

Do Natural Resources Influence Who Comes to Power, and How?

Maria Carreri, New York University
Oeindrila Dube, University of Chicago

Do natural resources impair institutional outcomes? Existing work studies how natural resources influence the behavior of leaders in power. We study how they influence leaders' rise to power. Our analysis focuses on oil price shocks and local democracy in Colombia, a country mired in civil conflict. We find that when the price of oil rises, legislators affiliated with right-wing paramilitary groups win office more in oil-producing municipalities. Consistent with the use of force to gain power, positive price shocks also induce an increase in paramilitary violence and reduce electoral competition: fewer candidates run for office, and winners are elected with a wider vote margin. Ultimately, fewer centrist legislators are elected to office, and there is diminished representation at the center. Our findings highlight how natural resources undermine democracy by distorting elections and suggest that conflict leaves the political sector vulnerable to the resource curse.

Do natural resources lead countries to develop faster? Paradoxically, many have argued that they instead hinder development (Gelb 1988; Sachs and Warner 1995, 2001; Sala-i-Martin and Subramanian 2013). A key reason behind this hindrance may lie in how natural resources affect politicians' incentives (Caselli and Cunningham 2009; Mehlum, Moene, and Torvik 2006; Robinson, Torvik, and Verdier 2006; Ross 1999). For example, theory suggests that they may lower accountability by easing taxation (Huntington 1991; Mahdavy 1970; Morrison 2007), increasing repression (Caselli and Tesei 2016), or allowing leaders to buy off the opposition (Acemoglu, Robinson, and Verdier 2004). Alternatively, they may exacerbate redistributive demands, leading those who hold power to maintain autocracy (Boix 2003). Given these potential consequences on the political sector, many cross-national studies have tried to assess how natural

resources affect democratic development. This rich literature has found mixed results.¹

Theoretical work in this area illuminates how natural resources distort politicians' behavior once in power. But do they also distort who comes to power? And, how they come to power?² After all, the desire to control windfall revenues may motivate influential groups to seize power through coercive strategies. These groups may constrict electoral participation in a bid to alter election outcomes. Or, they may turn to violence in the fight for power, skewing election outcomes toward those willing to use force.

The question of whether natural resources undermine electoral democracy holds global relevance—from Iraq to Nigeria to Burma, there is no shortage of countries with both natural resources and armed actors poised to intervene in electoral politics. We answer this question within one in-

Maria Carreri (maria.carreri@nyu.edu) is a PhD candidate at New York University, New York, NY 10012. Oeindrila Dube is Philip K. Pearson Professor of Global Conflict Studies at the University of Chicago, Harris School of Public Policy, Chicago, IL, 60637.

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1. The range of findings include: negative effects (Aslaksen 2010; Barro 1999; Brückner, Ciccone, and Tesei 2012; Jensen and Wantchekon 2004; Ramsay 2011; Ross 2001; Tsui 2010), heterogeneous effects (Andersen and Ross 2014; Caselli and Tesei 2016; Dunning 2008; Ross 2012), and insignificant effects (Alexeev and Conrad 2009; Haber and Menaldo 2011; Herb 2005; Wacziarg 2012). Morrison (2009) also finds that oil revenue exerts positive effects on regime stability.

2. Caselli and Cunningham (2009) address this question theoretically but posit that greater rents will incentivize more candidates to run for office, increasing electoral competition.

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stitutional context—Colombia—since this enables a clean research design. We harness data on local elections in nearly 1,000 municipalities over 1997–2007. We determine whether movements in the international price of oil influence election outcomes differentially in more oil-dependent municipalities.

This within-country strategy poses several identification advantages relative to cross-national analyses. First, the price of oil is exogenous to small producers such as Colombia, while this is questionable for large producers in a global sample. Second, there are fewer potential cross-sectional confounds: municipalities are more homogeneous than countries, and local election outcomes are more standardized relative to democracy measures across countries.³ Also, micro election data allows us to pinpoint specific aspects of democratic development undermined by natural resources, enabling us to unpack how these resources impair institutional outcomes.

The Colombian context also offers specific advantages for examining this topic. Its long internal conflict has bred many illegal armed groups that seek to control both politics and rents from natural resources—including left-wing guerrillas and right-wing paramilitary groups. During our study period, both armed groups used politically targeted violence, and the paramilitaries came to be known for massacring civilians. In addition, paramilitary groups also intervened directly in elections, assassinating candidates, and helping allied politicians gain office, in exchange for favorable policies (Acemoglu, Robinson, and Santos-Villagran 2013). Fortunately, recent data tracks whether legislators were affiliated with political parties that colluded with various paramilitary groups (Fergusson, Vargas, and Vela 2013).

Drawing on these data, we find that a rise in the price of oil leads to the differential election of pro-paramilitary legislators in more oil-dependent areas. These effects go hand in hand with lower competition in local elections: positive oil price shocks widen the vote margin of winners and reduce the number of candidates running for office. Correspondingly, fewer centrist mayors are elected, reducing representation at the center. In essence, oil price shocks alter the political equilibrium.

We also demonstrate that violence plays a role in these distortions, which past work on natural resources and democracy has largely ignored. We show that price shocks boost aggregate municipal revenue and the incidence of paramilitary activity and attacks in oil-rich regions. This is consistent with the idea that these groups seek to control territories

flush with rents (Dube and Vargas 2013) and intervene in elections to achieve control.

In contrast, we find no impacts on tax revenue and spending patterns, which suggests a limited role of these other mechanisms in our institutional context. In addition, we cast evidence against several alternative accounts. Changes in preferences based on income and security considerations are unlikely to be key drivers behind these effects. For example, we observe no significant impacts on wages; and price shocks do not induce effects in locations with oil pipelines, where security concerns should be most acute. Also, we observe substantial increases in the election of pro-paramilitary legislators in traditionally leftist strongholds, where voter turnout also falls differentially. These patterns are inconsistent with changes in preferences under democratic elections. Rather, they suggest that armed groups use coercion in achieving electoral ends, leading to a deterioration in local democracy.

Our paper complements a handful of other within-country studies of the political resource curse. Three focus on Brazil and find effects on outcomes such as corruption (Brollo et al. 2013; Caselli and Michaels 2013) and incumbency over the short run (Monteiro and Ferraz 2012). Looking in the United States, Goldberg, Wibbels, and Mvukiyehe (2008) also suggest that resource dependence affects sitting governors' vote shares. The biggest difference between these papers and our paper is that we examine the role of extralegal force. Our findings highlight how natural resources can induce groups to use coercive strategies, distorting who gains power based on political affiliation.⁴ In the remainder of the paper, we provide background on the Colombian context, lay out the mechanisms linking oil prices to elections, describe the empirical strategy and data, present the results, and conclude.

BACKGROUND

In this section, we provide background on Colombia's institutional setting, describing its local government, oil sector, and internal conflict.

Democracy and local government

Colombia has held national elections regularly since independence, except for two periods of military intervention (the last of which ended in 1958). Since 1988, the direct popular election of mayors, governors, and local councils has taken place at predetermined intervals of two to four years. We

3. A commonly used cross-national measure of democracy, the polity index, also includes components related to civil war (Vreeland 2008). An outcome such as this makes it difficult to disentangle the impact of natural resources on democracy from the impact of natural resources on conflict.

4. Monteiro and Ferraz (2012) and Brollo et al. (2013) look at candidate characteristics such as education, but neither considers the party affiliation of elected legislators.

focus on the election of mayors and councils as these positions vary at the municipality level, and we aim to identify the impact of municipal oil dependence.⁵

Notably, mayors are not allowed to run for immediate reelection (Dávila 2009), which limits individual-level incumbency.⁶ Mayors are also considered to be more powerful than the councils. Given their limited functions,⁷ a recent debate has even emerged about abolishing these entities (*El Tiempo* 2000).⁸ Council size varies by municipal population. Elections for council positions are municipality-wide, and candidates are elected through a list system.

The oil sector

Oil is Colombia's largest export. National legislation determines the royalty rate and specifies the amount received by each municipality, which is proportionate to the value of production during our sample period.⁹ As of 1996, royalty revenues from the production of oil and other natural resources, termed *regalias*, have been categorized separately in the fiscal accounts.

The Colombian conflict

The Colombian conflict includes three actors: leftist guerrillas, right-wing paramilitary groups, and the state. The guerrilla insurgency was launched in the 1960s. During the study period, it was led by the Armed Revolutionary Forces of Colombia (FARC) and the National Liberation Army (ELN).¹⁰ A first generation of independent paramilitary groups emerged to fight the guerrillas during the late 1980s. In 1994, the Peasant Self-Defense Forces of Córdoba and Urabá (ACCU) began crafting regional alliances with other paramilitary groups. They formed an umbrella organization called the United Self-Defense Forces of Colombia (AUC), giving rise to a second generation of paramilitarism in 1997. These paramilitaries were declared illegal as they violently targeted civilians (Restrepo, Spagat, and Vargas 2004). While some factions colluded unofficially with the military brigades (Human Rights

Watch 2000), they held no official affiliation with the government.

Both the guerrillas and paramilitaries rely on cocaine financing, aim to control territories with natural resources, and siphon associated rents. Commodity price shocks have been a key determinant of violent attacks by armed groups, with different actors specializing in predation over different natural resources. As documented extensively by Dube and Vargas (2013), paramilitary groups have been better positioned to dominate the oil region, in part, because two key paramilitary groups (including the ACCU) originated from areas that had oil, notably, for reasons that were unrelated to the presence of oil.¹¹ Once the paramilitary groups gained a foothold in these areas, they had a stronger ability to seize rents, including in response to rising oil value. Audits show that oil and gas royalties are often missing from municipalities where they exert influence (Human Rights Watch 2005). Armed groups siphon revenue either by colluding with aligned politicians or by extorting resources under threat of force, for example, by kidnapping and assassinating mayors (*El Tiempo* 2007). The guerrillas also blow up oil pipelines, though past work has demonstrated that these attacks do not respond to changes in oil prices (Dube and Vargas 2013).

Paramilitary intervention in elections

When the AUC was launched, the paramilitary groups made a strategic decision to influence electoral outcomes. They formed explicit pacts with politicians to support particular candidates. For example, the Pacto de Ralito called for a "refounding of the country" and was signed by prominent paramilitary leaders and more than 50 politicians, including senators, mayors, and local councillors (Lopez and Sevilla 2008). The large number of links between paramilitaries and politicians were revealed by the media in the "para-politics scandal."

Paramilitary organizations used many strategies to achieve their political ends.¹² They helped allied candidates by providing illegal financing or by intimidating and assassinating opponents (Lopez 2010).¹³ Additionally, they coerced voters by threatening violence or carrying out massacres (Acemoglu et al. 2013). Sometimes, they did this to get votes for their

5. Governors are department-level positions, and there are 33 such departments.

6. Nonconsecutive reelection is uncommon, occurring in 5% of our sample elections.

7. Citymayors.com (2012). <http://www.citymayors.com/mayors/colombian-mayors.html>.

8. <http://www.eltiempo.com/archivo/documento/MAM-1305716>.

9. Oil revenue was an important part of municipal revenue throughout this period. The ratio of oil revenue to total revenue for oil-producing municipalities in our sample was 14% in 1997 and 15% in 2005.

10. Other revolutionary groups such as M-19 and Quintn Lame also joined during the 1980s. Most of these other groups demobilized and formed political parties in the early 1990s. For example, the M-19 movement formed the M-19 Democratic Alliance political party.

11. Neither of these groups relied on oil for financing purposes initially, but both became dominant in these areas after expunging the guerrillas.

12. Much of this evidence comes from a laptop confiscated from paramilitary leader "Jorge 40." <http://www.semana.com/on-line/articulo/el-computador-jorge-40-puede-inicio-nuevo-proceso-8000/81379-3>

13. As an example, Jorge 40's computer revealed a recording of Carlos Maria Garcia Davila, a fellow paramilitary member, coordinating with politicians on an important electoral campaign in the Caribe Coast (Pedraza Saravia and Olaya 2011).

preferred candidates; other times, to suppress voters and keep people from voting (BBC 2002). They also bought votes and stuffed ballots (Valencia 2007).

Which politicians enjoyed paramilitary support? As documented by Acemoglu et al. (2013), the small, new political parties that emerged in Colombia in the 2000s were the parties that came to be affiliated with paramilitary groups. Fergusson et al. (2013) also present evidence that greater media exposure did not reduce the degree of collusion.

Finally, it is worth noting that the guerrillas drew back from attempts to influence electoral politics after an initial, disastrous attempt during the early 1980s. FARC formed a party called the Unión Patriótica (UP). But by 1988, over 500 of its members, including four congressmen and the presidential candidate, had been assassinated by the first generation paramilitaries (Dudley 2004). After that, the guerrillas repositioned themselves to focus exclusively on warfare.¹⁴

MECHANISMS

There are several pathways through which natural resources can affect institutional outcomes. They may influence how leaders gain power, and thus who holds office. Alternatively, they may influence the actions of those already in office. We examine each of these pathways below.

The means of gaining power

When the price of oil rises, more rents are up for grabs in oil-producing areas. In countries such as Colombia, with explicit sharing agreements, greater revenue accrues within the coffers of oil-rich municipalities. This boosts the value of controlling these locations, incentivizing armed groups to wrest political control. Indeed, past theoretical work shows that stealable resources promote conflict owing to predation incentives (Dal Bó and Dal Bó 2011; Grossman 1991).

The bid to wrest control, in turn, motivates armed groups to intervene in elections. Getting favored candidates into office has clear benefits, since these officials are the key to accessing municipal revenue. In Colombia, mayors decide on the allocation of public contracts. They are also positioned to divert public funds toward allies.

Armed groups can accomplish their goal of manipulating elections through several strategies. First, they can finance and support politicians from parties aligned with their political agenda or intimidate and assassinate politicians from nonaligned parties. Helping aligned candidates will serve to

14. Some of the political parties formed by the guerrillas continued participating in elections, but these participants either disconnected from the violent arm of the FARC or were organizations such as the Movement of April 19 (M-19), which demobilized in the 1990s.

consolidate their gains and expand their vote shares, while scaring off contenders will reduce the number of candidates running for office. Both effects will serve to reduce the competitiveness of elections.

Second, armed groups can manipulate the electorate. They may buy votes or intimidate voters to keep them away from the polls.¹⁵ All of these efforts to target candidates and voters will influence the political affiliation of elected legislators, inducing a political selection effect.

But, what types of candidates will get selected into office? In our institutional context, the paramilitaries are known to operate more in oil areas and explicitly target elections. Thus, positive oil price shocks should increase the number of elected officials aligned with pro-paramilitary parties in oil-dependent areas. Moreover, if violence is a key means through which paramilitary groups achieve political control, we should observe corresponding increases in the incidence of paramilitary violence in these locations.¹⁶

The actions of those in power

Natural resources may also affect institutional outcomes through the actions of those who already hold power. Theoretical work has documented how these resources can impede democracy through the actions of politicians. Under the canonical rentier mechanism, natural resources allow officials to buy off political support through light taxation and increased spending (Huntington 1991; Mahdavy 1970), particularly on patronage. For example, Robinson et al. (2006) theoretically show that politicians inefficiently expand public sector employment during resource booms. These spending and taxation patterns are held to lower accountability as citizens become politically disengaged and make weak demands for representation. If rentier mechanisms are at play, we should see lower tax revenue in municipal coffers as municipal governments lower taxes in nonresource sectors; and we should see significant increases in total spending, particularly on municipal employment.

A number of theories also posit that natural resources entrench leaders. As Boix (2003) points out, these resources are

15. Both strategies have been documented in Colombia. Thus, the impact on average voter turnout is theoretically ambiguous. However, armed groups are likely to violently target opposition voters, suggesting that systematic voter suppression by right-wing paramilitary groups is likely to be higher in left-leaning areas.

16. Relatedly, the decision to target elections may interact with the presence of conflict. Violent groups may already have a base of operations and know how to target opponents in locations with recurrent violence. Since these factors lower the cost of forceful intervention, oil price shocks may induce larger effects in locations that have historically experienced more conflict.

fixed factors, for which there is little threat of exit. This feature exacerbates demands for redistribution, curbing a leader's incentives to allow democratic politics. Other accounts of entrenchment emphasize that officeholders can spend resources buying off the opposition (Acemoglu et al. 2004) or repressing their opponents (Caselli and Tesei 2016; Ross 2012). Finally, if natural resources equip officeholders with the incentives and means to retain office, then we should observe general incumbency advantages in elections outcomes, as party-level incumbency is legally possible in this context.

Predictions

In summary, the accounts above imply five empirical predictions. First, if leader selection is important, then positive oil price shocks should boost the election of pro-paramilitary legislators. Second, if these effects reflect intervention by paramilitary groups, positive oil price shocks should lower electoral competition. Third, they should boost the likelihood of violent paramilitary activity in oil rich areas. Fourth, if rentier type effects are at play, then positive oil price shocks should differentially lower tax revenue and increase municipal spending in areas such as public employment. Fifth, if general entrenchment effects are important, then these price shocks should lead to a greater instance of reelection of incumbent parties. Importantly, all of these effects should be strongest in municipalities that produce more oil as positive oil price increases are, by definition, larger in these areas.

In testing the predictions on political selection, we draw on both mayoral and local council elections. In testing the role of competition, we focus on just mayoral elections, for which we have better measures. For example, the margin of victory can only be defined for these races. And the interpretation of candidates running for office is cleaner since council elections occur through a list system.

EMPIRICAL STRATEGY

We use a difference-in-differences empirical strategy to test our predictions. We assess whether changes in the international oil price exert differential impacts among municipalities that produce more oil.

Our cross-sectional variation is oil dependence, defined as the value of oil produced in per capita terms in 1993.¹⁷ During that year, 57 municipalities produced oil. Figure A.1 in the appendix (appendix and figs. A.1, A.2 available online shows the quartiles of oil production across municipal lo-

17. This is defined as barrels of oil produced in each municipality in 1993, multiplied by the per barrel international oil price in 1993, scaled by the municipal population in millions in 1993.

cations. This variable circumvents endogeneity concerns for several reasons. It precedes the start of the sample period and, thus, cannot reflect potentially endogenous oil discovery or extraction undertaken in response to election outcomes.¹⁸ Also, it precedes paramilitary consolidation, which started with the expansion of ACCU in 1994 and culminated in the formation of the AUC in 1997.¹⁹ In the appendix, we also present results using average oil production over 1988–96, which includes 62 oil-producing municipalities.

The time variation in our empirical strategy is the international price of oil. Importantly, this price is exogenous to Colombia's production, as the country holds less than 1% of the world oil market. Figure A.2 shows the oil price over time.

The estimating equation that represents our empirical strategy is:

$$y_{jrt} = \alpha_j + \beta_t + \delta_r t + (\text{Oil}_{jr} \times \text{Oil Price}_t)\lambda + \mathbf{X}_{jrt}\phi + \varepsilon_{jrt}, \quad (1)$$

where y_{jrt} are elections-related outcomes in municipality j , region r , and year t ; α_j are municipality fixed effects; β_t are year fixed effects; and \mathbf{X}_{jrt} are time-varying controls that always include the natural log of population. The variable Oil_{jr} is the oil dependence of municipality j in region r during 1993; Oil Price_t is the natural log of the international price of oil in real terms in year t . The term λ captures the differential effect of the oil price on political outcomes in municipalities producing more oil. Note that the constituent terms do not appear in equation (1) since municipality fixed effects control for and absorb the municipal-level Oil_{jr} variable while year effects control for and absorb the annual-level Oil Price_t variable.²⁰ The terms $\delta_r t$ are linear time trends in the four major geographic regions.²¹ These trends account for the fact that natural resources are concentrated in particular regions, which may have experienced different trends in institutional outcomes, based on varying rates of economic growth or armed group presence. For example, oil is concentrated in the Southeastern region, and guerrilla presence may have increased there in the latter part of our sample period, when the government seized control of the Demo-

18. Since it precedes the 1997 election by several years, this minimizes concerns that it reflects extraction decisions made with the aim of influencing political outcomes in the run-up to the first election in our sample.

19. Paramilitary presence could influence oil production if it reduces guerrilla presence, curbing threats of future violence, or, conversely, if paramilitary violence itself inhibits oil production.

20. We examine the effect of prices in levels versus growth since a growth specification may lead to an excess focus on short-run effects by capturing only year-to-year changes.

21. These are: Andean, Caribbean, Southeastern, and Pacific.

bilized Zone (DMZ), pushing the FARC eastward toward Venezuela.²²

We estimate equation (1) using ordinary least squares (OLS). Since boundaries changed in a potentially endogenous manner over this period, we use a concordance (Dube and Vargas 2013) to aggregate municipalities to their boundaries in 1988, a pre-sample year. In all specifications, standard errors are clustered at this original municipality level to control for serial correlation over time within these units.

DATA

This section provides an overview of our main variables, which are detailed further in the online appendix. We use data on mayoral and local council elections from the Registraduría Nacional del Estado Civil. Election years include 1997, 2000, 2003, and 2007. We also use data on governors' elections compiled by CEDE-Los Andes (Pachón and Sánchez 2014). For mayoral elections, we calculate measures of competition, including the actual and the effective number of candidates (Golosov 2010; Molinar 1991) as well as the winner's vote share, runner-up's vote share, and the margin of victory, defined as their difference. We also examine voter turnout. We classify whether winners of mayoral elections are from center right, center left, or extreme left political parties, which include the socialist party, Polo Democrático (Polo), and those historically associated with the guerrillas, such as the UP and M-19.

We also define whether elected municipal officials are affiliated with pro-paramilitary parties on the basis of an original event-based data set collected by Fergusson et al. (2013). This extraordinary data records all news events from *El Tiempo*, Colombia's leading newspaper, in which national-level politicians in the Congress are accused of collaborating with paramilitary groups over 1997–2010. We use these data to construct measures of pro-paramilitary affiliation using the approach of Dube and Vargas (2013). Importantly, in this approach, a party is defined as pro-paramilitary for the duration of the sample if one of its national-level politicians is accused of paramilitary collaboration in the Fergusson et al. data. This party classification is then combined with the Registraduría data to code the share of local council seats held by pro-paramilitary parties, and an indicator for whether the mayor is from a pro-paramilitary party. Table A.1 in the appendix (tables A.1–A.13 available online) shows the list of pro-paramilitary parties in our sample of mayoral elections, which extend to 2007.

22. The DMZ comprises five municipalities in Southern Colombia that the FARC were allowed to administer over 1999–2002.

This approach can generate measurement error along two dimensions. First, it is possible that a national-level senator may have colluded with paramilitary groups, but the rest of his party is not paramilitary aligned. This is unlikely to be pervasive because national legislators tend to be leading, influential members of their parties, so their positions typically serve as good proxies for the positions of other members. This is especially true for our context, since the paramilitary-affiliated parties tend to be small (Acemoglu et al. 2013). Also, paramilitary groups and political parties embarked on a coordinated effort to influence politics, with national-level politicians signing documents such as the *Pacto de Ralito*. Implementing these plans would require coordination within parties, rather than one-off acts of collusion between isolated politicians and armed groups.

A second type of measurement error may arise because there are parties running in local elections that do not have national-level representation. If some of these parties are pro-paramilitary, they may be missing from the classification. Suppose this measurement error is like white noise, simply adding mean zero error. This would bias our results toward zero. Suppose that the measurement error had some systematic bias, such as over- or undermeasuring pro-paramilitary parties. If this mismeasurement is uncorrelated with oil dependence, again this would not be a problem. Finally, suppose this mismeasurement were correlated with oil dependence. Even this correlation would not create a bias since the pro-paramilitary measure itself cannot respond to changes in oil prices. This is because the pro-paramilitary classification is held constant over the sample period.²³

While this approach circumvents potentially endogenous classifications, it creates a potential look-back problem, in that parties may be discovered to be paramilitary affiliated toward the end of the sample period but are specified to be paramilitary affiliated throughout the period. In the appendix, we also use the approach of Acemoglu et al. (2013) as an alternate measure of paramilitary affiliation to address this and other measurement concerns with this variable.

We also use electoral data from the three mayoral elections prior to our sample period (1988, 1992, and 1994) to gauge pre-sample political preferences. These data are in-

23. This is also why we would want to avoid using a measure that classifies individual local-level politicians as paramilitary affiliated. Consider two mayors colluding with paramilitary groups, one of whom is in an oil municipality. When the price of oil rises, and oil areas become more valuable, greater scrutiny by the media and political adversaries may lead to higher rates of discovery of paramilitary collusion for the politician in the oil area. Our time-invariant party-level measure circumvents this type of potentially endogenous classification.

complete in that vote shares accruing to candidates of different parties are unavailable for these elections. However, we can observe the party of the winner and use this information to construct indicators of whether the left won consistently, the right won consistently, or whether the area was swing, with a mix of winners of different political leanings.²⁴

Our data on municipal spending and revenue span 1997–2005 and come from the National Planning Department (NPD). We also use data on paramilitary and guerrilla activity, available up to the same year. This includes data from the Center for Study of Economic Development (CEDE), which allows us to observe if the paramilitaries or guerrillas (FARC or ELN) undertook any activities (such as arson, kidnappings, political homicides, or injuring army members) in a given municipality year.

We additionally use data originating from the Conflict Analysis Resource Center (CERAC), available over 1988–2005. We define indicators of whether any attacks were perpetrated by the paramilitaries and guerrillas in a given municipality year. We also use the number of attacks and clashes between these groups and these groups and the state, to define high conflict samples, such as those in which any of these variables exceeded their mean over 1988–92 or over 1988–2005.

We use income data from the Encuesta Nacional de Hogares (ENH), a representative household survey conducted in 23 Colombian departments, over 1998–2005. We use this source to construct (log) hourly wages in real terms, and two municipal-level measures of wage dispersion: the (log) ratio of wages at the 90th versus 10th percentile and at the 75th versus 25th percentile of the municipal wage distribution.

The Ministry of Mines and Energy (MME) provides our 1993 oil production measure and the oil pipeline length measure, which is from 2000, the earliest year available. Data on 1994 coca production are from the Dirección Nacional de Estupefacientes (DNE) and municipal population data come from DANE. Table A.2 in the appendix presents the descriptive statistics of key variables. Approximately 15% of

24. Here, left pools together center and extreme-left candidates. Analogously, right candidates includes all right-leaning candidates, but we only observe pro-paramilitary parties after 1997, when the AUC made a concerted decision to influence electoral politics. Moreover, in just under 6% of the cases, the winner came from a coalition, and we allow coalition winners to contribute to our definition of swing. For example, if a municipality had two left winners and a third coalition winner, we treat this as a mixed outcome as it would be inappropriate to code this municipality as consistently voting for the left. However, our results are robust to an alternate classification where we do not allow coalition winners to contribute to the swing definition but instead control for their effect separately.

mayorships and 11% of local councils are composed of pro-paramilitary legislators over this period.

Table 1 examines the cross-sectional characteristics of municipalities that did and did not produce oil in 1993. It shows that measures of poverty and public services do not vary significantly across these two groups.²⁵ However, oil locations are larger as measured by population and differ on geographic dimensions such as elevation. These differences could confound the effects if electoral dynamics differ in highly populated areas or in low elevation locations, in a manner correlated with the price of oil. We therefore control for time-varying (log) population and elevation interacted with the price of oil. In the appendix, we also present results controlling for all other covariates shown in table 1.

RESULTS

In this section, we present results on how oil price shocks affect the election of pro-paramilitary legislators and the competitiveness of local elections. To explore mechanisms, we also examine impacts on revenues and on violent activity by armed groups, and we discuss alternative accounts.

Oil price shocks and pro-paramilitary legislators

We discern the effect of oil price shocks on institutional outcomes by estimating equation (1). In table 2, we look at the election of pro-paramilitary mayors and the share of seats held by pro-paramilitary legislators in local councils, progressively adding in controls.²⁶

The results show that when the price of oil rises, pro-paramilitary legislators differentially attain office in more oil-dependent municipalities. The effects are substantial. The coefficient of .08 in column 3 tells us that a 10% increase in the price boosts the likelihood of a pro-paramilitary mayor by .008 more in the average oil municipality (with oil dependence 1.01), as compared to a non-oil municipality. This represents a 5.4% increase above the pro-paramilitary mayor mean (.15). Since the price of oil rose by 130% over 1997–2007, this implies a 72% greater chance of getting at least one pro-paramilitary mayor over the four elections in our sample. This is a per-election effect of approximately 18%.

The effect on the council share is also substantial, though smaller in magnitude. The coefficient in column 6 suggests

25. These balance statistics look the same if we instead compare municipalities above and below mean oil dependence in 1993.

26. The pro-paramilitary council share variable is unavailable for 2007. Thus our analysis of council outcomes includes the 1997 to 2003 elections.

Table 1. Characteristics of Oil and Non-oil Municipalities

	Non-oil Municipalities		Oil Municipalities		Difference in Mean (5)	SE of Difference (6)	Observations (7)
	Mean (1)	SE (2)	Mean (3)	SE (4)			
Unsatisfied basic needs 1993 (poverty)	53.108***	[.635]	55.217***	[2.613]	2.109	[2.689]	1,023
Secondary education 1993	.450***	[.008]	.472***	[.033]	.022	[.034]	961
Police stations 1997	37.807***	[6.129]	47.564*	[25.110]	9.756	[25.847]	978
Judicial officers 1997	81.265***	[13.560]	104.842*	[54.771]	23.578	[56.425]	987
Post offices 1997	41.040***	[6.589]	43.368	[26.630]	2.329	[27.434]	988
Rural development banks 1997	46.711***	[7.468]	45.895	[30.181]	-.816	[31.091]	988
Schools 1997	283.970***	[48.088]	430.737**	[194.135]	146.767	[200.002]	986
Hospitals 1997	21.063***	[3.437]	24.889*	[14.086]	3.826	[14.499]	961
Tax office 1997	17.757***	[2.877]	19.925*	[11.955]	2.167	[12.296]	968
Length of primary rivers	2.726***	[.339]	3.491**	[1.381]	.765	[1.422]	985
Land inequality (Gini)	.687***	[.004]	.696***	[.014]	.009	[.014]	853
In Demilitarized Zone (indicator)	.004**	[.002]	.000	[.008]	-.004	[.009]	1,023
Log population	-4.299***	[.035]	-3.750***	[.145]	.549***	[.149]	1,023
Elevation	1.271***	[.037]	.446***	[.153]	-.825***	[.158]	1,022
Cultivated coca 1994, indicator	.048***	[.007]	.088***	[.029]	.040	[.030]	1,023

Note. Oil refers to municipalities that produced oil in 1993. Non-oil refers to municipalities that did not produce oil in 1993. The coefficients and standard errors shown in cols. 1–4 are obtained by cross-sectionally regressing the municipal characteristic in each row on the oil and non-oil indicators (without a constant). The coefficients and standard errors shown in cols. 5–6 are obtained from a cross-sectional regression of each characteristic on a constant and the oil indicator, which captures the difference in characteristics across the two groups. Column 7 shows the number of observations in each of these regressions.

* Significant at the 10% level.

** Significant at the 5% level.

*** Significant at the 1% level.

that a 130% price hike differentially increases the share of pro-paramilitary councillors by 43% above the mean (of .12). This is a per-election effect of 11%. The difference in mag-

nitudes may arise because mayors are more powerful than local councils. As such, it would be more strategic for armed groups to target mayorships.

Table 2. Oil Price Shocks and the Election of Pro-paramilitary Legislators

	Pro-para Mayor			Pro-para Council Share		
	(1)	(2)	(3)	(4)	(5)	(6)
Oil dependence × Log oil price	.080*** [.022]	.081*** [.022]	.080*** [.022]	.049*** [.018]	.044** [.018]	.039** [.016]
Observations	3,659	3,659	3,659	2,964	2,964	2,964
Number of municipalities	959	959	959	998	998	998
Election years	1997–2007	1997–2007	1997–2007	1997–2003	1997–2003	1997–2003
Log population		Y	Y		Y	Y
Elevation × Log oil price			Y			Y
Mean oil dependence	1.01	1.01	1.01	1.01	1.01	1.01

Note. Standard errors clustered at the municipality level are shown in parentheses. Variables not shown in all specifications include municipality and year fixed effects and linear trends by region. Mean oil dependence is the mean for municipalities that produced oil in 1993.

* Significant at the 10% level.

** Significant at the 5% level.

*** Significant at the 1% level.

In the appendix, we explore whether these effects are larger in high conflict samples, where armed groups may have greater experience carrying out forceful interventions. We define whether armed group attacks and clashes exceeded their means over 1988–92 (the period preceding our 1993 oil dependence measure) and over 1988–2005 (the duration over which conflict data are available). Table A.3 shows that the magnitudes of the coefficients are always larger and statistically significant in the high conflict sample, and statistically insignificant in the low conflict sample, for both the pro-paramilitary mayor and council share outcomes. However, the effects are not statistically distinguishable from one another, as the low conflict sample exhibits relatively large standard errors, likely because two-thirds of the oil-producing municipalities fall into the high conflict group. Below, we build on this suggestive evidence and test directly for the role of conflict in shaping electoral outcomes by analyzing armed group activity and attacks.

Political competition

Next, we examine the competitiveness of local elections, in table 3. We look at candidates contending office and the vote margins of winners running in mayoral elections.²⁷

Column 1 shows that oil price shocks reduce the total number of candidates. The coefficient of $-.182$ in column 1 tells us that a 130% oil price rise induces a 6% effect, or a 1.5% per-election reduction. The next two columns show that this effect stems from reductions in candidates from non-pro-paramilitary parties, while there are no significant reductions in candidates from pro-paramilitary parties. These results are consistent with the scare-off effect, in which paramilitary groups successfully drive contenders out of office. As shown in column 4, the effect on electoral contenders also remains in place if we consider the effective number of candidates, which takes into account the vote shares received by each candidate.²⁸

Next, we examine effects on the margin of victory. Column 5 demonstrates a substantial increase in this outcome. The coefficient implies that a 130% oil price increase induces a differential per-election effect of 4.6%. This margin may increase if the winner's vote share rises or if the runner-up's vote share falls—for example, if votes become more

fragmented across other contenders. Columns 6–7 indicate that the winner's vote share rises, suggesting that the leading candidate consolidates his or her gains. In the final column, we show that the vote share accruing to paramilitary-affiliated parties also increases, further corroborating their electoral gains in response to oil price shocks. These findings provide evidence for our second empirical prediction on the competitiveness of local elections.

In appendix table A.4, we examine two other electoral outcomes. We find that there is a negative effect on the effective number of parties, but it is not statistically significant at conventional levels. This suggests that the scare-off effect operates on the level of candidates, but does not drive entire parties out of the election. We also find that there are no significant average effects on (log) voter turnout.²⁹ However, as we show below, there are heterogeneous effects on this outcome across municipalities.

Revenue and violent activity by armed groups

To what extent can we say that these impacts on political selection and competition reflect interference by armed paramilitary groups seeking control of revenues in oil-rich areas? To answer this question, the first part of table 4 gauges whether oil price shocks boost revenue and armed group activity in oil-dependent municipalities.

Columns 1–2 demonstrate substantial increases in both *regalias* revenue and total revenue. The coefficients suggest that a 130% oil price hike boosts these outcomes by 24% and 9% more in the average oil municipality, as compared to a non-oil municipality, over the sample period.³⁰ In the next columns, we show that the oil price shock differentially increases the likelihood of paramilitary activity and attacks, without affecting the likelihood of guerrilla activity or attacks.³¹ These findings support our third prediction that oil

29. These results are the same if we examine voter turnout in per capita terms (and the results are available upon request). But we lack exact data on eligible voters and so cannot construct exact turnout rates.

30. Since we conceptualize revenue to be a key mechanism, an alternative approach is to instrument revenue with the oil price interaction. We then lose the 2007 election as we do not have revenue data for that year. Appendix table A.5 presents these results for our main outcomes. All of the effects remain significant, verifying the robustness of the results to this alternate approach.

31. In appendix table A.6A, we examine the robustness of these results to controlling for all characteristics in table 1 (not just population and elevation). For example, it is possible that factors such as the presence of coca may affect conflict since the cocaine trade finances the armed groups, while public service provision or poverty may affect conflict by shaping individual's incentives to join armed groups. To maximize power, we first predict the dependent variable at the start of sample on the basis of ad-

27. We focus on the mayoral elections for this analysis since the vote margin of the winner can be defined, and because the council elections occur via list systems, which makes it difficult to interpret results around the number of candidates running for office.

28. These results estimate effects on the effective number of candidates as measured by the Molinar (1991) index, but appendix table A.4 shows that the result is the same if we use the Golosov (2010) index.

Table 3. Political Competition

	Total Candidates (1)	Pro-para Candidates (2)	Non Pro-para Candidates (3)	Effective Number of Candidates (4)	Margin of Victory (5)	Winner's Vote Share (6)	Runner Up's Vote Share (7)	Vote Share of Pro-para Parties (8)
Oil dependence ×								
Log oil price	−.182* [.098]	.042 [.044]	−.225*** [.073]	−.098** [.042]	.024** [.009]	.018** [.009]	−.006 [.005]	.049*** [.011]
Observations	3,710	3,703	3,703	3,678	3,597	3,597	3,597	3,678
Number of municipalities	967	965	965	960	957	957	957	960
Election years	1997–2007	1997–2007	1997–2007	1997–2007	1997–2007	1997–2007	1997–2007	1997–2007
Controls	Y	Y	Y	Y	Y	Y	Y	Y

Note. See table 2 for notes. Controls include the log of population and elevation interacted with log oil price. Effective number of candidates is the Molinar (1991) measure.

price shocks will boost revenue and paramilitary violence in oil areas.

These results are consistent with Dube and Vargas (2013), which also finds effects of oil price shocks on paramilitary violence. This reflects the idea that paramilitary groups have a relative comparative advantage in predated in the Colombian oil region. Overall, these findings lend support to the idea that coercion is used in the rise to power and that violent attacks and electoral intervention are complementary levers for controlling oil-rich areas.

Other aspects of the resource curse

In the remaining columns of table 4, we examine other dimensions of the resource curse stemming from the actions of those already in office. First, we consider rentier effects. In columns 7–9 we find no significant effects on tax revenue, total spending, and spending on personnel in municipal

governments. For total spending, the coefficient is positive but statistically indistinguishable from zero. For spending on personnel, the coefficient is negative, suggesting limited impacts on patronage networks. Second, we consider general incumbency effects in mayoral elections. But, in column 10, we find that there is no greater tendency to reelect whichever party is in power.³² For this institutional context, we find little evidence of our fourth and fifth empirical predictions.

Alternative accounts

Here we consider and present evidence against a number of important alternative accounts.

Changes in voter preferences. One set of alternative accounts posits that paramilitary-affiliated legislators may be elected to office owing to changes in voter preferences. We consider four ways in which preferences might change.

First, voters may prefer right-wing parties with more conservative policies owing to economic factors. For example, voters may respond if oil price hikes boost income or income inequality. Alternatively, if oil wealth is perceived to generate economic benefits, a rise in value may generate backlash against politicians with pro-environmental views.

Table 5 presents evidence against this account. Column 1 shows that the oil price shock did not exert significant effects on average wages, measured from household surveys.³³ This

ditional characteristics in table 1 and then control for its interaction with the price of oil (see appendix for more details). We account separately for the land Gini variable since it is missing for over 15% of the municipal sample. We also present estimates varying the sample period. Table A.6A shows that the results are generally robust across specifications, though sample period restrictions marginally affect the precision of the paramilitary attack effect when the land Gini interaction is included: specifically, when we restrict the sample to the shortest (post-1997) period, the estimate becomes marginally insignificant (p -value = .11), while the coefficient does not fall in magnitude, suggesting a loss in power from the shorter period. In contrast, the effect on the incidence of guerrilla attacks remains consistently insignificant across sample periods and control sets. In table A.6B, we repeat this analysis with the number of paramilitary and guerrilla attacks. We again find the same pattern of results, and the effect on the number of paramilitary attacks even remains significant at the 10% level with the land Gini control in the shortest (post-1997) sample period.

32. This restricts our elections sample to the 2000–2007 period. We verify that our main effect holds with the same magnitude and remains statistically significant in this subsample.

33. Column 1 estimates an individual-level wage regression with standard demographic controls: gender, age, age squared, whether the respondent was married, and years of education.

Table 4. Mechanisms

	Revenue and Armed Group Activity						Other Resource Curse Mechanisms			
	Log <i>regalias</i> Revenue (1)	Log Total Revenue (2)	Any Paramilitary Activity (3)	Any Guerrilla Activity (4)	Any Paramilitary Attack (5)	Any Guerrilla Attack (6)	Log Tax Revenue (7)	Log Total Spending (8)	Log Personnel Spending (9)	Party Reelected (10)
Oil dependence × Log oil price	.186*** [.062]	.068** [.030]	.024* [.013]	-.022 [.014]	.031* [.017]	.018 [.022]	.024 [.025]	.044 [.029]	-.018 [.033]	-.021 [.037]
Observations	3,427	8,234	9,063	9,063	9,198	9,198	8,219	8,397	8,291	2,662
Number of municipalities	683	1,007	1,007	1,007	1,022	1,022	1,006	1,007	1,007	905
Sample period	1997–2005						1997–2005			
Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Note. See table 2 for table notes.

Table 5. Income Effects and Preference Changes

	Log Wage (1)	Log Wage Ratio (90/10) (2)	Log Wage Ratio (75/25) (3)	Green Mayor (4)	Center Right Mayor (5)	Center Left Mayor (6)	Extreme Left Mayor (7)
Oil dependence × Log oil price	.021 [.016]	-.0004 [.030]	.009 [.009]	-.002 [.002]	-.051*** [.018]	-.055*** [.018]	.002 [.004]
Observations	207,835	1,050	1,050	3,710	3,710	3,710	3,710
Sample period		1998–2005			1997–2007		
Municipal controls	Y	Y	Y	Y	Y	Y	Y
Additional demographic controls	Y	Y	Y				
Number of municipalities	229	229	229	967	967	967	967

Note. See table 2 for table notes. Additional demographic controls include gender, education, if the respondent is married, age, and its square. Column 1 is an individual-level wage regression, and cols. 2–3 are municipal-level regressions with municipal averages of the demographic controls.

is consistent with the fact that the oil sector is not labor intensive and therefore employs relatively few individuals within the municipal workforce. Columns 2–3 examine ratios of wages at the 90th versus 10th percentile and at the 75th versus 25th percentile of the municipal wage distribution.³⁴ These results show that there were no discernible impacts on wage dispersion, casting further doubt on the idea that changes in economic conditions induced voters to shift rightward.

In the remaining columns of table 5, we examine the election of mayors from different types of political parties. Column 4 demonstrates that there were no significant effects on the election of Green party mayors, which is inconsistent with the idea that oil prices altered environmental preferences. Also, columns 5–6 show that there were significant reductions in mayors from both center right as well as center left political parties. As such, the rise of pro-paramilitary mayors did not go hand in hand with a general shift to the right. Rather, this phenomenon was accompanied by a decrease in mainstream mayors from both parties and thus a hollowing of the center.

Second, it is possible that oil-producing municipalities were already experiencing decreasing support for leftist parties and center right parties prior to the start of the sample period, and support for the extreme-right pro-paramilitary parties then filled this political vacuum during our sample period. If this is the case, we should observe differential pre-trends between oil and non-oil municipalities in political support for these parties, during the three pre-sample elec-

tions that took place in 1988, 1992, and 1994.³⁵ In table A.7A we use data on the partisan affiliation of mayors elected and examine pre-trends by interacting an indicator for oil municipalities with a linear time trend over 1988–94. We present pre-trend specifications for the extreme left, center left, and center right categories, and for all 26 parties that won any election over this period individually.³⁶ We see no significant trends among any of these three combined categories, suggesting no systematic tendencies in the election of either the left or center right parties as a whole. Among the 26 individual parties, we observe two significant trend coefficients. Note that statistically, we expect to find some significant coefficients by chance—for example, we expect to find a significant effect at the 10% level for 10% of the coefficients, or for two to three of the parties, even if there is no true effect. In our case we observe one coefficient significant at the 10% level and another significant at the 1% level. Probing further, we see that these coefficients are for the Movimiento Fuerza Progresista and the Movimiento Alianza Social Indígena, which are both minor political parties that together won just 36 of 3,169 mayoral contests that took place in the three pre-period elections.³⁷ Since they are small, decreased support for these two parties is unlikely to be the driver of the effects we observe for the post-1997 period. To verify this, in table A.7C, we reestimate our main specifications from ta-

35. We are grateful to an anonymous referee for pointing this out.

36. Table A.7B lists the names of these parties.

37. Specifically, Movimiento Alianza Social Indígena won 9 mayoral elections; and Movimiento Fuerza Progresista won 27 mayoral elections, 25 of which took place in the department of Antioquia, indicating it is also primarily a regional party.

34. These are municipal-level regressions which control for municipal averages of the demographic variables in column 1.

ble 2, eliminating these 36 municipalities where they won in the pre-period. We find that the effects on pro-paramilitary mayor and council share are unaffected by this sample restriction. These results demonstrate that trend decreases in support for other political parties prior to the sample period cannot account for the rise of pro-paramilitary legislators after 1997.

A third reason why voter preferences may have shifted toward pro-paramilitary legislators may have to do with security concerns. They are unlikely to be responding directly to increased guerrilla attacks, since table 4 (as well A.6A and A.6B) shows that price shocks do not significantly influence this outcome. Also, such a response should reduce the election of extreme-left mayors (affiliated with the guerrillas), but column 7 of table 5 shows there is no such effect.³⁸ Nonetheless, voters may respond to perceived threats of violence. These perceptions should be strongest in areas that have pipelines used to transport oil, since the guerrillas are known for exploding this infrastructure.³⁹ However, table 6 (col. 1) shows that a change in oil value does not lead to the differential election of pro-paramilitary mayors in locations with oil pipelines. Column 2 also shows insignificant effects on total revenue—municipalities do receive revenue from taxing oil transport, but these increases are insufficient to register increases in the total budget in pipeline areas. Our results from tables 4 and 6, together, suggest that paramilitary affiliates focus their efforts toward gaining electoral control of oil production areas, which have the largest, most visible revenue increases. Overall, the results do not support the idea of the electorate choosing paramilitary-affiliated legislators for protection purposes.

Fourth, if paramilitary-affiliated politicians gain office because preferences change in fair and free elections, we should see heterogeneous effects based on initial political preferences. We should not observe much of a response in left-leaning areas, where preferences of the representative voter lie farther from the extreme right position of pro-paramilitary parties—that is, where voters are inframarginal. And, responses should be relatively large in swing areas, where voters are marginal.

Columns 3–4 of table 6 test for these effects. We interact the oil price shock with indicators of whether a municipality consistently voted for the right or was swing in the three mayoral elections over 1988–94. (The omitted category is

areas that consistently voted left in these elections.)⁴⁰ The significant positive coefficient on Oil dependence \times Log oil price in column 3 demonstrates that there was a substantial increase in pro-paramilitary mayors in leftist locations. And the insignificant effects on the three-way interactions indicate that the effects were no smaller in the leftist areas than other areas. (In fact, the coefficient on the swing interaction is negative, corroborating that effects were no larger in these marginal areas.) These results seem inconsistent with changes in preferences under democratic elections. Rather, they appear more consistent with an account in which violent groups interfere in local elections, targeting a variety of voters, including inframarginal voters in left-leaning areas.

In line with this, column 4 also shows that voter turnout falls differentially in the left locations.⁴¹ The coefficient tells us that the 130% price increase reduced turnout differentially by approximately 11.5% in the average oil-dependent municipality in left-leaning areas (a per-election effect of 2.9%). This evidence goes hand in hand with well-documented accounts of paramilitary efforts to suppress votes (Acemoglu et al. 2013; Valencia 2007) and is consistent with the idea that electoral support obtained by pro-paramilitary parties was not entirely voluntary. Together, these results point to the use of force in electoral politics and suggest that oil price shocks compromise the quality of local democracy by inducing electoral interference.

Resources from higher levels of government. Our account posits that oil revenue accruing to municipalities serves as a draw for paramilitary groups to seek political control of these areas. However, an alternative account posits that oil revenue may be used as a financing tool to help these groups gain power. Revenues generated from taxing oil flow not just to municipal coffers but also to the department and national levels of government. Thus, these resources could be diverted to candidates in municipal elections from higher-level politicians. This diversion could serve as a competing channel if, for example, pro-para presidents allocate more resources to pro-paramilitary candidates in oil-dependent areas during years with high oil prices.

If this account is true, we should observe larger effects during the presidency of Álvaro Uribe, who was widely per-

38. These results do not change if we reclassify Polo, the socialist party, as center left vs. extreme left. These estimates are available upon request.

39. Pipelines are used to transport oil from producing municipalities to ports. Our sample includes 141 municipalities with oil pipelines.

40. Thus, the coefficient on Oil dependence \times Log oil price captures the effect of the price shock in left-leaning areas, while the coefficients on the three-way interactions capture the differential effects in the other areas.

41. In contrast, there is no significant effect on turnout in either the right or swing areas, as indicated by tests on the sum of the coefficients on the two-way and three-way interactions.

Table 6. Differential Effects by Swing Areas, Pipeline Locations, and Political Alignment

	Pro-para Mayor (1)	Log Total Revenue (2)	Pro-para Mayor (3)	Log Turnout (4)	Pro-para Mayor (5)	Pro-para Mayor (6)	Pro-para Mayor (7)
Oil dependence × Log oil price	.079*** [.022]	.068** [.030]	.081*** [.022]	−.079*** [.024]	.047** [.022]	.052* [.029]	.0493* [.029]
Oil pipeline length × Log oil price	.009 [.058]	.015 [.036]					
Oil dependence × Price × swing 1988–94			−.028 [.085]	.515 [.377]			
Oil dependence × Price × right 1988–94			.021 [.028]	.067** [.031]			
Oil dependence × Price × President Uribe in office					−.032 [.038]		
Oil dependence × Price × Previous governor pro-para						−.007 [.014]	
Oil dependence × Price × Previous governor and mayor pro-para							−.0001 [.005]
Observations	3,659	8,234	3,624	3,629	3,659	2,670	2,538
Number of municipalities	959	1,007	950	948	959	910	851
Sample period	1997–2007	1997–2005	1997–2007	1997–2007	1997–2007	2000–2007	2000–2007
Controls	Y	Y	Y	Y	Y	Y	Y

Note. See table 2 for table notes. In columns 3–4, the omitted category is areas that were left during the period 1988–94, so the coefficient on Oil dependence × Log oil price measures effects in these areas. Columns 3–4 also control for the two-way interactions of left, right, and swing with the oil price. Column 5 controls for the interaction of oil dependence and the indicator of whether President Uribe was in office (after 2002). Columns 6 and 7 additionally control for whether the previous governor was pro-para and whether both the previous mayor and governor were pro-para, respectively, along with the interactions of these indicators with 1993 oil dependence and the log oil price.

ceived to be pro-paramilitary in his orientation.⁴² In table 6, column 5, we introduce a three-way interaction between the oil price shock and an indicator for the Uribe period, after 2002. But the coefficient on this term is insignificant and negative, suggesting no such effect.

Analogously, pro-paramilitary governors may funnel oil money toward pro-paramilitary candidates in municipal races within their department. Governor elections occur concurrently with mayoral elections, so this effect can only arise if the governor holding office in the year before the election was paramilitary affiliated (which occurs 6% of the

time). Also this effect should be especially large when both the previous governor and mayor were pro-paramilitary (which is relatively rare, occurring 2% of the time). Columns 6–7 of table 6 show that the three-way interactions with both these alignment variables are small and insignificant. These results also suggest that resources flowing from higher levels of government are not the key driver behind our estimates.

Robustness checks

In this section, we subject our estimates to a number of robustness checks. We summarize these checks briefly here and provide greater details in the appendix.

Alternate measurement of pro-paramilitary affiliation.

First, we use an approach based on Acemoglu et al. (2013)

42. President Uribe was criticized for lenience in the amnesty terms offered to paramilitary groups during their 2003 demobilization. In addition, many members of his administration, including the head of the leading security organization, were implicated for involvement with paramilitary groups (Bronstein 2007).

to create an alternate measure of pro-paramilitary affiliation. This identifies paramilitary-supported parties as the non-traditional third parties (i.e., parties other than the traditional center left, center right, and extreme left parties) fielding candidates in each election. This other approach averts the potential look-back assignment of our measure. Table A.8 shows that effects on both the mayoral and local council outcomes are robust to this alternate measurement.

Linear trends by oil-producing area. Figure A.2 shows that the price of oil rose linearly for the majority of our sample period, with the exception of two dips. If institutional outcomes also trended differentially in oil-producing municipalities, for some reason besides the oil price rise, this could be a confound. While our main specifications control for linear trends by region, in table A.9 we add linear trends by whether municipalities produced oil in 1993. This could be an over-control by controlling for electoral trend responses to changes in the oil price. However, we find that all of our main outcomes remain statistically significant at conventional levels.

Controlling for the pre-period presence of paramilitary groups. As mentioned previously, paramilitary groups tend to be more active in the oil region, including at the outset of our sample period. This general tendency cannot confound our estimates since municipality fixed effects sweep out time-invariant effects. However, if paramilitary groups happened to intervene more aggressively in elections during years when the oil price was high, then this, combined with their presence in oil areas at the start of the sample could produce overestimates. To account for this confound, we create a measure of whether paramilitary groups (and also guerrilla groups) were active in each municipality over 1988–92. In table A.10, we control for the interaction of both of these variables with the oil price. Our results remain unaffected. This suggests that the cross-sectional correlation of paramilitary groups in oil areas at the start of the sample do not drive the effects.

Controlling for trends by department. In table A.11, we also control for separate linear time trends for each of Colombia's 33 departments. Almost all effects remain in place, with the exception of the effect on paramilitary activity, which becomes marginally insignificant (with a p -value of .12). However, the coefficient (in col. 12) is not substantially smaller in magnitude relative to the benchmark specification in table 4, column 3, indicating that the results do not change meaningfully with the inclusion of these trend controls.

Controlling for additional municipal characteristics. Table A.12 additionally controls for the other cross-sectional covariates in table 1. To maximize power, we first predict the dependent variable value in 1997 on the basis of these characteristics, in a manner similar to the procedure used for table A.6A and A.6B (see appendix for details). We then control for interactions of this predicted value with both the oil price and annual time trends. Table A.12 shows that our results are robust to controlling for price and trend effects for these additional variables.

Alternate measure of oil dependence. Our preferred specification measures oil dependence prior to 1994, since this marked the beginning of paramilitary expansion. However, there may be year-to-year variation in oil production, which raises concerns that our estimates could reflect idiosyncrasies in 1993 production. To address this, we employ mean oil dependence based on production over 1988–96, which spans the entire pre-sample period. Table A.13 shows that almost all the estimates remain in place, with the exception of a weaker effect on the margin of victory (which becomes marginally insignificant with a p -value of .104), and a smaller and weaker effect on total candidates. However, the negative effect on the number of non-pro-paramilitary candidates remains strongly significant, which continues to provide support for the scare-off effect and reduced electoral competition under this robustness check. As such, this alternate measure of oil dependence does not meaningfully change our findings.

CONCLUSION

This paper has examined how natural resources influence institutions using a within-country approach. While much of the past literature has focused on incumbent behavior, we ask whether these resources can influence the electoral process and distort who comes to power.

Focusing on Colombian politics, we find that oil price shocks reduce electoral competition and promote the election of legislators from right-wing pro-paramilitary parties. These effects correspond to greater violent activity by paramilitary groups. Our results are consistent with an account in which armed groups intervene forcefully in local elections with the aim of controlling resource rich regions. Overall, they show that natural resources may prove inimical to local democracy by shaping how leaders rise to power.

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