國際學碩士學位論文

Impact of the Resource Curse on the Process of Deindustrialization and the Role of Government

資源의 詛呪가 脫産業化에 미치는 影響과 政府의 役割

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서울大學校 國際大學院

國際學科 國際通商 專攻

南 珍 旭

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Thesis by

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Graduate Program in International Commerce

For the degree of Master of International Studies

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Graduate School of International Studies

Seoul National University

Seoul, Korea

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ABSTRACT

Impact of the Resource Curse on the Process of Deindustrialization and the Role of Government

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Although natural resource abundance usually allows a country to earn rents with less effort than building up a manufacturing industry requires, which takes a long time and sufficient technology to develop, many scholars have discovered that there is a negative relationship between natural resource abundance and economic growth. However, many of their papers focus solely on the impact of so-called 'resource curse' on economic growth. This thesis, on the other hand, focuses on the impact of the natural resource abundance on manufacturing sector instead of growth. Also, it attempts to empirically investigate how the 'resource curse' may lead to deindustrialization and whether the government plays a role on this matter.

Thus, the main objectives of this paper are, firstly, to examine various external and internal factors that influence the process deindustrialization, and secondly, to explore

how the government could utilize the rents earned from the commodity sector and improve the manufacturing sector, if the abundance of natural resources indeed impedes the manufacturing sector and economic growth. The panel data regression results indicate that resource curse-related variables do lead to, not only slow growth, but also deindustrialization. However, if the quality of institution or government improves, it is possible to lessen the negative impact of resource curse and may even be able to turn the negative impact to positive impact, if the quality is above certain level.

In contrast to previous studies that main used cross-section data, the analysis in this paper uses a panel data that allows panel data regression, which would give a more concrete result. This paper suggests that the natural resource abundance does not always end up being a curse to manufacturing industry. Instead, with the effort of government, it could be a blessing.

Keywords: Resource Curse, Deindustrialization, Manufacturing Value Added, Quality of Institution, Panel Data Analysis

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CHAPTER I. INTRODUCTION

1.1 Background

Ever since the epoch of the Industrial Revolution in the 18th century, the industrialization has been the key factor for economic growth. In 1962, Japanese economist, Akamatsu noted that the development of the industry is one of the historical stages of economic growth in developing countries.[1] And indeed, the miraculous economic growth of Germany, Japan and South Korea after the World War II, and China from the beginning of the new millennium was mainly based on the development of the manufacturing sector. Also, the dominant competitiveness of the industry has even led to the hegemonies of the United Kingdom in the 19th century and the United States after the World War II.

However, it seems that the industrialization is not the only path to the economic growth nowadays. With the recent soaring price of natural resources such as crude oil from the early 21st century, the resource-abundant countries such as those in Latin America have been experiencing a rapid growth rate. For example, Peru and Venezuela, which both are the countries with abundant natural resources, recorded the average growth of 6.84% and 6.83% respectively during the seven-year span from 2004 to 2010

[1] Kaname Akamatsu (1962), *A Historical Pattern of Economic Growth in Developing Countries.*

despite of the global financial crisis that has impacted the world economy from 2008.[2] So, is natural resource abundance a blessing, as it allows countries to earn benefits easily? Unfortunately, for the natural resource-abundant countries, the historical researches seem to object to this idea. The famous work on natural resource abundance and economic growth by Sachs and Warner (1995) formally showed that the relationship between economic growth and natural resource abundance is negative, instead of positive,[3] which could well be against the common sense. And many scholars also have shown in their research that the resource-abundant countries actually perform worse than those that own fewer natural resources. This phenomenon is often described as "resource curse". Although resource exploitation probably is not the only contributor to the cause of low development rate, the income growth rates between the newly-industrialized countries (NICs) and the resource-rich Latin American countries differ by huge amount. For example, the gross domestic product (GDP) per capita of Singapore and South Korea were $394 and $155, respectively in 1960, whereas the GDP per capita of Venezuela and Peru were $1,138 and $252, respectively. 50 years later in 2010, the GDP per capita rose up to $41,987 for Singapore and $20,540 for South Korea, but the GDP per capita for Venezuela and Peru didn't rise as much, increasing only up to $13,657 and $5,292, respectively.[4]

In addition to "resource curse", the theory of Dutch disease suggests that there is

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[2] Growth rates of Peru and Venezuela are computed by using data from World Databank, the World Bank Group, retrieved November 7, 2012.
[3] Jeffrey D. Sachs and Andrew M. Warner (1995), *Natural Resource Abundance and Economic Growth.*
[4] GDP per capita data are from World Databank, the World Bank Group, retrieved November 7, 2012 (unit: current US$).

a negative relationship between the manufacturing sector and the natural resource. This theory states that the sudden finding or huge increase in price of natural resources would cause the concentration of resources into the commodity sector and appreciation of currency, which therefore, would lead to the contraction of manufacturing sector due to loss in price competitiveness in the world market.

Finally, since the rents earned from the natural resources are induced easier than those earned from the manufacturing sector, they are easily subject to corruption, rent-seeking behavior. And it is quite obvious that such behavior would lead to a huge income gap between the owners of endowment and those who don't own. Thus, this would easily lead to slower development in sectors other than the resource exploiting sector, such as manufacturing and service sectors.

However, there also exists number of countries that have grown rapidly and become developed countries, such as Australia, Canada and New Zealand. Their main products are primary commodities like raw metals, beef, and lumber, yet, they are considered as highly developed countries. The main difference between these countries and other less developed resource-abundant countries is the effectiveness of government or institution. With better governance and corruption control, the resource-abundant developed countries have been able to use the earned rents from primary commodities more wisely and effectively.

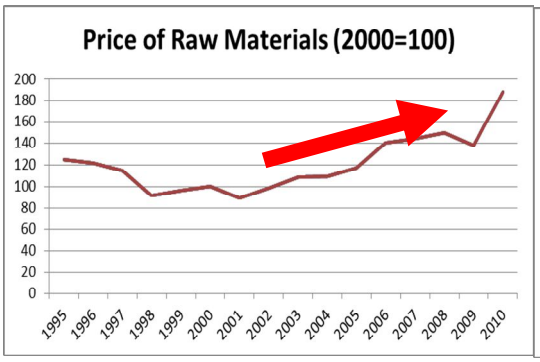
To sum up, despite of all the negative impacts of natural resources to the manufacturing sector explained above, this paper suggests that not all countries with abundant natural resources experience negative effect of the Dutch disease on

manufacturing sector. Depending on the effectiveness of the government and policy, the countries could use the rents earned from the natural resources well and achieve the growth in manufacturing sector, which would eventually be the boost and the base for the economic development.

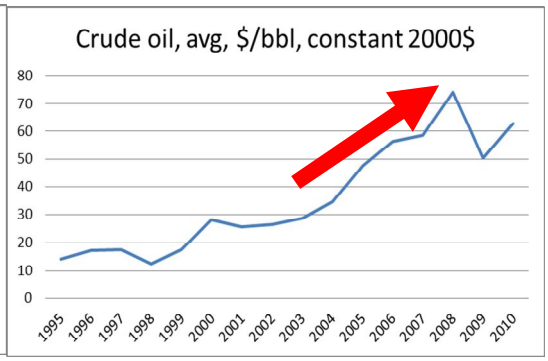
1.2 Recent Trend

With various suspected causes such as the second Gulf War and the rise of China, the price of raw materials, especially of crude oil has been rising drastically since the beginning of the 21st century. <Figure 1-1> and <Figure 1-2> display the increasing trend of the prices, which clearly is visible even with the naked eye. And with this soaring price, the exporters of these natural resources have been experiencing high growth rates. Surely, these countries have used the most out of this trend as they moved the factors of production into the resource extracting industry. <Figure 1-3> shows the rate of total natural resource rents for Latin American countries that heavily rely on export of natural resources. From 2001, when the price of raw materials has started to rapidly rise, the dependence on natural resources also has begun to increase.

<Figure 1-1> Price of Raw Materials

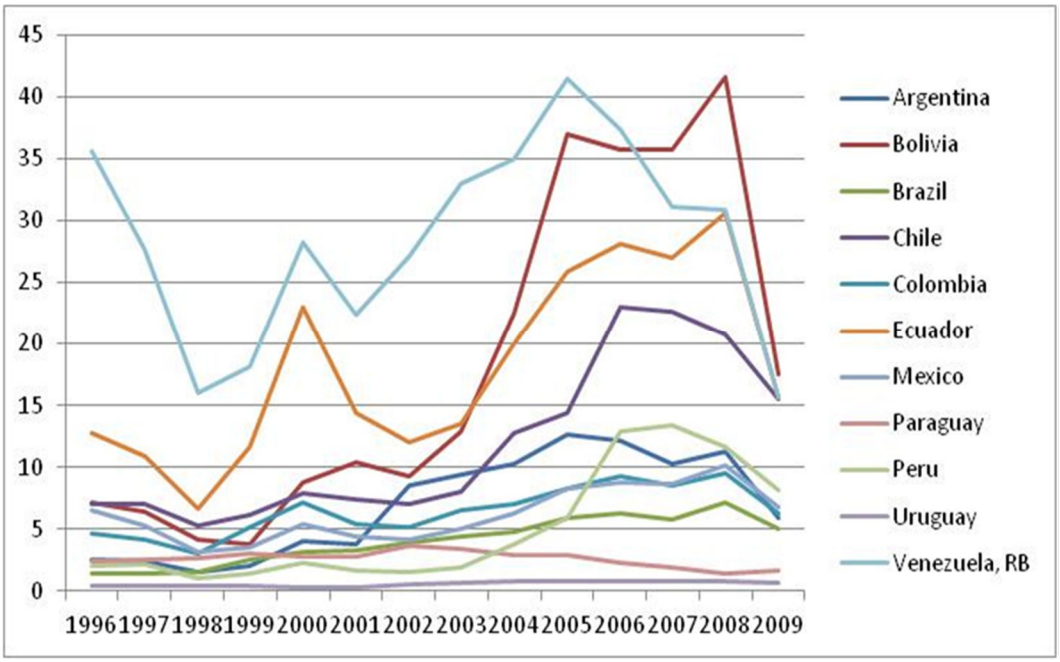


<Figure 1-2> Price of Crude Oil



Source: World Bank

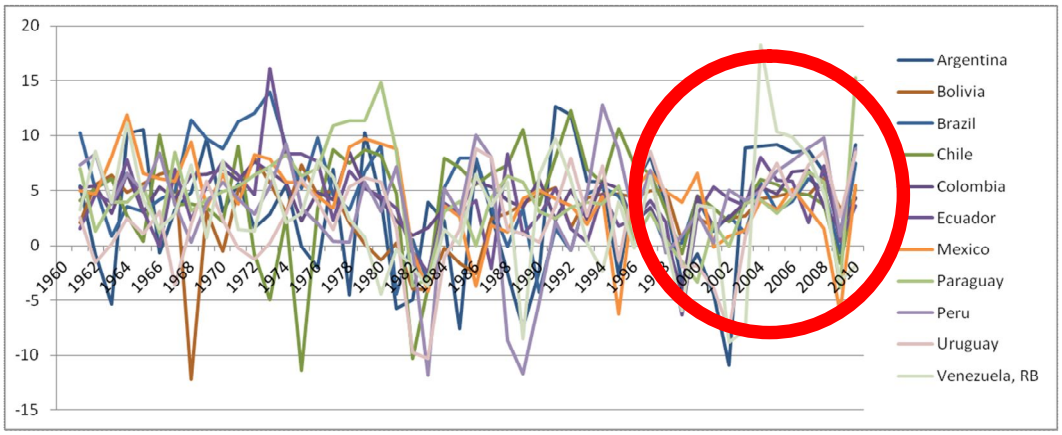
<Figure 1-3> Total Natural Resource Rents (% of GDP) from 1996 to 2009



Source: World Bank

The increasing prices of raw materials combined with the high dependence on raw materials seem to have eventually led to economic growth. <Figure 1-4> shows the growth rates of major Latin American countries and they have recorded high growth rates in recent years, which seem to have benefited a lot from resource exploitation. However, historically, they have constantly fluctuated and it seems as if these countries are unable to sustain them. And one possible reason could be the volatility of price of natural resources and deindustrialization.

<Figure 1-4> GDP Growth Rates Change of Latin America from 1960 to 2010

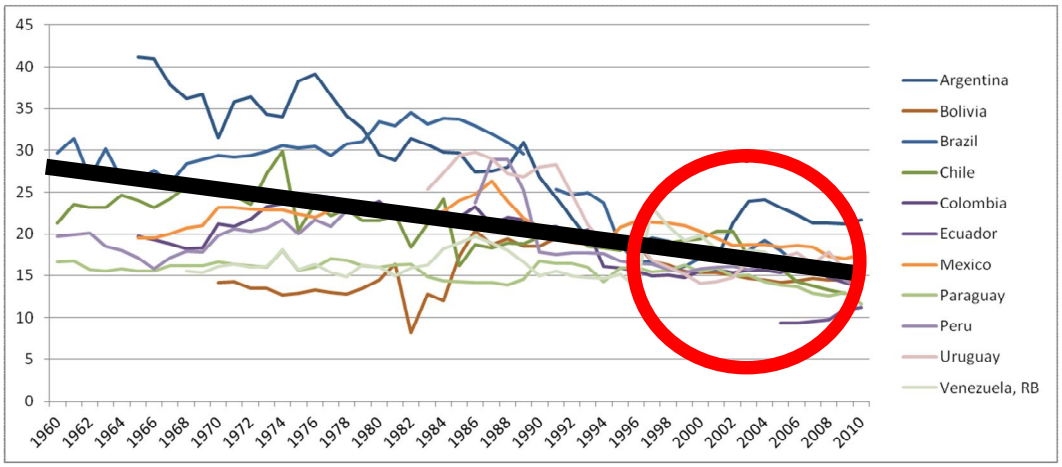


Source: World Bank

If the dependence on natural resources has increased, then the manufacturing sector of these countries probably has become less important in their economy. <Figure 1-5> shows the manufacturing value added (% of GDP) of these countries. According to the economist Alan Deardorff, manufacturing value added is "value added in the

manufacturing sector of an economy and those who believe that manufacturing is somehow more important than other sectors of the economy regard a decline in this as cause for concern."[5] By examining the trend of <Figure 1-5>, the high growth rates surely have not been achieved through development of the manufacturing sector and may have been hurt by the development of resource extracting industry.

<Figure 1-5> Manufacturing Value Added (% of GDP) of Latin America



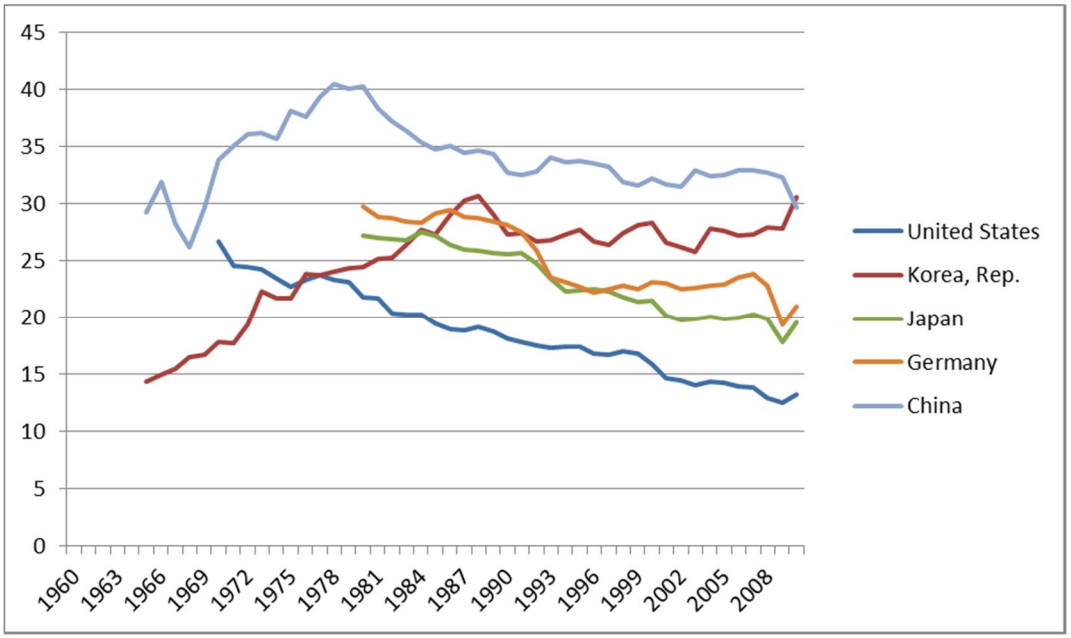
Source: World Bank

<Figure 1-6> shows the manufacturing value added of five major industrialized countries including South Korea and China that have been industrialized relatively recently. Except for the United States, the percentages are about 20 or above, whereas those of the Latin American countries are mostly under 20. Although those of the United States, Germany and Japan are in decline trend, it is likely due to the development of

[5] See Deardorff's Glossary of International Economics

service sector. On the other hand, those of Korea and China still occupy larger portion of their GDP and the development of manufacturing sector has been the critical factor in their rapid economic growth with no doubt.

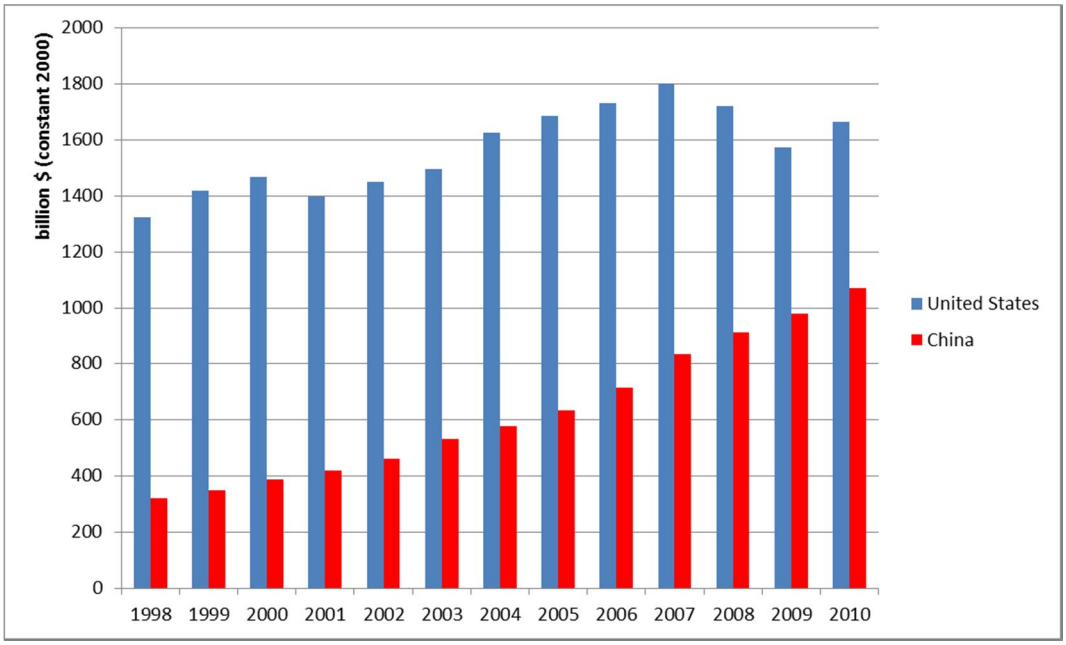
<Figure 1-6> Manufacturing Value Added (% of GDP) of
Major Industrialized Countries



Source: World Bank

Finally, <Figure 1-7> shows how China has been catching up the United States, in terms of total manufacture value added. Rise of China is crystal clear from the graph and it seems like it is only matter of time that China will overtake the United States in manufacturing industry, at least in terms of total value. Therefore, this manufacturing value added could be an important factor for explaining the development of a nation.

<Figure 1-7> Total Manufacturing Value Added from 1998 to 2010



Source: World Bank

1.3 Research Question

With these background and recent trends in mind, this paper attempts to examine the relationship between natural resource abundance or Dutch disease and manufacturing sector by analyzing both external and internal factors that could influence the process of deindustrialization and the role of government that could minimize or utilize the so-called negative influences mentioned above. So far, there have been many studies that examine the relationship between natural resource abundance and economic growth. However, the

impact of natural resources on manufacturing sector seems to be researched less to my best knowledge.

The two main research questions in this paper are as followings:

1. Which internal and external factors influence the process of deindustrialization? Do the factors of resource curse and Dutch disease that negatively influence the economic growth have the similar impact on manufacturing sector?
2. If the abundance of natural resources indeed impedes the manufacturing sector and the economic growth, can the government utilize the rents earned from the commodity sector and improve the manufacturing sector?

Therefore, this paper provides an interesting insight by analyzing what has been less studied before and attempting to explore policy recommendation that could help the countries with possible resource curse. Unlike many other previous studies on natural resources that mostly use cross-sectional data, this study uses panel data set of 110 countries all over the world with period of time from 1996 to 2010. This limited number of countries and time frame are set due to the availability of data.

The rest of the paper comprises of Chapter II, presenting a literature review on the factors that could have negative impact on industrialization, Chapter III on methodology and hypothesis, Chapter IV, providing the analysis of the panel data regression, Chapter V on the policy implication and finally, Chapter VI on conclusion.

CHAPTER II. LITERATURE REVIEW

2.1 Manufacturing Sector and Growth

Although the powerhouse countries like the United States and the United Kingdom have developed the enormously large-sized financial sector in recent years, which has played a role as an engine for economic growth, it has been the manufacturing sector that has acted as a major catalyst for the most developed and newly-developed economies for the past 250 years and there are several theories that support the importance of manufacturing sector on economic growth.

Firstly, British economist Nicholas Kaldor stated in 1966 that "the faster the rate of growth of the manufacturing sector, the faster will be the rate of growth of…[GDP], not simply in a definitional sense in that manufacturing output is a large component of total output, but for fundamental economic reasons connected with induced productivity growth inside and outside the manufacturing sector."[6]. This is so-called Kaldor's first law of economic growth, illustrating the importance of manufacturing sector on economic growth. He argued that because of the other external effects incurred by the manufacturing sector, it can boost the economy more than it seems to be.

Kuznets (1959) also argued that one of the main reasons why the low-income countries could not achieve high growth rates in the mid-1950s was a failure to

[6] Nicholas Kaldor (1966), *Causes of the Slow Rate of Economic Growth of the United Kingdom: an Inaugural Lecture.*

industrialize.[7] And those countries on Kuznet's list of low-income countries that experienced very rapid growth in recent periods are South Korea and Thailand. Not surprisingly, they could spread the industrial system in their economy during development periods.

2.2 Resource Curse

During a 1976 interview, former Venezuelan Oil Minister and OPEC co-founder Juan Pablo Perez Alfonzo told a young graduate student, "Ten years from now, twenty years from now, you will see: oil will bring us ruin."[8] And indeed, he seems to be right as the idea of natural resources being more of a curse than a blessing began to emerge in the 1980s. Richard Auty (1993) first started to use the term, "resource curse thesis" to describe how resource-abundant countries counter-intuitively grow slower than resource-poor countries.

Later, Sachs and Warner (1995) formally have shown this negative link between resource-abundance and growth, which then has been further explained by several other related theories. Some also argue that not only the natural resources, but large amount of financial flow from foreign aid or investment could provoke the effects similar to the

[7] Simon Kuznets (1959), *Six Lectures on Economic Growth*.
[8] Fortune, "The Devil's Excrement", February 3rd, 2003

resource curse.[9]

2.2.1 Dutch Disease

On the other hand, the term, "Dutch disease" was first used by *the Economist* article that describes the decline of the manufacturing sector in the Netherlands after the discovery of a natural gas field in 1959.[10] The Dutch disease explains the link between sudden finding or increase in exploitation of natural resources and decline in the manufacturing sector. The first economic model on Dutch disease was developed by Max Corden and Peter Neary. Corden and Neary (1982) argued that the economy consists of non-traded good sector and two traded goods sectors, the booming sector and the lagging sector. In case of the Netherlands, with a new discovery of a natural gas field, the demand for capital and labor in the extraction of natural gas industry (the booming sector), will be increased by the "resource movement effect", thus increasing production in the booming sector and decreasing in the lagging sector, which would be the manufacturing sector or the agricultural sector in this case. As the extra revenue would be created in the booming sector, the revenue earners would demand more of non-traded goods like service, shifting capital and labor to the non-tradable sector, away from the lagging sector. Therefore, the lagging sector eventually declines and this phenomenon is described as indirect-deindustrialization.[11] Since the demand for non-traded goods increases, the price of these

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[9] Raghuram G. Rajan and Arvind Subramanian (2011), *Aid, Dutch disease, and manufacturing growth*.
[10] The Economist, "The Dutch Disease", November 26th 1977, pp. 82-83.
[11] W. Max Corden (1984), *Boom Sector and Dutch Disease Economics: Survey and Consolidation*.

goods will increase as well, however, the price of the traded goods is determined in the world market, which is likely to remain unaffected by a price change in just a single country. Therefore, this leads to appreciation of the real exchange rate and further worsens the condition for the lagging sector. This phenomenon could also be explained by the Rybczynski theorem, which states that "at constant relative goods prices, a rise in the endowment of one factor will lead to a more than proportional expansion of the output in the sector which uses that factor intensively, and an absolute decline of the output of the other good.[12]"

Not only natural resources, but another theory that foreign aid could incur Dutch disease effect was suggested by Rajan and Subramanian (2011). They argued that large inflow of foreign capital could act in a same way as discovery of a new petroleum field. Thus, it ends up appreciating the currency and there would be decline in share of tradable goods.

In 2003, the United Nations Economic Commission for Latin America and Caribbean (ECLAC) indicated that the Latin American countries have been showing the sign of deindustrialization from observing decline in manufacturing employment.[13] This is another empirical evidence of the Dutch disease theory. However, as the recent growth rates of the Latin American countries mentioned earlier in this paper show, these countries have actually been experiencing high growth, despite of possible on-going deindustrialization process. This empirical evidence may imply that resource curse does not always occur in resource-abundant nations. However, it may also imply that the Latin

[12] Tadeusz Rybczynski (1955), *Factor Endowment and Relative Commodity Prices*.
[13] José Antonio Ocampo and Juan Martin (2003), *Globalization and Development.*

American countries would soon experience resource curse that their economies would slow down or in worst case, collapse.

Although Dutch disease is not the exact same term as resource curse, they are often intertwined as both terms are related with natural resources. The Dutch disease shows the effect on the tradable goods manufacturing sector and the resource curse focuses on the effect on the economic growth. In this paper, the technical distinction between them is not an issue; rather, combining them to observe the effect of natural resources is sought.

2.2.2 The Rentier State and Corruption

The term, rentier state is derived from political science and international relations theory since the 20th century. According to Beblawi (1990), a state could be identified as rentier: (1) if rent situations predominate; (2) if the economy relies on a substantial external rent and therefore does not require a strong domestic productive sector; (3) if only a small proportion of the working population is actually involved in the generation of the rent; and finally, (4) perhaps most importantly, which the state's government is the principal recipient of the external rent.[14]

This rentier state mostly applies to the countries with rich natural resources such as petroleum. And the problem that may arise in a rentier state is the obvious rent-seeking behavior as the higher proportion of wealth is concentrated in the natural resource

[14] Hazem Beblawi (1990), *The Rentier State in the Arab World.*

extracting sector, which earns so-called ‘easy money’. The investors would prefer to bribe a government official more than investing in other sectors such as manufacturing, which is costly, uncertain and difficult to develop.

Considering these factors together, there is more likely possibility of corruption in a rentier state. The corrupt government officials have less incentive to improve the institutional and regulatory quality as that could act as a constraint to building their own wealth, which in turn would dampen the possible growth in other sectors.

2.2.3 Natural Resources, Neither Curse nor Destiny?

All of the previous literatures mentioned above investigate on how natural resource abundance has been acting more as a curse instead of a blessing. However, Lederman and Maloney (2007) claim that there is no evidence of a negative impact of natural resource abundance on growth, stressing that there is no resource curse. They argue that it’s rather trade structure that has a bigger impact. In their analysis, they investigated variables such as export concentration and intra-industry trade indices, to find out whether these variables affect the growth more than the natural resource specialization does.

According to their result, assertion that resource abundance adversely affects growth is found not to be robust to a variety of measures of resource abundance or

estimation technique.[15] Also, export concentration, measured by a Herfindahl index and natural resource exports as a share of exports, has a predicted negative effect, which implies that if a country specializes in trading only few goods, it is more likely to grow slower than a country that diversifies its trade. And finally, intra-industry trade shows positive impacts on growth as predicted by theory, meaning that a country with higher share of intra-industry trade grows faster than a country with higher share of inter-industry trade.

Although export concentration and resource extraction may highly be correlated that higher export concentration means higher ratio of rents from natural resources in economy, Lederman and Maloney's study implies that if a government attempts to diversify the export goods and develop the industry, natural resource abundance may not end up being a curse. Instead, natural resource abundance would act as a boost to economic growth, with vast amount rents earned from resource extraction.

2.3 Manufacturing Industry, Dutch Disease and Governance

In recent years, there have been some efforts to investigate the role of governance. Some scholars have been questioning why the governments of the natural resource abundant countries could not utilize the 'easy money', turning it into the

[15] Daniel Lederman and William F. Maloney (2007), *Natural Resources, Neither Curse nor Destiny*

sustainable growth. And many blame the institutional quality. Shafaeddin (2005) shows that the results indicate manufacturing output, value added, capital expenditure and sales have increased after the reform when compared with the pre reform situation, relating government effectiveness and trade liberalization.[16]

Moreover, Mehlum, Moene and Torvik asserted that for countries with high institutional quality, the resource curse does not apply, proving the importance of governance in dealing with Dutch disease.[17,18] These studies imply that if the government uses the rents well, they could turn what mostly makes the economy slower into what indeed helps the economy grow.

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[16] Mehdi Shafaeddin (2005), *Trade Liberalization and Economic Reform in Developing Countries: Structural Change and De-Industrializaitoin.*
[17] Halvor Mehlum, Karl Moene and Ragnar Torvik (2006a), *Cursed by Resources or Institutions?.*
[18] Halvor Mehlum, Karl Moene and Ragnar Torvik (2006b), *Institutions and the resource curse.*

CHAPTER III. METHODOLOGY AND HYPOTHESIS

3.1 Methodology

In order to explore the relationship between manufacturing value added and other different variables, the panel least squares model is used in this paper. The data consist of 110 countries and time period from 1996 to 2010. Of more than 200 existing countries around the world, only 110 countries are included due to the availability of the data. Also, for each year, the countries with GDP lower than 10 billion dollar are excluded in order to eliminate possible outlier countries that could have odd effect on the regression result.

Lederman and Maloney (2007) assert that there is no resource curse. In order to prove their statement, they included variables that possibly have effect on growth rate such as export concentration, intra-industry trade, macro stability and capital accumulation along with natural resource dependence. In this paper, however, the impact on manufacturing industry rather than growth will be investigated.

Also, to examine the role of government on the possible process of deindustrialization, the regression model of Mehlum, Moene and Torvik (2006b) is improvised. They prove their argument by applying an interaction term between the resource abundance variable and institutional quality variable. In this paper, while the same model is used in the regression model, the dependent variable would be the proxy

for the manufacturing industry, instead of the economic growth variable.

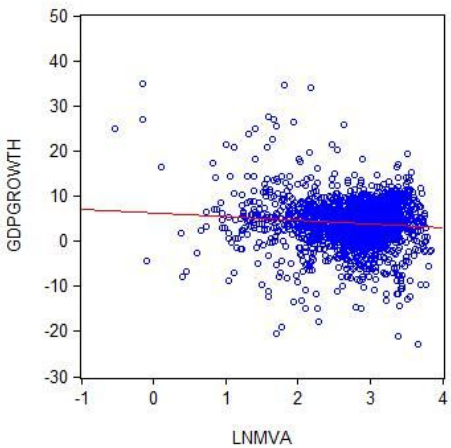
3.1.1 Basic Regression Equation

Based on the regression model of Lederman and Maloney (2007), the following equation is used to test the inverse relationship between manufacturing value added and Dutch disease related variables.

$$\textbf{\textit{Manufacture Value Added (\% of GDP)}} =$$
$$\beta_0 + \beta_1 GDP\ per\ Capita + \beta_2 GDP\ per\ Capita^2 + \beta_3 Commodity\ Price + \beta_4 Natural\ Resource\ Dependence + \beta_5 Inflation + \beta_6 Intraindustry\ Trade + \varepsilon$$

As stated earlier, manufacturing value added is used instead of the GDP growth rate as a dependent variable. If GDP growth and manufacturing value added were correlated, there wouldn't be a point to use this variable. However, their correlation coefficient is only -0.09 and <Figure 3-1> illustrates that there is virtually no correlation between these two variables.

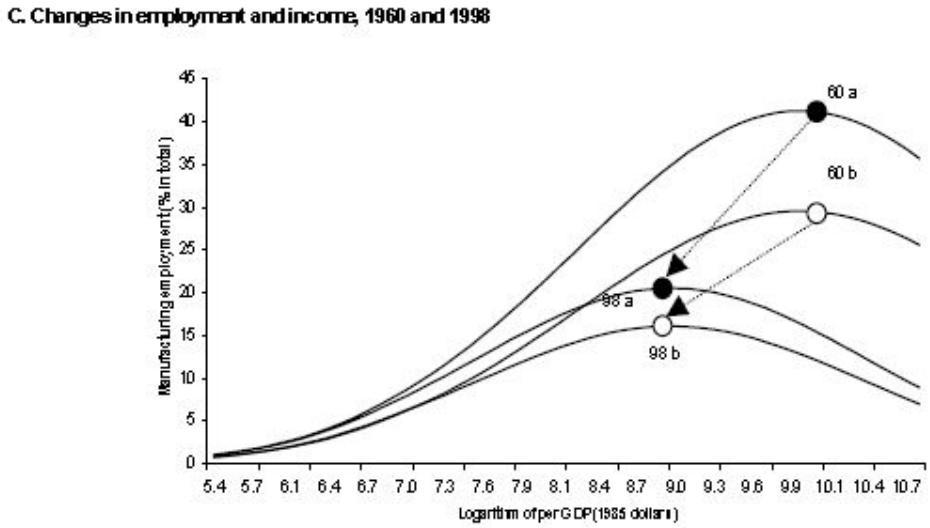
<Figure 3-1> Scatter Plot of GDP Growth and Manufacturing Value Added



Source: Computed using data from World Databank

Manufacturing value added has a unit of percentage of GDP, instead of total value added in dollars. And in this paper, instead of using just GDP per capita in panel regression, both GDP per capita and GDP per capita^2 will be used in the same regression equation as controlling variables. The reason behind inclusion of both terms is that a country does not grow its manufacturing sector forever and 100 percent of manufacturing sector usually does not imply the well-being of a country, because that would mean non-existence of agricultural and service sector. Usually, when a country is not wealthy, it starts with high primary sector concentration. As it experiences industrialization, the manufacturing sector starts to grow. However, when it reaches a certain point, the tertiary sector starts growing, decreasing the portion of secondary sector. To capture this inverse parabola shape in the regression, both GDP per capita and GDP per capita^2 as illustrated in <Figure 3-2>

<Figure 3-2> GDP per Capita and Manufacturing Employment



Source: Palma (2005)

Commodity price supposedly has a huge impact on manufacturing value added. As described in Dutch disease theory, not only a sudden discovery of natural resources leads to Dutch disease symptom, but a sudden increase in prices could also incur the same result. In this paper, both prices of agricultural goods and energy goods will be differentiated as these two goods might differ in the degree of influence.

Natural resource dependence is also a Dutch disease related variable. As Sachs and Warner (2001) and many other scholars used, it is usually measured by the degree of dependence in terms of primary exports as a percentage of GDP. But in this paper, instead of GDP, amount of total export will be used so that it captures the dependence and the competitive advantage of a country's commodity sector. So export dependence on natural

resources is computed by dividing the share of commodity exports by the total exports of a country.[19]

Inflation rate is used as a proxy for financial stability in an economy. It is an influential variable to financial flows in and out of a country and deeply related to the exchange rate. Hyperinflations in Latin American countries often have led to several financial crises. Therefore, inflation rate is used to capture how stable an economy is. High volatility would eventually have a negative effect on manufacturing sector.

Finally, the intra-industry trade index is included to capture the effect of trade structure as Lederman and Maloney (2007) pointed out. It is derived by the Grubel-Lloyd index (GL index). It measures intra-industry trade of a particular product. The formula is as follows:

$$GL_i = \frac{(X_i + M_i) - |X_i - M_i|}{X_i + M_i} = 1 - \frac{|X_i - M_i|}{X_i + M_i} \qquad ; \; 0 \leq GL_i \leq 1$$

where X_i denotes the export, M_i the import of good i.

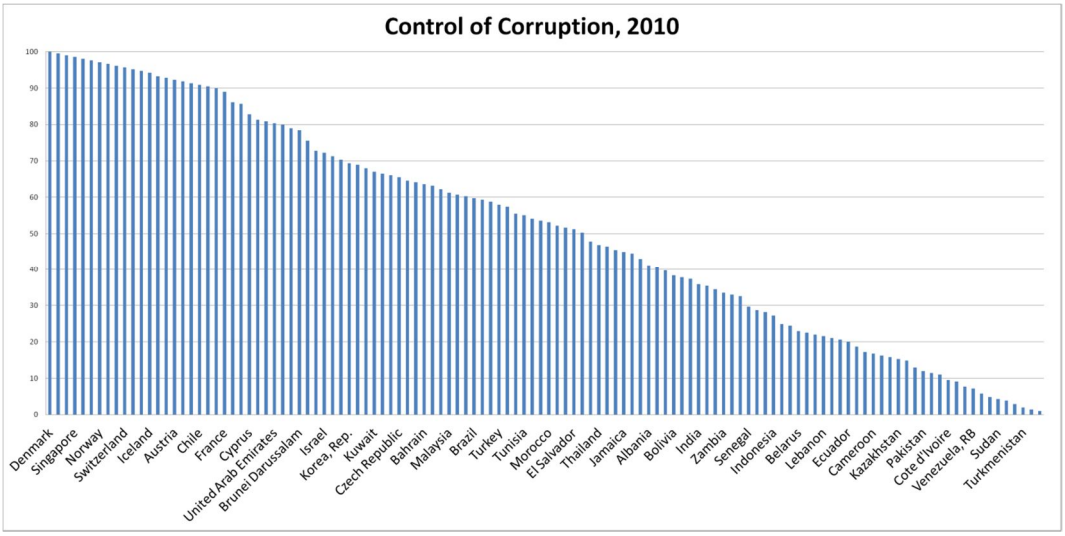
If $GL_i = 1$, there is only intra-industry trade, no inter-industry trade. Conversely, if $GL_i = 0$, there is no intra-industry trade, only inter-industry trade.

[19] Share of SITC 0 to SITC 4 exports in total export amount

3.1.2 Natural Resource Dependence and Role of Government

In order to answer the research question of investigating the role of government on industrialization and natural resource dependence, new variables are added to the regression model, control of corruption and government effectiveness. These variables measure the quality of governance. The higher the value is, the better the governance is. Since these two variables are alike and much correlated with correlation coefficient of 0.94, they will be included in the model separately. <Figure 3-3> shows a sample of control of corruption in 2010. The countries with better control of corruption obviously tend to be more developed nations such as Nordic countries and less developed countries in Africa are located at the bottom.

<Figure 3-3> Control of Corruption in 2010



Source: Worldwide Governance Indicators

And the main term in this regression model is the interaction term of natural resource dependence and control of corruption or government effectiveness. With this interaction term, it will be possible to see whether the better governance could reduce what supposedly is negative influence of high dependence on natural resources on manufacturing sector.

Manufacture Value Added (% of GDP) =

$\beta_0 + \beta_1 GDP\ per\ Capita + \beta_2 GDP\ per\ Capita^2 + \beta_3 Commodity\ Price + \beta_4 Natural\ Resource\ Dependence + \beta_5 Inflation + \beta_6 Intraindustry\ Trade + \beta_7 Control\ of\ Corruption + \beta_8 (Natural\ Resource\ Dependence * Control\ of\ Corruption) + \varepsilon$

and;

Manufacture Value Added (% of GDP) =

$\beta_0 + \beta_1 GDP\ per\ Capita + \beta_2 GDP\ per\ Capita^2 + \beta_3 Commodity\ Price + \beta_4 Natural\ Resource\ Dependence + \beta_5 Inflation + \beta_6 Intraindustry\ Trade + \beta_7 Government\ Effectiveness + \beta_8 (Natural\ Resource\ Dependence * Government\ Effectiveness) + \varepsilon$

3.1.2 Overall Variables

Overall, nine different variables are used in this panel regression analysis. Due to data availability issue, data of only 110 countries are included with the time frame of 1996 to 2010. <Table 3-1> summarizes the variables used in this paper.

<Table 3-1> Overall Variables

Variable	Definition	Source
Manufacturing Value Added	Net output – Immediate input (% of GDP)	World Development Indicators
GDP per Capita	Gross domestic product per capita (current $)	World Development Indicators
Price of Agricultural goods	Relative price of key agricultural goods, 2000 = 100, constant 2000$	World Development Indicators
Price of Energy	Relative price of key energy products 2000 = 100, constant 2000$	World Development Indicators
Export Dependence on Raw Material	The share of commodity exports with respect to the total exports of a country.	Computed using UN Comtrade Data
Inflation Rate – GDP deflator	Inflation as measured by the annual growth rate of the GDP implicit deflator shows the rate of price change in the economy as a whole. The GDP implicit deflator is the ratio of GDP in current local currency to GDP in constant local currency.	World Development Indicators

Variable	Definition	Source
Weighted GL Index	Intra-industry trade of a particular product. If GL = 1, there is only intra-industry trade, no inter-industry trade. Conversely, if GL = 0, there is no intra-industry trade, only inter-industry trade.	Computed using UN Comtrade Data
Control of Corruption*	The extent to which public power is exercised for private gain, including both petty and grand forms of corruption. Ranging from 0 to 100	Worldwide Governance Indicators
Government Effectiveness*	The quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. Ranging from approximately 0 to 100	Worldwide Governance Indicators

* Note: World Databank dataset does not include the data of the variables 'Control of Corruption' and 'Government Effectiveness' for year 1997 and 1999. The average of 1996 and 1998 values is used as a proxy for year 1997 and the average of 1998 and 2000 values is used for year 1999.

3.2 Hypothesis

In this regression model, two inquiries will be investigated. Firstly, according to various literatures, factors such as commodity boom, high export-concentration of few goods in economy, trade structure that is more of inter-industry than intra-industry have negative effect on growth rate. Then, would the identical factors have identical effect on

manufacturing sector as well? Would they possibly lead to deindustrialization of a country? The record of previous studies indicates that these factors would all lead to deindustrialization.

Secondly, if they indeed have negative influence on the manufacturing sector, could the better governance prevent the deindustrialization? Even if the factors mentioned above indeed do lead to deindustrialization, this does not necessarily lead to immediate negative growth, as generating 'easy money' from resource extraction actually is a creation of value, not a loss. Therefore, if a country is equipped with a high quality institution or well-functioning government, the effect of the factors mentioned above should be at least eased or even be positive in some case. And this effect is proven if the interaction term in the regression model shows a positive coefficient value.

CHAPTER IV. EMPIRICAL ANALYSIS RESULTS

A panel data analysis is conducted to test the theoretical models that are previously described in Chapter III. All the analysis has the time frame of 1996 through 2010 and includes 110 countries.

4.1 Basic Model

<Table 4-1> illustrates the empirical result of the basic model. The signs of coefficients of each variable resulted as expected. With every other variables being equal, *ceteris paribus*, GDP per capita has an inverse parabola-shaped relationship with manufacturing value added. This implies that manufacturing value added increases until certain point of income level, but beyond that income level, the share of manufacturing value added in GDP decreases. For commodity price variables, the results differ. According to the regression result, energy price is statistically negatively related with manufacturing value added. However, price of agricultural goods is statistically insignificant. This may imply that natural resource has a bigger influence on manufacturing industry than primary goods such as food and beverage. The coefficient shows that for every one percent increase in energy price, manufacturing value added as a percentage of GDP decreases by 0.146 percent. On the other hand, inflation rate statistically does not have a significant impact on manufacturing value added. Speaking

of the Dutch disease, export dependence on raw material, which would represent the closest variable to the Dutch disease, has a strong negative sign as expected and statistically significant as well. According to the regression model, if a country's export dependence on raw material increases by one percent, then manufacturing value added decreases by 0.307 percent. Finally, intra-industry trade seems to definitely help to growth in manufacturing sector according to the regression analysis.

<Table 4-1> Basic Model

Independent Variables	**Basic Model**	
GDP per Capita (log)	0.7731	***
	(0.0765)	
GDP per Capita² (log)	-0.0503	***
	(0.0045)	
Agricultural Goods Price (log)	-0.0390	
	(0.0764)	
Energy Price (log)	-0.1460	***
	(0.0244)	
Export Dependence on Raw Material	-0.3068	***
	(0.0470)	
Inflation (GDP Deflator)	0.0001	
	(0.0000)	
Weighted GL Index (log)	0.4456	***
	(0.0229)	
Constant	1.1689	***
No. of Observations	1534	
R^2	0.4637	

(Standard error in parentheses; *, **, ***: 10%, 5% and 1% level of significance.)
Source: World Databank and UN Comtrade

4.2 Natural Resource Dependence and Role of Government

4.2.1 Effect of Governance Indicator on Manufacture Value Added

<Table 4-2> summarizes the results of regression with control of corruption variable.

<Table 4-2> Regression with Control of Corruption

Independent Variables	With Corruption
GDP per Capita (log)	0.7397 ***
	(0.0893)
GDP per Capita² (log)	-0.0459 ***
	(0.0053)
Agricultural Goods Price (log)	-0.0819
	(0.0887)
Energy Price (log)	-0.1390 ***
	(0.0313)
Export Dependence on Raw Material	-0.2652 ***
	(0.0584)
Inflation (GDP Deflator)	0.0000
	(0.0003)
Weighted GL Index (log)	0.4902 ***
	(0.0269)
Control of Corruption	-0.0028 ***
	(0.0008)
Constant	1.4557 ***
No. of Observations	1205
R^2	0.4523

(Standard error in parentheses; *, **, ***: 10%, 5% and 1% level of significance.)
Source: World Databank and UN Comtrade

Although the original variables have the same sign and significance, one surprising result appears in this regression. That is, according to this model, a country with better control of corruption, *ceteris paribus*, manufacturing value added declines, which is an unanticipated result.

<Table 4-3> shows the same regression model as <Table 4-2> except that control of corruption variable is replaced by another governance indicator, government effectiveness. The result is almost identical as the regression with control of corruption that the sign of coefficient of government effectiveness is negative.

What could this somewhat surprising result imply? This might show that the countries with better control of corruption and government have already passed the certain income level, where the share of manufacturing value added in GDP begins to decline. For example, in 2010, the countries with the top 20 control of corruption value had manufacturing value added of 13.77 percent of GDP, when the average of all country was 15.19 percent. Also, the average GDP per capita for the top 20 countries that controlled corruption well recorded $49,907, when the average for the all country was $16,905.[20] Therefore, the negative signs for control of corruption and government effectiveness may have incurred from the fact that the developed countries have already reached the stage where they start building up and concentrate on the tertiary sector rather than the manufacturing sector.

[20] Data computed by using World Databank source (Unit: current US dollar)

<Table 4-3> Regression with Government Effectiveness

Independent Variables	**With Gov't Effectiveness**
GDP per Capita (log)	0.7428 ***
	(0.0896)
GDP per Capita² (log)	-0.0463 ***
	(0.0053)
Agricultural Goods Price (log)	-0.0633
	(0.0886)
Energy Price (log)	-0.1336 ***
	(0.0314)
Export Dependence on Raw Material	-0.2835 ***
	(0.0559)
Inflation (GDP Deflator)	0.0000 *
	(0.0004)
Weighted GL Index (log)	0.4876 ***
	(0.0273)
Government Effectiveness	-0.0024 **
	(0.0009)
Constant	1.3747
No. of Observations	1205
R^2	0.4494

(Standard error in parentheses; *, **, ***: 10%, 5% and 1% level of significance.)
Source: World Databank and UN Comtrade

In order to check whether the tertiary sectoral development (measured by the level of income as a proxy) is indeed the reason for this unanticipated result, a dummy variable is added. Since the model assumes that when a certain level of income is reached, a country's manufacturing value added proportion would decline, as the tertiary sector would develop. In order to capture this income level, for all the values that are over the income threshold are given 1 and 0 for those with less than the income threshold.

For the regression model with control of corruption,

$$\frac{\partial[\log(Manufacturing\ Value\ Added)]}{\partial[\log(GDP\ per\ Capita)]} = 0.7397 - 0.0918 \log(GDP\ per\ Capita)$$

For the regression model with government effectiveness

$$\frac{\partial[\log(Manufacturing\ Value\ Added)]}{\partial[\log(GDP\ per\ Capita)]} = 0.7428 - 0.0926 \log(GDP\ per\ Capita)$$

As a result, for the model with control of corruption variable, the threshold of log(GDP per Capita) is 8.065 and 7.939 for the model with government effectiveness variable. Therefore, in the countries with log(GDP per Capita) higher than the threshold level, the manufacturing value added would start to decline, as the income level increases. And the regression results with threshold are shown in <Table 4-4> and <Table 4-5>

The coefficients for both control of corruption and government effectiveness variable still remain negative. However, the coefficients for the dummy variable are also negative and the values imply that if GDP per capita of a country is over the threshold, the manufacturing value added would be 0.119 percent or 0.082 percent lower than those countries with less than the threshold income level.

<Table 4-4> Regression with Income Threshold (Control of Corruption)

Independent Variables	**With Income Threshold**
GDP per Capita (log)	0.8657 ***
	(0.1000)
GDP per Capita² (log)	-0.0514 ***
	(0.0056)
Agricultural Goods Price (log)	-0.0729
	(0.0885)
Energy Price (log)	-0.1388 ***
	(0.0312)
Export Dependence on Raw Material	-0.2720 ***
	(0.0546)
Inflation (GDP Deflator)	0.0000
	(0.0003)
Weighted GL Index (log)	0.4845 ***
	(0.0269)
Control of Corruption	-0.0028 ***
	(0.0008)
GDP per Capita Threshold Dummy	-0.1185 ***
	(0.0419)
Constant	0.8213
No. of Observations	1205
R^2	0.4560

(Standard error in parentheses; *, **, ***: 10%, 5% and 1% level of significance.)
Source: World Databank and UN Comtrade

<Table 4-5> Regression with Income Threshold (Government Effectiveness)

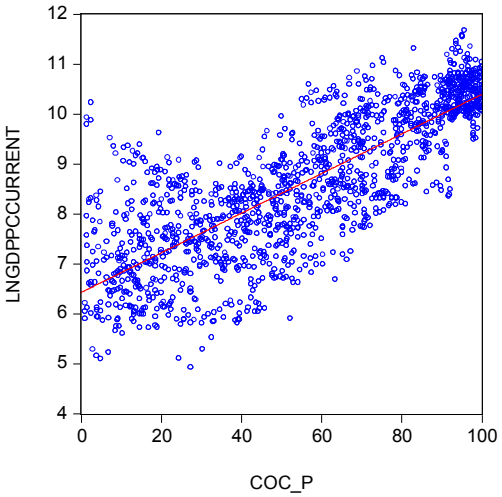
Independent Variables	**With Income Threshold**
GDP per Capita (log)	0.8649 ***
	(0.1055)
GDP per Capita² (log)	-0.0517 ***
	(0.0060)
Agricultural Goods Price (log)	-0.0577
	(0.0886)
Energy Price (log)	-0.1323 ***
	(0.0314)
Export Dependence on Raw Material	-0.2865 ***
	(0.0558)
Inflation (GDP Deflator)	0.0000
	(0.0004)
Weighted GL Index (log)	0.4828 ***
	(0.0274)
Government Effectiveness	-0.0022 **
	(0.0009)
GDP per Capita Threshold Dummy	-0.0819 *
	(0.0438)
Constant	0.8677
No. of Observations	1205
R^2	0.4510

(Standard error in parentheses; *, **, ***: 10%, 5% and 1% level of significance.)
Source: World Databank and UN Comtrade

Also, since control of corruption and GDP per capita are highly correlated with correlation coefficient of 0.808, also shown in <Figure 4-1>, it is likely the reason for negative coefficient of control of corruption. The same logic applies to government effectiveness variable. The correlation coefficient between GDP per capita and government effectiveness is 0.796 and <Figure 4-2> clearly displays their positive

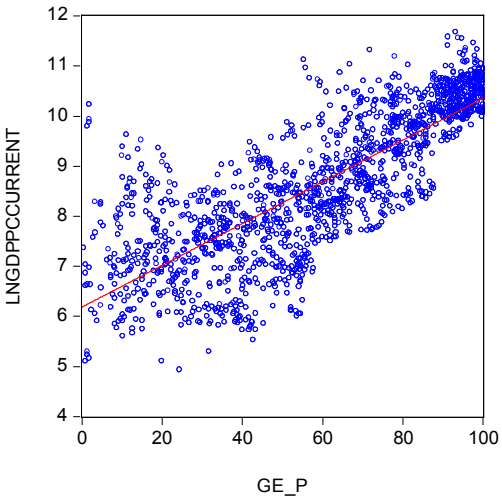
relation.

<Figure 4-1> Scatter Plot of GDP per Capita and Control of Corruption



Source: Computed using data from World Databank

<Figure 4-2> Scatter Plot of GDP per Capita and Government Effectiveness



Source: Computed using data from World Databank

Although the results that with better institutional quality, the manufacturing value added decline, may seem illogical, the reason is likely due to the high income level of countries that usually have more effective government and more advanced tertiary sector. With the tertiary sector growing fast, the proportion of manufacturing sector would decline, even if the manufacturing sector itself were extremely advanced. For the rest of the part, the dummy variable is not included to keep the model less complicated.

4.2.2 Effect of Governance Indicator on Natural Resource Dependence

This section investigates the effect of governance on natural resource dependence. As explained in the earlier chapter, it is examined by using an interaction term between governance indicator and natural resource dependence variable. First governance indicator used is control of corruption and the result of regression is illustrated in <Table 4-6>

The results for the original variables remain the same as the previous regressions. However, as hypothesized, the interaction term has a positive sign and statistically significant. This implies that with better control of corruption, the negative effect of natural resource dependence is reduced or even turn into the positive effect. So from which level does the effect of resource curse nullify? Since with other variable being equal, manufacturing value added = 2.0072 + -0.5858*export dependence on raw material + 0.0062*export dependence on raw material*control of corruption. After taking

derivative with respect to export dependence on raw material, the equation would look as following:

$$\frac{\partial[\log(Manufacturing\ Value\ Added)]}{\partial[Export\ Dependence\ on\ Raw\ Material]} = -0.5858 + 0.0062\ Control\ of\ Corruption$$

<Table 4-6> Regression with Interaction Term (Control of Corruption)

Independent Variables	**Interaction Term with Corruption**
GDP per Capita (log)	0.6713 ***
	(0.0900)
GDP per Capita² (log)	-0.0407 ***
	(0.0054)
Agricultural Goods Price (log)	-0.1069
	(0.0882)
Energy Price (log)	-0.1435 ***
	(0.0311)
Export Dependence on Raw Material	-0.5858 ***
	(0.0908)
Inflation (GDP Deflator)	0.0000
	(0.0004)
Weighted GL Index (log)	0.4945 ***
	(0.0267)
Control of Corruption	-0.0064 ***
	(0.0011)
Interaction Term	0.0062 ***
(With control of corruption)	(0.0014)
Constant	2.0072 ***
No. of Observations	1205
R^2	0.4611

(Standard error in parentheses; *, **, ***: 10%, 5% and 1% level of significance.)
Source: World Databank and UN Comtrade

This implies that the threshold level of control of corruption that nullifies the resource curse is 95.05. Mehlum, Moene and Torvik (2006a) concluded that resource abundance could be a blessing to economic growth, if the institutional quality is better than certain level. In this case, with better institution or governance, the rents from natural resources could be used to strengthen the manufacturing industry. In 2010, out of 110 countries included in the regression, only 11 countries recorded higher than control of corruption value of 95.05. Among these countries, only New Zealand, Norway, Canada, and Australia rely their export on natural resources more than 40 percent. This shows that these four countries have sufficient bureaucratic quality to prevent corruption that could have hindered the manufacturing growth. Even more depressing fact is that apart from Norway and Canada, they are not major petroleum exporters and rely more on agricultural and fishery goods.

As a second governance indicator, government effectiveness is examined. And the regression result shown by <Table 4-7> seems almost identical to the one with control of corruption. The signs of coefficients are the same as the previous equations and only coefficients values differ slightly. And the equation, taken derivative with respect to export dependence on raw material, *ceteris paribus*, looks as following:

$$\frac{\partial[\log(Manufacturing\ Value\ Added)]}{\partial[Export\ Dependence\ on\ Raw\ Material]} = -0.6860 + 0.0069\ Government\ Effectiveness$$

<Table 4-7> Regression with Interaction Term (Government Effectiveness)

Independent Variables	**Interaction Term with Gov't Effectiveness**
GDP per Capita (log)	0.6741 ***
	(0.0904)
GDP per Capita² (log)	-0.0414 ***
	(0.0054)
Agricultural Goods Price (log)	-0.0980
	(0.0883)
Energy Price (log)	-0.1383 ***
	(0.0312)
Export Dependence on Raw Material	-0.6860 ***
	(0.1076)
Inflation (GDP Deflator)	0.0000 **
	(0.0004)
Weighted GL Index (log)	0.4871 ***
	(0.0271)
Government Effectiveness	-0.0067 ***
	(0.0014)
Interaction Term	0.0069 ***
(With government effectiveness)	(0.0016)
Constant	2.0261 ***
No. of Observations	1205
R^2	0.4581

(Standard error in parentheses; *, **, ***: 10%, 5% and 1% level of significance.)
Source: World Databank and UN Comtrade

Here, the threshold level is slightly higher than that of control of corruption with the value of 99.49. Out of 110 countries, two countries have the institutional quality higher than the threshold level. And only Singapore and Finland scored higher than the threshold level in 2010, none of which are major petroleum-exporting nations. Although only two governments were effective enough to turn resource curse into resource blessing

according to this result, the positive sign of the interaction term implies that with more effective government, countries are able to cut the negative effects from the Dutch disease.

<Table 4-8> summarizes the results of each regression equation.

<Table 4-8> Overall Regression Model

Independent Variables	**Reg 1**		**Reg 2**		**Reg 3**	
GDP per Capita (log)	0.7731	***	0.7397	***	0.7428	***
	(0.0765)		(0.0893)		(0.0896)	
GDP per Capita² (log)	-0.0503	***	-0.0459	***	-0.0463	***
	(0.0045)		(0.0053)		(0.0053)	
Agricultural Goods Price (log)	-0.0390		-0.0819		-0.0633	
	(0.0764)		(0.0887)		(0.0886)	
Energy Price (log)	-0.1460	***	-0.1390	***	-0.1336	***
	(0.0244)		(0.0313)		(0.0314)	
Export Dependence on Raw Material	-0.3068	***	-0.2652	***	-0.2835	***
	(0.0470)		(0.0584)		(0.0559)	
Inflation (GDP Deflator)	0.0001		0.0000		0.0000	*
	(0.0000)		(0.0003)		(0.0004)	
Weighted GL Index (log)	0.4456	***	0.4902	***	0.4876	***
	(0.0229)		(0.0269)		(0.0273)	
Control of Corruption			-0.0028	***		
			(0.0008)			
Government Effectiveness					-0.0024	**
					(0.0009)	
GDP per Capita Threshold Dummy						
Interaction Term (With control of corruption)						
Interaction Term (With government effectiveness)						
Constant	1.1689	***	1.4557	***	1.3747	
No. of Observations	1534		1205		1205	
R^2	0.4637		0.4523		0.4494	

Independent Variables	Reg 4		Reg 5	
GDP per Capita (log)	0.8657	***	0.8649	***
	(0.1000)		(0.1055)	
GDP per Capita² (log)	-0.0514	***	-0.0517	***
	(0.0056)		(0.0060)	
Agricultural Goods Price (log)	-0.0729		-0.0577	
	(0.0885)		(0.0886)	
Energy Price (log)	-0.1388	***	-0.1323	***
	(0.0312)		(0.0314)	
Export Dependence on Raw Material	-0.2720	***	-0.2865	***
	(0.0546)		(0.0558)	
Inflation (GDP Deflator)	0.0000		0.0000	
	(0.0003)		(0.0004)	
Weighted GL Index (log)	0.4845	***	0.4828	***
	(0.0269)		(0.0274)	
Control of Corruption	-0.0028	***		
	(0.0008)			
Government Effectiveness			-0.0022	**
			(0.0009)	
GDP per Capita Threshold Dummy	-0.1185	***	-0.0819	*
	(0.0419)		(0.0438)	
Interaction Term (With control of corruption)				
Interaction Term (With government effectiveness)				
Constant	0.8213		0.8677	
No. of Observations	1205		1205	
R^2	0.4560		0.4510	

Independent Variables	Reg 6		Reg 7	
GDP per Capita (log)	0.6713	***	0.6741	***
	(0.0900)		(0.0904)	
GDP per Capita² (log)	-0.0407	***	-0.0414	***
	(0.0054)		(0.0054)	
Agricultural Goods Price (log)	-0.1069		-0.0980	
	(0.0882)		(0.0883)	
Energy Price (log)	-0.1435	***	-0.1383	***
	(0.0311)		(0.0312)	
Export Dependence on Raw Material	-0.5858	***	-0.6860	***
	(0.0908)		(0.1076)	
Inflation (GDP Deflator)	0.0000		0.0000	**
	(0.0004)		(0.0004)	
Weighted GL Index (log)	0.4945	***	0.4871	***
	(0.0267)		(0.0271)	
Control of Corruption	-0.0064	***		
	(0.0011)			
Government Effectiveness			-0.0067	***
			(0.0014)	
GDP per Capita Threshold Dummy				
Interaction Term	0.0062	***		
(With control of corruption)	(0.0014)			
Interaction Term			0.0069	***
(With government effectiveness)			(0.0016)	
Constant	2.0072	***	2.0261	***
No. of Observations	1205		1205	
R^2	0.4611		0.4581	

(Standard error in parentheses; *, **, ***: 10%, 5% and 1% level of significance.)
Source: World Databank and UN Comtrade

Overall, except for governance indicators showing up a negative sign, when the regression is conducted only with governance indicators in the basic model without the interaction terms, the regression results are as expected. As <Table 4-8> shows, there is

no major difference such as sign change across each regression. And except for price of agricultural goods and inflation rate that are statistically insignificant, all other variables are statistically significant, implying that they all have strong influence on manufacturing value added.

Price of agricultural goods may be insignificant, because the agricultural sector is likely to generate fewer rents than the energy sector does. Therefore, even if price of agricultural goods were to soar, the factors of production may not move to agricultural sector, compared to when they would, if price of energy resources were to rise.

CHAPTER V. POLICY IMPLICATION

The regression analysis in this paper implies that the resource curse or the Dutch disease does not necessarily lead to deindustrialization. It rather implies that with better control of corruption and government effectiveness, the process of deindustrialization could be slowed down or even reversed into the process of industrialization.

According to Stanford (2012), symptoms of Dutch disease are reliance on primary resource exports, deteriorating balance of payments, poor productivity growth, lousy innovation, failure to build global companies and environmental disaster.[21] And the results of the regression model support Stanford's analysis and imply that high reliance on natural resources would not only hinder the economic growth by showing the previously mentioned symptoms, but also the manufacturing industry.

However, the results also show that if the institution or the government is well-developed and effective, it could turn the negative impact into the positive one. Although a country needs a top-notch institution in order to do so according to the results, what kind of policies could a country possibly set to improve the quality of institution to prevent Dutch disease symptoms?

Martin (2007) argues that a country must assess its level of dependence on resource-based products in relation to policy goals such as growth and stability or considerations of poverty and vulnerability, so that a government could set its policy accordingly. He further asserts that the analysis of the problem should aim to specify the

[21] Jim Stanford (2012), *A Cure for Dutch Disease: Active Sector Strategies for Canada's Economy*

problem very carefully, as the policy solution is likely to depend heavily upon the specific nature of the problem.[22]

Overall, the key element for lifting the natural resource curse is reducing corruption, improving government effectiveness, in order to redistribute the huge amount of rents generated from natural resources into the other developing sectors, namely manufacturing sector, so that the wealth is not concentrated on certain few sectors, which as many scholars have already empirically found out, would dampen the economic growth.

In order to lift the natural resource curse, Palley (2003) suggested some measures that could remedy the problem. He argued that although the measures would surely help the countries to reduce negative impacts from natural resource curse, since the countries with corrupt government or institution would find it difficult to pursue some of the policies, the collective action by the international institution such as the World Bank and International Monetary Fund (IMF) would become relevant and important.[23]

Therefore, theoretically, there is a cure for resource curse, which is better governance. Establishing sectoral development councils, developing strategic sectors to build up competitiveness or even engaging in the 'currency war' may all be beneficial for developing the manufacturing sector and avoiding the resource curse. It is a simple answer to write, however unfortunately, also an extremely difficult answer to implement. Firstly, because it is natural that the firms seek rents, especially those that can be earned relatively easily. Also, it is difficult to prevent 'rent-seeking behavior'. Secondly, it is an

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[22] Will Martin (2007), *Outgrowing Resource Dependence: Theory and Developments*
[23] Thomas I. Palley (2003), *Lifting the Natural Resource Curse*

extremely difficult task to promote a sustainable industry, as Korea was able to do in the 1970s.

CHAPTER VI. CONCLUDING REMARKS

The natural resource is something that is given. It is something that nobody can create. It is usually very valuable. Considering these facts, if a country is loaded with such valuable resources, this must be a blessing. And indeed, it is for the owners of natural resources as they enrich their owners very easily. However, unfortunately, the blessing does not necessarily apply to the growth of a country. Various past studies have proven the existence of the 'resource curse' and acknowledge by them, many countries with symptoms of the curse have been trying to dispel or prevent the curse.

In this paper, instead of the impact on economic growth, the impact on the process of industrialization is investigated. As symptoms of the Dutch disease show, the countries with the disease often experience the decline in manufacturing sector, leading to deindustrialization. And indeed, the results of the panel regression conducted also show the sign of decline in the manufacturing sector, if a country concentrates more on the resource-related sectors.

The natural resources enrich the owners, then, could it also enrich the manufacturing sector? In order for this to be realized, the effective governance that efficiently uses the rents earned from the resource-extracting sector, along with the tight control of corruption that prevents the rent-seeking behavior, is necessary. If a country possesses a certain level of the government effectiveness or the control of corruption, the panel regression results in this paper shows that the negative effect of the natural resources on the manufacturing sector could be eased or even be overturned. Therefore, if

a country wants to prevent the resource curse, it needs an effective government or institution.

Although the panel data analysis in this paper supports the results of previous studies, there are some further studies that could be conducted for more sophisticated analysis. Firstly, the proxy for level of industrialization should be reconsidered. Although manufacturing value added displays how much manufacturing sector contributes to a country, higher manufacturing value added does not necessarily imply more industrialized country. For example, the United States has lower value of manufacturing value added than Korea does, but this does not mean that Korea is more industrialized country than the United States is. Also, manufacturing sector is not the only sector that can boost the economy. Other sectors, such as strong financial sector could be an alternative option for a country.

Secondly, export dependence on raw material could be divided into different areas such as agricultural goods and energy-related goods to analyze the different effects of various natural resources. Energy-related resources such as crude oil and coal induce 'easy money'. On the other hand, it is not easy to develop an advanced agricultural sector that creates huge value-added commodities. This fact is partly proven in the panel analysis in this paper, as the price of agricultural goods had statistically insignificant effect on manufacturing sector. Therefore, study on the effect of different natural resources on manufacturing sector is another research that could be extended.

Overall, with commodity boom and increasing resource price, there is a sign of possible deindustrialization in many of resource-abundant countries, shown by decline in

manufacturing value added. However, better governance can prevent the process of deindustrialization caused by resource curse. The only problem is that not many countries possess the sufficient enough quality of governance to do so.

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UN Comtrade

World Bank, World Development Indicators

World Bank, Worldwide Governance Indicators

국문초록

천연 자원의 풍족함은 나라에 있어서 축복이 될 수 있다. 산업을 발전시켜 경제성장을 이루는 것은 엄청난 시간과 고도의 기술을 필요로 하지만 자원의 경우 수출을 통해 손쉽게 재원을 얻을 수 있게끔 만들어주기 때문이다. 그런데 이러한 추리와는 달리 기존 문헌 연구와 주요 논문에서는 자원의 풍요가 경제 성장에 저해된다고 주장한 바 있다. 자원빈국인 대한민국과 자원부국인 베네수엘라와 같은 남미 국가들을 비교해보면 기존 문헌 연구의 자원의 저주 이론은 반박하기 쉽지 않다. 그리고 자원부국이 경제성장에 실패하는 이유 중 하나는 성장의 동력이 되는 산업화를 이루어내지 못하기 때문이다. 또한, 여러 선진국의 기관과는 달리 자원부국의 기관은 대체적으로 질이 떨어지며 효율적이지 못하여 자원수출을 통해 얻는 부를 산업화로 효과적으로 연결시키지 못하는 것이다.

기존 문헌에서는 이러한 자원의 저주가 경제성장에 미치는 영향을 위주로 분석한 바 있는데 본 논문은 기존과는 다른 관점에서 자원의 저주를 보고자 경제성장이 아닌 제조산업에 미치는 영향에 초점을 맞췄다. 또한, 기관의 질이 향상될 경우 자원의 부를 통해 산업화가 이루어질 수 있는 지에 대한 분석을 패널자료를 통해 하였다.

1996년부터 2010년까지 110개국을 상대로 한 패널자료 분석을 통해

자원의 저주는 경제성장뿐만 아니라 산업화에도 악영향을 끼치는 것이 증명되었다. 하지만 기관의 질이 좋아질수록 이러한 악영향은 중화되며 일정 수준을 넘을 경우 오히려 자원의 풍족함이 산업화에 도움이 되는 것으로 나타났다.

따라서 산업화를 이루는데 실패하는 자원부국은 투명성을 강조하는 정책과 법 제정을 통해 기관의 질을 높여 자원을 통해 얻는 부가 산업화로 이어질 수 있도록 노력해야 할 것이며 이는 궁극적으로 경제 성장으로 나타날 것이다.

주요어: 자원의 저주, 탈산업화, 제조부가가치, 기관의 질, 패널자료분석

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