

Do Oil Exports Increase the Perception of Corruption?

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“Corruption is the abuse of entrusted power for private gain. It hurts everyone whose life, livelihood or happiness depends on the integrity of people in a position of authority” [www.transparency.org/about us](http://www.transparency.org/about_us)

Abstract

Many authors have written about the “resource curse” where countries with large abundance of mineral resources have a consistent pattern of slow growing economies. Through the use of a logistic regression, that employs corruption perception index, economic freedom index, gross domestic product per capita, unemployment and oil exports; this paper finds that there is not causal relationship between country’s oil exports and the corruption perception. Nevertheless, other factors used in the model such as the economic freedom and level of development show a strong correlation with the country’s corruption perception

Introduction

It is striking to see how on the list of the most important oil exporters of the world, we can find countries with high indices of corruption. One would think that with the great income that the economies of Venezuela, Nigeria, Russia and others are obtaining these days thanks to the high oil prices, there should be no reasons to also have elevated levels of corruption¹.

Many different factors could be responsible for nurturing corruption or, on the contrary, impeding the formation of it. But what most literature show is, that perhaps countries’ natural resources also brought with it the raise to many other unexpected problems. Among the findings, high rents from oil, gas and metals, showed association with corruption and under-taxed (Kuboniwa, 2002; Tabata, 2002)

Large inflows of money should mean growth, as these funds are supposed to go directly toward development, education and in general to increase the standard of living of the citizen of that respective country. Realities can be different due to different factors, researchers have established through cross-country regressions analysis, that on average, natural resources have a negative impact on growth when these are considered in

¹ Country ranks for oil exports is obtained from the 2006 CIA World Factbook, corruption perception index is obtained from transparency international

isolation, but a positive impact when other explanatory variables, such as corruption, investments, openness, terms of trade, and schooling are included. (Stradiotto, 2004)

It is necessary to look deeper into the reasoning of why some of these countries with these abundant resources are less developed or more corrupt. Indeed, there are many variables that could be playing an important role in the final outcome. Resource abundant countries, such as Norway and Iceland, have experienced remarkable and sustained growth rates. When comparing successful cases (Norway and Iceland) to failures (Russia, Venezuela and Nigeria), the more stable democracies have more successfully avoided the resource curse. Presumably, this is due to the strength of the democratic institutions at work in those countries, where corruption is not tolerated and there are severe penalties for violating the law” (Stradiotto, 2004). Another reasoning is that natural resource abundance slows political change and solidifies regimes in power. Consequently, an abundance of resources drastically weakened nascent democratic institutions, repressing political parties so that power is weakly contested, public finances are opaque and corruption by both the elite and bureaucracy is rampant (Auty, 2001)

Despite the abundance of resources; the form of government and its failure to create a more diversified economy, will be in part responsible for worsening the standard of living of the poor. The dependability of a particular mineral resource; will bring instability in the income revenues; thus, affecting government planning. In its study “extractive Sectors and the Poor” (Ross, 2001) argued that a strong association existed between the dependency in oil and minerals and unusually bad conditions for the poor; in addition, it has a damaging effect of governments. Governments, tend to suffer from unusually high rates of: corruption; authoritarian government; government ineffectiveness; military spending; civil war. As mentioned, many scholars have studied the “resource curse” phenomenon. In his literature review about Resources – Curse or Blessing?, (Stevens, 2001) concluded that the answer “lies more in political economy than macro-economic analysis”²

When a government receives an unexpected flow of resources, either in the form of foreign aid or rents from oil, it creates an adverse impact on the political institutions of the recipient country by reducing checks and balances in government and democratic rules (Djankov, Montalvo and Reynal-Querol 2005a). Furthermore, the authors compared the effect of foreign aid with the effect of rents from oil. Their conclusion was that in the same way that aid can create corruption, natural resources encourage a behavior that instead of creating profit through trade or production; when obtained in an easy way it promotes corruption in parties in government. The authors further mention how this phenomenon known as rent seeking, also brings as a consequences that the parties in power try to concentrate decisions on how to redistribute those resources to themselves while excluding others—thus, increasing the benefits from rent seeking(Djankov, Montalvo and Reynal-Querol 2006).

² Stevens, Paul. “Resource Impact – Curse or Blessing? A Literature Survey. Centre for Energy, Petroleum and Mineral Law, University of Dundee. International Petroleum Industry Environmental Conservation Association IPIECA, March 2003

Background and Hypothesis

Background

Some regression models, considering effect of resources and economic growth, has been used. (Papyrakis and Gerlagh, 2004) worked on a model to examine the direct and indirect effect of natural resources abundance on economic growth. They focused on the transmission channels – the effect of natural resources on the other explanatory variables - concluding that natural resources have a negative impact on growth if considered in isolation, but positive direct impact on growth if others explanatory variables such as corruption, investment, openness, terms of trade , and schooling are included. The author’s objective was to investigate the causes for under-performance of most countries rich in natural resources and they also mentioned the main transmission channels highlighted in the literature.

A different approach, somehow relevant to this study, was the extended research not only considering how certain economic and cultural variables affects country’s corruption level, but also taking into account the impact that information technology can have on corruption. The conclusion showed that the greater access to information significantly lowers corruption levels across nations (Di Rienzo et al, 2007).

A suddenly increased income level due to a natural resource discovery may lead to sloth and less need for sound economic management and institutional quality (Sachs and Warner 1995, Gylfason 2000, 2001a). In addition, it may create a false sense of security and weaken the perceived need for investments and growth promoting strategies. Natural resource abundant economies benefit less from technology spillovers, typical for the manufacturing industries, since export of these industries is harmed by an appreciation of the local currency, e.g. through inflationary pressure due to increased domestic demand (Sachs et al. 1995, 1999a, Gillis et al. 1996, Gylfason 2000, 2001b). Finally, as the natural resource sector expands at the cost of other sectors, the returns to human capital decrease and investments in education decline (Gylfason 2001a).” Their model uses corruption as an independent variable and a coefficient of resource abundance.

To offer a different approach and contrasting with the existing research, this paper only concentrates in export of oil measured in barrel per day as an independent variable and uses the corruption perception index (CPI) as the dependent variable. The countries used in the study were selected only because they were oil exporters. The selected data is for the year 2006. The main purpose of the paper is to observe whether the amount of oil exports impacts the probability of corruption.

Hypothesis

The greater the barrel per day exported by a country the highest the probability that a country score higher in the corruption perception index.

Data Description and Regression Analysis

A logistic regression model will be used where the dependent variable has been transformed into a dichotomous variable. This form of regression can be used when the dependent variable is dichotomous and the independent variables can be of any type. The logistic regression is a form of regression that does not require normally distributed predictors, do not have to be normally distributed, linearly related, or of equal variance within each group.

Corruption Perception Index

Transparency International (TI) is a global civil society organization leading the fight against corruption. It is organized in a global network with more than 90 national locally established chapters and chapters-in-formation. The annual Corruption Perception Index (CPI) was first released in 1995. The CPI ranks more than 150 countries by their perceived levels of corruption, as determined by expert assessments and opinion surveys.³

Since the index is based on surveys and these change from year to year as well as the methodology; this paper only worked with the CPI of 2006. Although CPI has limitations generated by its methodology and because is based on opinions compiled in surveys made to business men and analysts, it is widely used by researcher all over the world and is considered a robust index. The CPI ranks the countries of the world according to “the degree to which corruption is perceived to exist among public officials and politicians”⁴ A high score means less perceived corruption.

The values for CPI are given as an index with a scale that goes from 0 – 10, where the greater the number, the less corrupt the country is. On this paper, all countries whose values were 5 or less were assigned a “0” meaning more corrupt and those with values greater than 5 were assigned a “1” or less corrupt. The CPI values were obtained from the surveys conducted and published by Transparency International.

Gross Domestic Product per capita

The size of the economy of a country is often measured by the Gross Domestic Product (GDP); when is per capita, it can be used as an indicator of the standard of living in an economy. The standard of living refers to the condition in which the inhabitants of that country live, the level of services and quality of good they can enjoy and are available; but also the way these are distributed for the population. When resources such oil are present in the economy and depending on the distribution of wealth, the standard of

³ From Transparency International website www.transparency.org

⁴ Frequently Asked Questions: TI Corruption Perception Index. Retrieved from its website on May 20, 2007 http://www.transparency.org/policy_research/surveys_indices/cpi/2006/faq

living maybe higher. GDP per capita is widely used and the fact that is measured very consistently among all countries allows for good comparisons. Although the use of GDP per capita is criticized because is not exactly a measure for standard o living; the fact that is a good indicator is enough for the purpose of this paper. Many other factors within the GDP make it important for this model. GDP also is an indicator of productivity and includes variables such as consumption and investment that are important to take into consideration.

In looking for variables that could predict increases in CPI the GDP component is one that should be considered.

Index of Economic Freedom

The Heritage Foundation and the Wall Street Journal have published the Economic Freedom index for over 10 years. The index measures and ranks 161 countries and uses 10 specific factors, and averages them equally into a total score. Each one of the 10 freedoms is granted using a scale from 0 to 100, where 100 represents the maximum freedom.

The highest form of economic freedom provides an absolute right of property ownership, fully realized freedoms of movement for labor, capital, and goods, and an absolute absence of coercion or constrain of economic liberty beyond the extend necessary for citizens to protect and maintain liberty itself. Some of the specific factors contained in the index could have an effect in corruption; hence why the inclusion in the model.

Founded in 1973, The Heritage Foundation is a research and educational institute - a think tank - whose mission is to formulate and promote conservative public policies based on the principles of free enterprise, limited government, individual freedom, traditional American values, and a strong national defense.⁵

Unemployment

The unemployment rate is measured in percentage and is the rate of unemployed workers to total labor force. Methodologies used by different countries in the way to measure this percentage may not be consistent. For the purpose of this paper, using unemployment in the logistic regression model permits looking into possible causalities with corruption perception index.

Regardless of the possible causes of unemployment, which are beyond this investigation and topic for another paper, it brings with it multiple social problems amply studied by many scholars. Increases in mental problems, suicides, arrests and assaults have been shown among others to be part of the impact of unemployment (Brenner, 1979). The inability to pay bills or secure the minimum needs for individuals, may well be part of

⁵ The Heritage Foundation . Retrieved from its website on May 20, 2007 <http://www.heritage.org/about/>

the suffering that some of those unemployed have to live with; consequently, people in need may look for any alternative at hand to source the lack of money income.

Oil Exports

With the price of oil around US\$60 per barrel, the so-called black gold has turned around for good or bad the economies and lives of countries and people wherever it has appeared. With countries such as China and India in full expansion and need of energy sources, the demand of oil does not seem to be going away anytime soon. Many countries are looking for efficient alternatives sources of energy, but still, oil remains as the most common and desired one and it is difficult to see dramatic changes of this trend in the horizon. Many countries - the U.S. among these - are seeing the growing dependence on oil as a matter of national security. Like the U.S., several others are trying to implement recipes to change the consumption habits and preserve the resources. Nevertheless, the desired reduction in oil consumption is not near.

Oil is significantly intertwined in the economy of all countries and those, which are exporters, have seen the benefit of a great cash inflow bonanza. Now, the abundance of oil comes sometimes with a price and one can observe how many exporters have diminished its activities in other sectors of the economy that were once important; only to concentrate in oil extraction and distribution. Now, these economies have become exclusively dependable on this particular resource and in many cases, like in the case of Venezuela, extraordinary excess of money have allowed the sustainability of an authoritarian government. Including the oil export in the model to relate the CPI to oil exports is the center of this study.

Regression Findings

Based on data obtained from Energy Information Administration a set of 56 oil exporter countries is used to test the hypothesis. All countries included were oil exporters during 2006 and data of its gross domestic product, corruption perception index and economic freedom was available. The main data sources were Transparency International for the Corruption Perception Index, The Fraser Institute for the Economic Freedom of the World index, CIA World Factbook and Energy Information Administration for Oil-exports (bbl/day) and GDP per capita (US\$).

Two models have been constructed to determine whether or not oil export increases or not the probability of scoring higher in the corruption index. The first model uses corruption index as the dependant variable and economic freedom, level of unemployment and gross domestic product per capita as the independent variables. The second model adds oil export in bbl/day as an additional independent variable.

Model 1:

Corruption Index = $f(\text{EconFree}, \text{GDPpercap}, \text{Unemploy})$

Model 2:

Corruption Index=f(EconFree, GDPpercap, Unemploy, bblperday)

Results

The results for both logistic models are provided in the following tables. The advantage of using a logistic regression is that is relatively free of restriction, which is one of the reasons why it has become so popular. The logistic regression offers the capability to analyze a mix of all types of predictors (continuous, discrete and dichotomous), the variety and complexity of the data sets that can be analyzed are almost unlimited.

Model #1 Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	17.803 ^a	.649	.872

Model #2 Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	17.753 ^a	.650	.872

Hesmer – Lemeshow Model #1

Step	Chi-square	df	Sig.
1	.756	7	.998

Hosmer-Lemeshow Test Model #2

Step	Chi-square	df	Sig.
1	.720	7	.998

Variables in the equation Model #1

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1	EconFree	.450	.173	6.806	1	.009	1.569
	GDPpercap	.000	.000	5.057	1	.025	1.000
	Unemploy	.160	.170	.886	1	.347	1.174
	Constant	-34.005	12.591	7.294	1	.007	.000

Variables in the Equation Model #2

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1	EconFree	.467	.193	5.829	1	.016	1.595
	GDPpercap	.000	.000	4.887	1	.027	1.000
	Unemploy	.167	.172	.939	1	.333	1.182
	bblperday	.000	.000	.058	1	.810	1.000
	Constant	-35.202	14.083	6.248	1	.012	.000

The results indicate that both models show a good fit to the data. Model 1 and 2

predict 91.7% that a probability exists for the independent variables to relate to corruption index. The overall accuracy shows that a probability of 91.1% exists for the level of corruption to be related to the independent variables.

For model 1 we observed chi-square (.756) and a -2loglikelihood (17.803). In order to assess the fit of the model 2 we observed that chi-square (.720) and -2loglikelihood (17.753) are satisfactory; showing that the model has an acceptable fit.

Both models show a strong association between corruption index and the independent variables (Cox & Snell= .650 model #2 and .649 for model #1) and (Nagelke R= .872 for both models). The model is accounting for 87.2% of variance. To further test the statistical significance of each coefficient of the model we look at Wald test. In model #1 the Wald test shows statistical significance of EconFree (6.806) and GDPpercap (5.057) at $\alpha= 1\%$ and $\alpha= 5\%$ while Unemploy (.886) was low. On model #2 the Wald test for oil exports (.058) with a significance (.998) which shows that oil exports does not have a statistical significance with the dependent variable corruption index as opposed to economic freedom (5.829) and GDP per capita (4.887). These have a significance of (.016 and .027) respectively. In the case of -2likelihood the value is acceptable (17.753)

Model #2 has a Chi-square of 58.733, -2loglikelihood of 17.753 and Nagelke of .872 while Model #1 has a chi-square of 58.683, -2loglikelihood of 17.803 and Nagelke of .872. The improvement of the model by adding oil exports is insignificant, something we can see by observing the small increase in -2likelihood. This allows concluding that no enhancement to the model has been achieved by including oil export. It is acknowledged that, the dichotomy scale applied to CPI (<5 assigned a 0 and >5 assigned a 1) result in the sensitivity of the analysis of the variables, and assigning 0 or 1 considering a different scale range may have an effect in the results that could be part of future investigation.

Conclusions

The purpose of this research was to determine whether or not the probability that a country will score higher in the CPI if more export of oil occurred. The major finding was that such probability does not exist; thus, CPI has not causal relationship with oil exports. Nevertheless, a significant finding was that Economic Freedom Index and GDP per capita variables used in the model were better predictors and in reality end up having a greater statistical significance with CPI.

The model did not use a large amount of variables to predict the probability; nevertheless, the model shows high correlation and good fit with a representative number of those used. Nevertheless, must be pointed out as well that the number of observations was not very significant.

The results were important and show that many opportunities for future research are possible and of great interest. Further investigation could include other variables in the

model. Among the future research goals could be the use of human development index to better predict the standard of living, include other type of export resources, digital divide, level of globalization of the country, education and political system. Revenues from oil export have an effect on society, business and politics; discovering the effects of oil exports in other relationships between oil and other variables will represent an interesting future extension to the present study.

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