SUPPLEMENTARY MATERIAL

STRATEGIC VIOLENCE DURING DEMOCRATIZATION
Evidence from Myanmar

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Supporting Information
Strategic Violence during Democratization:
Evidence from Myanmar

Following text to be published online.

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A.1. Summary Statistics

Table A.1: Summary Statistics

Statistic	N	Mean	St. Dev.	Min	Max
Total	3,300	0.129	1.240	0	56
State-based	3,300	0.082	1.051	0	53
One-sided	3,300	0.042	0.500	0	15
Non-state	3,300	0.005	0.092	0	3
# Mines	3,300	0.030	0.300	0	5
$\text{Log(Jade Price)}_{t-1}$	3,300	11.821	1.145	10.309	13.743
$\text{Log(Chinese Luxury Demand)}_{t-1}$	3,300	6.593	0.499	5.690	7.188
Year	3,300	2,010.500	2.873	2,006	2,015
Avg. Nightlights	2,632	5.764	15.642	0.000	63.000
Median Altitude	3,290	358.816	458.529	1.000	2,384.000

A.2.   Placebo Results

We estimate equation 1 using data from the pre-transition period (1995-2010), and coding D_{it} using years prior to the actual transition. These "placebo" (i.e., fake) transitions consistently generate null findings, indicating that mining and non-mining areas do not follow divergent trends prior to 2011. The right-most result uses the actual transition and is extremely similar to the coefficient from Table 1, model 1. The point estimates differ very slightly, as the model in the figure uses more data from the pre-transition period.

Figure A.1: Placebo vs. Real Results

DV: Log(Total + 1)

Placebo Models use series from 1995–2010.
Real Model estimated using data from 1995–2015.
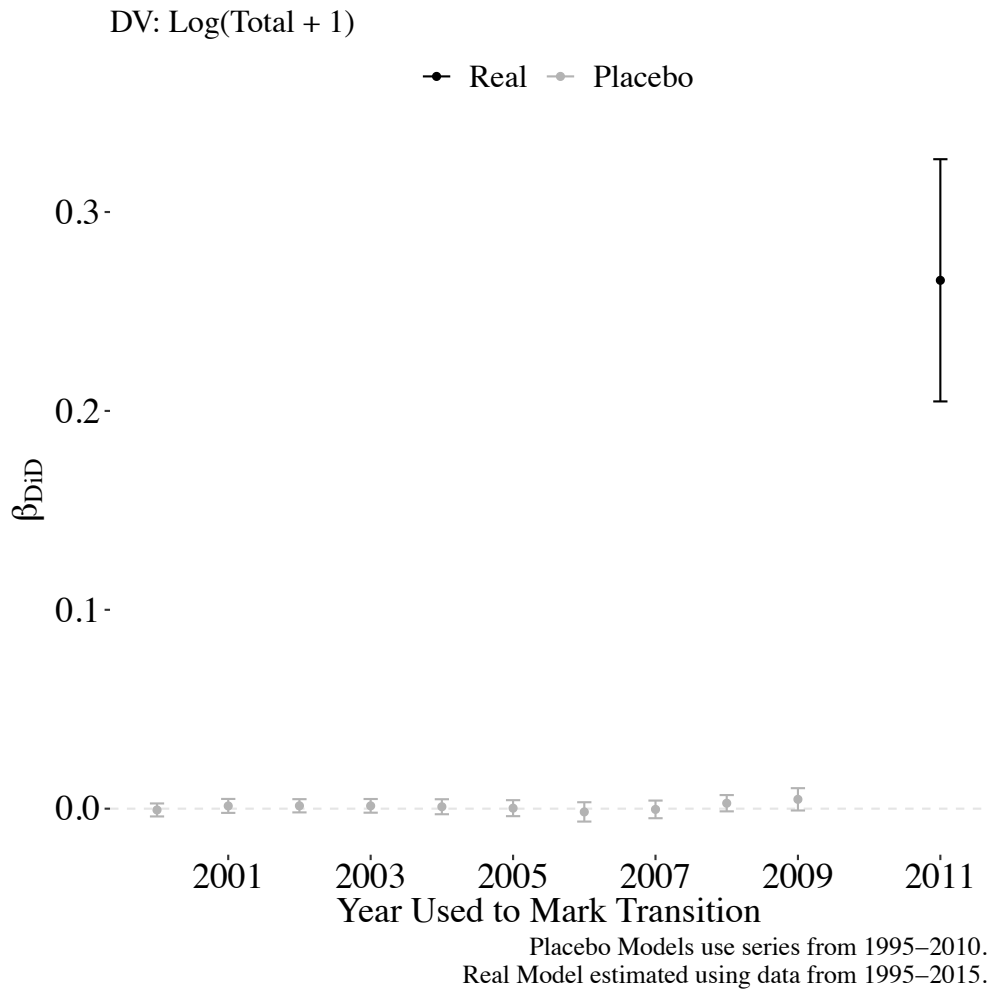
A.3.   Military-Owned Entities Targeted under US JADE Act

In July 2008, the United States enacted the Tom Lantos Block Burmese JADE Act.[37] The bill notes that Myanmar's junta owned much of Myanmar's jade sector, which was a major revenue source for the military regime. The purported goal of the legislation was "to impose sanctions on officials of the State Peace and Development Council in Burma, ...[and] to prohibit the importation of gemstones from Burma, or that originate in Burma."

To implement the JADE Act, the US Department of the Treasury's Office of Foreign Assets Control (OFAC) began including individuals and companies linked to the jade trade on their list of "Specially Designated Nationals" (SDNs), who are sanctioned by US law. We reviewed the list of Burmese SDNs from the JADE Act's passage until the 2011 transition and found thirteen major entities. (Table A.2 collapses related firms and individuals into a single entity.) Of the thirteen entities sanctioned under the JADE Act, military officials had a major ownership stake in twelve.

Table A.2: Burmese Specially Designated Nationals

Main Individual	Year Added	Military Link	Related Entities
Aung, Dagon Win	2009	Yes	Dagon International Limited; Dagon Timber Limited
Te Za	2009	Yes	Espace Avenir
Cecilia Ng/Steven Law	2009	No	Golden Aaron Pte. Ltd. (plus 9 associated companies)
Zaw Zaw	2009	Yes	Max Myanmar companies (plus 12 associated companies)
Saw Tun	2008	Yes	Ko, Daw Myint Myint
Ye Myint	2008	Yes	Myint, Daw Tin Li
Nyan Win	2008	Yes	Soe, Daw Myint Myint
Shwe Mann	2008	Yes	Thet, Daw Khin Lay
Aung Thet Mann	2008	Yes	Ayer Shwe Wah Company Ltd.
U Kyaw Thein	2008	Yes	Myanmar Aviation Export; Pavo Aircraft Leasing Pte. Ltd.
Thi Ha	2008	Yes	Htoo Group of Companies
Pye Phyo Tay Za	2008	Yes	Air Bagan Holdings Pte. Ltd.

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[37]https://www.treasury.gov/resource-center/sanctions/Documents/pl110_286_jade_act.pdf

A.4. Including Township-Specific Time-Trends

To rule out concerns about secular upward trends in conflict in mining townships (or declines in non-mining areas), we include township-specific linear trends in the model. Relative to the results reported in Table 1, the coefficients increase in magnitude.

Table A.3: Effect of Political Transition on Violence in Jade Townships (Includes Township-Specific Time-Trends)

	Dependent variable:		
	Log(Total + 1)	Log(State-Based + 1)	Log(One-sided + 1)
	(1)	(2)	(3)
# Mines $\times$ Post-2010 (D_{it})	0.289*	0.198*	0.164*
	(0.054)	(0.058)	(0.028)
Township FEs	330	330	330
Year FEs	10	10	10
Township Time-Trends	✓	✓	✓
Observations	3,300	3,300	3,300

Robust standard errors clustered on township; $^{\dagger}p < 0.1$, $^{*}p < 0.05$

Notes: OLS models using the specification from equation 1, including township-specific trends. Standard errors clustered at the township level are shown in parentheses. The dependent variable is the log of total events, state-based events, and one-sided government events (see Section 4).

A.5. Re-weighting to Balance Pre-Treatment Measures

We pre-process our data using the entropy balancing algorithm developed by Hainmueller (2011). By re-weighting based on on altitude, as well as pre-treatment measures of economic development and conflict, we manufacture a balanced sample of control (non-mining) townships to provided a better prediction of the counterfactual trend in mining areas. While we have to dichotomize our mining variable to implement this routine, our findings remain qualitatively similar.

Table A.4: Balance Table after Pre-Processing

	Treatment Mean	Control Mean	p-value
Median Altitude	748.667	748.366	0.999
Avg. Nightlights (1995-2000)	0.166	0.175	0.979
Avg. Nightlights (2001-2005)	0.159	0.167	0.980
log{Events + 1} (1995-2000)	0	0	0.968
log{Events + 1} (2001-2005)	0	0	0.972
log{One-sided + 1} (1995-2000)	0	0	0.970
log{One-sided + 1} (2001-2005)	0	0	0.978
log{State-based + 1} (1995-2000)	0	0	0.983
log{State-based + 1} (2001-2005)	0	0	0.983

Notes: We dichotomize observations into mining or non-mining and then use entropy balancing to re-weight control (non-mining) observations.

Table A.5: Effect of Political Transition on Violence in Jade Townships
After Pre-Processing Data with Entropy Balancing

	Log(Total + 1)	Log(State-Based + 1)	Log(One-sided + 1)
	Dependent variable:		
	(1)	(2)	(3)
J_{it}	0.409†	0.413*	0.140
	(0.221)	(0.198)	(0.101)
	p = 0.065	p = 0.037	p = 0.165
Township FEs	329	329	329
Year FEs	10	10	10
Observations	3,290	3,290	3,290

Robust standard errors clustered on township; $^{\dagger}p < 0.1$, $^{*}p < 0.05$

Notes: OLS models using the specification from equation 1, omitting the township-specific trends. J_{it} is an indicator for jade-mining areas post-2010. We re-weight the control observations to generate balance on the pre-treatment variables included in table A.4. Standard errors clustered at the township level are shown in parentheses. The dependent variable is the log of total events, state-based events, and one-sided government events (see Section 4).

A.6.   Including State×Year Fixed Effects

We allow for non-parametric time-trends by state by substituting state $\times$ year fixed effects for the year fixed effects in equation 1. This rules out any time-varying, state-specific confounds, such as changes that affect the entirety of Kachin State.

Table A.6: Effect of Political Transition on Violence in Jade Townships

	Dependent variable:		
	Log(Total + 1)	Log(State-Based + 1)	Log(One-sided + 1)
	(1)	(2)	(3)
# Mines × Post-2010 (D_{it})	0.212*	0.169*	0.107*
	(0.029)	(0.026)	(0.020)
Township FEs	330	330	330
State×Year FEs	150	150	150
Observations	3,300	3,300	3,300

Robust standard errors clustered on township; $^\dagger p < 0.1$, $^* p < 0.05$

Notes: OLS models using the specification from equation 1. We substitute State×Year fixed effects for the year fixed effects. Standard errors clustered at the township level are shown in parentheses. The dependent variable is the log of total events, state-based events, and one-sided government events (see Section 4).

A.7. Conflict in Townships under Ceasefires

We use an early release of data compiled by the Asia Foundation for its Township Development Indicators to identify areas covered by ceasefire agreements between ethnic armed organizations and the Tatmadaw signed in or before 2011. We then assess whether these areas experience a differential increase in violence following the political transition, substituting D_{it} for $\mathbb{1}$(Ceasefire) $\times$ $\mathbb{1}$(Post-2010) in equation 1.

Table A.7: Change in Conflict in Areas Previously Covered by Ceasefires

	Dependent variable:			
	Log(Total + 1)			
	(1)	(2)	(3)	(4)
$\mathbb{1}$(Ceasefire) $\times$ Post-2010	0.040	−0.001	−0.048	0.015
	(0.082)	(0.081)	(0.091)	(0.080)
Sample	Full	Non-Mining	Not Kachin	Not Shan-2015
Township FEs	330	324	312	330
State $\times$ Year FEs	150	150	140	149
Observations	3,300	3,240	3,120	3,245

Robust standard errors clustered on township; $^\dagger p < 0.1$, $^* p < 0.05$

Notes: OLS models that interact the post-transition indicator with an indicator for whether a township was covered by a pre-transition ceasefire agreement. Standard errors clustered at the township level are shown in parentheses. The dependent variable is the log of total events (see Section 4).

Comparing these results to model 1 of Table A.6, we find no evidence that townships covered by earlier ceasefire agreements saw a larger increase in violence after the transition. When we exclude jade-mining areas (some of which were covered by the 1994 ceasefire agreement with the KIA/KIO), the coefficient flips sign.

Looking more closely at the data, a few townships in Shan state covered by prior ceasefire agreements see an uptick in violence after 2011. However, much of this violence occurs in 2015, several years after the transition. Excluding only observations from Shan State in 2015 further attenuates the coefficient, which is an order of magnitude smaller than the estimate from Table A.6.

A.8. Inverse Hyperbolic Sine Transformation

Per Burbidge, Magee, and Robb (1988), we employ the hyperbolic sine transformation of our conflict data ($\text{IHS}(y) := \log\left\{y + (y^2 + 1)^{1/2}\right\}$). Like $\log(y + c)$, this function is defined at zero. Moreover, this transformation does not require us to add c and, thereby, assume that all areas experience some level of conflict.

Table A.8: Effect of Political Transition on Violence in Jade Townships

	Dependent variable:		
	IHS(Total)	IHS(State-Based)	IHS(One-sided)
	(1)	(2)	(3)
# Mines × Post-2010 (D_{it})	0.344*	0.287*	0.149*
	(0.041)	(0.043)	(0.020)
Township FEs	330	330	330
Year FEs	10	10	10
Observations	3,300	3,300	3,300

Robust standard errors clustered on township; $^{\dagger}p < 0.1$, $^{*}p < 0.05$

Notes: OLS models using the specification from equation 1. Standard errors clustered at the township level are shown in parentheses. The dependent variable is transformed using the inverse hyperbolic sine function applied to total events, state-based events, and one-sided government events (see Section 4).

A.9. Using Raw Counts as Dependent Variable

Table A.9 shows the results from equation 1 using the raw count as the dependent variable.

**Table A.9:** Primary Results using Raw Counts

	Total	State-Based	One-sided
	Dependent variable:		
	(1)	(2)	(3)
# Mines $\times$ Post-2010 (D_{it})	0.715*	0.497*	0.220*
	(0.067)	(0.060)	(0.029)
Township FEs	330	330	330
Year FEs	10	10	10
Observations	3,300	3,300	3,300

Robust standard errors clustered on township;
$^{\dagger}p < 0.1, {}^{*}p < 0.05$

Notes: OLS models using the specification from equation 1. Standard errors clustered at the township level are shown in parentheses. The dependent variable is the count of total events, state-based events, and one-sided government events (see Section 4).

Figure A.2: Conflicts in Jade-Mining and Other Townships before and after 2011
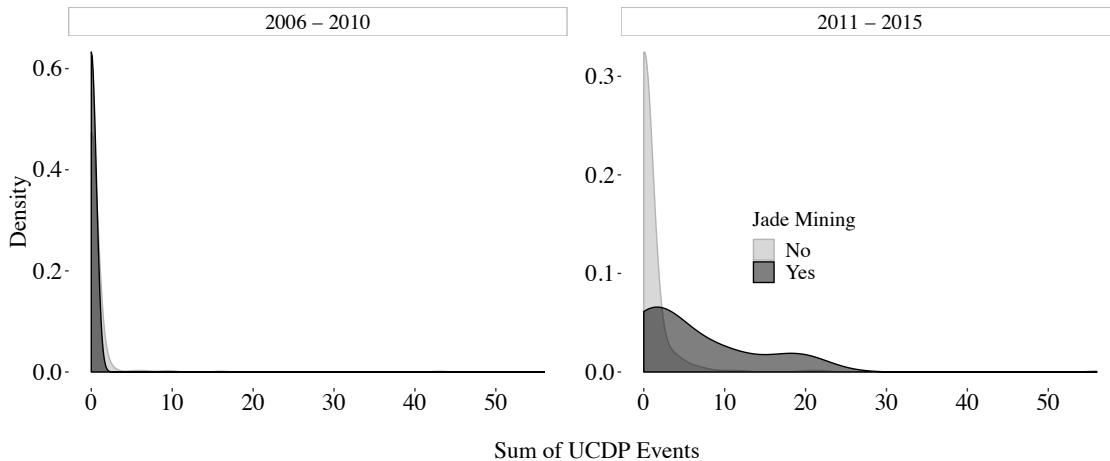
A.10. Null Effect on Non-State Conflict

Our argument implies that the uptick in violence relates to a proactive offensive by the military in their effort to retain control of the jade sector. While we find a differential increase in armed conflict events (particularly those involving government) in mining areas after the transition, we do not find a simultaneous increase in non-state conflict events. This both points to our preferred mechanism and suggests that the security situation in mining townships might have remained unchanged had the Tatmadaw never intervened.

Table A.10: Effect of Political Transition on Communal Conflict in Jade Townships

	Dependent variable:	
	Log(Total + 1)	
	(1)	(2)
# Mines $\times$ Post-2010 (D_{it})	$-0.001^{\dagger}$	$-0.002^{\dagger}$
	(0.001)	(0.001)
Township FEs	330	330
Year FEs	10	10
Township Time-Trends		✓
Observations	3,300	3,300

Robust standard errors clustered on township
$^{\dagger}p < 0.1, ^{*}p < 0.05$

Notes: OLS models using the specification from equation 1, omitting the township-specific trends. Standard errors clustered at the township level are shown in parentheses. Dependent variable is the log of non-state events (see Section 4).

A.11. Binary Measure of Mining Activity

Table A.11: Effect of Political Transition on Violence in Jade Townships

|	*Dependent variable:*		
	Log(Total + 1)	Log(State-Based + 1)	Log(One-sided + 1)
	(1)	(2)	(3)
$\mathbb{1}$(Mine) $\times$ Post-2010	0.475*	0.413*	0.140
	(0.220)	(0.198)	(0.101)
Township FEs	330	330	330
Year FEs	10	10	10
Observations	3,300	3,300	3,300

Robust standard errors clustered on township; $^{\dagger}p < 0.1$, $^{*}p < 0.05$

Notes: OLS models using the specification from equation 1, where we use a binary measure of mining activity to construct the interaction term rather than the number of mines. Standard errors clustered at the township level are shown in parentheses. The dependent variable is the count of total events, state-based events, and one-sided government events (see Section 4).

A.12. Substituting Chinese Luxury Demand for Jade Prices

As Myanmar is a top producer of jade, one could be concerned that violence reduces supply and boosts jade prices. We exploit the fact that nearly all jade produced in Myanmar is exported to China. Given the importance of Chinese demand for jade prices, we substitute jade prices in models 2 and 3 with Chinese luxury sales — specifically, high-end car sales — to isolate variation in prices that is unrelated to local conflict. While we only estimate the reduced form, the implied exclusion restriction is that Chinese luxury demand does not affect conflict in Myanmar except through its effects on jade prices; we find no qualitative evidence questioning this assumption.

Figure A.3: Relationship between Jade Prices and Chinese Luxury Demand

Series: ─ Chinese Luxury Demand (x2) ···· Jade Price
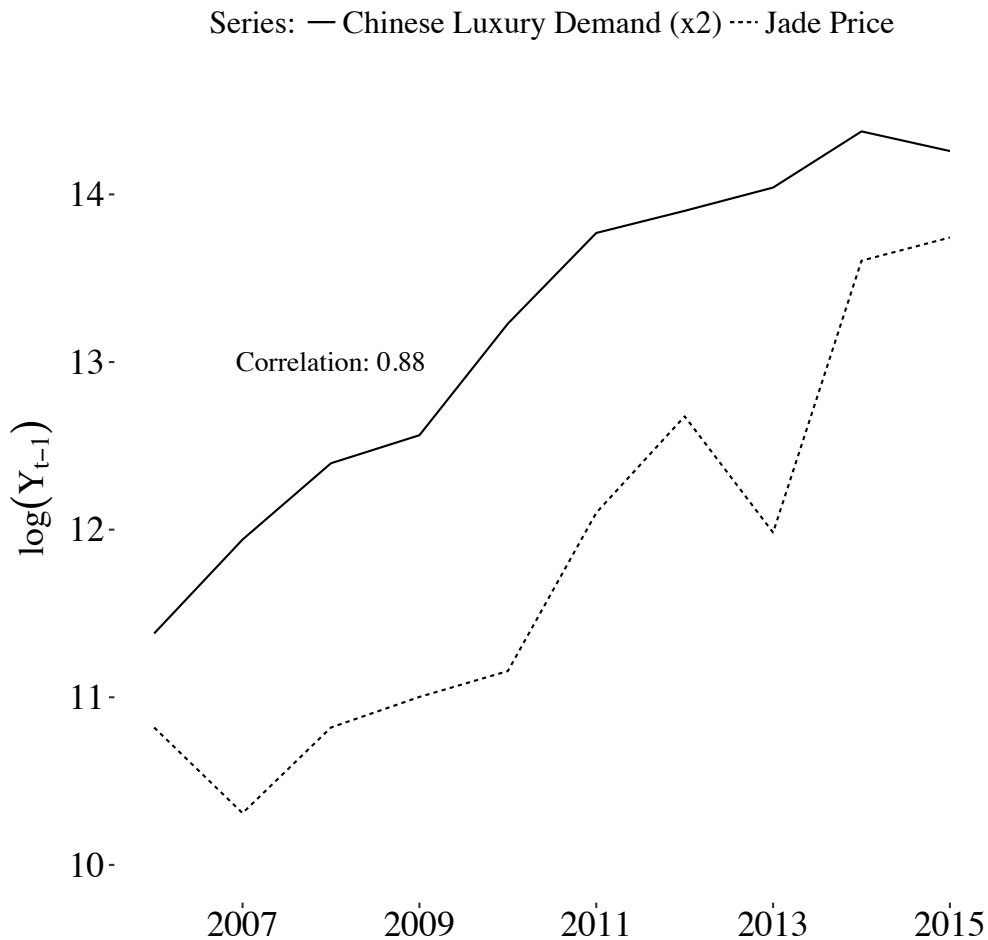
Notes: This figure shows the trends in both jade prices and Chinese luxury demand (measured by high-end car sales). Both series have been logged and lagged one year. We multiply the Chinese luxury demand series by 2 to focus attention on the nearly parallel trends, rather than the (inconsequential) level differences.

Figure A.3 first shows the striking correlation ($\rho = 0.88$) between Chinese luxury demand and jade prices. We then reproduce Table 2 but substitute our measure of Chinese luxury demand for jade prices. Despite a change in scale, the results remain the same.

Table A.12: Effect of Political Transition and Chinese Luxury Demand on Conflict in Jade Mining Areas

			Dependent variable:	
			Log(Total + 1)	
	(1)	(2)	(3)	(4)
Log(Chinese Car Sales)$_{t-1}$ $\times$ $\mathbb{1}$(Mines > 0)	0.41*	0.03†	-0.86	0.03†
	(0.18)	(0.02)	(0.78)	(0.02)
J_{it}				6.70
				(5.33)
Log(Chinese Car Sales)$_{t-1}$ $\times$ J_{it}				-0.89
				(0.73)
Township FEs	330	330	330	330
Year FEs	10	5	5	10
Observations	3,300	1,650	1,650	3,300

Robust standard errors clustered on township
$^\dagger p < 0.1$, $^* p < 0.05$

Notes: Columns 1-3: OLS models using the specification from equation 2; column 4: specification from equation 3. J_{it} is an indicator for jade-mining areas post-2010. Standard errors clustered at the township level are shown in parentheses. In all models we substitute Chinese luxury car sales for the jade price. Standard errors clustered at the township level are shown in parentheses. The outcome is the log of total events (see Section 4).

A.13.   Potential Generalizable Cases

We review recent and contemporary cases to determine a set of countries that meet our scope conditions, operationalizing the resources component through mining deposits.

First, we map all sub-provincial units — equivalent to counties in the US — using the Database of Global Administrative Areas (GADM). Second, we spatially merge in (1) point data on over 300,000 mineral deposits from the US Geological Survey's Mineral Resources Data System (MRDS), which is current as of 2011; and (2) data on armed conflict from the UCDP GED database, which covers 1989 to the present. This allows us to identify all autocracies containing districts with both natural resources and past conflict.[38] The resulting list (see Table A.13) includes thirty countries, including Angola, Eritrea, and Ethiopia (all identified in our reading of the secondary literature), as well as our case, Myanmar. This exercise and secondary literature on other cases suggest that the dynamic we uncover is not unique to Myanmar.

In addition to the cases in Table A.13, there are others that have non-mining resources that coincide with insurgent activity, e.g. Chad and Yemen, as well as democratic cases that exhibit similar tendencies, e.g. Mali and eastern India.

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[38] We operationalize autocracy as those countries with average Polity IV scores less than or equal to zero between 1989 and 2011.

Table A.13: Autocracies Containing Districts with Natural Resources and Past Conflict

Country	MRDS Total	UCDP Total	GADM 2 Units	Units with MRDS & UCDP	Polity Average (1989-2011)
Afghanistan	33	13475	328	23	-5
Algeria	225	2625	1504	75	-1
Angola	13	1115	163	7	-2
Cameroon	11	61	58	1	-4
China	1035	32	344	10	-7
Cote d'Ivoire	21	244	33	5	-2
Egypt	198	425	343	12	-5
Eritrea	13	84	50	7	-8
Ethiopia	27	1287	79	9	-3
Guinea	30	69	34	7	-2
Iran	411	121	268	9	-4
Iraq	49	4438	102	25	-6
Kyrgyzstan	40	39	44	3	-2
Laos	244	13	142	7	-7
Mauritania	9	16	44	2	-5
Morocco	106	5	54	1	-6
Myanmar	80	883	63	17	-7
Republic of Congo	11	198	48	4	-3
Rwanda	4	401	30	4	-5
Somalia	160	3079	74	19	0
South Sudan	1	889	45	1	0
Sudan	18	952	80	6	-6
Syria	9	201	60	2	-8
Tajikistan	37	265	59	9	-5
Tanzania	65	6	183	1	-2
Togo	5	92	21	2	-3
Uganda	27	1132	166	7	-3
United Arab Emirates	1	1	195	1	-8
Uzbekistan	60	28	161	4	-10
Zimbabwe	257	45	60	16	-4

A.14. UCDP Event Descriptions

To give a sense of the events that we analyze in this paper, we have extracted the critical text from the underlying news articles for a number of the UCDP incidents.

- January 2013. "Burmese military admits airstrikes against Kachin" — `https://www.usatoday.com/story/news/world/2013/01/02/myanmar-airstrikes/1805663/` — "Burma's military acknowledged launching airstrikes against ethnic Kachin rebels in the north and said it captured a hilltop post...The military announcement highlights a seeming disconnect between the government and the military, which retains much power behind the scenes. An order late last year by Thein Sein to halt offensive operations against the Kachin was not honored in practice."

- October 2013. "Fighting Resumes in Southern Kachin State" — `http://www.kachinlandnews.com/?p=23885` — "After several rounds of mortar shelling that also targeted an IDP camp and a boarding school in Mung Ding Pa village, Burmese army troops entered the village on Oct 22... A KLN source said that two villagers wounded and one died from an attack by Burmese army troops at Nam Hon village on Oct 15, just five days after KIO-Burmese government delegations met in Myitkyina. Fighting rage between KIA's 12th Battalion troops and Burmese army's combined troops near Saga Nam Hkum on Oct 23 at 10:30 am. More government troops are reported to have arrived in Namlim Pa village as fighting began yesterday."

- August 2014. "One Civilian Killed After TNLA, Govt Troops Clash" — `https://www.irrawaddy.com/news/burma/one-civilian-killed-tnla-govt-troops-clash.html` — One civilian was shot dead and another hospitalized with a gunshot wound following a clash between government troops and the Ta'ang National Liberation Army (TNLA) on Monday morning in northern Shan State, according to the ethnic rebel group...The Burmese Army continues to move troops in the area, which the ethnic Palaung armed group lays claim to."