"Oil Above Water": Economic Interdependence and Third Party Intervention

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Abstract

We explore how economic conditions shape the incentives for third parties to intervene in on-going internal wars. We develop a three-party model of conflict that highlights the role of the economic benefits accruing from the intervention and the potential costs in decision to intervene. We present novel empirical results on the role of oil in motivating third party military intervention. We predict that the likelihood of a third party intervention increases when: a) the country at war has large reserves of an oligopolistic good, i.e., oil, b) the relative competition in the sector is limited as the disruption brought by the conflict to the oil industry depends on the number of oil-exporting countries and their relative share in the market, and c) the relative demand for oil arising every year from

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the potential interveners is high, as net importers are more likely to be affected by waves of instabilities, while net exporters may even benefit from prolonged periods of price fluctuations.

Keywords: Intrastate Conflict; Third party intervention

JEL Classification : D74; D82; F5; H56

"... the truth ... always rises above falsehood as oil above water" (Miguel de Cervantes, *Don Quijote*, Chapter X)

Introduction

Civil wars are the dominant form of conflict in the world and constitute more than 90% of contemporary armed conflicts. Other states may intervene to foster specific outcomes in civil wars, or the externalities and threats entailed by ongoing civil wars for other states may promote intervention. By one estimate, about two thirds (97 out 150) of all civil wars over the period 1945-97 see intervention by foreign countries or international organizations.[1] Much of the research on intervention in civil war has examined their effects on outcomes and duration.[2] There has been much less attention on who intervenes and why. The lack of any consensus over whether interventions in civil war decrease subsequent violence or not is not surprising, given the lack of attention to the motivations and constraints faced by interveners. Whereas some researchers assume that interveners seek to bring conflicts to a quicker end,[3] others argue that interventions are likely to prolong wars by preventing specific outcomes that would have resulted absent interventions.[4]

Most existing works on motivations to intervene focus on a third party's security interests (i.e. proximity to conflict), humanitarian concerns (i.e. casualties, refugees), as well as ethnic and colonial ties to a conflict. The risk of transnational spread of a civil war can make states with strong interests in a region intervene to contain the conflict.[5] We argue that external actors also may have vested economic interests in conflict outcomes that could motivate intervention. Most existing research on third party intervention in civil war disregards the role of economic incentives and ties with

[1] Regan (2002).

[2] E.g., Regan (1996); Balch-Lindsay & Enterline (2000); Elbadawi & Sambanis (2000); Regan (2002); Doyle & Sambanis (2006); Findley & Teo (2006).

[3] Regan (2000).

[4] Balch-Lindsay & Enterline (2000); Trumbore (2003); Ross (2004).

[5] Salehyan & Gleditsch (e.g. 2006); Gleditsch (e.g. 2007a,b); Kathman (e.g. 2011).

countries in conflict.[6] This is all the more remarkable as economic incentives are often held to exert a powerful role on the onset and duration of civil war. In particular, many have argued that low economic opportunities in the conventional economy and the potential for rents from looting or control of national resources can motivate resort to violence and rebel recruitment.[7]

We believe the potential economic incentives to intervene in an internal war deserve more systematic attention. We develop a formal model that ties together key economic forces driving the decision to interfere in a civil war, highlight the potential benefits and costs. There has recently been more attention to modelling third-party intervention formally, but there is still no consensus on how to best characterize third party military intervention or how to integrate a third party into conventional two party models of conflict.[8] Since military intervention is a an expensive and risky endeavour, states must balance the expected costs with their strategic interests and possible economic benefits accruing form intervention. Beyond the lack of attention to economic incentives, the existing literature on third party intervention rarely endogenizes third party actors in a two-party civil war model. Our study also forges links between the theoretical predictions from a formal model and empirical analysis, which Blattman & Miguel [9] lament is rare in research on civil war.

We focus on the perhaps most prominent natural resource, namely oil, and how the expected impact of conflict on oil prices can create incentives to intervene. A number of studies have shown a direct effect on the risk of civil war from oil dependence, usually measured by oil exports as a share of a country's GDP.[10] There is also a large

[6] Notable exceptions that consider economic incentives for intervention include Aydin (2008; 2012), who examines the incentives to protect trading partners in interstate disputes and civil wars, and Koga (2011), who looks at how lootable natural resources such as secondary diamonds increase the likelihood of third party intervention in civil war by autocracies.

[7] See Collier & Hoeffler (1998, 2004); Fearon & Laitin (2003); Besley & Persson (2008); Collier *et al.* (2009); Brückner & Ciccone (2010).

[8] Bove & Smith (2011).

[9] Blattman & Miguel (2010).

[10] See Collier & Hoeffler (1998, 2004); Humphreys (2005); Ross (2006). The claim that oil invites civil conflict has been challenged by some researchers. Fearon (2005) argues that the results arise from omitted variables, such as the weakness of the economy. Brunnschweiler & Bulte (2009) argue that natural resource abundance increases the chances of peace via an income effect. Cotet & Tsui (2013)

related literature on how oil influences regime survival and political stability. Our main interest in this study lies in the consequences of civil war on oil markets. Supply disruptions arising from dramatic geopolitical events such as wars have caused many salient oil shocks.[11] Moreover, oil-related disruptions have been an important contributing factor in some recessions. From a demand-side perspective, an oil-importing country is clearly more likely to experience some drag on its economy as a result of oil shocks. Our model shows how potential interveners with substantial oil imports thus have incentives to contain hostilities, using intervention as a means of inhibiting or reducing the risk of conflict spillovers and economic turmoils.

Many arguments relating oil to foreign policy behavior are often underdeveloped and verge on conspiratorial.[12] However, this is an argument for more careful analysis and nuanced arguments rather than outright dismissal of the relevance of oil. Before turning to the development of our theory, we provide some simple examples where casual evidence suggest that states with greater needs for oil dependence have been more likely to intervene in oil producing countries. For example, Chad, Mali, and Niger are all former French colonies in the Saharan interior in Africa that have experienced numerous civil wars, yet only some episodes have seen interventions. In the late 1970s and the 1980s, France intervened repeatedly in Chad to support the government, supported in part by Libya. Oil exploration in Chad started in 1969 and oil was known to exist when the civil war halted further exploration. By contrast, Niger has no natural resources, and the French displayed no interest in intervening in its civil war. Furthermore, France did not intervene in the earlier Tuareg rebellion in Mali in the 1990s when the country did not have known profitable oil reserves. However, following renewed interest in the prospects for oil extraction in Mali in the mid-2000s, France chose to intervene after the secessionist attempt in 2012. Although the key rea-

raise doubts over whether the relationship between oil reserves and civil are robust to country fixed effects. Lastly, De Luca *et al.* (2014) show that valuable mineral resources may incentivize conflicting parties to protect and secure the area, thus displacing conflict.

[11] See Hamilton (2011) for a recent survey on the history of the oil industry.

[12] See, e.g., Colgan (2013) for a critique of many conventional arguments on oil and conflict.

son cited by France for intervening was to contain Islamic extremism, the incentives for intervention have arguably also increased with the presence of oil in the country and high oil prices.

To investigate more systematically whether oil wealth in countries involved in civil war indeed implies a higher likelihood of external intervention, in particular by oil-importing countries, we compile a nearly exhaustive panel of oil wealth and oil trade data, including stock variables such as the oil endowment and the size of reserves for the conflict country, as well as a potential third party intervener's balance of trade in oil. The stock variables we use depend on geological features and previous exploration efforts. As such, they should be less affected by conflict or intervention and hence less vulnerable to endogeneity concerns than flow variables widely used in studies of civil wars such as fuel exports as a percentage of GDP. Moreover, the (potential) intervener's balance of trade conveys information on the damage caused by regional instabilities to its oil supply. We test our theoretical framework empirically on a dyadic dataset pairing conflict states and potential interveners over the period 1945-1999.

We first present a model of conflict with the possibility of third party intervention. We then introduce the data used in the empirical tests of the propositions. We demonstrate considerable empirical support for our theoretical predictions. We conclude with some observations on the broader relevance of our results for understanding economic interdependence and intervention in conflict.

Theoretical Framework

We approach intervention by third parties as a unilateral decision and we assume that the potential third party interveners are self-regarding decision makers.[13] Unlike pre-

[13]Most of the literature on peacekeeping tends to focus on public benefits of intervention, and most of the attention to private concerns is on the cost side. There is a large literature on the problem of collective action problem in the provision of public goods, which has also been applied to multilateral interventions, see e.g., Olson & Zeckhauser (1966); Berkok (2006). In this model, interveners do generate a positive externality on other oil-consuming countries but by studying the incentives of a particular third party intervener we shed light on the private incentives to intervene. Allowing for

vious models of intervention, we go beyond the purely military effects and highlight the economic motives of interveners. Siqueira[14] studies the consequences of third party intervention on the warring parties' conflict incentives without, however, explicitly modelling the intervener's incentives. Chang *et al.*[15] consider how the interaction of the conflict technology of a third party intervener and of the belligerents' affects the sub-game perfect Nash equilibrium outcome. In their model, a third party can secure peace or disrupt an existing peaceful order, depending on the nature of the conflict and its objectives. Amegashie & Kutsoati[16] endogenize which side a third-party intervenes on, based on factors such as the shape of the conflict success function, the relative capacities of the combatants and the duration of the conflict in the absence of intervention. Their main focus is on the impact of the intervention on the conflict outcome, assuming that some form of altruism motivates the interveners. None of these models go beyond the canonical characterisation of conflict and intervention as a struggle for victory on the battleground. Moreover, they incorporate only military features (e.g. the fighting effort and the success ratio) while ignoring a number of potentially important non-military motives to intervene.

We model the military dimension of third party intervention by adopting the approach introduced by Grossman & Kim and more recently applied by Dunne *et al.*[17] To avoid the intricacies inherent to conflict games with simultaneous timing,[18] we assume that the target player and the intervener decide their armament levels *prior* to the potential aggressor taking an action, thus implying that the latter may be deterred from turning violent. In line with recent contributions on economic development and civil war, we should expect institutional end economic factors to influence interven-

multiple interveners would yield free-riding concerns, without, however, adding further intuitions as to the intervener's motivations.

[14] Siqueira (2003).

[15] Chang *et al.* (2007).

[16] Amegashie & Kutsoati (2007).

[17] Grossman & Kim (1995); Dunne *et al.* (2006).

[18] See De Luca & Sekeris (2013).

tion.[19] Chang *et al.*and Chang & Sanders[20] consider the economic motivations of third-parties to intervene militarily, yet the benefits of intervention are assumed to be exogenous. Our formalisation explicitly takes into account how economic factors may explain why some conflicts attract interventions while others do not. Lastly, our model resembles the recent works of Acemoglu *et al.*[21] on the role of the military in deterring civil wars and international threats, who similarly emphasize how third party interveners are rewarded in exchange for deterring threats.[22]

The model

We consider a world composed of two types of countries; oil producing countries, and non-oil producing ones. There are $H > 2$ oil producing countries, and a continuum of non-oil producing countries.[23] We normalize the total number of countries to unity. One oil producing country faces a threat by a rebel group seeking to seize control of the country.

Demand side

Each country is populated by a continuum of agents. The consumer's utility functions are modelled as in Singh & Vives.[24] Using z and q to designate the quantities of consumed non-oil and oil good, respectively, the utility of a representative individual of country i is given by:

$$v_i = z_i + \alpha q_i - \beta \frac{q_i^2}{2} \tag{1}$$

[19] See Besley & Persson (2010, 2011).

[20] Chang *et al.* (2007); Chang & Sanders (2009).

[21] Acemoglu *et al.* (2010b,a).

[22] Our models differ in at least two respects. Acemoglu et al (2010a; 2010b) propose a mechanism where a military can depose the ruling elites through a coup, which has no comparable role in our setting. We also consider the possibility that the government can deploy its own army instead of calling on a third party intervener, while no comparable option exists in Acemoglu et al (2010a; 2010b).

[23] We impose that there are more than two oil producing countries to avoid the disruption of oil production in one country to give rise to a monopoly whereby oil producers would cease interacting strategically to each other's production decisions.

[24] Singh & Vives (1984).

where α and β can be interpreted as demand for oil parameters.

The budget constraint of this representative consumer is given by:

$$w_i + \pi_i \geq z_i + pq_i + a_i \tag{2}$$

where π_i are the oil-related profits in country i, and thus equal to zero in non-oil producing countries. The parameter w_i captures the country's non oil-related wealth, including the non-modelled gains of trading non-oil goods.[25] The parameter p stands for the international price of oil, while the price of the non-oil good is normalized to unity. Lastly, a_i describes country i's military expenditures that are more carefully described below.

Supply side

All oil producing countries face the same technological constraint: the unit cost of oil production is equal to c. Moreover, the world demand for oil is given by $Q(p)$. The profits of country h are therefore:

$$\pi_h = p(Q)q_h - cq_h \tag{3}$$

If an oil-producing country experiences a civil war, oil production is halted in that country.

Finally assume that country k is embroiled in a civil war where a rebel group, r, challenges the government for the control of the country. The value of ruling the country is taken to equal some exogenous value W, which is the same for the government and the rebel group. The conflict technology in case of a civil war is a standard contest success function (CSF) technology where the likelihood that the actual gov-

[25] We here normalize the price of good z to unity, but we could also conceive of z as a basket of goods with price normalized to unity.

ernment remains in power is given by:

$$\lambda(a, r) = \frac{a}{a + r} \tag{4}$$

where a stands for the government's strength (whether provided by the government itself, a_G, or by a TPI, a_T) and r designates the rebels' strength. The unit cost of arming is constant for both sides and equal to unity and the government's budget equals exogenous wealth $w_h(.)$ augmented by its oil industry profits $\pi_h(.)$ provided the latter is operational.

The timing of the game is the following:

1. The government decides the size of its army, a_G.
2. The TPI decides the amount of troops/military aid to invest in supporting the government, a_T.
3. The opposition decides whether or not to prolong the civil war, and therefore its fighting effort r.
4. Oil producers export their product on world markets and markets clear.

We solve the game by backwards induction:

stage 4

The demand for oil for the representative consumer of country i is found after optimizing (1) w.r.t. q_i, after replacing the budget constraint in the objective function. The solution to this problem is given by:[26]

$$q_i^d = \frac{\alpha - p}{\beta} \tag{5}$$

[26]We assume throughout that $w_i(.) > \alpha/\beta$ to ensure a positive consumption of both goods at equilibrium.

The utility of the representative individual in any country i if country h is, respectively, at peace or war is given by:

$$v_i^p = w_i(H) + \pi_i(H) + \frac{(\alpha - p(H))^2}{2\beta} - a_i \tag{6}$$

$$v_i^w = w_i(H \setminus h) + \frac{(\alpha - p(H \setminus h))^2}{2\beta} - a_i \tag{7}$$

With $\pi_i(.) = 0$ if country i does not produce oil, and $a_i > 0$ if country i deploys a military force in country h. Moreover, we assume that $w_i(H) \geq w_i(H \setminus h)$.

Since there is a continuum of countries with the same type of consumers, the aggregate demand for oil on the international market is the same as the country demands for oil, namely $Q^d = q_i^d$ as given by (5). The oil producing countries maximize their profits given the oligopolistic structure of the market, and given the aggregate demand for oil. If no civil war occurs, country h's maximization problem is given by:

$$\max_{q_h} (\alpha - \beta Q)\, q_h - c_h q_h \tag{8}$$

Optimizing under the assumption that no civil war occurs in the remaining $H - 1$ oil-producing countries, yields the following results:

$$\alpha - 2\beta q_h - \beta \sum_{j \neq h} q_j - c_h = 0 \tag{9}$$

Or, re-arranging:

$$\alpha - \beta \sum_{j \in H} q_j = \beta q_h + c_h$$

This being true for any country, we can combine the conditions for countries h and i to obtain:

$$\Leftrightarrow q_i = q_h + \frac{c_h - c_i}{\beta}$$

Proceeding likewise for any $j \neq h$, we can re-write condition (9) as:

$$\alpha - (H+1)\beta q_h - Hc_h + \sum_{j \neq h} c_j = 0 \tag{10}$$

$$\Leftrightarrow q_h = \frac{\alpha + \sum_{j \neq h} c_j - Hc_h}{\beta(H+1)} \tag{11}$$

Aggregating and imposing that $c_j = c \forall j \neq h$ implies,

$$Q^s = \frac{H(\alpha - c) + c - c_h}{\beta(H+1)} = 0 \tag{12}$$

And therefore the equilibrium price is given by

$$p = \frac{\alpha + Hc + (c_h - c)}{H+1} = 0 \tag{13}$$

Lastly, we are in a position to compute the equilibrium profits:

$$\pi_h(H) = \frac{(\alpha - c - H(c_h - c))^2}{\beta(H+1)^2} \tag{14}$$

$$\pi_i(H) = \frac{(\alpha + c_h - 2c)^2}{\beta(H+1)^2} \tag{15}$$

If a civil war occurs in country h, no oil is produced in country h, and the world quantities and prices of oil are, respectively, given by:

$$Q^s(H \setminus h) = \frac{(H-1)(\alpha - c)}{\beta H} = 0 \tag{16}$$

$$p(H \setminus h) = \frac{\alpha + (H-1)c}{H} = 0 \tag{17}$$

Hence the profits of any oil-producing country:

$$\pi_i(H \setminus h) = \frac{(\alpha - c)^2}{\beta H^2} \tag{18}$$

stage 3

If the rebels attempt to control country h their payoff is given by:

$$v_o = \frac{r}{a + r} W - r \tag{19}$$

Optimizing yields the following reaction function:

$$r(a) = (aW)^{1/2} - a \tag{20}$$

Hence the associated utility:

$$v_o(a) = \left(W^{1/2} - a^{1/2}\right)^2 \tag{21}$$

Therefore, if $a \geq W$, the rebels do not initiate a civil war and earn zero utility, otherwise they initiate a civil war and obtain the payoff in Expression (21).

stage 2

Comparing the values of v_i^p and v_i^w from (6) and (7), we deduce that country i intervenes in the country experiencing a civil war, h, if:

$$w_i(H) + \pi_i(H) + \frac{(\alpha - p(H))^2}{2\beta} - a_T(a_G) \geq w_i(H \setminus h) + \pi_i(H \setminus h) + \frac{(\alpha - p(H \setminus h))^2}{2\beta} \tag{22}$$

Where the RHS payoffs follow from the fact that if the civil war cannot be avoided, the peace-related benefits are in any case lost so country i has no incentives in deploying a deterrent force in the host country. Alternatively, collecting all the terms on the LHS,

we can use the notation $\Delta_i = w_i(H) + \pi_i(H) + \frac{(\alpha - p(H))^2}{2\beta} - w_i(H \setminus h) - \pi_i(H \setminus h) - \frac{(\alpha - p(H \setminus h))^2}{2\beta}$ and therefore re-write Inequality (22) as:

$$\Delta_i - a_T(a_G) \geq 0 \tag{23}$$

We can therefore define the reaction function of the TPI, $a_T(a_G)$, as :

$$a_T(a_G) = \begin{cases} \max\{W - a_G, 0\} & \text{if } \Delta_i \geq W - a_G \\ 0 & \text{otherwise} \end{cases}$$

where the value W is the cost of civil war-deterring troops derived in stage 3, and a_G are the troops already deployed by the host government.

stage 1

The last step to complete the analysis is to determine the host government's optimal strategy. The host government may either attempt to deter the rebels from prolonging the civil war, or may confront the rebels on the battleground. The optimal strategy of the host government if it aims at putting an end to the civil war is to invest the minimal required amount of troops provided the expected reaction of the TPI. Defining by $\underline{a}_G$ the minimal required investment of the host government for deterrence to be achieved at equilibrium, we have that $\underline{a}_G = W - a_T(a_G)$. On the other hand, if the host government decides to pursue undeterred rebels, then:

$$a_G = \arg\max_{a_G} \left\{ \frac{a_G}{a_G + r(a_G)} W - a_G \right\} = a_G = \arg\max_{a_G} \left\{ (a_G W)^{1/2} - a_G \right\} = \frac{a_G}{4}$$

We therefore deduce that at equilibrium the civil war is terminated if:

$$w_h(H) + \pi_h(H) + \frac{(\alpha - p(H))^2}{2\beta} + W - \underline{a}_G \geq w_h(H \setminus h) + \frac{(\alpha - p(H \setminus h))^2}{2\beta} + \frac{W}{4} \quad (24)$$

The LHS of the above expression captures the peace-time utility in country h, provided the government expends an amount $\underline{a}_G$ deterring the rebel forces from pursuing the civil war. Notice that if the TPI is expected to intervene irrespectively of the value of a_G, then $\underline{a}_G = 0$. The RHS captures the country's payoffs when the civil war is prolonged. In the remainder of the paper we shall assume that the host government is too poor to deter the civil war on its own (i.e. $w_h(H \setminus h) < W$) so as to focus on the subset of countries under civil war where third party interveners can help putting an end to violence, provided they have incentives to do so.

Third party interventions

Two general results may easily be derived from Expression (22).

Proposition 1. *The higher the oil endowments of an oil-producing country experiencing a civil war, the more likely a third party intervention occurs*

Proof. Differentiating expression (22) with respect to c_h affects only $p(H)$ and $\pi(H)$, thus leaving the RHS unaffected. Differentiating the LHS of (22) yields:

$$\frac{1}{\beta(H+1)^2}\left((2-H)\alpha + 3c_h - 5c\right)$$

Since $H > 2$, upon inspection of $\pi_h(H)$ we deduce that $\alpha > 3c_h - 2c$ for $\pi_h(H) > 0$, which is a necessary condition for h not to leave the market. This implies that $\alpha > 3c_h - 5c$. □

This proposition implies that irrespectively of the identity of a potential third party intervener, the incentives to intervene are higher the larger the oil endowments of the country experiencing a civil war. This result is straightforward for *non-oil producing*

countries that are more eager to deter civil wars in highly endowed countries. Indeed, the disruption of the latter's oil industry would lead to a higher increase in international oil prices than if the oil producer was poorly endowed. The less obvious result relates to *oil producing* countries whose profits increase subsequently to an increase in oil disruption. The profits of the these oil producers are independent of country h's reserves under Civil War since the latter's industry stops functioning. As a consequence, county' h's reserves affect any oil producer's incentives to intervene through (i) the (negative) impact of high oil reserves on the other producers' profits, and (ii) the (positive) impact of high oil reserves on the reduced world oil prices for consumers. We nevertheless show that the lower the reserves of the country likely to experience a civil war, the more likely the oil producing country intervenes militarily in the former despite the positive effect this reserves' change has on the latter's profits.

A second result can be obtained upon inspection of (22):

Proposition 2. *The higher the trade between two countries, the more likely the trade partner intervenes in the oil-producing trade partner experiencing a civil war.*

Proof. This follows from the assumption imposed on $w_i(.)$ which is an increasing function of the gains from trade. □

This result is straightforward: since countries benefit from bilateral trade, should a country see its trade interupted because of a civil war, its trade partners will have incentives to intervene militarily.

Oil importing countries

Let us next consider specifically oil importing counties, which, by assumption, do not produce oil and thus do not receive any resulting profits π_i. The condition for such countries to intervene simplifies to:

$$\Xi = w_i(H) + \frac{(\alpha - p(H))^2}{2\beta} - a_T(a_G^*) - w_i(H \setminus h) - \frac{(\alpha - p(H \setminus h))^2}{2\beta} \geq 0 \qquad (25)$$

This expression allows us to derive the following result:

Proposition 3. *The more oligopolistic the market for oil, the more likely a TPI occurs.*

Proof. Differentiating Ξ w.r.t. to the number of oil producing countries, H, yields:

$$\frac{\partial \Xi}{\partial H} = -\frac{(\alpha - p_o(H))\,\partial p_o(H)/\partial H}{\beta} + \frac{(\alpha - p(H \setminus h))\,\partial p(H \setminus h)/\partial H}{\beta}$$

or,

$$\frac{\partial \Xi}{\partial H} = \frac{1}{\beta}\left((\alpha - p(H \setminus h))\,\partial p(H \setminus h)/\partial H - (\alpha - p(H))\,\partial p(H)/\partial H\right) \tag{26}$$

Using the equilibrium values derived, this expression becomes:

$$\frac{1}{\beta}\left(\frac{(\alpha - c)H + c - c_h}{(H+1)^3}(\alpha - 2c + c_h) - \frac{(H-1)(\alpha - c)^2}{H^3}\right) \tag{27}$$

Differentiating Expression (27) with respect to c_h yields a positive expression, thus implying that if Expression (27) is verified for the maximal admitable values of c_h, it is necessarily true for any value of c_h. The highest admissible value of c_h is a cost sufficiently high to drive the optimal production of country h to zero, hence c_h^{min} must be such that q_h as given by (11) is equal to zero, or $c_h = \frac{(\alpha - c)}{H} + c$. Replacing in Expression (27) allows us to conclude that the expression is negative if:

$$\left(\frac{(\alpha - c)H - \frac{\alpha - c}{H}}{(H+1)^3}\right)\left(\alpha - c + \frac{\alpha - c}{H}\right) < \frac{(H-1)(\alpha - c)^2}{H^3} \tag{28}$$

or,

$$\frac{\partial \Xi}{\partial H} < 0 \Leftarrow \frac{(H - \frac{1}{H})(1 + \frac{1}{H})}{(H+1)^3} < \frac{(H-1)}{H^3} \tag{29}$$

Developing and re-arranging yields:

$$\frac{\partial \Xi}{\partial H} < 0 \Leftarrow 0 < H^3 + H^2 - H - 1 \tag{30}$$

With the second inequality being verified in the relevant range of parameters, i.e. for $H > 2$. □

Increasing the competition on the oil production market implies that prices will decrease under both scenarios, i.e., where country h is peaceful and where it expe-riences a civil war. Yet, as the effect of increased competition on prices — i.e., the elasticity of prices to the number of producers — is stronger for low levels of com-petition. For higher levels of competition the gap in prices between intervention and non-intervention tends to narrow, thus reducing the incentives to intervene in country h.

Oil-importing countries can also be shown to be increasingly likely to intervene, the higher their imports:

Proposition 4. *The higher the oil imports of a country, the more likely it intervenes militarily in an oil-producing country experiencing civil war.*

Proof. This result follows from the fact the LHS of expression (25) can easily be shown to be increasing in α and decreasing in β, the two demand parameters where the demand - and therefore the imports - is increasing in α and decreasing in β □

Oil Exporting countries

With respect to oil exporting countries we can derive the following result:

Proposition 5. *When the oil exports of symmetric oil producers increase, the likeli-hood any of them intervenes militarily in an oil-producing country experiencing civil war decreases.*

Proof. Oil exporting countries are by definition oil-producing ones. Differentiating Expression (22) with respect to the demand parameter α yields, after simplification, that Expression (22) is decreasing in α if the following expression is verified:

$$\frac{2(\alpha - c + c_h - c) + H^2(\alpha - c) + H(c - c_h)}{(H+1)^2} < \frac{2(\alpha - c)(H+1)^2 + (H-1)^2(H+1)^2(\alpha - c)}{H^2} \tag{31}$$

and this expression can easily be shown to be verified for $c_h = c$ and $H > 2$. □

This result follows from the fact that the higher the international demand for oil, the higher the profits of oil producers. Hence, despite the direct negative effect of increased oil prices for consumers in oil producing countries, consumers are still overall better off because of the wealth from higher oil profits.

Data and Empirical strategy

We now turn to the empirical analysis of our propositions on the military and economic conditions likely to affect third party interventions in a civil war. We first describe our data.

Dependent Variable

Our data on third party intervention come from Koga,[27] who extend Regan's[28] original data with information from Pearson & Baumann[29] and Pickering & Kisangani[30] for additional conflicts. The data covers the civil wars identified by Fearon & Laitin over the 1945-1999 period. Military intervention in a civil conflict is defined as a "convention breaking military activities in the internal affairs of a foreign country targeted at the authority structures of the government with the aim of affecting the balance of power between the government and opposition forces".[31] The unit of observation is dyadic - i.e. country at war and any of the potential interveners - and is observed from the begin until the end of the conflict. Every state in the international system is

[27] Koga (2011).
[28] Regan (2002).
[29] Pearson & Baumann (1993).
[30] Pickering & Kisangani (2009).
[31] See Regan (1998), p.756.

considered a potential intervener in each civil war. Figure 1 shows the number of civil wars and third party interventions in civil wars in our dataset.

Oil

We assembled a very large dataset on oil, which includes stock variables, i.e., oil reserves, oil endowment, wildcats and new discoveries, as well as flow variables, i.e., oil import and export, and oil prices. *Oil reserves* and *oil initial endowment*[32] in thousand million barrels and crude oil prices in 1990 USD per barrel are taken from Cotet & Tsui, drawing on information from the Association for the Study of Peak Oil and Gas (ASPO), the BP Statistical Review of World Energy and the Oil & Gas Journal (OGJ). We also use information from these data on the number of *wildcats* (i.e. exploratory borehole), drilled at any given year and new *oil discoveries* in thousand million barrels, which can be treated as a positive oil shock. This database allows for a much broader examination of the impact of oil on intervention decisions, both across countries and over time.

Data on *oil imports* and *oil exports* are taken from Feenstra *et al.*[33] and are available for the period 1962 to 2000. We construct three indicators: 1) the balance of trade in oil, constructed as the difference between the quantity of oil export and the quantity of oil import in cubic meters (only available from 1984 on). A positive value indicates that the third party is a net exporter, e.g., Saudi Arabia. 2) The bilateral oil import, which is the quantity of oil imported by the third party from the conflict state. 3) The size of oil-exporting countries in relation to the world oil market which serves as an indicator of the amount of competition among them. We use a commonly accepted measure of market concentration, the Herfindahl-Hirschman Index (*HHI*), which is calculated by squaring the market share of each exporting country in the oil market, and then summing the resulting numbers. The HHI can range from close to zero to 10,000. In a perfectly competitive market, HHI approaches zero while higher values

[32] Oil endowment includes undiscovered resources and is mostly determined by geography while oil reserves depend on previous exploration effort and the rate of extraction (see Cotet & Tsui, 2013).

[33] Feenstra *et al.* (2005).

of the index indicate a market approaching a monopoly.[34] We create the HHI index using data on the quantity of oil exported by each country in the world every year. The above measures are fine-grained variables and allows us to submit our theoretical arguments to rigorous testing.

Control Variables

To anchor our results in the existing literature on third party intervention, we build on Koga's econometric model and include most of her explanatory variables, along three dimensions: the characteristics of a potential intervener, the characteristics of the conflict state and measures of connections between them. In particular, we include the *Polity IV* scores, indicating the level of democracy, for both the potential intervener and country at war. To capture the relative fighting effort and the conflict technology of the opposition we use the *rebel strength*, an ordinal measure of the military strength of rebels relative to the government which is meant to proxy for the ability to target government forces, the ability of rebel groups to resist repression, and the availability of nonviolent alternatives.[35] The *capability ratio* is a measure of a third-party state's military advantage over a conflict state and is constructed as the log of the ratio of the Correlates of War's Composite Index of National Capabilities. We control for connections between the third party state and the country at war, in particular the capital-to-capital *distance* between the conflict and third-party states and the existence of *ethnic ties* between the key supporters of a political leader in a third-party state and an ethnic group in power in a conflict state. Data on ethnic ties were assembled by Koga, drawing on information from Austvoll and Fearon *et al.*.[36] Additional control variables are year dummies for the Cold War, dummies for *previous interventions* by other countries in the same civil conflict and the number of *years since the last military intervention* for the same dyad. We report probit estimates with robust standard errors, adjusted for clustering by dyads to take into account temporal dependencies

[34] If, for example, there were only one oil exporting country, it would have 100% of the market shares, and the HHI would then equal 10,000.

[35] Cunningham *et al.* (2009).

[36] See Austvoll (2006) and Fearon *et al.* (2007).

and heteroskedasticity. We transform all the positive continuous variables into logs to scale down the variance and reduce the effect of outliers.

Results

As our theoretical model makes clear, there are two dimensions to oil trade, demand and supply, since every economic transaction has two sides. The results in Tables 1 and 2 focus on the supply side and show how third party's decision is based upon the attributes of the conflict state in terms of oil wealth, while Tables 3 and 4 include the demand side, that is, the intervener's demand for oil and the characteristics of the market.

Before discussing our main explanatory variables, we briefly summarize the results with regard to the control variables, which in general do not differ notably from the findings reported in previous studies. The Polity IV score of the intervener does not significantly affect the likelihood of intervention, while we are more likely to see intervention in more autocratic conflict states. The higher the military advantage of a third-party state over a conflict state (lratio, i.e. the capability ratio) the higher the odds of military intervention. Unsurprisingly, major powers are more able and willing to intervene, and have historically sought to increase and protect their sphere of influence (e.g. USA and Soviet Union) and possess better power projection capabilities. The strength of the opposition forces is a main explanatory factor of external intervention in civil wars. The coefficient indicates that an improvement in the rebel capabilities increases the probability of a military intervention, possibly because it picks up the lack of competitive advantage of the government, which reduces its chances to prevail on the other side and to develop a peace process. Taken together, these results suggest that intervention supporting either a government or a rebel group is more likely when it can effectively alter the balance of power in favour of the supported side. This should increase the prospect for the victory of the supported side and shorten war du-

ration. Previous interventions in the same civil war have a positive effect, while the number of years elapsed since the previous military intervention for the same dyad decreases the likelihood of a renewed interest in the conflict. The existence of ethnic ties increase the likelihood of external involvement in the affairs of the country as they motivate foreign countries to support a group sharing the same ethnic identity. The expectation that interventions by neighbouring states should be more likely given the risk of conflict spillover is confirmed by the log of distance, which is negative. Finally, the Cold War saw a global competition between the superpowers and hence more instances of foreign support to one of the two sides.

Our main contribution lies in the identification of some economic forces driving the decision to intervene. Civil wars in oil producing countries have ramifications far beyond that nation's borders and they could contaminate oil markets very quickly. Heightened tensions can prompt an exodus of oil companies from the conflict country while oil supply fears may easily affect oil prices and have predictable consequences on the oil industry. To what extent is the protection of the oil market a crucial objective that encourages countries to undertake military interventions?

Table 1 is a direct test of Proposition 1, stating that third party interventions are more likely the higher the oil endowments of a country at war. We focus on stock variables: oil reserves, oil endowments, the amount of new oil discoveries and the number of wildcats. With the exception of the amount of recent oil discoveries (model C), all the indicators have significant effects on the likelihood of external intervention in the expected direction. This is consistent with our claim that the profitability of the exporting industry is a strong factor determining the decision to interfere in a civil war. Although flow variables from the conflict states such as oil exports are likely to be endogenous to intervention, our stock variables here are unlikely to suffer from such problems. A previous study by Koga uses a binary variable for whether crude oil and/or gas is produced in the conflict state or not, taken from PETRODATA.[37] Possi-

[37]Lujala *et al.* (2007)

bly because of this problem, she does not find any significant effect of hydrocarbon production on military intervention. On the contrary, we find that countries with a potential for oil production are more likely to be targeted by foreign intervention.

Yet, whether an oil-rich country is going to experienc third party interventinos depends on the value of its reserves, which is given by the product of the quantity of its endowments and the world oil prices. Given the notable fluctuations in oil prices, the incentives to intervene are shaped by the value of this country's reserves rather than the quantity. Table 2 replaces our stock variables in thousand million barrels with its value (i.e. quantity times price in constant 1990 USD). The geoeconomic salience of an oil-rich country primarily derives from the value of its wealth, which is time varying given the volatility of oil prices. As we can see, both the log of the value of oil reserves (model A) and the log of the value of its endowments (model B), positively affect the choices of third parties and are significant at conventional levels. The value of new oil discoveries (model C) fails to attain statistical significance, even though it has the expected sign, while the number of wildcats "weighed" by oil price again is positive and significant.

Our model also sheds light on the role played by the demand for oil in the decision to intervene. As previously mentioned, in Tables 3 and 4 we use the balance of trade in oil of each potential intervener, which indicates the third party's appetite for energy. Table 3 uses quantities while Table 4 replicates Table 3 using values (quantities times price). A negative value indicates that a country is a net importer while positive values pick up trade surpluses in oil. Given the possibility of negative values (i.e. net importer) we cannot log transform these variables, but we express them in billion to scale them down. Over the last decades many countries like the UK and Indonesia became net importers after being net exporters for a long period, while new discoveries in other countries have led to the opposite trend.

We test our hypotheses in order of importance, starting with column A where we test Propositions 4 and 5. The net demand for oil is negative and significant, thus

indicating that an increasing need for oil in a country is associated with higher odds of involvement in civil conflicts. In column B we consider Proposition 3, or that an intervention is more likely the more oligopolistic the market for oil. Our theoretical expectations with regards to the HH index of market concentration are also supported by the empirical findings. High HH indices signal low levels of competition within the oil industry and capture the importance of stabilising a region to prevent or reduce shocks to the market. Accordingly, the coefficient is positive and statistically significant. Model C replicates model B but include an interaction term by multiplying the amount of reserves in the country at war and the balance of trade in oil in the intervening country. This interaction allows for the possibility that the oil dependence in a third party state affects its likelihood of intervention in a civil war conditional on the level of reserves in the conflict state. The balance of trade still affects the likelihood of intervention, negatively and significantly, but this now depends on the amount of reserves in the country at war. Finally, model D includes the quantity of bilateral imports of oil from the conflict state to the potential interveners to offer an empirical support to Proposition 2. There is a notable decrease in the number of observations due to missing data on bilateral trade. Yet, results point out that a dependence on oil from the conflict country increases the willingness of a third party state to intervene when its supplier is embroiled in a civil war. Note, however, that the coefficient of bilateral oil import is most certainly contaminated by two sources of endogeneity, namely omitted variables bias and reverse causality. The first is a consequence of possible unobserved co-determinants of intervention and trade which may have not been included in the model. The second may arise from causality running both ways, i.e., the intervention may boost bilateral imports. As such, this result must be interpreted with caution. Finally, Table 4 mimics Table 3 but makes use of the value of oil trade and oil reserves by multiplying stock and flow variables by oil prices. As we can see, the results are almost identical, but the coefficients are overall smaller as the multiplied terms have higher values.The impact of oil is larger than many of the factors stressed in other

research on interventions, such as pre/post-Cold War or ethnic ties.

Beyond statistical significance, Figure 2 illustrates the implied substantive effects of our results for model A in Table 4, across differences in demand and the supply concerns. The shaded colors indicate how the probability of intervention for a modal dyad vary according to combinations of the value of reserves (supply side) and the balance of trade in oil (demand side). Both axes range from the minimum to the maximum values. Higher reserves in the conflict country make interventions more likely, while negative values of balance for the interveners (i.e., higher net imports) make interventions more likely. The absolute probabilities range from 0.002 to 0.2%. Although interventions are rare overall, the likelihood of intervention increase by a factor of about 100 from the low likelihood to a high likelihood scenario. As such, we conclude that the implied impact of oil in our model is also substantively important, consistent with our theoretical arguments.

Conclusions

The rhetoric or the professed goals for intervening in civil wars are often controversial, and there may be a variety of other factors motivating intervention. As of the time of writing (November 2013), many observers have drawn attention to how we have seen international intervention in the civil war in Libya but not in the Syrian conflict. The proverbial "thirst for oil" is often offered as a near self-evident explanation, echoing previous claims about the alleged "true" motivate of the 2003 US invasion of Iraq.[38] We certainly acknowledge that such claims are often incomplete and simplistic. However, challenging dubious claims is best done by more serious analysis, and we believe that the possible differential economic benefits of intervention are worthy of more scholarly attention.

Our formal model presented here highlights the relationship of potential third party

[38] See, e.g., Moisés Naím, "Why Libya, But Not Syria? Five Answers", *The Huffington Post*, 18 May 2011.

interveners to the conflict country, and emphasizes variation in their costs of ongoing conflict and benefits of intervention. We integrate third parties into a conventional model of civil conflict between a government and opposition forces, where conflict has implications for oil production and exports and in turn prices for oil importers. We consider a world composed of oil producing and non-oil producing countries and identify a set of parameters that will influence incentives for third parties to intervene. Whereas existing research has largely disregarded the role of economic factors and oil, we demonstrate that both supply and demand factors tend to increase the incentives for external military involvement, and we find strong empirical support for our claim.

Our article most directly helps to shed light light on economic and strategic conditions that influence the likelihood of third party intervention, and we note that oil shocks are often to a larger extent routed in security-related political developments and events. Beyond the immediate implications for intervention in civil wars, we think that our model and results also help provide a deeper understanding of other events and trends in world politics. In particular, our approach can partially account for foreign policy towards the oil-rich countries in the Middle East. The strong economic dependence of developed economies to the steady supply of crude oil have likely favored a strong emphasis on stability. Beyond Western military involvement in response to conflict, such as the interventions to roll back the 1990 Iraqi invasion of Kuwait, the US also provides large-scale military aid and troops to Persian Gulf oil producers, and has a history of supporting conservative autocratic states, in spite of the emphasis on democratic reform elsewhere. We see this military and political support at least in part motivated to ensure that countries on the Arabian Peninsula maintain crude oil prices within a target range. The enduring record of geopolitical instability in oil producing regions and the likely increase in the global demand for oil leads us to expect that economic incentives will figure prominently in whether we see interventions in civil war. However, with a less energy dependent US and a more energy dependent China, the specific states with the greatest incentives to intervene

are likely to change notably in the future.

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Table 1: Supply side - endowment

	Model A	Model B	Model C	Model D
third_polity	0.007	0.006	0.007	0.006
	(0.007)	(0.007)	(0.007)	(0.007)
con_polity	-0.018**	-0.022**	-0.024***	-0.026***
	(0.008)	(0.009)	(0.009)	(0.009)
lratio	0.172***	0.166***	0.140***	0.174***
	(0.033)	(0.033)	(0.035)	(0.034)
majpow2	0.857***	0.903***	0.978***	0.886***
	(0.155)	(0.167)	(0.165)	(0.171)
reb_relstr	0.132*	0.127*	0.100	0.106
	(0.077)	(0.076)	(0.071)	(0.072)
premilint	0.436***	0.424***	0.420***	0.437***
	(0.075)	(0.078)	(0.076)	(0.080)
spellmili	-0.074***	-0.064***	-0.063***	-0.065***
	(0.016)	(0.019)	(0.019)	(0.018)
ethnictie	0.584***	0.600***	0.587***	0.588***
	(0.135)	(0.150)	(0.150)	(0.148)
lndistance	-0.490***	-0.527***	-0.516***	-0.537***
	(0.071)	(0.080)	(0.082)	(0.079)
Coldwar	0.351**	0.389***	0.399***	0.392***
	(0.138)	(0.146)	(0.145)	(0.144)
lReserves	0.019***			
	(0.007)			
lendowment		0.067*		
		(0.037)		
lnewdiscovery			-0.020	
			(0.133)	
lwildcat				0.091**
				(0.041)
N	69406	55567	55567	55567

* p < 0.10, ** p < 0.05, *** p < 0.01

Robust standard errors are given in parentheses clustered by dyad

Table 2: Supply side - value

	Model A	Model B	Model C	Model D
third_polity	0.006	0.007	0.007	0.006
	(0.007)	(0.007)	(0.007)	(0.007)
con_polity	-0.018**	-0.021**	-0.024***	-0.026***
	(0.008)	(0.009)	(0.009)	(0.009)
lratio	0.175***	0.170***	0.150***	0.172***
	(0.033)	(0.034)	(0.036)	(0.033)
majpow2	0.853***	0.896***	0.945***	0.894***
	(0.156)	(0.168)	(0.168)	(0.168)
reb_relstr	0.136*	0.149*	0.101	0.115
	(0.078)	(0.076)	(0.071)	(0.073)
premilint	0.434***	0.418***	0.426***	0.431***
	(0.075)	(0.078)	(0.077)	(0.079)
spellmili	-0.075***	-0.065***	-0.064***	-0.066***
	(0.017)	(0.019)	(0.019)	(0.018)
ethnictie	0.586***	0.606***	0.599***	0.594***
	(0.134)	(0.150)	(0.149)	(0.148)
lndistance	-0.492***	-0.536***	-0.518***	-0.539***
	(0.070)	(0.078)	(0.081)	(0.077)
Coldwar	0.353**	0.397***	0.387***	0.398***
	(0.138)	(0.146)	(0.144)	(0.145)
lValueReserves	0.016***			
	(0.006)			
lValueEndowment		0.044**		
		(0.022)		
lvaluenewdiscovery			0.044	
			(0.038)	
lvaluewildcat				0.043**
				(0.019)
N	69406	55567	55567	55567

* p < 0.10, ** p < 0.05, *** p < 0.01

Robust standard errors are given in parentheses clustered by dyad

Table 3: Demand side - quantity

	Model A	Model B	Model C	Model D
third_polity	0.004	0.006	0.006	-0.006
	(0.010)	(0.010)	(0.010)	(0.022)
con_polity	-0.018	-0.016	-0.017	-0.039
	(0.015)	(0.015)	(0.016)	(0.030)
lratio	0.218***	0.214***	0.215***	0.320***
	(0.069)	(0.070)	(0.069)	(0.086)
majpow2	0.603**	0.621**	0.619**	1.010***
	(0.246)	(0.247)	(0.245)	(0.383)
reb_relstr	0.083	0.115	0.104	0.209
	(0.122)	(0.137)	(0.136)	(0.158)
premilint	0.459***	0.453***	0.459***	0.843***
	(0.153)	(0.154)	(0.154)	(0.277)
spellmili	-0.067***	-0.071***	-0.070***	-0.077***
	(0.024)	(0.025)	(0.025)	(0.020)
ethnictie	0.670***	0.663***	0.706***	1.268***
	(0.184)	(0.189)	(0.191)	(0.328)
lndistance	-0.510***	-0.520***	-0.517***	-0.454***
	(0.083)	(0.086)	(0.087)	(0.124)
Coldwar	0.597**	0.597**	0.581**	0.633***
	(0.258)	(0.262)	(0.259)	(0.236)
lReserves	0.032***	0.033***	0.028***	0.067***
	(0.009)	(0.009)	(0.010)	(0.023)
balancequantity	-2.003**	-1.899**	-1.049	
	(0.848)	(0.836)	(0.905)	
HHI		259.629**	253.027**	
		(122.148)	(120.873)	
lReservesXbalance			-0.110**	
			(0.051)	
lbilateralquantity				0.073***
				(0.021)
N	31951	31951	31951	7291

* p < 0.10, ** p < 0.05, *** p < 0.01

Robust standard errors are given in parentheses clustered by dyad

Table 4: Demand side - value

	Model A	Model B	Model C	Model D
third_polity	0.003	0.005	0.004	-0.006
	(0.011)	(0.011)	(0.011)	(0.021)
con_polity	-0.017	-0.015	-0.016	-0.039
	(0.015)	(0.015)	(0.015)	(0.029)
lratio	0.218***	0.214***	0.217***	0.321***
	(0.071)	(0.072)	(0.072)	(0.089)
majpow2	0.602**	0.615**	0.612**	1.026***
	(0.254)	(0.255)	(0.254)	(0.394)
reb_relstr	0.099	0.133	0.121	0.209
	(0.123)	(0.139)	(0.139)	(0.161)
premilint	0.456***	0.450***	0.463***	0.856***
	(0.155)	(0.155)	(0.156)	(0.278)
spellmili	-0.066***	-0.070***	-0.070***	-0.077***
	(0.024)	(0.025)	(0.025)	(0.020)
ethnictie	0.672***	0.665***	0.704***	1.268***
	(0.186)	(0.191)	(0.192)	(0.317)
lndistance	-0.513***	-0.525***	-0.525***	-0.467***
	(0.084)	(0.086)	(0.087)	(0.125)
Coldwar	0.575**	0.577**	0.561**	0.592**
	(0.267)	(0.270)	(0.269)	(0.238)
lValueReserves	0.026***	0.027***	0.023***	0.061***
	(0.008)	(0.008)	(0.009)	(0.020)
balancevalue	-0.038***	-0.036**	-0.020	
	(0.014)	(0.014)	(0.017)	
HHI		269.465**	263.873**	
		(124.826)	(124.408)	
lValueReservesXbalance			-0.002**	
			(0.001)	
lbilateralvalue				0.054***
				(0.017)
N	31951	31951	31951	7291

* p < 0.10, ** p < 0.05, *** p < 0.01

Robust standard errors are given in parentheses clustered by dyad

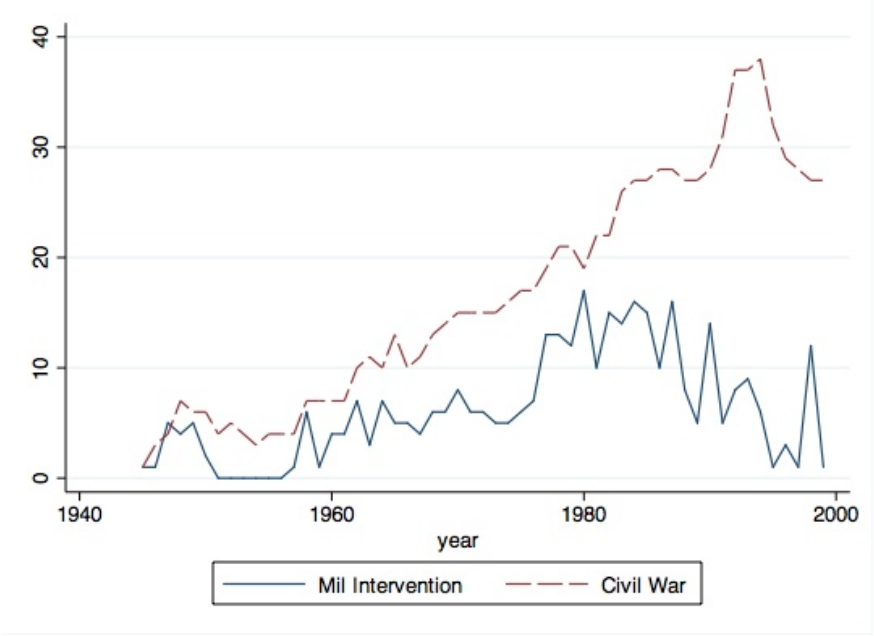

Figure 1: Number of civil wars and military interventions

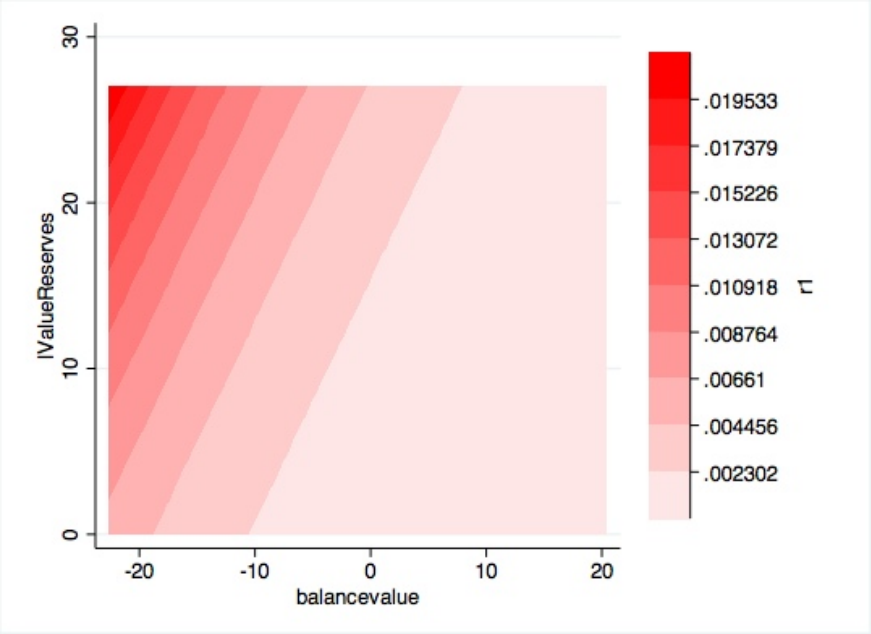

Figure 2: Marginal impact of combinations of oil reserves (value) and the balance of trade in oil (value) on the likelihood of intervention