

the Association between an Economy's
Reliance of the Natural Resources and the
Likelihood of the Civil Conflicts

Zikuan (Daniel) Zhu

Advisor: Professor Conor Carney

College of the Holy Cross

Economic and Accounting Department Honor Thesis

The Association between an Economy's Reliance on the Natural Resources and the Likelihood of the Civil Conflicts

Zikuan (Daniel) Zhu

April 14, 2024

Abstract

This paper examines the association between the degree of natural resource reliance of a country's economy and the corresponding country's likelihood of civil conflict. The existence of conflicts arises from failed attempts for peace. The paper's theoretical model finds a significant association between natural resource reliance and the likelihood of civil war. Like previous literature, the underlying assumption of the analysis is that natural resource reliance is closely related to the greed narrative of civil conflict. The empirical analysis of the paper utilizes country-level data on natural resources and conflict to show that there is a significant association between a country's reliance on natural resources and the likelihood of civil conflict controlling for other political factors that are correlated with the likelihood of civil conflict. Thus, these empirical results support the theoretical assumptions made in the literature and suggest a connection between natural resources and the greed narrative of civil conflict.

1 Introduction

Civil conflict is a globally significant issue given its tremendous potential consequences for its country, including violence, loss of property, fatality, and injury. The occurrence of civil conflict could further cause negative impacts on the rest of the world, like international trade depressions, a refugee crisis, and even ethical issues like the Rwandan Genocide.

regression analysis, I aimed to ascertain the significance of this association, utilizing a simple linear re-

degree of democracy for the Pahlavi Iran was an absolute Monarchy with a low degree of democracy, high income, and regional inequality, which are factors of social unrest.

The case of Iran provides a motivation to investigate the effect of resources on the likelihood of civil war, controlling political factors like degrees of democracy, social factors like income inequality, and cultural factors, which in this case is religion. Understanding whether a significant association exists between resources and conflict while controlling for political, social, and cultural factors can aid in conflict mitigation by promoting democracy and reducing inequality.

Contemporary literature categorizes civil war causes into political and economic factors, designating

I intend to explore.

Theoretical models serving as the foundation for civil conflict often center around different players and their interactions. Initially, Trygve Haavelmo introduced a two-sector model involving the central government and rebels⁶. This model expanded to encompass multiple players, acknowledging ordinary individuals positioned between governments and rebels. Garinkel and Skaperdas summarized these models, emphasizing the probability of winning for players concerning available resources⁷.

These models gradually incorporated various external and internal variables, considering technology, asymmetric information, and trade between production and war. They later extended to investigate determinants of civil wars, exploring tradeoffs between conflict and production⁸. In 2004, Ernesto Dal Bo and Pedro Dal Bo argued that low income might incite civil wars, suggesting that adverse income shocks incentivize recruitment for conflict at a reduced opportunity cost⁹. However, validating this theory empirically is crucial.

Theoretical models find applicability in two primary scenarios. Firstly, they explain situations where unequal income distribution heightens the likelihood of civil war between existing government and rebel sectors. Specifically, this Model could help explain the formation of hem-reduced heigh-

improved quality of life. However, due to the unfair allocation of the benefits generated by the natural resources, people gained less than expected, leading to the formation of the rebellion, and further increasing the likelihood of civil conflicts. Based on this reasoning, Do Bol's theoretical models could help answer the possible significant association between low income and the likelihood of civil war.

The question I study is indispensable from the empirical data. As for the remark on Blattman's work, there is a constant demand for new data because the present literature always wants to establish a significant association between economic factors like poverty and the likelihood of civil war. The main challenges for my empirical analysis are identifying the lurking variable that would confound the causation, finding good proxies for the political factors, and including economic factors to explain their association with the likelihood of civil conflicts.

First, I need to identify possible lurking variables in the association. The most important one is inflation¹¹. The change in the price level is a typical example in which the economists tried to eliminate the possible confounding variables. Considering the statistics relating to the real income generated by natural resources is necessary because inflation can easily influence nominal income and confound the possible association between different variables related to the income and the likelihood of the civil conflicts. My data set considers the percentage of GDP generated by natural resources, which checks an economy's reliability on natural resources and gets rid of the influence of possible inflation, given that the percentage is about the relative size of the value of natural resources compared to the value of economic output for a given country at a given year.

Next, I need to find and include political variables to be included in my models, given that present-day literature tried to find a good proxy for the political factors in the empirical model to have a better explanation of the likelihood of civil conflicts¹². Typical example is the works of Fearon and Laitin¹³. In the work of Fearon and Laitin, one of the proxies for the political factors is the fraction of the ethnicity within the region. Given a significant positive correlation between the risk of civil war and ethnic fractions, Fearon and Laitin conclude that ethnic fractions may have a significant effect on the risk of civil war. It is necessary to check ethnic diversity in each region I investigated and try to

oil and mineral wealth tends to make states less democratic.¹⁴ The negative association between the abundance of natural resources and the democracy level provided the insight that the abundance of natural resources may be negatively related to the level of democracy¹⁵. There are also economists working on the relationship between the abundance of natural resources and income inequality¹⁶. A typical example would be the work conducted studying the relationship between natural resources and income inequality by Anyanwu et al¹⁷. The positive association between inequality and the abundance of natural resources provides insight into the need to control the variable about social inequality, which is Gini.

Then, I need to find possible economic variables to measure the economic benefits of natural resources. Economists try to find whether there is a significant relationship between economic factors and the likelihood of civil war. A typical example of this is the work done by Collier and Hoeffler in 2004¹⁸, arguing that the proxies for the economic factors have an overall more significant effect on the likelihood of civil war¹⁹. Collier and Hoeffler also remarked that resource abundance, which they measured by using the primary goods of export, significantly affected the civil war. I build from this result and explore the empirical relationship between abundant natural resources and the likelihood

3 Data and the Summary Statistics

I apply the data about the likelihood of civil war, the percentage of the GDP that relies on the natural resources of each country, the democracy index, and finally, the Gini Coefficient. The time length of these data ranges from 1990 to 2018.

I use binary variables data for the dependent variable to determine whether a country has a civil conflict at a specific time. To offer criteria for the binary variable to assign 0 or 1 for each observation, the present literature defines "civil war" as "a violent conflict within a state between a government and one or more internal opposition groups, with sizeable combatant or battle-related fatalities" which are required "at least 5 percent of the weaker side's fatalities" and "Sub-war Civil Conflict" as "a violence between a government and one or more internal opposition without any quantitative requirement."²¹. Given that the binary variable would be 1 if there is a civil conflict at that time and 0 otherwise, the dependent variable is the likelihood of having a civil conflict for a specific country in each year.

One of the independent variables is the total natural resources rents (% of GDP) from the World Bank²². Total natural resources rents (% of GDP) is the percentage of the GDP that relies on each country's natural resources, the economic value generated by the natural resources divided by the GDP. According to the World Bank, the definition of such statistics is "Total natural resources rents are the sum of oil rents, natural gas rents, coal rents (hard and soft), mineral rents, and forest rents."²⁸

The other one of the independent variable would be the oil Gini which is calculated based on the number of different ethnic groups within different countries and the amount of petroleum occupied by the different ethnic groups.²⁴ Then the Gini Coefficient is calculated based on the formula of Gini.

The economic model also includes several control variables. The Gini coefficient is based on the

and has a combined evaluation as an index.

Furthermore, I use ethnic polarization to measure the ethnic factors of different countries. The polarization will measure how isolated a country is from the rest within the country and can be calculated by the formula as following²⁶: $R:Q = 1 - \frac{1}{N} \sum_{i=1}^N \frac{p_i^2}{p_i}$ where p_i is the proportion of people belonging to the i -th ethnic group, and the N means that there are N ethnic groups within the state. $R:Q$ means the degree of ethnic polarization. The data source is the data sets accompanied by the article of Fearon and Laitin²⁷ and the article of Alberto Alesina et al²⁸. The data set constructed by Fearon and Laitin and Alberto Alesina et al. is based on the formula about. Lastly, the summary statistics are attached as Table 1, and the data is between 1990 and 2018.

Table 1

Variable	Observation	Mean	Standard Deviation	Min	Max
Civil War	1519	0.066	0.249	0	1
Civil Conflict	8,279	0.1523131	0.3593458	0	1
Natural Resources as % GDP	7,823	8.667728	10.31358	.0006549	59.34108
Oil Gini	7,823	0.1700097	0.2596664	0	0.9765269
Gini Index	7,858	44.84392	11.84769	17.71	77.085
Democracy	8,096	0.2231966	7.412305	-10	10
Ethnic Polarization Alesina	8,073	0.5529812	0.2426001	0	0.96764
Ethnic Polarization Fearon and Laitin	7,814	0.5377077	0.2681706	0	.9856

From the summary statistics, about 7% of all observations in the data set are going through a civil war, and about 20% of the total observations are experiencing civil conflicts. An economy can be highly reliant on natural resources, which is about 80%, or there is no reliance. However, the typical economy is not primarily reliant on natural resources, given that the typical percent of GDP generated by natural resources is about 7.6%. A typical country could achieve a equality in the oil allocation since the average Gini of oil is 0.1700097. However, oil Gini also indicates that there could be extreme inequality of 0.9765269 in the oil allocation and extreme equality of 0. Based on the summary statistics of the ethnic polarization, I could see that ethnic groups cannot live in isolation from other ethnic groups, which is 0, and can also live in almost complete isolation, which is 0.98 or 0.96, respectively, based on different data sources. Typically, different ethnic group polarization is

²⁶ Montalvo, José G., and Marta Reynal-Querol. "Ethnic Polarization, Potential Conflict, and Civil Wars." *The American Economic Review* 95, no. 3 (2005): 796-816. <http://www.jstor.org/stable/4132741>

²⁷ James D Fearon and David D. Laitin. "Ethnicity, Insurgency, and Civil War." *The American Political Science Review* 97, no. 1 (2003): 75-90, <http://www.jstor.org/stable/3118222>.

²⁸ Alberto Alesina et al. "Fractionalization." *Journal of Economic Growth* 8, no. 2 (2003): 155-94, <http://www.jstor.org/stable/40215942>.

between these two extremes, about 0.55. This means that different ethnic groups in a country have moderate interactions with each other.

Along with these independent variables and control variables, The model includes different kind of interaction variables. For example, the interaction variable between the percent of GDP generated by the natural resources and the oil Gini coefficients would be important. This is because it is reasonable to think that ethnic group with few possession of oil would be more likely to launch civil wars or civil conflicts against the ethnic groups which possessed a large amount of oil in a country of which the economy is highly relied on the natural resources. Other interaction variables like the interaction variable between the Democracy level and oil Gini is also important for a country with high oil Gini combined with low democracy level would also lead to higher likelihood of civil war since the ethnic groups with few possession of oil and has no other political approach except war to fight for more possession of natural resources which in this case the oil.

4 Theoretical reasoning and The Model

The statistical model should include economics, the economy's reliance on natural resources, and political variables like levels of democracy and social inequality. Such formation of the model is because the formation of civil conflicts satisfies both greed and grievance narratives.

First, the relation is suitable in the greed narrative. Suppose there is a certain amount of natural resources in the country. In that case, it generates an economic benefit, measured by the proportion of the GDP generated by natural resources. This is based on economic value of natural resources having been extract in different countries in different years. Then, given the opportunity for economic benefit,

income distribution generated by natural resource extraction would lead the people without any capital already at the low end of the income distribution to fight for a just allocation of resources and increase the likelihood of a civil conflict. Therefore, the grievances also explain the relationship between the abundance of natural resources and the likelihood of civil conflict.

The other three factors in the Grievances category that could also explain the association are the level of democracy and ethnic factions within the country. For the level of democracy, the public would fail to pursue their rights to allocate the benefit from the natural resources through peaceful negotiation in a country with a low democracy level. The lack of peaceful democratic negotiation would force the people to fight for their rights violently and thus would lead to civil conflicts. The degree of ethnic polarization could also explain the causation; if there is a high ethnic polarization within a country, any ethnic group is unwilling to share its benefits with other ethnic groups. A high degree of ethnic polarization would lead to grievances for people in a specific ethnic group who would tend to think they have an unfair allocation, which would more likely lead to civil conflict. Moreover, the whether there was a civil or conflict in the recent year would also have an association with the likelihood of the civil war or the the civil conflict in the present. It is important for the statistical model to include the lag variable measuring whether there is a previous war.

By showing that both narratives could explain association, it is necessary to include proxies from the economic, political, and social factors. The response variable would be the likelihood of civil war or civil conflict for different countries at different times. The main covariates in my model are the economic value of the natural resources, the likelihood of civil conflict for country i at time t , the level of democracy, the degree of social inequality, and ethnic polarization. The model would also include the time-fixed effects. In the analysis, I first investigate the case of the civil war from the general

business cycle. The model will also include the dependent variable to consider whether there is

variables then combine with the independent variable I want to investigate to check the combined effect using the interaction terms $LowGini_{it} \times NR_{it}$, $HighGini_{it} \times NR_{it}$, $LowDemo_{it} \times NR_{it}$, and $HighDemo_{it} \times NR_{it}$. This model also includes the time-fixed effect to avoid bias from the business cycles, like the previous model. Again, The model would include the dependent variable to consider whether there is a civil war or a civil conflict in the previous year for a given country and in a given year.

5 Result and Analysis

I separate the data analysis into four parts to check the civil conflict and the civil war in the regular and binary linear regression models. The regular linear model is the following, as mentioned before:

$$y_{it} = \beta_0 + \beta_1 NR_{it} + \beta_2 OilGini_{it} + \beta_3 Gini_{it} + \beta_4 Demo_{it} + \beta_5 eth_{it} \\ + \beta_6 lag_{it} + \beta_7 Demo_{it} \times NR_{it} + \beta_8 Gini_{it} \times NR_{it} + \\ \beta_9 eth_{it} \times NR_{it} + \beta_{10} Year_i + \beta_{11} Country_t + \beta_{12} \epsilon_{it}$$

$\theta_{it} \times NR_{it}$

The regression result for the civil war is attached in Table 2. Model (1) is the simple regression model with only the likelihood of a civil war for a given country at a given time and the percentage of GDP generated by natural resources. Model (2) is the regression model with (1) and the control variables. Model (3) is the regression model, including both (2) and the time- xed e ects. Model (4) is the regression model, including both (3) and the interaction variables.

Models (5), (6), and (7) in the result table have the same regression model as models (2), (3), and (4) correspondingly. However, (5), (6), and (7) use the ethnic polarization measurement from Fearon and Laitin , while (2), (3), and (4) use the ethnic polarization measurement from the paper from Alberto Alesina et al in table 2

First, model (1) exhibits a signi cant association between the Oil Gini and the likelihood of civil war. Given that the slope coe cient is greater than 0, there could be a signi cant positive association between the oil Gini and the likelihood of civil war. The test statistic shows a signi cant association between the likelihood and resource inequality. However, the regression also shows that there is no signi cant association between the economy's reliance on the natural resources and the likelihood of the civil war. This is reasonable given the fact that few modern countries wage civil war because of the high or low degree of reliance of natural resources for if this is true there should be lots of civil war occurred in Japan which is country with few reliance of natural resources or Saudi Arabia which heavily relied on the natural resource. This model provide some insight to the relation between Oil Gini and the likelihood of the Civil War. However, the model must also consider the omitted variable biases and xed e ects using multiple controls, xed e ects, and interactional variables. Furthermore, the regression also shows that there is no signi cant relationship between the percent of GDP generated by the natural resources.

Model (2), which includes model (1) and the control variables, and Model (3) which includes model (2) and the time xed e ect show that the association between the likelihood of a civil war and the oil Gini is positively signi cant. The signi cant association indicates that the inequality in the oil allocation can be one of the reasons for the civil war, agreeing with model (1)'s conclusion. Furthermore, Model (5) and (6) which use the same regression model as the model (2) and (3) but with di erent measure of the ethnic polarization from model (2) and (3) exhibit similar behavior that there is a signi cant positive association between the oil Gini and likelihood of the civil war. All the model 2, 3, 5, and 6 indicated that the whether there is a previous civil war would signi cantly in uence whether there is a previous civil war. This actually indicates that whether there is a previous civil war could explain whether there is a civil war in the present signi cantly.

Then, I analyze the Model (4), which includes all the variables. The result table shows that Economics's reliance on the natural resource is signi cantly positively associated with the likelihood of

civil war. Inequality is significantly positively associated with the likelihood of civil war. Both of these two variables are significant at the 10% significance level. Even though there is no significant association between the civil war and the Oil Gini in this model, the result table shows that there is a significant positive association between the likelihood of the civil war and the interaction variable between oil Gini lagging one year and Democracy in the notation $\text{OilGini} \cdot \text{Democracy}$. The significance of the interaction between the democracy level and the oil Gini implies that the increase Oil Gini only may not increase the likelihood of civil war but the combined effect between the oil Gini and the democracy level may increase the likelihood of the civil war. The significance could be understood as the countries with either a high Oil Gini or a low democracy level may have less likelihood of civil war than the countries with both an increase Oil Gini and an increase in the democracy level. Furthermore Model 4 also indicates that there is a significant association between between the likelihood of the civil war and the interaction variable between oil Gini lagging one year and Gini in the notation $\text{OilGini} \cdot \text{Gini}$.

Model (7) is the same as model (4). Model (7) exhibits the same conclusions for the combined effect between democracy and the Oil Gini lagging one year. Moreover, Model (7) shows that inequality measured by Gini and democracy have significant negative associations with the likelihood of civil war. Moreover, similar to the previous model previous status of civil war is the most essential variable to estimate the likelihood of the present civil war.

There are two counterintuitive results. First, both models (7) and (4) exhibit the positive effect of the combined effect between democracy and the oil Gini. The negative association is counterintuitive, given that democracy is expected to decrease the likelihood of civil war in the interaction term. I should have further analysis in the binary variable analysis in the later part of the paper, given that there might be a nonlinear relation between likelihood and the level of democracy. Moreover, the result shows a negative relationship between oil allocation inequality and the likelihood of a civil war, meaning that increased oil inequality would decrease the likelihood of a civil war, which is counterintuitive. This is possible because people extremely lack of oil have no wealth to fund a civil war to fight for their rights in some extreme inequality for they have nothing to consume for oil. These counterintuitive results imply a nonlinear relationship between the combined effect of democracy, the Oil Gini, and the likelihood of civil war. Similarly, there is a nonlinear relation between income inequality and the likelihood of civil war. The significance of these nonlinear behaviors would be tested through the binary Model.

Next, I analyze the effect of each independent variable on the likelihood of the civil conflict. The regression result for the civil conflict is attached as Table 3 below. Table 3 Tn6ciat5(T)83(3ult)-645(in)-752(

First, model (1) exhibits a significant association between the percent of GDP generated by natural resources and the likelihood of civil conflict. Given that the slope coefficient is less than 0, there could be a significant negative association between the percentage of GDP generated by natural resources and the likelihood of civil war. The Model (1) shows that there is a positive association between the

The significance of the interaction variable between the percent of GDP generated by natural resources and Oil Gini implies that reliance on natural resources alone may not increase the likelihood of a civil conflict. However, its combined effect with Oil Gini may increase the likelihood of civil conflict. Such significance could be understood as the countries with increased reliance on natural resources may have less likelihood of civil war than the countries with increased Oil distribution inequality level and increased reliance on natural resources. Moreover the significance of the the interaction variable between the percent of GDP generated by natural resources and Gini implies that reliance on natural resources alone may not increase the likelihood of a civil conflict. However, its combined effect with Gini may decrease the likelihood of civil conflict. Such significance could be People at the bottom of the income distribution has no funding to wage civil conflict to fight against the social unfairness.

Furthermore, model (4) also shows a significant positive association between whether there is a civil conflict in the previous year and the likelihood of civil conflict. Like model (4), model (7) shows the same conclusion with model (4). Like the case of the civil war, the positive association between the likelihood of civil conflict and whether there was a civil conflict last year is also significant. Further analysis may need to separate both civil war and the civil conflict into two categories. One is that there is no previous war or conflict. The other is there was a previous civil war or civil conflicts.

The binary model results in Table 4 below, which supports a combined narration of the greed and grievance narratives. Countries with high grievances, characterized as low democracy levels, may not have a higher chance of civil war because war is destructive and costly, and there are enough benefits to incentivize one. Countries with high levels of natural resource reliance may also not increase the likelihood of civil war because no one wants to destroy the benefit generated by the natural resource. However, if a country has both factors, people will have greed for more resources and no peaceful ways to pursue more benefits or rights. Civil war is a reasonable way to advocate for more benefits and rights; thus, a country's likelihood of civil war increases.

The binary model also have a similar conclusion for the interaction variable between the oil Gini and democracy level. The result indicates that the low democracy would discourage the likelihood of the civil war or the civil conflicts given the same level of the Oil Gini. This phenomenon can be reasoned in the similar logic as the previous paragraph.

The Results indicate that the for the oil Gini explained the occurrence of the civil war better than the economic reliance on the natural resource. However, the economic reliance on the natural resource may better explain the likelihood of the civil conflicts.

For the combined effect, the table exhibit a significant negative association between the combined effect between natural resources and high democracy for the models emphasizing on the civil conflict. This is reasonable because a higher level of democracy leads people to prefer to pursue their rights

peacefully and thus decrease the likelihood of civil conflict. However, the result also exhibits a significant negative association between the combined effect of the reliance on natural resources and the low level of democracy. This means that a country with a high reliance on natural resources may decrease its likelihood of a civil conflict if the government is autocratic. This could be explained by the fact that an autocracy eliminates all possibility of conspiracy for uprising and thus has a small likelihood of civil conflicts.

The Result table also indicates a similar result for the combined effect of the between oil Gini and high democracy for the models emphasizing on the civil war. This is also reasonable for the similar reasoning as the previous paragraph. The thing that is counterintuitive is that there is a negative association between the oil Gini and the likelihood of the civil war incidence even though it is reasonable to think that there is a positive association between the percent of the GDP generated by the natural Resources. People are constantly looking for more economic benefits and in the economy which the natural resources are heavily relied on, people would pursue for more benefits generated by the natural resources through different conflicts. One possible reasoning for the negative oil Gini and the likelihood of the Civil War incidence is that the source of oil is restricted to few people with other economic benefit. the rest of the People, lacked of the income, has no funding to wage civil war to pursue their economic right.

All four models exhibit a significant positive association between economic reliance on Natural resources and the likelihood of civil war or civil conflicts. Furthermore, the likelihood of a significant negative association appeared in all four Model's results. These results agree with the present-day literature's conclusion that natural resources drive a higher likelihood of civil war or conflicts. Democracy

Table 4	(1)	(2)	(3)	(4)
VARIABLES	Civil War	Civil War	Civil Con ict	Civil Con ict
NR%GDP	-0.000225 (0.00161)	0.000737 (0.00137)	0.00504** (0.00217)	0.00508*** (0.00184)
Oil Gini	-0.162 (0.0929)	-0.175 (0.0942)	0.114 (0.125)	0.122 (0.126)
High Gini	0.00135 (0.0130)	0.000651 (0.0133)	0.0127 (0.0176)	0.0116 (0.0178)
Low	-0.0			

conflict and the low Gini. This implies that low inequality would decrease the likelihood of a civil war, which agrees with the present-day literature. Furthermore, there is a significant positive effect between the likelihood of civil conflict and the combined effect between the low Gini and the reliance on natural resources. This is counterintuitive but could be explained by the fact that people would feel jealous of people who used to have similar income but higher income than them now, thus increasing the likelihood of civil conflict. Similar to the previous result, the previous civil conflict is significantly associated with the occurrence of the civil conflict.

6 Conclusion and Further Research

The thesis would conclude that there is a significant association between a country's reliance on natural resources and its likelihood of having a civil conflict or the interaction variable with some control variables. Another conclusion is that there is a significant association between a country's Oil Gini and its likelihood of having a civil war or the interaction variable with some control variables.

Furthermore, a country with low inequality may have less likelihood of civil war than countries with high inequality overall. This is reasonable because people have less grievance to the income allocation and thus are less likely to have civil war.

The intriguing result is that the likelihood of a civil war between two countries with the same level of Oil Gini is lower for the autocratic country. The likelihood of a civil war between two countries with the same level of Oil Gini is lower for the country that is democratic. Countries that are neither fully democratic nor fully autocratic may have a higher likelihood of civil war compared to other countries if all these countries have the same level of reliance on natural resources.

The further research could be separated into two parts: mathematical modeling using a differential equation system to analyze the behavior of the combined effect of democracy and reliance on natural resources on a country's likelihood of civil war, and normative analysis, which is mainly about the causation between reliance of natural resources and the likelihood of a civil war using instrumental variables.

Further research could focus on the mathematical modeling of the statistical Model using differential equation systems. This is inspired by Bianca and Guerrini³² who use differential equations and persistence topology to analyze the bifurcation behavior of the Solow growth model in the working age. The analysis showed that there is also a bifurcation behavior from democracy and the interaction variable between democracy and the reliance on natural resources in the case of civil war. Holding the reliance on natural resources constant, a country that is either autocratic or democratic is less likely

³²Carlo Bianca and Luca Guerrini, "Existence of Limit Cycles in the Solow Model with Delayed-Logistic Population Growth", *The Scientific World Journal*, vol 2014. Accessed December 8, 2023, <https://doi.org/10.1155/2014/207806>.

to encounter a civil war than countries that are neither democratic nor autocratic. This would be an

[4] Besley, Timothy J., and Torsten Persson. "The Incidence of Civil War: Theory and Evidence."
National Bureau of Economic Research Working Paper 14585 (2008). Accessed December 8, 2023.

[15] Garinkel, Michelle R., and Stergios Skaperdas. "Economics of Conflict: An Overview." In Handbook of Defense Economics, Volume 2, Defense in a Globalized World, edited by Todd Sandler and Keith Hartley, 649-710. Amsterdam and Oxford: Elsevier, North-Holland, 2007.

[16] Gleditsch, Nils Petter, Peter Wallensteen, Mikael Eriksson, Margareta Sollenberg, and Håvard Strand. "Armed Conflict 1946-2001: A New Dataset". Journal of Peace Research 39 no.5(2002):615-637. Accessed December 8, 2023. <https://journals.sagepub.com/doi/10.1177/0022343302039005007>.

[17]

Oxford (T.R.) or Gurr (1(p))-1260-464(al.5) 829J)-1470-46icr) 526(Regi1089526(Charac(W)istof)-3526(Oxford(Tsteer))Tanr.)

- [26] Shakibi, Zhand. Pahlavi Iran and the Politics of Occidentalism: the Shah and the Rastakhiz Party. London; New York; Oxford; New Delhi; Sydney: I.B. Tauris, 2021.
- [27] Sundberg, Ralph and Erik Melander. "Introducing the UCDP Georeferenced Event Dataset", *Journal of Peace Research* 50, no.4, (2013): 523-532. Accessed December 8, 2023. <https://journals.sagepub.com/doi/10.1177/0022343313484347>
- [28] Takeyh, Ray. *The Last Shah: America, Iran, and the Fall of the Pahlavi Dynasty*. New Haven: Yale University Press, 2021.
- [29] Uppsala University and the Centre for the Study of Civil War at the International Peace Research Institute in Oslo (PRIO). UCDP/PRIO Armed Conflict Dataset, V 23.1. 2023. Compiled by Therese Pettersson. Distributed by Uppsala Conflict Data Program Department of Peace and Conflict Research. <https://ucdp.uu.se/downloads/>.
- [30] World Bank. Fuel Exports (% of Merchandise Exports). 2023. Distributed by The World Bank. <https://data.worldbank.org/indicator/TX.VAL.FUEL.ZS.UN>.
- [31] World Bank, Ores and Metals Exports (% of Merchandise Exports). (2023) Distributed by The World Bank. <https://data.worldbank.org/indicator/TX.VAL.MMTL.ZS.UN>.
- [32] World Bank, Total natural resources rents (% of GDP). (2023) Distributed by The World Bank. <https://data.worldbank.org/indicator/NY.GDP.TOTL.RT.ZS>.
- [33] World Inequality Database. (2023) Income Inequality, Gini Coefficient, All countries, All years. 2023 Distributed by World Inequality Database. <https://wid.world/data/>.