



Are natural resources bad for health?

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ABSTRACT

The purpose of this paper is to empirically examine whether economic dependence on various natural resources is associated with lower investment in health, after controlling for countries' geographical and historical fixed effects, corruption, autocratic regimes, income levels, and initial health status. Employing panel data for 118 countries for the period 1990–2008, we find no compelling evidence in support of a negative effect of resources on healthcare spending and outcomes. On the contrary, higher dependence on agricultural exports is associated with higher healthcare spending, higher life expectancy, and lower diabetes rates. Similarly, healthcare spending increases with higher mineral intensity. Finally, more hydrocarbon resource rents are associated with less diabetes and obesity rates. There is however evidence that public health provision relative to the size of the economy declines with greater hydrocarbon resource-intensity; the magnitude of this effect is less severe in non-democratic countries.

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1. Introduction

Evidence on the positive effects of health investments on productivity and growth is well-established (e.g., Fogel, 1994; Barro, 1998; Rivera and Currais, 1999; van Zon and Muysken, 2001; Howitt, 2005). Poor health status reduces physical work capacity and productivity, preventing some developing countries from escaping poverty traps (Bhargava et al., 2001). This effect is reinforced by high mortality rates and shorter lifespans which discourage savings and reduce the return on education (Chakraborty, 2004). These dynamics can, however, be disrupted due to resource booms in resource-dependent developing nations.¹ A very small amount of literature, however, examines the links between a country's economic dependence on a natural resource and human capital accumulation, particularly in health.

Enjoying a higher natural resource wealth allows increasing spending on healthcare² (Acemoglu et al., 2009), which should translate into higher economic growth and better quality of life (Cotet and Tsui,

2013). In addition, sustainable development in economies that depend on depleting a natural resource to survive requires not only investing the resource receipts in building financial and physical assets to diversify the economy's sources of income, but also investing in human capital (e.g., health and education) to ameliorate the (negative) effect of resource depletion in the future (Bravo-Ortega and De Gregorio, 2005). Therefore, it is expected that countries which enjoy high natural resource revenues and those that are more dependent on the depletion of natural resources invest more in healthcare. To the contrary, Karl (2004) reports that most types of commodity dependence, especially minerals and oil, are associated with higher levels of poverty and malnutrition, and worse health status; mirrored by lower life expectancy and higher infant mortality rates.

Comparisons of health status in countries with and without natural resources of similar income levels usually show worse health status in the former. Table 1 presents average health status indicators for agricultural, mineral and hydrocarbon-dependent economies³ as compared to those of economies not based on natural resources during the period 1990–2008. These countries cover all geographical areas around the world (see Table 1A, in the appendix, for the geographical distribution and the type of resource intensity of these countries).

It is interesting to see that despite a significantly larger average per capita health spending in all three types of resource-intensive economies

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¹ In the present study resource-dependent economies refer to countries that have agricultural exports exceeding 10% of their total exports, or have mineral rents exceeding 5% of their GDP, or have energy (oil, gas, and coal) rents exceeding 20% of GDP. It is also worth noting that the terms "resource-dependent" and "resource-intensive" economies are used interchangeably throughout the rest of this paper.

² Since healthcare is considered a "normal" good, in the sense that the demand on healthcare-related products increases as income and wealth increase.

³ Hydrocarbon and energy dependent economies are used interchangeably and refer to countries that intensively depend on the receipts from oil, natural gas and coal in their economic structure.

Table 1
Statistics per health indicator.

Health measure	Non-OECD					OECD
	Non-resource	Energy	Mineral	Agro		
Per capita health expenditures (2000 USD)	433.8	700.3	653.1	613.35		1024.7
Public health expenditures % GDP	3.66	3.51	3.45	3.22		4.58
Life expectancy at birth	64	62.4	61.57	59.61		75.59
Diabetes % population	10.82	11.05	10.71	10.29		7.97
Obesity (BMI > 25) % population	46.57	46.01	43.88	40.32		56.69

Note: average period (1995–2008) for 118 countries.

compared to non-resource less developed countries, they record lower life expectancy at birth. Highly agricultural economies have the lowest life expectancy which drops below 60 years as compared to 75 years in OECD countries and almost 64 years in non-resource less developed countries. Energy-intensive economies register slightly higher life expectancy (63 years) than both mineral (62 years) and agricultural (59 years) economies. Diabetes rates also indicate that energy-dependent economies have the highest percentage of population with diabetes (more than 11%) as compared to agricultural, mineral, non-resource, and OECD countries.

Fig. 1 also depicts a negative correlation between different types of commodity dependence and life expectancy. This correlation is however insignificant in mineral and hydrocarbon resource economies, especially at higher resource intensity levels. Agricultural resources clearly have high and very significant negative correlation with life expectancy.

The purpose of this paper is to answer the question of whether resource-led development (measured by the degree of resource-dependence) is indeed responsible for the lower investment in healthcare and the poorer health status. The main hypothesis we attempt to test is that when countries' geographical, historical, and institutional traits are controlled for, the negative correlation between natural resource-dependence and health will turn out to be insignificant (or even become positive). The central argument we advance here is that resource dependence, as well as poor development and worse health status, are all outcomes of historical developments and other factors which lead to forming the so called "extractive" institutions. The latter refer to the least conducive rules that govern the economy and political life such that they reduce the incentives to boost productivity (Acemoglu and Robinson, 2012). Weak states and poor legal systems that cannot enforce the law, for instance, may deepen the reliance on natural resource-revenues over time because the state finds it easier to administer – than tax laws. The same type of weak legal systems often leads to more poverty, income inequality, and poor health spending and status.⁴ Therefore, the (seemingly) negative association between natural resource dependence and health could be driven by a host of country-specific geographical, historical, and institutional factors which have led to both worsening health status and to more dependence on natural resources over the years. Put differently, natural resources do *not* shape health and disease outcomes, but weak (extractive) political and economic institutions in resource-dependent countries do.

The literature on the links between natural resources and human capital, and health (status and spending) in particular, is limited and the evidence is inconclusive. The one study that comes close to our objective in this paper is Cotet and Tsui (2013). They indeed find that oil wealth has led to *better* quality of life through

significant reductions in infant mortality and gains in longevity; especially in less democratic oil-rich countries where the resource is concentrated in the hands of the ruling elite and initial health conditions were severely poor. Unlike our study that focuses on the link between health and resource-dependence in recent years, their study focuses on oil resource initial-endowments and investigates the links between oil discoveries, growth and health outcomes, using a before-after analysis.

Gylfason (2001a, 2001b) argues that resource windfalls raise income in the short-term, despite low or even deteriorating productivity, allowing resource-intensive economies to enjoy high consumption levels. Meanwhile, these countries may develop a 'false sense of security' which reduces the incentive to invest in human capital and puts them on a lower long-term growth trajectory; the so called *resource curse*.⁵ The implication of this theory is that resource windfalls lead to less investment in human capital.

Political economy theories also provide some relevant insights into the links between resource-abundance and human capital. Governments of resource-abundant countries may *mindfully underinvest* in human capital and *block* technological and institutional development to remain in power (Acemoglu and Robinson, 2006). Gylfason et al. (1999), Gylfason (2001a and 2001b), and Birdsall et al. (2001) find that more resource-intensive countries invest a lesser proportion of their income in education and have lower school enrollment rates.

On the other hand, rentierism, that is the government's fiscal dependence on resource rents, tends to displace government taxes, lowering the deadweight welfare costs of taxation, and hence those of public goods. Therefore, resource-rich countries would be able to extend public goods (including education and health) at a lower social cost (Mahdavy, 1970; Beblawi, 1987; Ross, 2001; Robinson et al., 2006; Tsui, 2010).

In fact, the *rentier effect* (Ross, 2001) suggests that oil-rich countries may *mindfully overspend* on the provision of public goods, including healthcare, to *buy* public cooperation and societal peace. This gives rise to the prediction that natural resources may have contributed more towards improving healthcare services and conditions in non-democratic countries where the resource is controlled by the ruling elite (Cotet and Tsui, 2013). Indeed, Beblawi (1987) identifies Kuwait, as the first oil-Gulf country to become a welfare state, sharing the oil receipts with the population. Morrison (2009) provides empirical evidence in support of the 'rentier state' hypothesis; oil windfalls lead to more social public spending and more stability in both democratic and non-democratic regimes. Stijns (2006) also finds that resource abundant economies tend to devote more resources to human capital accumulation.

Unlike the above studies, our study investigates the links between dependence on various types of natural resources and healthcare spending and status. We contribute to the literature by using a range of healthcare spending and health status indicators that account for

⁴ This explanation is given by Acemoglu and Robinson (2012) in their book "Why nations fail", in which they argue that countries which develop "extractive", i.e., weak, political institutions will tend to promote "extractive" or weak economic institutions as well. These are the nations that are doomed to fail.

⁵ For recent and comprehensive surveys on the resource curse see: Wick and Bulte (2009), Frankel (2010), Deacon (2011) and van der Ploeg (2011).

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