Project proposal: How strong is the relationship between a country's degree of dependence on natural resource rents and its corruption level?

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1. Introduction

Corruption: An endemic disease?

Corruption is one of the most intensely debated phenomena in the fields of public policy and development. Although there is no universally accepted definition of corruption, the consensus in the literature is that it occurs when "public official (A), acting for personal gain, violates the norms of public office and harms the interests of the public (B) to benefit a third party (C) who rewards A for access to goods or services which C would not otherwise obtain" (Brown (2006)).

There is substantial empirical evidence that corruption obstructs efforts to reduce poverty and inequality, accelerate economic growth and promote sustainabile development (see Ades and Tella (1996), Mauro (1998), Azfar, Lee, and Swamy (2001) and Gupta and Abed (2002)) . This is why most countries avow their commitment to fighting and avoiding corruption. And yet, corruption remains an endemic problem across the developing world.

The question of which factors are conducive to higher levels of corruption is central to this discussion. Since many national governments, international organizations and development agencies have stepped up their efforts to fight corruption Michael (2009), it is crucial to know what policies and institutional characteristics are worth funding in order to fight corruption. In recent years, for instance, many countries have set up anti-corruption agencies, appointed corruption ombudsmen and deepened transparency laws, in line with alleged international best practices.

Nevertheless, more empirical research is needed in order to identify the factors that enable the spread and persistence of corruption. In particular, a better understanding of the ways in which corruption takes hold in public institutions could aid policymakers to determine in which areas to concentrate their efforts. This includes understanding the interplay between economic activity, rent-seeking behavior and corruption. In this context, it is worth keeping in mind that empirically, developing countries with large stocks of natural resources have tended to develop more slowly than developing countries with less natural resources (the 'resource curse'). Could it be that corruption is the missing link -that is, that the dependence on natural resources leads to higher corruption levels, and that these hinder economic development?

2. Research Question

This paper seeks to answer a simple question:

Is the degree of reliance on natural resources a good predictor of a country's corruption level?

Our preliminary hypothesis is that the answer is yes, higher levels of resource dependency are associated with higher levels of corruption, across countries and within countries across time. This is what the existing empirical evidence suggests (see among others Leite and Weidmann (1999) and Sala-i-Martin and Subramanian (2003)).

However, the evidence is now somewhat outdated, since it predates the commodity-driven boom of the last fifteen years, during which many resource-dependent countries (particularly in Africa) experienced very high rates of economic growth. Do recent trends in economic development contradict the 'resource curse' hypothesis? Have developing countries become better at managing the exploitation of natural resources? We will look at economic and political data for all countries since the Second World War in order to examine these issues.

3. Literature Review

In the last two decades, a significant amount of research in the field of development economics has sought to explore and understand the nature of the relationship between natural resource exploitation, good governance and economic development. The trigger for much of the interest in this topic was the empirical discovery made in 1995 by Sachs and Werner that countries with abundant natural resources tend to experience slower economic growth than countries with scarce natural resources (Sachs and Warner (1995)). This phenomenon was termed the "Natural resource curse".

Nevertheless, the hypothesis that Sachs and Werner put forth to explain this empirical relationship is purely economical: they conjectured that the exploitation and export of natural resources might provoke an over-valuation of a country's currency, thus making its other exports uncompetitive (i.e. the "Dutch disease"). Sachs and Werner further develop this thesis in "The curse of natural resources" (Sachs and Warner (2001)).

Following Sachs and Werner's original paper, many scholars have hypothesized that the culprit for the low growth rates of resource-rich nations might be not overvalued currencies but weak and ineffective institutions. This is what Mehlum et al call the "rent-seeking hypothesis", through which "resource abundance leads to a deterioration of institutional quality in turn lowering economic growth" (Mehlum, Moene, and Torvik (2006)). The idea is that as governments in countries with relatively weak institutions become more dependent on natural resources, they engage in rent-seeking behavior that is detrimental for the development and functioning of institutions.

There is substantial empirical evidence for this institutional hypothesis. For instance, Leite (Leite and Weidmann (1999)) concludes that the availability of natural resources is one of the factors on which corruption depends, along with government policies and the concentration of bureaucratic power. Similarly, analyzing the case of Nigeria, Sala-i-Martin and Subramanian (Sala-i-Martin and Subramanian (2003)) conclude that "some natural resources – oil and minerals in particular – exert a negative and nonlinear impact on growth via their deleterious impact on institutional quality" (Sala-i-Martin and Subramanian (2003)).

One crucial fact highlighted by the empirical literature is that not all types of extractive industries have the same impact on the quality of governance and economic development: some researchers (notably Pendergast (2007) and Shaxson (2007)) find that the exploitation of fuel resources have a more negative impact on governance than the exploitation of other natural resources. Finally, an important lesson from the empirical literature is that the effect of natural resource reliance on corruption levels depends on the quality of democratic institutions (see for instance (**???**)).

4. Methodology and data sources

4.1 General description of the proposed method

Our analysis will investigate the nature of the relationship between the level of corruption in one country and its level of dependence on natural resource exploitation. Using panel data for all countries in the world, for all years available since the Second World War, will take a measure of corruption as our dependent variable, which we will regress on a measure of dependence on natural resources as well as control variables. our depen work will seek to measuring the impact of natural resources dependency on corruption levels using yearly information (Panel Data).

4.2 On the measurement of Corruption (the dependent variable)

Corruption, given its nature, is not easily measured. For this reason, this work will use the perception of corruption as a proxy for corruption. While biases in terms of how people perceive corruption and how it deeply embedded in it is the country can gravely affect the results, a possible solution is to use several available indexes of corruption with different methodologies.

On the one hand, the World Governance Indicators from the World Bank provides a yearly aggregate measure of the perception of corruption done through surveys to the public and to experts on the subject. On the other hand, the Corruption Perception Index by Transparency International also captures the perception of analysts and experts on how corrupt a particular country seems to be.

Another possible source is the International Country Risk Guide made by the PRS Group, used in the work of Leite and Weidmann (1999) to assess the trend on perception of corruption. These indexes could be combined into one unique index for perception of corruption to make them more robust. We also expect to test if the results of these indexes are correlated in order to ensure they capture the same phenomenon.

4.3 On the measurement of Dependence on natural resources (variable of interest)

To measure the dependence of natural resources we will use The World Bank's indicator *Total Natural Resources Rents (% of GDP)* which is defined as the sum of oil rents, natural gas rents, coal rents (hard and soft), mineral rents, and forest rents (Group (2014)). This indicator will let us see how the fluctuating levels of rents from natural resources affect the perception of corruption. With this indicator, however, we will not be able to differentiate between sources of resource rents (e.g. oil and gas versus forestry or minerals).

4.4 Our proposed regression model

Our empirical analysis method will consist of a regression of our measure of Corruption against Natural Resource Dependency (our explanatory variable of interest) plus two control variables:

- **Corruption** This is the dependent variable and, as explained in 3.3, it will be measured through a proxy (perception of corruption), on an index from 0 to 10 (where lower scores indicate more corruption).
- **Natural Resource Rents** Measured as percentage of GDP with World Bank data.
- **GDP per capita** This is a control variable. It is in Purchasing Power Parity terms. It is necessary to include it in the regression since poorer countries tend to be more corrupt and depend more on natural resources. Therefore, if we exclude it we might induce Omitted Variable Bias in our estimators.
- **Armed Conflict** This is the second control variable. It is a proxy for political stability. It indicates how many armed conflicts a country has suffered on its own territory since 1946. The data is from the Peace Research Institute Oslo's Conflict Data Program.

- **Unemployment** This is our third control variable. There is empirical evidence that perception of corruption increases when unemployment increases. It is measured as the average yearly unemployment rate (mid-year or at year-end).

Our regression equation is thus:

$$Corruption = \beta_0 + \beta_1 NaturalResourceRents + \beta_2 GDPpercapita + \beta_3 ArmedConflict + \beta_4 Unemployment + \epsilon$$

We may also add dummy variables for the different regions in order to control for region-specific effects.

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