

# Multinational Companies and the Political Economy of Natural Resources

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## Abstract

In this work I study the role of Multinational Companies in the political economy of the hosting country. The paper addresses the question of the large heterogeneity displayed by countries relying on natural resources in the measures of autocracy, democracy and political stability. In this work I propose a first step toward a unified approach in the study of political equilibria in contexts with not defined property rights. I consider two players potentially competing for a rent derived from the natural resource sector controlled by a MNC. By exploiting the different possibilities of alliance and contrast between the players inside the country, the model delivers four type of equilibria: stable cooperative equilibrium, unstable cooperative equilibrium, repression and conflict. Such equilibria resulted to be ordered in the value of the natural resource. Finally I obtain that the presence of the MNC, being perceived as a common competitor may create incentives for cooperation between the competing players.

# 1 Introduction

There is great heterogeneity in the measures of autocracy, democracy and political stability displayed by countries relying on natural resources. If, for example, Saudi Arabia features a strong tendency toward a stable autocracy, Nigeria has been swinging between repressive military regimes and conflict outbreaks, and Venezuela has been going back and forth between democracy and autocracy with patterns that closely follows the price of oil ([10]). Other countries, instead, such as Norway, the US and Canada, are stable democracies irrespective of the oil price.

In this work I propose a theory that captures such heterogeneity through the interaction between rent seeking groups within the country and a Multinational Company (MNC). Such theory helps explain the heterogeneous political effect of natural resource windfalls. I consider two players potentially competing for a rent derived from the natural resource sector. In the model I assume that the sector is controlled by a MNC and the size of the rent the two players compete for is endogenously determined by the player's strategies. I look at political economic equilibria in poorly institutionalized polities in terms of distribution of power and rent. By power I mean the quantity of physical means of coercion cumulated by a group. The model here developed allows to describe four political outcomes: (a) regimes with low level of redistribution and skewed distribution of power (b) conflict equilibrium (c) stable cooperative equilibrium with equally distributed rent and absence of power accumulation and (d) unstable cooperative equilibrium with equally distributed rent and absence of power accumulation.

The model proposes a unified approach to the study of political equilibria in resource rich countries and represents a first attempt to rationalize the role of MNC in the determination of political equilibria. The main goal of the model is to identify transitions from repressive to cooperative equilibria and from repressive equilibrium to conflict. I find that, depending on the conflictual cleavages within the country, the presence of a MNC can have two different effects. On the one hand MNCs tend to increase the violence of repressive equilibria, on the other, being perceived as a common competitor, can produce the opposite results: create incentive for cooperation between the competing players.

Political economy of weak states has recently called the attention of several scholars, both in Economics and in Political Science. A relatively small literature exists that deals with the different political equilibria that can arise in a poorly institutionalized context. Within these studies particular attention has been devoted to the understanding of the effect of resource rent on the determination of political equilibria (for a review see [35]). It seems uncontroversial that the rent represented by natural resources revenue can shape political outcomes. Literature has stressed the role of Oil and natural gas in fostering the autocratic nature of regimes ([10]; [32]) and the role of rent seeking behavior in the determination of civil conflict (for a review see [32]). Yet the mechanisms through which natural resources affect political outcomes has not been clarified. In order to rationalize these political equilibria, different, but complementary theories have been proposed. The most widely accepted explanation of stable autocracies is based on the theory of the Rentier State. According to

[24], a Rentier State is defined as a state that receives substantial rents from “foreign individuals, concerns or governments.” The essence of the causal mechanisms invoked by the theory is based on the idea that natural resource revenues allow the government to invest in coercive activity to maintain order. Rentier State tends to be stable when there is a relative low level of distributional conflict. If instead resources are concentrated in a region populated by ethnic or religious minority, resource extraction may promote or exacerbate tensions and competition for resource control, leading to outbreaks of violence. This has been the case in countries such as Angola, Burma, the Democratic Republic of Congo, Indonesia, Nigeria, Papua New Guinea, Sierra Leone, and South Africa. A large number of empirical studies and a growing number of theoretical works has dealt with the relationship between natural resources and the likelihood of civil conflict, [33]. The seminal papers by [12] explain civil conflict as the result of the opportunity of rebellion, often formalized as rent seeking behavior of competing groups in a given country. The ultimate cause of conflict would be determined by economic opportunities represented by natural resource rent versus the traditional sector. Clear empirical evidence has been provided by [36]. The authors study the effect of coffee and oil prices on the likelihood of violence in Colombia. They found that higher wages in the coffee plantations decrease the likelihood of conflict by reducing labor supplied to natural resource appropriation, while a rise in oil price increases violence by raising gains from appropriation. Finally there are several countries whose institutions were already developed at the time of the discovery of the natural resources and are today on the safe side of the “political curse of natural resources”. Such countries are the US, Canada and Norway. See [9]; [31]; [28] for studies on the quality of institutions and the resource curse.

My model is able to deliver the above mentioned equilibria - already present in the literature - but also to accounts for cooperative outcomes that arise in poorly institutionalized settings. Equilibria in which redistributive policies are implemented by the ruler in a context in which property right enforcement is not binding have not been explored yet. The interest of such equilibrium relies on its possibility to explain the mechanism behind endogenous process of cooperation in rent seeking environment and to account for equilibrium transitions as the result of changes in the value of the natural resource. Examples of such situations are represented by the history of Venezuela in its swings between redistributive and kleptocratic equilibria or Central American during its transition from repression to cooperation in the years after the Second World War. How such cooperative settings arise is an open question, at least in the context of developing countries - see [2] and [21] for the franchise extension in the UK as a cooperative political equilibrium. To my knowledge there is no work that accounts for cooperative behavior between players potentially competing for rents in a context with no defined property rights. Both economists and political scientists studying the role of resource rent in political equilibria have neglected a crucial aspect of the issue: the endogeneity of the rent resulting from the power relationship between the internal players within the economy and the foreign player invoked by [24] in his definition of Rentier State, that is, the Multinational Company extracting the natural resource. The most innovative feature of my model is to consider

such outcomes as the result of the confrontation between the groups of interests within the economy and the MNCs. There is large anecdotal and some econometric evidence that shows the political-economic relevance of the ownership structure in the natural resource sector. Yet there are no studies that formalize the role of MNCs in the political economy of natural resources.

Multinational Companies are widely recognized as crucial actors in the political economy of natural resources. [39] provided a detailed narrative of major events in the Oil industry, paying particular attention to the fate of international Oil majors and their relationship with local hosting governments. Even though there exists a rich literature about MNCs, most of such studies avoid the political economic implication that such actors have in the hosting countries. Scholars in International Business and International Political Economy have been studying MNCs and their relationship with the hosting government essentially focusing on the determination of the bargaining power behind the profit sharing, [38]; [14]. Recently a different wave of works in political science and economics has started to rise questions about the connections between politics, conflict and Multinational Companies. [25] proposed a theory that see MNCs as an element in the determination of the relative power between central governments and local authorities. Direct transfer and investment from MNC to local politicians would alter internal relationship and affect the political equilibrium. [13] have studied the flows of information between the US government and few companies with interest in US backed military interventions. The authors show that there existed a strong link between military intervention in natural resource rich countries and US corporate interests in the same countries. [17] study nationalization in the oil industry during 1960-2006. They develop and test a theoretical model that predicts nationalization when Oil price is high and checks and balances on the executive are limited. With a different aim [26] show that MNCs in the diamond sector benefited from the Angolan civil war. [4] show that the presence of MNCs in the extractive sector increases the likelihood and intensity of civil conflicts. [23] show that the presence of MNCs can be explained by the lack of alternative source of revenue for the government and the intensity of the distributional conflict within the country.

My model also contributes to the literature on endogenous political change and the current debate on whether economic conditions determine political outcomes or political choices determine economic outcomes ([7]; [16]; [30]). This work intends to be a first step toward an agenda in which the extension of the political game to foreign actors, such as MNCs, contributes to explain how governments allocate resources and how resource windfalls affect political institutions in equilibrium.

## 1.1 Political Incentives and Multinational Companies

The core of the arguments in support of the mechanism behind my model is based on the available empirical evidence and anecdotal accounts of MNC's involvement in Civil Wars. In this work I mean to develop a theory based on the idea that MNC's profitability increases when the government is challenged by a rebel player and its revenue depends heavily on the natural resource rent. Although such mechanism is supported by empirical evidence, the information available only partially justify

the assumptions of the model. The facts that there are no works that suggest a stabilizing role of MNCs should be imputed more to the limited attention that has been devoted to these questions rather than to the incontrovertibility of such considerations. In this sense the theory here proposed can only be thought as a first attempt to explore the political economic implications of MNCs and should be judged in terms of its explanatory ability rather than on the robustness of its assumptions. Future work will be done in order to microfoundate and clarify these aspect of the theory.

The essence of the mechanism I consider is based on the notion of “certainty of office” or political survival. If a government is challenged by an opposition player, the probability of remaining in office decreases, this imply a higher need for immediate revenue, and as a consequence, a lower bargaining power of the government versus the MNC, that translates into a higher share for the MNC, see [26]. In this way MNCs contribute to the determination of the institutional structure in which they operate. Different level of distributional conflict create incentives for different patterns of cooperation or conflict between the internal player and the MNC. In such context a highly conflictive political environment would allow the MNC to act according to the “divide-and-rule” strategy. As just stated a conflict between the internal players would imply a higher level of revenue dependence for both players. The MNC can therefore secure its position in the extractive sector and increase its bargaining power vis-a-vis the government by supporting the rebel player. In the model this mechanism appears only in a very reduced form and is imposed by assumption. Future version of this work will include an active role for the MNC and a microfoundation of the above mentioned bargaining process. An emblematic case of such mechanism is represented by the De Beer involvement in the Angolan civil war.

According to the Africa scholar [19], the resumption of the conflict in Angola brought a 250 percent increase in the share value of De Beers. This causal relationship is confirmed by statistical evidence provided by [26] who found that the end of the conflict, marked by the death of the rebel leader and by the official cease-fire, decreased returns of the Angolan portfolio. The authors interpret the results in light of the benefits that some incumbent firms may have derived from the conflict environment. The occupation of parts of the territory by the rebels and the instability created by civil war may constitute a barrier to entry, reduce the government’s bargaining power, and facilitate non-transparent licensing schemes.

Explicit active role of MNCs has been documented both in the case of the DRC and Angola. During the conflict period, some foreign companies operated beyond their “core business” activities. [19] has reported that MNCs have been directly involved in Angolan political and financial matters, helping both factions to finance arms purchases. Prominently, Elf reportedly has acted as a facilitator in oil-for-arms deals, supporting both sides in the Angolan conflict. In the case of the Congolese conflict, in 1997, foreign companies rapidly supported the Rwandan-backed rebel movement as it gained control of eastern Zaire (including key mining sites). The rebel leader, Laurent Kabila, earned an estimated US\$300 million by offering concession contracts and renegotiating those signed with the president in office, Mobutu.

These cases, although limited in their generality, provide elements in support of the idea that MNCs benefit from conflicts and may, as a consequence, attempt at divide-and-rule strategies. If an internal conflictive environment reinforces MNCs position, a stable autocracy may lead to conflictual relationships between the MNC and the government. Conflicts between host governments and MNCs are usually centered on the issues of division of the rent. Bargaining and negotiation between host states and the companies determine such division ([37]). The literature on autocratic regimes stresses the relationship between resource rent and political survival, see [3]; [33] and . In particular [1] studied the mechanism whereby kleptocratic dictators are able to survive without the support of the local population. The key mechanisms rely on the rent available to the government.

In this sense the role of the MNC appears to be crucial as it represents both the source of rent for the government and an antagonist player in the appropriation of such rent. The relative vulnerability of the ruler vs. the MNC is the element that determines the strategies employed by both players.

As a consequence authoritarian rulers with no support of the local population tend to see MNCs as their natural allies (see [1]; [19]; [33]) since they provide the means for their own survival. This situation can evolve into two directions. If the regime becomes too strong and the natural resource value is high, then incentives for expropriation increase as in [17]. If instead the value of the resource decreases the presence of the MNC gives incentives to the ruling player to co-opt the opposition and reduce the MNC's share by increasing royalties and taxes. The novelty of my work consists in modeling the latter scenario. The former of the two possible scenarios is modeled by [17]. The authors consider a leader who maximizes the ruling group welfare choosing whether to nationalize MNC's assets or not. A strong enough dictator would incur in lower cost of nationalization in comparison to a dictator whose control of the territory is weaker. Given the current state of the literature it is not clear whether MNCs should be better off in a liberal democratic system or in a dictatorial regime. In the first case the existence of checks and balances does not permit the government to change rules of the game at its will, permitting MNCs to rationally plan long term investment. On the contrary liberal democracies tend to control monopolies and can not give too generous incentives to foreign investors. [20] conclude that the weaker the democracy, the easier will be for the MNC to extract better deals and obtain monopolistic power. Quantitative studies have shown that on average the profit sharing between government and the MNCs favors developed versus developing countries ([27]). McMillan analysis shows that it is not democracy per se (free voting system, respect of civil rights and so on), but the accountability of the government, the bureaucratic quality and the low level of corruption that determines this difference between developed and developing countries. The limited informations available seem to suggest that the more stable and constrained a government is, the higher its bargaining power will be against the MNCs. The following points summarize the above discussion: (a) conflict between the players within the economy reduce the bargaining power of the government and therefore the rent available to the country (b) stability of government increase the bargaining power of the government and the size of the rent (c) a government supported by the potentially conflicting group has higher bargaining power with

respect to a government who's stability rely on coercion. In my model I employ points (a), (b) and (c) to study the different strategical alliances that can arise between the group in office, the potential opposition, and the MNC and obtain the equilibria described in the literature.

The rest of the paper is organized as follows. In the next section, I present a model that formalizes the main ideas discussed above and derives the main comparative statics. Section 3 briefly discuss the cases of the Central America's Republics and Nigeria, showing the transitions form repressive to conflict and cooperative equilibria described by the model. Section 4 concludes.

## 2 The Model

I consider an economy (Hosting Economy) populated by two players labeled  $i \in \{1, 2\}$ . Each player possesses one unit of a player-specific inalienable resource. This unit can be used for the production of two different goods: a consumption good and a coercive good. I denote  $x_i$  the proportion of the unit used for the production of the consumption good and  $y_i$  the investment in the coercive activity. The economy is also endowed with one unit of natural resource rent. Such natural resource is extracted by a Multinational Company (MNC) operating in the country. The natural resource rent has to be divided between the MNC and the players in the hosting economy. There are three main ingredients of the model. The *conflict technology*, the *ownership technology* and the *production technology*. The *ownership technology* determines, for any given value of  $y_1$  and  $y_2$ , the share of the natural resource that stays in the hosting country,  $R(y_1, y_2)$  and the one that is appropriated by the MNC,  $1 - R(y_1, y_2)$ . The logic behind the *ownership technology* relies on the idea of *country stability* and is meant to capture the underling bargaining process between the government and the MNC discussed in the previous section. The *conflict technology* determines, for any given value of  $y_1$  and  $y_2$ , each player's probability of winning sole possession of the the rent  $R(y_1, y_2)$  in the event of war. For player  $i$  this probability is represented by  $p(y_i, y_j)$ , for  $i \neq j$ , which is assumed to be a continuously differentiable function of  $y_i$  and  $y_j$  with

$$p(y_1, y_2) + p(y_2, y_1) = 1. \quad (1)$$

The probability of winning is  $\frac{1}{2}$  when  $y_1 = y_2$  (and  $x_1 = x_2$ ). In the case war is avoided - when at least one of the two player invest 0 in coercive activity,  $p(y_i, y_j)$  represents the share of the rent  $R(y_1, y_2)$  that goes to player  $i$ . Whatever is not invested in the coercive technology is consumed by the player according to the *production technology*.

The *production technology* is a linear function that transforms the inputs  $x_1$  and  $x_2$  into the consumption good. The function is player specific and represents the opportunity-cost of violence. Finally the variable  $k$  captures the market value of the natural resource.

The players make simultaneous choices of  $x_i$  and  $y_i$  that satisfy the resource constraint. Choices are then revealed. The conflict, production and ownership technology, the win probability and the size of the rent to be won in the event of war after the choices are revealed are alla common

knowledge.

Assuming that both players are risk neutral and expected utility maximizers, the payoffs for player one and 2 are respectively

$$\begin{aligned} V^1(y_1, y_2) &= p(y_1, y_2)R(y_1, y_2)k + \beta_1 x_1 \\ V^2(y_1, y_2) &= [1 - p(y_1, y_2)]R(y_1, y_2)k + \beta_2 x_2. \end{aligned} \tag{2}$$

The equilibrium concept is the Nash equilibrium.

## 2.1 Technologies specification and Equilibria

This section introduce assumptions on the technologies that are sufficient for existence of a pure-strategy equilibrium.

### 2.1.1 The Conflict Technology

First notice that for any  $z$  and  $w$  in the interval  $[0,1]$ , equation (1) can be rewritten as  $p(w,z)=1-p(z,w)$ . Letting the subscript 1 and 2 indicate the partial derivative with respect to the first and second arguments of  $p(\cdot, \cdot)$ , respectively, it follows that

$$\begin{aligned} p_1(w, z) &= -p_2(z, w) \\ p_{11}(w, z) &= -p_{22}(z, w) \\ p_{12}(w, z) &= -p_{12}(z, w) \end{aligned} \tag{3}$$

This means that the partial derivatives at any point have opposite sign and the same absolute value. From now on we will then use only  $p$  for  $p(y_1, y_2)$  and  $1 - p$  as the corresponding function for player 2, while  $p_1$  will stands for the partial derivative of  $p$  with respect to  $y_1$ .

Assumptions about the *conflict technology* are the following:

#### Assumptions 1

- (i)  $0 < p_1 < \infty$  [and  $-\infty < p_2 < 0$  by eq. 3]
- (ii)  $p_{11} \begin{smallmatrix} \leq \\ \geq \end{smallmatrix} 0$  as  $y_1 \begin{smallmatrix} \geq \\ \leq \end{smallmatrix} y_2$  [and  $p_{22} \begin{smallmatrix} \leq \\ \geq \end{smallmatrix} 0$  as  $y_1 \begin{smallmatrix} \geq \\ \leq \end{smallmatrix} y_2$  by eq. 3]
- (iii)  $p_{12} \begin{smallmatrix} \geq \\ \leq \end{smallmatrix} 0$  as  $y_1 \begin{smallmatrix} \geq \\ \leq \end{smallmatrix} y_2$
- (iv)  $0 < p < 1$

Part (i) states that the power of a player is increasing in his own strategy and decreasing in his opponent's strategy. Part (ii) states that power is concave in a player's strategy when its investment is greater then the opponent's one and convex otherwise.<sup>1</sup> Part (iii) implies that the marginal

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<sup>1</sup>An alternative specification could allow for concavity regardless of the opponent's strategy. This assumption seems to be more realistic: an additional investment in army is likely to be increasingly beneficial for the least advantaged player, thus convexity follows. See [34] for an application and discussion of such *conflict technology*.



return on power increases in the opponent strategy when concavity holds. This is a natural extension of (ii). Finally part (iv) states that under no strategy combination a player can be fully in power.

### 2.1.2 The Ownership Technology

The ownership function is meant to capture the underlying bargaining process between the hosting economy and the Multinational Company. In the previous section I have argued in support of the idea that the higher the level of social cooperation within the country, the higher is the bargaining power that the hosting economy would have against the MNC. Conversely when there is a conflict in the country, the need for immediate cash implies the lowest possible bargaining power for the hosting country. Finally I considered the cases in which the stability of the country is guaranteed by means of coercion. In such cases the stronger is the repressive player, the higher is its bargaining power versus the MNC. Such ideas are formalized in the following assumption which is symmetric for player two.

#### Assumptions 2

- (i)  $R_1 > 0$  as  $y_1 > y_2$
- (ii)  $R_1 < 0$  as  $y_1 \leq y_2$
- (iii)  $R_{11} < 0$
- (iv)  $R_{12} < 0$
- (v)  $R(1, 0) = R(0, 1) = 0$
- (vi)  $(0, 0) = \arg \max\{R(0, 0)\}$

Part (i) implies that if player 1 increases its coercive effort whenever he is in advantage, then the rent increases. This is the logic behind the repressive stability: whenever stability is maintained through coercive activity, then an increase in the power of the coercive player would increase the rent against the MNC. Part (ii) implies that for any increase in coercive activity from the disadvantaged player, this lead to a more intense conflict and the rent decreases. Moreover the same happens when the two players have the same level of army, that is either we are moving toward a more intense level of conflict, or we are moving away from a non conflictual environment. Part (iii) and (iv) only states the concavity of the function in both players' strategies. Part (v) is useful to avoid an equilibrium with complete coercive investment. Finally part (vi) states that the maximum of the conflict technology is attained when there is cooperation in the country. The next assumption is useful to guarantee the existence of an equilibrium. I impose restrictions on the convexity of the function  $p(.,.)$  and a lower bound for the concavity of  $R(.,.)$  whenever the function is increasing. In this way I guarantee that coercive activity is never too valuable even for a repressive player and therefore obtain concavity of the payoff functions.

### Assumptions 3

- i.  $\frac{R_{11}}{R} < -\frac{p_{11}}{p}$  and  $\frac{R_{11}}{R_1} < -\frac{2p_1}{p}$  [and  $\frac{R_{22}}{R} < \frac{p_{22}}{1-p}$  and  $\frac{R_{22}}{R_2} < \frac{2p_1}{1-p}$  by eq. 3]

### Assumptions 3

- ii.  $V_{1,2}^i(0,0) > 0$

Assumption 4 is meant to guarantee that the different possible equilibria are mutually exclusive.

### THEOREM 1:

Under Ass 1-3, there exists either a cooperative or a repressive or a conflict equilibrium. This equilibrium can not be full destruction, (1,1).

*Proof in Appendix*

## 2.2 Cooperative, Repressive and Conflict Equilibrium

This section examines the conditions under which each of the three types of equilibrium arises. These conditions involve three interpretable variables. The first is the derivative of the conflict technology evaluated at the point in which no player makes a coercive investment. This variable represents the conflictual cleavage in the country and is a measure of the ease or difficulty of conflict. If the conflictual cleavage is deep, then the two players are clearly defined and it is easy to organize conflict, mobilize people and avoid free riding. This is the case, for example, of ethnically and geographically divided groups whose members share common interest toward the natural resource appropriation. In such case a net separation between groups implies a high distributional conflict. An example is the Angolan case that saw the confrontation of two distinct groups determined around the urban - rural cleavage, the UNITA and MPLA or the contrast between the oil producing region in Nigeria and the federal government. The opposite example may be represented by Australia or any long term democracy. In such countries the division in group does not actually exists, at least in terms of groups that could organize themselves military to obtain the control over the natural resource sector. This is captured by the derivative of the conflict technology very close to zero.

The second variable is the ratio between the marginal productivity in the traditional sector over the value of the natural resource rent. This variable represents the opportunity cost of violence. The higher the ratio the less prone to conflict the players will be. Finally the derivative of the ownership technology evaluated at the point in which no player makes a coercive investment represents the cost of instability. The higher this variable the higher are the losses derived from instability. For simplicity I define this variable as the power of the MNC.

### 2.2.1 Cooperative Equilibrium

Necessary and sufficient condition for an equilibrium with zero coercive effort are the following:

$$\begin{aligned} V_1^1(0, 0) &\leq 0 \\ V_2^2(0, 0) &\leq 0 \end{aligned} \tag{4}$$

This is based on the fact that each player payoff function is strictly concave in that player's strategy when the other player strategy is 0 which is a direct consequence of A3.1.

By differentiating the payoff functions we have

$$\begin{aligned} V_1^1 &= p_1 R k + p R_1 k - \beta_1 \\ V_2^2 &= -p_2 R k + (1 - p) R_2 k - \beta_2 \end{aligned} \tag{5}$$

Evaluating (5) at (0,0) and noticing that  $p(0, 0) = 1/2$  and  $p_1(0, 0) = -p_2(0, 0)$  we can rewrite (4) as:

$$\begin{aligned} p_1(0, 0) R(0, 0) k + 1/2 R_1(0, 0) k - \beta_1 &\leq 0 \\ p_1(0, 0) R(0, 0) k + 1/2 R_2(0, 0) k - \beta_2 &\leq 0 \end{aligned} \tag{6}$$

Now let  $p_i^0 = p_i(0, 0)$ ,  $R_i^0 = R_i(0, 0)$ ,  $R^0 = R(0, 0)$ , the necessary and sufficient conditions reduce to

$$p_i^0 \leq \frac{\beta_i}{k R^0} - \frac{R_i^0}{2 R^0} \quad \text{for } i \in \{1, 2\} \tag{7}$$

First think to notice is that sufficient condition for cooperation is  $|\frac{R_i^0}{R^0}| \geq \frac{p_i^0}{p^0}$  for  $i \in \{1, 2\}$ . This condition is satisfied for either a sufficiently ineffective conflict technology or for a sufficiently high reduction in the size of the rent due to the conflict. That is, the more the MNC is able to increase its bargaining power with instability, the more likely a cooperative equilibrium would be. The intuition behind the expression is that, whenever the losses implied by instability are higher than the gains to be obtained by the additional investment in coercive power, then a cooperative equilibrium is achieved. When this condition is satisfied the cooperative equilibrium is achieved irrespective of the natural resource value.

If the condition is not satisfied,  $|\frac{R_i^0}{R^0}| < \frac{p_i^0}{p^0}$ , the cooperative equilibrium is still possible, but depends on the relative size of the three key variables of the model.

The lower is the opportunity-cost - the inverse of  $\frac{\beta_i}{k}$  - the more sustainable is cooperation, conversely the higher the price and  $p_i^0$  the less likely this equilibrium will be. Finally the more reactive is the ownership function  $R(., .)$  to instability (the more "powerful" is the MNC) the higher are the incentive toward cooperation between the two players. Proposition 1 summarizes these first results.

#### Proposition 1

*When  $|\frac{R_1^0}{R^0}| \geq \frac{p_1^0}{p^0}$ , and  $|\frac{R_2^0}{R^0}| \geq \frac{p_2^0}{p^0}$ , then the cooperative equilibrium is the only possible one and natural resource windfall would not affect the institutional setting of the country. This is the case*

when  $p_1^0$  is sufficiently low for both players.

When this is not the case the cooperative equilibrium requires a sufficiently low price of natural resources, a sufficiently productive "traditional sector".

This first proposition is in line with the recent literature on the relationship between institutions and the resource curse. On the one hand [9] and [31] has been stressing the non monotonic effect of natural resources on growth and development; on the other [10] have shown that resource windfalls have no effect on democracies while they do on autocracies. Coherently with this line of research, my model shows that, for sufficiently low level of *conflict effectiveness*, natural resource windfalls do not affect political equilibria. In this sense the interpretation as  $p_1^0$  as the conflictual cleavage also draw a parallel with the concept of *democratic capital* expressed by [29].

Finally lets consider the role of  $|\frac{R_1^0}{R^0}|$ . For  $p_1^0$  sufficiently close to 0, the presence of a MNC does not play any role. Cooperation is the political equilibrium independently from the presence of the MNC. If instead  $p_1^0$  is not close to 0, we have the result that the presence of an external claimer on the natural resource, make the two players in the economy more likely to cooperate. Suppose there is no MNC, that is  $R^0 = 1$  and  $R_i^0 = 0$ , then our conditions simply becomes  $p_1^0 \leq \frac{\beta_i}{k}$  which is a condition that hardly apply to the context here under analysis. It would require either a *conflict effectiveness* lower then the unit or a value of the natural resources lower then the traditional sector.

### 2.2.2 Repressive equilibrium

A repressive equilibrium is defined as an equilibrium in which only one player engages in coercive activity. Such equilibrium captures the idea of a regime in which one player appropriates the natural resource rent using the coercive investment as deterrent against the other player. In the natural resource literature these countries are seen as *rentier state*. The ruling player use the rent extracted from the natural resource to invest in the military apparatus and maintain power. A repressive equilibrium is characterized by a strategy combination such that  $(y'_1, y'_2) = (0, y_2^*)$  with  $y_2^* > 0$  (or the reverse in case player 1 is the repressive player).

A strategy combination  $(0, y_2^*)$  is an equilibrium if

$$\begin{aligned} V_1^1(0, y_2^*) &\leq 0 \\ V_2^2(0, y_2^*) &= 0 \end{aligned} \tag{8}$$

So conditions in (8) are necessary for  $(0, y_2^*)$  to be an equilibrium. We can show that (8) can be further reduce to the following conditions.

$$\begin{aligned} V_1^1(0, 0) &< 0 \\ V_2^2(0, 0) &> 0 \end{aligned} \tag{9}$$

(Proof in Appendix)

Therefore we can consider conditions in (9) to be necessary for a repressive equilibrium.

Rewriting condition (9) in its extended form  $\frac{\beta_2}{kR^0} - \frac{R_2^0}{2R^0} < p_1^0 < \frac{\beta_1}{kR^0} - \frac{R_1^0}{2R^0}$  it is immediately clear that, a repressive equilibrium arise only if there is an asymmetry between the two player, when the strategies are  $(0, 0)$ .

Eq. (9) characterize the conditions that have to be satisfied for a specific repressive equilibrium to be sustainable. Using equation (8) we can look at the comparative statics for the repressive player. Denoting with a star the functions evaluated at  $(0, y_2^*)$  we have

$$\begin{aligned} k[p_1^*R^* + R_1^*p^*] - \beta_1 &\leq 0 \\ k[R_2^*(1 - p^*) - p_2^*R^*] - \beta_2 &= 0, \quad \text{with } p_2 < 0 \end{aligned} \quad (10)$$

If conditions in (8) are satisfied then the comparative static looks as follows:

$$\frac{dy_2^*}{dk} = -\frac{R_2(1 - p) - p_2R}{k[R_{22}(1 - p) - 2p_2R_2 - p_{22}R]} > 0$$

Since as  $y_2 > y_1$  we have  $R_2 > 0$  and  $p_2 < 0$  then the numerator is always positive and by Ass 3.2 the denominator is always negative, we have that an increase in the price  $k$  lead to a more asymmetric distribution of power and rent . Notice finally that the derivative is decreasing in  $k$ , that is the optimal strategy is concave in the natural resource. Proposition 2 summarize this first part of the results concerning the repressive equilibrium.

### Proposition 2

*A repressive equilibrium is such that one of the two players invests zero and the other invest a positive amount. Necessary condition for the existence of such equilibrium is the asymmetry between the two players. If an increase in  $k$  does not change the equilibrium it leads to a more asymmetric distribution of power and rent. Finally the optimal strategy  $y_2^*$  is concave in the natural resource value  $k$ .*

### 2.2.3 Conflict

Since the conditions for the cooperative equilibrium are necessary and sufficient and those for the repressive equilibrium are necessary, we have that the following conditions are sufficient for a conflict equilibrium:

$$\begin{aligned} V_1^1(0, 0) &> 0 \\ V_2^2(0, 0) &> 0 \end{aligned} \quad (11)$$

Following the same steps as in the previous case and keeping the notation, the above condition can be expressed as:

$$\begin{aligned} k(2p_1^0R^0 + R_1^0) - 2\beta_1 &> 0 \\ k(2p_1^0R^0 + R_2^0) - 2\beta_2 &> 0 \end{aligned} \quad (12)$$

We first can notice that such condition requires that  $2p_1^0 > |R_1^0/R^0|$  and  $2p_1^0 > |R_2^0/R^0|$  as opposite to the cooperative case. If we use again the effectiveness of the conflict technology as a reference point we have that a sufficient condition for such equilibrium is

$$p_1^0 > \frac{\beta_i}{kR^0} - \frac{R_i^0}{2R^0} \quad \text{for } i \in \{1, 2\}$$

As it has been shown for the case of repressive equilibrium, it is easy to derive the comparative statics for the conflict case: both  $(y_1^*, y_2^*)$  are increasing in  $k$ . The situation is specular with respect to the cooperative one. In this context the presence of a MNC reduces the probability of conflict. Proposition 3 summarizes the result for the conflict equilibrium.

**Proposition 3**

*Necessary condition for a conflict equilibrium is  $2p_1^0 > |R_i^0/R^0|$  for both player 1 and 2. If the necessary condition is met, conflict is an equilibrium for a sufficiently low cost of violence:  $\beta_i/k$ .*

## 2.3 Equilibrium change: resource windfalls and MNCs

Summing up the possible equilibria are characterize by the following, mutually exclusive, conditions.

- **Cooperation:**  $p_1^0 \leq \frac{\beta_i}{kR^0} - \frac{R_i^0}{2R^0}$  for  $i \in \{1, 2\}$  (CP)
- **Repression:**  $\frac{\beta_i}{kR^0} - \frac{R_i^0}{2R^0} < p_1^0 < \frac{\beta_j}{kR^0} - \frac{R_j^0}{2R^0}$  for  $i \neq j$  (R)
- **Conflict:**  $p_1^0 > \frac{\beta_i}{kR^0} - \frac{R_i^0}{2R^0}$  for  $i \in \{1, 2\}$  (C)

Such characterization allows us to study the dynamic of change from one equilibrium to an other given exogenous shock in the determinants of the model.

For the sake of the exposition let me rewrite the above conditions in terms of two cutoff values defined as functions of the parameters.

$$\text{Let } \underline{k}(\beta_{1,2}, p_1^0, R^0, R_1^0) \equiv \min\left\{\frac{2\beta_1}{2R^0 p_1^0 + R_1^0}; \frac{2\beta_2}{2R^0 p_1^0 + R_2^0}\right\} \equiv \underline{k} \text{ and } \bar{k} = \max\left\{\frac{2\beta_1}{2R^0 p_1^0 + R_1^0}; \frac{2\beta_2}{2R^0 p_1^0 + R_2^0}\right\}$$

Given the cutoff values  $\bar{k}$  and  $\underline{k}$  we can redefine the equilibrium in terms of the value of the natural resources  $k$ .

$$(y_i^*, y_j^*) = \begin{cases} (0, 0) & \text{if } k \leq \underline{k} & \text{Cooperative} \\ (0, x_j) & \text{if } \underline{k} < k < \bar{k} & \text{Repressive} \\ (z_i, h_j) & \text{if } k \geq \bar{k} & \text{Conflict} \end{cases}$$

This characterization allows for a simple interpretation of the results of the model.

We first can notice that the three equilibria are ordered in the key variable  $k$  which represents the value of the natural resources. For a sufficiently low value of the natural resource the equilibrium is cooperative. As  $k$  increases the equilibrium can shift into a repressive or conflict equilibrium.

The comparative statics reported in the previous sections can be summarized as follow:

- An increase in the conflictual cleavage  $p_i^0$  tends to increase the likelihood of a violent equilibrium as it shifts down both cutoff values  $\bar{k}$  and  $\underline{k}$ .
- An increase in the “traditional sector” productivity,  $\beta_i$ , tends to reduce the likelihood of a violent equilibrium, as it decreases the opportunity cost of violence.
- An increase in the power of the Multinational Company tends to decrease the likelihood of a violent equilibrium as it decreases the share of the rent can be appropriated through violence.
- An increase in the asymmetry between the two players tends to increase the probability of a repressive equilibrium as it moves away the two cutoff values  $\bar{k}$  and  $\underline{k}$ .
- Finally, for conflictual cleavages sufficiently low, the only possible equilibrium is cooperative, irrespective of the value of the natural resources.

To further analyze the role of the Multinational Company in the next session I propose an extension of the model in which the MNC is allowed to intervene in the game making transfers to the players.

Finally I consider two examples of equilibrium transitions that are captured by the model.

### 3 Extension

TBA

## 4 Two Examples of Equilibrium Change

In this section I briefly discuss two historical experiences that capture the comparative statics presented in the model. The first one is the case of the Central American Republics and their shift from repressive to cooperative equilibria. This first case is meant to clarify that it is the presence of the MNC and not the mere nature of the natural resources the key factor that trigger the equilibria. The second is a more well known case: the Nigerian patterns from repression to conflict.

### 4.1 Central American between Repression and Cooperation

The Central American region became independent from Spain in the 1821, but it took several decades to achieve a stable political structure. Before the 1870s, the governments revenue was so weak, national armies so small, that it was not difficult to rise the man and weapons to mount a serious challenge to the government in power. With the expansions of foreign companies in the region, incentives toward alliances between local dictators and MNCs rose. The companies expanded their activities seeking the control of the new banana's market. The companies had both financial and material (means of transportation) resources for backing a revolution, and politicians had the carrot of concessions to dangle in front of them ([11]). The expansion of economic opportunity, in particular through coffee and banana exports, and the alliance between the ruling elite and the MNCs brought stability in the region, allowing governments to use revenue raised through land concession, to avoid political challenges.

Starting from the 1870s the region entered in a repressive equilibrium characterized by the alliance between the coffee elite and the MNCs.

In Guatemala two *caudillos* ruled for thirty-six years during the period 1870 - 1920. In Costa Rica Tomas Guardia lasted form 1870 to 1882, Nicaragua Jose Santos Zelaya ruled form 1893 to 1909. The political system was personalistic and domestic authority almost absolute ([11]). Distributive cleavages were socially and ethnically based with the racial separation of owners and workers adding tension to the social situation. In Nicaragua, El Salvador and Guatemala, under the *caudillos* rule, the government cooperated with the MNCs in order to overcome the problem of shortage of labour supply by alienating access to communal land and imposing coercive labour systems. Only in Honduras, the absence of a nationally owned coffee sector had delayed the emergence of



a clearly identified ruling group, leading to internal struggle within the elite for the control of the natural resource rent. The economic system in the region was essentially based on the export of two commodity: coffee and bananas. The first was controlled by the national élite and the second by MNCs.

By the 1920s, United Fruit controlled more than 70% the banana business followed by the New Orleans-based Standard Fruit Company. Virtually all the facilities for the commodities transportation were owned by the Companies that got most of their first lands in Central America as a result of railway concessions rather than banana production land grants. Given the cooperative relationship between the MNCs and the ruling élite, the only group that could potentially challenge the political and economic order was represented by the indigenous workers.

In the period that goes from the 1870 to the WWII the consolidation of such groups has been slowdown by the cooperation between the ruling class and the Company (UFC). These were times in which the interests of United Fruit and the local ruling classes coincided. According to [6], the dictators helped United Fruit's business by creating a system with little or no social reform, and in return United Fruit helped them to remain in power. The alliance depended on the socio-political conditions of the host countries (the level of the distributive cleavage) and the multinational's ability to generate income and economic stability in favor to the ruling governments (the size of the rent versus the size of the alternative source of income). Still in the first decade after the Second World War, economic circumstances were very favorable to those group controlling the traditional exports of coffee and bananas, whose combined share of total foreign exchange earnings in 1954 was around 80% or more everywhere except Nicaragua (where it was nearly 50%) ([8]).

#### **4.1.1 The cooperative equilibrium**

The 1950s and 1960s saw important changes in the banana market. The international demand for the commodity decreased given the substitution in the US of fresh fruit with canned fruits ([6]) and as a consequence the value of the banana production decreased. Export prices from Costa Rica fell by 32.8% between 1956 and 1960, while in Honduras the decline between 1957 and 1960 was 22%.([8]) The coffee sector instead experienced a much better performance. After 1945, prices rose steadily and the unit value of coffee exports had doubled by 1949; the outbreak of the Korean war in 1950 produced a further sharp increase and by 1954 prices had reached an all-time peak at a level some four times higher than the previous peak in the late 1920s. In this period the Latin American exporters joined in the efforts to stabilize prices. Their attempts produced a Latin American Coffee Agreement in 1958 and an International Coffee Agreement (ICA) based on a system of export quotas in September 1959. During the coffee boom the surplus was reinvested and between the 1954 and 1960 new exports of cotton, beef and sugar gave birth to a transformation of the agricultural sector that ultimately led to a significant degree of export diversification. Such transformation represented a crucial change in the relative importance of the foreign dominated commodity versus the nationally

dominated ones, determining a further decline in the importance of the banana's sector.

This change, in line with the theory here developed, represented a fundamental shift in the relationship between the elite and the MNCs. Given the relative decrease of importance of the revenue derived from the companies exports and the still huge role played by MNCs in the Central American republics, the governments started to denounce the unfair treatment received by the companies. The Oil crises represented the ultimate event that aligned all the Central American governments with the new strategy. In 1973 the sharp increase of the Oil price further decreased the profits derived from the foreign owned versus the domestic sector. In September of 1974 the governments of Costa Rica, Guatemala, Honduras, Panama and Colombia signed an agreement creating a banana export cartel modeled after the Organization of Oil Exporting Countries (OPEC) called UPEB (Banana Export Countries Union, in its Spanish acronym). The essential goal was to increase taxation on bananas exported by MNCs and modify land and tax concessions granted to such companies by the local governments several decades before (Vallejo, 1982). The founders of UPEB claimed that the producing countries were getting an unfair share of banana's exports profits. According to them, the Central American countries were getting 11% of the income generated in the banana market, while the multinationals received 37% and the retailers in the consuming countries earned 19% ([22]). These concessions had been granted for long periods of time (between 58 and 99 years, and sometimes with an indefinite deadline) and established an average tax of 2 cents per bunch, which is equivalent to 80 cents per ton. In order to increase the tax to 55 dollars per ton, the governments of Costa Rica, Honduras and Panama passed laws that nullified the previous contracts between the governments and the multinationals in 1974, 1975, and 1976, respectively. While a democratically elected government in Costa Rica introduced these measures, they were also passed by the military López Arellano and Torrijos in Honduras and Panama. These laws not only increased taxes but also eliminated many of the generous concessions the foreign corporations had enjoyed until then ([6]).

While assuming this position with respect to the MNCs, the government also changed attitude toward the indigenous worker population. This period, named then Banana's War, has been characterized by an unprecedented cooperation between the elite and the workers of the foreign sector. Harsh confrontation started between the governments and the Company (United Fruits - renamed United Brands - and Standard Fruits). In response to the MNC's initiatives to suspend exports and boycott the UPEB reforms, a diverse coalition of landowners and labour unions mobilizes to create a unified front against the United Brands attempts to sabotage. The Panama's dictator Torrijos even promised to pay the wage of the banana workers as long as the conflict continued. In Honduras Arellano decided to go forward with the most aggressive agrarian reform in Honduran history expropriating land from Standard Fruit and distributing to 44,700 families ([6]). In September 1974, thanks to the cooperation between the elite and the workers, the United Brands accepted the UPEB reforms and the new political environment. By 1976 the new banana tax was in force among the UPEB members. The tax varied from 0.35 dollars per box in Honduras to 0.45 in Guatemala and was therefore lower than originally intended, but it represented a huge rise on previous revenues

from bananas and it increased the retained value from banana exports whose c.i.f. price almost doubled between 1973 and 1974.

#### **4.1.2 Equilibrium patterns in Central America's political economy**

- Alliance between elite and MNCs: 1870 - 1950

Development of the national sector and foreign sector. Control of the facilities for exports by the companies. Alliance between local dictators and Companies in support of a repressive equilibrium

- Economic determinants of the transition: 1950 - 1960

Change in the economic conditions. Export diversification. Decrease in the relative and absolute value of bananas exports. Fall of banana's export prices of 27% on average between 1956 and 1960. The Oil crisis led to the decrease of the government revenue related to the foreign owned sector. Confrontation between governments and the Companies. Creation of the UPEB finalized to the modification of taxes and land concessions.

- The new cooperative equilibrium: 1970 - 1980 Banana's War 1974. Costa Rica, Honduras and Panama pass laws to increase the share of revenues going to the governments. The Companies boycott production and exports. Arise of the cooperative equilibrium: indigenous workers are joined by businessman and local elite in their contrast with the Companies. Governments pass redistributive law including: social security, land redistribution, minimum wage. All the governments managed to increase taxes: Costa Rica from 0.25\$ per box to 0.95, Panama from 0.35 to 0.4, Guatemala from 0.35 to 0.5 and Honduras from 0.25 to 0.5.

#### **4.2 Nigeria between Repression and Conflict**

Nigeria is well known to be one of the classic examples of "Petro-State" in which patterns of violence and repression have triggered rent seeking behaviour. Nigerian economy is heavily dependent upon petroleum, which by the early 1990s accounted for 90% of the country's foreign exchange receipts, 97% of total export receipts, contributes about 25% of the country's GDP and provided for 70% of budgetary revenues ([15]). Immediately after the first Oil commercialization in the early 60s, the political debates have been characterized by contrast over rent distribution. Oil has been the burning political issue leading to the Nigerian civil war of 1967-70. The main results of the war have been the process of centralization of the Nigerian government and the de facto alliance between the government and international oil companies (especially Shell-BP) ([18]).

Since the war, Nigeria has remained in a state of latent violence. The winning side, the federal military government, appropriated the bulk of oil revenues to expand state investment, to build a large federal bureaucracy, to sustain a well-armed coercive apparatus and to construct an extensive patronage system. After the civil war the country moved into a repressive equilibrium in which the

military government acted to secure a firm grip over crude oil reserves and to reverse the centrifugal tendencies the war had brought to a head.

The proportion of oil revenues allocated to the producing regions has been reduced from around 50 per cent at the time of the civil war, to 30 per cent in 1970, 25 per cent in 1977, 5 per cent in 1981 and a mere 1.5 per cent by 1984.

Little of the oil revenue has been invested in the communities in the Niger Delta, where most of the oil is produced. The corruption and ultimately hollowing-out of the state was reinforced by a flawed 'cohabitation' between state (especially military) elites and international oil firms. This enabled Nigeria's military rulers and their acolytes to accumulate wealth and power. And it allowed oil multinationals to extract oil with little effective government regulation or community voice in their operations or in the distribution of oil surpluses ([18]).

The rise of oil prices starting from the 2000s led to renewed violence in the producing regions. In the train of the protest movements, there emerged a new political economy of privatized violence, fueled by oil. Its protagonists played on the grievances of Niger Delta communities to foster appropriative activities. Starting from the 2000s, an increased number of armed groups feature seizures of oil installations, hostage taking, bunkering, intimidation and violence driving the region into a conflict equilibrium. In this section I am going to show how the recent evolution of the Nigerian political economy is explained by the model.

Table 1: Measurement

		<b>Concept</b>	<b>Measure</b>
Parameters	$p_1$	Conflictual Cleavage	Fractionalization - Institutions
	$R_1$	MNC's strenght	Number of MNCs and Contract type
	$\beta_i$	Cost of violence	Group specific GDP/capita
	$K$	Rent Market Value	NR Price
Equilibrium Objects	$p^*$	Group's Share	Group's Share
	$R^*$	MNC's Share	MNC's Share
	$(y_1^*, y_2^*)$	Equilibrium Type	Number of violent event per year

#### 4.2.1 The groups division

The Nigerian state makes its appearance on the international stage as a collection of ethnicity brought together by the british rule in 1914. Form that moment onward Nigeria outgrew its original status of an artificial, foreign-made" aggregation of self-sufficient agricultural communities. Though still far from national unit, it emerged as a group of much larger Regional economies, each increasingly tying itself to the world economy. (Helleiner 1966, p. 6) The main cleavages that emerged during the formation of the Nigerian state are based on the difference between the North and the South,

further divided into West and East. Each region was dominated by a different ethnic group, but the main differences lied on the line separating the North from the South. The former mainly of Muslim religion, poorer and less educated, the latter mainly christian and more prone to commercial activities. School Enrollment is particularly representative to understand the division between the different part of the country. In 1957, according to [5] the South accounted for roughly 50% of the population, but for more then 90% of primary school enrollment. Using data from the DHS it is possible to see how such disparity has lasted over time. In the 1990s, the religious and educational cleavages remain fundamental to understand the rising conflict between the different groups (see tables in Appendix).

The conflict around oil has therefore found a fertile terrain in which cultural and ethnical differences among the main groups of the Nigerian Federation favored tensions and contrasts.

Finally, using "electricity at home" as a proxy for per capita Gdp, it is possible to see the disparity in terms of income between the poorer Nord and the richer South (see tables in Appendix).

The southern economy has traditionally been based on the production of cash crops such as palm oil, rubber and cocoa, while the north was mainly based on agricultural self production.

Such findings are consistent with the model's comparative statics which predict that the group with the highest opportunity cost of violence would emerge as the one in control of the Government.

#### **4.2.2 Political Power, Repression and Rent Distribution**

The first attempt to write down the basis and levels of sharing revenues among the component units (or regions, as they were then called) of the Nigerian Federation was in 1946, when the Phillipson Fiscal Commission, set up by the Colonial Administration, proposed the derivation principle as a basis for fiscal federalism. The idea was that revenue should be shared, among other things, in proportion to the contribution each region made to the common purse or central government. Derivation became the only criterion used to allocate revenues among the regions from the 1949.

The rise of the oil sector completely changed the equilibrium of the game. Production in 1960, still only 17,000 barrels per day, quickly rose to 415,000 in 1966. The contribution of the sector to total government revenue (mainly in royalties and rentals) rose to 17 percent in 1967, and its foreign exchange contribution then amounted to about one-fifth of the value of total exports (Pearson 1970, tables 2, 5, and 7). In this context regional tensions grew. This mainly occurred because of the regions' unequal access to the new source of revenue. The new importance of the Oil sector brought renewed tensions on the issue of the allocation of revenue among the regions. This had long been a source of contention, but the discovery of oil in the regions of the Niger Delta (South) raised the stakes, and caused shifts in the different regions' preferred method of allocation.

The model predicts that the groups with the higher opportunity cost of violence would engage in coercive activity and as a consequence gain political power. The facts are consistent with the model. Since the constitution of the 1951 the region of the North dominated the federal government.

After the Civil War and the break down of civil rule, the army maintained the power on behalf of

the northern region (more than 50% of the army was made of northern population).

### 4.2.3 Oil and Repression

The end of the Civil War inaugurated a period of repression and centralization of the rent distribution and political power. The three regions were dismantled and substituted by 12 states. All political offices were abolished after the coup of January 1966, and the civil service was made directly accountable to the military who maintained the control of the country after the end of the civil war. As part of the process of reducing the autonomy of the states, the federal government retained an increasing share of federal revenue, as noted above, and became virtually the sole source of funds for the states.

The following graphic reports the evolution of the distribution mechanisms from the so called “derivation” principle, to the federal government centralization.

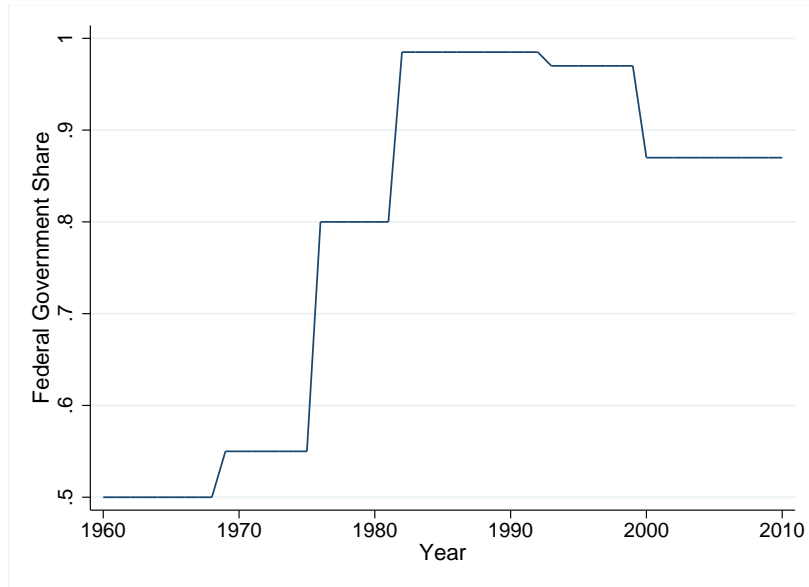


Figure 1: Rent Distribution

As it can be noticed by the graph, the evolution strongly penalized the producing states in particular during the 80s and 90s. This same period is also associated with the increased government violence and a growing use of the army to maintain stability in the country. In such a contest the model predicts a higher share of resources going to the “stronger” player as reported by the graphic.

The next graph shows the evolution of the level of governmental repression according to the index created by Amnesty International <sup>2</sup>.

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<sup>2</sup>The State Terrorism Database - Level 1: Countries under a secure rule of law, people are not imprisoned for their views, and torture is rare or exceptional. Political murders are extremely rare. Level 2: There is a limited amount of imprisonment for non violent political activity. However, few persons are affected, torture and beatings

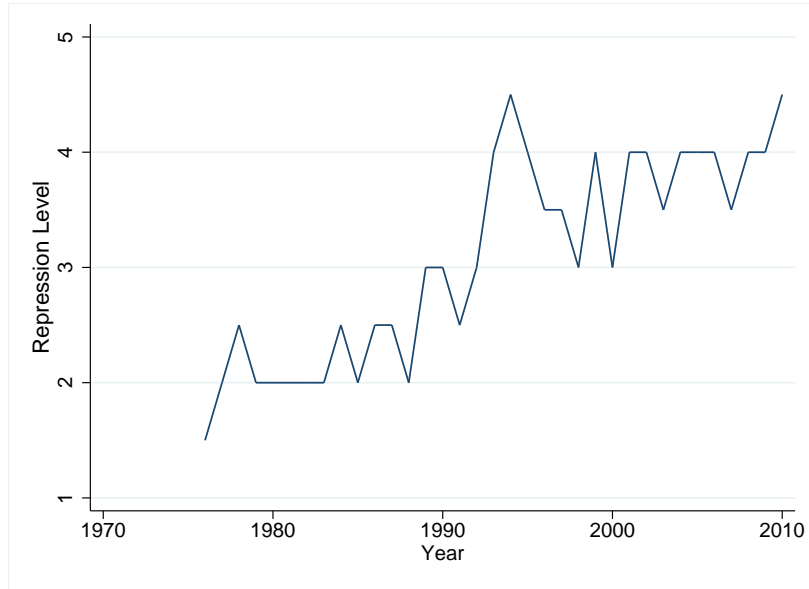


Figure 2: State Repression

It seems clear by the graphic that it is possible to identify two different period in terms of State's violence. The first, by the late 70s to the early 90s in which the violence level fluctuates between 2 and 3, and the second one, from the early 90s to 2010, in which violence level fluctuate between 3 and 4.

#### 4.2.4 Toward a Conflict Equilibrium

The Oil producing region, the Niger Delta, is today divided into 9 states: Abia, Akwa Ibom, Cross River, Rivers, Bayelsa, Delta, Imo, Ondo, Edo.

The traditional source of revenue are fishing and cash crop cultivation (rubber, palm oil and cocoa). Since the oil boom such cultivation have been abandoned. The worsening of economic conditions is captured by the evolution of poverty (less than 1\$ per day) that passed from 28.1% in 1980 to 65.6 % in 1996 ([? ]). Economic and environmental degradation plays an important role in rising the opportunity cost of violence - as captured by the parameter  $\beta$  in the model. Resources depletion is mainly the result of oil spill and gas leaks that lead to the to water contamination, pollution of soil and air ([? ]). Since 1958, when the first oil well was drilled at Oloibiri, over 1,481 oil wells have sprung up, producing from about 159 oilfields. There are more than 7,000 kilometres

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are exceptional. Political murder is rare. Level 3: There is extensive political imprisonment, or a recent history of such imprisonment. Execution or other political murders and brutality may be common. Unlimited detention, with or without a trial, for political views is accepted. Level 4: Civil and political rights violations have expanded to large numbers of the population. Murders, disappearances, and torture are a common part of life. In spite of its generality, on this level terror affects those who interest themselves in politics or ideas. Level 5: Terror has expanded to the whole population. The leaders of these societies place no limits on the means or thoroughness with which they pursue personal or ideological goals.

of pipelines and flow lines, and 275 flow stations operated by 13 oil companies. Five per cent of the land of the region is occupied by the oil industry. [?] have shown that one standard deviation increase in the oil price in year of birth for women of Southern ethnic groups results in a change relative to Northerners, among others, of a fall in height of 0.29 centimeters.

The main drivers of the conflict equilibrium is represented in the model by the evolution of the opportunity cost of violence, captured by  $\beta$ , and the rise in the value of the natural resources.

The model predict therefore an increase in the level of conflict given the increase in the value of the natural resources starting from the early 90s. The following graphic shows the outcomes in terms of conflict and its fluctuation with the value of the natural resources.<sup>3</sup> In the model the conflict presence and intensity is captured by the struggle for the share of the natural resources.

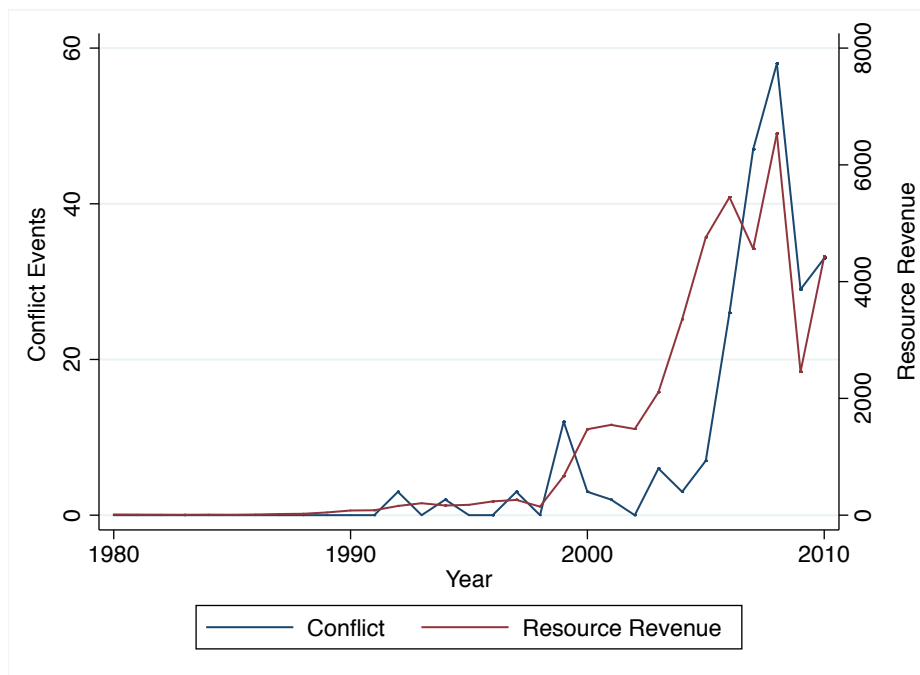


Figure 3: Rent Distribution

As shown in the previous graph the correlation between conflict and the value of the natural resources in Nigeria is very high, with an elasticity of 0.8 and an  $R^2$  of roughly 70%.

<sup>3</sup>According to the definition provided by the GTD, an event must represent the threatened or actual use of illegal force and violence by a non-state actor to attain a political, economic, religious, or social goal through fear, coercion, or intimidation.



## 5 Conclusion

The purpose of this work has been to develop a theory of the role of MNCs in the political economy of natural resources. Based on empirical consideration I developed a model in which the level and the distribution of violence in the country determines the size of the rent appropriated by the MNC and by the players within the country. The relationship between the internal political economy - the rent seeking behavior of the player - and the presence of the MNC, gives rise to three types of equilibria: cooperative, repressive and conflictual. The contribution of this work is to make a first step toward the understanding of the mechanisms that underly the transition between these equilibria. So far the literature has failed to explain the great heterogeneity that exist in the effect of natural resource windfalls on political equilibria and the patterns that lead to their transformations. I find that including MNCs in the political game it is possible to account for cooperative outcomes in rent seeking environment that would otherwise require unrealistic change in the value of the natural resources to be supported.

In particular I show that the presence of MNC can lead to cooperative equilibrium as the results of the confrontation between the players within the economy and the MNCs: the common enemy situation.

I finally discuss the cases of Central American Republics and Nigeria, showing that the experiences of these countries are consistent with the model here developed.

In conclusion, although limited, I consider these as encouraging results toward the exploration of the role of MNC in the determination of political equilibria in the context of weak states and lack of defined property rights.

## 6 Appendix

### 6.1 Proof of Theorem 1

I proceed to the proof of theorem 1 in four steps. In order to develop the proof the following lemmas are going to be proved.

**Lemma 1:** *There is no equilibrium such that  $(y_1^*, y_2^*) = (1, 1)$ .*

Suppose  $(y_1^*, y_2^*) = (1, 1)$  is an equilibrium. And suppose  $\bar{y}_2 = 1$ , then  $y_1 = 1$  has to be a best response to the opponent's strategy  $\bar{y}_2 = 1$ . Therefore  $V^1(1, \bar{y}_2) \geq V^1(y_1, \bar{y}_2)$  for all  $y_1 \in [0, 1]$ . This implies that

$$\begin{aligned} V^1(1, \bar{y}_2) &= kp(1, 1)R(1, 1) = 0 \\ &\geq V^1(y_1, \bar{y}_2) = kp(y_1, 1)R(y_1, 1) + (1 - y_1)\beta_1 \\ &= (1 - y_1)\beta_1 \quad \text{for all } y_1 \in [0, 1] \end{aligned} \tag{13}$$

where the second equality follows by ass. 2.v. Therefore since for any  $y_1 < 1$  we have that  $V^1(y_1, \bar{y}_2) > V^1(1, \bar{y}_2)$  that contradict our hypothesis. Therefore  $(1, 1)$  can not be an equilibrium.

**Lemma 2:** *Consider  $r_i(y_j)$  to be the best response function of player  $i$  for  $y_j \in [0, 1)$ , then the function has the following properties:*

- (i) it is single valued and continuous
- (ii)  $r_i(y_j) < 1$
- (iii)  $\lim_{y_j \rightarrow 1} r_i(y_j) < 1$

#### Proof

Part (i) follows by Ass 3 that impose strict concavity of the payoff functions. Therefore the best response function has to be single valued and continuous over the opponent's strategy  $y_j \in [0, 1)$ . Part (ii) is clear by the proof of lemma 1. With  $y_j < 1$ , any  $y_i < 1$  would yield a positive payoff, while  $y_i = 1$  would yield zero. Finally part (iii) follows directly from lemma 1 since we have proved that  $r_i(1) < 1$  it follows that  $\lim_{y_j \rightarrow 1} r_i(y_j) < 1$ .

**Lemma 3:** *There exists a Nash-equilibrium of the game*

#### Proof

Consider our best response function for the full strategy set  $y_j \in [0, 1]$

$$R_i(y_j) = \begin{cases} r_i(y_j) & \text{if } y_j < 1 \\ \lim_{y_j \rightarrow 1} r_i(y_j) & \text{if } y_j = 1 \end{cases}$$

which is a continuous function on  $[0, 1]$ . Then, by Brouwer's fixed point theorem, the function  $R_1 \circ R_2 : [0, 1] \times [0, 1]$  has a fixed point. Any such fixed point would belong to  $[0, 1)$  as shown in Lemma 1.

Together Lemmas 1-4 prove Theorem 1.

## 6.2 Condition (8) implies (9)

I will first show that  $V_2^2(0, y_2^*) = 0$  implies  $V_2^2(0, 0) > 0$  and then that condition (8) implies condition (9).

The first implication follows directly by assumption A3 which implies strict concavity of the payoff function in the player strategy. Since  $y_2^* : V_2^2(0, y_2^*) = 0$  it follows immediately that  $\forall y_2 \in [0, y_2^*)$  it has to be that  $V_2^2(0, 0) > 0$ .

Therefore we are left to show that  $V_1^1(0, y_2^*) \leq 0$  together with  $V_2^2(0, 0) > 0$  imply  $V_1^1(0, 0) < 0$ .

Suppose that it is not true, then we have that

$$V_1^1(0, 0) \geq 0 \quad \text{and} \quad V_2^2(0, 0) > 0$$

Moreover by assumption  $V_{1,2}^1(0, 0) > 0$ , then the optimal strategy for player 2 has to be strictly greater than zero. Since  $y_2^* > 0$  and

$$V_1^1(0, 0) \geq 0 \quad \text{and} \quad V_{1,2}^1(0, 0) > 0$$

we have that also the optimal strategy for player 1 has to be strictly greater than zero,  $y_1^* > 0$ . This implies that the equilibrium can not be a repressive equilibrium as it was assumed. Therefore condition (9) is a necessary condition for a repressive equilibrium.

## 6.3 Data Appendix

Table 2: **religion by region (%)**

<b>religion</b>	<b>region</b>				
	Southeast	Southwest	Northwest	Northeast	Total
Christian	87	64	8	14	48
Islam	4	34	92	83	49
Traditional religion	6	1	0	1	2
No religion	4	2	1	0	2
Total	100	100	100	100	100

*Source:* 1990.DTA

Table 3: **educational attainment by region (%)**

<b>educational attainment</b>	<b>region</b>				<b>Total</b>
	southeast	southwest	northwest	northeast	
no education	19	13	31	38	100
incomplete primary	52	28	8	12	100
complete primary	38	43	9	11	100
incomplete secondary	29	61	6	5	100
complete secondary	26	64	6	4	100
higher	20	75	4	1	100
<b>Total</b>	<b>26</b>	<b>31</b>	<b>19</b>	<b>23</b>	<b>100</b>

*Source:* 1990.DTA

Table 4: **has electricity by region (%)**

<b>electricity</b>	<b>region</b>						<b>Total</b>
	north central	north east	north west	south east	south south	south west	
no	50	61	54	47	34	25	47
yes	48	38	46	49	62	71	51
not de jure resident	1	1	1	3	4	4	2
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

*Source:*2003.DTA

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