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The Natural Resource Curse Revisited:

Case Study of Latin America

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中南美 地域을 中心으로

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The Natural Resource Curse Revisited:

Case Study of Latin America

Thesis by

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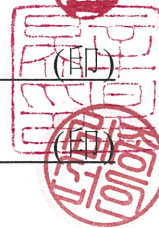國際學科 國際地域學專攻

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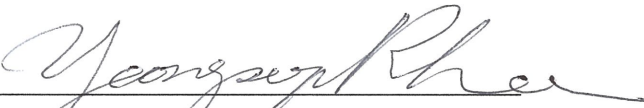# The Natural Resource Curse Revisited:

Case Study of Latin America

Presented by **Younghae Tahk**

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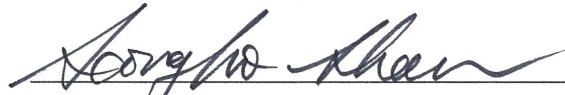
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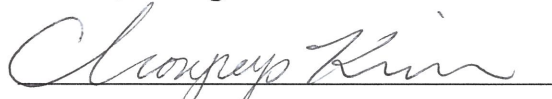Committee Chair   Rhee, Yeong-Seop

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Abstract

The Natural Resource Curse Revisited:

Case Study of Latin America

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Many papers have used cross-sectional regressions to prove the negative relationship between natural resource abundance and economic growth. However, most of the recent empirical works on natural resource abundance and growth focus on the aggregated natural resources as a whole. The aggregation of the different components of natural resources into one measure may neglect differences in their growth impacts. Therefore more research is needed to examine whether different natural resources have different effects on growth and which resources have the strongest growth effect. This paper suggests that not all natural resources hinder economic development. Depending on the natural resource type, some resources such as fruits, vegetables and agricultural raw materials show robust positive correlations with economic growth. On the other hand, there are commodities such as oil and natural gas that create opportunities for

rent-seeking behavior and are crucial for determining the level of corruption. These commodities show significant negative relations with economic growth. The case studies of Latin America confirm that certain natural resource abundance can be detrimental to economic growth.

Thus, the aim of this thesis is twofold. First, the effect of natural resource abundance on economic growth is examined by different resource types. Natural resources are classified into five categories and their impacts on growth are analyzed. Second, the effect of different natural resource types on corruption is investigated. Natural resource wealth can create certain distortions that work as mechanisms which hamper economic development. In order to explore these mechanisms, the effect of natural resources on corruption is examined by subcategories. The regression results indicate that subsidiary food and fuel exports are strongly associated with corruption.

In contrast to previous studies that mainly used cross-sectional analysis, this paper is focused on a panel data set for the period 1970-2009 and up to 156 countries including Latin America, Sub-Saharan Africa, Asia and Europe as regional variables. This paper contributes to the field of natural resources and economic growth by providing interesting insights as the analyses on the natural resource exports at a disaggregated level are rather rare.

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CHAPTER I. INTRODUCTION

1.1. Background

If Moses had turned far east and made the Israelites settle down in the oil-rich Middle East during the Exodus, would Israel have developed much more than it could have? The link of natural resource abundance and economic development has been a perplexing puzzle to many scholars. Indeed, natural resource abundance has seemed to be more of a curse than a blessing. The famous research done by Sachs and Warner (1995) asserts that there is a significant negative relationship between natural resource abundance and economic growth. The term "resource curse" describes the paradoxical phenomenon of how resource-rich countries perform worse than those with fewer natural resources. For example, the per capita GDP in 1970 was $1,993 in Republic of Korea and $6,302 in Venezuela. Nevertheless, the per capita GDP of Korea increased to $16,372 while Venezuela's figure did not change that much over the last forty years.[1] There are many contributors to economic progress; however, this disappointing performance of Venezuela could be explained by the "resource curse" phenomenon. Ironically, natural resource wealth seems to inhibit economic development rather than promote it.

Moreover, resource-rich countries are subject to rent-seeking behavior than

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[1] Source: World Databank, The World Bank Group, retrieved April 6, 2012.

resource-poor countries, as governments seek for rents that are earned by the natural resource endowments. These rents – the income of "men who love to reap where they never sowed"[2] – induce rent-seeking behavior and corruption that ultimately impede economic growth.

Many papers have used cross-sectional regressions to prove the negative relationship between natural resource abundance and economic growth by focusing on the aggregated natural resources as a whole. The aggregation of the different components of natural resources into one measure may neglect differences in their growth impacts. This paper suggests that not all natural resources hinder economic development. Depending on the natural resource type, some resources such as fruits, vegetables and agricultural raw materials show robust positive correlations with economic growth. On the other hand, there are commodities such as oil and natural gas that create opportunities for rent-seeking behavior and are crucial for determining the level of corruption. These commodities exhibit significantly negative correlations with economic growth.

1.2. Research Question

This paper examines the relationship between natural resource abundance and

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[2] See Smith (2003).

economic growth by utilizing the natural resource subcategories. It first seeks to verify the "resource curse". The effect of natural resource abundance is examined by five resource subcategories; main food, subsidiary food, agricultural raw materials, ores & metals and fuel. So far, no previous study has decomposed food into two categories. As it is proven in the following sections, the two subcategories of food have robust but contrasting effects on economic growth. This paper contributes to the field of natural resources and economic growth by providing interesting insights as the analyses on the natural resource exports at a disaggregated level are rather rare.

Next, it seeks to determine if corruption acts as a mechanism of the "resource curse". Natural resource wealth can create certain distortions that work as mechanisms which cause the negative relationship between natural resource abundance and economic growth. In this paper, corruption is explored as a mechanism to poor economic growth. This paper also takes a closer look at the effect of different types of natural resources on corruption.

Thus, this paper addresses two research questions.

a. How do natural resources affect economic growth once divided into sub-categories? Do different types of natural resources exert similar influences on growth across nations?

b. Are large endowments of natural resources especially ores & metal and fuel associated with high level of corruption? What are the effects of natural resources on corruption by subcategories?

While earlier studies mainly use cross-sectional analysis, this study is focused on a panel data set of 156 countries for an extended period of time from 1970 to 2009 including Latin America, Sub-Saharan Africa, Asia and Europe as regional variables. To the best of my knowledge, the data range is one of the largest in the field of natural resources and economic growth.

The rest of the paper is organized as follows. Section II provides a literature review on the natural resource curse and its effect on economic growth. Section III presents a theoretical framework and describes the data. Section IV examines the theoretical model through a panel data analysis on growth and corruption. Section V delineates the "resource curse" in Latin America and finally, Section VI concludes.

CHAPTER II. LITERATURE REVIEW

Natural resources seem to have been more of a curse than a blessing for many countries. A growing body of literature has supported the view that resource-abundant countries often score poorly in economic growth than resource-deficient countries. The negative relationship between natural resource abundance and economic growth is sometimes referred to as the "resource curse thesis" (Auty, 1993, p.1). Many scholars including Sachs and Warner (1995) found that countries with great natural resource wealth tend to grow more slowly than resource-poor countries. This inverse correlation can be explained by several theories.

2.1. Dutch Disease

Dutch disease is named after the negative effects of natural gas discoveries in the Netherlands. It describes the macroeconomic impacts that generally occur after natural resource booms. According to Corden and Neary (1982), an economy has three sectors: a booming sector, a lagging sector and a non-traded goods sector such as the construction and service sector. The first negative effect after a resource boom is the appreciation of the real exchange rate caused by the large inflow of foreign exchange from the booming export sector ("spending effect"). The second is the shift of capital

and labor from the manufacturing sector (the agricultural sector for developing countries) to the booming sector ("resource movement effect"). The shift of resources (capital, labor) generates the manufacturing sector to decline. This sectoral shift can be detrimental when the natural resources begin to deplete or when there is a slump in commodity prices.

2.2. The Rentier Effect

Certain natural resources hinder development through what is termed the "rentier effect" (Ross, 2001, p.327). Rent is the difference in the natural resource value and the extraction cost. There are several consequences when the government earns this 'easy money' – revenues that are easily gained from resource extraction. According to Ross (2001, p.332), the first outcome is the "taxation effect". The government or the "rentier state" has less motivation for taxation of the population when they extract massive revenues from the natural resources. Without the pressure of taxation, citizens have less incentive to demand accountability from the government to develop a deep civil society. The next result of the "rentier effect" is called the "spending effect" (Ross, 2001, p.333). Rent-seeking activity increases spending on patronage since it is costly to invest in an industry than to bribe a government official to provide resources at below-market prices. Stakeholders acquire rents by any means

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possible, even distorting political and social incentives. This can lead to increased corruption and conflict, adversely affecting long-run growth in the end.

According to Gelb (1988, p.6), there are two types of economic rents. The first is the Ricardian rent which is associated with resources such as coffee and rubber that may be renewable. The other is the Hotelling rent which is associated with non-renewable and exhaustible resources. Hotelling rents are by and large captured by states, called the "rentier states". Oil and mineral productions in general are large-scale, enclave, and capital-intensive whereas industries that accrue Ricardian rents are usually labor-intensive.

Most of the previous literatures have used the aggregation of natural resources as the proxy for natural resource abundance. However, Isham et al. (2005) classify natural resources into "point-source" natural resources such as oil and minerals which are extracted from a narrow geographic area and "diffuse" natural resources such as rice and wheat[3] that are produced on small family farms. Revenues from "point-source" natural resources are more concentrated and capturable whereas revenues from "diffuse" natural resources are more distributed. Isham et al. contend that developing countries that export "point-source" natural resources are prone to slower economic growth due to institutional failure. However, Alexeev and Conrad (2009) claim that large endowments of oil and minerals do not appear to deter economic growth.

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[3] Not all agricultural commodities are considered as "diffuse" natural resources. For example, coffee and cocoa are sometimes regarded as "point-source" natural resources if their production is concentrated in the manner of oil and minerals extraction.

CHAPTER III. THEORETICAL FRAMEWORK

This section defines the variables and presents the regression equations. The next section follows with the regression results. The panel data analysis is focused on a sample of around 160 countries from 1970 to 2009. Empirical implications of the model are estimated using the panel data with eight sub-periods (five-year span). Changes in the pattern of primary exports are taken into account whereas previous studies use initial income and initial primary exports data.

3.1. Growth Regression

3.1.1. Natural Resource Abundance and Economic Growth

In order to test the inverse correlation of natural resource abundance and economic growth, the following regression equation was developed:

$$GDPGR = \alpha_0 + \alpha_1 \ln GDPPC + \alpha_2 POPGROWTH + \alpha_3 INFLATION + \alpha_4 GCE + \alpha_5 SAVINGS$$
$$+ \alpha_6 OPEN + \alpha_7 FDI + \alpha_8 PCR + \alpha_9 PRIMARY + \varepsilon_1 \qquad (1)$$

The data and sources are described in detail in the appendix. Some key issues are highlighted. GDPGR refers to the growth of per capita GDP from 1970 to 2009.

lnGDPPC refers to GDP per capita in logarithm form. Additional variables are included such as population growth, inflation, government consumption expenditure, gross savings, trade openness, foreign direct investment, and the primary completion ratio. PRIMARY refers to the share of primary exports (the share of all natural resource exports) to GDP.

Natural resource abundance is commonly measured by the degree of dependence in terms of primary exports as a percentage of GDP. Sachs and Warner (2001) suggest that GDP should be in the denominator of the natural resource indicator because the goal is to "measure the importance of natural resources in the economy, not just per capita". (Sachs & Warner, 2001, p.830 footnote 1) Moreover, Latin America, Sub-Saharan Africa, Asia and Europe are included as regional variables. ε_1 is the random error term.

3.1.2. Different Types of Natural Resources and Economic Growth

As explained in Section II, the aggregation of the components of natural resources into a single measurement obscures the diverse impacts on economic growth. Sala-i-Martin and Subramanian (2003) used the share of the exports of four types of natural resources – fuel, ores & metals, agricultural raw materials, and food – in GDP

and total exports.[4] In this framework, primary exports can be classified into five categories. To estimate whether the relationship between natural resource abundance and growth varies with the different types of natural resources, the following model is performed:

$$
\begin{aligned}
GDPGR = {} & \beta_0 + \beta_1 \ln GDPPC + \beta_2 POPGROWTH + \beta_3 INFLATION + \beta_4 GCE + \beta_5 SAVINGS \\
& + \beta_6 OPEN + \beta_7 FDI + \beta_8 PCR + \beta_9 MFOOD + \beta_{10} SFOOD + \beta_{11} AGRIRAW \\
& + \beta_{12} ORESMETALS + \beta_{13} FUEL + \varepsilon_2
\end{aligned}
\tag{2}
$$

FOOD refers to the share of food exports to GDP and comprises the commodities in SITC sections 0 (food and live animals), 1 (beverages and tobacco), and 4 (animal and vegetable oils and fats) and SITC division 22 (oil seeds, oil nuts, and oil kernels). For further clarification, FOOD is decomposed into two categories; animals (meat, fish, etc.), vegetables, fruits in one category and subsidiary substances like sugar, coffee, beverages, etc. in the other. The former is simply named MFOOD for main food and the latter, SFOOD for subsidiary food for reference.[5]

AGRIRAW refers to agricultural raw materials that comprise SITC section 2 (crude materials except fuels) excluding divisions 22, 27 (crude fertilizers and minerals excluding coal, petroleum, and precious stones), and 28 (metalliferous ores and scrap).

ORESMETALS (Ores & metals) comprise the commodities in SITC divisions

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[4] Sala-i-Martin and Subramanian find that only exports of fuel and minerals have robust negative impacts on growth via their adverse impact on institutional quality.
[5] For detailed classification of MFOOD and SFOOD, refer to appendix.

27 (crude fertilizer, minerals nes), 28 (metalliferous ores, scrap), and 68 (non-ferrous metals).

FUEL comprises SITC section 3 (mineral fuels). However, in order to test the pure effect of oil per se, petroleum products are not included in the sample. For example, Republic of Korea exports petroleum products[6] but is not an oil-exporting country. Thus, including petroleum product exports in the sample could mislead the oil resource effect on economic growth.

3.2. Corruption Regression

Natural resource abundance can cause certain distortions that hinder economic growth. In order to explore these distortions, the relationship between natural resources and corruption is investigated as in Equation (3). Corruption will be measured by the World Bank Governance indicator, "control of corruption". Control of corruption tends to be lower in resource-abundant countries. In addition, Latin America, Sub-Saharan Africa, Asia and Europe are included as regional variables.

$$COC = \gamma_0 + \gamma_1 \ln GDPPC + \gamma_2 POPGROWTH + \gamma_3 INFLATION + \gamma_4 GCE + \gamma_5 SAVINGS \\ + \gamma_6 OPEN + \gamma_7 FDI + \gamma_8 PCR + \gamma_9 PRIMARY + \varepsilon_3 \qquad (3)$$

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[6] Petroleum products consisted 74% of primary exports from 2001 to 2010 in Republic of Korea.

Moreover, in order to test which natural resource endowments are associated with high level of corruption, the following regression is performed:

$$
\begin{aligned}
COC = {} & \delta_0 + \delta_1 \ln GDPPC + \delta_2 POPGROWTH + \delta_3 INFLATION + \delta_4 GCE + \delta_5 SAVINGS \\
& + \delta_6 OPEN + \delta_7 FDI + \delta_8 PCR + \delta_9 MFOOD + \delta_{10} SFOOD + \delta_{11} AGRIRAW \\
& + \delta_{12} ORESMETALS + \delta_{13} FUEL + \varepsilon_4 \qquad\qquad (4)
\end{aligned}
$$

CHAPTER IV. EMPIRICAL ANALYSIS

4.1. Growth Regression

4.1.1. Natural Resource Abundance and Economic Growth

In Section IV, the theoretical model is examined through a panel data analysis. The regressions include a panel of roughly 160 countries observed from 1970 to 2009. There are eight sub-periods dividing the data with five year spans. In addition to the natural resource variables, a set of further control variables are included that are likely to influence economic growth. The other variables considered are population growth, inflation, government consumption expenditure, gross savings, trade openness, foreign direct investment, and the primary completion ratio. *Ceteris paribus,* an economy with lower inflation, lower government spending, a more open trade policy, higher investment ratio, and higher education level is expected to have a higher rate of growth. All variables, in the growth regression, are significant (except for foreign direct investment) and correctly signed with coefficient estimates that are close to what is found in previous studies.

Table 4.1 summarizes the results that use the general framework of Equation (1). It appears that the share of primary exports in GDP remains significant after controlling for the other variables and shows an adverse effect on growth. Thus, natural resources in aggregate appear to have a robust negative effect on growth.

Table 4.1 Natural Resource Abundance and Economic Growth

Dependent Variable: GDP growth rate, 1970-2009

Independent Variables	(1)	(2)	(3)
Constant	3.577*** (4.78)	3.730*** (5.00)	4.707*** (5.47)
lnGDPPC	-0.472*** (-4.43)	-0.525*** (-4.89)	-0.627*** (-5.21)
Population Growth	0.569*** (5.68)	0.606*** (6.05)	0.712*** (6.63)
Inflation	-0.006***(-3.40)	-0.006***(-3.53)	-0.006***(-3.39)
Government Expenditure	-0.079*** (-3.44)	-0.077*** (-3.36)	-0.076*** (-2.95)
Gross Savings	0.067*** (4.91)	0.078*** (5.52)	0.070*** (4.56)
Trade Openness	0.004 (1.56)	0.006** (2.07)	0.006** (2.04)
FDI	0.004 (0.75)	0.003 (0.56)	0.002 (0.40)
Primary Completion Ratio	0.026*** (3.86)	0.027*** (4.09)	0.024*** (3.35)
Natural Resources		-2.382*** (-2.92)	-1.995** (-2.41)
Latin America			-0.104 (-0.30)
Sub-Saharan Africa			-0.623 (-1.63)
Asia			0.524 (1.08)
Europe			0.770* (1.95)
Adjusted R²	0.16	0.17	0.17
No. Observations	641	641	641

(T-Statistics for coefficients are in parentheses. Superscripts *, **, *** correspond to a 10%, 5% and 1% level of significance.)

Regional Variables

It is a common view that countries in Latin America or Africa have poorer growth performances than other countries. In some previous cross-country regression studies like the research done by Barro (1991), dummy variables for Latin America and Sub-Saharan Africa are negative and significant in growth regressions. Latin America, Sub-Saharan Africa, Asia and Europe are added as regional dummy variables in Equation (1). All of the structural variables (except for foreign direct investment) remain significant, even after the inclusion of regional dummy variables. Column 3 of Table 4.1 shows that dummies for Latin America and Sub-Saharan Africa are negatively signed but not significant. Asia and Europe appear to have positive effects on growth but only Europe is significant at the 10% level.

4.1.2. Different Types of Natural Resources and Economic Growth

Natural resources in aggregate appear to have a significantly negative influence on growth. However, this aggregate measurement can distort the accurate picture of natural resources' impact on economic growth. Not all natural resources are subject to the "resource curse". Thus, the five types of natural resources discussed in the previous section are applied in Table 4.2.

Table 4.2 Different Types of Natural Resources and Economic Growth

Dependent Variable: GDP growth rate, 1970-2009

Independent Variables	(4)	(5)
Constant	3.082*** (3.89)	3.394*** (4.24)
lnGDPPC	-0.487*** (-4.45)	-0.514*** (-4.68)
Population Growth	0.619*** (6.19)	0.626*** (6.28)
Inflation	-0.006***(-3.52)	-0.006***(-3.49)
Government Expenditure	-0.075*** (-3.26)	-0.076*** (-3.28)
Gross Savings	0.089*** (5.83)	0.093*** (6.08)
Trade Openness	0.003 (1.10)	0.002 (0.85)
FDI	0.004 (0.85)	0.005 (0.92)
Primary Completion Ratio	0.028*** (4.21)	0.026*** (3.86)
Food	-0.193 (-0.09)	
Main food		8.135**(1.98)
Subsidiary food		-4.776* (-1.67)
Agricultural Raw Materials	13.304* (1.86)	15.977** (2.21)
Ores & Metals	-2.838 (-1.26)	-3.254 (-1.44)
Fuel	-3.931*** (-3.47)	-4.054*** (-3.58)
Adjusted R²	0.17	0.18
No. Observations	641	641

(T-Statistics for coefficients are in parentheses. Superscripts *, **, *** correspond to a 10%, 5% and 1% level of significance.)

All of the control variables in the growth regression are significant (except for trade openness and foreign direct investment) and correctly signed. Table 4.2 shows that all the natural resource subcategories except ores & metal remain significant. Food in general has a negative effect on growth; however, once divided into main food and subsidiary food, the former category such as meat, fish, vegetables, and fruit appear to have a strong positive effect on growth. Agricultural raw materials such as rubber, wood, silk and cotton also exhibit significantly positive correlations to growth. These findings do not support the hypothesis that primary exports hinder economic growth. The results reveal that some natural resource endowments such as main food and agricultural raw materials explain economic growth.

On the other hand, subsidiary food such as sugar, coffee, beverages and fuel show negative effects on growth. Particularly fuel has a strong adverse effect on growth at a 1% significant level.

4.2. Corrupt Regression

4.2.1. Natural Resource Abundance and Control of Corruption

The next section explores whether large endowments of natural resources especially subsidiary food and fuel are associated with high level of corruption. Before illustrating the interrelationship between natural resources and corruption, the

possibility for multicollinearity was investigated in the regressions. Unlike Equation (3) and (4), the logarithm form of per capita GDP is not included in the corruption regressions due to multicollinearity problem. Table 4.3 outlines the correlation matrix of all the variables. When there are variables that have correlation coefficients around 0.9 or above, this can point to multicollinearity. It indicates that control of corruption and per capita GDP variables are strongly associated with each other, hence implying a multicollinearity problem.

Table 4.3 Matrix of Correlations

| | Dependent Variables | | Independent Variables | | | | | | | | | | | | | | | |
	GDPGR	COC	GDPPC	POPGR	INFLAT.	GCE	SAVINGS	OPEN	FDI	PCR	PRIMA.	FOOD	MFOOD	SFOOD	AGRIC.	ORESM.	FUEL
GDPGR	1																
COC	-.19	1															
GDPPC	-.25	.83	1														
POPGR	.25	-.23	-.15	1													
INFLAT.	-.13	-.25	-.21	-.17	1												
GCE	-.25	.48	.35	-.28	-.02	1											
SAVING	.10	.22	.31	.09	-.09	.03	1										
OPEN	-.00	.25	.23	-.11	-.06	.16	.17	1									
FDI	-.00	.19	.36	-.01	-.04	.01	.04	.41	1								
PCR	-.17	.41	.35	-.47	.01	.37	.34	.25	.02	1							
PRIMA.	-.03	-.17	-.06	.15	.00	.02	.39	.15	-.05	.06	1						
FOOD	-.10	-.11	-.16	-.03	.03	.05	-.23	.26	-.01	-.03	.32	1					
MFOOD	-.08	.04	-.01	-.11	-.00	.15	-.13	.29	.01	.18	.25	.75	1				
SFOOD	-.08	-.20	-.22	.04	.05	-.05	-.23	.14	-.03	-.20	.26	.85	.30	1			
AGRIC.	.02	-.14	-.16	-.02	.02	-.06	-.07	.12	-.04	-.21	.21	.18	.02	.25	1		
ORESM.	.01	-.09	-.07	.07	.03	-.00	.03	.07	.02	-.01	.24	.07	.03	.07	.22	1	
FUEL	-.03	-.09	.05	.10	-.03	-.00	.52	-.02	-.04	.12	.79	-.11	-.07	-.11	-.03	.02	1

Table 4.4 presents that natural resources are significant at the 1 percent level and negatively signed with control of corruption. This implies that natural resources as a whole are detrimental to control of corruption.

Table 4.4 Natural Resource Abundance and Control of Corruption

Dependent Variable: COC (Control of corruption)

Independent Variables	(1)	(2)	(3)
Constant	-1.931*** (-8.01)	-2.056*** (-9.02)	-2.082*** (-8.44)
Population Growth	-0.051 (-1.41)	-0.013 (-0.39)	0.045 (1.26)
Inflation	-0.016*** (-5.76)	-0.015*** (-5.52)	-0.013*** (-5.23)
Government Expenditure	0.071*** (8.46)	0.074*** (9.37)	0.060*** (6.94)
Gross Savings	0.010** (2.33)	0.022 (4.80)	0.021*** (4.38)
Trade Openness	0.001 (1.03)	0.002** (2.26)	0.001* (1.68)
FDI	0.005*** (3.19)	0.003** (2.40)	0.002 (1.60)
Primary Completion Ratio	0.008*** (3.47)	0.007*** (3.34)	0.007*** (3.01)
Natural Resources		-1.627*** (-6.76)	-1.384*** (-5.76)
Latin America			0.125 (1.15)
Sub-Saharan Africa			0.046 (0.36)
Asia			0.044 (0.26)
Europe			0.691*** (5.95)

Adjusted R²	0.39	0.46	0.50
No. Observations	364	364	364

(T-Statistics for coefficients are in parentheses. Superscripts *, **, *** correspond to a 10%, 5% and 1% level of significance.)

4.2.2. Different Types of Natural Resources and Control of Corruption

It appears that all natural resource subcategories are negatively signed with control of corruption in Table 4.5. Food and fuel among the natural resource subcategories exert strong negative impacts on control of corruption significant at the 1 percent level. These two categories also had adverse effects on economic growth. This finding is contrary to Leite and Weidmann's theoretical finding (1999) that food industries tend to induce a lower level of corruption. Specifically, subsidiary food exhibits a strong and negative correlation with control of corruption.

Ores & metal also illustrate a negative relationship with control of corruption at the 10% level of significance. This category also had a negative but insignificant correlation with growth. The interesting part is that main food and agricultural raw materials had positive effects on economic growth; however, they show negative effects on control of corruption although the results are not significant.

Table 4.5 Different Types of Natural Resources and Control of Corruption

Dependent Variable: COC (Control of corruption)

Independent Variables	(4)	(5)
Constant	-1.960*** (-7.97)	-1.922*** (-7.68)
Population Growth	-0.034 (-0.96)	-0.034 (-0.97)
Inflation	-0.015*** (-5.65)	-0.015*** (-5.60)
Government Expenditure	0.072*** (9.09)	0.072*** (9.01)
Gross Savings	0.021*** (3.99)	0.021*** (4.03)
Trade Openness	0.001* (1.72)	0.001 (1.64)
FDI	0.003*** (2.62)	0.004*** (2.62)
Primary Completion Ratio	0.007*** (3.12)	0.007*** (2.87)
Food	-1.628*** (-2.54)	
Main Food		-0.788 (-0.66)
Subsidiary Food		-2.226** (-2.31)
Agricultural Raw Materials	-1.963 (-0.80)	-1.688 (-0.68)
Ores & Metals	-1.313* (-1.89)	-1.317* (-1.89)
Fuel	-1.687*** (-5.06)	-1.693*** (-5.07)
Adjusted R²	0.44	0.44
No. Observations	364	364

(T-Statistics for coefficients are in parentheses. Superscripts *, **, *** correspond to a 10%, 5% and 1% level of significance.)

Summary

1. The empirical findings for a panel of around 160 countries support the general notion that natural resource abundance hinders economic growth. Natural resources in aggregate appear to have a significant negative effect on growth.

2. However, this aggregate picture does not accurately describe the relationship between natural resource abundance and economic growth as natural resources are measured as a whole. The results from the regressions indicate that the "resource curse" does not exist for certain natural resources. In particular, main food and agricultural raw materials appear to have significant positive growth effects. On the contrary, it is subsidiary food and fuel that have robust negative impacts on growth.

3. To explain the negative correlation between certain natural resources and economic growth, a corruption regression was performed utilizing different types of natural resources. The results present that the export of natural resources collectively leads to an increase in corruption. Specifically, subsidiary food and fuel show robust negative impacts on control of corruption.

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CHAPTER V. RESOURCE CURSE IN LATIN AMERICA

Natural resource abundance has played a vital role in Latin America's economic history. From gold and silver to sugar, coffee and oil; primary exports have been critical in shaping Latin American economies. Nonetheless, Latin America with all its natural riches has experienced a relatively poor economic performance over the past forty years. Is Latin America prone to the "resource curse"? Which natural resource abundance has become a problem and has hindered economic growth in Latin America?

Table 5.1 and 5.2 present the composition of exports of the major Latin American countries in 1970 and 2009.

Table 5.1 Composition of Latin American Exports (%), 1970

Country	Main food	Subsidiary food	Agricultural raw materials	Ores & metals	Fuel	Manufactures
Argentina	59%	14%	10%	0%	0%	16%
Brazil	10%	53%	12%	10%	0%	15%
Chile	3%	2%	3%	88%	0%	4%
Colombia	4%	68%	6%	1%	8%	13%
Costa Rica	39%	40%	0%	0%	0%	21%
Ecuador	47%	45%	2%	1%	0%	4%
El Salvador	4%	55%	10%	1%	0%	30%
Guatemala	15%	44%	10%	0%	0%	31%
Mexico	20%	17%	8%	16%	1%	38%
Peru	1%	43%	6%	48%	1%	2%
Uruguay	43%	5%	31%	1%	0%	20%
Venezuela	1%	1%	0%	6%	62%	30%

Source: World Bank

Table 5.2 Composition of Latin American Exports (%), 2009

Country	Main food	Subsidiary food	Agricultural raw materials	Ores & metals	Fuel	Manufactures
Argentina	19%	31%	1%	4%	6%	39%
Brazil	11%	23%	3%	12%	6%	44%
Chile	15%	5%	5%	58%	0%	16%
Colombia	6%	9%	0%	2%	42%	42%
Costa Rica	17%	7%	0%	1%	0%	74%
Ecuador	29%	7%	1%	0%	45%	18%
El Salvador	9%	13%	0%	1%	0%	76%
Guatemala	16%	28%	2%	5%	3%	45%
Mexico	4%	3%	0%	2%	11%	79%
Peru	7%	10%	1%	37%	2%	44%
Uruguay	50%	12%	9%	0%	0%	29%
Venezuela	0%	0%	0%	1%	63%	35%

Source: World Bank

The tables show a significant increase in the share of manufactured goods in Latin America. However, the portion still represents less than 50 percent of total exports in nine out of twelve countries considered. This implies that Latin America still heavily depends on primary exports. In particular, fuel accounted for more than 60% of total exports in Venezuela and slightly less than 50% in Ecuador.

As discussed in the previous section, subsidiary food and fuel exports exert negative effects on economic growth. This section takes a closer look at the cases of the major oil exporters, Venezuela and Ecuador and coffee exporters, El Salvador and Guatemala.

5.1. The "Black Gold" – Oil

Petroleum has been the largest internationally traded commodity in Latin America. Unlike other natural resources, petroleum industry has some unique characteristics.

First, petroleum is depletable. Because of its non-renewable, exhaustible nature, any price exceeding the cost of extraction is considered pure economic rent. Moreover, oil productions are generally enclave economies due to its concentration of deposits in a few geographic locations.

Second, petroleum industry is more prone to boom-bust cycles than other primary commodity industries. Countries dependent on oil exports can be subject to crises when world oil prices plunge. According to Manzano and Rigobon (2001), resource-rich countries utilized commodities as collateral for debt when commodities prices were high in the 1970s. However, oil-dependent countries for example, Venezuela and Ecuador went into debt after the oil price plummeted in the 1980s.

Third, petroleum industry generates massive rents which become the base of patronage. Its oligopolistic structure and rent-seeking behavior weaken institutions and increase corruption. Karl (1997) mentioned that corruption from oil rather than Dutch disease has been the culprit of the major oil exporters' poor economic performance.

In many oil-producing developing countries, oil windfalls were mostly used for unproductive expenditures rather than for poverty alleviation or economic

development. The ultimate use of oil revenues depends on who owns the "black gold": the state in most OPEC economies. However, the allocation of oil revenues was inadequately planned in most cases. Why have the Latin American economies been unable to utilize their oil windfalls to accelerate growth?

1) Venezuela

Venezuela, a founding member of the Organization of the Petroleum Exporting Countries (OPEC) ranks the 10th largest net exporter of oil[7] and at the same time is one of the most corrupt countries in the world.[8] Petroleum has had a prevalent influence on Venezuela's economy since the advent of the oil industry in the 1920s. When Terry Lynn Karl went to Venezuela to do some field research in the 1970s, OPEC's founder, Juan Pablo Pérez Alfonzo told her; "Don't study OPEC. Study what oil is doing to Venezuela…Ten years from now. Twenty years from now, you will see. Oil will bring us ruin."[9] Just as he has prophesied, Venezuela's economic growth has deteriorated during the past thirty years.

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[7] Top World Oil Net Exporters, 2009. *U.S. Energy Information Administration*. Retrieved May 11, 2012, from http://www.eia.gov/countries/index.cfm?topL=exp
[8] The Corruption Perceptions Index 2011. *Transparency International*. Retrieved May 11, 2012, from http://cpi.transparency.org/cpi2011/results/
[9] Karl (1997), Preface.

Figure 5.1 shows the historical data of oil exports[10] and GDP growth of Venezuela from 1970 to 2006.

Figure 5.1 Oil Exports and GDP Growth in Venezuela, 1970-2006
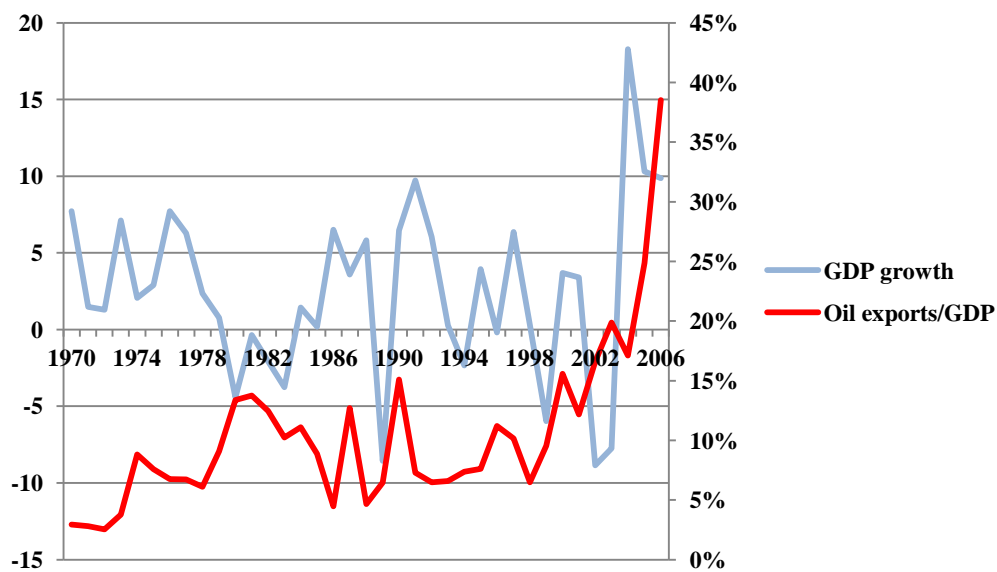
Source: World Bank

Figure 5.1 illustrates that oil exports and GDP growth have moved in opposite directions. If the oil exports graph is rotated 180 degrees along the horizontal axis, it becomes strikingly identical to the GDP growth graph. The oil exports graph appears

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[10] To reiterate, petroleum products are not included in the calculation of oil exports in order to analyze the oil effect per se. For example, Singapore and Republic of Korea exported more petroleum products than Venezuela or Saudi Arabia in 2010; however, both countries are not considered petro-states.

unchanged when reflected across the horizontal axis, indicating the type of mirror reflection symmetry. This means that when oil exports have increased, the GDP growth rate has decreased and vice versa.

Like many OPEC countries, the Venezuelan economy was shaped by oil-led development. The economy experienced a boom during the 1970s when there was an increase in world oil prices in 1973-74 and in 1979-80. Figure 5.2 presents the annual average crude oil price from 1970 to 2010.

Figure 5.2 Annual Average Crude Oil Price ($/barrel), 1970-2010
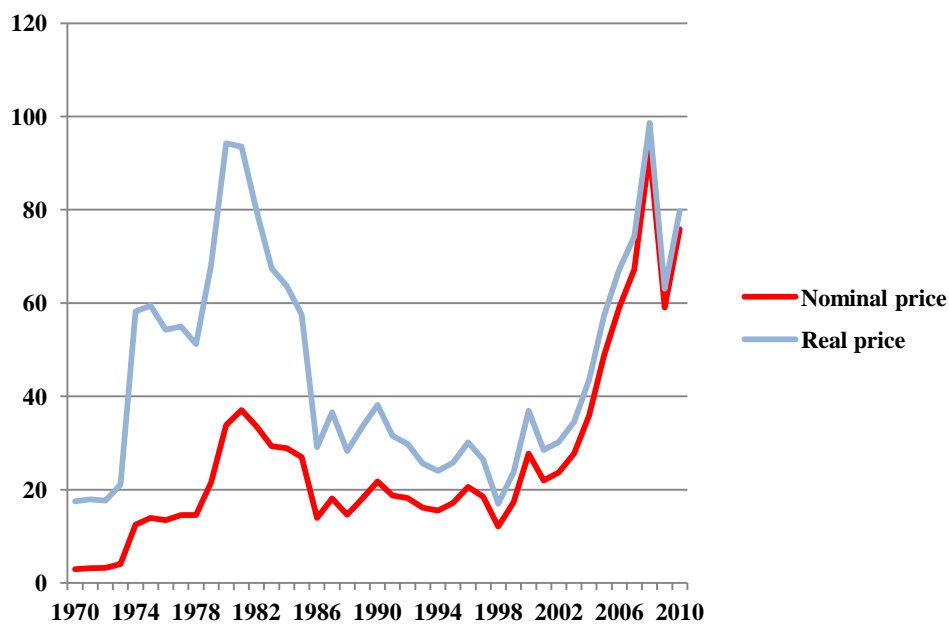
Source: U.S. Energy Information Administration
Note: Real price (Jul 2012 US dollars)

The Venezuelan government consumed its oil revenues to accelerate economic growth and improve the welfare of the people. However, in order to fund substantial development projects, Venezuela borrowed heavily from foreign banks during its boom cycles. GDP had been stagnating since 1979 and as the oil prices started to collapse in the 1980s, Venezuela found itself with considerable foreign debt. As Karl has pointed out, "Venezuela was paying $0.40 back to foreign banks for every dollar earned on a barrel of oil by the end of the 1980s." (Karl, 1997, p.173) In 1989, the Venezuelan government had to turn to the International Monetary Fund (IMF) for structural-adjustment loans. Venezuela is a clear example of a country that was constantly subject to boom-bust cycles that depended on the oil price volatility.

2) Ecuador

Before its oil discovery, the main export products of Ecuador were bananas, coffee and cocoa. The large-scale oil production began after discovering vast amounts in 1967. Ecuador joined OPEC in 1973; however, it left the organization in 1992 after falling behind in its membership dues.[11]

During the oil booms in the 1970s, the government of Ecuador used its oil revenues to increase current expenditures and accumulated massive external debt by

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[11] Ecuador rejoined OPEC in 2007.

borrowing from foreign commercial banks. However, economic conditions began to weaken in the 1980s as oil prices started to fall. As a result, the GDP growth rate plunged after the second oil boom.

Figure 5.3 depicts the historical data of oil exports and GDP growth rate of Ecuador from 1970 to 2006. Similar to the case of Venezuela, oil exports and GDP growth movements went in opposite directions like a horizontal reflection.

Figure 5.3 Oil Exports and GDP Growth in Ecuador, 1970-2006
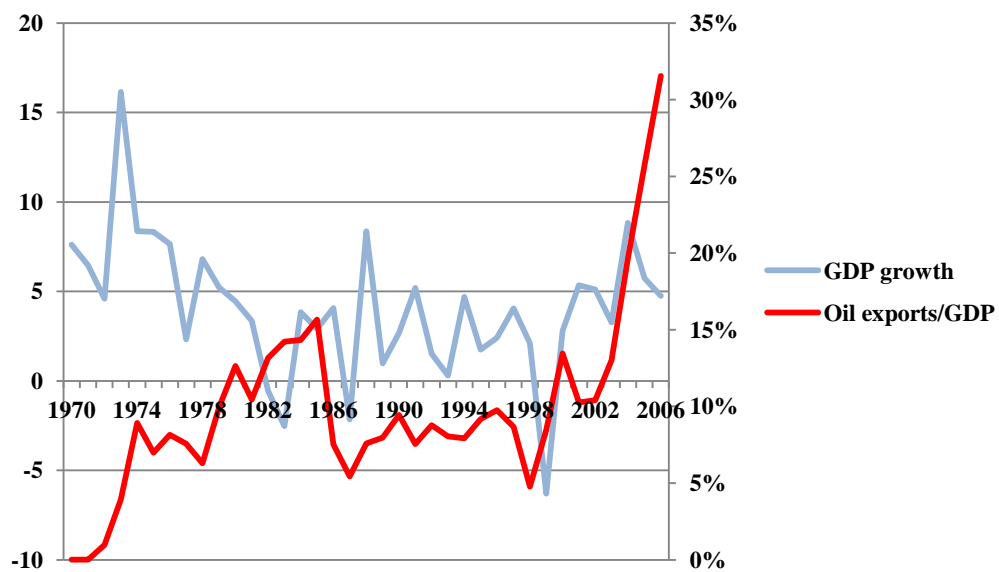
Source: World Bank

Ecuador experienced a severe economic crisis in 1999 when the oil price

plummeted in the late 1990s. Around 40% people of the total population were living on less than $2 a day and Ecuador defaulted on some of its foreign debt. Ecuador still relies on oil exports heavily and its strategy to utilize the oil windfalls has seemed to be unsuccessful throughout its economic history.

5.2. The "Brown Gold" – Coffee

Coffee production began in the 19th century and has been one of the most widely distributed commodities in Latin America. There was a dramatic increase in international coffee trade from the second half of the nineteenth century to the 1930s. Although coffee lacks any value as a source of energy, it has long been the main foreign exchange earner in Latin America.

Coffee has some distinctive features from other natural resources.

First, coffee is a very labor-intensive crop as cherries are handpicked and beans are sorted by hand. Unlike sugar, coffee production does not require much mechanization. Family members especially wives were mobilized to the fullest extent during the 19th century in Latin America. According to Stolcke, the "self-provisioning by family members, without compensation, reduced the cost of labor and generated labor rents." (Roseberry, 1995, p.78)

Second, the economic structure in coffee plantations ties each person to a

landowner which results in clientelism. As Isham has mentioned, "crops such as sugar, coffee and cocoa were grown on large plantations in Latin America. Cultivatable land was relatively scarce, decolonization occurred late and property rights were weak. Land elites were able to amass great personal fortunes, resist more democratic reforms, and consolidated power." (Isham, 2005, p.9) The deep division between these land elites and poor rural masses clashed in revolutions in Latin America. The "brown gold" granted the coffee elites to take control of not only the coffee industry but also the rest of the economy.

1) El Salvador

Coffee production in El Salvador expanded greatly in the late 19th century. The coffee exports reached nearly 90 percent of total exports in the 1920s and 1930s and provided almost half of the country's export revenues. The heavy dependence on a monocrop enabled the coffee elites to stay in power. The coffee oligarchy controlled not only the coffee production but also the processing, the exports and even the economy outside the coffee sector. Since the coffee elites provided most of the government's revenues, corruption and patronage were the name of the game throughout the country. The dominance of the coffee elite power continued until the 1980s, although their direct control reduced after the Great Depression.

The next graph presents the coffee exports in El Salvador and its GDP growth.

The GDP growth graph flipped over the horizontal line becomes somewhat similar to the coffee exports graph, illustrating reflection symmetry. This supports the results from the growth regressions that subsidiary food exports have significant negative effects on growth.

Figure 5.4 Coffee Exports and GDP Growth in El Salvador, 1986-2010
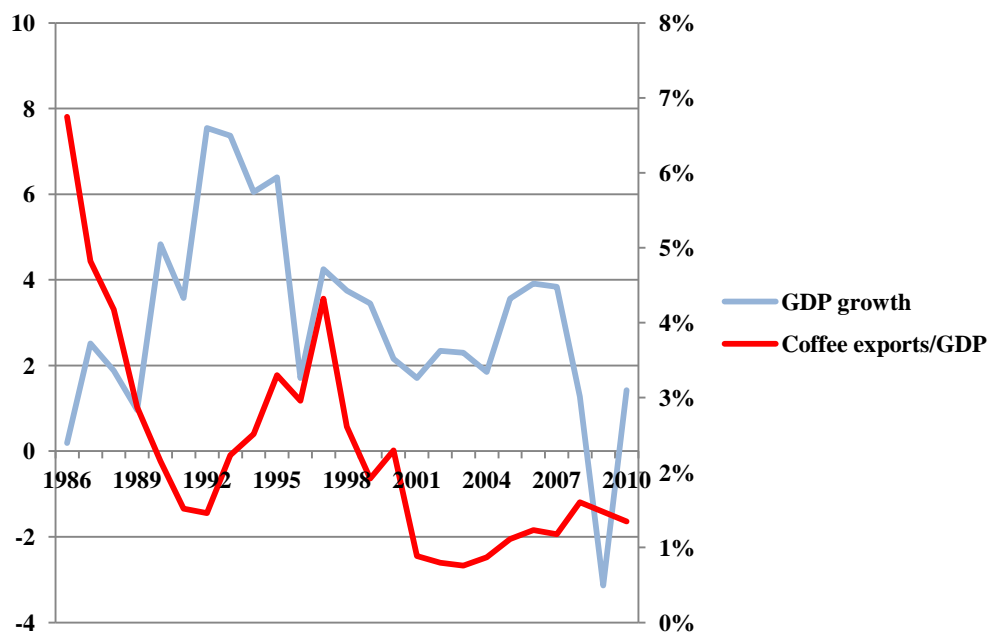
Source: World Bank

The economy of El Salvador was vulnerable to coffee price cycles which were highly volatile, especially after the 1970s. Figure 5.5 shows the annual average

coffee price from 1980 to 2010.

Figure 5.5 Annual Average Coffee Price (US cent per pound), 1980-2010
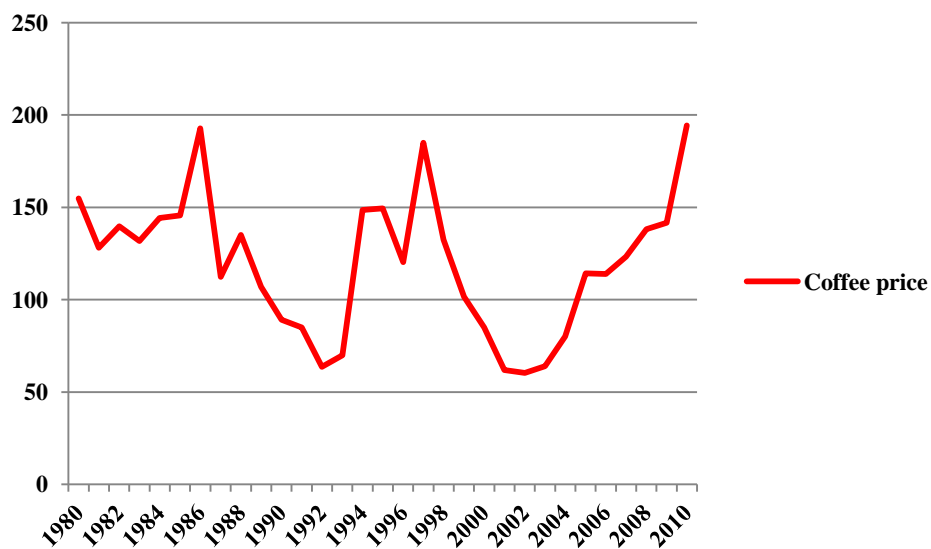
Source: International Coffee Organization

After a price jump in 1986, world coffee prices fell to US$1.12 per pound in 1987 causing coffee exports to decline in value from US$511 million to US$374 million. When the coffee price hit the lowest in the 1992, the coffee exports dropped to 1.5% of GDP whereas the GDP growth rate recorded 7.5% in El Salvador.

In sum, the social and economic structures that were shaped by coffee, created a consolidation of a coffee oligarchy in El Salvador. The state along with the coffee

elites played essential roles in developing the coffee economy based on large estates. However, the division between the coffee elites and landless masses led to subsequent unrest in the society.

2) Guatemala

Guatemala is one of the world's top ten coffee exporters. Coffee production started when the major export crop, indigo became unprofitable due to the development of artificial dyes in Europe during the mid 19th century. Shortage of cheap labor was an impediment to the expansion in coffee production during this period. Labor exploitation and debt peonage were prevalent especially among the indigenous people. Coerced labor helped the owners of coffee *fincas* (estates) to accrue considerable profits. According to Paige, the "dominance of the large estate in the control of coffee was almost complete in Guatemala." (Paige, 1997, p.62) Although direct coercion ended in the 1940s, the coffee production had developed inegalitarian plantations.

Poverty has been notably higher among the indigenous people so far and Guatemala's income distribution is one the most unequal in the world. The lengthy civil war from 1960 until 1996 was a result of heightened tensions caused by unequal land distribution and poverty.

Moreover, the poor record of human capital accumulation is one of the outcomes of the unequal land distribution and control of labor in conjunction with the development of coffee. Figure 5.6 indicates that Guatemala's adult literacy rate is below Latin America's average and even lower than the world average.

Figure 5.6 Adult Literacy Rate in Guatemala (% of people ages 15 and above), 2010
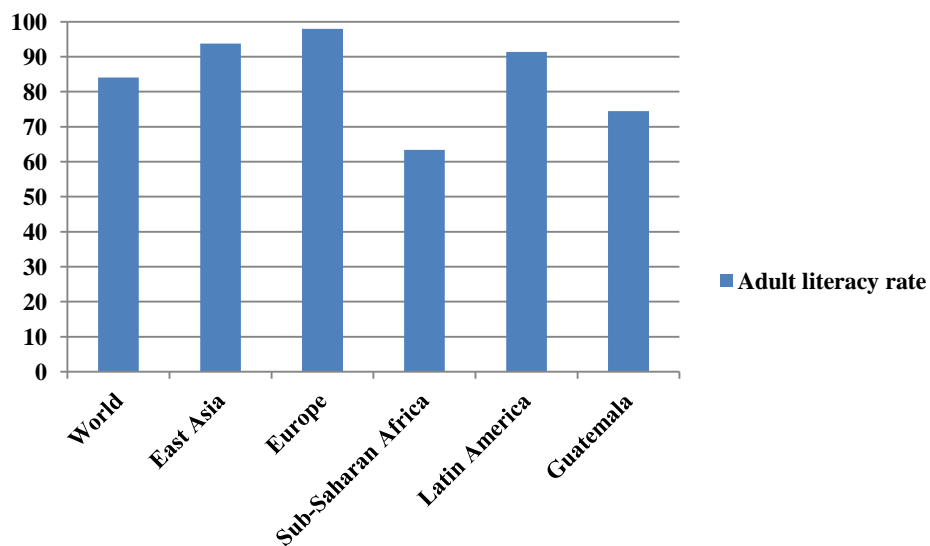
The coffee elites appear to have survived the economic turmoil during the early 1980s. Labor repression continued in the coffee sector as the *finqueros* (finca owners) attempted to maintain labor exploitation which would maximize their profits.

As coffee production increased at the expense of subsistence agriculture, the food production decreased and the living standards of the *colonos* (resident workers) and day laborers deteriorated. As long as the wealth of Guatemala depends on the *finca* ownership, coffee and power will remain closely linked together adversely affecting the economy.

Figure 5.7 Coffee Exports and GDP Growth in Guatemala, 1986-2010
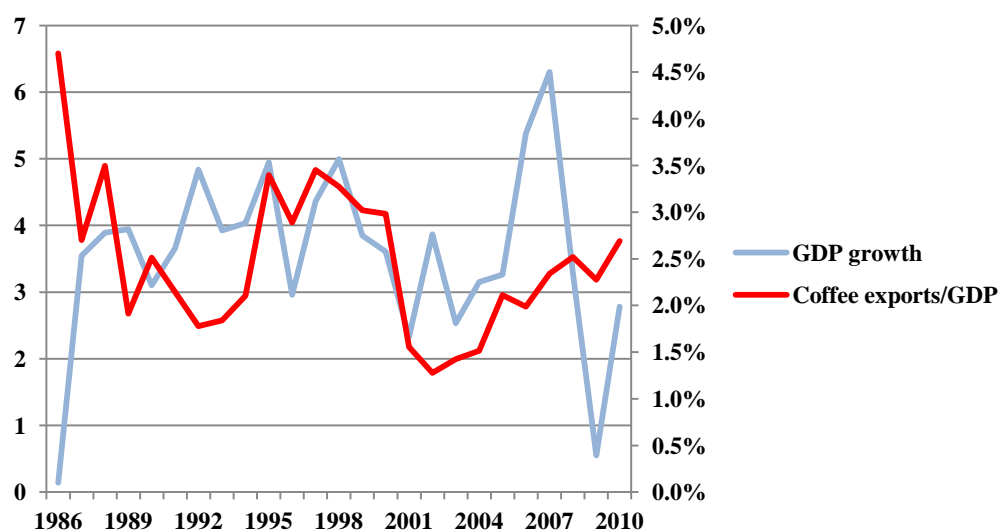
Source: World Bank

CHAPTER VI. CONCLUSION

This paper has presented econometric evidence supporting the "resource curse thesis". A panel data set of around 160 countries for an extended period of time from 1970 to 2009 was used including Latin America, Sub-Saharan Africa, Asia and Europe as regional variables. Moreover, a set of additional variables were included such as GDP per capita, population growth, inflation, gross savings, trade openness, investment rates, government expenditure ratios, and control of corruption. There has been an inverse correlation between natural resource abundance and economic growth over the period 1970-2009. The results also imply that exports of natural resources have, above all, led to an increase in corruption.

However, the question is whether various types of natural resources carry out similar influences on economic growth across nations. Natural resources were classified into five categories: main food, subsidiary food, agricultural raw materials, ores & metals and fuel. Contrary to what many have assumed in the resource curse theory, not all natural resources adversely affect growth. Main food and agricultural raw materials show significantly positive effects on growth.

Certain types of natural resources are likely to exert negative influences on long-run economic performances. The empirical results suggest that subsidiary food and fuel exports are strongly associated with slower growth and corruption.

The case studies of Latin America confirm that certain natural resource

abundance can be detrimental to economic growth. Countries dependent on coffee or oil are likely to experience slower growth than those dependent on meat and vegetables. Thus, this paper contributes to the field of natural resources and economic growth by providing interesting insights as the analyses on the natural resource exports at a disaggregated level are rather rare.

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APPENDIX

\<Descriptions on data\>

Variable name	Description	Source
<u>Dependent variable</u>		
GDPGR	Annual percentage growth rate of GDP	World Bank, WDI
COC	Control of corruption	World Bank, WDI
<u>Natural resource variables</u>		
PRIMARY (% of GDP)	Primary exports (SITC 0, 1, 2, 3, 4, 68)	UN COMTRADE
FOOD (% of GDP)	SITC section 0, 1, 4 and division 22	UN COMTRADE
Main food (% of GDP)	SITC division 00, 01, 02, 03, 04, 05	UN COMTRADE
Subsidiary food (% of GDP)	SITC division 06, 07, 08, 09, 22 and section 1, 4	UN COMTRADE
Agricultural raw materials (% of GDP)	SITC section 2 excluding division 22, 27, 28	UN COMTRADE
Ores & metals (% of GDP)	SITC division 27, 28, 68	UN COMTRADE
Fuel (% of GDP)	SITC section 3 excluding petroleum products	UN COMTRADE
<u>Possible determinants of economic growth</u>		
lnGDPPC	Logarithm of GDP per capita	World Bank, WDI
POPGROWTH	Population growth (annual %)	World Bank, WDI
INFLATION	Inflation (annual %)	World Bank, WDI
GCE	General government final consumption expenditure (% of GDP)	World Bank, WDI
SAVINGS	Gross savings (% of GDP)	World Bank, WDI
OPEN	Trade openness (% of GDP)	World Bank, WDI
FDI	Foreign direct investment, net inflows (% of GDP)	World Bank, WDI
PCR	Primary completion rate, total (% of relevant age group)	World Bank, WDI
<u>Regional variables</u>		
LA	Latin American countries (N=30)	
SSA	Sub-Saharan African countries (N=34)	
ASIA	Asian economies (N=13)	
EU	European countries (N=27)	

\<List of countries(economies)\>

Latin America	Sub-Saharan Africa	Asia	Europe
Argentina	Benin	Brunei Darussalam	Austria
Bahamas	Botswana	Cambodia	Belgium
Barbados	Burundi	China	Bulgaria
Belize	Cameroon	Hong Kong	Cyprus
Bolivia	Cape Verde	Indonesia	Czech Republic
Brazil	Central African Republic	Japan	Denmark
Chile	Congo	Macao	Estonia
Colombia	Cote d'Ivoire	Malaysia	Finland
Costa Rica	Democratic Republic of the Congo	Philippines	France
Cuba	Ethiopia	Republic of Korea	Germany
Dominica	Gabon	Singapore	Greece
Dominican Republic	Gambia	Thailand	Hungary
Ecuador	Ghana	Vietnam	Ireland
El Salvador	Kenya		Italy
Grenada	Madagascar		Latvia
Guatemala	Malawi		Lithuania
Guyana	Mali		Luxembourg
Honduras	Mauritania		Malta
Jamaica	Mauritius		Netherlands
Mexico	Mozambique		Poland
Nicaragua	Namibia		Portugal
Panama	Niger		Romania
Paraguay	Nigeria		Slovak Republic
Peru	Rwanda		Slovenia
Saint Kitts and Nevis	Senegal		Spain
Saint Lucia	Seychelles		Sweden
Suriname	Sierra Leone		United Kingdom
Trinidad and Tobago	South Africa		

Uruguay	Swaziland
Venezuela	Togo
	Uganda
	United Republic of Tanzania
	Zambia
	Zimbabwe

\<Standard International Trade Classification (SITC) Revision 3\>

Code	Label
0	Food and live animals
00	Live animals other than animals of division 03
001	Live animals other than animals of division 03
01	Meat and meat preparations
011	Meat of bovine animals, fresh, chilled or frozen
012	Other meat and edible meat offal
016	Meat, edible meat offal, salted, dried; flours, meals
017	Meat, edible meat offal, prepared, preserved, n.e.s.
02	Dairy products and birds' eggs
022	Milk, cream and milk products (excluding butter, cheese)
023	Butter and other fats and oils derived from milk
024	Cheese and curd
025	Birds' eggs, and eggs' yolks; egg albumin
03	Fish, crustaceans, mollusks and preparations thereof
034	Fish, fresh (live or dead), chilled or frozen
035	Fish, dried, salted or in brine; smoked fish
036	Crustaceans, mollusks and aquatic invertebrates
037	Fish, aqua. invertebrates, prepared, preserved, n.e.s.
04	Cereals and cereal preparations
041	Wheat (including spelt) and meslin, unmilled
042	Rice
043	Barley, unmilled
044	Maize (not including sweet corn), unmilled
045	Cereals, unmilled (excluding wheat, rice, barley, maize)
046	Meal and flour of wheat and flour of meslin
047	Other cereal meals and flour
048	Cereal preparations, flour of fruits or vegetables

05	Vegetables and fruits
054	Vegetables
056	Vegetables, roots, tubers, prepared, preserved, n.e.s.
057	Fruits and nuts (excluding oil nuts), fresh or dried
058	Fruit, preserved, and fruit preparations (no juice)
059	Fruit and vegetable juices, unfermented, no spirit
06	Sugar, sugar preparations and honey
061	Sugar, molasses and honey
062	Sugar confectionery
07	Coffee, tea, cocoa, spices, and manufactures thereof
071	Coffee and coffee substitutes
072	Cocoa
073	Chocolate, food preparations with cocoa, n.e.s.
074	Tea and mate
075	Spices
08	Feedstuff for animals (excluding unmilled cereals)
081	Feeding stuff for animals (no unmilled cereals)
09	Miscellaneous edible products and preparations
091	Margarine and shortening
098	Edible products and preparations, n.e.s.
1	Beverages and tobacco
11	Beverages
111	Non-alcoholic beverages, n.e.s.
112	Alcoholic beverages
12	Tobacco and tobacco manufactures
121	Tobacco, unmanufactured; tobacco refuse
122	Tobacco, manufactured
2	Crude materials, inedible, except fuels
21	Hides, skins and furskins, raw
211	Hides and skins (except furskins), raw
212	Furskins, raw, other than hides & skins of group 211
22	Oil seeds and oleaginous fruits
222	Oil seeds and oleaginous fruits (excluding flour)
223	Oil seeds & oleaginous fruits (incl. flour, n.e.s.)
23	Crude rubber (including synthetic and reclaimed)
231	Natural rubber & similar gums, in primary forms
232	Synthetic rubber
24	Cork and wood
244	Cork, natural, raw & waste (incl. blocks, sheets)
245	Fuel wood (excluding wood waste) and wood charcoal
246	Wood in chips or particles and wood waste
247	Wood in the rough or roughly squared
248	Wood simply worked, and railway sleepers of wood
25	Pulp and waste paper
251	Pulp and waste paper

26	Textiles fibres and their wastes
261	Silk
263	Cotton
264	Jute, other textile bast fibre, n.e.s., not spun; tow
265	Vegetable textile fibres, not spun; waste of them
266	Synthetic fibres suitable for spinning
267	Other man-made fibres suitable for spinning
268	Wool and other animal hair (incl. wool tops)
269	Worn clothing and other worn textile articles
27	Crude fertilizers other than division 56, and crude materials
272	Crude fertilizers (excluding those of division 56)
273	Stone, sand and gravel
274	Sulphur and unroasted iron pyrites
277	Natural abrasives, n.e.s. (incl. industri. diamonds)
278	Other crude minerals
28	Metalliferous ores and metal scrap
281	Iron ore and concentrates
282	Ferrous waste, scrape; remelting ingot, iron, steel
283	Copper ores and concentrates; copper mattes, cemen
284	Nickel ores & concentrates; nickel mattes, etc.
285	Aluminium ores and concentrates (incl. alumina)
286	Ores and concentrates of uranium or thorium
287	Ores and concentrates of base metals, n.e.s.
288	Non-ferrous base metal waste and scrap, n.e.s.
289	Ores & concentrates of precious metals; waste, scrap
29	Crude animal and vegetable materials, n.e.s.
291	Crude animal materials, n.e.s.
292	Crude vegetable materials, n.e.s.
3	Mineral fuels, lubricants and related materials
32	Coal, coke and briquettes
321	Coal, whether or not pulverized, not agglomerated
322	Briquettes, lignites and peat
325	Coke & semi-cokes of coal, lign., peat; retort carbon
33	Petroleum, petroleum products and related materials
333	Petroleum oils, oils from bitumin. materials, crude
334	Petroleum oils or bituminous minerals > 70% oil
335	Residual petroleum products, n.e.s., related mater.
34	Gas, natural and manufactured
342	Liquefied propane and butane
343	Natural gas, whether or not liquefied
344	Petroleum gases, other gaseous hydrocarbons, n.e.s.
345	Coal gas, water gas & similar gases (excluding hydrocar.)
35	Electric current
351	Electric current
4	Animal and vegetable oils, fats and waxes

41	**Animal oils and fats**
411	Animals oils and fats
42	**Fixed vegetable oils and fats, crude, refined or fractionated**
421	Fixed vegetable fats & oils, crude, refined, fractio.
422	Fixed vegetable fats & oils, crude, refined, fract.
43	**Processed animal and vegetable oils and fats**
431	Animal or veg. oils & fats, processed, n.e.s.; mixt.
68	**Non-ferrous metals**
681	Silver, platinum, other metals of the platinum group
682	Copper
683	Nickel
684	Aluminium
685	Lead
686	Zinc
687	Tin
689	Miscellaneous no-ferrous base metals for metallur.

국문 초록

기존 문헌 연구에서는 천연 자원의 풍요가 경제 성장에 부정적인 영향을 미친다고 주장한 바 있다. 또한 주요 논문들은 천연 자원을 하나의 카테고리로만 설정하여 각각의 천연 자원의 특성에 따른 효과를 분석하지 못한 한계점을 갖고 있다.

본 논문은 이 점을 보완하고자 천연 자원을 다섯 개의 카테고리(주요 식품, 보조 식품, 농산 원료품, 광석 & 금속, 연료)로 나누어 경제 성장에 미치는 영향을 각각 살펴본 데 그 의의가 있다. 1970년부터 2009년까지 156개국을 상대로 한 패널 데이터 회귀 분석을 통해 주요 식품(육류, 채소, 과일 등)과 농산 원료품(고무, 목재, 비단, 솜 등) 수출의 경우 경제 성장과 강한 양(+)의 상관 관계가 있음을 증명하였다. 반면 보조 식품(설탕, 커피, 코코아 등)과 연료(석유, 천연 가스 등) 수출의 경우 경제 성장에 부정적인 영향을 미치는 것으로 나타나고 있다.

본 연구는 그 원인을 부패와 연관하여 분석하였으며 회귀 분석 결과, 보조 식품과 연료 수출의 경우 모두 부패와 강한 상관 관계가 있는 것으로 나타났다.

또한 중남미 지역을 중심으로 한 실증 분석 결과, GDP 대비 원유, 커피 수출과 GDP 성장률이 음(-)의 상관 관계를 보여주고 있어 다시 한 번

보조 식품, 연료 수출과 경제 성장간에는 역의 상관 관계가 존재함을 증명 하였다.

주요어: 자원의 저주, 경제 성장, 천연 자원 세부 분류, 부패, 패널 데이터
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