

# **An Introduction to Empiric Approach to the Resource Curse Phenomenon in Small Island Developing States (SIDS)**

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**Abstract:** The dependence on natural resources exports and its effects on economic growth represent one of the fields of study in political economy. This paper represents an empiric analysis of sets of macroeconomic data for several Small Island Developing States (SIDS). Data was analyzed for Bahrain, Barbados, and the Dominican Republic. This paper searches for the potential mechanism of transmission of the resource curse. The countries, which were selected, are dependent upon either tourism as a source of revenue, natural resources or are to a degree dependent upon both. In order to avoid potential problems from using cross-section data, individual time-series analysis methods were used. By using a Vector Autoregressive framework, this paper concludes that there is evidence of both direct transmission from natural capital towards economic growth, as well as indirect transmission through political instability and increased level of corruption. These findings are overall conclusive with the previous works discussing the resource curse hypothesis. The key policy recommendation is ensuring that funds obtained from the exploiting of resources or tourism are used to develop a more stable and long-term sustainable economy.

**Keywords:** Resource curse, GDP growth, SIDS, Political instability, Natural capital.

## **1. INTRODUCTION**

The main intention of this paper is to study the research hypotheses empirically, by comparing the role of natural capital in the small economies that are dependent on natural resource exports or tourism (economies that primarily depend on foreign guests and consumption, i.e. receptive tourist countries), respectively.

There is a well-known differentiation between different forms of capital: natural, financial, foreign, real, human, and social (Gylfason, 2004: 23). Goodwin (2003: 1) on the other hand differentiates between five kinds of capital: financial, natural, produced, human, and social. He states, "All are stocks that have the capacity to produce flows of economically desirable outputs. The maintenance of all five kinds of capital is essential for the sustainability of economic development." All these forms of capital represent determinants of (economic) growth. However, of all the different types of capital, only natural capital can influence growth negatively in a direct way.

The effect of resources may have shifted over time is the weak or non-existent connection between income levels and resource abundance, despite the close correlation between income growth and resource abundance over the last decades. One hypothesis is that the eventual

change in the growth effect of natural resources is to be found because countries with different levels of institutional quality industrialized at different times.

### **1.1 Problem Statement**

In our intention to move beyond the discussion on the ubiquitous “resource curse” thesis, we are inclined to accept the claim that natural capital, if used directly, negatively influences economic growth. The level of transformation of natural capital into other forms of capital is the lowest exactly in resource extraction and export activities.

The negativities of small economies, besides other features, usually include vulnerability to external shocks (albeit resilience as well, especially in some cases), less opportunities to diversify the economy, smaller workforce base, small resource base (in most cases).

### **1.2 Aim of the study**

The research of resource curse in natural capital or tourism dependent small economies was focused on small economies of the world (classified by the size of their GDP) that are either highly dependent on natural resources rents as percentage of GDP or highly dependent on tourism as a sector of their economies. The aim was to determine whether in small economies similarities exist between the dependence on natural resources, and tourism, respectively.

## **2. LITERATURE REVIEW**

Natural capital is an economic construct that describes the natural world, its ecosystems, and their value to society (Farley, 2012: 264). The key is utilizing the forms of natural capital that are present in the environment in order to form a long-term stable economy, rather than favor short-term investments or exclusive development of one branch of the industry. There are multiple concepts and definitions of natural capital.

For example, the UK Natural Capital Committee defines natural capital as the elements of nature that directly and indirectly produce value or benefits to people, including ecosystems, species, freshwater, land, minerals, the air and oceans, as well as natural processes and functions. International Institute for Sustainable Development: natural capital is the land, air, water, living organisms and all formations of the Earth's biosphere that provide us with ecosystem goods and services imperative for survival and well-being. Furthermore, it is the basis for all human economic activity.

Natural capital can be defined as the world's stocks of natural assets, which include geology, soil, air, water and all living things. It is from this Natural capital that humans derive a wide range of services, often called ecosystem services, which make human life possible.

The GLOBE natural capital initiative emphasizes that natural capital refers to those aspects of the natural environment that deliver socio-economic value through ecosystem services.

OECD statistical glossary defines natural capital as follows: Natural capital are natural assets in their role of providing natural resource inputs and environmental services for economic production. Usually the definitions of natural capital include environmental assets, as well as ecosystems.

In the last 40 years, there is a negative robust correlation between the share of resource exports in GDP and economic growth. This correlation remains even when many other factors are controlled for. The robustness of the correlation between resource abundance and growth, even when we control for many other factors, gives us an indication that there may be a causal effect from resources to growth—but only an indication. And this is the main challenge of the empirical literature on the resource curse as it now stands. It is not hard to predict that the empirics of the resource curse will continue to attract considerable research interest; there are

simply still so many unanswered questions—in particular, the most important: is there a causal effect from resource abundance to growth? (Torvik, 2009: 244).

The resource curse features especially during the last four decades, but before countries such as the United States seemed to have harnessed resources for growth. Is this because those countries that industrialized first also had good institutions and those countries that remained underdeveloped had bad institutions and when resources were exploited at a later stage they led to corruption, rent seeking, and strife? Key is the contractual basis for exchange (van der Ploeg, 2011: 370).

Those resource-abundant countries, which are interested in balancing the well-being of future and the present and are simultaneously in the process of liquidating natural wealth, should pursue a policy of prudently saving and investing the rents from resource extraction. This has led to a focus upon extended national accounting aggregates (such as net or “genuine” savings) that provide information on the extent to which resource abundant countries are accumulating net wealth. (...) This relationship can be measured using a direct measure of natural resource abundance: the share of resource rents in GDP for a range of natural resources including energy and mineral and timber resources, pointing to the inability of resource-rich economies to transform the natural good fortune into saving that explains the curse (Atkinson and Hamilton, 2003: 1793-4).

Genuine savings measure the extent to which countries are, on balance, liquidating or creating national wealth. In other words, observation of the genuine savings rate contains useful information regarding the extent to which the proceeds of resource depletion have been used to finance investment (rather than current consumption), whereas conventional investment and saving ratios measure only gross accumulation (Atkinson and Hamilton, 2003: 1801). The importance of genuine savings is also embraced and accentuated by van der Ploeg (2011). The Hartwick rule of investing all resource rents in other forms of capital provides a pragmatic guide for sustainable development. Genuine saving is the traditional concept of net saving, namely public and private saving minus depreciation of public and private investment, plus current spending on education to capture the change in intangible (human) wealth, minus the value of net depletion of exhaustible natural resources and renewable resources (forests), minus damages of stock pollutants (carbon dioxide and particulate matter) (van der Ploeg, 2011: 396).

Natural capital affects economic growth directly as well as indirectly by crowding out other types of capital through the five channels of transmission, shows Gylfason (2004: 25). The long-term stagnation of growth or negative growth, as well as the fluctuations of growth, experienced by resource dependent countries, can be pinned to this fact, and fluctuations of prices of commodities on the world market, respectively.

GDP and economic growth is improved by liquidating natural capital (Naidoo, 2004). However, the real question is – should the natural capital be transformed into some other form of capital before leaving the country, in order to maintain a higher and long-term GDP growth. The proponents of the resource curse thesis mentioned before have no doubts about it. For a country that has natural capital, it is better to transform it into some other form of capital before exporting it. In resource extraction, dependent countries, natural capital is usually exported without its transformation, and in most cases, resource curse is a consequence. In tourism, dependent countries, natural capital is used as a means to attract tourists (mostly foreign). In that way, services are exported and natural capital does not leave a country, hence it is of a different kind (landscapes, natural environments etc.).

Natural resource extraction (in this context we primarily refer ourselves to fuels and/or minerals and ores) and exports, if not accompanied by industrial production in the countries of origin, in most cases cause economic stagnation or even regression, rising social inequality, keep or increase widespread poverty, rise corruption, hinder democratic processes and "kill" political freedom and civil liberties. At least that is what various proponents of the "resource curse" thesis (Robinson, Torvik and Verdier, 2006; Rosser, 2006; Schubert, 2006; Humphreys, Sachs and Stiglitz, 2007; Brunnschweiler and Bulte, 2009; Torvik, 2009; van der Ploeg, 2011; Hendrix and Noland, 2014) claim. There are only a couple of exceptions to that rule, hence actually verifying it. The best exception due to the cultural and historical patterns of social and economic development is most probably Norway. Exceptions due to the planned government policies of economic transformation include Qatar and Dubai, which in the recent two decades have been able to diversify their economies.

Tourism, if it is not completely based on artificial objects (as large cities, or completely artificial objects as Las Vegas or Disneyland for example), is also mostly dependent (like resource extraction, agriculture, and forestry) on natural capital i.e. the natural environment that is preserved enough and suitable for tourist development. The level of transformation of natural capital into other forms of capital is of course higher, but compared to some other forms of economic activity, is lower. In most cases, tourism does not demand highly educated work force, and is very dependent on external factors (economic situation in the countries that emit tourists, security challenges etc.). Therefore, tourism that is mainly dependent on foreign tourists, suffers from external shocks, and is in that sense similar resource extraction. On the other hand, the fluctuations of prices of commodities represent a major economic shock for resource extraction dependent countries. Geopolitical challenges, sabotages, terrorist attacks represent major security threats to resource extraction and tourism respectively. Nevertheless, tourism is much more vulnerable to the afore-mentioned security challenges than resource extraction is.

Regarding the smallness of the state (economy), the small size of the market (in terms of land area and population) may lead to less diversification of raw materials and resources, which restricts domestic production (Castello and Ozawa, 1999).

Smaller island states tend to be particularly prone to exogenous shocks such as natural disasters, international political instability and fluctuations in prices of raw materials. Despite this, the idea of vulnerability should be considered in the context of the degree to which economies manifest resilience in tackling shocks (Camilleri and Falzon, 2013: 135).

Small island developing states (SIDS) have often been depicted as powerless, dependent, and sometimes failed, states (McGillivray et al., 2010). Guillaumont (2010) stated that only 15 per cent of SIDS were low-income economies (in: Philpot, Grey and Stead, 2015: 33). Indeed, Armstrong and Read (2000: 288-289) asserted: 'islandness' has virtually no impact on the economic performance of microstates.

Greig, Turner and D'Arcy (2011), studying the case of Mauritius as a small island developing state, pointed that Mauritius is often offered as a 'success story' or 'economic miracle'. Philpot, Grey and Stead (2015) who studied Seychelles as a SIDS, did another study of a particular small island developing state (SIDS).

Globalisation, tourism (transborder movement of tourists), transborder capital movements, rapid transference and adoption of institutional design and policies from some countries to others – influences on small states (Bourne, 2003: 2-3). Nevertheless, tourism, due to its specificities, also can have negative characteristics on economies, which are too dependent on it.

### 3. METHODOLOGY

#### 3.1 The variables used and data constraints

The data was extracted for the selected Small Island Developing States (SIDS) where data was available and where they were relevant for this research study. As the goal is to study the empiric effects of natural capital, we include the variable Gross Value Added (GVA) as a proxy variable for natural capital. Further, as the proxy variable for economic growth we standardly account by measuring the inflation adjusted Gross Domestic Product (GDP), while for measuring political stability we use two variables constructed by Kaufmann, Kraay and Mastruzzi (2010). There is generally limited data available for the small economies of the world, which represented a significant research constraint.

The goal is to study whether natural capital causes negative impulses in these variables, thus creating the forefront of what is variously known as the ‘resource curse’. The resource curse is a phenomenon, which is caused mostly by lack of diversity, something that affects most small economies. Thus, as a working hypothesis, this paper assumes that such a lack of diversity is one of the key factors in creating a negative economic impact. The countries selected are described in Table 1, with the descriptions and sources of the variables.

#### 3.2 Model Specification

**Table 1:** Description of variables

Country	Variable	Abbreviation used	Measurement	Source
Bahrain	Gross Domestic Product	GDP	Constant LCU	World Bank
Barbados	Genuine Savings	GS	Percentage of GDP	World Bank
Dominican Republic	Political stability and absence of violence/terrorism	PolStab	On a scale of -2.5 to +2.5	Kaufmann, Kraay and Mastruzzi (2010)
	Corruption	Corruption	On a scale of -2.5 to +2.5	Kaufmann, Kraay and Mastruzzi (2010)

The VAR framework is described by the following basic equation:

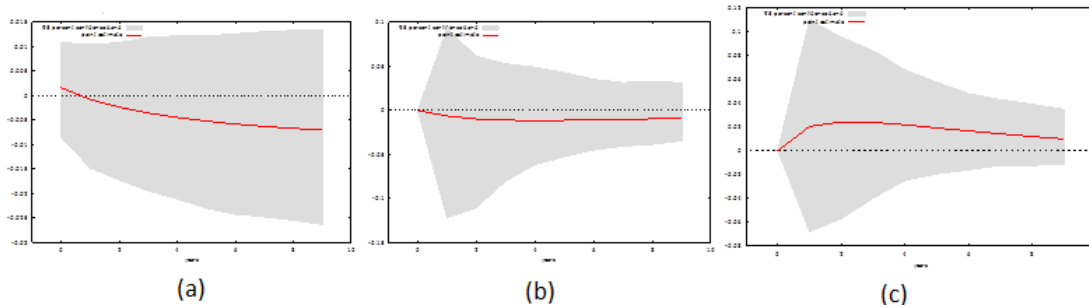
$$GDP_t = \alpha_0 + \alpha_1 GDP_{t-1} + \dots + \alpha_{1,2} GDP_{t-n} + \alpha_2 GS_{t-1} + \dots + \alpha_{2,1} GS_{t-n} + \alpha_3 PolStab_{t-1} + \dots + \alpha_{3,1} PolStab_{t-n} + \alpha_4 Corruption_{t-1} + \dots + \alpha_{4,1} Corruption_{t-n} + \varepsilon_{t,1} \quad (1)$$

From that basic equation, the only difference, which exists, is viewing the differences of GS on various dependent variables, meaning that not only the relevance of natural capital on GDP is tested, but also the variables, which account for corruption and political stability. In order to test these relations, Impulse Response Functions (IRFs), are used. This form of analysis will allow us to test the impact of change of one of the variables on the dependent variable, with the assumption that we hold the level of the other variables constant. The preliminary hypothesis is that through these IRFs we will manage to prove both a direct link (an adverse impact of natural capital on GDP) and an indirect link where natural capital has a long-term negative impact on political stability.

### 4. FINDINGS

Prior to conducting the IRFs, the variable GDP was transformed into the form of its natural logarithm. This is done in order to prevent issues regarding heteroscedasticity, with all of the

necessary tests to ensure the stability of the models provided in the appendix. The first model concerns Bahrein.

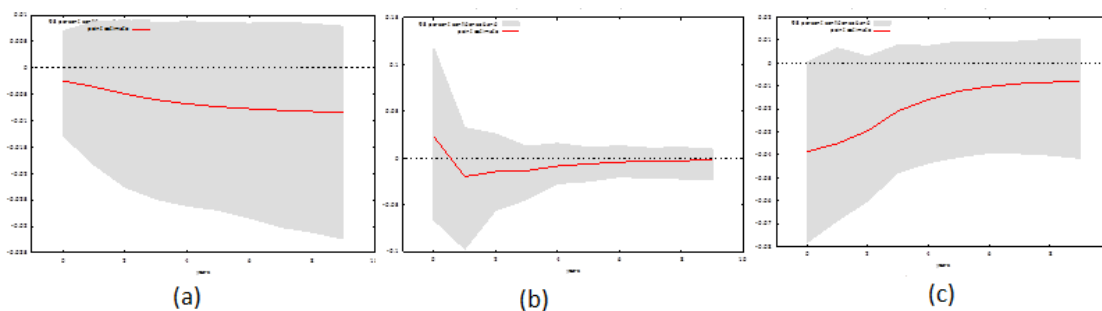


**Figure 1:** IRF for Bahrein

Source: Authors' calculations and GRETLE software

Note: (a) displays the response of GDP to an impulse of GAS (b) displays the response of Corruption to an impulse of GAS, while (c) displays the response of PolStab to an impulse of GAS.

As can be seen from the IRFs, there is empiric evidence of several channels of transmission. Notably, for the case of Bahrein, which is heavily dependent on export of oil resources, there is a long and persisting negative trend going from natural capital towards GDP. While the first impulse is slightly positive, there is clear evidence of a persisting negative trend. The evidence is not so conclusive in the case of corruption, though the responses are constantly negative. Political stability, based on our research, seems not to be a channel of transmission for the resource curse to Bahrein, though the cause of that may be that the variable used accounts for both political stability and the absence of violence and terrorism.



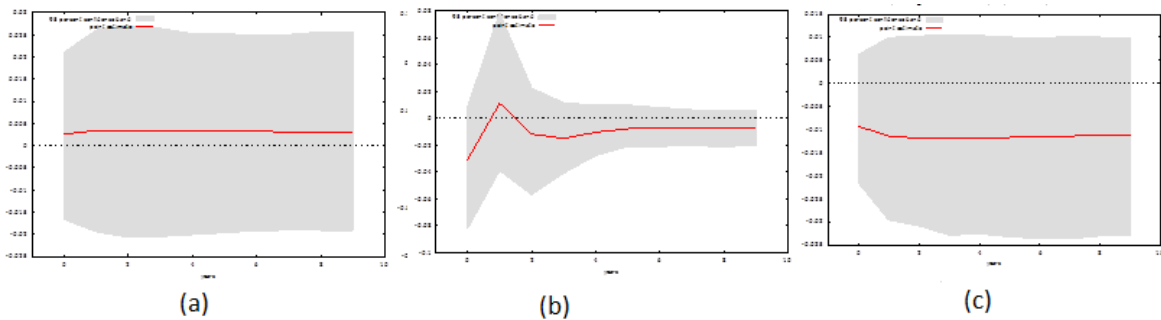
**Figure 2:** IRF for Barbados

Source: Authors' calculations and GRETLE software

Note: (a) displays the response of GDP to an impulse of GAS (b) displays the response of Corruption to an impulse of GAS, while (c) displays the response of PolStab to an impulse of GAS.

The results indicate a similar trend for Barbados. There is a clear and persistent long-term negative trend going from natural capital towards economic growth. This is likely because the evolution and focus of only one element crowds out other potential areas of development. In the case of Barbados, it is also clear that these elements are also impacted by variables related to political stability. Most significantly, an increase in corruption, which is associated with an increase of both political instability and decreased economic growth (de Vaal and Ebben, 2011). Equally significantly, the negative initial reaction of political stability to natural capital is very strong. Such an increase in political stability, essential to modern-day economies, crowds' potential investments and limits economic growth. Thus, for the case of the Barbados, we find that there is empiric evidence similar to many other countries which suffer from the natural resource curse. This curse does not really have to be associated with natural resources, but

may be found in any economy that is insufficiently diverse and highly dependent upon exogenous factors.



**Figure 3:** IRF for Dominican Republic

Source: Authors' calculations and GRETLE software

Note: (a) displays the response of GDP to an impulse of GAS (b) displays the response of Corruption to an impulse of GAS, while (c) displays the response of PolStab to an impulse of GAS.

The results for the Dominican Republic are slightly different from those of Barbados or Bahrein. Namely, we find that natural capital has slightly positive impulses, which start at the first impulse and persist throughout the observed periods. The result for corruption indicates mostly negative impulses, while there is a strong persistent negative trend of natural capital causing political instability.

Several factors should be considered, notably that Barbados is a country strongly dependent on tourism, Bahrain on resource exports, while the Dominican Republic has a slightly more diverse economy. The main conclusion is that the dependency on a single sector of the economy increases the negative effects by crowding other potential sources of growth. In addition, all of these small economies are highly dependent upon external shocks; making perceived political instability a highly relevant factor in maintaining investor confidence in their economies.

## **5. CONCLUSION AND RECOMMENDATIONS**

This paper observed three SIDS and conducted an empiric analysis of possible methods of transmission of the so-called natural resource curse. The preliminary findings are that there is evidence of both indirect methods of transmission through political instability, as well as direct transmission through harming economic growth in countries where economic growth is almost entirely dependent on one source of revenue. In Bahrain and Barbados, we find that there is a direct element of transition directly through natural capital towards economic growth.

There are two distinct and almost unrelated difficulties in conducting further research on the topic. One difficulty is the lacking consensus of which variable should be used to account for natural capital and the diverse results across the scientific community which have largely been impacted by the use of completely different variables. The second is overcoming difficulties resulting from the "smallness" of the economy, especially, as noted by Castello and Ozawa (1999), their insufficient diversification and danger to exogenous shock. While diversification may not provide immediate positive impacts, it is a necessary element in ensuring the sustainability of these small economies.

## **APPENDIX**

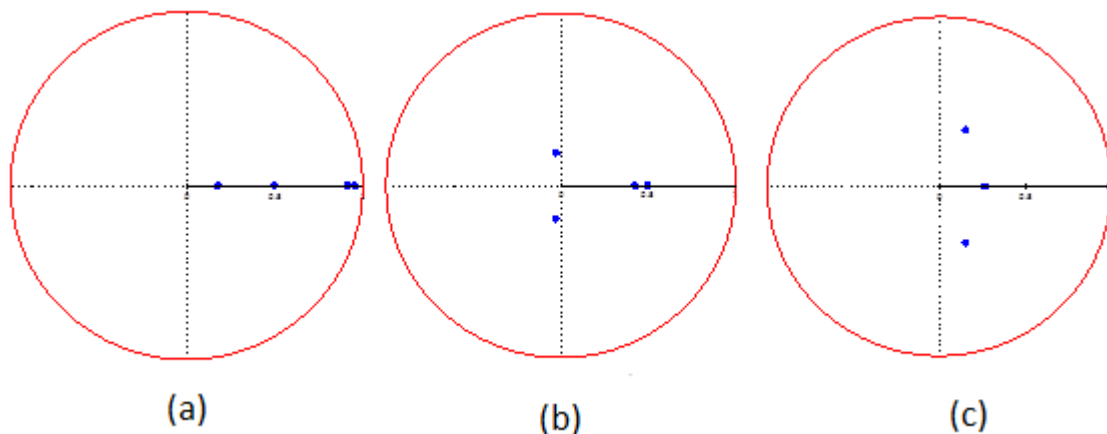
The Table A1 displays the figures regarding autocorrelation, proving that no model suffers from the issue of autocorrelation.

**Table A1:** Autocorrelation test

Country Model	Test-statistic value	P-value
Bahrain	1.448	0.229
Barbados	0.9508	0.329
Dominican Republic	0.2716	0.602

Source: Authors' calculations and GRETLE software

Figure A1 displays all of the VAR inverse roots. As all of the VAR inverse roots are within the unit circle, we find that there is no evidence of parameter structural instability.



**Figure A1:** VAR Inverse Roots

Source: Authors' calculations and GRETLE software

Note: (a) displays the inverse roots for Bahrein; (b) displays the inverse roots for Barbados; while (c) displays the inverse roots for the Dominican Republic.

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