EFFECT OF POLITICAL INSTABILITY ON ECONOMIC DEVELOPMENT

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ABSTRACT. Within the conflict literature there has been much disagreement about the relationship between civil wars, natural resources, and state economic performance. We find that this disagreement results from not accounting for the spatial disaggregation of conflict events within a country. Our hypothesis is that the economic impact of civil conflict is contingent on the conflict's location relative to major economic and labor resources within a state. We use subnational data on the spatial distribution of conflict, resources, and infrastructure to test the long-term impact of domestic conflict on state economic performance. To estimate the spatial distribution of conflict we use data from the PRIO Armed Conflict Location and Event Data. We combine the conflict location data with geospatial data on economic centers, natural resource locations, and infrastructure grids to generate spatial variables that approximate how far each conflict is from centers of interest. We then estimate the effect of the spatial variables on economic performance. By doing so, we are able to resolve tensions in the literature regarding the relationship between economic performance and civil wars.

1. Introduction

Understanding the effects of civil conflict has become an integral part of the study of economic development (Serneels and Verpoorten, 2013). From a theoretical perspective there is little consensus about the impact that conflict has on economic performance. While neoclassical models predict that recovery from conflict should be relatively quick, others such as Barro and Sala-i-Martin (2004) and Sachs (2006) argue that recovery will be extremely slow or even trapped in a low level equilibrium. Empirical analyses have borne out no clear answers either as results on the economic ramifications of civil war vary depending on the cases and time periods included (Kang and Meernik, 2005).

There are also puzzling cases of countries enmeshed in domestic armed conflicts that have seemingly little impact on economic growth. Mexico, for example, has been engaged in a drug war since December 2006 and the number of deaths stemming from this civil conflict have only increased since that time. Yet, even as fatalities due to the drug war reached new peaks, Vikram Pandit of Citigroup cited Mexico in 2012 as being extremely well poised for growth. Others have argued that Mexico is actually beginning to catch up to its regional rival, Brazil (Vardi, 2012). This contrasts greatly with the economic fortunes of other countries in the midst of civil war where economies have plumetted. Collier et al., 2003, for instance, describe civil war as "development in reverse." "The overall economic and political legacy from civil war," they write, "is thus sufficiently adverse that rapid recovery is unlikely." Nevertheless, some countries appear to weather domestic conflict better than others.

To explain this variation in economic performance between countries in the midst of civil war, it is necessary to understand how conflict affects growth. In this paper we argue that to explain variation in economic performance between countries in the midst of civil war, it is necessary to account for the spatial location of the conflict relative to major population and economic centers. Much of the extant literature has focused on

examining the effect of conflict on economic growth at the national level. The implicit assumption of these approaches is that all civil wars are alike, whether they be occurring right outside the capital or on the fringes of the country. We argue that the location of conflicts to major cities and capitals will determine the effect of civil conflict on economic performance, and that conflicts only significantly dampen economic performance if they are proximate to major population and economic centers.

The rest of the paper proceeds as follows. We begin with a review of the literature on the relationship between economic growth and civil war. In section 2, we explain the mechanisms of our hypothesis through the case of Colombia. In section 3, we describe how we construct our measures capturing distance of conflicts between major economic and population centers and lay out our estimation approach. Finally, we discuss the findings of our analysis and end with next steps.

1.1. **Literature Review.**

1.1.1. *Civil War → Economic Performance.* Collier, 1999 identifies five avenues through which civil conflict can impede economic performance: through the *destruction* of resources, through *disruption* of social and economic activity, through *diversion* of resources to the war effort, through *dissaving*, and through *portfolio substition* or divestment. Of course, these mechanisms are related to one another; portfolio substitution may be exacerbated by the destruction of resources or the disruption of socioeconomic activity. Overall, Collier finds that civil wars correspond to a 2.2 percent decrease in annual economic growth. While he suspects that the impact will differ across economic sectors, reliable and disaggregated data was not available to test this hypothesis thoroughly. However, preliminary evidence for this is found in their analysis of the National Accounts data of Uganda before, during, and after its civil war.

Instead of disaggregating economic outcomes, Imai and Weinstein, 2000 instead disaggregate conflict itself. They distinguish between those conflicts that cover larger or smaller

geographic areas and hypothesize that larger conflicts (in terms of geographical spread) will result in worse economic performance. Using a variety of regression techniques, they find that there is a negative correlation between the geographical spread of conflict and the decade average of economic growth for each country. Widespread conflicts, they argue, are more likely to result in damage to infrastructure, divestment from normal state spending, and capital flight. However, in subsequent simulations that account for estimation and fundamental uncertainty, the authors show that these results are uncertain and should be interpreted with caution.

That civil wars negatively impact economic performance, while in line with the "war ruin" hypothesis, runs counter to the "war renewal" hypothesis. Some scholars have argued that wars, international wars in particular, can spur economic development[1]. The prevailing wisdom with regard to civil war, however, is that outcomes of this nature are the exception rather than the rule. In a test of economic and social determinants of post-conflict recovery in the context of civil war, Kang and Meernik, 2005 find that these conflicts can lead, under different conditions, to either rapid or stagnant economic recovery. They conclude that the long-term economic impacts of civil war are largely dependent on post-war governance and foreign assistance. They also find that aggregate estimates of conflict destructiveness are negatively correlated with long-term growth.

Not only do several studies link civil war to domestic economic performance, there is also evidence that civil wars have regional economic consequences. Murdoch and Sandler, 2002b find some evidence that states neighboring civil war states are more likely to experience poor short-term economic performance. They attribute this effect to the disruption of trade and uncertainty about the potential for conflict to spread across the border. In a follow up study, Murdoch and Sandler, 2002a suggest that the spatial dispersion of economic effects from civil conflict differ from region to region.

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[1]For a review of this discussion, see Rasler and Thompson, 1985

1.1.2. *Economic Performance → Civil War.* Much work has been done on the causal effects of economic performance on civil war. Indeed, there is likely an endogenous relationship between economic performance and civil war; each exacerbates the other. While our work here sidesteps this argument by focusing exclusively on observations of civil war, we will briefly review the relevant literature. In a report for the World Bank by Collier et al., 2005, the authors describe what they term the *conflict trap.* States that find themselves in the *conflict trap* are those that have experienced civil war with, are subsequently affected by its economic and social consequences, and are therefore more likely to experience further civil conflict. During civil wars, resources are diverted from productive economic activity to destructive activity. These diverted resources act to stall progress during the conflict and are often used to destroy the infrastructure necessary for growth afterwards. These changes to economic performance, as well as structural changes to the economy itself, make the resurgence of war more likely.

In accordance with this theory, Fearon and Laitin, 2003 argue that poor economic growth is the primary condition conducive for civil war. More specifically, they believe that strong economic growth proxies for robust governance and that states with low GDP growth likely have infrastructures that are unable to implement counter-insurgent policies. In an effort to parse out the causal effect of economic growth shocks on civil war, Miguel, Satyanath, and Sergenti, 2004 instrument income growth with rainfall. They find that rainfall is strongly correlated with income in sub-Saharan Africa, a region also prone to civil conflict in recent decades. Using a two-stage estimation approach, they find that rainfall, their exogenous instrument for income, is positively correlated with the likelihood of civil war.

1.1.3. *Disaggregating Civil Wars.* Recently, scholars have begun to spatially disaggregate civil conflicts. New data allows researchers to focus on how the geography of internal conflict varies. Pierskalla and Hollenbach, 2013 use subnational data on African states

to asses the role cell phone coverage plays in facilitating violent conflict. They theorize that cell phone coverage will enhance the collective action capabilities of rebel groups by improving coordination, communication, and in-group monitoring. A series of empirical tests confirm this hypothesis and indicate that cell phone coverage corresponds to a 50%-300% increase in conflict likelihood for a given area (depending on the estimation strategy used).

Berman and Couttenier, 2013 explore another sub-state determinant of civil conflict. Recognizing that economic shocks are associated with changes to the probability of civil conflict,[2] they seek to determine where conflict will emerge when these shocks occur. Given an external economic shock in a trading partner, Berman and Couttenier expect that states should be at an increased risk of experiencing conflict. However, not all locations within a state will feel the effects equally. Those areas most directly connected to the trading partner will be more likely to experience violent conflict than those areas that are less dependent on the trading partner. They operationalize this measure of dependence, or "remoteness," as distance from a seaport. Indeed, they find that conflicts are more likley to arise near seaports following an economic shock than they are further away.

Buhaug, 2010 argues that the geography of conflict is a function of rebel strength. In particular, strong rebel groups are able to conduct military operations near capital cities while weak ones are not. These weaker groups are only able to survive in areas more distant from capitals. In our analysis, we control for the strength of rebel groups to account for this confound.

2. Theory

We suspect that substate factors will determine the economic impacts of civil conflict. In particular, citizens must be able and willing to participate in commerce. When

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[2]For more, see Miguel, Satyanath, and Sergenti, 2004 and Vargas and Dube, 2013.

major population centers are threatened by violence, residents will be less likely to engage in economically productive activities. Violence near major population centers not only threatens residents directly, but impedes business by threatening trade between the population center and other cities or rural areas.

While this hypothesis may resemble those of Imai and Weinstein, 2000, ours differs in the hypothesized mechanism through which conflict affects economic performance. While we do not disagree that the spread of a conflict could impact state economic prospects, we argue that conflict area is not necessary for adverse economic performance. Conflict area is only one possible proxy for overall destructiveness. However, conflicts with smaller spatial areas can be similarly disruptive if they are centered near (and impede access to) the urban centers described above. In fact, we anticipate measures of proximity rather than spread to be more appropriate to test the hypothesis that conflict obstructs vital economic activity.

Glaeser and Shapiro, 2002 discuss the historic role of cities in warfare and their current role with respect to terrorism. Cities, they argue, once provided safe haven in the midst of conflict; defense of a concentrated population is easier than defense of a dispersed population. However, as the tactics of warfare have shifted over the centuries, the relationship between violent conflict and cities has become more complex. Their dense populations also tempt belligerents and maximize the impact to cost ratio of a given violent action. Finally, the authors point out that warfare destroys transportation infrastructure which can interfere both with commerce and with rebuilding during a conflict.

That armed conflict near and within cities should impact national economic performance is not surprising given the existing body of literature that suggests a close relationship between urban agglomeration and national economies. Quigley, 1998, p. 137 concludes that "large cities have been and will continue to be an important source of economic growth." This echoes the work of Jane Jacobs who argued that cities are the primary motivators of state economies and should be given primacy over the nation state

in economic analysis (Jacobs, 1969; Jacobs, 1984). In the past three decades, economists have followed Jacobs' lead and investigated city-level economic drivers (Lucas, 1988; Ciccone and Hall, 1996; Begg, 1999). One oft-cited mechanism by which cities can provide economic advantages to industry is knowledge spillover. Industries that concentrate in cities benefit from one another through knowledge transfer (Jaffe, Trajtenberg, and Henderson, 1993; Glaeser, 1994; FIrestone, 2010). Empirical estimates of agglomeration effects indicate that a doubling of employment density correspond to a 5% increase in labor productivity (Ciccone and Hall, 1996; Ciccone, 2002).

We extend this line of research by conceptualizing civil wars not as homogeneous national phenomenon, but as a diverse class of violent conflict with properties that distinguish the effects of one conflict from another. Since urban economies are responsible for a disproportionate share of national economic performance, civil conflicts in or near these engines of commerce should likewise exert a disproportionate influence on state performance.

This hypothesis does not seem unknown to armed actors. The guerilla group Fuerzas Armadas Revolucionarios de Colombia (FARC) appears to have internalized these mechanisms. In 1998 and 1999, the organization moved its violent operations from mostly rural areas of Colombia into major cities and near to the capital (Petras and Brescia 2000). This coincided with economic strain caused by the implementation of an IMF/World Bank structural readjustment program. However, the timing was likely not coincidental. FARC advocates a number of political and economic reforms and chooses targets strategically related to these objectives.

Forbes magazine, reporting on peace talks between FARC guerillas and the Colombian government in 2012, wrote:

> FARC's strategy and [beliefs have] always been to make economic pressure on both, multinational companies and the Colombian government.

This has been done by attacking oil and natural gas infrastructure affect-
ing companies such as Pacific Rubiales Energy, Oxy and Ecopetrol. For
non-fuel related international companies with subsidiaries in Colombia,
such as Goodyear, Nestle, Microsoft, Toyota, among others, FARCs modus
operandi was mainly racketeering, kidnappings and extortion. (Flannery
2012)

By targeting economic centers and resource infrastructure, FARC can strain Colombia's
economy, frighten investors, and bolster support from poor and rural workers sensitive to
wealth disparity in the country. Rabasa and Chalk, 2001 identify a three-pronged strategy
pursued by FARC in the 1990s: to consolidate power in coca-growing regions, to conduct
military operations in economically valuable areas, and to isolate major cities from the
rest of the country by limiting communication and travel between them.

While FARC seems to exploit its ability to target areas of economic importance includ-
ing cities, other insurgencies tend to be more peripheral. India, for instance, has faced
challenges by armed groups in its north-east for half a century. However, this area of
India is remote, primarily agrarian, and relatively less populous than other parts of India.
Indeed, for much of this period, India has experienced relatively robust economic growth.
Mexico, now nearly a decade into a violent and complicated conflict between several orga-
nized criminal enterprises and the federal government, has maintained healthy economic
performance. For much of this time, the cartel violence generally occurred in rural areas
along drug trafficking routes and not within major cities. Beittel, 2011 writes in 2011
that "drug trafficking-related killings remain concentrated in a relatively few cities," but
notes that the violence was beginning to expand in geographic range by 2010.

We turn now to an empirical test of our proposition. Using a dataset that includes
510 country-years of civil war from 71 different countries, we seek to determine how the
geography of conflict impacts state economic outcomes.

3. Data and Sample

3.1. **Conflict and City Data.** To measure economic performance we use annual percent change in GDP collected from the World Development Indicators at the World Bank. Unlike much of the extant literature in constructing our dependent variable we focus on year over change instead of a ten year average. This allows us to estimate the direct effect of conflict on economic performance in that year. A ten or five year average approach would hide important variation in our dependent variable that can be explained by the proximity of conflict to economic centers.

To determine the location of conflicts we turn to the PRIO Conflict Site Dataset. This dataset contains geo-referenced armed conflict events from 1989 to 2008. In total this dataset provides us with approximately 800 geo-referenced internal conflict-year cases. To gather information on capital and major cities we turn to yearly editions of The World Almanac from 1989 to 2008. Typically, the Alamanacs list at least three major cities, including the capital, for each country and year from 1989 to 2008.

In figure 1, we show the geographic distribution of conflicts and cities. The centroid locations of conflicts are shown by red dots. Not surprisingly, we can see that in many cases conflict locations are clustered within specific parts of a country. In most cases, this clustering is indicative of the same conflict moving within the geographic boundaries of a country over time. The blue diamonds in 1 denote the locations of major cities as identified in The World Alamanacs from 1989 to 2008. Countries shaded in grey are those for which no armed conflict took place in this period according to the PRIO dataset.
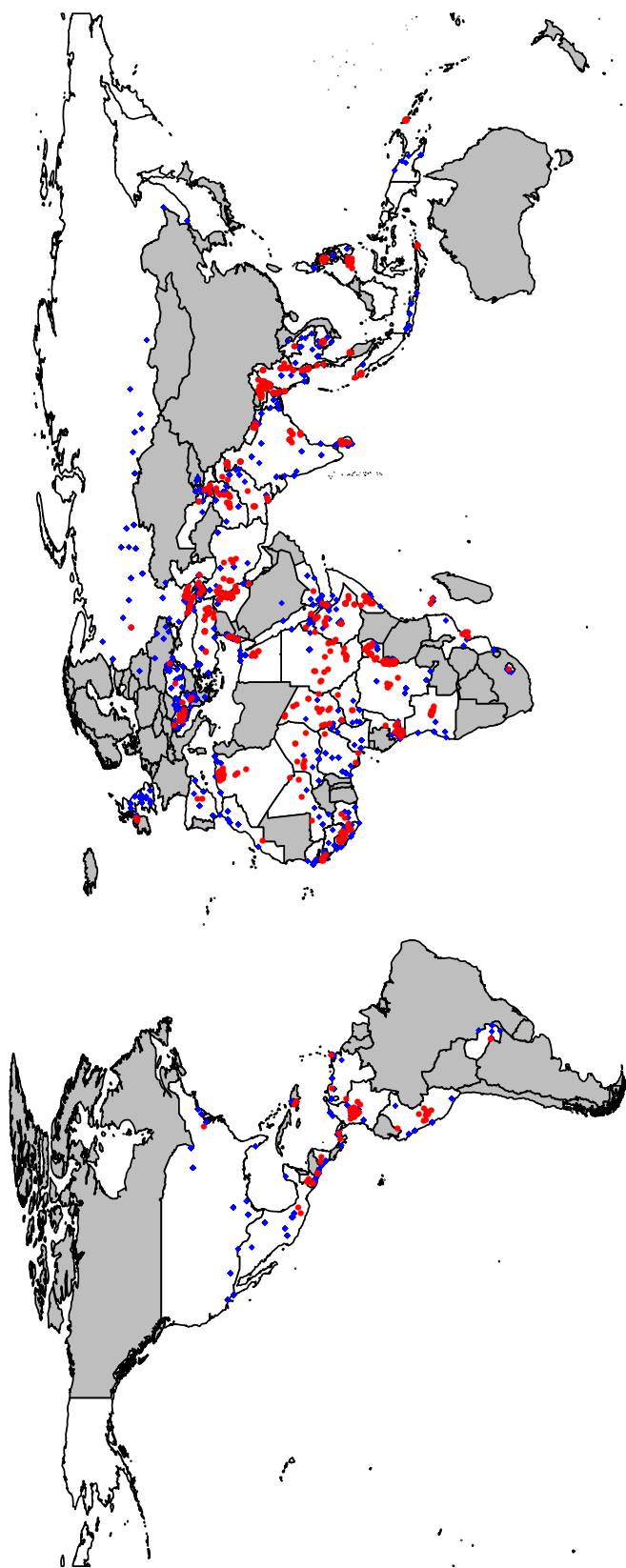
Figure 1. This map illustrates the geographic distribution of all conflicts, according to the PRIO Conflict Site Dataset, and major cities listed in The World Almanac from 1989 to 2008. Countries for which no armed conflicts are recorded are shaded in grey.

Our analysis focuses on exploring variations in economic growth in countries undergoing conflict by the proximity of those conflicts to major cities, thus we restrict our sample to only those countries that are listed as having conflicts in the PRIO dataset. To determine proximity, we calculate the distance in kilometers between the centroid of each of the conflicts with the centroids of city locations. Meaning that for each year we determine the distance between every conflict and every major city within a state. For example, in figure 2 we show the location of armed conflicts in Colombia, dots colored in shades of blue, major cities, depicted as triangles, and the capital, a diamond.[3] For Colombia each of the red dots represents the same conflict but a different year, with earlier years shaded in light blue and later years shaded in dark blue. Thus for every year we made six distance calculations – one for every city.

Our dependent variable is at the country-year and our key independent variable, distance between conflicts and major cities, is at the conflict-country-year level. To deal with this, we aggregate up to the country-year level by calculating the minimum logged distance any conflict is from a major city. Thus if a country faced, for example, four conflicts in one year, the datapoint that we would aggregate up to the country-year level would be for the conflict that was closest to a major city. This obviously is somewhat problematic as we end up discarding the information from the other conflicts. At the same time, we argue that this choice of aggregation is what conforms closest to our theoretical claims about economic activity only being severely disrupted in cases of conflicts being proximate to major cities. From the PRIO dataset we also bring in additional information about that conflict, specifically its intensity, the area of conflict, whether the conflict involves a territorial dispute, and its duration.

Last, we include a number of additional control measures. First, we control for a country's total, logged land area to differentiate between the proximity effects of conflicts

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[3]One armed conflict involving rebel actors and the Colombian government occurred outside of Colombia's borders.
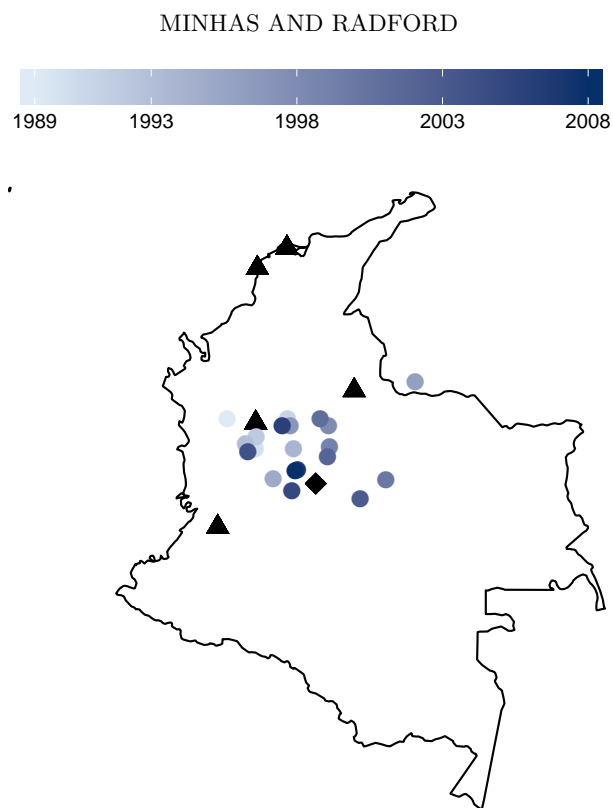
Figure 2. This map illustrates the geographic distribution of all conflicts, according to the PRIO Conflict Site Dataset, and major cities listed in The World Almanac from 1989 to 2008. Countries for which no armed conflicts are recorded are shaded in grey.

within large and small countries. We also control for a couple of macroeconomic variables that could affect year over year changes in GDP, specifically, lagged inflation and whether or not the state is an upper income country, as defined by the World Bank.

Add in descriptors for each of these variables and expectations of their sign.

A drawback with circular conflict zones is that they cover more territory than is actually affected by the conflict, including territories of neighboring countries.4 Due to the nature of armed conflict it may be impossible to gain information on the exact locations of armed encounters, occupied territories, and rebel bases. It might be possible to map the actual conflict-affected area with high precision for some well- reported conflicts, but it would be virtually impossible to code all conflict-years in the dataset coherently in a similar manner. The operationalization of conflict zones is essentially a trade-off between precision and

simplicity, and in most cases a circular conflict zone will give a good indication of the core area of the conflict.

To estimate the model we use random effects clustered on countries. The model we estimate is shown below:

$$\%\Delta Log(GDP_{i,t}) = \beta_1(Ln(Min.\ Conflict\ Dist.)_{i,t})$$

$$+ \ \beta_2(Conflict\ Intensity_{i,t}) \ + \ \beta_3(Conflict\ Type_{i,t})$$

$$+ \ \beta_4(Conflict\ Duration_{i,t}) \ + \ \beta_5(Ln(Conflict\ Area)_{i,t})$$

$$+ \ \beta_6(Upper\ Income_{i,t}) \ + \ \beta_7(Inflation_{i,t-1})$$

$$+ \ \beta_8(Democracy_{i,t-1}) \ + \ \beta_9(World\ GDP\ Growth_t)$$

$$+ \ \mu_{i,t} \ + \ \epsilon_{i,t}$$

4. Results

We depict the results of our model in figure **??**. Most of the findings here are in line with our theoretical expectations. We find that higher levels of conflict intensity are associated with lower levels of GDP growth. The effect of conflict type is positive, indicating that non-territorial disputes are related to lower levels of GDP growth as well. Surprisingly, conflicts that are of a longer duration are, on average, not having a negative effect on GDP growth.

Most importantly, we find strong support for our key hypothesis relating the proximity of a conflict to lower levels of GDP growth. The fact that the logged, minimum conflict distance variable is positive indicates that conflicts closer to major cities have an adverse effect on economic growth.

To assess the substantive effect of the minimum conflict distance variable we conduct a number of simulations. We set up scenarios where we hold all variables to their median
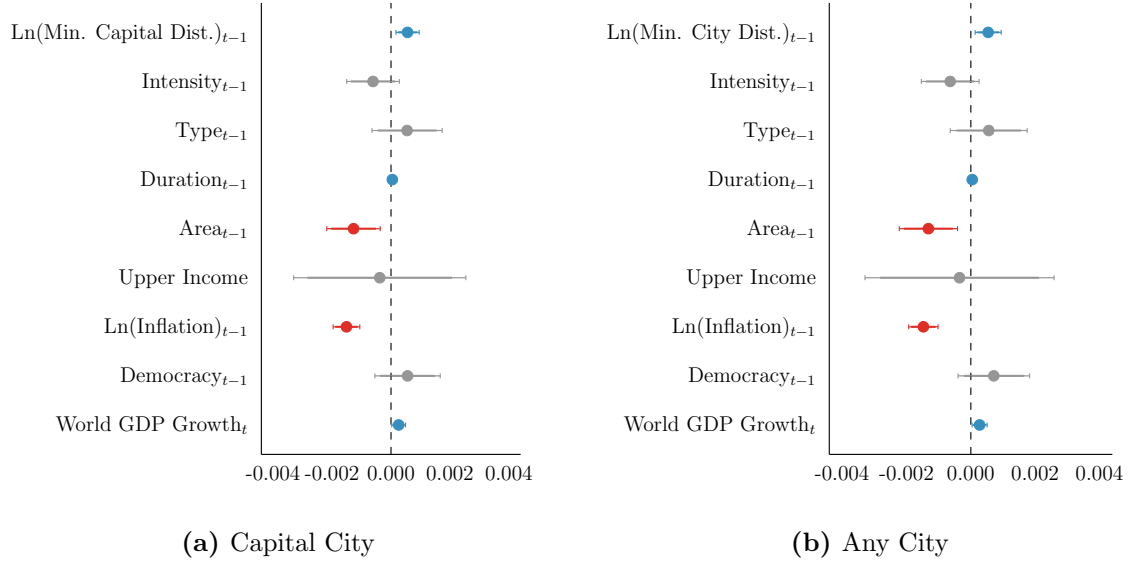
Figure 3. Regression results using conflict distance from capital city on the left, and the chart on the right shows regression results using minimum conflict distance from any major city. Darker colors indicates that the coefficient estimate is significantly different from zero at a 95% CI, while lighter the same for a 90% CI. Grey indicates that the estimate is not significantly different from zero at either of those intervals.

except for the logged, minimum conflict distance, which we range from its minimum to maximum value. Next, we conduct 1,000 random draws from a multivariate normal to obtain distributions for the point estimates of each of the regression coefficients. After obtaining these distributions, we calculate the predicted value of GDP growth based on the conditions set by the scenarios. We plot the results of this analyis in figure 4.

Here we can clearly see that conflicts located farther away from major cities have almost no adverse impact on economic growth. On average, countries for which conflicts are farther away see almost no declines in economic growth and, in fact, are likely to still see positive growth. Where we see more variation, however, is on the effect of conflicts near to major cities. Although on average our model estimates that these more proximate conflicts are associated with negative levels of economic growth our estimate of this effect is highly uncertain. This just indicates to us that more work needs to be done in parsing
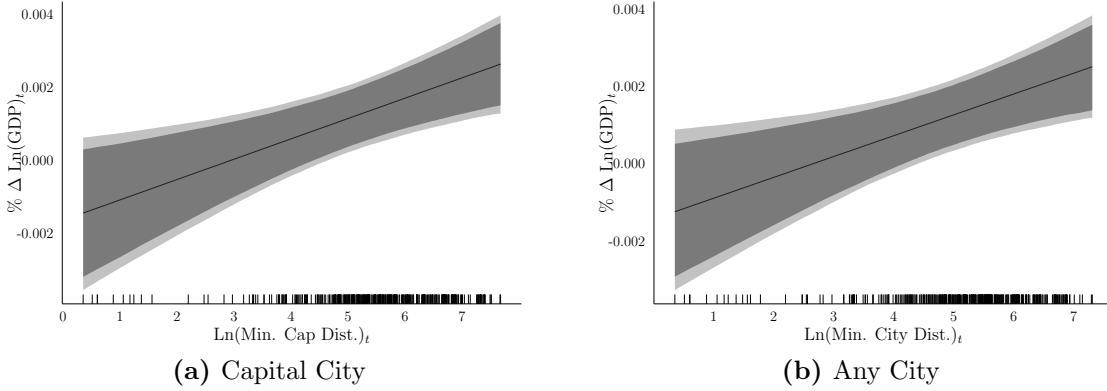
(a) Capital City

(b) Any City

Figure 4. Expected values for GDP growth based on scenarios where all variables are held to their constants but Ln(Min. Conflict Dist.) varies from its minimum to maximum. The 90% interval of each distribution is shaded in dark grey and the 95% in a lighter color.

out possible variation in economic growth levels for those countries that are experiencing conflicts proximate to their major cities. Nonetheless, overall our results are quite in line with our theoretical expectations.

4.1. **Model Performance.** To assess the accuracy and performance of these estimates we employ a simple two-fold cross validation procedure. We use this procedure both to determine the robustness of our coefficient estimates when estimated on different subsamples of our dataset, and to assess how well the results of our model would generalize to an independent dataset. To begin the cross-validation, we split the 653 sanction cases in our dataset into six approximately equal subsets. We then run each model shown in Table **??** six times, where in each iteration we left out one subsample to use as a test set. This allows us to compare the prediction accuracy of each model, thereby helping us to determine the gains from incorporating the reciprocity covariates that are key to our argument.

First, however, we show the results for our reciprocity covariates when we rerun our survival analysis on each of the six folds from the cross-validation. This analysis helps us to understand whether some of the subsets in our dataset follow a different pattern than
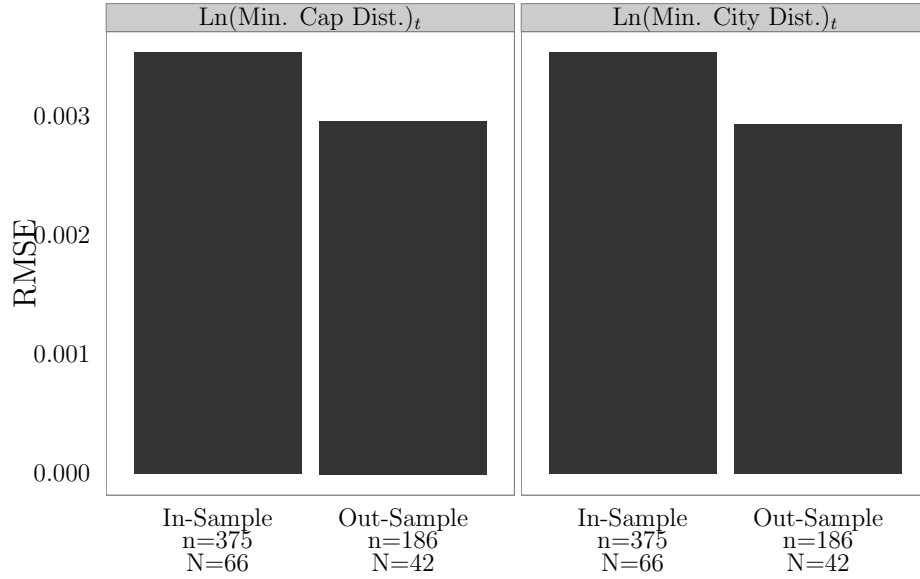
Figure 5. In and out of sample performance.

what is in the broader set.[4] Figure **??** shows that this is not the case for the analysis we present here, the coefficient estimates for compliance and sanction reciprocity remain consistent across each of these subsamples.[5]

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[4]**beck2008time**

[5]The parameter estimates for the other covariates also remain consistent across each of the six folds but we leave them out here due to space constraints.
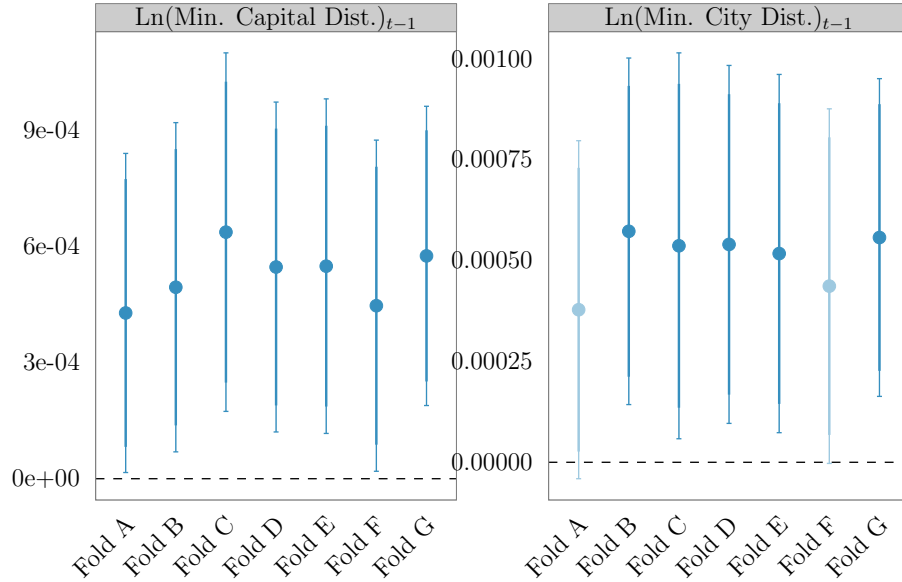
Figure 6. Each row here shows the coefficient estimate of distance from rerunning the model on eight random subsamples within the dataset. All the covariates used in the initial models were included as well.

5. Conclusion

Our project seeks to explain observed discrepencies in the economic impact of civil conflict. Violent intrastate conflicts have occured in one third of countries in just the past several decades. While civil wars seem to primarily afflict developing states, their actual economic impacts are still subject to debate. Some states weather civil conflict for years or even decades while simultaneously prospering economically. Other states see their economies stall and suffer substantial declines in growth. Despite this heterogeneity observed among civil war states, the individual characteristics of civil conflict that lead to disparate outcomes have only recently been subject to academic scrutiny. In this first step of a larger project to distinguish the geography of civil conflict, we hope to have contributed to our understanding of why some civil conflicts impact economic performance more severely than others. We have used a novel approach in the study of civil conflict to distinguish between spatially dissimilar events and shown that this new measure of

interest, the minimum distance between conflict epicenters and major population centers, is a substantive determinant of economic growth. While the proximity of conflict to major cities helps us to better understand how domestic armed conflict produces disparate economic outcomes across countries, one can imagine a number of other hypotheses that derive from this research.

Population centers are critical to economic performance, but still tell only a part of the story. States rely on various natural resources as well as critical infrastructure to prosper. Trade depends on safe and reliable access to ports, airports, and railways. Businesses rely on safe and reliable access to natural resources. And foreign direct investment relies on the investor's perception of state stability. While there is a large literature on natural resources and conflict at the state level, little work has disaggregated this data and explored the micro-relationship between conflict and resources. Future iterations of this paper will explore each of these hypotheses using geospatial data on the economic assets of interest.

Looking beyond aggregate measures of state economic performance, we hope to further explore how the geography of conflict impacts the surrounding region. A growing body of work suggests that civil conflict is, in and of itself, contagious. However, the precise mechanisms that determine contagion risk are still unclear. We propose that looking at the location of conflict within a state will shed light on how conflicts and their economic effects spread across borders. The same logic that applies to the hypotheses presented in this paper applies to neighboring states as well. Resources and population centers that are near the border between a peaceful state and a civil war state may be impacted in the same way that resources and cities within the conflict state are. This may help to explain the disparate regional economic effects of civil war observed by Murdoch and Sandler, 2002a.

References

Barro, Robert J. and Xavier Sala-i-Martin (2004). *Economic Growth*. MIT Press.

Begg, Iain (1999). "Cities and Competitiveness". In: *Urban Studies* 36.5-6, pp. 795–809.

Beittel, J.S. (2011). *Mexicos Drug Trafficking Organizations: Source and Scope of the Rising Violence*. DIANE Publishing. ISBN: 9781437980875. URL: http://books.google.com/books?id=Z38r6HDRDPsC.

Berman, Nicolas and Mathieu Couttenier (2013). "External shocks, internal shots: the geography of civll conflicts". In: *Working Paper*.

Buhaug, Halvard (2010). "Dude, Where's My Conflict?: LSG, Relative Strength, and the Location of Civil War". In: *Conflict Management and Peace Science* 27, p. 107.

Ciccone, Antonio (2002). "Agglomeration effects in Europe". In: *European Economic Review* 46, pp. 213–227.

Ciccone, Antonio and Robert E. Hall (1996). "Productivity and the Density of Economic Activity". In: *The American Economic Review* 86.1, pp. 54–70.

Collier, Paul (1999). "On the Economic Consequences of Civil War". In: *Oxford Economic Papers* 51, pp. 168–183.

Collier, Paul et al. (2003). *Breaking the Conflict Trap: Civil War and Development Policy*. Washington, D.C.: World Bank and Oxford University Press.

Collier, Paul et al. (2005). *Breaking the Conflict Trap: Civil War and Development Policy*. Oxford University Press.

Fearon, James D. and David D. Laitin (2003). "Ethnicity, Insurgency, and Civil War". In: *The American Political Science Review* 97.1, pp. 75–90. ISSN: 00030554.

FIrestone, Simon (2010). "Diverse cities and knowledge spillovers". In: *The Annals of Regional Science* 44.1, pp. 1–20.

Glaeser, Edward and Jesse M. Shapiro (2002). "Cities and Warfare: The Impact of Terrorism on Urban Form". In: *Journal of Urban Economics* 51, pp. 205–224.

Glaeser, Edward L. (1994). "Cities, Information, and Economic Growth". In: *Cityscape*, pp. 9–47.

Imai, Kosuke and Jeremy M. Weinstein (2000). "Measuring the Economic Impact of Civil War". In: *Working Paper*.

Jacobs, Jane (1969). *The Economy of Cities*. Random House.

– (1984). *Cities and the Wealth of Nations: Principles of Economic Life*. Random House.

Jaffe, Adam B., Manuel Trajtenberg, and Rebecca Henderson (1993). "Geographic Localization of Knowledge Spillovers as Evidenced by Patent Citations". In: *The Quarterly Journal of Economics* 108.3, pp. 577–598.

Kang, Seonjou and James Meernik (2005). "Civil War Destruction and the Prospects for Economic Growth". In: *The Journal of Politics* 67.1, pp. 88–109.

Lucas, Robert E. (1988). "On the Mechanics of Economic Development". In: *Journal of Monetary Economics* 22, pp. 2–42.

Miguel, Edward, Shanker Satyanath, and Ernest Sergenti (2004). "Economic Shocks and Civil Conflict: An Instrumental Variables Approach". In: *Journal of Political Economy* 112.4, pp. 725–753.

Murdoch, James C. and Todd Sandler (2002a). "Civil wars and economic growth: A regional comparison". In: *Defence and Peace Economics* 13.6, pp. 451–464.

– (2002b). "Economic Growth, Civil Wars, and Spatial Spillovers". In: *Journal of Conflict Resolution* 46.1, pp. 91–110.

Pierskalla, Jan H. and Florian M. Hollenbach (2013). "Technology and Collective Action: The Effect of Cell Phone Coverage on Political Violence in Africa". In: *American Political Science Review* 107.2, pp. 207–224.

Quigley, John M. (1998). "Urban Diversity and Economic Growth". In: *Journal of Economic Perspectives* 12.2, pp. 127–138.

Rabasa, Angel and Peter Chalk (2001). *Colombia Labyrinth: The Synergy of Drugs and Insurgency and Its Implications for Regional Stability*. Monograph Reports. RAND Corporation.

Rasler, Karen and William R. Thompson (1985). "War and the Economic Growth of Major Powers". In: *American Journal of Political Science* 29.3, pp. 513–538.

Sachs, Jeffrey (2006). *The End of Poverty: Economic Possibilities for Our Time*. Penguin.

Serneels, Pieter and Marijke Verpoorten (2013). "The Impact of Armed Conflict on Economic Performance Evidence from Rwanda". In: *Journal of Conflict Resolution*, p. 0022002713515409.

Vardi, Nathan (2012). "The Mexican Miracle: Despite Drug War, Economy Is Booming". In: *Forbes*.

Vargas, Juan and Oeindrilla Dube (2013). "Commodity price shocks and civil conflict: evidence from Colombia". In: *The review of economic studies* 80.4, pp. 1384–1421.

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