Urban Concentration and Civil War

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Abstract

The explosion of cities and megacities has increased scholars' and policy-markers' attention to the effects such changes might have on conflict; the increasing urban environment has been linked to a shift in the nature of warfare, but not necessarily to the propensity of intrastate war itself. In this paper we argue that high levels of urban concentration – the concentration of populations in one or relatively few urban centers – increases the both the likelihood of civil war and the intensity of such conflicts, for a number of reasons. Urban concentration limits the ability of the state to project power across space, exacerbating grievances in rural areas, allowing rebels to more easily control territory and enhance their military strength, and creating high-value targets in cities. At the same time, once a conflict begins in a state with high levels of urban concentration, the state lacks information about and access to peripheral areas, so it relies on indiscriminate violence, in turn making such conflicts more lethal. This paper indicates that urban concentration exerts a crucial influence on the likelihood and nature of intrastate warfare.

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Introduction

The global rise of cities has not only heightened skylines, but also fears of future instability and turmoil (§2-3 Fie, 2007; Kilcullen, 2013). The future of warfare, scholars and analysts argue, can be found in cities (Peters, 1996; Hahn II and Jezior, 1999; Graham, 2004; Adamson, 2015; Gentile et al., 2017). To prepare, the U.S. military has invested hundreds of millions of dollars in "Military Operations in Urban Terrain," including the construction and expansion of state-of-the-art training facilities and the development of new training systems (Loc, 2011; Watson, 2011). Ongoing and protracted interventions in Iraq and Afghanistan have particularly predisposed the armed forces of the United States and its allies to assume that future challenges for counterinsurgents will be closely tied to the dynamics of fighting in tight physical spaces, in densely populated areas, and among enemies connected both physically and informatically to one another.

Despite the increasing focus on and investment in urban operations, urban areas have typically proven inhospitable for the organization of sustained rebellion (Kalyvas, 2007) and civil wars. When compared to the hinterlands, in urban environments states need only project power over a relatively limited geographic area to deter or end civil wars, and lack of space for training in cities makes it difficult for insurgents to practice the military skills needed to challenge stronger incumbents (e.g. Galula, 1964). Higher opportunity costs for participation in violent rebellion and structural advantages for state policing and repression also make organizing and sustaining rebellion in urban centers challenging. How and why do cities lead to conflict emergence if cities are simultaneously inhospitable to those who engage in conflict?

We argue that while urban centers may play an increasingly important role in the nature of warfare (**?**), the relationship between cities and high intensity civil war is profoundly conditioned by urban geography, most notably the degree of concentration (or, conversely, dispersion) of urban populations across a country's cities. Higher levels of *urban concentration* increases the probability of experiencing civil conflict, and increases the chances that such a civil conflict will be more intense. When a country has a high level of urban concentration, the central government may only retain complete control of the capital and perhaps a few other key cities, leaving peripheral communities largely untouched by the state's governance, opening up the possibility for local political entrepreneurs to organize opposition. In other words, high levels of urban concentration inhibit the state's ability to project power and authority across territory. The concentration of the urban population within one or a few cities creates a contrast between an urban center where the state exercises control and rural hinterlands and semi-rural outskirts where state presence is relatively more scarce.

With stronger state presence in major urban centers, high urban concentration can strain state resources and lead to peripheral insurrection and unrest (Bates, 1981; Wallace, 2013). Excessive urban concentration means few resources permanently assigned to peripheral areas, little to no infrastructure available to supply emergency resources, weaker institutional and affective ties between core and periphery, and fewer intelligence assets. The state's inability to project power over space as a consequence of high urban concentration results in an urban-rural gap that creates conditions ripe for high intensity civil conflict. Peripheral areas then become breeding and training grounds for capable insurgencies with the allegiance of local populations. At the same time, cities in highly concentrated countries become valuable targets for insurgents. Governments are thus faced with two bad options: resorting to strategies that rely on deadly force and indiscriminate targeting while sustaining higher levels of casualties against more capable insurgencies, or relinquishing territorial control beyond a few cities.

Examples of rebellions in the periphery abound, and include the "tribal areas" in Afghanistan, which have sheltered the Taliban, the Venezuela-Colombian border, home to both the Revolutionary Armed Forces of Colombia (FARC) and the National Liberation Army (ELN), as well as the Karen state in Myanmar, home to the longest ongoing insurgency in the world. Broader empirical trends demonstrate that irregular wars typically begin and are primarily fought in rural spaces and smaller cities, not in a country's major cities (e.g. Kalyvas, 2007), though they may eventually reach those locations.

In this paper we show that urban concentration and high intensity civil war onset – defined as civil wars that result in total casualties of at least 1,000 people in a given country-year – are highly correlated with one another, even after controlling for a rich set of factors that might confound that relationship. We also assess how urban concentration affects civil war battle deaths once conflict is underway. The results support our hypothesis that urban concentration is positively associated with high intensity civil war onset and civil war battle-deaths. Though recent research on civil war processes has increasingly relied on micro-level theorizing and empirical data from a few cases, providing extraordinary insight into causal mechanisms, it often raises questions of generalizability. Our theory aims to contextualize some of these micro-level findings and to evaluate slow-moving, structural factors that influence intrastate conflict.

We make a number of theoretical and empirical contributions to the literature on state breakdown, political order, and civil war. First, we provide a set of theoretical mechanisms through which certain configurations of spatially distributed populations can undermine or create challenges for political order. Second, we move beyond existing works in this tradition by introducing a new conceptual apparatus for understanding urban concentration. Third, we develop a new measure for this concept and show that it has a profound and robust effect upon the likelihood of civil war onset and the intensity of lethal civil war violence. Finally, we demonstrate that the effects of urban concentration on the likelihood of high intensity civil conflict stand in stark contrast to the consequences of *urbanization*, meaning the movement of people from the rural areas to urban centers. Whereas urbanization is frequently associated with protest activity and anti-regime agitation (Huntington, 1968; Buhaug and Urdal, 2013), urbanization may also mitigate the likelihood of full-scale civil war (Collier and Hoeffler, 2004). Taken together, these contributions provide both scholarly insights into the determinants of political disorder while also offering policymakers lessons for how to avoid the potentially pernicious effects of urban concentration.

The next section presents in more detail our theory linking urban concentration to the onset of high-intensity civil wars and civil war battle-deaths, the third section presents our measure of urban concentration used in the cross-national regressions—a Herfindahl-Hirschman index—while the fourth provides the quantitative results. Our findings demonstrate a positive relationship between urban concentration and high-intensity civil war onset, as well as civil war battle-deaths. These results are robust to the addition of a battery of control variables, multiple estimators, and additional robustness tests. The final section considers avenues for future research and concludes.

Urban Concentration and State Institutions

As megacities and urban centers have become increasingly prominent, especially in the global South, scholars have sought to understand how cities shape violence and internal threats to regime stability. Cities may shape the likelihood of conflict and its dynamics through two primary factors: urbanization and urban concentration. Urbanization is defined as the movement of people from the countryside to cities writ large. Urbanization may change rapidly, as a result of natural disasters, conflict, or economic booms, and is sometimes linked to significant and typically non-violent anti-regime activity (Auvinen, 1997; Kalyvas, 2007). Yet urbanization remains negatively associated with prolonged and organized civil war (Urdal, 2008): urbanization makes it challenging for incipient insurgencies to form. As more and more people from diverse backgrounds move into cities, mobilization along identity-based cleavages becomes increasingly difficult. Additionally, as more people live in cities, states need only project power over a relatively limited geographic area, when compared to the hinterlands. Lastly, the the lack of space for training in cities makes it difficult for insurgents to practice the military skills needed to challenge stronger incumbent enemies (e.g. Galula, 1964; Anthony and Robison, 2017).

On the other hand, urban concentration refers to how people are distributed across cities in a given territory. When the majority of a country's population resides in few major urban centers, typically one or two, urban concentration is high. When people reside in a country with a constellation of multiple urban centers, urban concentration is low. The concentration of people in cities tends to be directly related to the concentration of state power, either as a mere consequence of the concurrent concentration of wealth and power, or as a conscious policy meant to mollify those in urban centers. It is not a coincidence that most government policies and public institutions exhibit some degree of urban bias, even in political systems designed to preserve the power of rural communities, such as the United States. In the modern era, cities are responsible for a disproportionate share of economic activity, tax revenue, and are the main locus for political organization and mobilization (Jacobs et al., 1984). State power tends to accumulates around these focal points, from which it emanates out into the peripheries (Tollefsen and Buhaug, 2015). Even in many European countries, where the coercive apparatus of the state was often positioned in the hinterland to defend against external aggression (Tilly, 1992), other elements of state presence remained concentrated in core cities. In other regions, where interstate warfare played a smaller role in the formation of the modern state, the concentration of state institutions in urban centers tends to be even more pronounced (Herbst, 2000).

In countries with low levels of urban concentration–multiple urban centers dispersed throughout its territory–state power is more evenly distributed, increasing the state's ability to project power into rural spaces. In countries with high levels of urban concentration (only one or a few cities housing most of the urban population), state power resources tend to be similarly concentrated. Governments with concentrated populations usually continue investing in already established urban centers, and regimes tend to rely on public policies that benefit urban cores while pushing the costs of those policies onto peripheral cities and rural populations (Bates, 1981; Wallace, 2013). The neglected peripheries are therefore relatively deprived of good governance and social service provision that have been shown to dampen the propensity for civil conflict (Tollefsen and Buhaug, 2015; Taydas and Peksen, 2012; Henderson, 2002). In that sense, urban concentration contributes to the "social inaccessibility" of a state, where rulers "may decide to leave backward [peripheral] zones alone: not investing in infrastructure or bureaucratic and socioeconomic institutions, and refraining from providing costly public goods that serve no greater political purpose" (Tollefsen and Buhaug, 2015: 10).

Moreover, while urban concentration leads to a concentration of state institutions in the main or a few cities, in some cases these resources become strained, with the urban center itself becoming a source of political instability. This occurs if city growth outpaces state capacity-building; state resources are limited by economic crises; social cleavages (socio-economic, racial, religious) emerge within a city; or political ineptitude and mismanagement hinder effective service provision (e.g. Gaviria and Stein, 2000; Campante and Do, 2014; Castells-Quintana, 2015). As first conceptualized by Butcher and Griffiths (2017) and applied to foreign policy, urban concentration across space can be conceptualized as a topographic map of power. Low levels of urban concentration correspond to a relatively smooth map, with little variation. High levels of urban concentration represent one or a few major peaks, with vast valleys in between. The power discrepancy between the urban center and the countryside provides an optimal nexus for insurgent action.

As a consequence, we argue, civil conflict is more likely, and it is more likely to be particularly intense, when urban concentration is high. The central government in these states may only retain complete control of the capital, while peripheries provide the opportunity for local political entrepreneurs and affiliated strongmen to provide protection to disaffected populations that have long been ignored by the center.[1] As a result of

[1]Galula (1964: 27), for example, notes that a "high ratio of rural to urban population gives

the link between urban concentration and circumscribed state power and authority, three conditions emerge that tend to foster high intensity civil conflict: insurgent mobilization in the countryside, rebel targeting of urban centers, and indiscriminate violence by the state in the periphery. These dynamics are frequently coupled with a contraction of governing services as the state military apparatus expands to meet new threats. We discuss each of these in turn.

First, rural peripheries are ideal spaces for insurgents to accumulate strength (Weidmann, 2015). Drawing on pre-existing social and political organizations in these areas allows rebels to harness discontent with neglected local demands or active government repression of political movements. In such rural areas, insurgents can taken advantage of less densely populated geographical spaces necessary to establish bases, train recruits, and mobilize the peasantry (Galula, 1964; Mao, 1937; Guevara, 2002). From these peripheral bases, insurgencies organize and strategize with comparatively fewer concerns about targeted, disruptive state repression; initiate propaganda, indoctrination, and education campaigns; and seek covert external support from foreign countries (Fearon, 2004; Lischer, 2005; Salehyan, 2007; McColl, 1969). If militants *do* have allies abroad, rural areas and small cities—particularly in border regions—make it easier for foreign states to deliver logistical support and materiel. Insurgents are therefore better able to match incumbent military strength, prolonging the duration and intensity of conflicts (Kalyvas and Balcells, 2010). Furthermore, attacks against isolated army posts and surprise ambushes against government troops far from urban centers are easier to inflict than tightly coordinated assaults on major cities or pitched battles (Kalyvas, 2007; Buhaug and Lujala, 2009).

Second, high levels of urban concentration make the main cities into clear, valuable targets for insurgent groups. In countries where a large proportion of residents are concentrated in one or few cities, disproportionate attention, symbolic value, and economic

an advantage to the insurgent."

production are placed on these urban centers, making for an especially attractive target for insurgents. A single insurgent attack on urban mass transit infrastructure, for example, may not only generate widespread publicity for the rebel cause, but may also result in a high number of casualties and longer-term economic hardship. Media (including social media) and reporting also suffer from an urban bias (e.g. Woolley, 2000; Kalyvas, 2004): violence in urban centers draws media attention to the cause and helps signal insurgent strength (Zhukov, 2012). The publicity arising from and the grievances spurred by urban warfare could together improve the ability of rebels to recruit new members from the urban core. The inability to project power over space arising from high urban concentration can therefore contribute to insurgent-specific factors that increase the probability of experiencing higher intensity conflicts, specifically rebel military strength (through recruitment and training) and effectiveness (through high-impact attacks).

Third, limited penetration of state institutions in the hinterlands that follows from high levels of urban concentration and the difficulties projecting military power across long distances (Buhaug, 2010) tend to increase government reliance on indiscriminate violence against civilians in the countryside, exacerbating the lethality of conflict. Governments are more likely to use indiscriminate violence when they have limited access to reliable information about rebels (Kalyvas, 2006), and such violence often backfires (Francisco, 2004; Kocher et al., 2011). In the western state of Darfur in Sudan against the Sudan Liberation Movement/Army and the Justice and Equality Movement (De Waal, 2007), Senegal against the MFDC (Amn, 1998), and Suriname against the Jungle Commando (MacDonald, 1988), governments relied on indiscriminate violence against civilian populations, which only further mobilized support for the rebel cause and caused already violent conflicts to escalate.

A summary of the *Frente Farabundo Martí de Liberación Nacional* (FMLN) in El Salvador reflects the dynamics of our theory. The FMLN's leaders and initial members were recruited in city centers. Prior to the onset of the civil war, FMLN cadres moved to the countryside and into the mountains to train and avoid government detection and suppression. When the FMLN launched their broader armed campaign, rebel combatants moved from the rural countryside to population centers in the periphery, slowly advancing and encircling San Salvador, the capital (Lungo and Schmidt, 1996: 56). As the FMLN conquered more territory, it began establishing governance structures such as schools and clinics within the regions it controlled, further facilitating recruitment within the hinterlands (Commission, 1992: 87). By the mid-1980s, the FMLN had begun targeting the infrastructure and symbols of the Salvadoran government's power in El Salvador's few cities in order to sabotage the economy, destroy the population's sense of security and order, and exacerbate grievances. These activities justified increased government repression: because the state had limited abilities to conduct effective counterinsurgency in the countryside, it increasingly relied on death squads ("*escuadrónes de la muerte*") that deployed indiscriminate violence in the countryside to curtail rebel activity (Wood, 2000: 67-69). In 1989, the FMLN launched its final assault on San Salvador, attacking the capital city and eventually forcing the government into peace negotiations that led to the FMLN's legalization as a political party (Toft, 2009: 70-95).

Though the conflict occurred decades earlier and on a different continent, the Ethiopian People's Revolutionary Party's (EPRP) contest against the Ethiopian regime follows similar patterns. First, urban concentration limited the Ethiopian's state's governance to cities (Legurn and Lee, 1977: 65), and throughout the 1960s and 1970s the Ethiopian government faced significant challenges delivering governance over the full reach of its territory, particularly outside city centers (Markakis and Ayele, 1978: 35). The Ethiopian government, for instance, forced students to supplement governmental services by teaching in the peripheral areas (Tadesse, 1998a: 45-46). A radicalized core of university students moved to the hinterlands to begin active recruitment and training in the rural areas, "because the military and economic base of the enemy are located in the cities and he is weaker in the rural areas" (Tadesse, 1998a: 88). There, the EPRP established camps and governance structures to recruit rural peasants (Tadesse, 1998b: 367-369). In the cities, the EPRP then targeted high value persons and economic bases in the city centers through a campaign of assassination and infiltration (Halliday and Molyneux, 1981: 122). Ultimately, the rurality that resulted from high levels of urban concentration—an impoverished countryside with little state penetration—allowed the EPRP to gain territorial control, train new members, and recruit to the cause, while focusing on high-value urban targets (Tadesse, 1998b: 151). Finally, lacking both the knowledge about EPRP combatants as well as the ability to project power to the peripheries (and even to some urban enclaves), the Dergue massacred and tortured hundreds of thousands of Ethiopians through its Red Terror campaign (Tadesse 1998b: 3-4; BBCNews 1999). Indiscriminate violence, due in part to given patterns of urban geography, helped increased the intensity of Ethiopia's civil war.

To summarize, our key hypothesis is that countries with high levels of urban concentration are more likely to experience civil wars than those that have lower levels of urban concentration, and that such civil wars should be particularly bloody. In the next section, we use cross-national data to assess whether this relationship between urban concentration and high intensity conflict and battle-deaths exists across the full universe of cases.

Empirics

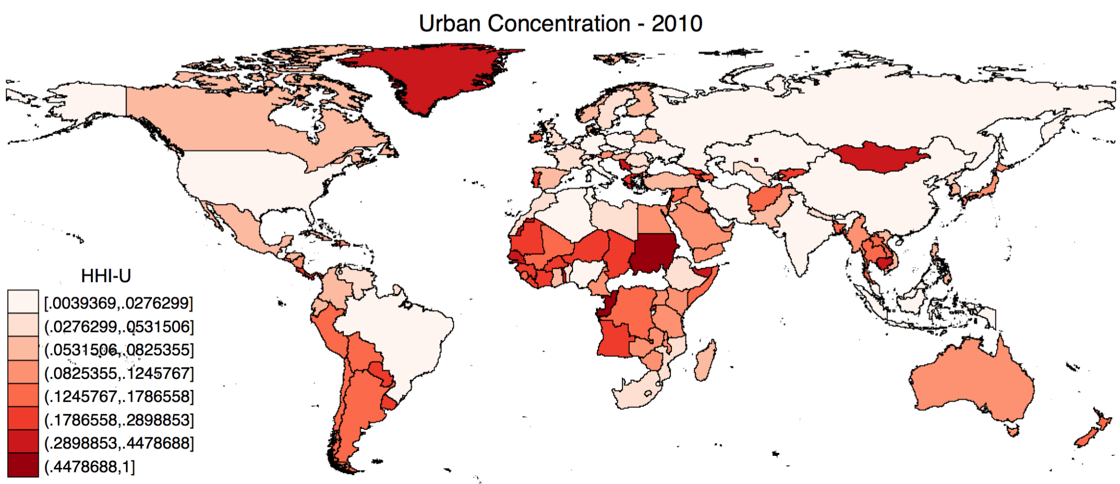
Data

To test the connection between urban geography and civil war, we begin with the UCDP/PRIO Armed Conflict dataset. We argue that urban concentration affects both the *onset* and *intensity* of conflict. As such, we rely on two dependent variables to capture this variation. First, we use UCDP/PRIO's binary coding of the onset of high-intensity conflicts at the country-year. For these models, the dependent variable takes a value of 1 if there is a new high-intensity conflict that kills at least 1,000 people in a given country-year, and 0 otherwise. Second, to capture variation in intensity during conflict, we use UCDP/PRIO battle death estimates, a common measure of conflict intensity. By using these two variables, we are able to measure not only the onset of high intensity conflict, but also variation in the intensity of conflict over time.

For our key independent variable, *Urban Concentration*, we draw on data from the UN World Urbanization Prospects for population figures in major cities from 1950 through 2010. We define major cities as those with more than 750,000 inhabitants. For countries that have no cities that meet that threshold, we count the largest city. Using much lower cutpoints, such as 500,000 and 300,000, yield very similar results, as we demonstrate in the appendix.

Operationalizing urban concentration is complex, as there is no consensus, even among geographers, on how to conceptualize and measure it. Some measure urban concentration as the share of a country's total population living in the largest city, or even in the capital city, while others rely on the share of the urban population (Wallace, 2013). Still others measure population dispersion as a Gini coefficient of the population as distributed over arbitrarily-sized polygons across the country (e.g. Collier and Hoeffler, 2004). A focus on the largest city alone, for example, can obscure the degree to which the population is concentrated or dispersed beyond that one city. Using such a measure, a country (A) with only one major city that accounts for 40% of its urban population while the rest is dispersed in various small cities would look exactly like a country (B) with five major cities that account for nearly 100% of the urban population yet in which the largest city has the same 40% of the urban population with the other 60% dispersed throughout the other four in equal shares of 15%. Following the discussion in the preceding sections, however, we would expect these two countries would confront substantially different incentives for both insurgent mobilization and government repression, therefore changing the probability of experiencing civil war.

To address this conceptual distinction, we use a Herfindahl-Hirschman Index of urban concentration (henceforth HHI-U). The HHI-U consists of the sum of the squared shares of a country's urban population living in each major city. This produces an index ranging from 0 (less concentrated) to 1 (more concentrated) that places greater weight on skewed distributions. An HHI-U of 1 represents total concentration in one city (e.g. the case of city-states like Singapore and, formerly, Hong Kong) to flat distributions that approach 0. The US today, for example, has a HHI-U of 0.016, which is significantly higher than Germany's very low 0.004, but still much lower than the Congo's 0.45 or Singapore's 1. Returning to our hypothetical countries mentioned above, A and B, they would rate 0.16 and 0.25, respectively. While this might not seem like much of a difference, they are approximately one standard deviation apart in our real world data. The map below shows the geographic distribution of the *Urban Concentration* variable in 2010.



Because the UN population data used to calculate the HHI-U is reported in five-year increments only, we lag our measure of urban concentration by five years to ensure that the level of urban concentration precedes the onset of conflict.

In addition to our key independent variable, *Urban Concentration*, we include several controls for variables that potentially correlate with conflict onset and urban concentration. Specifically, we control for: percentage of population living in urban areas (urbanization), population size, ethnic discrimination, youth population, territory size, mountainous terrain, per capita GDP, and regime type.

Because of its theoretical importance, we review the distinction between *urban concentration* and *urbanization*, and why we include the latter as a control. We expect that urban concentration—the distribution of urbanites across one or many cities—to generate a higher probability of civil conflict. Yet urbanization—the percentage of people living in urban as opposed to rural areas writ large—is highly and positively correlated with overall economic and social development and state capacity, and thus likely to be *negatively* correlated with civil war onset. As previously discussed, while urban concentration and urbanization are conceptually related, the degree of correlation between urbanization and urban concentration is fairly low and indirect: while urban concentration tends to be higher in highly rural countries, this correlation is not very strong.[2] Countries can be highly urbanized and dispersed (the United States and Germany), mostly rural and highly concentrated (Rwanda and Uganda), both highly urbanized and highly concentrated (South Korea and Uruguay) or mostly rural and dispersed (India). Moreover, we expect the effects of urban concentration to be largely independent of a country's overall level of urbanization.[3]

Because of the binary construction of our first dependent variable, for these models we use a logistic regression estimator. To account for temporal dependence in the data, in most of the first set of models we include a control for years since the last conflict, and the squared and cubic terms for this variable (Carter and Signorino, 2010). Because we

[2]The correlation coefficients between urban concentration and urbanization, and between urban concentration and GDP per capita in our data are only 0.04 and -0.08, respectively. We also tested for potential interactions between concentration and these variables, as well as non-linear effects of concentration, finding no significant results. We also ran tests, presented in the Appendix, excluding Singapore, a rich and stable city-state (and therefore extremely concentrated).

[3]It is worth noting that there is some disagreement in the measurement of urbanization, particularly regarding what counts as "urban" areas, with some census takers such as the United States Census Bureau adopting strict quantitative cut-offs, with others such as the United Nations and the World Bank relying on self-reported classifications. The differences among different ways of measuring urbanization are sometimes significant, but tend not to be dramatic, and not nearly as problematic as differences in conceptualizing and measuring urban concentration.

are using time-series cross-sectional (TSCS) data, it is possible that the significance of the relationship is overstated, since observations from the same country in different years are treated as independent. We correct for this by clustering standard errors by country. All time-varying controls are lagged by one year. The second set of models, which we study the effect of urban concentration on civil war battle-deaths, uses both a log-linear and a random-effects negative binomial estimator, as described below. In the appendix we also report results from a two-stage hurdle model, in which the first stage is selection into conflict (onset) and the second stage is conflict intensity (battle-deaths).

We control for a number of potential confounders. First, we include a number of population and socio-demographic variables. The first, *Population* (logged) (Heston et al., 2012), is included as larger populations are thought to allow rebels to better hide from superior regime forces, and more populous countries tend to be less concentrated. Second, we include the variable *Discrimination* which captures the size of the largest discriminated minority as a percent of other ethnic groups in the country (from Buhaug et al. (2013)), which may help capture inter-group grievances that could cause intense civil conflict. It is important to account for this because urban concentration and other forms of geographic inequality—and the policies that cause them—may stem from particular geographic distributions of ethnic or political groups within a country and inequalities between them. Third, we add a variable for *Youth*, measured as the percentage of a country's population aged 0 to 24: this variable has been shown to affect society's mobilizational capacity and potential for violence, especially in urban settings Urdal (2006). While Urdal (2006) focuses on share of population aged 15 to 24, we expand the age group to include younger children, many of whom are used in combat and support functions in armed conflict around the world.[4] We expect that youth bulges would be particularly dangerous in countries with high levels of urban concentration.

[4]We find that narrowing the age group underestimates the effect of youth bulges on civil war onset.

In addition to a state's specific demographic and social factors, a state's geographic features could be critical confounders. As such, we control for a country's *Area* (in millions of square kilometers) (Lake and O'Mahoney, 2004), as larger-sized territories are both harder for governments to project power over and urban concentration tends to be less acute in larger countries. We also include a measure for *Rough Terrain* (logged, from Fearon and Laitin 2003), which relates to rebel opportunity for rebellion and may affect urban concentration by creating physical obstacles to intercity communication or limiting urban sprawl.

We include measures of economic and political factors that may be related to the onset of bloody civil wars and have been hypothesized to correlate with urban concentration. We add *GDP per capita* (logged) to account for the country's level of economic development and state capacity (Heston et al., 2012). It is important to note that data for per capita GDP contain significant missingness, however, leading to a sizable reduction in the number of observations. [5] Greater levels of development have been shown to correlate negatively with both conflict and urban concentration. Regime type also affects the likelihood of conflict and potentially correlates with urban concentration. In particular, democratic regimes are less likely to experience civil conflict and tend to have lower levels of urban concentration (though see Gaviria and Stein 2000). We include the *XPOLITY* measure of regime type (Vreeland, 2008), which we update through 2010 given that the data run through 2004. We follow the same procedure using the component indicators (Constraint on Chief Executive, Competitiveness of Executive Recruitment, Openness of Executive Recruitment), in the latest release of Polity IV. We include XPOLITY because components of the Polity IV scores include features of political unrest and political vio-

[5] To test for the possibility that our results suffer from "advanced democracy bias" (Lall, 2016), we reran all models using imputed values for GDP per capita. The results are not only robust to this change, but become slightly stronger and more significant when imputed values are used.

lence; to use Polity IV to predict civil unrest would bias our estimates. XPOLITY corrects for this. In robustness tests reported in the Appendix, Table A4, we also include alternative measures, such as the dichotomous measure of democracy from Cheibub et al. (2010), as well as their six-way typology of regime types.

In Table A5 we also include measures of the availability of oil, gems and drugs, from Lujala (2010); oil rents per capita and an indicator for whether oil accounts for over one third of a country's exports, from Colgan (2015); and, to capture states' military capabilities, in Table A6, military expenditures and personnel (per capita, logged), as well as indicators for the production of iron and steel and energy consumption (logged), both from the Correlates of War (Singer et al., 1972).[6]

Results

Conflict Onset Results

Model 1 in Table 1 presents the bivariate relationship between urban concentration and the onset of conflict, demonstrating that the likelihood of conflict onset increases with ur-

[6] We don't include these latter factors in our main models for a few reasons. First, we doubt there exists a direct correlation between military capabilities and urban concentration. Second, designed for the study of interstate conflict, the COW dataset counts only forces intended for fighting *foreign* actors, thus excluding internal security forces. Counting only those forces would be misleading: while national militaries are often used for internal repression and combating domestic threats, and governments capable of raising large militaries may also be able to maintain large internal security forces, some militaries are either legally prohibited from or unwilling to perform these functions, and actual levels of military mobilization can be negatively related to the size of internal security forces if recruitment is diverted from the latter to the former. Moreover, military personnel and expenditure and the probability of civil war onset are both positively correlated with the incidence of interstate conflict.

ban concentration. We also report results using decade and region fixed effects.[7] Model 2 in Table 1 reports results including clustered standard errors and a variety of controls described above. The coefficient on urban concentration remains largely unaffected. As expected, youth population, total population, size of discriminated group, and territory size have positive and significant coefficients while urbanization and mountainous terrain have the expected negative signs but are not statistically significant.[8]

Table I: Urban Concentration and Civil War Onset

	Model 1	Model 2	Model 3	Model 4	Model 5
Urban Concentration	.955*	1.829**	2.265***	1.655**	1.826**
	(.575)	(.798)	(.805)	(.774)	(.766)
Constant	-4.218***	-15.161***	-16.311***	-13.513***	-32.346***
	(.137)	(3.970)	(4.115)	(3.329)	(3.946)
Peace years	No	Yes	Yes	Yes	Yes
Clustered SEs	No	Yes	Yes	Yes	Yes
Decade FEs	No	No	No	Yes	No
Region FEs	No	No	No	No	Yes
Obs.	6208	4958	5134	4958	4958
χ^2 statistic	2.444	98.948	90.871	115.091	303.405
Pseudo R-Squared	.002	.103	.103	.121	.119

Standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

Models 2-6 include controls for: Urbanization, Discrimination, Population, Percent Youth, Area, Terrain, GDP Per Capita, X-Polity

Peace years operationalized as cubic polynomials

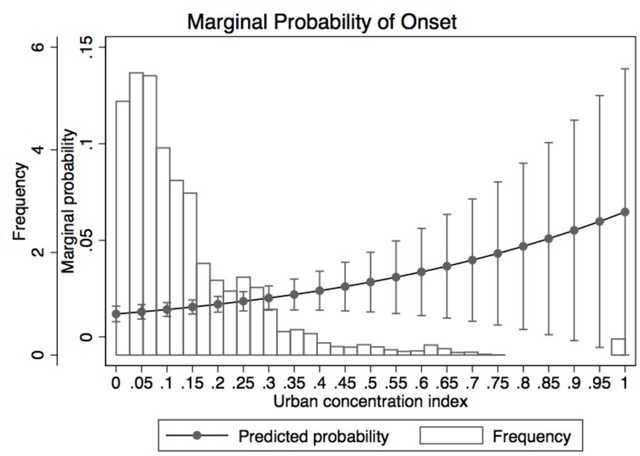
To facilitate the interpretation of the substantive effect of urban concentration, Figure 1 shows the predicted probability of onset from Model 2 at varying levels of urban concentration. This is overlaid with a histogram of *Urban Concentration*, to illustrate the distribution of the data with respect to the index. It shows that although the probability of civil war outbreak in any given year is always small, the probability of onset is about

[7] This estimates separate intercepts for each region or decade, thereby eliminating bias produced by unobserved or unmeasured characteristics across these different groups. The fixed-effect model disregards cross-group variation and estimates only the effects of across-time variation within each group.

[8] These coefficients can be found in the full table reported in the Appendix.

65% higher for states in the 90th percentile of *Urban Concentration*,[9] compared to states in the 10th percentile.[10]

Figure 1: Predicted Probability of Civil War Onset Given Urban Concentration



In model 3 we do not lag the urban concentration variable. The results become more significant, possibly because of the increase in the number of observations. In models 5 and 6 of Table I we present results using the same controls as model 2 but with fixed effects for decade and region,[11] respectively. The coefficient for *Urban Concentration* is robust to these changes in model specification.

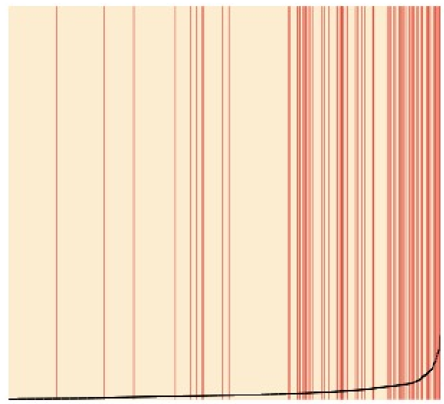
To examine model fit, the separation plot in Figure 2 (Greenhill et al., 2011) matches high-probability predictions from our base model in Table I, Model 2, to actual occurrences of the event of interest, and low-probability predictions to non-occurrences of the event of interest. Dark and light panels correspond to actual instances of events and non-events, respectively, and are ordered with corresponding $\hat{p}$ values increasing from

[9]About 0.021, or 2.1% when *Urban Concentration* is approximately 0.3. Countries with urban concentration indexes around that value include Panama, Senegal, and Israel.

[10]About 0.013, or 1.3% when *Urban Concentration* is approximately 0.021. Countries with urban concentration indexes around that value include the United States, Algeria and Italy.

[11]Africa, Americas, Asia, Europe, and Oceania.

Figure 2: Separation Plot, Model 2
Note: Lines concentrated on right-hand side indicate good model fit



left to right (thin lines in graph). Models that fit well have a high concentration of dark panels on the right side of the graph. Our base model has very good fit: most events are clustered on the right-hand side.

Battle Deaths Results

For a more granular picture of conflict intensity, Table II examines the determinants of battle deaths during conflicts, using both a log-linear and a random-effects negative binomial estimator. In the Appendix we also report results from a two-stage hurdle model, in which the first stage is selection into armed conflict. The battle deaths variable is taken from the UCDP/PRIO data set, using their lower estimate of annual battle deaths.[12] The same controls are included as in Table I.[13] The large, statistically significant and positive

[12]In robustness tests we use the higher estimates of battle-related fatalities, which strengthens our results.

[13]The only difference is that instead of controlling for peace years, we control for the duration of the conflict spell, since we expect that conflict intensity ebbs and flows with time.

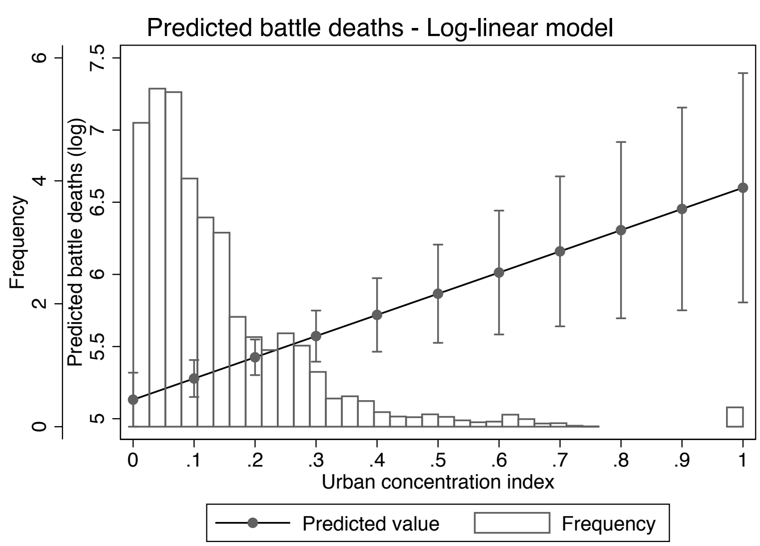
coefficient for *Urban Concentration* in both bivariate and multivariate models, using log-linear and negative binomial models, indicates that urban concentration prompts more intense civil wars and that this variation holds across countries and within countries over time. Figure 3 reports predicted battle deaths, demonstrating that a shift from the 10th percentile of *Urban Concentration* to the 90th percentile is associated with a 60% increase in predicted battle deaths. This translates into an additional 100-900 deaths a year, depending on whether we use low or high battle death estimates.

Table II: Urban Concentration and Civil War Battle Deaths

	Log-Linear		RE Neg Binomial	
	(1)	(2)	(3)	(4)
Urban Concentration	0.92**	1.11**	1.19***	1.17***
	(0.40)	(0.50)	(0.31)	(0.42)
Observations	972	813	972	813

Standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01.
Models 2 and 4 include the following controls:
Urbanization (%), Discrimination, Population size, Percent Youth, Area, Conflict Spell Duration, Mountainous Terrain, GDP Per Capita, X-Polity.

Figure 3: Predicted Battle Deaths (logged), Negative Binomial Estimator



While we do not present all models here, we conducted robustness tests similar to those described above for the logit models of conflict onset, with remarkably consistent results. Tables with all models, as well as a number of additional tests, can be found in the appendix. Most importantly, we rule out sensitivity to temporal dependence, influential observations, and any individual countries driving the results.

Finally, while some might think that urban concentration and onset are both driven by prior conflict, we show in Table A2 that this is not the case: we control for time since the onset of conflict of *any intensity* (and its cubic polynomials), include a longer lag for the concentration variable, and exclude all countries from the analysis once they experience outbreak of an armed conflict. Our results hold, providing increased confidence that our results are not being driven by potential endogeneity between concentration and conflict.

Conclusion

Urban geography is a fundamental determinant of political order. The evidence in this paper has shown the large and positive effect urban concentration has on high-intensity civil war onset and number of battle-deaths once conflict begins. The cross-national results are robust to a variety of model specifications and estimators, as well as the inclusion of a battery of confounders. Future research could examine the precise mechanisms connecting urban geography to patterns of armed group recruitment (as opposed to the use of violence), and could use geolocated conflict data to assess whether political violence predominantly occurs in or around urban centers or in the hinterlands.

One implication of our theory and empirical results is that the rural-urban divide for insurgencies is just as important as early counterinsurgents and theorists of political order proposed, but that this is driven largely by urban concentration rather than urbanization. Additionally, although politically salient, the rural-urban dichotomy isn't clear cut *analytically*, as some insurgencies simultaneously operate in urban centers and the hinterlands, while capitalizing on the resources of both. This dynamic has consequences for the prediction of future instances of high-intensity civil war. While some argue that with increasing urbanization we are likely to see more urban insurgencies (Kilcullen, 2013), and while current US counterinsurgency policy seems to bet heavily on that scenario, our results suggest that the effect of urbanization is conditional upon the distribution of those urban populations across space. If populations are contained within one or a small number of cities we may see more civil wars, but these are unlikely to play out exclusively or chiefly as urban conflicts. Urban centers will likely continue to serve as recruitment grounds for ideologically-committed young people, locales for the mobilization of capital, and sites for urban riots, but the dynamics of contestation and state repression that help generate and sustain insurgency are likely to favor the hinterlands, not major cities. Successful insurgencies may eventually make their way back to the cities and fight the government for control, but only once they have gathered sufficient strength. Territorial gains by the Islamic State of Iraq and Syria in 2014 and 2015, and the Taliban in Afghanistan in 2016-2017, for example, appear to fit this pattern. This suggests that while some increased focus on training for urban operations is warranted, it is important to avoid overcorrecting.

Our argument and findings also have consequences for state-led economic development policies and the deployment of the state's military assets across space. Governments would do well to intentionally help shape patterns of urban geography. While attempts to favor urban elites at the cost of the rural poor may unwittingly incentivize movement to the cities (Bates, 1981; Wallace, 2013), investing in multiple urban centers—as opposed to just the capital city, as is often done—could both placate urban elites with the capacity to overthrow the regime, deter insurgents from organizing for rebellion, and extend the geographic reach of the state. This is a useful corrective to many policy recommendations to undertake *rural* development projects that might increase the opportunity costs of rebellion in the countryside, but leave resources open for capture by armed groups.

Mao (1937: 67) wrote that it is not to the government's advantage "to wage war over a vast area...she cannot disperse her strength and fight in a number of places, and her greatest fears are these eruptions in her rear and disruption of her lines of communication." Where incumbent governments are unable to extend their reach beyond a few key cities, reflecting an inability to develop multiple loci of power and administration across space, the threat of civil war looms. Given current demographic and geographic trends, increasing urbanization appears likely. What remains unknown is how those urban populations within a state will be distributed across space and how state institutions will conform to these geographic patterns. Governments with high degrees of urban concentration and limited administrative and military outposts in their far-flung territories will be unlikely to credibly deter rebellion and prevent the escalation of high-intensity violent conflict.

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Appendix

Robustness tests

First, Table A1 presents the full results for the main models for conflict onset. In Table A2, we address potential concerns about endogeneity, namely the possibility that urban concentration and onset are both (partly) driven by prior conflict. While there is no truly satisfactory way to resolve this issue, we included in Model 1 the time since any conflict of any intensity (and its cubic polynomials), in Model 2 a longer lag for the concentration variable, and, in Model 3, we excluded all countries from the analysis once they experience outbreak of an armed conflict.

Then, in Table A3, Model 1, we exclude peace years altogether to ensure our findings are not driven by the inclusion of years of peace between the onset of high intensity civil conflicts. Second, to guard against the possibility that our results are largely determined by one or a few outliers, we re-estimate our models by dropping individual cases and then dropping influential observations. For A3, Model 2, we simply used the Stata command `jackknife`, which drops an individual observation, reruns the model, replaces the dropped observations, excludes the following observation, then re-runs the model again. Once all observations have been omitted, new coefficients and estimates are calculated. For A3, Model 3, we calculated the Pregibon's beta for all observations and dropped all potentially high-leverage cases. Pregibon's beta is equivalent to Cook's distance in linear regressions. We followed established convention and classified as high-leverage observations those with Pregibon's beta greater than 1. Our findings are robust to each of these tests.

Additional tables replicate the results of our main analysis on conflict onset controlling for alternative measures of regime type (A4), natural resources (A5), military capabilities (A6), alternative measures of concentration using different cut-off for city size (A7). We also report results excluding Singapore–a rich, stable, and extremely concentrated (being a city-state)–from the analysis (A8).

We also present robustness tests for the analysis on conflict intensity, including not lagging the independent variable, adding decade, region, country-fixed effects, and random effects for both log-linear (A9) and negative-binomial (A10 models). Finally, we model both the onset and intensity of conflict using a two-stage hurdle model (A11).

Table A1: Full Results of Main Models, Table 1

	Bivariate	Full Model	No Lag	Decade FEs	Region FEs
	(1)	(2)	(3)	(4)	(5)
Urban Concentration	.955*	1.829**	2.265***	1.655**	1.826**
	(.575)	(.798)	(.805)	(.775)	(.766)
Urbanization (%)		.004	.005	-.004	.012
		(.010)	(.010)	(.010)	(.012)
X-Polity		.014	.014	.026	.046
		(.027)	(.028)	(.029)	(.030)
Population size		.326**	.365**	.236*	.316**
		(.144)	(.151)	(.122)	(.130)
Pop. Aged 0-24 (%)		.088***	.093***	.083***	.144***
		(.028)	(.029)	(.026)	(.035)
GDP per capita (log)		-.054	-.059	.024	.014
		(.178)	(.184)	(.162)	(.180)
Discrimination		.015***	.015***	.015***	.012**
		(.005)	(.005)	(.005)	(.005)
Mountainous terrain (% log)		.178*	.183*	.195**	.282**
		(.094)	(.101)	(.087)	(.119)
Territory (mil sq km)		.138	.131	.183**	.181***
		(.100)	(.108)	(.079)	(.060)
Peace years (cubic polynomials)	No	Yes	Yes	Yes	Yes
Const.	-4.218***	-15.161***	-16.311***	-13.513***	-32.346***
	(.137)	(3.970)	(4.115)	(3.329)	(3.946)
Obs.	6208	4958	5134	4958	4958
χ^2 statistic	2.444	98.948	90.871	115.091	302.404
e(r2-p)	.002	.103	.103	.121	.119

Table A2: Addressing endogeneity. Using time since conflict of any intensity, 10-year lag, excluding countries from analysis after first outbreak of conflict

	(1) Time since any conflict	(2) 10-year lag	(3) No prior conflict
Urban Concentration (5yr lag)	1.40**	6.90***	
	(0.56)	(2.22)	
Urban Concentration (10yr lag)			6.27**
			(2.50)
Urbanization (%)	0.00	-0.08*	-0.13*
	(0.01)	(0.05)	(0.07)
X-Polity	-0.02	-0.04	-0.37*
	(0.03)	(0.16)	(0.20)
Population size (log)	0.07	0.14	0.75**
	(0.07)	(0.43)	(0.35)
% of pop. age 0-24	0.03	-0.14***	-0.15**
	(0.02)	(0.05)	(0.06)
GDP per capita (log)	-0.16	-0.47	0.45
	(0.16)	(0.85)	(0.45)
Discrimination	0.00	-0.02	0.02
	(0.01)	(0.03)	(0.02)
Mountainous terrain (% log)	0.18**	0.85*	0.47
	(0.08)	(0.47)	(0.36)
Territory (mil sq km)	0.14***	0.38*	0.46
	(0.04)	(0.22)	(0.36)
Peace years (cubic polynomials)	Yes	Yes	Yes
Observations	5359	2919	2619
R^2			

Clustered standard errors in parentheses

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

Table A3: Additional Robustness Tests for Onset of Conflict, Excluding Peace Years, Influential Outliers, Jackknife

	No Peace Years	Jackknife	Excludes Influential Outliers
	(1)	(2)	(3)
Urban Concentration	2.310***	1.829**	2.038**
	(.805)	(.902)	(.871)
Urbanization (%)	.005	.004	.005
	(.010)	(.011)	(.011)
X-Polity	.022	.014	.017
	(.027)	(.032)	(.027)
Population size	.342**	.326***	.480***
	(.158)	(.123)	(.127)
Pop. Aged 0-24 (%)	.088***	.088***	.104***
	(.029)	(.026)	(.031)
GDP per capita (log)	-.125	-.054	-.062
	(.187)	(.231)	(.212)
Discrimination	.016***	.015***	.014***
	(.005)	(.005)	(.005)
Mountainous terrain (% log)	.202**	.178*	.182*
	(.097)	(.099)	(.094)
Territory (mil sq km)	.141	. 1377***	-.016
	(.110)	(.058)	(.069)
Peace years (cubic polynomials)	No	Yes	Yes
Jack-knife	No	Yes	No
Dropping Influential Observations	No	No	Yes
Obs.	4958	4958	4955
F statistic		6.709	
χ^2 statistic	61.529		76.089
Pseudo R-squared	.097	.103	.108

Standard errors in parentheses. * $p < 0.10$,** $p < 0.05$, *** $p < 0.01$

Table A4: Additional Robustness Tests for Onset of Conflict, Different Measures of Regime Type

	Dichotomous Measure	Six-Way Typology
	(1)	(2)
Urban Concentration	1.629**	1.451*
	(.830)	(.829)
Urbanization (%)	.004	.007
	(.010)	(.010)
Democracy (Dichotomous)	-.298	
	(.315)	
Parliamentary		.351
		(.822)
Semi-parliamentary		-.099
		(.573)
Presidential		.270
		(.476)
Civilian Dictatorship		.498
		(.434)
Military Dictatorship		-.749
		(.820)
Monarchical Dictatorship		Omitted
Pop. size (log)	.330**	.310**
	(.138)	(.144)
Pop. Aged 0-24 (%)	.070**	.070**
	(.031)	(.033)
GDP per capita (log)	-.017	-.052
	(.173)	(.179)
Discrimination	.015***	.016***
	(.004)	(.004)
Mountainous terrain (% log)	.179*	.227**
	(.092)	(.090)
Territory Size (mil sq km)	.112	.115
	(.088)	(.092)
Peace years (cubic polynomials)	Yes	Yes
Obs.	5036	5036
χ^2 statistic	89.022	100.093
Pseudo R-squared	.096	.101

Standard errors in parentheses. * $p < 0.10$,** $p < 0.05$, *** $p < 0.01$

Table A5: Additional Robustness Tests for Onset of Conflict, Natural Resources

	All Natural Resources	Oil Only
	(1)	(2)
Urban Concentration	1.666*	1.950**
	(.957)	(.986)
Urbanization	-.002	.008
	(.013)	(.012)
X-Polity	.022	.039
	(.029)	(.031)
Population size (log)	.362**	.330**
	(.181)	(.161)
Pop. aged 0-24 (%)	.088***	.089***
	(.031)	(.032)
GDP per capita (log)	-.061	-.253
	(.216)	(.273)
Discrimination	.017***	.013**
	(.005)	(.005)
Mountainous terrain (% log)	.173	.184
	(.109)	(.116)
Territory size	.123	.119
	(.102)	(.107)
Coca, cannabis or opium (dummy)	-.245	
	(.355)	
Prod. of gems (incl. diamonds, dummy)	-.202	
	(.276)	
Oil production (dummy)	.213	
	(.422)	
Oil more than 1/3 of exports (dummy)		.774*
		(.462)
Oil rents per capita		-.0003
		(.0003)
Obs.	4613	4258
χ^2 statistic	89.199	101.415
Pseudo R-Squared	.099	.107

Standard errors in parentheses. * $p < 0.10$,** $p < 0.05$, *** $p < 0.01$

Table A6: Additional Robustness Tests for Onset of Conflict, Military Personnel and Expenditures

	Mil. Personnel and Expenditures	Energy and Iron and Steel
	(1)	(2)
Urban Concentration	1.941**	1.665**
	(.876)	(.836)
Urbanization	-1.107	-.956
	(1.182)	(1.281)
X-Polity	.044	.054*
	(.031)	(.033)
Pop. size	.261	.362*
	(.171)	(.191)
Pop. aged 0-24 (%)	.100***	.096***
	(.026)	(.027)
GDP per capita (log)	-.291	-.250
	(.203)	(.202)
Discrimination	.885*	1.080**
	(.456)	(.502)
Mountainous terrain (% log)	.270***	.243**
	(.100)	(.100)
Territory size	.0001	.0001
	(.0001)	(.0001)
Share of pop. in armed forces (log)	-9.709	-15.241
	(16.964)	(17.467)
Mil. expenditures per capita (log)	.531***	.566***
	(.148)	(.159)
Energy Consumption (log)		.013
		(.097)
Iron and Steel prod. (log)		-.047**
		(.023)
Obs.	4836	4803
χ^2 statistic	135.417	138.036
Pseudo R-Squared	.133	.136

Standard errors in parentheses. * $p < 0.10$,** $p < 0.05$, *** $p < 0.01$

Table A7: Additional Robustness Test, Alternative Measure of Urban Concentration (300,000 Cut-off)

	Bivariate	Base model	No lag	No clustered SEs	Decade FEs
	(1)	(2)	(3)	(4)	(5)
Urban concentration	.628	2.205**	2.401**	2.205**	1.861
	(.650)	(1.090)	(1.142)	(1.097)	(1.199)
Urbanization		.002	.003	.002	-.005
		(.010)	(.010)	(.010)	(.011)
X-Polity		.011	.009	.011	.022
		(.027)	(.028)	(.033)	(.029)
Population		.357**	.388**	.357***	.258*
		(.152)	(.159)	(.124)	(.132)
Pop. Age 0-24		.089***	.094***	.089***	.084***
		(.029)	(.030)	(.026)	(.027)
GDP Per capita		.0005	-.011	.0005	.065
		(.181)	(.180)	(.219)	(.166)
Discrimination		.014***	.014***	.014***	.014***
		(.004)	(.005)	(.005)	(.004)
Mountainous terrain (% log)		.160*	.159*	.160	.175**
		(.089)	(.096)	(.103)	(.083)
Territory (mil sq km)		.139	.132	.139**	.185**
		(.099)	(.106)	(.059)	(.078)
Const.	-4.167***	-16.082***	-16.940***	-16.082***	-14.150***
	(.142)	(4.256)	(4.368)	(3.678)	(3.661)
Obs.	6208	4958	5134	4958	4958
χ^2 statistic	.861	91.772	81.955	79.833	109.979
R^2	.0008	.103	.101	.103	.121

Standard errors in parentheses. * $p < 0.10$,** $p < 0.05$, *** $p < 0.01$

Table A8: Additional Robustness Test, Excluding Singapore

Urban Concentration	2.13**
	(0.85)
Urbanization (%)	0.01
	(0.01)
X-Polity	0.02
	(0.03)
Population size	0.33**
	(0.14)
% of pop. age 0-24	0.09***
	(0.03)
GDP per capita (log)	-0.07
	(0.18)
Discrimination	0.01***
	(0.00)
Mountainous terrain (% log)	0.17*
	(0.09)
Territory (mil sq km)	0.14
	(0.10)
Constant	-15.21***
	(3.93)
Observations	4917
R^2	

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A9: Log-linear Models of Civil War Battle Deaths, robustness tests

	(1)	(2)	(3)	(4)	(5)	(6)
Urban Concentration	1.12***	0.97*		0.67	1.03*	1.86*
	(0.41)	(0.52)		(0.52)	(0.53)	(1.02)
Urban Concentration (not lagged)			1.11**			
			(0.50)			
Urbanization (%)		-0.00	-0.00	-0.01	-0.00	-0.01
		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
X-Polity		-0.05**	-0.04**	-0.03*	-0.04**	-0.04*
		(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Pop. size		0.02	0.04	-0.03	0.11*	-0.09
		(0.06)	(0.06)	(0.06)	(0.06)	(0.12)
Pop. aged 0-24 (%)		0.03**	0.03**	0.02	0.04**	0.00
		(0.01)	(0.01)	(0.01)	(0.02)	(0.02)
GDP per capita (log)		-0.18	-0.19	-0.22*	-0.10	0.03
		(0.12)	(0.12)	(0.12)	(0.12)	(0.18)
Discrimination		-0.00	-0.00	-0.00	-0.00	-0.00
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Mountainous terrain (% log)		0.37***	0.39***	0.39***	0.38***	0.36***
		(0.05)	(0.05)	(0.05)	(0.06)	(0.10)
Territory size		0.17***	0.16***	0.17***	0.13***	0.16***
		(0.03)	(0.03)	(0.03)	(0.03)	(0.06)
Conflict spell duration		0.04***	0.04***	0.04***	0.05***	0.06***
		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Decade fixed effects				YES		
Region fixed effects					YES	
Random effects						YES
Observations	6776	4958	4958	5134	4958	4958
R^2	0.000	0.388	0.389	0.384	0.393	0.394

Standard errors in parentheses. * $p < 0.10$,** $p < 0.05$, *** $p < 0.01$

Table A10: Random-Effects Negative Binomial Models of Civil War Battle Deaths, robustness tests

	(1)	(2)	(3)	(4)	(5)	(6)
Urban Concentration	1.11***	0.99**		0.95**	1.49***	0.81*
	(0.32)	(0.42)		(0.43)	(0.43)	(0.45)
Urban Concentration (not lagged)			1.33***			
			(0.42)			
Urbanization (%)		-0.01*	-0.00	-0.01	-0.01	-0.01*
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
X-Polity		-0.02**	-0.01	-0.01	-0.02*	-0.02**
		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Pop. size		0.07	0.12***	0.08*	0.18***	0.08*
		(0.04)	(0.04)	(0.04)	(0.05)	(0.05)
Pop. aged 0-24 (%)		-0.00	-0.00	-0.01	-0.00	-0.01
		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
GDP per capita		0.24***	0.25***	0.22***	0.24***	0.26***
		(0.08)	(0.08)	(0.08)	(0.08)	(0.08)
Discrimination		-0.01***	-0.00**	-0.00*	-0.00*	-0.01***
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Mountainous terrain (% log)		-0.07*	-0.08*	-0.07*	-0.15***	-0.14***
		(0.04)	(0.04)	(0.04)	(0.05)	(0.05)
Territory size		-0.00	-0.04*	-0.03	-0.11***	-0.02
		(0.02)	(0.02)	(0.02)	(0.03)	(0.03)
Conflict spell duration		0.02***				0.02***
		(0.00)				(0.00)
Decade fixed effects				YES		
Region fixed effects					YES	
Country fixed effects						YES
Observations	946	800	813	800	800	784
Pseudo R^2						

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A11: Hurdle Model (exponential) of Civil War Battle Deaths

Urban Concentration	1.10*
	(0.57)
Urbanization (%)	-0.00
	(0.01)
X-Polity	-0.05***
	(0.02)
Log(Total Pop.) 1 year lag	0.05
	(0.06)
% of pop. age 0-24	0.03**
	(0.01)
GDP per capita	-0.17
	(0.12)
Discrimination	-0.00
	(0.00)
Mountainous terrain (% log)	0.40***
	(0.05)
Territory (mil sq km)	0.16***
	(0.03)
Conflict spell duration	0.04***
	(0.01)
Selection Stage	
Urban Concentration	1.05***
	(0.20)
Urbanization (%)	0.01***
	(0.00)
X-Polity	0.04***
	(0.01)
Log(Total Pop.) 1 year lag	0.41***
	(0.02)
% of pop. age 0-24	0.05***
	(0.00)
GDP per capita	-0.03
	(0.05)
Discrimination	0.02***
	(0.00)
Mountainous terrain (% log)	0.01
	(0.02)
Territory (mil sq km)	-0.06***
	(0.01)
Sigma	
Observations	4927
R^2	

Standard errors in parentheses

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

Figure A1: Comparing Predicted Probabilities of Onset for Logged and Non-Logged Measure of Urban Concentration