DEPARTMENT OF ECONOMICS AND FINANCE

CHAIR OF APPLIED STATISTICS AND ECONOMETRICS

AN ECONOMETRIC ANALYSIS: EFFECTS OF NATURAL RESOURCES ON GROSS DOMESTIC PRODUCT

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Academic Year 2021/2022

ABSTRACT

This work tries to analyse the link between Gross Domestic Product (GDP), in particular GDP per capita, and natural resources present within a country's borders. The effect of natural resources has long been debated by economists worldwide: some argue that resources positively impact a country's GDP, others say they have no measurable effect, others still report the presence of natural resources may be detrimental to the economic growth and prosperity of a country.

The first step to disentangle the dilemma is to present the key players, that are GDP and natural resources; then to further unravel the problem a statistical analysis is needed. We applied a fixed effects regression model which takes into account the data for 153 countries around the world referring to the last fifty years. The results of the econometric analysis show that natural resources are not significant to explain a country's GDP per capita. Finally, in the economic analysis section the results are presented, explaining the theories of the resource curse and of the Dutch disease phenomenon.

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I. INTRODUCTION

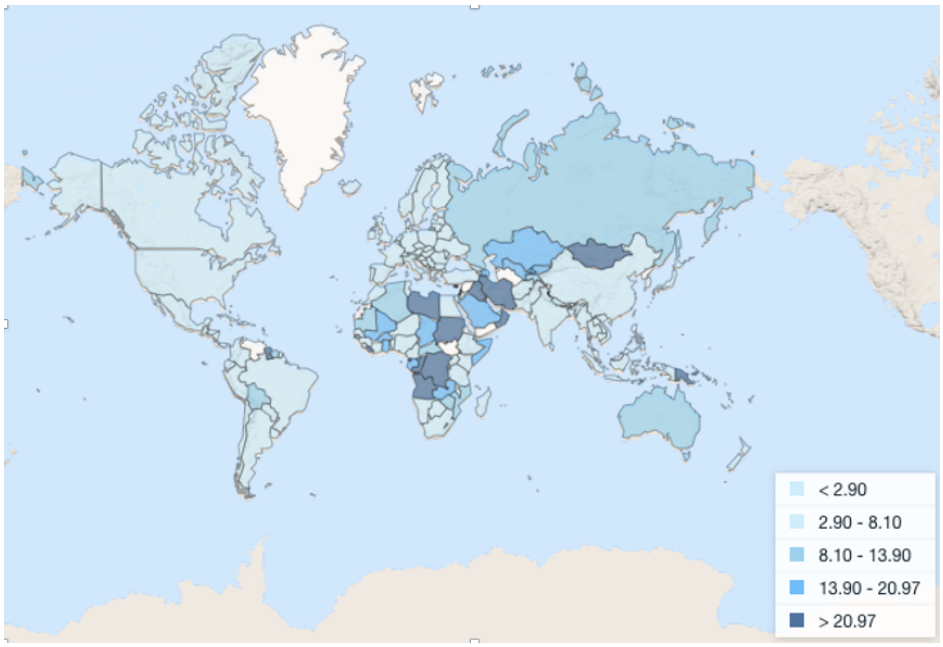
Natural resources and economic growth and development have gone hand in hand from the beginning of times. As we think of the most prominent civilizations throughout the millennia, it is impossible not to think of the great impact that a prosperous and resource rich land has on economic and cultural development. One may think, for example, of the Roman empire that during its golden era relied heavily upon natural resources. As a matter of fact, starting from the beginning of the reign of Emperor Augustus up to the III century AD, Romans used to perform intense gold, iron and other metals mining. In regions such as Spain (rich in gold, silver, copper, tin, and lead), and Britain (rich in iron, lead, and tin) many alluvial deposits were mined to extract the precious materials crucial for the production of weapons, minting of coins, and production of utensils at large.

But what exactly are natural resources? This question is crucial in understanding the developing of this work and to answer it is best to use the definition provided by the World Trade Organization (WTO) which defines natural resources as: "stocks of materials that exist in the natural environment that are both scarce and economically useful in production or consumption, either in their raw state or after a minimal amount of processing"[1]. During the econometric analysis in this work natural resources are represented using natural resources rents which are the surplus values once all costs and returns have been taken into account.

The natural resources landscape nowadays. Today natural resources play a huge role even in our everyday life, as natural resources are needed for the use and production of everyday services and goods. Figure 1 shows how total natural resources rents vary a lot across the globe, and how countries with higher natural resources rents are usually associated with a lesser level of development, but we will see in chapter four why this may be the case.

[1] World Trade Organization. (2010). *World Trade Report 2010: Trade in natural resources.* World Trade Organization. https://www.wto.org/english/res_e/publications_e/wtr10_e.htm.

Figure 1. Heat map of total natural resources rents across the world, % of GDP, 2020. Source: World Bank, Total Natural Resources Rents.



So far, only the positive side of natural resources has been shown. In recent times economists have tried to precisely determine the effect of natural resources on a country's Gross Domestic Product (GDP) but this has produced mixed results. Some researchers report that natural resources only affect positively a country's GDP just like history has shown for the past times, others contrarily believe that natural resources exert a negative effect on a country's wealth. A third vein concludes that no effect can be traced between the two.

II. GROSS DOMESTIC PRODUCT

a. A Brief History of Gross Domestic Product

Gross domestic product or as it is commonly referred to GDP, is quite possibly the most famous economic measure of all. We hear politicians, economists and journalists talk about it all the time, but what exactly is GDP?
GDP is a measure of all final goods and services produced within a specific country and during a specified time period. It is also important to note that GDP has as unit of measure currency, may it be the country's specific currency or a more common currency, such as in this work the US dollar.

The first classical version of GDP was invented by Royal Society economist William Petty (1623-1687). Petty believed that a nation's wealth was far greater than just the amount of gold and silver it possessed, so he came up with the first estimate of England's national income using the method of double-entry bookkeeping. All this was done to establish whether England was capable of financing its conflict with the Dutch, by measuring the economy's monetary value as a whole and estimating the total tax revenue.
Fast forward to World War II prominent economist John Maynard Keynes published a book, *"How to Pay For The War"*[2], in his essay he complained about the poor reliability of the statistics available at the time and how every government has deemed collecting statistics a waste of money.
GDP then evolved from a tool for measuring war financing to the more peaceful statistic we all know when, understanding its great potential, British Treasury official, Austin Robinson, commissioned two young economists, Richard Stone and James Meade, to develop what would become the first GDP report, later published with the United Kingdome government's budget in 1941.

[2] Keynes, J. M. (1940). How to Pay for the War: A Radical Plan for the Chancellor of the Exchequer. Macmillan and Co., Ltd.

The last evolution of GDP measurement occurred in 1946, when a committee of statisticians encharged by the United Nations gathered at Hunter College in New York and redacted the recommendations for collecting national statistics.

The follow up question should be, how do we determine GDP? Three approaches exist: The first one, called the *value added approach,* consists of summing the Gross Value Added, gross value of output-value of intermediate goods, across all industries then adding taxes and subtracting subsidies to get the GDP at market prices.

The second method, called the *income approach*, is based on the belief that all expenditures in an economy should be equal the total income generated by the production of all goods and services a common formulation for GDP is:

$$GDP = COE + GOS + GMI + T_{P\&M} - S_{P\&M} \quad (1)$$

Where:

- *COE*, compensation of employees, indicates the total remuneration to employees for their work.
- *GOS*, gross operating surplus is the surplus due to owners of incorporated businesses.
- *GMI*, gross mixed income, is the surplus of non-incorporated businesses.
- $T_{P\&M}$, taxes on production and imports.
- $S_{P\&M}$, subsidies on production and imports.

The third and final *demand* or *expenditure approach*, is arguably the most common way of computing GDP, and it works according to the following equation:

$$GDP = C + I + G + (X - M) \quad (2)$$

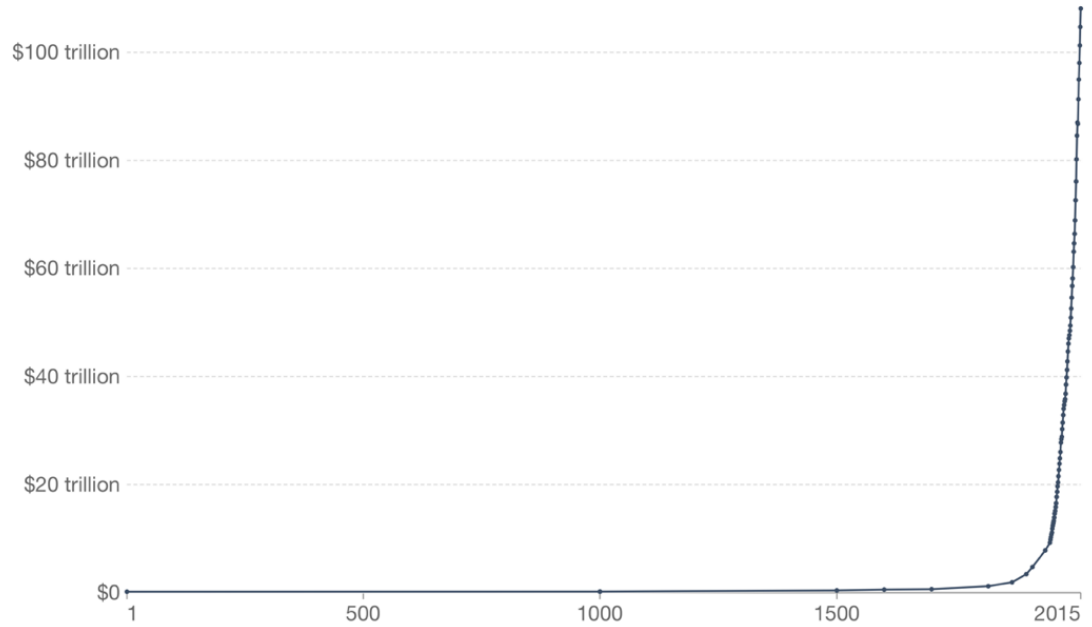
Where:

- *C* is consumption.
- *I* is investments.
- *G* is government spending.
- *X-M* is exports minus imports.

b. GDP Growth, a Surprisingly Recent Phenomenon

There is for sure a strong link between economic growth and natural resources as previously highlighted in the introduction section, but as strange as it may seem GDP growth is a surprisingly recent phenomenon since world GDP has been increasing only in the last two and a half centuries. This growth was certainly sparked by the beginning of the industrial revolution which took place in 18th century in England (Figure 2). The mechanism that generates this economic growth also nowadays works as such: technological advances increase the wages of those capable of using such advantages skillfully, these higher wages induce more people to invest in the acquisition of such skills and families will then invest more on quality rather than quantity of children. The return to acquiring skills keeps increasing, driving this process on and on. It is easy to see how the link between natural resources and GDP growth is still very tight up to this day as technological advances would not be possible without natural resources. Think of how we could build computers and electronic devices without the precious metals that are used to produce the chips that run them.

Figure 2. World GDP over the last two millennia (International $ in 2011 prices, adjusted for inflation)



c. GDP: Limitations and Criticisms

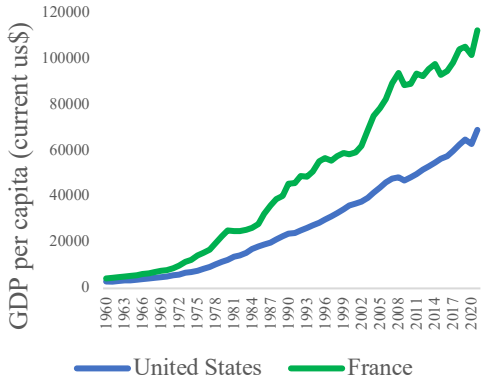
"Gross national product does not allow for the health of our children, the quality of their education or the joy of their play. It does not include the beauty of our poetry or the strength of our marriages, the intelligence of our public debate or the integrity of our public officials. It measures neither our wit nor our courage, neither our wisdom nor our learning, neither our compassion nor our devotion to our country. It measures everything in short, except that which makes life worthwhile."[3]

The words of Robert F. Kennedy are clear in stressing the limitations of GDP, as it only takes into account the economic wealth of a nation, but not even that as it disregards income disparity within a country. GDP poorly functions as an indicator of well-being since it may rise even in instances that have negative social impacts. As an example, we may take extreme weather-related events. Hurricanes that have seen an increase with the recent climate changing conditions, the damage done by hurricanes Katrina and Sandy on the southern coasts of US added tens of billions to GDP as resources are brought in to cope with the disasters. Certainly, hoping for more catastrophes to increase GDP is not what one does.

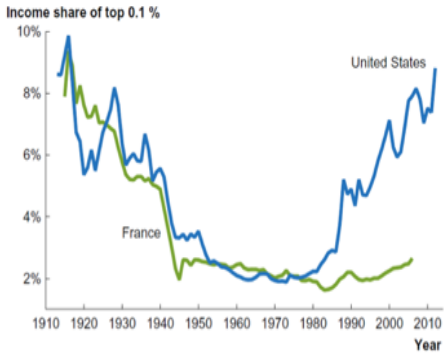
This easy example clearly shows how GDP neglects several factors that most of us would consider particularly important in evaluating the well- being of a society. These factors, along with others, include: income distribution, the quality of the environment, leisure time, the value of democracy, and happiness.

Figure 3. Panel A: GDP per capita (current US$) US vs. France. Source: World Bank. Panel B: Income share of top o.1% US vs. France. Source: The World Top Incomes Database.

A



B

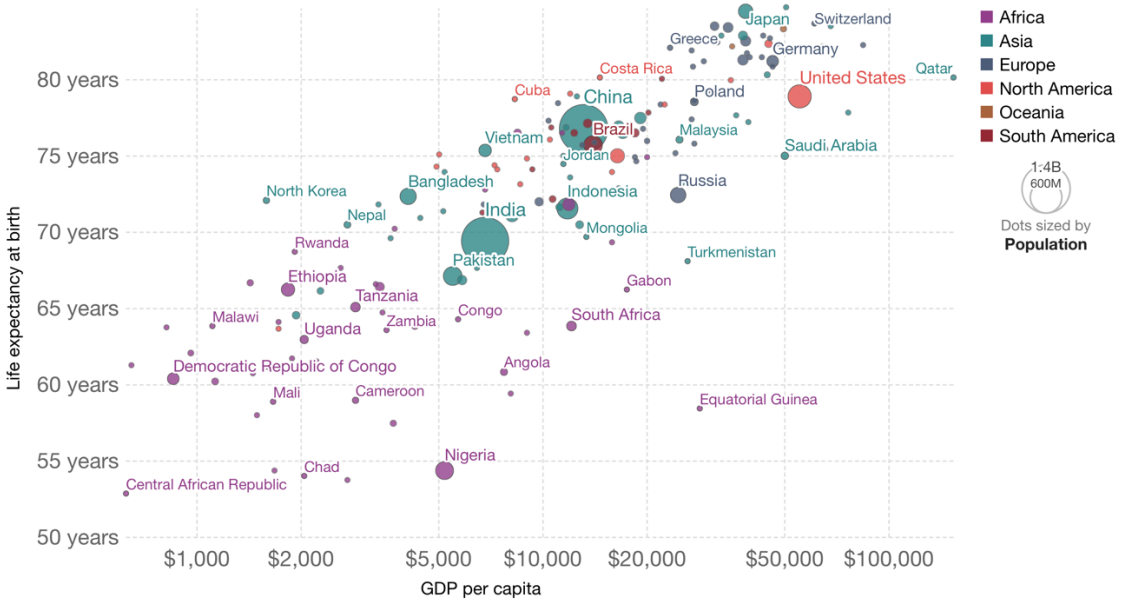


[3] Robert F. Kennedy, Remarks at the University of Kansas, March 18, 1968.

Figures 3 show exactly this, we can see how GDP per capita, and income share of the top 0.1% follow a very similar path starting from the 1970s. Yet, both France and the United States have been getting richer but not all citizens have, as income disparity, also seen a surge.

Not all is lost as there is plenty of scientific evidence that shows how many statistics, not encompassed by GDP positively correlate with it. Some of these well-being statistics include health and life expectancy (Figure 4), education, and happiness. The following graph precisely shows this, comparing life expectancy at birth and GDP on a global level.

Figure 4. Life expectancy vs. GDP per capita, 2018. GDP is measured in 2011$. Source: Clio_Infra & UN population division, Maddison project database 2020.



III. DATA AND METHODS

a. Data Collection

For the purpose of the analysis, the data was gathered from the database of the World Bank. The predictor variable is *GDP per capita (GDP_capita)*, that is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products divided by midyear population. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. It is expressed in constant 2015 U.S. dollars. The explanatory variables used are the following:

- *Total natural resources rents (nat_res)*, the main variable to be tested, refers to the sum of oil rents, natural gas rents, coal rents (hard and soft), mineral rents, and forest rents. Rents are the surplus values once all costs and returns have been taken into account. That is the difference between the price at which an output, deriving from a resource, can be sold and its extraction or production costs, including normal return. Expressed as percentage of GDP.

- *Gross capital formation (cap_form)*, expressed as percentage of GDP consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories. Fixed assets include land improvements (fences, ditches, drains, and so on); plant, machinery, and equipment purchases; and the construction of roads, railways, and the like, including schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings. Inventories are stocks of goods held by firms to meet temporary or unexpected fluctuations in production or sales.

- *Current account balance (CA_bal)* is the sum of net exports of goods and services, net primary income, and net secondary income. This variable is also expressed as percentage of GDP.

- *Foreign direct investments (FDI)* are the net inflows of investment to acquire a long-lasting management interest (10 percent or more of voting stock) in an enterprise

operating in an economy different than that of the investor. It is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments. This series shows new investment inflows less disinvestment in the selected economy from foreign investors and is divided by GDP and expressed as a percentage of it.

- *Household final consumption expenditure (consumption)* is the market value of all goods and services, including durable products, purchased by households. It excludes purchases of residences but includes imputed rent for owner-occupied houses. It also includes payments and fees to governments to obtain permits and licenses. Here, household consumption expenditure includes the expenditures of non-profit institutions serving households, even when reported separately by the country. This item also includes any statistical discrepancy in the use of resources relative to the supply of resources and is expressed as percentage of GDP.

- *Gross savings (savings)*, expressed as percentage of GDP are calculated as gross national income less total consumption, plus net transfers.

The time span of the data ranges from 1970 up until 2015 and all the variables are reported on a yearly basis. Given that the dataset includes many countries of the world, and many had missing values for the variables used (leaving 153 countries in the dataset used for the econometric analysis), the following countries were excluded from the analysis:

American Samoa, Andorra, Angola, Bermuda, British Virgin Islands, Cayman Islands, Channel Islands, Cabo Verde, Curacao, Djibouti, Dominica, Equatorial Guinea, Ethiopia, Faroe Islands, French Polynesia, Gibraltar, Greenland, Grenada, Guam, Guyana, Isle of Man, Kiribati, Korea, Dem. People's Rep., Kosovo, Lao PDR, Lesotho, Liberia, Liechtenstein, Malawi, Mali, Maldives, Marshall Islands, Micronesia Fed. Sts., Monaco, Montenegro, Myanmar, Nauru, New Caledonia, Northern Mariana Islands, Palau, Papua New Guinea Samoa, San Marino, Sao Tome and Principe, Seychelles, Sint Maarten (Dutch part), Somalia, South Sudan, St. Kitts and Nevis, St. Lucia, St. Martin (French part), St. Vincent and the Grenadines, Sudan, Suriname, Syrian Arab Republic, Timor-Leste, Trinidad and Tobago,

Turkmenistan, Turks and Caicos Islands, Tuvalu, United Arab Emirates, Vietnam, Virgin Islands (U.S.), Yemen, Rep., Zambia.

b. Fixed Effect Regression Model

The kind of data used is called panel data, since it captures the behaviour of entities across time. Panel data, also known as longitudinal data, allows to control for variables one cannot observe or measure (such as cultural factors) and also allows to control for variables that change over time but not across countries (such as national policies, international agreements).

The regression model used is the fixed effect regression model, since we are interested in analysing the impact of variables that vary over time, in this case GDP per capita.

When employing fixed effect, we make the assumption that the individual's characteristics may influence or bias the predictor or outcome variables, and we must account for this.
We may evaluate the overall impact of the predictors on the outcome variable by removing the impact of those time-invariant traits using FE.
Another important hypothesis of the FE model is that those time-invariant characteristics are exclusive to the individual and should not be correlated with other individual characteristics. Each entity is different therefore the entity's error term and the constant (which captures individual characteristics) should not be correlated with the others.

The equation for the entity (country) fixed effect regression thus becomes:

$$Y_{it} = \beta_0 + \beta_1 X_{1,it} + \cdots + \beta_k X_{k,it} + y_2 E_2 + \cdots + y_n E_n + u_{it} \quad (3)$$

Where:

- i is the entity and t is time (years).
- Y_{it} is the dependent variable.
- $X_{k,it}$ represents the independent variables.
- β_k is the coefficient for the independent variables.
- u_{it} is the error term.

- E_n is entity *n,* since they are binary dummies we have *n-1* entities in the model to avoid the *dummy variable trap*.
- y_2 is the coefficient for the binary repressors.

In the analysis we also want to control for time fixed effects. This means controlling for underlying observable and unobservable systematic differences between observed time units, to do so a year dummy is inserted in the regression model, and thus the equation evolves into:

$$Y_{it} = \beta_0 + \beta_1 X_{1,it} + \cdots + \beta_k X_{k,it} + y_2 E_2 + \cdots + y_n E_n + \delta_2 T_2 + \cdots + \delta_t T_t + u_{it} \quad (4)$$

Where:

- *i* is the entity and *t* is time (years).
- Y_{it} is the dependent variable.
- $X_{k,it}$ represents the independent variables.
- β_k is the coefficient for the independent variables.
- u_{it} is the error term.
- E_n is entity *n,* since they are binary dummies we have *n-1* entities in the model to avoid the *dummy variable trap*.
- y_2 is the coefficient for the binary repressors.
- T_t represents time as a dummy variable, so we have *t-1* time periods to avoid the *dummy variable trap*.
- δ_t is the coefficient for the time regressors.

Applying this equation to the model we get:

$$GDP\_capita_{it} = \beta_0 + \beta_1 consumption_{it} + \beta_2 cap\_form_{it} + \beta_3 CA\_bal_{it} + \beta_4 savings_{it} + \beta_5 FDI_{it} + \beta_6 nat\_res_{it} + country\ fixed\ effect + time\ fixed\ effect + u_{it} \quad (5)$$

Where *i* represents country *i* and *t* denotes the year ranging from 1971 to 2020. The strength of this analysis is that including country and time fixed effects mitigates the threat of omitted variable bias arising from unobserved variables that either do not change over time (like cultural attitudes) or do not vary across countries.

IV. EMPIRICAL RESULTS AND ECONOMIC ANALYSIS

a. Empirical Results

In order to test whether natural resources have a significant impact on the GDP per capita of a country we devise a hypothesis test, testing at 95% confidence level the following two hypothesis:

- H_0: $\beta_{nat\_res,0}=0$
- H_1: $\beta_{nat\_res,0}\neq 0$

To test this hypothesis, we must first compute the *t*-statistic by dividing the estimated coefficient by its standard error. The resulting ratio tells us how many standard-error units the coefficient is away from zero.

We then compute the p-value, the probability of observing a value of $\beta\widehat{nat\_res}$ at least as different from $\beta_{nat\_res,0}$ as the estimate computed, assuming that the null hypothesis is correct.[4]

If the p-value is less than 0.05 we can reject the null hypothesis H_0.

VARIABLES	Statistics
consumption	-146.0262***
	(10.43049)
cap_form	-82.67454***
	(14.45038)
CA_bal	35.98421***
	(13.72075)
savings	-47.31585***
	(14.043)

[4] Stock, J. H., & Watson, M. W (2020). *Introduction to Econometrics*. Pearson.

FDI	17.6251***
	(4.002388)
nat_res	23.20049
	(14.27197)
constant	14313.57***
	(1532.528)
Observations	5,014
Number of Groups	148
R-squared	0.2048

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

$$GDP\_capita_{it} = 14313.57 - 146.0262 consumption_{it} - 82.67454 cap\_form_{it} + 35.98421 CA\_bal_{it} - 47.31585 savings_{it} + 17.6251 FDI_{it} + 23.20049 nat\_res_{it} + country\ fixed\ effect + time\ fixed\ effect + u_{it} \quad (5.1)$$

We can observe that the R-squared is 0.2048, this means that the independent variables explain 62% variance of the dependent variable. Moreover, we can see how the variable encompassing natural resources is not statistically significant in explaining GDP per capita on a global level.

Figure 5. GDP per capita vs. natural resources rents. Source: World Bank. (2020). Total natural resources rents (% of GDP), GDP per capita (constant 2015 US $).

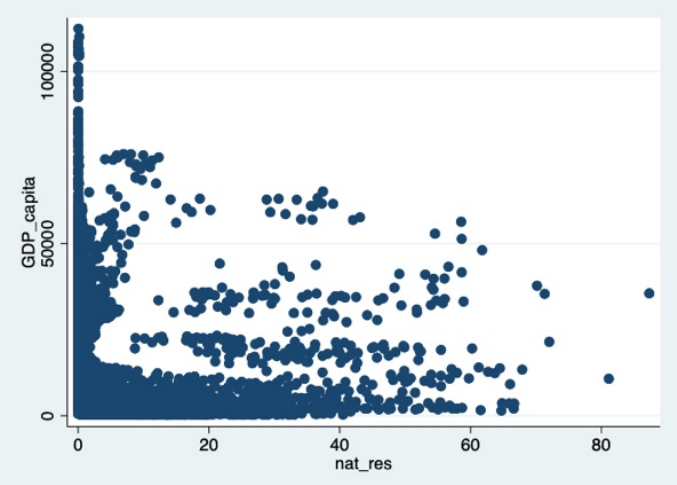


Figure 5 shows a scatter plot, in particular, it points out how GDP per capita –located on the *y*-axis– and natural resources presence –located on the *x*-axis– are uncorrelated. In fact, the dots do not align on a precise line, but are rather disposed randomly on the *xy* plane.
This disposition confirms the fact that GDP per capita and natural resources presence among world countries are uncorrelated.

Moreover, we also need to interpret the coefficients. Take for example the coefficient for current account balance (CA_bal), which is ≈36.0. This means that if current account balance were to increase by 1 unit (1%) GDP per capita would increase by 36 units (36 US$). Applying the same reasoning for natural resources rents (nat_res) we obtain that an increase by 1 unit (1%) leads to an increase of ≈23.20 US$ in GDP per capita, were the variable statistically significant.
The fact that the variable natural resources rents is not statistically significant means that the variable natural resources rents has no effect on the dependent variable (GDP per capita). Why this may be the case is a difficult answer to give. One explanation may be that the regression contains the data for 153 countries around the globe and that the average effect of natural resources, tested at 95% confidence, may be null as some countries' GDP relies heavily on natural resources such as The Republic of Congo, and Iraq, while other countries don't, as for Malta and Luxembourg. With the result being that natural resources rents on average don't play a great part in explaining GDP.

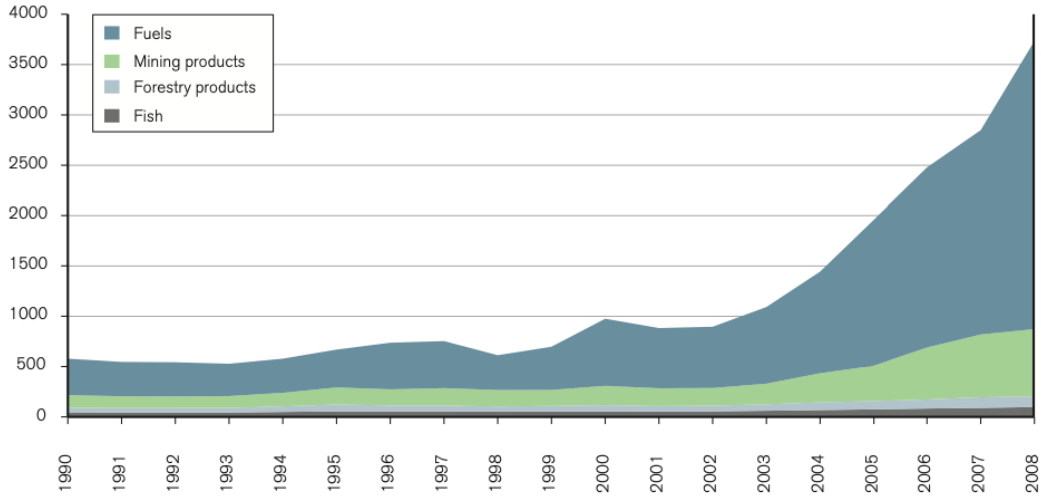
b. Economic Analysis: Natural Resources, Blessing or Curse?

To many the results of the first regression may seem surprising and rightly so, it would be instinctive to think that the availability of natural resources on a country's land would induce a higher GDP per capita.

However, many explanations exist in favour of the evidence brought forward in the regression analysis.

The first one being that the data available takes into consideration only the last fifty years (1971-2020) and during this period trade has vastly improved to the point where not having natural resources within a country's borders is not much of an impediment as it is fairly easy and cheap to import natural resources from resource-rich countries. Figure 6 shows how world trade in some natural resources such as fuels, mining products, forestry products, and fish have seen a great increase in the span of just eighteen years.

Figure 6. World natural resources exports by product, 1990-2008 (Billion dollars). Source WTO secretariat estimates.



An important point is brought forward by some economists that argue that excessive dependency on natural resources exports may even be detrimental to economic growth, leading to the so-called *resource curse*, whereby resources become more of an economic disadvantage than an instrument that boosts economic growth. The most famous case of this phenomenon is the *Dutch disease*. The term refers to the decline of the Dutch manufacturing sector after the discovery of the Groningen natural gas field in 1959. The transmission mechanism for the *Dutch disease* works as such: natural resources booms increase income and demand for goods and services, which in turn leads to inflation and appreciation of the real exchange rate. Via

this appreciation the export of non-resource commodities become more expensive vis à vis the world market prices, attracting less and less investments. This negative effect on the resource-rich country's economic growth is called *spending effect*.

Adding to this effect, internal inputs (labor and materials) are shifted to the natural resource sector. The prices of these inputs rise in the domestic market. As a result, the production costs of other export sectors (manufacturing and agriculture) increase, contracting these sectors. This adverse effect on non-resource sectors is called the resource *pull effect*. The *spending* and *pull* effects of growth in resource output crowd out non-resource output, and growth overall.

Another factor that may explain the absence of a sizeable effect of natural resources on GDP per capita within a country is the key role that institutions play in the use of said resources along with the presence in many resources-rich countries of severe corruption.

The subject is divisive as some emphasize that resources have a corrosive effect on the quality of a country's institutions and on economic growth, while others emphasize that it is the quality of institutions that determines whether resources pose a curse or blessing to the economy of a country. This two-way causality is almost impossible to disentangle. Arezki and Brückner examined the effect of oil rents on corruption and state stability for a panel of 31 oil-exporting countries between 1992 and 2005. They found that an increase in oil rents significantly increases corruption scores, especially in countries with a high share of state participation in oil production.[5]

On the other hand, Bhattacharyya and Hodler suggest that natural resources only induce corruption in countries with enduring non-democratic regimes.[6] Explaining how the quality of institution “decides” whether resources are curses or blessings.

Furthermore, natural resource rents may limit a country's transition to democracy because they increase the incentive of authoritarian leaders to retain power. Such leaders are more willing to use violent repression or other means to avoid democratic participation of citizens.

Consistent with this hypothesis, Torvik argues that a good institutional apparatus overcomes the negative effects of natural resource endowments on growth, rendering such resources

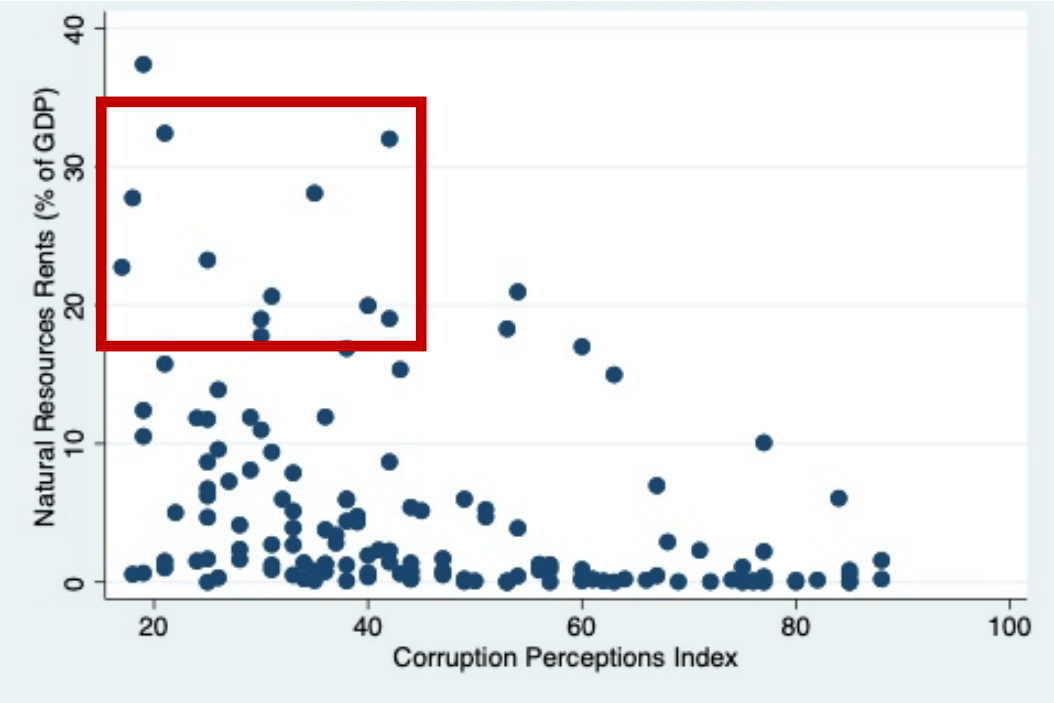
[5] Arezki, R., Brückner, M., 2011. Oil rents, corruption, and state stability: evidence from panel data regressions. *Eur. Econ. Rev*. 55 (7), 955–963.

[6] Bhattacharyya, S., Hodler, R., 2010. Natural resources, democracy and corruption. *Eur. Econ. Rev.* 54 (4), 608–621.

beneficial for the country's economic prosperity.[7] Similarly, Sarmidi et al. argue that as institutional quality improves, the negative effect of resource abundance on growth should dissipate.[8]

Figure 7 is a scatter plot graphing Natural resources rents (expressed as % of GDP) and Transparency International's CPI (corruption perceptions index) of 2020 for 144 world countries. In the highlighted region we can see how the top 7 countries by natural resources rents exhibit CPI scores below the world average of 45.44. This is in line with what was explained previously that resource dependent countries have often very corrupt institutions.

Figure 7. Natural resources rents vs. CPI. Source: World Bank. (2020). Total natural resources rents (% of GDP). - Transparency International. (2020). Corruption perceptions index.



[7] Torvik, R., 2009. Why do some resource-abundant countries succeed while others do not? *Oxf. Rev. Econ. Policy* 25 (2), 241–256.

[8] Sarmidi, T., Law, S.H., Jafari, Y., 2014. Resource curse: new evidence on the role of institutions. *Int. Econ. J.* 28 (1), 191–206.

V. CONCLUSION

There is still debate among economists worldwide on the impact of natural resources on a country's GDP. Some argue that resources positively impact a country's GDP, others say they have no measurable effect, other theories, such as the *resource curse* and the *Dutch disease*, report that natural resources may be detrimental to the economic growth and prosperity of a country.

This study aimed at unravelling the relationship between natural resources and GDP per capita, through a world-level econometric study, including 153 countries, to assess what kind of relation existed between the two. The analysis we conducted with the fixed-effect regression model was not able to determine a statistically significant link between natural resources rents and GDP per capita, concluding that no effect of natural resources is reflected onto GDP per capita in this analysis. This study with some limitations, including the unavailability of a complete dataset for all the countries included in the world bank list, may offer a trigger for future research on the topic.

BIBLIOGRAPHY

Alogoskoufis, G., (2013), "Petty impressive", *The Economist.*

Arezki, R., Brückner, M., (2011). Oil rents, corruption, and state stability: evidence from panel data regressions. *Eur. Econ. Rev*. 55 (7), 955–963.

Bertolucci, S., (2018), "Beyond GDP: Economics and Happiness". *Berkley Economic Review.*

Badeeb, R. A., Lean, H. H., & Clark, J. (2017). "The evolution of the natural resource curse thesis: A critical literature survey." *Resources Policy*, 51, 123-134.

Bhattacharyya, S., Hodler, R., 2010. Natural resources, democracy and corruption. *Eur. Econ. Rev.* 54 (4), 608–621.

Causa, O., et al. (2014), "Economic Growth from the Household Perspective: GDP and Income Distribution Developments Across OECD Countries", *OECD Economics Department Working Papers*, No. 1111, OECD Publishing, Paris, https://doi.org/10.1787/5jz5m89dh0nt-en.

Coyle, D., (2014), "Warfare and the Invention of GDP", *The Globalist.*

Frajman Ivković, A., (2016). "Limitations of The GDP as a Measure of Progress and Well-Being". *Ekonomski vjesnik/Econviews - Review of Contemporary Business, Entrepreneurship and Economic Issues* 29 (1):257-72.

Frankel, J. A., (2010). "The natural resource curse: a survey" (No. w15836). *National Bureau of Economic Research.*

Lucas, R. E., (2002). "The industrial revolution: Past and future." *Lectures on economic growth*, *109*, 188.

Natural Resource Governance Institute, (2021), 2021 Resource Governance Index. *Natural Resource Governance Institute.* https://resourcegovernance.org/analysis-tools/publications/2021-resource-governance-index.

Sachs, J. D., & Warner, A. M., (2001), “The curse of natural resources.” *European economic review*, *45*(4-6), 827-838.

Sarmidi, T., Law, S.H., Jafari, Y., (2014), Resource curse: new evidence on the role of institutions. *Int. Econ. J.* 28 (1), 191–206.

Scherzer, J. and Sinner, Jim, Resource Rent: Have you paid any lately?, *Ecologic Research Report* No.8, December 2006

Stock, J. H., & Watson, M. W (2020). *Introduction to Econometrics*. Pearson.

Suzuki, D., (2014). "How the GDP Measures Everything 'Except That Which Makes Life Worthwhile". *EcoWatch.*

Torvik, R., 2009. Why do some resource-abundant countries succeed while others do not? *Oxf. Rev. Econ. Policy* 25 (2), 241–256.

World Trade Organization. (2010). World Trade Report 2010: Trade in natural resources. *World Trade Organization.* https://www.wto.org/english/res_e/publications_e/wtr10_e.htm.