The Responsibility of Resource Wealth: The Impact of Governance on HDI and GDP per Capita in Resource Rich Developing Countries

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Abstract

The resource curse is a well documented economic theory that looks to explain why developing countries, abundant with natural resources, have historically struggled to achieve sustainable development. My thesis examines this phenomenon by focusing on the role that governance plays in determining both human and economic development. To measure quality of governance my research isolates two variables: voice and accountability as well as control of corruption. Combining these governance indicators with other economic indicators my thesis concludes that while changes in economic variables can push human and economic development in different directions, changes in quality of governance will guide both forms of development in the same direction.

I would like to thank Professor Ghosh for guiding me through the research process. His insights into my topic were extremely helpful and for this I am very grateful. I would also like to thank my parents for encouraging my interest in economics and always motivating me to achieve my best work.
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I. Introduction

Common sense suggests that large natural resource endowments should aid a country’s development. On the contrary, the illusion of wealth that comes from an abundance of resources is often never realized. Natural resources have been documented as burdening the developing world with what is commonly known as the ‘resource curse.’ This phenomenon is clearly evident when comparing the development of East Asia to that of Africa and Latin America. While many African and Latin American countries have rich deposits of minerals and oil their growth over the past 40 years is minuscule in comparison to that of resource deficient East Asia. In fact, in the 2008 Human Development Index (HDI) rankings 11 out of the bottom 21 countries were classified as natural resource rich1.

However, not all developing countries rich in natural resources are destined for slow development. Botswana and Chile are examples of development successes. Botswana is a diamond rich country, but has averaged over 5% annual Gross Domestic Product (GDP) growth since its independence in 1966. Chile is a major copper exporter, but since the Latin American debt crisis in the early 1980’s, it has averaged over 6.5% annual GDP growth2. Therefore, given the right circumstances the apparent resource curse can be a blessing.

The obvious question that follows is why do some rich resource developing countries prosper, and why do some fail? Initial literature attributed the development struggles of resource rich countries to “Dutch Disease,” nicknamed after the economic slowdown the Netherlands experienced after the discovery of natural gas off its coast.

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2 World Development Indicators Online, 2008.
However, more recent literature has focused on the role of governance in overcoming the resource curse. The governance argument essentially states that natural resource wealth confers great responsibility to the government’s institutions and therefore exemplary institutions will allow a country to survive and prosper.

Using a combination of empirical and qualitative analysis my thesis looks at which aspects of governance help or hinder the development of resource rich developing countries. While this specific question is not unique, the methodology I am using to ask it is different to previous methods. Instead of solely focusing on economic development I will introduce human development into the analysis, and focus specifically on a sample of resource rich developing countries that contain both growth successes and failures.

The sectional breakdown of my thesis is as follows. First, a literature review examines previous work on my topic. Second, a data description introduces the data set I am working from and the major variables featured in the analysis. Third, the methodology section analyses the steps I took in arriving at my final regressions. Fourth, I state some hypotheses I had developed before engaging in the empirical analysis. Fifth, a results section details the findings of my regressions. Sixth, a discussion section places the regression results in context and conjectures explanations as to their signs and magnitudes. Seventh, a conclusion summarizes the overarching ideas explored and unearthed in my thesis. Lastly, the appendix includes a more detailed data description as well as graphs and tables referenced throughout the paper.
II. Literature Review

“Dutch Disease”

A variety of hypotheses have been introduced to explain the existence of the resource curse. As stated earlier the initial explanation centered around the economic phenomena commonly known as the "Dutch Disease." The Dutch Disease earned its name during the 1950's and 1960's in Holland when rich natural gas deposits were discovered off its coast in the North Sea. The discovery, and subsequent exportation of the natural gas, resulted in a sharp appreciation of the national currency which was followed by a decrease in profitability of Dutch manufacturing and service exports. The crowding out of manufacturing and service exports temporarily hurt the Dutch economy, but it soon recovered and fears of de-industrialization did not materialize (Gylfason, 2001.)

The Dutch Disease hypothesis is centered on the principle that large scale exportation of a natural resource will make the economy solely reliant on that resource. When resource exportation begins a current account surplus will accumulate leading to, in an open economy with flexible exchange rates, an appreciation of the domestic currency. This appreciation will make non-resource exports, usually manufacturing goods, less competitive in world markets. The domestic currency's appreciation will also cause the "spending effect" where domestic consumers increasingly favor international producers over domestic. The spending effect leads way to the "resource pull-effect" when labor and capital flock to the still competitive resource and non-tradable sectors of the economy. The resulting picture is an economy heavily reliant on its resource sector (Humphreys, 5-6.)
A heavily resource based economy creates two problems. First, the country's export share of GDP growth decreases which hurts overall GDP growth. Second, the country's revenues become increasingly dependent on the global price of their resource. When global commodity prices are high the government is faced with large budget surpluses, but when prices fall the government is plunged into a budget deficit. This problem is often exaggerated by the natural volatility of commodity prices.

When left unabated the Dutch Disease leads to a significant deterioration in the traded goods sector, but the Dutch Disease does not explain why governments fail to make corrections. The fact that some countries prosper from resource wealth is a clear indicator that government policy plays a large role in the resource curse. Therefore, a strictly economic explanation for the resource curse is not sufficient.

“Get Rich Quick”

Another potential explanation for the resource curse is the false sense of security natural resource wealth gives a country and the lack of investment in human capital it inspires. When a country is given the ability to extract dollars from the ground it looks past the need to establish an educated labor force. This concept has a long history and can be summarized by a quote from Jean Bodin in 1576. “Men of a fat and fertile soil, are most commonly effeminate and cowards; whereas contrariwise a barren country makes men temperate by necessity, and by consequence careful, vigilant, and industrious.”

This hypothesis was tested by Thorvaldur Gylfason where he analyzed educational inputs, outcomes, and participation levels against natural capital. In his study Gylfason believed that analyzing education variables would provide an accurate model

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for determining whether policy makers were planning for the future. Gylfason’s results showed negative relationships between a country’s natural capital share of national wealth and public expenditure on education as well as number of years of schooling for girls ⁴.

While the argument that natural resource wealth creates a “get rich quick mentality” among policy makers is plausible, it is not the best explanation for the resource curse. One problem with the explanation is that there is no testable theory as to why revenue booms would affect the ability of policy makers to create policy. Another is that developing countries are always offered advice by The World Bank and International Monetary Fund as to the best way to govern their riches. Given this advice it is not logical that developing countries would blatantly ignore it. Instead, another explanation is needed.

**The Role of Institutions**

The political institutions in a resource rich country are the true determinants of how resource wealth will affect that country. Economic explanations relating to the Dutch Disease help to explain some of the inverse relation between resource wealth and growth, but not every resource rich country suffers from slow growth. As a result, there must be another explanation. Natural resource wealth gives responsibility to the government’s institutions and therefore exemplary institutions will allow a country to survive and prosper through the resource curse.

⁴ The regression estimated an increase of 18 percentage points in the natural capital share of a country is associated with a 1% of GNP decrease in public education spending. The regression indicates that a 5% increase in share of natural capital in national wealth will produce a 1 year decrease in expected years schooling for females. Results detailed in Gylfason’s research, “Natural Resources, Education, and Economic Development.”
There is little evidence to suggest that specific natural resources have different effects on institutional quality, but academic literature does point to a trend differentiating resources as either point-sourced or diffused. Point-sourced resources require extensive capital to obtain them. Examples include oil and diamonds. Since, the majority of the public does not have access to the extraction of point-sourced resources the wealth created by them is often prone to corruption and rent-seeking. On the other hand, diffused resources are available to the majority of the public and can easily be consumed. Diffused resources, such as fertile soil and irrigation, often aid in small holder agricultural growth. These observations are enhanced by data indicating point source economies grow at a rate of 0.65 per annum compared diffused economies which grow at 4.58 per annum (Isham et al., 2005.) Data collected by S. Mansoob Murshed further supports this point since out of 42 natural resource rich countries labeled development failures between 1960 and 1998, 36 were classified as point-sourced (Murshed, 2004.)

It is also argued that point-sourced resources indirectly cause slow development by delaying industrialization (Isham et al., 2005.) It is widely accepted that point-sourced resources are easily controlled by a small group of people. Therefore, this small group of people will attempt to prevent industrialization from occurring since industrialization would lead to the formation of an urban labor class and a powerful urban middle class. These new social classes would demand more services from the state, digging into the power and wealth of the resource elite. The repression of industrialization also coincides with the repression of education and the formation of effective civil society. The authors
summarize their argument by claiming that point-sourced abundance simultaneously ‘strengthens states’ and ‘weakens societies.’ As a result, the most pertinent course of study is to focus on countries recognized as point-sourced economies. However, questions surrounding the mechanisms of transmission between point-sourced wealth and slow growth still remain.

“Privatization”

Upon discovering natural resource wealth a country's government is first faced with the complex problem of how to extract it. In cases where the resource wealth consists of readily available fertile land and water the solution is much easier than when the resource wealth is either oil or minerals. An oil or mineral rich government will be faced with a variety of public and private participants, all of whom vying for a stake in the resource.

The problem arises from the fact that developing countries do not have the capital or educated labor force required to extract the resource without assistance. Early attempts by developing countries to act by themselves failed as resource extraction was slow, marked by little transparency, and was riddled with corruption. Therefore, the perceived solution seemed to lie with private contractors, often from foreign countries. It was believed privatization would be successful since the contract would naturally go to the most efficient company. These private contractors would extract the resource wealth and give either a fixed amount or a percentage of the profits to the country. In theory this gave the developing country the most efficient stream of revenue possible. The underlying problem behind this approach was that the private contractors ultimately do not have the best interest of the country and its people in mind (Stiglitz, 2007.) Instead,
their loyalties lie with their company and they will look to negotiate the best profit, maximizing deal possible for the company.

Privatization allows companies to act out of self interest leading to problems with corruption and the diversion of profits. First, the deals allowing private companies to extract resource wealth are often extremely complicated with many different payments being made with lots of different actors. This leads to the basic agency problem that the more people handling the money, the better chance one of the officials will be corruptible. A second, problem involves conflict of interest. Often, government officials will be shareholders in the corporation that is extracting the resource. Therefore, they can feel the temptation to lower taxes or other payments made to the government which would increase the company's profitability, indirectly, putting more money in their own pockets (Stiglitz, 2007.) Lastly, foreign companies can also enhance environmental concerns that come from natural resource extraction. Foreign companies, acting in their own profit maximizing self-interest, will often create pollution hazards which can hurt the development prospects of citizens already living there.

Problems relating to privatization and foreign companies are well documented in Nigeria. Foreign oil companies, and a series of Nigerian governments, have been accused of working together to suppress protests of the Ogoni people. The Ogoni are an ethnic group who reside in the oil rich Nigeria Delta. Pollution caused by the foreign oil companies has destroyed the profitable farming and fishing industries that existed before the oil companies arrived. In addition, the pollution has made even the most basic needs, such as clean drinking water, hard to come by. In an area that was once self-sustaining, disease and poverty are now the norm. The human rights activist Oronto Douglas places
the blame on both the government and oil companies. “There is a symbiotic relationship between the military dictatorship and the multinational companies who grease the palms of those who rule. They are assassins in foreign lands. They drill and they kill in Nigeria” (Shah, 2004.)

“National Oil Companies”

Besides privatization the other option developing countries have, is to create a national oil company (NOC.) Robinson, Torvik, and Verdier, examine NOC’s and attribute mistakes made by government officials to corruption. They believe natural resource wealth presents the allusion of great wealth, which in turn increases the incentives for government officials to remain in power. The model they created looks at an incumbent politician attempting to gain reelection and whether the politician will use resource rents productively or illegally to help them win. Since NOC’s remain in very close contact with the government, the lines of communication and accounting between the NOC and government are often opaque. This lack of transparency often makes it all too easy for politicians to siphon off some resource revenue for illegal use as the likelihood of being caught is very slim. The authors argue that when developing countries sponsor NOC’s the government itself is often not strong enough to withstand the pressures of corruption that accompany NOC’s (Robinson et al. 2005.) In addition, NOC’s are often characterized by over employment which yeilds inefficiencies. Not only is over employment an inefficiency in itself, it often enhances corruption problems as it increases agency problems.

The story of government becoming too close to NOC’s is illustrated by Hugo Chavez coming into power in Venezuela. The story can be told in two parts: first, the
firing of skilled labor, and second, the assent of Chavez’s cronies. When Chavez came to power in 1999 he complained about profits being earned by Petróleos de Venezuela (PDVSA) and cut government funding for the company along with replacing several old executives with new ones he knew to be loyal. In response, as many as 40,000 skilled workers organized a strike against the changes, to which Chavez responded by firing all of them. The firings eradicated much of the foreign human capital inside PDVSA, which crippled productivity. After the firings Chavez appointed incompetent cronies as replacements. Included in the group of PDVSA’s new management were several members of the Chavez family. All told, after Chavez came to power he forced PDVSA too close to the executive branch of government and as a result the company lost a great amount of transparency, succumbed to corruption, and lost a great deal of profitability.

Problems with privatization and NOC’s arise when the existing government does not have strong enough institutions. When strong institutions are in place, such as tax collection and contract enforcement, the effects of corruption will be mitigated. Therefore, an argument can be made that developing countries are better off keeping their resource wealth in the ground until they have strong enough institutions in place to maximize the benefit. Also, the value of resource wealth is likely to only increase as other countries continually deplete their own supplies. However, this policy would be extremely hard to implement, especially in developing countries, where the citizens are desperate for development with immediate tangible results.

“Colonial Influences”

Another argument as to why natural resource wealth promotes bad institutions examines whether the country’s former colonial power was extractive or settling. This

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5 “National oil companies: Oil’s dark secret”, 2006
argument seeks to explain vast regional differences in development between North America and South America/Africa. In North America colonists were looking to settle and create new societies. Therefore, they laid the foundations for a strong social contract. On the contrary, colonists arriving in South America and Africa were simply looking to extract as much profit from the land as possible. Their first priority was to maximize profit for their home land rather than create a sustainable society.

Terry Lynn Karl also states that resource rich countries have been forced to develop under a significant amount of foreign influence, specifically from their former colonial power. In some empirical studies the influence of former colonial powers has proven beneficial. Former British colonies usually adopted the British rule of law after independence, and have generally developed stronger institutions than their French and Belgium counterparts. However, a developing country’s closeness to its former power has hurt development as well. Foreign corporations from the previous colonial power are often lobbying and more likely to secure lucrative resource contracts which may not be in the developing countries best interest (Karl, 3-23.)

“Democracy and Development”

While it is generally accepted amongst academics that bad institutions are at the heart of the resource curse it is unclear as to what forms of government produce these institutions. Despite the varying definitions of democracy all forms of democratization are believed to promote the growth of civil society. Civil society refers to the interactions between a country’s citizens as well as the extent to which citizens’ voices are heard in government. Terry Lynn Karl argues that many resource rich countries have not developed a civil society since the governments have never needed to tax their citizens.
In medieval Europe leaders who were looking to create a nation had to invest significant effort into building a relationship with their subjects so they could impose taxes and raise the necessary revenue without the risk of revolt. Resource revenues have often eliminated the need to tax, therefore limited interaction between citizens and the state (Karl, 3-23.) The Middle East provides examples of such countries where civil society and political freedoms are limited. Saudi Arabia and Kuwait are not often perceived as developing countries in terms of GDP per capita, but they rank much lower on total development scales such as the Human Development Index (Ross, 1999.)

In addition, a stable democracy can help resolve commitment issues that arise with authoritarian regimes. With authoritarian regimes investment can be constrained due to discontent surrounding the idea that a single person can instigate so much change. In democracies systems of checks and balances prevent a single political actor from obtaining too much power. Well developed democracies also go hand in hand with capitalism which helps advance economic efficiency.

However, despite evidence that democracies promote growth there is also literature describing its potentially negative consequences. Contrary to what was argued above, democracies can actually retard investment by placing emphasis on immediate consumption. Increases in immediate consumption naturally decrease savings rates which in turn lower investment, hurting growth. These pressures are seen to be exaggerated in poor countries where the majority of the population has a very high propensity to consume.

Critics of democracy also argue that democracies are unable to launch the grand social programs needed to jumpstart development in poor countries. An authoritarian
government is able to pursue long term programs that involve sacrifice in the short run for a brighter future. Examples of developing countries that have had unsuccessful experiments with democracy include Zimbabwe and Venezuela, where the initial democratic systems of government broke down and stagnated the country’s development prospects.

Ultimately, the academic literature is divided between the two ends of the political spectrum as to which regime is most conducive to development, particularly in developing countries. Tallying data on regime changes in Latin America and Sub-Saharan Africa shows 61 transitions in government between the years 1950 and 1990 (Rock, 2008.) This is powerful evidence that there is not a single system of government that prevents the resource curse.
III. Data Description

My data set will be limited to 41 countries over the year 1996 to 2007. I chose 41 countries that were all designated by the World Bank as extractive industry dependent since their average oil, gas, or mining exports from 1990-1999 were over 20 percent of total exports. The timeframe, 1996 to 2007, was chosen because these are the years the WGI data is available. While more than 12 time observations would be preferable I still hope to find significant results as previous studies have already used the same data effectively.

“Dependent Variables”

In order to determine whether a country has been successful in utilizing its natural resources, statistics are needed to measure a resource rich country’s overall level of development. One such measure is annual GDP per capita. This indicator is consistent with the vast majority of economic research on the topic. GDP is a widely used measure of economic development, because data on it is readily available and increases in GDP often do result in a higher standard of living. Therefore, I will be using GDP per capita as a dependent variable measured by GDP in constant 2000 U.S dollars divided by the mid year population of a country.

However, using strictly GDP per capita can bypass other aspects of human development. Therefore, in the following analysis I will also be using the United Nations Human Development Index (HDI). HDI is an indexed value of overall human development that extends beyond simply GDP per capita. HDI measures three aspects of

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7 See (Appendix: Table 1) for list of all 41 countries used in the panel data.
human development: a long and healthy life, knowledge, and a decent standard of living.
A long and healthy life is determined by adult life expectancy at birth. Knowledge is measured as a combination between adult literacy rates and combined gross primary, secondary, and tertiary enrollment statistics. Finally, a decent standard of living is represented by GDP per capita, in U.S dollars, purchasing power parity9.

HDI is an important measure of human development since it can help recognize countries experiencing growth without development. Growth without development occurs when a country’s overall GDP per capita is improving, but without equal increases in overall quality of life. For example, many oil rich countries in the Middle East have high GDP per capita levels, but low levels of adult literacy and political freedoms10. Another reason for including HDI is that resource rich countries are especially prone to fluctuations in the price of their resource and therefore can have exceptionally high GDP growth one year and a large drop the next. Volatility in the international price of the country’s commodity explains the drastic variations, but large year to year changes in GDP do not accurately reflect the changes in a country’s level of development. Since GDP statistics only comprise one third of the HDI’s overall value it a less volatile measure of development.

“Governance Data & Independent Variables”

As mentioned in the literature review, an increasing amount of scholarly work on the resource curse recognizes the importance of good governance in natural resource rich developing countries. As a result, recent research on the resource curse has been directed towards quantifying individual measures of governance. By nature the concept of

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10 See Appendix: Graph 2, Differences between HDI and GDP per capita.
governance is difficult, if not impossible, to be boiled down into a single statistic. Therefore, most attempts at measuring governance have used specific elements of a country’s society, such as freedom of the press or levels of corruption, that when combined paint a picture of overall quality of governance.

The data I have used to measure governance comes from the Worldwide Governance Indicators (WGI.) The WGI is a development research project of the World Bank and have been releasing their governance indicators since 1996. The WGI defines governance as “the traditions and institutions by which authority in a country is exercised.” The data does not provide a single governance statistic, but instead breaks it down into six dimensions: voice and accountability (VA), political stability and absence of violence/terrorism (PS), government effectiveness (GE), regulatory quality (RQ), rule of law (RL), and control of corruption (CC)\textsuperscript{11}.

Brief descriptions of the six governance indicators follow. VA captures the ability of citizens to freely select the government they desire, along with freedom of expression and media. This variable recognizes the important role that a country’s citizens play in whether or not their country ultimately achieves good governance and subsequent development success. Second, PS reflects the likelihood that the government’s central institutions and rules will become undone by coups or other violent protests. Third, GE refers to the capacity of the government to create and enact quality public policy. Fourth, RQ describes the government’s ability to create policy that aids the formation of a healthy private sector in the country’s economy. Fifth, RL illustrates the confidence citizens have in the country’s justice system, protection of property rights,

\textsuperscript{11} See Appendix: Table 3 for summary statistics.
and protection against violence. Lastly, CC marks the extent to which public office is used for private benefit and frequency of accepting bribes\textsuperscript{12}.

Additional variables that will be included in the analysis include education, trade openness, point-source natural resource exports, and investment as a percentage of GDP. The addition of each of these variables gives greater insight on the role of governance in development as well as explains additional variation in the dependent variables\textsuperscript{13}.

\textsuperscript{12} World Governance Indicators Online.
\textsuperscript{13} Additional information on all of the variables can be found in the written section of the appendix.
IV. Methodology

“Choosing Between Governance Indicators”

Beginning my data analysis I suspected my regressions may suffer from multicollinearity between the governance indicators and that it would be necessary to narrow the six down. While any undesired correlations between independent variables would not affect the equation’s overall ability to explain variation in the dependent variable, the coefficients on the independent variables would have overstated standard errors. An initial correlation matrix proved my suspicions as there were several high correlations between governance indicators.14

To help minimize problems that can arise from high correlation between independent variables I chose to run a series of specification regressions. The results of the regressions can be found in the appendix, but they demonstrated strong significance for VA as well as GE, weak significance for CC and RQ, and mixed results of RL and PS.15 Combining the results of the specification regressions with the correlation matrix it is clear that not all six governance indicators could be used. From the specification regressions it is clear that either VA or GE has to be included, but not both. I chose VA since it appeared more in line with the idea of measuring change in overall human development rather than just economic development. For a second governance indicator I chose CC, despite its lack of significance in the specification regressions. Previous literature has identified corruption as a fundamental cause of the resource curse since it is

14 Voice and government effectiveness .7469, voice and law .6282, government effectiveness and law .8776, regulatory quality and corruption .7769, and political stability and law .7559. (See Appendix: Table 2)
15 See Appendix: Regression Results 1 & 2 for results of specification regressions.
present from the earliest stages of resource extraction. By including CC in my regression I hoped to discover significant results supporting the above logic.

“Initial Baseline Regressions”

An additional step to verify that my regressions would satisfy the criteria for an Ordinary Least Squares (OLS) Regression was to check for the possibility of heteroskedasticity between error terms and governance indicators, as well as the presence of outliers. Looking at the residuals for voice and accountability when regressed upon GDP per capita, there appeared to be possible heteroskedasticity in addition to potential outliers. As a result, to correct against these effects I ran robust regressions looking to decrease the standard errors of the coefficients.

The next decision in my analysis was whether to include fixed effects. Since the data set is in panel form it lent itself to fixed effects, however, I chose only to include time fixed effects and exclude country. In macroeconomic panel data regressions country fixed effects are often used in place of institutional quality variables. This is due to the fact that by nature institutional quality variables are not volatile. Therefore, since my regressions include relatively steady values per country over time the addition of country fixed effects would add little to the results.

Before running my initial baseline regressions I included the three independent variables mentioned in the data description into the regression: trade openness, pointsourced natural resource exports and investment as a share of GDP. The baseline regressions initially included the four following equations:

\[ \text{baseline regressions} \]

\[ \text{initial baseline regressions} \]

\[ \text{heteroskedasticity} \]

\[ \text{outliers} \]

\[ \text{robust regressions} \]

\[ \text{decrease standard errors} \]

\[ \text{fixed effects} \]

\[ \text{steady values} \]

\[ \text{country fixed effects} \]

\[ \text{add little to results} \]

\[ \text{initial baseline regressions} \]

\[ \text{inclusion} \]

\[ \text{three independent} \]

\[ \text{variables} \]

\[ \text{data description} \]

\[ \text{regression} \]

\[ \text{heteroskedasticity} \]

\[ \text{outliers} \]

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\[ \text{robust regressions} \]

\[ \text{decrease standard errors} \]

\[ \text{fixed effects} \]

\[ \text{steady values} \]

\[ \text{country fixed effects} \]

\[ \text{add little to results} \]

\[ \text{initial baseline regressions} \]

\[ \text{inclusion} \]

\[ \text{three independent} \]

\[ \text{variables} \]

\[ \text{data description} \]

\[ \text{regression} \]

\[ \text{heteroskedasticity} \]

\[ \text{outliers} \]

\[ \text{robust regressions} \]

\[ \text{decrease standard errors} \]

\[ \text{fixed effects} \]

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\[ \text{regression} \]

\[ \text{heteroskedasticity} \]

\[ \text{outliers} \]

\[ \text{robust regressions} \]

\[ \text{decrease standard errors} \]

\[ \text{fixed effects} \]

\[ \text{steady values} \]

\[ \text{country fixed effects} \]

\[ \text{add little to results} \]

16 Stiglitz, Joseph. “What is the Role of the State?” 2007
17 See Appendix: Graph 1 for to observe heteroskedasticity and potential outliers in VA.
HDI  =  B_0 + B_1VA + B_2CC + B_3NatShareExports + B_4TradeOpenness 
+ B_5InvestGDP + \varepsilon 

GDPPC = B_0 + B_1VAC + B_2CC + B_3Education + B_4NatShareExports + B_5TradeOpenness 
+ B_6InvestGDP + \varepsilon 

HDI  =  B_0 + B_1VA + B_2CC + B_3NatShareExports + B_4TradeOpenness + B_5InvestGDP 
+ B_6InteractVA + B_7InteractCC + \varepsilon 

GDPPC = B_0 + B_1VA + B_2CC + B_3Education + B_4NatShareExports + B_5TradeOpenness 
+ B_6InvestGDP + B_7InteractVA + B_8InteractCC + \varepsilon 

"Accounting for Non-Linear Relationships"

As the results of the regressions show the initial baseline regressions have strong significance in VA, NatShareExports, and Education. However, CC, TradeOpenness, InvestGDP, and two additional interaction terms often suffer from a lack of significance. The first step to improve the significance of the independent variables was to look for non linear relationships. One method of searching for non linear relationships is to regress the natural logs of the variables. While it is plausible to take the natural log of most variables they should not be take for indexed measures, such as VA and CC. Taking a natural log alters the interpretation of the variable’s coefficient and it is often not conducive to indexed measures. After trying several specifications using the natural log of different variables the regressions were best using just the natural log of GDP per capita.

18 See Appendix: Regression Results 3 for initial baseline regressions.
Another way to check for non-linear relationships is the inclusion of interaction terms. I included two interaction terms, InteractVA and InteractCC, in the initial baseline in an attempt to capture what I believed would be an “upside-down U” shaped relationship between VA and development. The interaction terms correspond to the NatShareExports variable multiplied by each of the two governance indicators. However, as the regressions show, the inclusion of these interaction terms only hurt the significance of VA and CC. Therefore, instead of interacting NatShareExports with governance, I interacted NatShareExports with TradeOpenness. The rationale behind this interaction term was the impact of a country’s resource share of exports really depends on the openness of the country’s economy. Using both the natural log of GDP per capita as well as the NatShareOpen interaction term the coefficients in the last set of baseline regressions had much higher levels of significance.

“Endogeneity Issues”

One final issue I will address regarding the methodology used in my data analysis is the possibility for endogeneity, or two-way causation, to exist between my governance indicators and dependent variables. In my model I am looking to use governance indicators to explain a portion of a country’s development, measured by HDI and GDP per capita. However, while it is true that governance does explain development, the reverse can also be argued that the level of development determines the quality of a country’s institutions. The end result is the potential for endogeneity and that the coefficients on my OLS regressions may be biased.

A method commonly used to correct for endogeneity is the use of instrumental variables. An instrumental variable is supposed to harbor a strong correlation with the
independent variable and low correlation with the dependent variable. The initial attempt
to use NatShareExports as an instrumental variable was unsuccessful. Correlations
weaker than -.2 were observed with HDI and GDPPC and none were observed to be
stronger than -.3 with VA and CC\textsuperscript{19}. Another attempt to identify an instrumental
variable was natural resource share of exports multiplied by that country’s distance away
from the equator. However, with no correlation stronger than -.11 between the
instrumental variable and governance indicators, the results were unsatisfactory.

Since it proved very difficult to find an appropriate instrumental variable to
include into the panel data, the same concept was used, but with cross-sectional data.
The instrumental variable was settler mortality rates, as used by Acemoglu, Johnson and
Robinson in their work, “The Colonial Origins of Comparative Development.” The idea
behind using settler mortality rates is that they are highly correlated with present day
institutional quality variables and that it is impossible to argue that settler mortality rates
were determined by a country’s present day level of development (Acemoglu, 2001.)
The reason why this variable must be included in cross-section data is because settler
mortality rates are a single observation for each country. Therefore, the cross-sectional
data was constructed by taking averages of all the variables included in the panel data.
The underlying idea behind this strategy was to compare the regression results from the
cross-section data with those from the panel data and attempt to discover which direction
the panel data coefficients were biased towards.

\textsuperscript{19} See Appendix: Table 2, correlation matrix.
V. Hypotheses

Before running regressions examining the effects of governance upon natural resource rich developing countries’ development I had proposed several hypotheses regarding my future results. The first was that greater responsibility lies with the governments of natural resource rich developing countries that those without resource riches. In developing countries it is all too easy to siphon off significant portions of resource revenues via corruption. Money that is lining the pockets of corrupt officials does not help the development of the country, but merely enhance the personal wealth of a few. In addition, corruption is not isolated to just private resource extraction programs but also afflicts government sponsored programs. Therefore, I deemed control of corruption as a very important variable in my analysis and expected to see a positive correlation between a countries ability to control corruption and their overall development prospects.

A second hypothesis was that a resource rich developing country’s government must allow the citizens of the country an adequate political voice. Too often the government and the people view themselves as separate entities, but both must realize that cooperation is needed if they are to develop. Therefore, governments must encourage the formation of a civil society to discuss political issues and allow debate surrounding policy. To capture the formation of a civil society I used the voice and accountability variable and therefore I expected it to have a strong positive sign.

Other hypotheses I had proposed did not specifically relate to governance, but included variables such as education and degree of resource dependence. I anticipated a strong positive relationship between education and development since education is
crucial for any country looking to achieve long run sustainable development. This is particularly true for resource rich countries where human capital must be created to allow natives of the country to eventually take over the resource extraction operations as well as create new industries and diversify the economy. Also, I expected a negative relationship between the degree of a country’s resource dependence and its development. The reasoning behind this hypothesis was the greater the resource dependence of a country the more vulnerable it would be to bad governance. As a result, the smallest mistakes by its leaders would be magnified in size.
VI. Results

In the results section I will begin by explaining the cross-section regressions in which settler mortality rates were used as an instrumental variable, and move onto the results of the baseline OLS regressions I ran from the panel data.

“Instrumental Variable Regressions”

The cross-section regressions were performed for both HDI as well as GDP per capita, and instrumented for both VA and CC. All additional independent variables that were present in the panel data baseline regressions were also included. The first regression had HDI as the dependent variable and instrumented for VA. Settler mortality was significant at the 95th percentile for the first-stage regression, and when instrumented VA proved significant at the 95th percentile with a coefficient of .2741\(^2\). However, when running similar regressions for combinations of lnGDPPC, VA, and CC none of the coefficients on the instrumented variables were significant.

“OLS Regressions”

The OLS regressions I ran showed many of the independent variables to be significant, specifically when regressed upon the natural log of GDP per capita. The regressions were as follows:

\[
\begin{align*}
\text{HDI} & = B_0 + B_1VA + B_2CC + B_3NatShareExports + B_4TradeOpenness \\
& \quad + B_5InvestGDP + B_6NatShareOpen + \varepsilon \\
\text{lnGDPPC} & = B_0 + B_1VA + B_2CC + B_3Education + B_4NatShareExports + B_5TradeOpenness \\
& \quad + B_6InvestGDP + B_7NatShareOpen + \varepsilon
\end{align*}
\]

\(^{20}\) See Appendix: Regression Results 4 & 5 for first-stage regressions and instrumental variables (2SLS) regressions.
Starting with the HDI regression, VA and InvestGDP were both significant at the 99th percentile\textsuperscript{21}. The coefficient on VA was .0350 which can be interpreted as a 1 unit increase in the WGI VA index for a specific country corresponding to a .0350 increase in that same country’s HDI. To put a .0350 unit increase in HDI in context it would generally increase a country’s ranking 5 to 12 positions. The coefficient on InvestGDP was .0063, interpreted as a one unit increase in investment percent of GDP resulting in a .0063 unit increase in HDI. While a .0063 unit change in HDI seems minutely small it is in reference to a 1 percent increase in investment share of GDP, which is also a very small change. Therefore, when investment percent of GDP is looked at in the context of a 5 or 10 percent increase the corresponding increase in HDI ranges from .0315 to .0630 units.

Continuing to examine the HDI regression the coefficients on the other variables were not significant, the most important of these being CC. While it is disappointing that the regression was unable to capture a significant result regarding corruption, it is not completely unexpected since the variable often lacked significance during the initial specification regressions.

Moving onto the GDP per capita regression the results were much more impressive with the majority of the coefficients achieving significance at the 99th percentile and all of them achieving significance at a 90% percentile. To begin, VA was significant at the 99th percentile and had a coefficient of .3256. Since the regressions were performed by taking the natural log of GDP per capita the coefficients must be interpreted using a Log-Lin framework. Therefore, a .3256 coefficient means a 1 unit increase in VA results in a 32.56 percent increase in GDP per capita. While a 32.56 \textsuperscript{21} See Appendix: Regression Results 6 for final baseline regressions.
percent increase in GDP per capita seems unrealistically large when applied in context it appears logical. A 1 unit increase in the WGI VA variable is actually a very large increase since the scale of the index only extends from 2.5 to -2.5. In fact, over the timeframe that the indicators have been established only one country has experienced an increase of over 1 unit in VA\textsuperscript{22}. Next, CC was significant at the 90\textsuperscript{th} percentile and yielded a coefficient of -.1894, meaning a one unit increase in CC results in a 18.94 percent decline in GDPPC. The sign on this coefficient is surprising, but the magnitude is large as for the same reasons as with VA.

Other variables that I included in the regression and which turned out to be significant include NatShareExports, Education, and TradeOpenness. NatShareExports, measuring the share of total exports that are point-sourced natural resources, has a coefficient of -.0454 and is significant at the 95\textsuperscript{th} percentile. This is interpreted as a one percent increase in point-sourced natural resource exports decreasing GDP per capita by 4.54 percent. Next, the education variable is strongly significant at the 99\textsuperscript{th} percentile and has a coefficient of .0291. Since Education is measured as the percent of total age eligible students who attend either primary, secondary, or tertiary schools, the value corresponds to a 1 percent increase changing GDP per capita by positive 2.91 percent. Lastly, the variable measuring trade openness has a coefficient of -.0075 and is significant at the 99\textsuperscript{th} percentile. The trade openness variable is measured as a percent and therefore a 1 percent increase in trade openness decreases GDP per capita by .75 percent.

\textsuperscript{22} Nigeria experienced a 1.28 unit increase from 1996 to 2007.
VII. Discussion

I will begin the discussion of my regressions by stating how the results compared to each hypothesis and then discuss broader themes that are supported and contrasted by the two different measures of development, HDI and GDP per capita.

"Voice and Accountability"

Voice and accountability had a strongly significant positive relationship with both HDI and GDP per capita. However, as stated in the results section I harbored concerns that the .0350 coefficient for the HDI regressions was too low. Combining this value with the cross-section regressions, where the coefficient on VA was .2741, I can estimate that the coefficient on VA should be higher. It is likely that the coefficient is biased downwards; due to endogeneity issues and that the real effect of VA on HDI is greater than .0350.

Continuing with VA, I expected the coefficients to be positive; however I was surprised by the strength of its significance. One reason why I didn’t expect the VA results to be as strong as they were deals with the differences between autocratic and democratic systems of government. Typically, autocratic governments limit citizen’s political and social freedoms, and by nature drastically reduce their citizen’s ability to spearhead political regime change. However, despite the lack of freedoms autocratic regimes have been capable of producing economic growth. On the other hand, democratic governments grant their citizen’s much higher levels of political freedoms and are elected into government by the people. Likewise, democratic regimes have also been proven successful in promoting economic growth. Therefore, I was expecting a non-linear relationship. Extremely high and low levels of VA would correspond to
substantial economic development, whereas mid range values might correspond to
development failures.

A second reason why I did not expect such strong results was a suspected time lag
between VA and development. While laws may be in place encouraging free elections
and freedom of the press, there is often a time lag between when the legislation is written
and when the benefits are felt. This is particularly relevant to political freedoms where it
takes time for citizens to trust the political process and generate interest in the issues that
affect not just themselves, but their country as a whole.

Ultimately, suspicions regarding a non-linear relationship and time lags did not
materialize. Instead the regression results strongly supported the concept that citizens
must be active in a country’s political society and have a strong say in how their
government is determined.

“Control of Corruption”

Results surrounding control of corruption were considerably less significant and
therefore I was unable to draw substantial conclusions regarding its impact on
development. As mentioned in the results section, the coefficient on CC was
insignificant for HDI and significant at the 90th percentile for GDP per capita. Given this
result, it is interesting to note the sign on CC was negative when it achieved significance.
This is contrary to what I had hypothesized and against the majority of economic
literature on corruption.

One study that proposes an explanation for corruption effecting growth positively
was written by Michael Rock and Heidi Bonnett. In this study they propose that if people
can exert monopoly power over corruption networks and the corrupt are stationary with
long time horizons then the effects of corruption on growth can be positive. For example, if developing states establish beneficial relationships with capitalists looking to promote new sectors of the economy, it will help the state even if the government officials are receiving kick backs in return. However, this framework runs into problems when applied to resource rich countries since the corruption primarily affects the resource extraction process and not the creation of new sectors of the economy.

“Endogeneity Issues”

Lastly, while the problem of endogeneity between measures of development and governance indicators was mentioned in the methodology, the proposed solution was not completely successful as mentioned in the results section. Out of the four instrumental variable regressions only one of them produced a significant coefficient on the instrumented variable and therefore the direction of the bias was only estimated for one coefficient. While endogeneity issues may still bias the regression coefficients a paper written by Daniel Kaufmann and Aart Kraay, “Growth Without Governance”, argues that the endogeneity problem might of overstated. They claim by separating the relationship between governance and development into two separate equations they observe a strong positive causal effect between governance and economic development, but a slightly negative causal effect between economic development and governance. This is saying that improvements in quality of governance are unlikely to be the result of economic development, but instead other factors. Their explanation of the empirical findings rests on the idea that “if the fruits of income growth largely accrue to the elite who benefit from mismanagement of government, then the otherwise possible positive impact of income growth on governance could be offset by the effect of the elite’s negative
influence (Kaufman, 2002.)” This explanation is easily transferable to resource rich
developing countries and can be used to argue that the endogeneity problems are not as
serious as previously believed.

“Non-Governance Independent Variables”

Upon viewing the results of the non-governance variables the GDP per capita
regression exhibited a greater number of significant variables, but both regressions
demonstrated interesting results. The point-sourced natural resource exports variable
showed significance for GDP per capita, but not HDI. As expected the variable has a
negative sign, but the magnitude appears a little high. Since a one percent increase in
point-sourced natural resource exports results in a 4.54 percent drop in GDP per capita,
this also means a 10 percent increase in point-sourced natural resource exports results in a
45.40 percent drop in GDP per capita. While the former could be believable the latter
seems unreasonable as GDP per capita would not change that dramatically. The same
logic can be used when looking at the education variable, which is only present in the
GDP per capita regression.

Moving onto the trade openness variable both regressions gave significant results
and had different signs. When regressed upon HDI, trade openness proved positive, and
when regressed upon GDP per capita it was negative. This is an interesting result as
economic literature has previously cited increasing trade openness as a path to economic
growth; however, the opposite might be true for resource rich developing countries.
Increased trade openness may simply make a developing country more vulnerable to
shocks in the global economy. However, the coefficient on trade openness remains
positive when regressed upon HDI. A potential explanation for the switch in sign is that
HDI is taking factors other than simply economic growth into account in its determination of overall development. Trade openness could open channels for the increased modernization of a country ranging from political freedoms to attitudes regarding education. Both of these factors would contribute to a rise in HDI and therefore the trade openness variable may be capturing these effects whereas GDP per capita does not.
VIII. Conclusion

In conclusion, my thesis has yielded interesting significant results, but there were disappointments. The most obvious disappointment was the lack of significance surrounding CC. In future analysis it might be appropriate to direct research towards governance indicators other than CC, or use different CC data. Another potential change in analysis would be to break down the VA variable into its components in an attempt to pinpoint the specific elements of citizen-government contact that are most beneficial to growth.

Despite these proposed alterations my results still unearthed interesting conclusions. Two broad conclusions can be reached from the strong positive relationship between VA and the development indicators and the lack of significant relationship between CC and the development indicators. First, VA is of greater importance than CC in determining which aspects of governance effect the development of resource rich developing countries. Second, is that change in VA affects HDI and GDP per capita equally.

The first conclusion is plausible since the government and citizens need to work together effectively if resource revenues are to be redistributed in a growth friendly manner. While it is hard to believe CC does not play a role in development, the importance of the citizenry and the government working together cannot be overlooked. The second conclusion was unexpected, but produces important findings regarding development. Before the analysis I expected that an increase in quality of governance would increase human development more than economic development. I suspected this would hold even greater truth when referring to a governance indicator dealing with
entirely non-economic factors such as political freedoms and rates of participation in elections. However, it can be concluded that changes in some measure of governance will yield equal changes in HDI and GDP per capita.

Extending conclusions towards non-governance indicators, it is clear that the results begin to show variations between HDI and GDP per capita. Observing the results it is apparent the signs for trade openness are different and the same is true for the interaction term reporting trade openness multiplied by point-sourced resource exports. As reported in the discussion there are possible explanations for the variables having these signs, but when combined with the conclusions reached regarding governance they paint a bigger picture. While changes in economic variables can push human and economic development in different directions, changes in quality of governance will guide both forms of development in the same direction.

In conclusion, my thesis focused on the ability of governance to explain changes in the development of resource rich developing countries. Whereas previous literature had already studied this topic in considerable depth I approached it from a different angle, using measures of both human and economic development indicators as well as limiting my sample size to strictly resource rich developing countries. My findings lend support to the theory that governance plays a large role in determining whether a resource rich developing country will be a development success or failure. However, where my results move beyond previous literature is that they indicate improvements in quality of governance will increase human and economic development whereas purely economic policy initiatives may only increase one form of development. Specifically, the results demonstrated strong increases in growth when citizens were granted greater a political...
voice and elected officials were held more accountable for their actions. As resource rich
developing countries look to handle the responsibility of resource wealth they must
consciously improve the quality of their government by including more the country’s
citizens into the political process. Only then will resource rich developing countries be
on a path to sustainable human and economic development.
IX. Appendix

The written appendix serves as a more detailed data description. Starting with
more information regarding the WGI, descriptions of the governance indicators as well as
other variables will be included. After the written portion of the appendix, data tables
and regression tables will follow.

The data for the six variables described above come from 31 different data
sources provided by 25 both governmental and private organizations. These
organizations range from well know economic development organizations such as
Freedom House to smaller regional organizations that collect data via surveys of
households and firms. Each government indicator is an indexed value of many different
statistics pertaining to that specific aspect of governance. For example, Freedom House
measures VA using data covering: political rights, civil liberties, freedom of the press,
civil society, electoral process, and public voice. In contrast, the Economist Intelligence
Unit measures VA focusing on: vested interests, accountability of public officials,
human rights, and freedom of association. Therefore, since the governance indicators are
based upon an extremely large amount of data, discrepancies between individual sources
are smoothed out when combined. All told, the six fundamental governance concepts are
derived from over 300 measures of governance.

In addition, to the WGI variables measuring governance I included other
independent variables into my analysis. The first was education. While education does
not specifically fall under the WGI’s definition of governance, the development of human
capital is a clear indication of whether a country’s government cares about its citizens and
is looking ahead to long term sustained development. Education is especially important
in natural resource rich countries where often a major barrier to development is that the country’s citizens are not educated enough to extract the resource wealth by themselves.

To measure education I used the primary, secondary, and tertiary school gross enrollment percentage. This variable is obtained by dividing the number of people in a country who are enrolled in either primary, secondary, or tertiary schools by the total number of people who are of the appropriate age for any of the three types of schools. The data comes from the World Development Indicators and I pulled observations from 1996 to 2007. Where there were gaps in the WDI data I supplemented it with data found on individual Human Development Reports.

Since I am studying the effects of governance on countries with large natural resource endowments an independent variable is needed to distinguish the extent to which different countries are resource dependent. The 41 country sample size already narrows the list down, but a distinction needs to be made between those who are mildly and highly dependent on natural resource. Therefore, another variable included in the data set is resource share of total exports. This variable was calculated by identifying which commodities were to be classified as point sourced on the Standard International Trade Classification (SITC) list. Using guidelines from United Nations Conference on Trade and Development (UNCTAD) online database, the commodities used were numbers: 27, 28, 3, 68, 667, and 971. After summing the total value exported for each commodity it was divided by the total nominal value of exports to give a resource percent of total exports.

Two additional variables were included capturing trade openness and investment as a share of GDP. The trade openness variable sums a country’s exports and imports
and then divides by total GDP for that same year. Data for the variable came from the United Nations Conference on Trade and Development (UNCTAD) online database and looks to capture the degree of interconnectivity each country has in global markets as well to explain some of the overall deviation in both HDI and GDP per capita. Data on investment divided by GDP was pulled from the WDI under the title of gross capital formation as a percentage of GDP. This variable captures the level of government and private investment that is essential to drive long term GDP growth.
Table 1
Country List in Sample Size

<table>
<thead>
<tr>
<th>Country</th>
<th>Average oil, gas, and mining share of total exports (1990-99) %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Algeria</td>
<td>28.7</td>
</tr>
<tr>
<td>Angola</td>
<td>83.5</td>
</tr>
<tr>
<td>Armenia</td>
<td>20.0</td>
</tr>
<tr>
<td>Bolivia</td>
<td>35.6</td>
</tr>
<tr>
<td>Botswana</td>
<td>70.0</td>
</tr>
<tr>
<td>Cameroon</td>
<td>33.5</td>
</tr>
<tr>
<td>Central Afr. Republic</td>
<td>42.1</td>
</tr>
<tr>
<td>Chile</td>
<td>46.6</td>
</tr>
<tr>
<td>Congo (Dem. Rep.)</td>
<td>80.0</td>
</tr>
<tr>
<td>Congo, Rep.</td>
<td>88.1</td>
</tr>
<tr>
<td>Ecuador</td>
<td>30.4</td>
</tr>
<tr>
<td>Gabon</td>
<td>73.8</td>
</tr>
<tr>
<td>Ghana</td>
<td>34.0</td>
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<td>Guinea</td>
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<td>Iran</td>
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<td>Kazakhstan</td>
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<td>Kyrgyz Republic</td>
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<td>Peru</td>
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<td>Syria</td>
<td>48.9</td>
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<tr>
<td>Togo</td>
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<td>Yemen</td>
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<td>Zambia</td>
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Table 2
Correlation matrix

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<tr>
<th></th>
<th>VA</th>
<th>GE</th>
<th>RQ</th>
<th>CC</th>
<th>PS</th>
<th>RL</th>
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<td>VA</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>GE</td>
<td>0.7469</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RQ</td>
<td>0.252</td>
<td>0.2155</td>
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<td></td>
<td></td>
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<tr>
<td>CC</td>
<td>0.2702</td>
<td>0.2772</td>
<td>0.7769</td>
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<td></td>
</tr>
<tr>
<td>PS</td>
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<td>0.599</td>
<td>0.3283</td>
<td>0.3446</td>
<td>1</td>
<td></td>
</tr>
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<td>0.2981</td>
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Graph 1

Scatter plot demonstrating potential heteroskedasticity
Graph 2
Differences between HDI and GDP per capita

Two different stories: from human development to income

HDI and GDP data refers to 2005 as reported in the 2007/2008 Report.

23 Graph developed by Human Development Reports, “How HDI relates to GDP.”
### Regression Results 1

**Initial Specification Regressions GDPPC**

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| N    | 260 | 260 | 260 | 260 |
| r²   | 0.3312 | 0.3101 | 0.3313 | 0.5087 |

Standard errors in parentheses
* p<.10, ** p<.05, *** p<.01
## Regression Results 2

*Initial Specification Regressions HDI*

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| N    | 266          | 266          | 266          | 266          |
| r2   | 0.7347       | 0.7606       | 0.7335       | 0.7609       |

*Standard errors in parentheses
* p<.10, ** p<.05, *** p<.01*
Regression Results 3
*Initial Baseline Regressions*

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N: 252  r^2: 0.1926  0.3175  0.1984  0.3191

Standard errors in parentheses
* p<.10, ** p<.05, *** p<.01
### Regression Results 4

*First-Stage instrumental Variable Regressions*

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Standard errors in parentheses
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### Regression Results 5

**Instrumental Variables (2SLS) Regressions**

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<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>HDI</td>
<td>GDPPC</td>
<td>HDI</td>
<td>GDPPC</td>
</tr>
<tr>
<td><strong>VA</strong></td>
<td>0.2741**</td>
<td>1779.1528</td>
<td>0.2075*</td>
<td>1449.2424</td>
</tr>
<tr>
<td></td>
<td>(0.1237)</td>
<td>(1432.4389)</td>
<td>(0.1090)</td>
<td>(900.2879)</td>
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<tr>
<td><strong>CC</strong></td>
<td>-0.1076</td>
<td>-101.0152</td>
<td>-0.5212</td>
<td>-1155.1221</td>
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<tr>
<td></td>
<td>(0.0694)</td>
<td>(629.7702)</td>
<td>(0.4382)</td>
<td>(2289.4657)</td>
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<tr>
<td><strong>education</strong></td>
<td>26.2363</td>
<td>31.3115</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(26.9355)</td>
<td>(20.8120)</td>
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<td></td>
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<tr>
<td><strong>natshareex-s</strong></td>
<td>0.0056</td>
<td>0.3711</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.0033)</td>
<td>(33.5400)</td>
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</tr>
<tr>
<td><strong>trade_open-s</strong></td>
<td>0.0015</td>
<td>-26.2762*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.0015)</td>
<td>(12.9214)</td>
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<tr>
<td><strong>investgdp</strong></td>
<td>0.0093</td>
<td>62.0798</td>
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</tr>
<tr>
<td></td>
<td>(0.0071)</td>
<td>(55.1539)</td>
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<tr>
<td><strong>natshareopen</strong></td>
<td>-0.0000*</td>
<td>0.3337</td>
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<tr>
<td></td>
<td>(0.0000)</td>
<td>(0.3043)</td>
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<tr>
<td><strong>_cons</strong></td>
<td>0.2396</td>
<td>6.2158</td>
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</tr>
<tr>
<td></td>
<td>(0.1714)</td>
<td>(1644.4255)</td>
<td></td>
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</tr>
</tbody>
</table>

|        | 25               | 26               | 26               | 26               |
|        | 0.3501           | 0.5407           |                | 0.4955           |

*Standard errors in parentheses

* p<.10, ** p<.05, *** p<.01
Regression Results 6
Final Baseline Regressions

<table>
<thead>
<tr>
<th></th>
<th>(1) HDI</th>
<th>(2) lnGDPPC</th>
<th>(3) HDI</th>
<th>(4) lnGDPPC</th>
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</thead>
<tbody>
<tr>
<td>VA</td>
<td>0.0345*** (0.0124)</td>
<td>0.3451*** (0.0800)</td>
<td>0.0350*** (0.0125)</td>
<td>0.3256*** (0.0779)</td>
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<tr>
<td>CC</td>
<td>0.0132 (0.0200)</td>
<td>-0.2013* (0.1071)</td>
<td>0.0122 (0.0201)</td>
<td>-0.1894* (0.1027)</td>
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<tr>
<td>natshareex-s</td>
<td>-0.0010*** (0.0004)</td>
<td>0.0099*** (0.0027)</td>
<td>0.0032 (0.0026)</td>
<td>-0.0454** (0.0180)</td>
</tr>
<tr>
<td>education</td>
<td>0.0287*** (0.0026)</td>
<td>(0.0026)</td>
<td>(0.0026)</td>
<td>0.0291*** (0.0026)</td>
</tr>
<tr>
<td>trade_open-s</td>
<td>0.0001 (0.0002)</td>
<td>0.0010 (0.0014)</td>
<td>0.0007* (0.0004)</td>
<td>-0.0075*** (0.0028)</td>
</tr>
<tr>
<td>investgdp</td>
<td>0.0062*** (0.0013)</td>
<td>0.0384*** (0.0120)</td>
<td>0.0063*** (0.0013)</td>
<td>0.0374*** (0.0117)</td>
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<td>(0.0009)</td>
<td>(0.0006)</td>
<td>0.0124*** (0.0040)</td>
<td>(0.0040)</td>
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<tr>
<td>_cons</td>
<td>0.4553*** (0.0346)</td>
<td>3.8433*** (0.3858)</td>
<td>0.4075*** (0.0435)</td>
<td>4.4237*** (0.4050)</td>
</tr>
</tbody>
</table>

N: 252 247 252 247
r²: 0.1926 0.4646 0.1978 0.4809

Standard errors in parentheses
* p<.10, ** p<.05, *** p<.01
X. Works Cited


