

# Resource Curse and the Solution

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## Abstract

Despite the positive effect on the economic growth in some countries, natural resources tend to have rather inverse impact on the growth in most natural resource-rich countries. Such paradox is well-known as the *resource curse*. This paper reviews a number of literatures related to the effect of natural resources on the economy and how to avoid the inverse impact of the natural resources, in terms of economic as well as political aspect. The result of literature reviews shows that the curse tends to be more related to point-resources such as minerals and petroleum rather than diffuse-resources such as land. The abundance of natural resources helps stimulate the economic growth while the dependence hurts. Natural resources also indirectly affect the growth through civil war, income inequality, rent-seeking, corruption, democracy, education and etc. In order to escape such curse, it is mostly suggested that the country should improve its quality of institutions, because it reduces the incentives for rent-seeking and corruption which are detrimental on growth. Trade liberalization also reduces the extent of the over-valuation and relieves the symptom of Dutch disease.

**Key words:** Growth, Natural resources, Resource curse

## 1. Introduction

Natural resources are one of the top 20 most important determinants of economic growth (Sala-i-Martin, 1997). Through history, it has played an essential role for prosperity in a number of the countries characterized as developed (Kolstad and Wiig, 2009b). In many export concentrated countries, natural resources also cover large proportion of their total exports. As shown in the Table 1, it is clear that, with very few exceptions, countries with the highest export concentration scores also have substantial high shares of natural resources in their total exports. Following Sachs and Warner (1995b, 1997a), the share of natural resources in total exports is represented by the share of primary commodities in total exports.

The export concentration indices obtained from United Nations (2009) shows the value from 0–1 with values closer to 1 indicating greater concentration of export. The table shows that in Guinea-Bissau and Angola—the respective highest and the second highest export concentration—natural resources play significant roles in their economies indicated by the 99.62% and

**Table 1 Export Concentration and Share of Natural Resources in Merchandise Exports in 2008**

	Export Concentration Index (0–1)	Share of Natural Resources in Total Export (%) <sup>1)</sup>
Guinea-Bissau	0.98	99.62
Angola	0.97	99.75
Venezuela	0.93	96.02
Azerbaijan	0.92	98.64
Nigeria	0.91	94.29
Sudan	0.91	99.28
Libyan Arab Jamahiriya	0.85	97.62
Gabon	0.84	96.54
Suriname	0.82	15.08
Maldives	0.82	99.99
Turkmenistan	0.81	95.87
Saudi Arabia	0.80	92.82
Samoa	0.79	14.77
Equatorial Guinea	0.77	96.92
Yemen	0.77	94.14
Congo	0.76	86.69
Iran (Islamic Republic of)	0.76	89.42
Mali	0.74	94.29

Source: United Nations (2009) and author.

99.75% share of natural resources in total export, respectively.

Finding from Chambers (2009) shows that an increase of natural-resource utilization will raise the balanced growth path's output growth rate. More specifically, when more natural resources are utilized in production within a country, its subsequent 5-year growth rate in output will rise. However, a sizable body of studies has shown that many resource-rich countries have suffered from the curse of natural resources that is natural resources in turn have inverse impact on the economic growth. Most of the recent resource curse literatures are inspired by the empirical study of Sachs and Warner (1995b, 1997a) showing the evidence of the so-called *Resource Curse*. Evidently, many resource-rich African countries such as Angola, Nigeria, Sudan and the Congo continue to experience low per capita income and low quality of life while the East Asian economies such as Hong Kong, Japan, Korea, Singapore and Taiwan have

1) Calculated by the author using data from United Nations (2009).

achieved western-level standards of living despite having less exportable natural resources (Frankel, 2010).

## 2. Economic Growth and Natural Resource

Despite a number of arguments that Dutch disease effects largely explain the growth collapse in resource-abundant economies, Auty (2008) argues that they neglect the importance of policy in mediating outcomes. His subtle explanation is that export base theory shows how natural resource booms can also sustain economic diversification. This theory is developed by Innes (1920), North (1955) and Watkins (1963) in order to explain the growth of diversified, prosperous, regional economies based upon the export of primary products, rather than upon industrialization. The main concept of the resource-driven development is that the smaller the natural resource rent to the GDP and the more diffusely it is spread across economic agents, the higher probability of engendering a developmental political state that sustains rapid growth in per capita GDP which in turn strengthen sanctions against anti-social governance (Auty, 2008).

Various theoretical reasoning and statistical evidence suggest that possession of natural resources endowment can confer negative effects on economy (for example, Sachs and Warner, 1995b, 1997a, 1997c, 2001). However, Stijns (2005, 2009) assumed that resource abundance is likely to affect economy in many different ways, which they called “Channels of Operation”. One of them is the effect of natural resources on human capital accumulation. Stijns (2009) shows the positive nexus between the education and subsoil wealth per capita indicated by the decrease in both male and female illiteracy when the subsoil wealth per capita distribution is moved up quartile by quartile.

Following up on the empirical strategy by Brunnschwelie and Bulte (2008) in exploring the determinants of resource dependence, Brunnschwelie and Bulte (2009) analyzed the impacts of resource dependence as well as abundance on the prosperity of the onset of conflict by running three different regression equations including a resource dependence equation, an income equation, and a conflict regression equation. They found that resource dependence may be influenced by both the biophysical context (resource abundance and geography), and by the institutional framework and the policy choices it generates (government system and trade openness). Their specific empirical results demonstrated a (weakly) concave relationship between resource dependence and the onset of conflict in the sense that resource dependence initially leads to higher probability of conflict, but then decreases the probability. In other words,

their conclusive results are consistent with the view that the resource scarcity—rather than resource abundance—may drive conflict.

Lederman and Malony (2007) found that, regard less of the estimation technique, trade structure variables are important determinants of economic growth rate. They found no evidence of resource curse using any of various measures of resource abundance. They found, in the panel context, that natural resources exports enter positively and significantly at the 1% level. They strongly argued the Sachs and Warner (1995b, 1997a)'s assertion that resource abundance negatively affects growth. Similarly, Mehlum et al (2006), Gylfason (2008) and Hillbom (2008) found that Botswana, which is the world largest producer of gem diamonds (Mahajan, 2009), does not suffer from Dutch disease. Instead, its per capita GDP based on purchasing power parity had climbed to 13,992 USD in 2009 (IMF, 2010). The well-management of its diamonds by using the rents to support the economic growth has made Botswana the richest country in mainland Africa (World Bank, 2007).

Although some resource-rich countries suffer from negative economic growth (i.e. Azerbaijan, Kazakhstan, the Russian Federation, Turkmenistan, Uzbekistan and Venezuela), Botswana, Ghana and China are the example of resource-rich countries with positive genuine saving rates enjoying substantial growth<sup>2)</sup> (van der Ploeg, 2010). Conducting a simple frequency count of the pro poorness of 240 growth spells in extractive and non-extractive economies, Davis (2009) found that extractive economies have positive growth spells that are more frequently pro-poor.

It is interesting that sometimes resource dependence and resource abundance have different effect on the economic growth. Some literatures show positive impact of natural resource dependence on the growth while natural resource abundance has negative impact (i.e. Arezki and van der Ploeg, 2007; Torvik, 2009). On the other hands, natural resource dependence has negative impact on the growth (i.e. Gylfason, 2008) while natural resource abundance has positive impact (i.e. Brunnschweiler, 2008; Brunnschweiler and Bulte, 2008; Gylfason, 2008). Gylfason (2008) found that natural capital share representing natural resource abundance statistically contributes to economic growth. Furthermore, using subsoil assets instead of natural capital in the regression analysis thus excluding timber resources, non-timber forest resources, pastureland, cropland and protected areas from consideration to focus on mineral assets, his find-

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2) Other examples from Auty (2001a) are Australia, Canada, Malaysia and Norway who are the exceptions to the resource curse hypothesis, whereas Nigeria and Mexico appear to suffer from the resource curse.

ing showed that the total effect of an increase in the subsoil asset share on growth remains negative as long as total per capita wealth is below 25,000 USD which is true of 82 among 164 countries.

### 3. Resource Curse

Frankel (2010) considered six channels whereby natural resources might possibly lead to poor economic performance as follows:

- (1) High commodity price volatility imposes risk and transactions costs.
- (2) Specialization in natural resources can be detrimental to growth if it crowds out the manufacturing sector that is the locus of positive externalities.
- (3) Specifically, mineral riches can lead to civil war which is certainly an obstacle to development.
- (4) Endowment of point source commodities<sup>3)</sup> such as oil and minerals, and some crops can lead to poor institutions including chronic power struggles, inequality, corruption, class structure, and absence of rule of law and property rights.
- (5) The Dutch disease resulting from a commodity boom entails real appreciation of the currency and increased government spending both of which expand nontrade goods and service sectors such as housing and render uncompetitive non-commodity export sectors such as manufacturing.
- (6) The Prebisch (1950) hypothesis of long-term trends in world commodity prices (however, this channel is counteracted by theoretical arguments for a positive trend, and empirical findings that there is no consistence either way).

Beginning with Sachs and Warner (1995b), a number of recent works have shown a broadly similar conclusion about the inverse impact of natural resource on economic performance. Economists have noticed that many countries have a wealth of natural resources are also full of very poor people (Wenar, 2008). During the last 50 years, instead of the prosperous growth, it appears that there are a number of countries rich in resources such as diamond or oil do worse in terms of economic development or growth leading to the term of resource curse by Sachs and Warner (1995b). The best known formal empirical tests for the resource curse, among others, are found in the works of Sachs and Warner (1995b, 1997a, 1997b, 1999,

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3) Point source resources are those where ownership is concentrated and exploitation is capital intensive. They are typically oil and minerals, but also plantation-grown agricultural crops (Stevens, 2008).

2001) employing natural resource exporters as a share of GDP as their proxy, they persistently found a negative correlation between natural resource and economic growth. According to Aldave and García-Peñalosa (2009), the empirical literature has identified three factors that seem to be most systemically correlated with poor economic performance: low educational attainment in the population, widespread corruption and abundant natural resources.

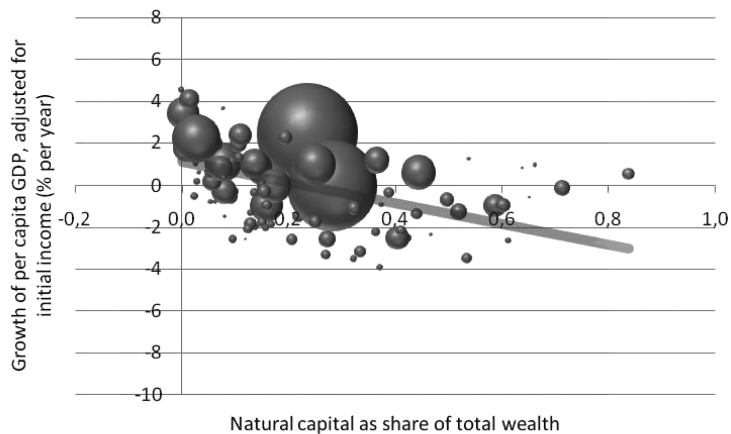
A large body of empirical evidence demonstrates an inverse relationship between natural resource endowments and economic growth, even when controlling for a variety of variables (Bulte and Damania, 2008). It has been widely held that countries specializing in natural resource extraction have suffered from the so-called: “resource curse” (see Davis and Tilton, 2005; Stevens, 2005; Davis and Cordano, 2008). The resource curse seems to be particularly more related to point resources such as minerals and petroleum, rather than diffuse resources such as land (Leite and Weidmann, 1999; Auty, 2001b; Sala-i-Martin and Subramanian, 2003; Isham et al, 2004, 2005; Kolstad et al, 2009; van der Ploeg and Poelhekke, 2009). The resource curse is also well-known as the paradox of plenty referring to the paradox that countries or regions rich in natural resources, specifically point-source nonrenewable resources like minerals and fuels, tend to have less economic growth and worse development outcomes than countries with fewer natural resource endowments. This paradox is due to several reasons including a decline in the competitiveness of other economic sector caused by appreciation of the real exchange rate, volatility of revenues from the natural resource sector due to exposure to global commodity market swings, government mismanagement of resources or ineffectual institutions (Wikipedia, 2010).

According to Pegg (2010), despite a number of sources, at least five different dimensions are highlighted in the resource curse literature. First, resource-abundant countries are alleged to not invest adequately in education (Gylfason, 2001 challenged by Stijins, 2006). Second, resource abundant countries are subject to increase risks for civil war (Collier and Hoeffler, 1998, 2000, 2004, 2005; Ross, 2004). Third, resource-abundant countries have difficulties in establishing or consolidating democratic forms of governance (Ross, 2001a; Jensen and Wantchekon, 2004). Fourth, it is believed that resource abundance leads to the risk of increased corruption and have corrosive effects on the quality of institutions (Ades and Di, 1999; Leite and Weidmann, 1999 partially challenged by Petermann et al, 2007; Mehlum et al, 2008; Bulte and Damania, 2008; Kolstad and Wiig, 2009b). And fifth, oil and mineral-abundant states are seen acceptable to the Dutch disease and other ailments which finally lead to slow or negative growth (Sachs and Warner, 1995b; 2001 challenged by Davis, 1995 and

Stijins, 2005).

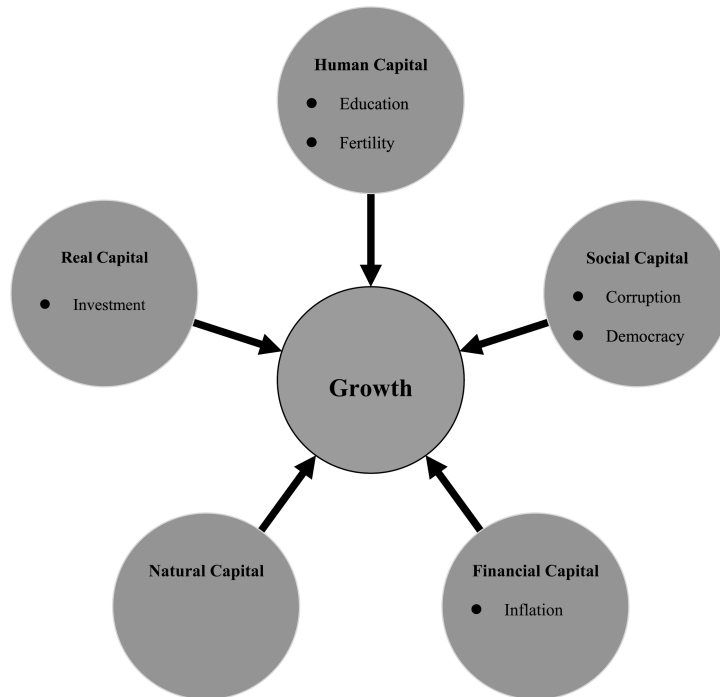
A number of paradoxical finding of a negative relationship between a sizable resource sector and economic growth has attracted attention from academics, policy-makers as well as international organizations (Brunnschweiler and Bulte, 2008). A sizable body of literature show the negative impact of the natural resource on the economic growth (i.e. Barro, 1991; DeLong and Summers, 1991; Mankiw et al, 1992; King and Levine, 1993; Sala-i-Martin, 1997; Rodriguez and Sachs, 1999; Sachs and Warner, 1995a, 1995b, 1997a, 1997b, 1997c, 1999, 2001, Boschini et al, 2003; Gylfason and Zoega, 2006; van der Ploeg, 2006; Arezki and van der Ploeg, 2007; Gylfason, 2008; Mehlum et al, 2008 ; Torvik, 2009). Assuming that the share of primary product exports in GDP is a suitable proxy for resource wealth, it has been shown that many countries that are well-endowed with natural resources are likely to grow slower than their resource-poor counterparts (i.e. Sachs and Warner, 1995b, 1997a, 2001; Auty, 2001a).

According to Gylfason (2008), natural resources are a fixed factor of production that impedes potential economic growth, causing a growing population and a growing stock of capital to run into diminishing returns. The Figure 1 shows the relationship between the share of natural capital in total wealth used as a proxy for natural resource dependence and average annual per capita GDP growth of 164 resource-rich countries in 1960–2000. Gylfason found the expected relationship that a decrease in the natural capital share by 20 percent of total wealth statistically corresponds to an increase in per capita GDP growth by 1 percentage point per year.



Source: Calculated by Gylfason (2008) based on data from World Bank (2006, 2007).

**Figure 1 Economic Growth and Natural Capital 1960–2000**



Source: Gylfason (2008).

**Figure 2 Different Kinds of Capital and Growth**

Gylfason (2008) distinguished total capital or total national wealth into five categories: real capital, human capital, social capital, financial capital and natural capital. Among these kinds of capital, natural capital seems different in that it tends to unleash forces that may have an adverse impact on the accumulation of other kinds of capital. He also emphasized that no country was ever held back by the burden of too much real capital or human capital or social capital or financial capital.

Sala-i-Martin and Subramanian (2003) showed the evidence that between 1965 and 2000, Nigeria–Africa’s largest oil exporter–received substantial percentage of its GDP from oil revenues totaled about 350 billion USD. In the 30 years after 1970, however, the percentage of Nigerians living in extreme poverty (1 USD/day) increased from 36 percent to almost 70 percent. According to van der Ploeg (2010), negative genuine saving rates of many resource-rich countries are often judged to be detrimental to their economic performance. There may also be political economy reasons for negative genuine saving (which leads to negative growth) to do with institutions, corruption, and badly functional market.

Due to the attractiveness of high profitability in the natural resources extraction, the eco-



conomic diversification may be neglected or delayed by the authorities. Even the authorities try to diversify the economy, this is made difficult since the resource extractive operation is vastly more lucrative and out-competes other industry. In economics, Dutch disease is a concept that purportedly explains the apparent relationship between the increase in exploitation of natural resources and a decline in the manufacturing sector. It refers to a situation where an increase in commodity price (such as oil price) increases real wages and appreciates the real exchange rate which in turn lowers competitiveness and production of the non-resource exports (manufacturing) sector (van Wijnbergen, 1984; Matsuyama, 1992; Sachs and Warner, 1995b, 1997a, 1999, 2001; Torvik, 2001). Natural capital tends to crowd out foreign capital by reducing the demand for foreign exchange, contribute to an overvaluation of the currency of the home country (Gylfason, 2008). The example of the phenomenon from Arezki and Ismail (2010) is the appreciation of the real exchange rates of Nigeria and Venezuela over the period 1992 to 2009 when the oil export unit value increases. According to Corden and Neary (1982, pp. 827), the Dutch disease operates through two distinct channels: the resource movement effect and the spending effect. The resource movement effect refers to the shift in production towards the natural resources sector. For example (in WTO, 2010) in an economy with three sectors: natural resources, manufacturing and a sector producing non-traded goods, the booming natural resources sector will take factor inputs (including labor) away from the rest of the economy. This leads to an exceed demand for non-traded goods, thus the increase in price of non-traded goods. The spending effect refers to the fact that additional spending caused by the increase in natural resources results in a further appreciation of the real exchange rate. In other words, the extra revenues originating from the resource exports boom raise domestic incomes as well as internal demand for all goods. Since the price of tradable goods is set on world market, the additional spending boosts the relative price of non-tradable goods resulting in a further appreciation of the real exchange rate (WTO, 2010).

Despite a large number of positive or negative impacts of natural resources on economic growth, some literatures found neither negative nor positive impact of the natural resource on the economic growth (i.e. Ding and Field, 2005).

#### **4. Solution of the Resource Curse**

A substantial body of studies suggest that, depending on the level of institutions of countries, countries with bad institutions of democratic accountability and the rule of law suffer a nega-

tive impact of natural resources whereas countries with good institutions do not (i.e. Mehlum et al, 2008; Bulte and Damania, 2008; Collier and Goderis, 2009). Mehlum et al (2008) have argued that poor institutions cannot prevent rent-seeking activity that can offset the gain from natural resource abundance. Rent-seeking reduces the net increase in income for the society (Kolstad et al, 2009). Institution is a key to avoiding rent-seeking by increasing the relative profitability of entrepreneurs' productive options (Mehlum et al, 2008). Stevens (2008) commented that in countries where institutions are good, politicians are less able to use patronage to influence election outcomes. On the other hands, in countries where institutions are bad perverse political incentives will dominates, and these will have negative impacts on the economy. The recommendation to solve the negative outcome is therefore the policy improvement. He suggested that countries should improve the quality of their institutions to undermine the negative political-economic impact that natural resource exploitation will otherwise have.

According to Kolstad and Wiig (2009b), for years, the observation that institutions need to be improved to address the resource curse has been interpreted as a need to improve formal institutions through technical means such as rewriting the petroleum law or recognizing bureaucracies. Likewise, the advice from Norman (2009) is that taking care to support the development of rule of law in resource-rich developing countries may be of particular importance.

Karabegović (2009) commented that nations with sound economic institutions are more capable of managing the revenue from natural resources and forming it into positive impact on the economic growth. In addition, sound economic institutions also increase efficiency by eliminating barriers to entrepreneurial activity and establishing a rule of law, which is crucial for economic activity. Such institutions, she added, mitigate the curse by reducing incentives for rent-seeking and corruption. This is consistent with the recommendation that addressing corruption is essential in helping resource-rich developing countries escape the detriment of the resource curse (Kolstad and Søreide, 2008).

A commonality of centralized and decentralized political economy models of the resource curse is that resource rents create dysfunctional behavior (rent-seeking of patronage) when institutions are poor which decreases allocative efficiency in the country (Kolstad and Wiig, 2009b). Using two types of model namely the rent-seeking model of Mehlum et al (2008) emphasizing the importance of institutions of private sector efficiency (i.e. the rule of law, bureaucratic efficiency, the risk of expropriation and reputation of contracts) and the patronage model of Robinson et al (2006) stressing the institutions of public sector accountability, Kolstad (2009)

found that countries with better private sector institutions (rule of law) suffer less from the resource curse. Dropping the rule of law index and its interaction with natural resource abundance and includes the democracy index and its interaction, it supports the patronage model of Robinson et al (2006) that better public sector institutions (more accountable government) appears to ameliorate the resource curse. However, the adjusted  $R^2$  value decreases into 0.69 suggesting reduced fit. Adding both institutional indices and their interaction terms, and testing the hypothesis simultaneously, Kolstad (2009) found that only the rule of law interaction term is statistically significant. In other words, when controlling for the impact of private sector institutions, public sector institutions have no additional explanatory power. Therefore, his final result concludes that only private sector institutions are important in avoiding the resource curse. His suggestion is that policy makers and donors in poor resource-rich institutions should prioritize the development of institutions governing the private sector.

Like stamping out of corruption, increased democracy can be viewed as an investment in social capital (Gylfason, 2008). Empirical findings of Bhattacharyya and Hodler (2010) support their theoretical prediction that natural resources foster corruption in resource-rich countries with poor democratic institutions. They also suggested that natural resources may tend to reduce the corruption in strong democracies. In terms of political regimes, Lujala (2009) showed that democratic countries are likely to experience less devastating conflicts in the resource-rich economies.

Since corruption is detrimental on growth, it is essential to reduce the possibility of corruption in order to escape from the curse in the resource-rich countries. According to Kolstad and Wiig (2009a), lack of transparency can exacerbate corruption-related problems; transparency, therefore, has been viewed as central to curbing corruption (see also Stiglitz, 2003) and other dysfunctions in natural resource-rich countries. They pointed out that transparency has indirect impact on moral costs through its effect on social norms. In sum, they concluded that transparency is likely to reduce the corrupt behavior in the resource-rich economies. They also showed that transparency play the role in reducing the possibility of rent-seeking activities and increasing the accountability of the government. In addition, information is also a key factor in facilitating and sustaining cooperative behavior which reduce the possibility of corruption.

Gylfason (2008) suggested that since restriction against foreign trade and direct investment exacerbates the Dutch disease, trade liberalization would help reduce the extent of the overvaluation and relieve the symptom of Dutch disease. Gylfason (2008) also pointed out that both economic and political diversifications are good for growth because economic diversification

directs economic activity away from excessive reliance on primary production in agriculture or a few natural-resource-based industries thus facilitating the transfer of labor from low-paying occupations in low-skill-intensive farming or mining to more lucrative occupations in more high-skill-intensive jobs in manufacturing and services where political diversification stimulates growth by redistributing political power from ruling elites to the people, thus, in many cases, replacing an extended monopoly of often ill-gotten power by democracy and pluralism. Gylfason also suggested that resource-rich economies especially need diversification, because these countries often face jeopardy—that is, natural resource wealth that is concentrated in the hands of relatively small groups that seek to preserve their own privileges by standing in the way of both economic and political diversification that would disperse their power and wealth.

## 5. Natural Resources Externalities

Natural resources not only have direct impact on the economy, they also have indirect impact via their effect on corruption (i.e. Leite and Weidmann, 1999; Kronenberg, 2004; Bulte and Damania, 2008; Kolstad and Wiig, 2009a), education (i.e. Kronenberg, 2004; Gylfason, 2001, 2008), civil war (Collier, 2000; Collier and Hoeffler, 1998, 2000, 2004, 2005), democracy (i.e. Ross, 2001a; Gylfason, 2008), rent seeking (i.e. Torvik, 2002; Gylfason, 2008; van der Ploeg, 2010) and etc. Auty (2008) and Collier (2000), for example, argued that the growth collapse that resulted from the cumulative distortion of the economy in resource-rich countries may not be the ‘trigger’ of civil strife, but they provide the conditions in which such triggers can easily emerge. Collier (2000) also suggested that civil strife has strongly positive link not only with primary exports, but also with economic decline (that is growth collapse).

In many resource-rich countries, the competition for rents has fuelled war (le Billon, 2001). In extreme cases, struggles over natural resource revenue can spark civil wars that destroy physical and institutional infrastructure (Gylfason and Zoega, 2006; Mehlum et al, 2006). According to Brunncuweiler and Bulte (2009) the pioneering empirical contribution based on cross-section analysis by Collier and Hoeffler (1998) found that resource dependence had a significant curvilinear effect on the onset and duration of war. The effect on duration is consistent with the findings of Lujala (2009, 2010) that conflicts in which natural resources located are longer and more violent than other types of conflict. Specifically, Lujala (2010) found that if natural resources are located inside the actual conflict zone, the duration of conflict is doubled. The longer duration of conflicts as a result of the exploitation of gems in a conflict zone is positively

associated with the large number of combat-related deaths (Lujala, 2009).

A number of literatures point out that natural resources are the cause of conflicts within the countries (i.e. Smillie et al, 2000; United Nations, 2001; Auty, 2004; Humphreys (2005); Ross, 2006; Schollaert and Van der gear, 2009). The example of an African resource-rich country is that the conflict in the Democratic Republic of the Congo has become mainly about access, control and trade of five key mineral resources: coltan, diamonds, copper, cobalt and gold (United Nations, 2001). Schollaert and Van der gear (2009) pointed out that ethnic heterogeneity might indeed appear as a curse, since many of the war-torn countries highly depend on the exploitation of natural resources, and since this type of activity is characterized by low opportunity cost of fighting.

Many conflicts within societies are often provoked by natural resources (i.e. Collier, 2007; Schollaert and van der Gear, 2009) as different factions and groups fight for their share (Wikipedia, 2010). Sometimes, these emerge openly as separatist conflicts in regions where the resources are extracted (i.e. in Cabinda province which is an oil-rich area of Angola), but the conflicts are often in the hidden form, i.e. fights for access to budgetary allocations between different ministries (Wikipedia, 2010).

In terms of income inequality, resource abundance exacerbates income inequality between the populace and political elite. Benedikt and Samuel (2009) found that inequality falls, in the short run, in response to a resource boom. They argued that low growth and high inequality in the resource-abundant countries is due to their bad economic policies (see also Auty, 2001a, 2001b).

There is a variety of literatures on the way which institutions matter for growth. Theory suggests that conflict over natural resource can affect human, social, and institutional capital (Norman, 2009). In addition to the direct impact, the natural resources indirectly affect the economic growth by affecting the quality of institutions (Ross, 2001b; Acemoglu et al, 2005; Isham et al, 2005; Norman, 2009), and that institutions in turn have an impact on economic growth (Acemoglu et al, 2005; Isham et al, 2005; Norman, 2009). Over the last decade, the literature on economic growth has identified the critical importance of institutional quality (Karabegović, 2009). Since the economic institutions determine how economic inputs—human, physical, and natural resource capital—are transformed into economic outputs such as economic growth, they are important for the nation's growth (Sobel, 2008). Recent research into the natural resource has specified institutions as a key variable in determining whether a country suffers from the resource curse (Stevens and Dietsche, 2008). Resource-rich countries with badly defined prop-

erty rights and rapacious rent-seeking really are worse off (van der Ploeg, 2010).

According to van der Ploeg (2010), as natural resource revenues and resource rents dwindle away at a faster rate in comparison to homogeneous society, the country ends up with lower foreign assets in the long run and a lower level of sustainable consumption. This often occurs especially large in countries with a large degree of fractionalization, poorly developed property rights and not much monopoly power on the market for its natural resources.

It is often expected that resource-rich economies may be more susceptible to corruption than others. This is particularly to occur in the case of point-source natural resources (Auty, 2001b). In many developing countries that are rich in natural resources, corruption is a massive problem explaining why resource-rich countries perform badly in terms of socio-economic development (Kolstad and Wiig, 2009a). Countries with a lot of fighting activities caused by natural resources are likely to suffer from corruption and erosion of the quality of the legal system, which discourages saving and investment in productive capital (Hodler, 2006). The extent of corruption in the resource-rich countries distorts the set of policies chosen by the government, with detrimental effects for the economic performance (Bulte and Damania, 2008).

Possessing natural resources has indirect impact on economic growth (Leite and Weidmann, 1999; Sala-i-Martin and Subramanian, 2003) through increases in rent-seeking (Lane and Tornell, 1996; 1999; Baland and Francois, 2000; Torvik, 2002; Hodler, 2006; Gylfason, 2008), measured by the level of corruption (Leite and Weidmann, 1999), and that corruption negatively affects the growth (Mauro, 1995; Leite and Weidmann, 1999; Kronenberg, 2004; Bulte and Damania, 2008). Corruption is another key part of the resource curse (Kolstad et al, 2009). Many extractive operations of natural resources are illegal and encouraged by multi-national corporations in collusion with national governments (Ayres, 2004). In resource-abundant countries, it is often easier to maintain authority through allocating resources to favored constituents than through growth-oriented economic policies. This political corruption is fueled by enormous flows of money from natural resource sector.<sup>4)</sup>

In many oil-rich countries, corruption issues are the same as those of other developing countries, but their incidence and impact maybe heightened by the presence of large resource rents (Kolstad et al, 2009). Using a game-theoretic model, Bhattacharyya and Hodler (2010) showed that resource rents increase corruption if and only if the quality of the democratic institu-

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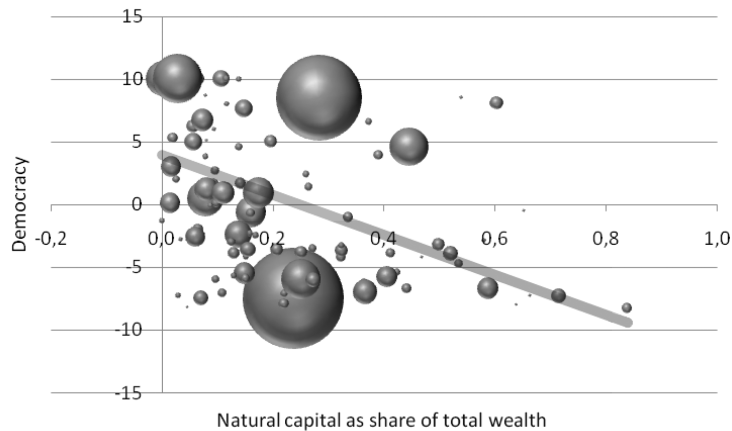
4) Source: [www.adelaide.edu.au/cies/0320.pdf](http://www.adelaide.edu.au/cies/0320.pdf);  
[http://english.cpiasia.net/index.php?option=com\\_content&view=article&id=1749%3A%20malaysia-catches-the-dutch-disease&Itemid=171](http://english.cpiasia.net/index.php?option=com_content&view=article&id=1749%3A%20malaysia-catches-the-dutch-disease&Itemid=171)

tions is below a certain threshold level. To test the prediction, they used a reduced form model and panel data from 1980-2004 of 124 countries. Their findings implied that resource-rich countries indeed have a tendency to be corrupt (unless the democratic institutions are sufficiently sound) since resource windfalls encourage their government to engage in rent-seeking. But in the case of Australia and Norway, this tendency can be checked by sound democratic institutions that keep governments accountable to the people. Rapacious rent-seeking rather than anticipation of better times may be one important reason why many natural resource-rich countries face disastrous economic and social outcomes (van der Ploeg, 2010). The more agents are involved in rent-seeking, the more income is reduced (Kolstad et al, 2009). In resource-rich countries, rent-seeking domestic producers often demand protection against foreign competition, for instance, in the form of restrictions against foreign direct investment and trade, exacerbating the Dutch disease that manifests itself through reduced incentives to produce non-primary goods and services for export which the overvalued currency renders uncompetitive at world market prices, reducing trade (Gylfason, 2008). Extensive rent-seeking can breed corruption in business and government, thus distorting the allocation of natural resources and reducing both social equality and economic efficiency (Gylfason, 2008).

Some of the most resource-rich economies in the world are also among the least democratic and least egalitarian (Gylfason, 2008). Resource rents can either enhance or undermine the contribution of democracy to growth (Collier and Hoeffler, 2009). Some studies found that natural resources impede democracy as found, for example, by Ross (2001); Gylfason (2008), for the negative effect of oil on democracy; that is countries that have high revenues from oil are less democracy.

The result estimated by Gylfason (2008) as illustrated in the Figure 3 shows that democracy as a representative of social capital varies inversely with the natural capital share across countries. The slope of the regression line through the scatter suggests that a decrease in natural capital share by 20 percentage point (i.e. from 40 percent of total wealth to 20 percent) goes along with more than three-point increase in the democracy index. The figure shows that liberalization from excessive reliance on natural resources goes along with increased freedom from dependence on narrow political elites and vice versa. In other words, natural capital tends to crowd out social capital and vice versa. This is consistent with the finding of Ross (2001a) that oil wealth is inversely related to democracy. When democracy is endogenous variable, Gylfason (2008) found that resource dependence weakens democracy while resource abundance strengthens.

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Source: Calculated by Gylfason (2008) based on data from Polity IV database and World Bank (2006).

**Figure 3 Democracy and Natural Capital**

Bulte and Damania (2008) suggested that the main effect of resource abundance on economic growth occurs through interaction with political variables. Depending on the type of political regime, they demonstrated that resource endowments allow government to extract greater surplus (bribes) by pursuing policies that are detrimental to GDP in autocratic regimes. Their study, however, found that the effect is mitigated or even reversed into positive in democratic systems. Using a cross-country sample of up to 90 countries from all continents to empirically investigate whether constitutional features determine how natural resource abundance affects economic growth, Andersen and Aslaksen (2008) found that presidential democratic regimes suffer from the resource curse whereas parliamentary democratic regimes do not.

In resource-rich countries, Lujala (2009) empirically found that gemstone mining and hydrocarbon production in the conflict zone have largely positive relationship with the number of battle deaths (both more than double the number of battle deaths) whereas hydrocarbon outside the conflict zone are significantly associated with a decline in the number of combat deaths. A more detailed analysis of Lujala (2009) revealed that conflicts over territory with hydrocarbon production are the most severe, with example being the secessionist conflicts in the oil-rich Southern Sudan and Niger Delta.<sup>5)</sup>

Natural resources, not only reduce growth through Dutch disease, rent-seeking, corruption

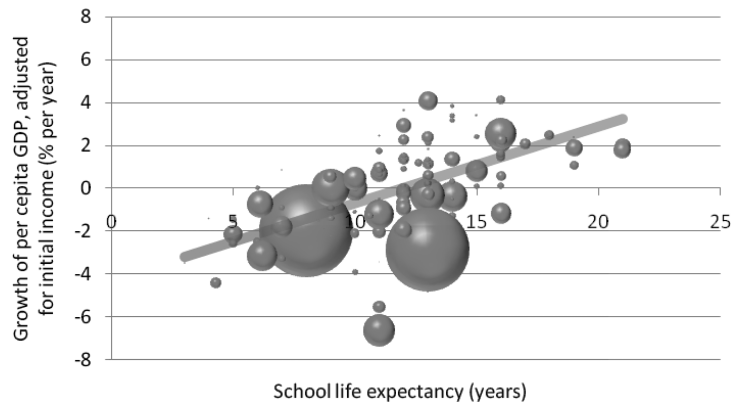
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5) According to Lujala (2009), The second Sudanese Civil War from 1983–2004 accumulated more than 55,000 battle deaths, whereas the Nigerian Civil War (the Biafran War) in 1960s killed more than 70,000 in combat deaths in just four years.



and overconfidence, but also have negative impact on human resources. In many countries, natural resource industries tend to pay far higher salaries than what would be available elsewhere in the economy attracting the best talent from both private and government sectors (Wikipedia, 2010). Hence, a deprivation of their best skilled personnel. In addition, natural resources also lead to the neglect of public and private incentives to accumulate human capital (that is education) (Gylfason, 2001, 2008). There is also evidence from Gylfason (2001) that, cross countries, public expenditures on education relative to national income, expected years of schooling and school enrolment are all inversely related to natural resource dependence. The regression result by Gylfason (2008) showed that an increase in school life expectancy by three years from one place to another goes along with an increase in per capita growth by more than one percentage point indicating the important of education on growth and vice versa (Bils and Klenow, 2000). When education is treated as endogenous, Gylfason (2008) found that resource dependence hurts education while resource abundance helps.<sup>6)</sup>

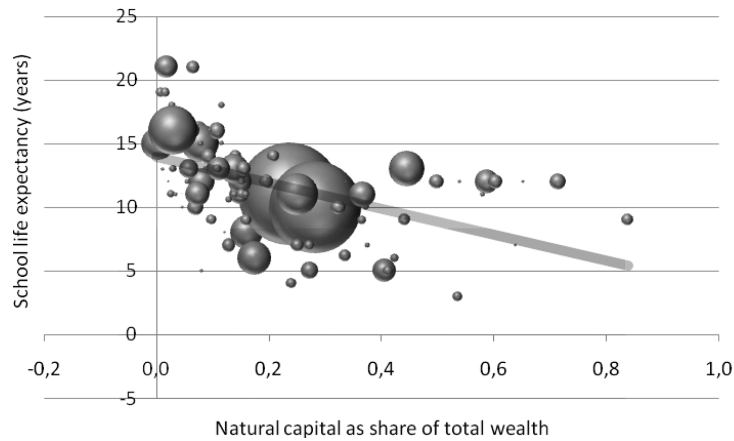
According to Gylfason (2008), natural capital tends to crowd out human capital as well by weakening public and private incentives to promote education. Except for Botswana where government expenditure on education relative to income is among the highest in the world, Gylfason showed the inverse relationship between school life expectancy and natural resource dependence as proxied by the share of natural capital in total wealth of 164 resource-rich



Source: Calculated by Gylfason (2008) based on data from World Bank (2007) and UNESCO.

**Figure 4 Economic Growth and Education 1960–2000**

6) Gylfason (2008) defined resource abundance as the amount of natural capital that a country has at its disposal: forests, land, oil fields, mineral deposits, and the like whereas resource dependence is the extent to which the nation in question depends on these natural resources for its livelihood.



Source: Calculated by Gylfason (2008) based on data from UNESCO and World Bank (2006).

**Figure 5 Education and Natural Capital 2000–2005**

countries.

Recent work by Bulte and Damania (2008) which is consistent with the study of Gylfason (2008), suggested that resource booms might be logically linked to low education through rent-seeking and corruption. Besides the effect on education, focusing on the relationship between abundance and the institutions that establish or fail to establish the rule of law, Norman (2009) found the inverse effect of the mineral abundance (as distinct from a resource extraction intensive economy) on the rule of law which is an important requirement for growth. However, the robust evidence for direct effect of the mineral abundance on the economic growth was not found.

## 6. Conclusion

Although some studies showed the importance of natural resources on economic growth, most studies in this paper showed that natural resources have a negative impact on the economic performance. It has been shown that many resource-rich countries tend to have slower growth. Beginning with Sachs and Warner (1995b), most of recent studies have shown a similar conclusion about the inverse impact of natural resources on economic performance. This paradox is well-known as a resource curse. The curse of natural resources is likely to be particularly more related in the countries rich in point-resources such as minerals and petroleum rather than diffuse-resources such as land. Distinguishing the difference between natural resources abun-

dance and natural resource dependence, Gylfason (2008), for example, showed that the abundance supports the growth while the dependence impedes. Not only the direct impact, natural resources also have indirect impact on the economy through civil war, income inequality, rent-seeking, corruption, education, democracy and etc.

Most of the suggestions to avoid the curse are to improve the quality of institutions to undermine the inverse impact of natural resources on the economy. Countries with sound economic institutions are more capable of managing the revenue from natural resources and forming it into positive impact on the growth. Sound institutions mitigate the curse by reducing incentives for rent-seeking and corruption which are detrimental on growth. Trade liberalization also helps reduce the extent of the overvaluation and relieve the symptom of Dutch disease.

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