and there are no any peak value currently. Therefore, I decided to remove the variables of log of urban population share square as Model 5, because the purpose that square the variables is to see whether there is U-curve for the particular variable and find the peak value it. However, after remove the log of urban population share square, the results shows that all the independent variables and five period dummies variables are insignificance since all the p-value is higher than significant level of 0.1, 0.05 and 0.01. It indicates that all the variables is not suitable to use in the model, thus the whole model is became insignificance. From here, I understand that although there are no peak value for urban population share to total population, however, it shows that there are keep increasing for the urban population share over the periods, and it is an important contribution for the Malaysia deindustrialization. The positive coefficient sign of three independent variables also consistent with past researches such as Colosio (1979); Matthew (2002); Singariya & Sinha (2015); and Szirmai & Verspagen (2015).

CHAPTER 5: CONCLUSION AND POLICY IMPLICATIONS

5.0 Findings and Contributions

There is lot of the researches done regarding on whether Malaysia is facing negative deindustrialization, however, there are lack of studies on whether Malaysia is facing premature deindustrialization. Therefore, I did my study by focusing on examine the state of Malaysia deindustrialization. To answer my first question: what are the factors that contributes to the deindustrialization? I had studied the worldwide experienced and also did the literature reviews by previous researchers. I found that total population, GDP per capita and the share of urban population to total population able to explaining the manufacturing share to GDP. Next, to test the validity and reliability of each of the independent variables, I run t-test for all the independent variables. I found that total population and GDP per capita is significantly relationship to the manufacturing share to GDP, however only the share of urban population to total population is insignificant. Furthermore, I formulate a multiple linear regression which combine all three independent variables and used of the result computed to answer my second question: is Malaysia deindustrialize earlier as facing premature deindustrialization? All the data are extracted from World Bank. After completed this study by analysed the data and did the literature reviews, my last question could be answered: deindustrialization is blessing or cursing to Malaysia?

In this study, I am providing some evidence to conclude that Malaysia is facing negative deindustrialization. There are three important evidences that been pointed in this paper. Firstly, the contribution of manufacturing share to GDP rose from 10.26% in 1960 and achieve the highest value of 30.94% in 1999, then started to drop since 2000s and achieve 22.79% in 2015. Next, I found that most of the

labour in manufacturing sector are low-skilled migrant workers, it could not bring much positive impact on Malaysia manufacturing sector, since it required technical skill and knowledge, as well as advance technology. However, Malaysia unable to catch-up with the technology transformation and over-reliance on low-skilled migrant workers. Therefore, Malaysia unable to capture the lucrative part of the value chain in manufacturing production.

Second, I using the share of manufacturing export and import to calculate the trade balance. I found that Malaysia enjoys an improvement on TB over 1990 until 2000, and reach the highest export values of 80.4329%. However, when comes into 2000s, the manufacturing export decrease consistently to 66.9274% in 2015. The TB values are in negative values for all the times, started from 1965 to 2015, it indicates that import exceed export of the manufacturing goods, and shows that the government unable to generate higher return in manufacturing activities.

Third, Malaysia facing an important issue about Malaysia unable to self-sustaining on quality and quality human capital. Due to lack of connectivity of universities and manufacturing firms, therefore, students lack of experience to explore to real world working environment and firms also unable to explore to new technology and knowledge (Rasiah, 2011). Furthermore, Malaysia facing increasing of unemployment rate for tertiary graduates which is from 15.20% in 2000 to 28.80% in 2014. All of these factor forces government to rely on the help of foreign companies in manufacturing sectors, it will definitely affected the growth of the sectors. Lastly, when analyse the overall performance of Malaysia manufacturing sector, I found that labour productivity is low, additionally, Malaysia was stuck into middle income trap, although I had provided the table in Chapter 1 to shows that Malaysia is the world third hi-tech exporter, it still unable to function well as the engine to drive up the Malaysia economic growth.

For the model regression, I have included the variables of total population, GDP per capita and the share of urban population to total population in order to examine the manufacturing share to GDP. 56 observation years is included in the model which from 1960-2015. From the result, I found that there are highly significant and positive relationship between all these three independent variables

with the manufacturing share to GDP (see Model 4) shown at Chapter 4. From this paper, I found that Malaysia was deindustrialize earlier since Malaysia only achieve 30.94% for the manufacturing share to GDP while the peak value should be 40.47%. Therefore, I had provided sufficient evidence that Malaysia is facing premature deindustrialization. After completed the study, I can said that deindustrialization in Malaysia is bring no positive impact for them, which did not really functioned as engine of growth to support Malaysia's economic development.

5.1 Policy Implications

Three policy implications should be drawn from this study. Firstly, the connectivity between universities and manufacturing firms is important to fostering a quality graduate. The manufacturing firms can provides an effective training program to welcome universities students for internship, in order to help to gain experience to real world manufacturing environment, so that graduates able to gain the skills and apply the knowledge learned through the practical. From here, firms also able to absorb the updated information regarding the advanced technology used in manufacturing production. Besides that, it is necessary for the universities and firms to establish a framework towards the commercialization of R&D on manufacturing sectors to attract more students, lecturers, researchers and scientists involved in the R&D process.

Secondly, self-sustaining of quantity and quality for human capital should become the main concerned by the government, in order to develop the manufacturing sectors. Domestic workers are not willing to get employed in manufacturing sectors, thus Malaysia was over reliance on low-skilled foreign workers. Malaysia lacks of the experts to the advance knowledge and technology for the manufacturing sector, therefore, Malaysia need to review and revise on their immigration policy. Malaysia should introduce a standard and regulate to the use and import of low-skilled migrant workers. In the meantime, Malaysia should

formulate a policy toward the hiring of the foreign experts and high-skilled foreign workers, by simplification the process of apply the permanent resident cards to work in Malaysia, it would help the foreign workers to complete the application process in more easy and convenience ways, in order to attract more foreign experts to work in Malaysia, especially in the education and manufacturing industries. Government should reviews of its policy on employee benefits, basic paid and work opportunity, comparatively to foreign country, to encourage Malaysian overseas students and workers contribute back to Malaysia. With their expertise knowledge and working experience in globally, they able to fostering local Malaysian students, and enhancing the manufacturing performance. In addition, Malaysia can collaboration with other developed countries that experienced in developing the manufacturing sectors by providing training program, introduce new technology, advanced technical skill and knowledge to Malaysia local manufacturers, in order to improve the process of manufacturing production, and labour's skill and knowledge. These actions taken will improve the quality of Malaysia's labour and technology used in operating the manufacturing processes. Malaysia will able to self-sustaining on high-skilled labour to manufacturing sectors in long term periods. Thus, Malaysia able to entered into stage 3 of industrialization which mentioned by Fujimoto & Ohno (2006) in Chapter 2.

Last but not least, research and development is an important element for the development of industries. The supporting of the grants on R&D should be continued, and formulate a policy frameworks that consistent with Japan, the Republic of Korea, Taiwan, Singapore and China that successfully using the implementation of R&D for development of industries. The grants should be well-monitor by the government to make sure that all grants is functioned to supporting knowledge-based public goods (Rasiah, 2011). Advanced knowledge and technologies will determine the speed of the manufacturing growth, the government should take initiative and put efforts to shift the structural from low value-added labour-intensive to high value-added capital and knowledge intensive industries. In other words, government should move up for the transformation toward technology-based in manufacturing sector to overcome the problem of negative and premature deindustrialization.

5.2 Recommendation

In this study, I am concerning on the conditions of employment, human capital and manufacturing performance, however, there are lack of discussion on the importance of technology. As I mentioned, technology will strongly determine the growth of the manufacturing sectors, therefore, it is an important factor that should be included in future study on deindustrialization. Industrialization as an engine of growth also largely influence by the government's industrial policies. In this study, the impact of Malaysia's industrial policies on manufacturing sectors has not discussed in details, therefore, I would recommend future researchers to focus on the impact of Malaysia industrial policy in each of the Malaysia Plan on manufacturing sectors.

Besides that, I also recommend that researcher can apply the similar study on low-income and developed countries to differentiate the impact between low-income, developing and developed countries of premature deindustrialization. In terms of time period limitation, I would advise that future researches can obtain data from various database. In doing so, researchers can collect more data for analysis, instead of depending only on World Bank data.

References

Abdi, H. (2007). The Method of Least Square. CA, USA: Thousand Oaks.

Acemoglu, D., Johnson, S., & Robinson, J. A. (2005). The Rise of Europe: Atlantic Trade, Institutional Change, and Economic Growth. *American Economic Review, 95*(3), 546-579.

Aggarwal, S. C. (2004). *Labour Quality in Indian Manufacturing: A State Level Analysis.* Indian Council for Research on International Economic Relations, Working Paper No. 126.

Amsden, A., & Chu, W. W. (2003). *Beyond Late Industrialization: Taiwan's Upgrading Policies.* Cambridge, MA: MIT Press.

Bluestone, B., & Harrison, B. (1982). *The Deindustrialization of America. Retrieved April 2, 2017, from* http://www.d.umn.edu/~epeters5/Cst1201/Articles/Deindustrialization%20of%20America.pdf

Carnovale, M. (2012). *Developing Countries and the Middle-Income Trap: Predetermined to Fall?* Doctoral dissertation, New York University.

Chang, H. J. (2012). The Manufacturing Sector and the Future of Malaysia's Economic Development. *Jurnal Pengurusan, 35,* 3-12.

Chen, X., Li, G. P., & Xi, Q. M. (2015). Urbanization Level and Spatial Distribution of Manufacturing Industry: An Empirical Research Based on Provincial Panel Data. *SCIENTIA GEOGRAPHICA SINICA, 35*(3), 259-267.

Colosio, D. (1979). *Urbanization and Economic Development in Mexico.* International Institute for Applied Systems Analysis, Working Paper No. 79/019.

Cowie, J., & Heathcott, J. (2003). *The meanings of deindustrialization*. Ithaca, NY: ILR Press.

Dadush, U. (2015). *Is Manufacturing Still a Key to Growth?* OCP Policy Center, Policy Paper No. 15/07.

Fang, C. C. C., & Haraguchi, N. (2016). *The importance of manufacturing in economic development: Has this changed?* United Nations Industrial Development Organization (UNIDO), Working Paper 1/2016.

Fei, J. C. H., & Ranis, G. (1961). A Theory of Economic Development. *The*

American Economic Review, 51(4), 533-565.

Fujimoto, T., & Ohno, K. (2006). *Industrialization of Developing Countries: Analyses by Japanese Economists.* Report presented and discussed at the GRIPS, Tokyo.

Goay, J. D. X., Lee, Y. H., Low, T. T., Tan, K. C., & Wong, L. K. (2013). *MIDDLE-INCOME TRAP: FROM THE PERSPECTIVE OF ECONOMIC GROWTH,* University Tunku Abdul Rahman.

Gollin, D., Jedwab, R., & Vollrath, D. (2013). *Urbanization with and without Industrialization.* George Washingston University, Washington, DC.

Ho, M. S., & Jorgensen, D. W. (1999). *The Quality of the U.S. Work Force, 1948-95.* Unpublished manuscript, Harvard University.

Human Development Social Protection and Labor Unit East Asia and Pacific Region. (2013). *Immigration in Malaysia: Assessment of its Economic Effects, and a Review of the Policy and System.* Retrieved April 2, 2017, from http://psu.um.edu.my/images/psu/doc/Recommended%20Reading/Immigration%20in%20Malaysia.pdf

Ismail, R., & Yuliyusman, F. (2014). Foreign Labour on Malaysian Growth. *Journal of Economic Integration, 29*(4), 657-675.

Kaldor, N. (1967). *Strategic Factors in Economic Development.* Ithaca, NY:Cornell University Press.

Kaldor, N. (1975). What is Wrong with Economic Theory? *Quarterly Journal of Economics, 89*, 347-357.

Kalecki, M. (1st Ed.). (1976). *Essays on Developing Economies.* Hassocks: Harvester Press.

Kim, S. (2005). Industrialization and Urbanization: Did the Steam Engine Contribute to the Growth of Cities in the United States? *Explorations in Economic History 42*, 586-598.

Kniivila, M. (2006). *Industrial development and economic growth: implication for poverty reduction and income inequality.* Department of Social and Economic Affairs, New York, 295-332.

Lai, Y. W., & Narayanan, S. (2014). Immigrant Labor and Industrial Upgrading in Malaysia. *Asian and Pacific Migration Journal, 23*(3), 273-344.

Lavopa, A., Naude, W., & Szirmai, A. (2013). *Industrialization Lessons from BRICS: A Comparative Analysis.* University of Maastricht, Discussion Paper No. 7543.

Loke, W. H., & Tham, S. Y. (2011). Industrial Deepening in Malaysia: Policy Lessons for Developing Countries. *Asian Development Review*, *28*(2), 88-109.

Matthew, P. D. (2002). *The Information Economy and American Cities.* Baltimore, US: The Johns Hopkins University Press.

Mohamad, M. (2001). *MID-TERM REVIEW OF THE EIGHTH MALAYSIA PLAN 2001-2005.* Retrieved April 2, 2017, from http://www.epu.gov.my/sites/default/files/MidTermReviewRMKe8.pdf

Nubler, I. (2014). *A theory of capabilities for productive transformation: learning to catch up.* Transforming Economies: Making Industrial Policy Work for Growth, Jobs and Development, Geneva: International Labour Organization.

Othman, S. A. (2011). *Is Malaysia deindustrializing for the wrong reasons?* Retrieved April 2, 2017, from https://www.mier.org.my/newsarticles/archives/pdf/samirul(p.34)6_7_2011.pdf

Palma, J. G. (2014). Industrialization, 'premature' deindustrialization and the Dutch disease. *Revista NECAT, 3*(5), 7-23.

Rasiah, R. (2011). Is Malaysia Facing Negative Deindustrialization? *Pacific Affairs, 84*(4), 715-736.

Rodrik, D. (2016). Premature deindustrialization. *Journal of Economic Growth, 21*(1), 1-33.

Ramaswamy, R., & Rowthorn, R. (1997). *Deindustrialization-Its Causes and Implications.* Retrieved April 2, 2017, from https://www.imf.org/EXTERNAL/PUBS/FT/ISSUES10/INDEX.HTM

Saeger, S. (1997). Globalisation and deindustrialization: myth and reality in the OECD. *Weltwirtschaftliches Archiv, 133*(4), 579-608.

Singariya, M. R., & Sinha, N. (2015). Relationships among Per Capita GDP, Agriculture and Manufacturing Sectors in India. *Journal of Finance and Economics, 3*(2), 36-43.

Szirmai, A., & Verspagen, B. (2015). Manufacturing and economic growth in developing countries, 1950-2005. *Structural Change and Economic Dynamics, 34*(C), 46-59.

Targetti, F. (2005). Nicholas Kaldor: Key Contributions to Development Economics. *Development and Change, 36*(6), 1185-1199.

Tregenna, F. (2014). A new theoretical analysis of deindustrialization. Cambridge Journal of Economics, 38(6), 1373-1390.

Tregenna, F. (2015). *Deindustrialization, structural change and sustainable economic growth.* United Nations Industrial Development Organization (UNIDO), Working Paper 2/2015.

World Bank (2016). *Malaysia.* Retrieved March 2, 2017, from http://data.worldbank.org/country/malaysia

World Trade Organization. (2001). *Malaysia: December 2001*. Retrived April 2, 2017, from https://www.wto.org/english/tratop_e/tpr_e/tp180_e.htm

World Trade Organizations. (2009). *International Trade Statistics.* Geneva: World Trade Organization.

Young, A. A. (1928). Increasing Returns and Economic Progress. *The Economic Journal, 38*(152), 527-542.