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Oil Prices and Interstate Conflict Behavior

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Abstract

Anecdotal evidence suggests high oil prices embolden leaders in oil-rich states to pursue more aggressive foreign policies. This article tests the conjecture in a sample of 153 countries for the time period 1947–2001. It finds strong evidence of a contingent effect of oil prices on interstate disputes, with high oil prices associated with significant increases in dispute behavior among oil-exporting states, while having either a negative or null effect on dispute behavior in nonexporting states.

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INTRODUCTION

> When I heard the president of Iran, Mahmoud Ahmadinejad, declare that the Holocaust was a "myth," I couldn't help asking myself: "I wonder if the president of Iran would be talking this way if the price of oil were $20 a barrel today rather than $60 a barrel." When I heard Venezuela's President Hugo Chávez telling British Prime Minister Tony Blair to "go right to hell" and telling his supporters that the U.S.-sponsored Free Trade Area of the Americas "can go to hell," too, I couldn't help saying to myself, "I wonder if the president of Venezuela would be saying all these things if the price of oil today were $20 a barrel rather than $60 a barrel, and his country had to make a living by empowering its own entrepreneurs, not just drilling wells." (Thomas Friedman, "The First Law of Petropolitics")

Thomas Friedman's First Law of Petropolitics suggests that high oil prices embolden producers to adopt more confrontational foreign policies (2006). The events of 2008 would seem to provide his conjecture with plenty of anecdotal support. Russia's invasion of neighboring Georgia—ostensibly in response to Georgian aggression against the breakaway region of South Ossetia—occurred in August of that year, just one month after crude oil prices hit their then highest point since 1980. A month later, Bolivia's Evo Morales and Venezuela's Hugo Chávez—both part of the left-leaning "pink tide"—expelled their US ambassadors as punishment for the United States purportedly fomenting unrest.[1] Chavez sent ten tank battalions to its border in response to a Colombian incursion into neighboring Ecuador.[2] War raged between Israel and Hamas in the Gaza Strip. With Iranian backing, Hamas was able to launch rocket attacks on Bersheeba and Gedera. Khaled Mashaal, the chairman of the Damascus-based Hamas Political Bureau, would later say that Iran had played a "big role," providing money and moral support.[3]

Following Russia's annexation of the Crimea and ongoing unrest in eastern Ukraine, energy politics are back in the spotlight: In April 2014, Russia's state-owned Gazprom doubled the price it charges Ukraine for natural gas and threatened to shut off shipments to Ukraine's state-owned Naftogaz.[4]

Examples of oil-backed coercive diplomacy abound: the 1967 and 1973 Arab oil embargoes, Chavez's recurrent threats to embargo oil shipments to the United States, and Russia's intermittent restrictions of energy flows to Eastern Europe. In each of these instances, the use of oil as a source of coercive diplomatic leverage roiled markets, pushing up prices if not always dramatically curtailing supply.

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1. Referring to violent riots in Bolivia and a coup attempt in Venezuela.

2. "Chavez sends tanks to Colombia border in dispute," *Reuters*, March 2, 2008 available at www.reuters.com/article/2008/03/02/us-venezuela-colombia-idUSN022763302008030 (accessed on July 2, 2014).

3. "Hamas Leader: Iran Played 'Big Role' in Helping the Gaza Fight," *Associated Press*, February 2, 2009, available at http://www.foxnews.com/story/2009/02/02/hamas-leader-iran-played-big-role-in-helping-gaza-fight/ (accessed on July 2, 2014).

4. "Ukraine makes inroads on energy security as Donetsk teeters," *Christian Science Monitor*, April 15, 2014, available at http://www.csmonitor.com/Environment/Energy-Voices/2014/0415/Ukraine-makes-inroads-on-energy-security-as-Donetsk-teeters-video (accessed on July 2, 2014).

The 2008 examples, however, raise the question of whether high prices actually embolden leaders to pursue more bellicose foreign policies. This paper attempts to discern whether oil prices affect patterns of interstate dispute behavior. The results are clear: Higher oil prices are associated with an increased frequency of disputes in oil-producing states, but not in non-oil producers. I find no evidence that global prices are driven by dispute behavior in oil-producing states, suggesting that the identified correlations are not evidence of reverse causality.

The remainder of this paper proceeds as follows. The next section summarizes the nascent literature on oil and interstate conflict, arguing that most causal mechanisms identified in the literature are implicitly price-contingent and developing hypotheses to test this conjecture. The following section discusses data, the estimation strategy, and results. It then briefly considers the potential for endogeneity—that conflict behavior drives oil prices—before offering conclusions.

OIL EXPORTERS AND CONFLICT BEHAVIOR

There is now a well-established body of literature linking oil wealth to intrastate conflict (Le Billon 2001, Fearon and Laitin 2003, Ross 2004a and 2004b, Ross 2012, Le Billon 2013), though there is some disagreement about mechanisms: whether oil is primarily a contestable resource, whether extraction fuels grievances related to local environmental costs and diffuse economic benefits, or whether oil wealth tends to produce weak state institutions because of the ease with which states can capture resource rents. Others focus on the location of oil deposits, arguing for spatially differentiated effects. Päivi Lujala (2010) finds that onshore oil production increases the probability of conflict onset by 50 percent. In contrast, offshore production is not associated with conflict onset. Moreover, conflicts tend to last longer when oil reserves or gemstones are located within the conflict zone. Matthias Basedau and Jan Henryk Pierskalla (2014) find that when oil deposits overlap territorially with powerful, politically included ethnic groups, the normal relationship between oil and conflict is reversed, and oil exploitation has a pacifying effect.

By comparison, the literature on the impacts of oil resource wealth for interstate conflict is still nascent. Oil exporters have more aggressive foreign policies and engage in interstate disputes more frequently than non-oil exporters. Jeff Colgan (2010) finds that "petrostates"—states in which revenues from net oil exports constitute at least 10 percent of GDP—have engaged in militarized interstate disputes (MIDs) 50 percent more frequently than nonpetrostates in the post–World War II era.[5] Natural resource exporters—particularly oil exporters—engage in militarized disputes more often than nonresource exporters, though these disputes rarely escalate into full-blown wars.

5. "Militarized interstate disputes are united historical cases of conflict in which the threat, display or use of military force short of war by one member state is explicitly directed towards the government, official representatives, official forces, property, or

Why would oil exporters be more conflict-prone? Indra de Soysa, Erik Gartzke, and Tove Grete Lie (2011) note that oil is a highly contestable resource: a stock of natural capital that can be captured through conquest. Because of its contestability, oil should make a state a more appealing target. Fighting over oil may ultimately be less attractive, however, than either purchasing it or cultivating close ties with governments in producing countries. As the United States learned first-hand in Iraq, it is easy to underestimate the costs associated with occupying and directly governing foreign territory, even if (or perhaps because) that territory is rich in resources (Wimberley 2007). Stability in oil-producing countries is often based on complex, dense networks of patronage that are much easier to destroy than to rebuild. The presence of oil veritably ensures that insurgents will have little trouble arming and equipping themselves, either through extortion—or "revolutionary taxation," depending on one's point of view—or direct third-party support.

Oil exporters may be more conflict-prone because their pursuit of security provokes security dilemma dynamics. The rents generated from oil exports help finance large, technologically sophisticated militaries in exporting countries. Since 2000, six of the top ten countries in terms of military expenditures per capita have been oil exporters: the United Arab Emirates, Kuwait, Qatar, Oman, Saudi Arabia, and Norway (Hendrix and Noland 2014, 61). Even if these expenditures are driven by a desire to enhance defensive capacity, the fungibility of most military assets makes their amassment by one country an inherent menace to its neighbors (Jervis 1977). While this menace can be mitigated through credible signaling of defensive intent (Fearon 1997), credible signaling of intent is more difficult for many oil-exporting states, which are less democratic (Lake 1992, Andersen and Ross 2014) and less well integrated in global governance institutions (Ross and Voeten 2011, Hendrix and Noland 2014).

Alternately, oil producers may be more conflict-prone because they expect to face less grave consequences for saber-rattling behavior. Because oil is a strategic resource, major powers invest significant resources in securing global supply lines and have incentives to prevent large-scale conflict in oil-producing countries that might result in global price spikes. Given that all the members of the UN Security Council except Russia are major oil importers, maintaining stability in oil-producing states and deterring oil-seeking territorial aggression approach an international norm. The 1991 Gulf War, in which a US-led coalition responded to Iraq's invasion of neighboring Kuwait, was waged under the auspices of a UN Security Council binding resolution. This implicit security guarantee may produce a form of moral hazard: Essentially indemnified against large battlefield and territorial losses, oil exporters may be more casual about the use of force—or threats of force—in their dealings with other countries, especially countries that are not energy exporters and are thus not similarly insured themselves. De Soysa, Gartzke,

territory of another state. Disputes are composed of incidents that range in intensity from threats to use force to actual combat short of war" (Jones, Bremer, and Singer 1996, 163).

and Lie (2011) find that oil exporters tend to initiate more MIDs with non-oil exporters, although the substantive effect is small.

These dynamics (outsized militaries and implicit security guarantees) may embolden certain types of leaders more than others. Because state authorities can easily appropriate oil revenues, they provide rulers with greater resources with which to buy off opposition and spend on their militaries, reducing the domestic costs associated with more risky foreign policy behavior. Although this logic establishes means, it does not establish motive. Leaders of many oil-rich states—such as Saudi Arabia, the United Arab Emirates, Nigeria, and Gabon—are satisfied with their position in the status quo and lack revisionist ambitions: dissatisfaction born of a belief that they are not "receiving their due from the international order" (Kugler and Organski 1989). In contrast, revolutionary leaders—leaders who come to power by force and attempt to transform preexisting political and economic relationships, both domestically and abroad—often have revisionist ambitions and are less hesitant about using force to resolve international disputes. Colgan argues revolutionary governments with oil wealth have both motive and means to initiate militarized disputes, and finds they initiate MIDs more frequently (2010, 2013).

These findings, however, are not conditional on oil prices. This gap in the literature is curious, since academic and policy community interest in the subject certainly correlates with price spikes: The 1973 embargo produced a decade of scholarship on oil and US national security (Krasner 1978, Rostow 1979, Nye 1980), and the 2000s have seen renewed interest on energy security and broader energy-sector impacts on economic and political development (Birdsall and Subramanian 2004, Yergin 2011, Ross 2012, Colgan 2013).

All of the mechanisms outlined previously—being an attractive target, moral hazard dynamics related to strategic importance, military expenditures leading to security dilemmas, and revolutionary leaders emboldened by deep coffers—should be attenuated or amplified by price effects. The issue salience school of international relations (Diehl 1992, Hensel et al. 2008) argues that the value attached to a particular issue determines whether a state will be willing to commit scarce resources and bear costs associated with conflict to achieve its goals. States marshal their resources in pursuit and defense of their interests, but not all interests are equal. States will be more willing to bear the costs of conflict over highly salient issues. For all states, energy is a national interest. This interest should be more salient at times of high prices for two reasons. First, high prices increase the present discounted value of ownership of these resources, potentially making oil-rich countries more attractive targets for conquest. Second, the moral hazard dynamics engendered by major powers' dependence on energy imports should be greater when prices are higher.

The military expenditure mechanism and the bloated coffers mechanism are predicated on receipts from sales of oil providing plentiful resources for investment in soldiers and materiel.

Government revenues in oil-exporting countries can fluctuate wildly due to changes in market prices. Take Nigeria, for which petroleum exports account for 70 percent of total export revenue. Figure 1 plots economic growth, total government revenue growth, and oil price growth for the period 2004–12. While GDP growth was consistently over 5 percent per annum, government revenues fluctuated widely: They increased from $14.2 billion to $17.5 billion from 2007 to 2008 (23 percent growth) before falling by $2.4 billion the following year. These changes in revenue correlate closely with real oil prices (r = 0.6). When prices are low, government revenues in oil-exporting countries will be lower; when prices are high, revenues will be higher.

In the bargaining model of conflict, fighting is ex post inefficient: Because fighting is costly, there are always some outcomes that both parties would prefer to conflict (Fearon 1995, Powell 2002). As the perceived costs of conflict increase, the range of outcomes both parties prefer to war increases. These costs can be real, in terms of "blood and treasure," but also take the form of opportunity costs: the economic and social losses stemming from diversion of productive resources into fighting. Opportunity costs are typically characterized as a "guns and butter" trade off, in which states decide between allocating resources to satisfying internal ends and allocating resources to military purposes (Powell 1993). The more a state allocates to addressing internal demands, the fewer resources are available to invest in the military. When government revenues are down, the opportunity cost of conflict increases proportionally; internal demands on the state are more difficult to meet, giving leaders a less-free hand with which to pursue aggressive (and potentially expensive) foreign policies.

These theoretical conjectures yield a straightforward testable hypothesis (H_1):

H_1: Oil prices will be positively associated with interstate conflict behavior in oil-exporting states.

What about the effects for non-oil exporters? The theoretical effects are ambiguous: Low oil prices translate to lower mobilization costs. Modern armies are incredibly energy-intensive: the US Army, for instance, consumed an average of 47.7 million liters of fuel per day in 2006, roughly equal to the daily consumption of Iraq or Sweden (Lengyel 2007). All things held constant, low fuel costs lower the perceived costs of engaging in conflict. High fuel costs, however, raise the present discounted value of control of oil supplies, a contestable resource, thus increasing the attractiveness of oil exporters as targets. However, per the moral hazard logic, high prices should also increase the incentives for major powers to act preemptively to deter escalation against oil producers. Theoretically, the two effects should counter one another, leading to the expectation that oil prices will not be correlated with dispute behavior in nonexporting states. Again, these theoretical conjectures yield a straightforward testable hypothesis (H_2):

H_2: Oil prices will not be associated with interstate conflict behavior in non-oil-exporting states.

Aggregate correlations are consistent with these hypotheses. Figure 2 plots the real price per barrel of oil against annual counts of MIDs involving oil-exporting and non-oil-exporting countries for the period 1947–2001. Oil prices are positively correlated with dispute behavior in oil states ($r = 0.5$, $p = 0.01$), whereas oil prices are uncorrelated with dispute behavior in non-oil-exporting states ($r = 0.07$, $p = 0.59$). Of course, these correlations could be spurious; worse yet, they could be evidence of reverse causality, since conflict behavior in oil-exporting countries may cause price increases. For instance, spot crude prices jumped 11.6 percent on the day Iraq invaded Kuwait (August 2, 1990).[6] More careful econometric analysis is needed.

DATA, ESTIMATION, AND RESULTS

This study builds on a replication of Colgan (2010), who presents a monadic[7] analysis of the effects of oil exporter status on militarized interstate disputes. The models are run on a dataset comprising 153 states for the period 1947–2001; coverage of the variables restricts the analysis to 6,014 country-years.[8]

The dependent variable is the country-year count of MIDs. Behaviorally, MIDs range from relatively minor acts, such as or including troop incursions into disputed territory and firing warning shots, and attacks resulting in fatalities. They are considered the most comprehensive and widely used data source on interstate conflicts. I present tests for two operationalizations: total MIDs, irrespective of

6. Interestingly, spot crude prices dropped 30.3 percent on January 17, 1991, the day Operation Desert Storm (the invasion of Iraq by a 34-member country coalition force) commenced, providing some prima facie evidence that major power intervention can effectively tamp down prices by intervening on behalf of oil-rich states (such as Kuwait).

7. *Monadic* refers to the structure of the data. Whereas most interstate conflict studies use dyads—pairs of states—as the unit of analysis, the theoretical mechanisms identified here are monadic in nature; that is, they should affect the conflict propensity of state A in ways that are independent of the attributes of state B. Colgan's main effects regarding oil exporter status and revolutionary leadership are supported by both dyadic and monadic analyses.

8. As with Colgan (2010), the limiting constraint on sample size is whether the country was coded by the Polity IV project. The states included in the sample are Afghanistan, Albania, Algeria, Angola, Arab Republic of Egypt, Argentina, Armenia, Australia, Austria, Azerbaijan, Bangladesh, Belarus, Belgium, Benin, Bosnia and Herzegovina, Botswana, Brazil, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Canada, Central African Republic, Chile, China, Colombia, Comoros, Costa Rica, Côte d'Ivoire, Croatia, Cuba, Cyprus, the Czech Republic, the Democratic People's Republic of Korea, the Democratic Republic of Congo, Denmark, Djibouti, the Dominican Republic, Ecuador, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Finland, the former Yugoslav Republic of Macedonia, France, Gabon, The Gambia, Georgia, Germany, Ghana, Greece, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hungary, India, Indonesia, Iraq, Ireland, Islamic Republic of Iran, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kuwait, Kyrgyz Republic, Lao People's Democratic Republic, Latvia, Lebanon, Lesotho, Liberia, Libya, Lithuania, Madagascar, Malawi, Malaysia, Mali, Mauritania, Mexico, Moldova, Mongolia, Morocco, Mozambique, Namibia, Nepal, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Panama, Papua New Guinea, Paraguay, Peru, the Philippines, Plurinational State of Bolivia, Poland, Portugal, Qatar, República Bolivariana de Venezuela, the Republic of Congo, the Republic of Korea, the Republic of the Union of Myanmar, the Republic of Yemen, Romania, the Russian Federation, Rwanda, Saudi Arabia, Senegal, Sierra Leone, Singapore, the Slovak Republic, Slovenia, Somalia, South Africa, Spain, Sri Lanka, Sudan, Swaziland, Sweden, Switzerland, the Syrian Arab Republic, Tajikistan, Tanzania, Thailand, Togo, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Uganda, Ukraine, United Arab Emirates, the United Kingdom, the United States, Uruguay, Uzbekistan, Vietnam, Zambia, and Zimbabwe.

which state instigated, and instigated MIDs, those in which the country in question is the initiator (i.e., took the first action). The mean for MIDs is 0.5, with at least one MID occurring in roughly 25 percent of country-years, and with a maximum value of 26 (pertaining to Iran in 1987). The mean for instigated MIDs is 0.24, with at least one MID instigated in 10 percent of country-years, with a maximum of 23 (Iran in 1987).

The main independent variable is the real price of oil per barrel (West Texas Intermediate) in constant 2008 dollars; data are from Hamilton (2009).[9] Table 1 presents prices by decade for the period under study (1947–2001). Oil prices ranged from a low of $17.54 per barrel in 1947 to a high of $96.72 per barrel in 1980. Average prices were highest in the 1980s, when oil traded at prices 157 percent higher than the average of the 1960s. The relative standard deviation (RSD, σ / μ) indicates that while prices were higher on average in the 1980s, prices were more volatile in the 1970s, the decade characterized by two OPEC embargos. This stands in contrast to the 1950s and 1960s, a period characterized by comparatively low prices and very low price volatility.

To test for conditional effects, I interact the price variable with several variables drawn from Colgan (2010). *Oil state* is a dummy coding that takes a value of one if revenues from net oil exports constitute at least 10 percent of GDP, zero otherwise. Oil states account for 11.6 percent of country-years in the sample, with eleven states meeting this threshold for the entire time period.[10]

Revolutionary leader is a dummy coding for whether the head of state was a revolutionary leader or not. Colgan's definition of a revolutionary leader has two components. The first involves the means by which the ruler comes in to office: "First, has the individual leader used armed force against his own state at any time prior to coming to office as an integral part of coming to national influence, and ultimately, state leadership? Second, were there mass demonstrations or uprisings, violent or nonviolent, that were instrumental in deciding the outcome of the transition?" (Colgan 2012, 444–45). The second refers to the types of policies the leader implemented while in office: "Did the leader usher in a major change to the constitution? Did the leader adopt communism or fascism as the official ideology of the state/ruling party? Did the leader overhaul rules governing property ownership?" (445). Revolutionary leaders are present in 13.8 percent of country-years in the sample, with Russia/Union of Soviet Socialist Republics (82 percent), Cuba (81 percent), Albania (79 percent), Serbia/Yugoslavia (78 percent), and the Democratic Republic of the Congo (76 percent) having the largest proportion of time spent under revolutionary governments. For a complete list of revolutionary leaders, see Colgan (2012).

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9. Results are robust to price data derived from the British Petroleum Statistical Review of World Energy (2013), available at http://www.bp.com/content/dam/bp/pdf/statistical-review/statistical_review_of_world_energy_2013.pdf (accessed on June 29, 2014).

10. Algeria, Angola, Iran, Iraq, Kuwait, Oman, Qatar, Saudi Arabia, the United Arab Emirates, Venezuela, and Yemen.

Various controls are included as well. I control for (ln) *population* size and (ln) GDP *per capita*. Larger states have engaged in more disputes, while the effect of GDP per capita is theoretically ambiguous: Wealthier states tend to have more resources to invest in military capacity, but this would affect both their ability to project force and their ability to deter attempts to use force against them. I control for *major power status*, since major powers tend to be more involved in international disputes than even their population size and level of development would suggest. I control for *democracy* as well. While pairs of democracies are much less likely to fight (Oneal and Russett 1997), the theoretical effect of democracy in the monadic sense is less well established. However, it is important to include as a control, since oil exporters tend to be more autocratic than non-oil exporting countries (Ross 2001, Anderson and Ross 2014). Democracy is operationalized using the revised combined Polity score, a 21-point scale ranging from 10 (strong democracies) to –10 (strong autocracies) (Marshall and Jaggers 2009). Finally, I include controls for temporal dependence: *peace years*, or a count of years since a country's last MID, and its squared and cubed terms (Beck, Katz, and Tucker 1998).[11] All specifications include panel fixed effects and clustered standard errors.[12] All independent variables are lagged one time period to address concerns about the endogeneity of prices to conflict behavior, a relationship that will be probed further in robustness checks. Because the dependent variable is a count variable, I report results for negative binomial and Poisson regression.

Table 2 presents results for four models; the odd numbered models correspond to MID onsets; the even numbered, to instigated MIDs. Interaction terms complicate interpretation of coefficients, since levels of statistical significance are conditional on the mediating variable taking on a value of zero (Braumoeller 2004). The dummy specifications of oil exporter status and revolutionary leadership, however, simplify interpretation. The coefficient on *oil price* represents the effect of oil prices on nonexporting, nonrevolutionary leader–led countries, while the coefficients on the *oil state* and *revolutionary leader* represent the effect of these factors on MIDs and instigated MIDs when oil prices are zero—the effect necessarily varies across observed values of the interacted variable. To assess the impact of oil prices in oil states and under revolutionary leaders, one must calculate the conditional slope as an additive function of the coefficients on oil price and the interaction terms.

The results provide support for Friedman's First Law of Petropolitics (H_1). Higher oil prices are associated with an increased frequency of MID onsets in oil states, but not in non-oil states. All things being equal, a one standard deviation ($18.60) increase in the price of oil per barrel from the sample

11. Nathaniel Beck, Jonathan N. Katz, and Richard Tucker's (1998) temporal controls are used to replicate Colgan's (2010) analysis.

12. Because panel fixed effects are included, several time-invariant controls in Colgan's (2010) analysis (number of contiguous territorial borders with other states, region dummies, and percent Muslim) are excluded from the analysis.

mean ($33.81) is associated with a 13 percent increase in the frequency of MIDs (model 2.1). Phrased in Friedman's terms, oil states are roughly 30 percent more likely to be involved in disputes when oil prices are at $60 per barrel than when they are at $20 per barrel. No such relationship is found for non-oil states, providing support for H_2. Confirming the results of Colgan's earlier analysis, however, the confluence of oil state status and revolutionary leadership is associated with significantly more bellicose behavior, and this finding is not price contingent: The *oil state* x *revolutionary leader* interaction term is positive and significant in all four specifications, while the *oil price* x *oil state* x *revolutionary leader* interaction term is not statistically significant in all four specifications. Given that revolutionary-led oil states are still oil states, however, their dispute propensity increases as prices increase, though the proportional effects are smaller given the higher baseline incidence of MIDs.

These findings indicate the bellicosity of oil states relative to non-oil states is price-contingent. Figure 3 plots predicted counts of MIDs for revolutionary-led oil states, oil states without revolutionary leaders, and non-oil states across a range of values for oil prices. The results indicate that revolutionary oil states are much more dispute-prone over a broad range of oil prices. Above $70 per barrel, oil states are significantly more dispute-prone than non-oil states. Below $30 per barrel, oil states are less dispute-prone than non-oil states, though the finding is not statistically significant. Revolutionary-led oil states are the most dispute-prone across all oil prices, though the finding is statistically insignificant above $70 per barrel.

The multivariate results provide less support for a link between oil prices and initiated MIDs. The coefficients on *oil price* x *oil state* in models 2.2 and 2.4 are close to zero with large confidence intervals. The coefficients on *oil price* x *oil state* x *revolutionary leadership* are larger ($\beta = 0.010$) than those for *oil price* x *oil state* in models 2.1 and 2.3, suggesting a potentially large effect. However, neither is statistically significant. Given that oil states with revolutionary leaders make up only about 2 percent of observations in the sample, however, the standard errors are bound to be large. While I cannot reject the null, the potential effect is 43 percent larger than the reported effects of oil prices in oil states irrespective of the nature of leadership.

Descriptive statistics for the most bellicose leaders in the dataset are consistent with the findings derived from the econometric analysis. I compute instigated MIDs per leader for all 1,029 leaders in the dataset. The top ten are presented in table 3. Revolutionary leaders of oil states account for three of the top ten spots: Ruhollah Khomeini, Saddam Hussein, and Muammar Qaddafi. Revolutionary leaders of oil states account for only 1 percent of leaders in the sample but 30 percent of the most bellicose. Moreover, average oil prices were above the sample mean during the tenures of these three leaders. The rest of the top ten comprises the leaders of major powers (the United States and China), whose foreign policies tend to be more interventionist; long-serving Korean heads of state; and the nonrevolutionary leader of

an oil-exporting country (Syria). Replicating the same calculations for countries rather than leaders, the most bellicose countries are China, Iran, Iraq, the United States, and Turkey. While the United States and China are UN Security Council members, capable of projecting military power at a global scale, two of the top five positions are occupied by oil states that have experienced significant periods under revolutionary leadership.

Further caution is warranted in interpreting the findings related to initiate MIDs, however. While MIDs are observable, it is often difficult to assign clear initiator status in international disputes. If we believe military action is governed by strategic dynamics and that military action can be initiated in response to nonmilitary acts of provocation (e.g., public statements, declarations of territorial control, or threats of violence in the future), it significantly complicates the attribution of "aggressor" status.[13] However, to the extent said codings are defensible, these descriptive statistics provide some additional support for the link between oil exporter status, oil prices, and bellicose behavior.

ARE OIL PRICES ENDOGENOUS TO CONFLICT?

A possible alternative explanation for these findings is that conflict behavior, especially in oil-exporting states, drives up world prices, and thus the relationship is simultaneous (at best) or a case of reverse causality (at worst). There is plenty of anecdotal evidence to suggest conflict and/or unrest in oil-producing states affects market prices: In the month prior to Iraq's invasion of Kuwait, oil had been trading at $17.30 per barrel; in the month after, the price had shot up almost 60 percent. This case, however, may be atypical. Kuwait is one of the world's top five exporters; Iraq is itself an oil-exporting country; and both are located in the Middle East, home to the world's largest oil reserves.

Typically, instrumental variables would be useful in parsing causality. Kristopher Ramsay (2011), for instance, uses natural disaster damage in oil-producing states as an instrument for oil income per capita in oil-producing states, which he demonstrates has negative effects for political democracy. However, the estimated effects are all contingent; thus, for instrumental techniques to provide leverage, I would need credible instruments not just for oil prices, oil exporter status, and revolutionary governments but also for their separate interactions; one cannot simply estimate interactions between an endogenous regressor with a valid instrument and noninstrumented mediating variables.[14]

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13. Per Faten Ghosn, Glenn Palmer, and Stuart Bremer (2004): "The revisionist variable is sometimes used in conjunction with the Side A variable to identify which side was responsible for 'initiating' the dispute. We wish to caution against misinterpretations of identification of the 'initiator'… the state or states on Side A on the first day of the dispute are simply the first states to take codeable military action. They should not be interpreted to be the states that 'started' the conflict, or that are responsible for the conflict" (138–39).

14. This is the "forbidden regression" (Woolridge 2010).

Instead, I investigate whether dispute behavior in the aggregate affects oil prices at the yearly level. Table 4 presents results for simple time series regression of global oil prices for 1947–2001 as a function of lagged prices (t-1) and various contemporaneous measures of dispute behavior in the international system: the total number of MIDs systemwide (models 4.1 and 4.2), the total number of MIDs in oil-exporting states (models 4.3 and 4.4), and finally the total number of MIDs in revolutionary-led oil-exporting states (models 4.5 and 4.6). Results are reported both for raw counts and log-transformed counts. If dispute behavior is driving price changes at the global level, we should see positive correlations between these various operationalizations of conflict behavior and oil prices at time (t). However, we do not: None of the coefficients on the dispute measures are significant; while the coefficient estimates for MIDs in oil states and revolutionary-led oil states are relatively large, the p-values are close to 1. I find no evidence that oil prices—or rather, oil price changes—are driven by dispute behavior either at the global level or aggregate dispute behavior in oil-exporting states. Models 4.7 to 4.12 replicate the analysis, but include the logged, summed value of all damage from the natural disasters[15] measure used by Ramsay (2011) as an instrument for oil revenues in oil-producing states. Though the sample is truncated due to data availability, it provides strong evidence that natural disaster damage in oil-exporting countries is a significant driver of global prices, while dispute behavior is not. The coefficients on disaster damage are positive and significant ($p < 0.05$) in all six specifications, but never for the aggregate measures of dispute behavior. Oil prices may embolden more bellicose foreign policies among oil-producing countries, but their dispute behavior does not, in the main, drive oil prices.

This evidence is at odds with conventional wisdom but consistent with some of the theoretical mechanisms outlined earlier. While dispute behavior may drive price changes in the short term (i.e., over a period of days or weeks), the strategic significance of oil prices and oil-exporting states encourages major powers to act in ways that stabilize markets, either through market intervention, as with the release of oil from the United States Strategic Petroleum Reserve in 1990, or direct, armed intervention, as with Operation Desert Storm. Oil prices may have shot up 60 percent in the month after Iraq's invasion of Kuwait, but the day after the US-led coalition commenced aerial bombing against Iraqi targets, they fell by nearly a third ($30.28 per barrel on January 16, 1991, to $21.10 per barrel on January 17), back to preinvasion levels. By the end of hostilities, oil was back to trading at less than $20 per barrel.

CONCLUSIONS

Friedman's First Law of Petropolitics is consistent with an emerging body of evidence on the domestic political effects of oil resource wealth: Democracy and oil wealth are inversely related (Ross 2001, Tsui 2011, Andersen and Ross 2014), and as the price of oil rises, democracy in oil-producing states wanes

15. Earthquakes, volcanoes, mudslides, waves and surges, and windstorms (i.e., hurricanes and typhoons) (Ramsay 2011, 514).

(Ramsay 2011). Moreover, there is an emerging body of evidence that suggests oil producer status exerts powerful effects on those countries' international affairs as well, suppressing participation in institutions of global governance (Ross and Voeten 2011) and, when combined with revolutionary, revisionist ambitions, making them more conflict-prone (Colgan 2010, 2013). However, our knowledge of how oil prices affect interstate behavior is comparatively scant; these studies do not explicitly incorporate price effects. This article addresses this gap, and provides evidence that oil-producing states are emboldened by high oil prices to pursue more aggressive foreign policies. Moreover, it provides evidence that dispute behavior in oil-producing states is not as significant a driver of oil prices as conventional wisdom might suggest.

Ramsay (2011) notes that an emphasis on prices, rather than a simple binary distinction (oil-producing state or not) "puts into play many new factors about the resource curse: World prices, strategic cartels, and drilling and environmental policies in the developed world can now all be understood as having important implications for the political development of oil rich countries" (527). This article suggests these price effects extend beyond the domestic political development of resource producers and into the international arena. A focus on prices, rather than producer status, opens the door to practical policy implications. For instance, Iran is now, and will be for the foreseeable future, an oil-producing state; no policy intervention is likely to change that reality in the near term. To the extent that conservation, alternative fuel policy in developed countries, and increased exploration/supply diversification bring down prices, they will also have the positive externality of reducing conflict in the international system.

REFERENCES

Andersen, Jørgen Juel, and Michael L. Ross. 2014. The Big Oil Change: A Closer Look at the Haber-Menaldo Analysis. *Comparative Political Studies* (forthcoming).

Basedau, Matthias, and Jan Henryk Pierskalla. 2014. How Ethnicity Conditions the Effect of Oil and Gas on Civil Conflict: A Spatial Analysis of Africa from 1990-2010. *Political Geography* 38, no. 1: 1–11.

Beck, Nathaniel, Jonathan N. Katz, and Richard Tucker. 1998. Taking Time Seriously: Time-Series-Cross-Sectional Analysis with a Binary Dependent Variable. *American Journal of Political Science* 42, no. 4: 1260–88.

Birdsall, Nancy, and Arvind Subramanian. 2004. Saving Iraq from Its Oil. *Foreign Affairs* (July/August): 77–89.

BP (British Petroleum). 2012. *BP Statistical Review of World Energy* (June). Available at www.bp.com/en/global/corporate/about-bp/energy-economics/statistical-review-of-world-energy.html (accessed on July 9, 2014).

Braumoeller, Bear. 2004. Hypothesis Testing and Multiplicative Interaction Terms. *International Organization* 58, no. 4: 807–20.

Carter, David B., and Curtis S. Signorino. 2010. Back to the Future: Modeling Time Dependence in Binary Data. *Political Analysis* 18, no. 3: 271–92.

Colgan, Jeff D. 2010. Oil and Revolutionary Governments: Fuel for International Conflict. *International Organization* 64, no. 3: 661–94.

Colgan, Jeff D. 2012. Measuring Revolution. *Conflict Management and Peace Science* 29, no. 4, 444–67.

Colgan, Jeff D. 2013. *Petro-Aggression: When Oil Causes War*. New York: Cambridge University Press.

de Soysa, Indra, Erik Gartzke, and Tove Grete Lie. 2011. *Oil, Blood, and Strategy: How Petroleum Influences Interstate Conflict.* University of California, San Diego. Available at http://pages.ucsd.edu/~egartzke/papers/oilwar_040152011.pdf (accessed on July 9, 2014).

Diehl, Paul F. 1992. What Are They Fighting For? The Importance of Issues in International Conflict Research. *Journal of Peace Research* 29, no. 3: 333–44.

Fearon, James D. 1995. Rationalist Explanations for War. *International Organization* 49, no. 3: 379–414.

Fearon, James D. 1997. Signaling Foreign Policy Interests Tying Hands versus Sinking Costs. *Journal of Conflict Resolution* 41, no. 2: 68–90.

Fearon, James D., and David D. Laitin. 2003. Ethnicity, Insurgency, and Civil War. *American Political Science Review* 97, no. 1: 75–90.

Friedman, Thomas L. 2006. The First Law of Petropolitics. *Foreign Policy* 154, no. 3: 28–36.

Ghosn, Faten, Glenn Palmer, and Stuart Bremer. 2004. The MID3 Data Set, 1993–2001: Procedures, Coding Rules, and Description. *Conflict Management and Peace Science* 21, no. 2: 133–54.

Hamilton, James D. 2009. Understanding Crude Oil Prices. *Energy Journal* 30, no. 2: 179–206.

Hendrix, Cullen S., and Marcus Noland. 2014. *Confronting the Curse: The Economics and Geopolitics of Natural Resource Governance*. Washington: Peterson Institute of International Economics.

Hensel, Paul R., Sara McLaughlin Mitchell, Thomas E. Sowers, and Clayton L. Thyne. 2008. Bones of Contention: Comparing Territorial, Maritime, and River Issues. *Journal of Conflict Resolution* 52, no. 1: 117–43.

Huntington, Samuel P. 1993. The Clash of Civilizations? *Foreign Affairs* 72, no. 3: 22–49.

Jervis, Robert. 1977. Cooperation under the Security Dilemma. *World Politics* 30, no. 2: 167–214.

Jones, Daniel M., Stuart A. Bremer, and J. David Singer. 1996. Militarized Interstate Disputes, 1816–1992: Rationale, Coding Rules, and Empirical Patterns. *Conflict Management and Peace Science* 15, no. 2: 163–213.

Krasner, Stephen D. 1978. *Defending the National Interest: Raw Materials Investments and U.S. Foreign Policy.* Princeton: Princeton University Press.

Kugler, Jacek, and A. F. K. Organski. 1989. The Power Transition: A Retrospective and Prospective Evaluation. In *Handbook of War Studies,* ed. Manus Midlarsky. Boston: Unwin Hyman.

Lake, David A. 1992. Powerful Pacifists: Democratic States and War. *American Political Science Review* 86, no. 1: 24–37.

Le Billon, Philippe. 2001. The Political Ecology of War: Natural Resources and Armed Conflicts. *Political Geography* 20 no. 5: 561–84.

Le Billon, Philippe. 2013. *Wars of Plunder: Conflicts, Profits, and the Politics of Resources*. New York: Columbia University Press.

Lengyel, Gregory J. 2007. *Department of Defense Energy Strategy: Teaching an Old Dog New Tricks.* Brookings Institution Working Paper (August). Washington: Brookings Institution. Available at www.brookings.edu/~/media/research/files/papers/2007/8/defense%20lengyel/lengyel20070815 (accessed on July 9, 2014).

Lujala, Päivi. 2010. The Spoils of Nature: Armed Civil Conflict and Rebel Access to Natural Resources. *Journal of Peace Research* 47, no. 1: 15–28.

Marshall, Monty J., and Keith Jaggers. 2009. *Polity IV Project: Political Regime Characteristics and Transitions, 1800–2008*. College Park, MD: University of Maryland. Available at www3.nd.edu/~mcoppedg/crd/PolityIVUsersManualv2002.pdf (accessed on July 9, 2014).

Nye, Joseph S. 1980. Energy Nightmares. *Foreign Policy* 40: 132–54.

Oneal, John R., and Bruce M. Russett. 1997. The Classic Liberals Were Right: Democracy, Interdependence, and Conflict, 1950–1985. *International Studies Quarterly* 41, no. 2: 267–94.

Powell, Robert. 1993. Guns, Butter, and Anarchy. *American Political Science Review* 87, no. 1: 115–32.

Powell, Robert. 2002. Bargaining Theory and International Conflict. *Annual Review of Political Science* 5: 1–30.

Ramsay, Kristopher W. 2011. Revisiting the Resource Curse: Natural Disasters, the Price of Oil, and Democracy. *International Organization* 65, no. 3: 507–29.

Ross, Michael L. 2001. Does Oil Hinder Democracy? *World Politics* 53, no. 3: 325–61.

Ross, Michael L. 2004a. How Do Natural Resources Influence Civil War? Evidence from Thirteen Cases. *International Organization* 58, no. 1: 35–67.

Ross, Michael L. 2004b. What Do We Know about Natural Resources and War? *Journal of Peace Research* 41, no. 3: 337–56.

Ross, Michael L. 2012. *The Oil Curse: How Petroleum Wealth Shapes the Development Prospects of Nations.* Princeton: Princeton University Press.

Ross, Michael L., and Erik Voeten. 2011. Unbalanced Globalization in the Oil Exporting States. Paper presented at the annual meetings of the American Political Science Association, Seattle, September 3. Available at https://courses.cit.cornell.edu/patel/psac/Ross_PSAC_3_2.pdf (accessed on July 9, 2014).

Rostow, Walt W. 1979. The Key Security Tasks of the 1980s. *International Security* 4, no. 2: 180–88.

Tsui, Kevin K. 2011. More Oil, Less Democracy: Evidence from Worldwide Crude Oil Discoveries. *Economic Journal* 121, no. 551: 89–115.

Wimberley, Laura H. 2007. Pyrrhic Peace: Governance Costs and the Utility of War. PhD dissertation, Department of Political Science, University of California, San Diego.

Woolridge, Jeffrey M. 2010. *Econometric Analysis of Cross Section and Panel Data*, 2nd ed. Cambridge, MA: MIT Press.

Yergin, Daniel. 2011. *The Prize: The Epic Quest for Oil, Money and Power*. New York: Simon and Schuster.

Table 1 Real oil prices in constant 2008 dollars

Period	Average price per barrel	High	Low	RSD
1947–50	21.52	23.00	17.54	0.12
1951–60	21.90	23.06	20.61	0.03
1961–70	19.76	21.16	18.38	0.05
1971–80	45.24	96.73	18.14	0.53
1981–90	50.81	86.03	28.78	0.40
1991–01	28.37	37.47	18.81	0.18

RSD = relative standard deviation

Sources: Hamilton (2009), author's calculations.

Table 2 Fixed effects negative binomial estimates of oil price effects on militarized interstate disputes in revolutionary-led oil states, 1947–2001

Variables	(2.1) MIDs negative binomial	(2.2) Instigated negative binomial	(2.3) MIDs Poisson	(2.4) Instigated Poisson
Oil price	−0.000	0.002	−0.000	0.001
	(0.002)	(0.003)	(0.002)	(0.003)
Revolutionary leader	0.078	0.271	0.103	0.281
	(0.149)	(0.186)	(0.146)	(0.182)
Oil price x revolutionary leader	0.003	−0.003	0.002	−0.003
	(0.003)	(0.004)	(0.003)	(0.004)
Oil state	−0.270	−0.390	−0.317	−0.466
	(0.243)	(0.578)	(0.241)	(0.566)
Oil state x revolutionary leader	0.901**	0.894*	0.935**	0.960*
	(0.364)	(0.505)	(0.392)	(0.53)
Oil price x oil state	0.007**	0.001	0.007**	0.001
	(0.003)	(0.008)	(0.003)	(0.008)
Oil price x oil state x revolutionary leader	−0.002	0.01	−0.003	0.007
	(0.006)	(0.01)	(0.006)	(0.01)
Major power status	0.345***	2.770***	0.370***	2.837***
	(0.126)	(0.196)	(0.127)	(0.216)
Cold War period	0.008	−0.207	0.032	−0.101
	(0.108)	(0.193)	(0.125)	(0.26)
ln population	0.188	0.001	0.196	0.073
	(0.167)	(0.245)	(0.179)	(0.277)
ln GDP per capita	−0.145*	−0.043	−0.145*	−0.022
	(0.078)	(0.123)	(0.077)	(0.121)
Democracy	0.007	−0.020*	0.008	−0.018
	(0.009)	(0.012)	(0.009)	(0.011)
Peace years	−0.152***	−0.253***	−0.157***	−0.255***
	(0.023)	(0.035)	(0.023)	(0.034)
Peace years[2]	0.008***	0.015***	0.009***	0.015***
	(0.002)	(0.004)	(0.002)	(0.004)
Peace years[3]	−0.000**	−0.000**	−0.000**	−0.000**
	0	0	0	0
Constant	−2.110	−18.650***	−2.188	−24.367***
	(1.51)	(2.322)	(1.649)	(2.761)
Observations	6,014	6,014	6,014	6,014
Country FE	Yes	Yes	Yes	Yes

ln = natural logarithm; MID = militarized interstate dispute

2. Squared terms
3. Cubed terms

Note: Note: Standard errors in parentheses. ***, **, and * represent, respectively, $p < 0.01$, $p < 0.05$, and $p < 0.1$.

Source: Author's estimations.

Table 3 Oil, revolutionary leadership, and bellicosity—assessing postwar leaders

Country	Leader	Actual instigated MIDs	Oil state, proportion of leader tenure	Revolutionary leader?	Average oil price per barrel during tenure (US dollars)
Iran	Ruhollah Khomeini	64	1	Yes	59.65
China	Mao Zedong	52	0	Yes	22.47
Iraq	Saddam Hussein	51	1	Yes	42.70
North Korea	Kim Il-Sung	26	0	No	33.43
China	Deng Xiaoping	23	0	No	45.73
Egypt	Gamal Abdel Nasser	22	0	Yes	20.92
Libya	Muammar Qaddafi	17	1	Yes	39.70
South Korea	Hee Park	16	0	Yes	27.11
United States	Ronald Reagan	16	0	No	54.33
Syria	Hafez Al-Assad	16	0.7	No	41.51

MID = militarized interstate dispute

Source: Author's calculations.

Table 4 Time series estimates of dispute behavior and global oil prices, 1947–2001

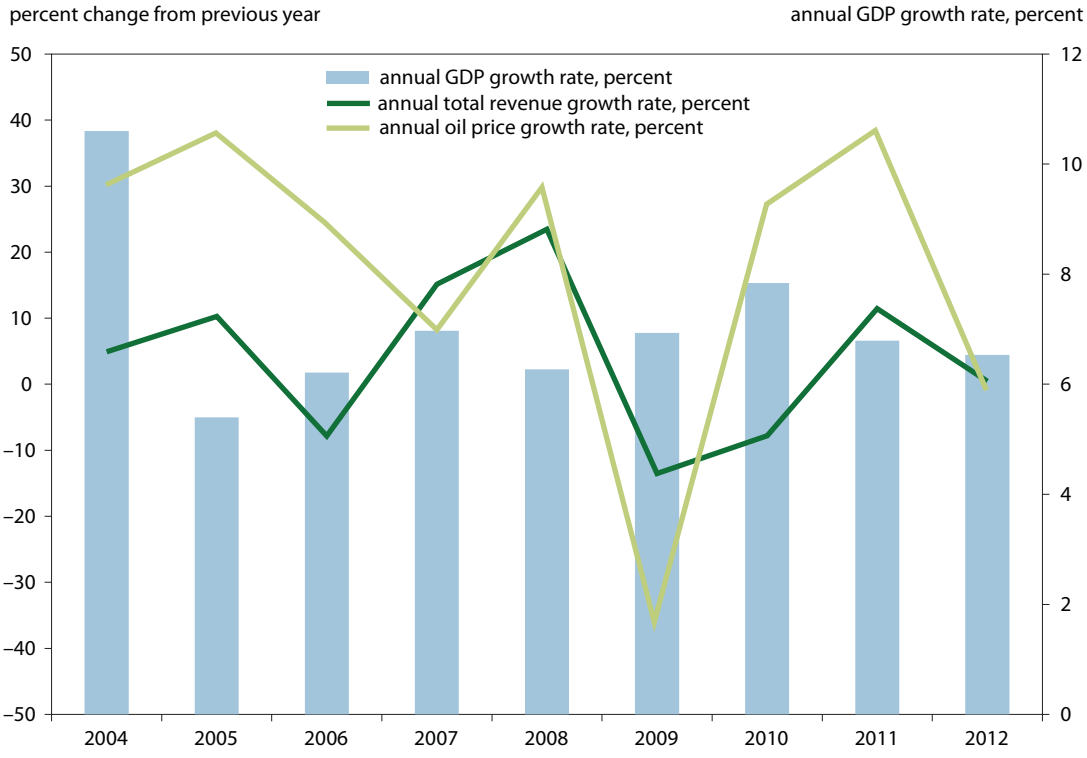
Variables	(4.1)	(4.2)	(4.3)	(4.4)	(4.5)	(4.6)
Real oil price$_{t-1}$	0.885***	0.886***	0.861***	0.855***	0.876***	0.854***
	(0.067)	(0.067)	(0.071)	(0.073)	(0.07)	(0.074)
Total onsets	(0.009)					
	(0.065)					
ln total onsets		−0.641				
		(4.184)				
Onsets in oil states			0.185			
			(0.183)			
ln onsets in oil states				2.444		
				(2.452)		
Onsets in Revolutionary-led oil states					0.087	
					(0.211)	
ln Onsets in revolutionary-led oil states						1.655
						(1.746)
Time trend	0.007	0.026	−0.050	−0.088	0.001	−0.046
	(0.1)	(0.102)	(0.101)	(0.13)	(0.085)	(0.101)
Constant	−11.055	−44.645	100.904	173.508	1.143	93.228
	(194.045)	(190.177)	(197.451)	(252.039)	(167.321)	(197.782)
Observations	54	54	54	54	54	54
R-squared	0.803	0.803	0.806	0.806	0.803	0.806
	(4.7)	**(4.8)**	**(4.9)**	**(4.1)**	**(4.11)**	**(4.12)**
Real oil price$_{t-1}$	0.826***	0.822***	0.807***	0.785***	0.832***	0.824***
	(0.083)	(0.085)	(0.088)	(0.096)	(0.087)	(0.092)
Total onsets	0.096					
	(0.088)					
ln total onsets		5.004				
		(6.609)				
Onsets in oil states			0.214			
			(0.22)			
ln onsets in oil states				4.328		
				(4.132)		
Onsets in revolutionary-led oil states					0.056	
					(0.253)	
ln onsets in revolutionary-led oil states						0.895
						(2.547)
Log disaster damage in oil-producing countries	4.552**	4.327**	4.215**	4.179**	4.192**	4.152**
	(1.919)	(1.919)	(1.899)	(1.894)	(1.928)	(1.929)
Time trend	−0.533**	−0.490*	−0.466**	−0.522**	−0.385*	−0.389*
	(0.243)	(0.248)	(0.217)	(0.24)	(0.203)	(0.203)
Constant	956.426**	861.860*	835.622*	940.323**	675.620*	684.790*
	(458.077)	(457.449)	(411.916)	(455.817)	(381.997)	(382.043)
Observations	34	34	34	34	34	34
R-squared	0.8	0.796	0.798	0.799	0.792	0.793

ln = natural logarithm; t-1 = year previous

Note: Standard errors in parentheses. ***, **, and * represent, respectively, $p < 0.01$, $p < 0.05$, and $p < 0.1$.

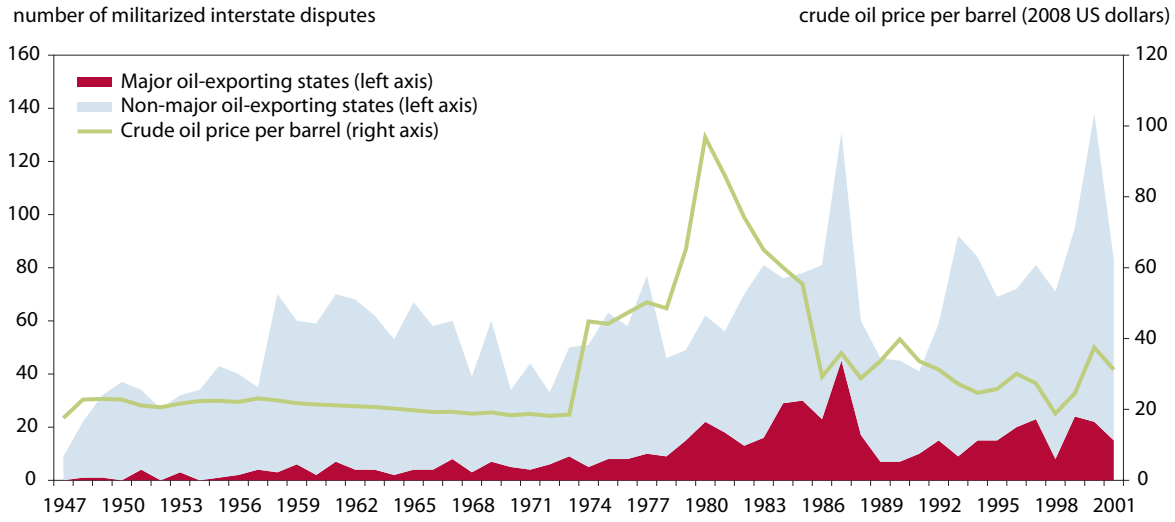
Source: Author's estimations.

Figure 1 Oil prices, government revenues, and economic growth in Nigeria, 2004–12



Sources: BP (2012); author's calculations.

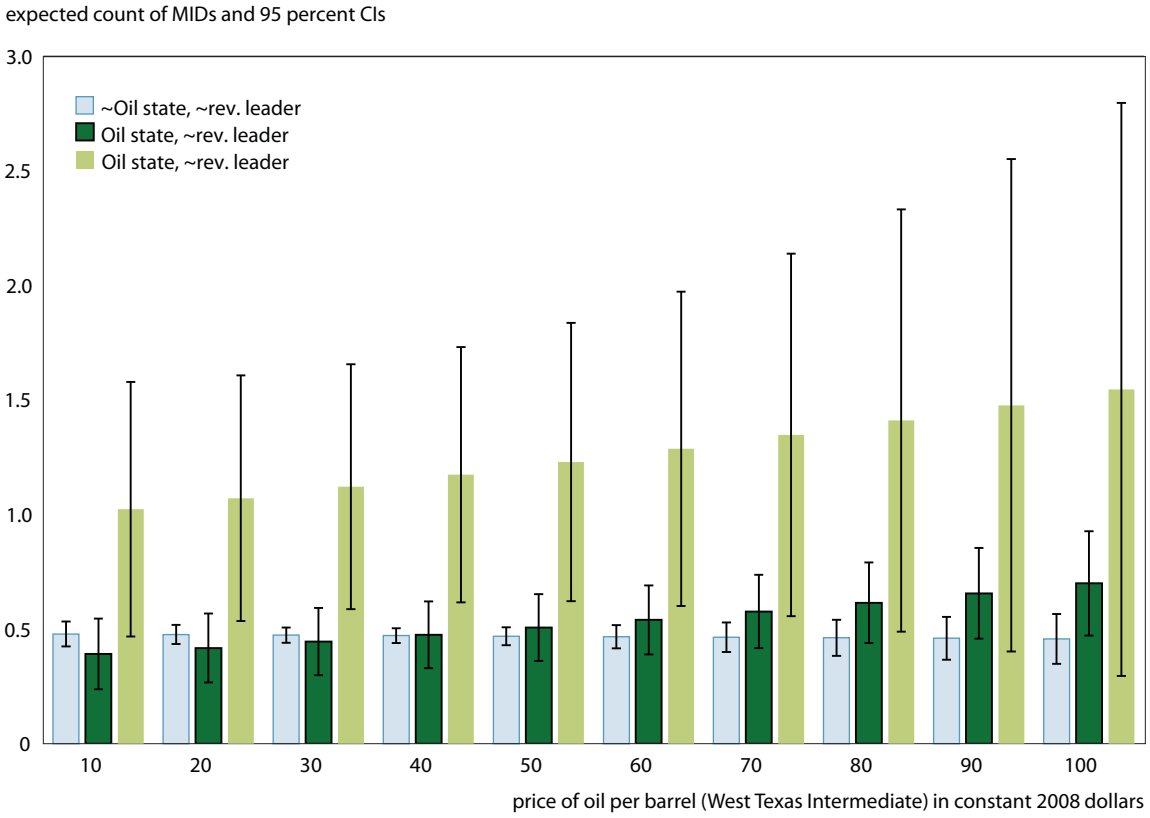
Figure 2 Oil prices and militarized interstate disputes, 1945–2001



Note: Oil prices are strongly correlated with dispute behavior in oil states where net oil exports account for 10 percent or more of GDP ($r = 0.5$, $p = 0.01$). Oil prices are uncorrelated with dispute behavior in non-oil-exporting states ($r = 0.07$, $p = 0.59$).

Sources: Ghosn, Palmer, and Bremer (2004); Colgan (2010); British Petroleum (2012).

Figure 3 Expected counts of militarized interstate disputes per year across the observed range of oil prices for non-oil states, oil states without revolutionary leaders, and oil states with revolutionary leaders



MID = militarized interstate dispute; CI = confidence interval; Rev. leader = revolutionary leader

Source: Hamilton (2009).