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NATURAL RESOURCES AND RESOURCE CURSE EFFECT ON CHILD HEALTH OUTCOMES IN THE DEVELOPING ECONOMIES

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Abstract

The primary focus of this study is to investigate if natural resource abundance impacts under-five mortality rates in developing countries. Based on a multi-factor health production model, the results revealed that natural resource abundance had not been associated with reductions in under five mortality rates providing support in favour of the well-known resource curse thesis. The results lead to the conclusion that natural resource abundance in the developing countries cannot be taken as a form of security against improving child health outcomes and could undermine sustainable development goals relating to child health.

Keywords: Morality Rates, Developing Countries, Natural Resource Abundance, Child Health.

1. Introduction

Developing countries, despite having abundant natural resources (oil, gas, minerals, forests and vast expanses of agricultural land), reveal high mortality rates among children aged below five. Available statistics indicate that natural resources per capita is many times higher than the per capita incomes in the developing countries (Figure 1). Despite this, many countries did not achieve the Millennium Development Goal targets of reducing the mortality rate among children aged five and below by two thirds by 2015 (United Nations Development Program, 2011). In the developing countries, the average under-five mortality rate is 69 per 1000 live births, much higher than the average of 6 per 1000 live births for the developed countries. The 2030 Agenda for Sustainable Development Goals (SDG)aims to reduce under-five deaths to as low as 25 per 1,000 live births by 2030 (United Nations, 2018). An issue that deserves attention is whether the natural capital abundance of the developing economies can impact the SDG. This study examines the effect of natural capital abundance and under-five mortality rates in a large sample of developing economies. The next section discusses the method of analysis. The third section presents the findings. The final section concludes.

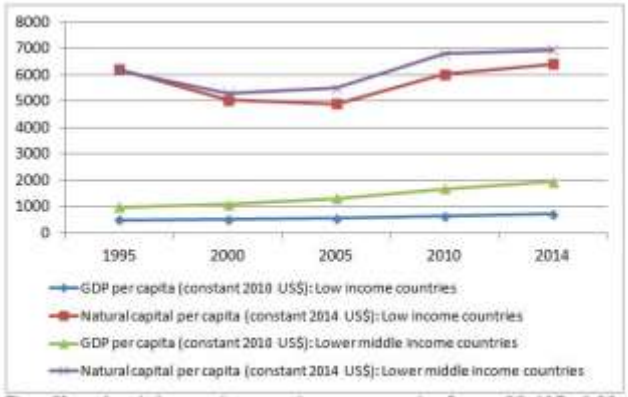

Fig. 1. Natural capital per capita versus incomes per capita. Source: World Bank Wealth Accounts (https://datacatalog.worldbank.org/dataset/wealth-accounting).

2. Methodological Approach

The natural capital abundance and economic prosperity deficits have led to the resource curse thesis (Sachs and Warner, 1999 and Auty, 1993 and 2017). The general idea behind this thesis is that the per capita incomes of resource-scarce countries grew more than the per capita incomes of resource-abundant countries with resource-poor economies outperforming resource-rich countries and resource abundance has been detrimental to the development of resource-rich countries. Available literature also shows evidence of natural resource as a curse on populations health well-being. For example, Wigley (2017) found robust evidence that petroleum-poor countries outperform petroleum-rich countries in combating under-five mortality rates while Makhlouf, Kellard and Vinogradov (2017) found that commodity terms of trade increased child mortality in commodity-dependent countries.

Research into population health also reveals several factors impacting human health outcomes as reviewed by Martin et al, (2011). Cutler et al's (2006) study provides strong support that the main contributors to mortality decline in children were improved nutrition and medical technological progress. Poor maternal health increased child mortality (Gordillo-Tobar et al. 2017). Worsening economic environment adversely affects infant health. Income inequality is found to be inversely associated with infant mortality rates (Siddiqi et al, 2015) while health care spending is associated with reductions in mortality (Bernet et al. 2018).

The natural resource abundance and health outcome relationship are tested using the Grossman (1972) health production model where under-five mortality is the dependent variable. According to Sen (1998), mortality rates are better indicators of the health status of the population.Deaths measure mortality among children aged five years and under (per 1,000 live births).

The total natural capital per capita is the core variable of interest.This study considers total natural capital (natural capital per capita, constant 2014 US$) and includes forests, fossil fuels and minerals, extracted from the World Bank's *Wealth Accounts* database (https://databank.worldbank.org/data/source/wealth-accounts/preview/on).

The model controls for economic, public health, and environmental factors. The first economic variable is income measured by gross domestic product per capita at purchasing power parity, constant 2011 international dollars). Income captures the "Preston curve" effect (Preston, 1975). Total health care spending (measured by domestic general government health expenditure per capita at purchasing power parity, international dollars) is the second economic measure. Public health expenditure improves health outcomes, including reductions in under-five mortality rates (Barenberg et al, 2017).

Three public health care factors are included. The first is nutrition, measured by cereal production in kilograms per hectare. Estimates from the Food and Agriculture Organization (3 April 2019) show that cereals supply 51 per cent of calories and 47 per cent of protein in the average diet. Nutrient-rich food is necessary for child growth (World Bank, 2006). The second factor is improved sanitation (the percentage of the population using at least essential sanitation services). Augsburg and Rodriguez-Lesmes (2018) suggested that improving infrastructure for sanitation can bring about reductions in sanitary and water-related infections and mortality. The third factor is the average immunisation against measles and diphtheria for a percentage of children ages 12-23 months. Immunisation minimises deaths (Damm et al., 2016).

Three environmental factors controlled are air quality, urban population and distance (latitude) from the equator.This study also controls for PM2.5 air pollution as exposure to this pollutant is linked to mortality and morbidity (Heroux et al. 2015). Air quality is measured by mean annual exposure (micrograms per cubic meter) of PM2.5. The health effects of urbanisation are poor sanitation and the rapid spread of infectious diseases in urban areas (Cutler and Miller, 2005). Urbanisation is measured by the urban population as a percentage of the total population.

Dearden, Lloyd and Cateny (2019) note that human health is inextricably linked to geography. Thus, a geographical location (tropical locations) can impact human health as a result of erratic weather conditions which disrupt food production, spreading infectious diseases and damaging physical infrastructure. The distance from the equator is the minimum distance from the equator (latitude) to a country's nearest city.

A country's political environment can impact children's health well-being, among other things, as the absence of democracy means depriving people their rights in seeking improvements in their well-being. Political instability is included as an institutional variable with a numerical value ranging from -2.5 (weak) to 2.5 (strong).

The period covered is 2000, 2005, 2010 and 2014. The source of the data for political instability is the World Bank's Worldwide Governance Indicator (https://www.govindicators.org). The measure for GEO is World Atlas (https://worldatlas.com). The data source for all other variables is the World Banks World Development Indicators (https://databank.worldbank.org/data/source/world-development-indicators).

The countries are Bangladesh, Bolivia, Burkina Faso, Burundi, Cambodia, Cameroon, Central African Republic, Chad, Comoros, Democratic Republic of Congo, Congo Republic, Cote d'Ivoire, Egypt, El Salvador, Ethiopia, The Gambia, Georgia, Ghana, Guinea, Haiti, Honduras, India, Indonesia, Kenya, Kyrgyz Republic, Lao, Liberia, Madagascar, Malawi, Mali, Mauritania, Moldova, Mongolia, Morocco, Mozambique, Nepal, Nicaragua, Niger, Nigeria, Pakistan, Papua New Guinea, Philippines, Rwanda, Senegal, Sierra Leone, Solomon Islands, Sri Lanka, Tajikistan, Tanzania, Togo, Uganda, Ukraine, Vietnam, Yemen, Zambia, and Zimbabwe.

3. The Empirical Findings and A Discussion of Results

All variables are estimated in their natural logarithms using the heteroskedasticity-consistent covariance matrix, which utilises robust standard errors to correct for heteroskedasticity. Table 1 presents the results for each of the years 2000, 2005, 2010 and 2014. Interestingly, coefficient natural capital is positive in all of the four years and contrary to theoretical expectations of a negative correlation. The positive relationship provides strong evidence that natural capital abundance has not been associated with reductions in under five mortality rates. This finding supports the resource curse thesis from an under-five health perspective, suggesting that natural capital abundance may be a curse on under-five health outcomes.

Table 1. The effect of total natural capital on under-five mortality rates.

Variables	2000	2005	2010	2014
Constant	8.557	8.212	5.307	4.864
	(5.401)*	(6.162)*	(2.840)*	(3.424)*
Natural capital	0.089	0.115	0.116	0.196
	(1.157)	(1.709)***	(1.501)	(2.402)*
Immunisation	-0.286	-0.354	-0.032	-0.019
	(1.319)	(1.749)***	(0.089)	(0.084)
Sanitation	-0.176	-0.150	-0.187	-0.237
	(2.273)**	(1.938)***	(2.177)**	(2.761)*
Nutrition	-0.121	-0.182	-0.109	-0.133
	(1.457)	(2.446)**	(1.133)	(1.380)
Income	-0.397	-0.144	-0.015	-0.001
	(2.770)*	(1.062)	(0.108)	(0.010)
Health expenditure	-0.046	-0.205	-0.442	-0.419
	(0.531)	(3.344)*	(5.520)*	(4.107)*
Air quality	0.236	0.221	0.162	0.169
	(2.475)**	(2.955)*	(2.348)*	(2.018)**
Urbanisation	0.088	0.026	0.175	0.086
	(0.594)	(0.242)	(1.330)	(0.729)
Latitude	-0.057	-0.095	-0.085	-0.021
	(0.891)	(1.939)**	(1.812)***	(0.376)
Political instability	-0.013	0.129	0.023	0.056
	(0.157)	(1.577)	(0.299)	(0.662)
Observations	56	56	56	56
Adjusted R²	0.66	0.75	0.78	0.80

(*), (**) and (***) indicate statistically significant at the 1, 5 and 10 per cent levels, respectively.

In Table 1, the result of air quality confirms that high *PM2.5* exposure is associated with higher mortality rates amongst children aged five years and less. The results provide strong support that increased spending on health care is related to a reduction in under-five mortality rates. This negative correlation of nutrition with under-five mortality provides evidence that proper nutrition can have the significant beneficial effects of contributing to mortality reductions of children underfiveyears of age. The results also provide some support that immunisation programs are essential for improving child health, thus, reducing their

chances of early death. Coefficient of sanitation is negative and statistically significant in all four years, suggesting that enhanced hygiene dampens the prospects of premature mortality in children. Incomes do translate into a reduction in under-five mortality rates and support of the "Preston curve" effect.The results of latitude provide the support that countries located closer to the equator are likely tohave poor health outcomes.The findings of political instability remain inconclusive.

4. Conclusion and Policy Implications

This study revealed that in the developing countries, natural resource abundance had not been associated with reductions in under-five mortality rates, providing support in favour of the resource curse thesis. Based on the findings, it can be concluded that natural resource abundance in the developing countries cannot be used as a safeguard measure in allowing security for children's health. In working towards achieving the aims of SDG relating to lowering under-five mortality rates, governments ought to take actions where natural capital is transformed into wealth creation that directly benefitschildren's health. Governments ought to establish policies that allow utilisation of natural resources for health wellbeing of children and as well as the health of the wider population.

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