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 theoretical model states 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 use a hierarchical Bayesian model to estimate the effect of the spatial variables on economic performance. By doing so, we are able to resolve some of the tensions in the literature regarding the relationship between economic performance and civil wars.

1 Introduction

Puzzle: Why do some conflicts have immediate impacts on a country's economy while others that fester for decades have little to none.

Negative cases (cases where there was civil war but no major declines in economic growth)

Mexico case: high levels of violence since 2008 but little effect on economic growth. Mexico facing serious internal political stability (civil violence, civil war...) yet this has little effect on economic growth as of yet. When should we expect to see the adverse effects of civil war manifest themselves in terms of lower economic growth?

Cases apart from Mexico:

Pakistan - NWFP India Israel Russia - Chechnya Columbia - FAARC

Positive cases

Syria Sudan Congo Maybe European Countries

To tell the stories from these cases we should have a descriptive paragraph talking about a couple of cases. Then we should construct a chart that shows just two countries one from the negative case bucket and one from the positive case bucket where we have GDP per capita or GDP per capita growth on the Y-Axis and time on the X-axis. We can have separate charts for each country so that we can take into acount varying times in conflict periods. Then have another paragraph describing the plot.

Current literature has focused on examining the effect of conflict on economic growth at the national level. Additionally, much of the literature has focused on the effect of declines in economic growth on the incidence of civil war. We will argue that the analyses presented to date have been conducted at the wrong level. Analyzing the effect of civil conflict on economic growth needs to be done at a subnational level.

Spatial Dist Hypothesis: Location of conflicts to major cities and capitals determine effect of civil conflict on economic performance. thesis: conflicts only significantly dampens economic performance if they are a threat to major population centers. conflicts isolated in sparsely populated territories of the country have little to no effect on the whole.

The rest of the paper proceeds as follows.

1.1 Literature Review

1.1.1 Civil War → Economic Performance

? identifies five avenues through with 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 distruption 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, **?** 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, **?** 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, perhaps unsuprisingly, 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 (2002) 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 (2002) suggest that the spatial dispersion of economic effects from civil conflict differ from region to region.

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 here. In a report for the World Bank by **?**, 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

[1]For a review of this discussion, see **?**

changes to the economy itself, make the resurgence of war more likely.

In accord with this theory, Fearon and Laitin (2003) aruge 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 counterinsurgent policies. In an effort to parse out the causal effect of economic growth shocks on civil war, **?** 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. **?** 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).

? 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

[2] For more, see **?** and **?**.

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.

? 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.

2 Theory

We suspect that substate factors will determine the economic impacts of civil conflict. While lootable resources are often pointed to as sources of funding for rebel groups, these same resources are often critical to state economic performance. The loss of safe access to these resources due to internal conflict should adversly affect a state's economy. Companies that rely on the extraction of resources may find themselves unable to access those resources if armed conflict is proximately located to the resource sites. Therefore, we expect state economic performance to be inversely related to the distance from conflict zones to valuable resources.

Other resources are also valuable to a state's ability to conduct business. In particular, citizens must be able and willing to participate in commerce. When 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. For this same reason, violence near important transporation hubs such as airports and sea ports should threaten business.

Finally, the perception of violence near major cities and resource centers should negatively impact foreign investment. Investors will react negatively to news that violence is occuring near major cities and resources. Investment is generally contingent on the expectation of a stable labor base and, sometimes, reliable access to resources. Conflicts that appear to threaten these, whether they do or not, should correspond to a decrease in foreign investment.[3]

While these hypotheses may resemble those of **?**, ours differs somewhat 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) those resources outlined above. In fact, we feel measures of proximity rather than spread are more appropriate to test the hypothesis that conflict obstucts vital economic activity.

These hypotheses do not seem unknown to armed actors. The guerilla group Fuerzas Armadas Revolucionarios de Colombia (FARC) appears to have to 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 affecting 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)

[3] While we intend to test each of these hypotheses carefully, our project in its current form addresses only the second hypothesis - the effect of conflict distance from city centers on aggregate state economic performance. Future iterations of this paper will also include tests of the remaining hypotheses using foreign investment, economic growth, and domestic investment as dependent variables.

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.

3 Empirics

3.1 Data and Sample

To measure economic performance we use annual percent change in GDP, which we collect from the World Development Indicators at the World Bank. We choose to focus on year over change in GDP because we expect conflicts proximate to major cities to lead to reductions in growth.[4] Unlike much of the extant literature in constructing our dependent variable we focus on year over change instead of a ten year average. We believe this approach to be superior because it allows us to estimate the direct effect of the conflict on economic performance in that year. A ten-year average approach might hide important variation in our dependent variable that can be explained by the proximity of conflict to economic centers.

Our key independent variable on the location of conflicts come from the PRIO Conflict Site Dataset. This dataset contains geo-referenced armed conflict events from 1989 to 2008.[5] A downside of this geo-referenced database is that every conflict-year is assigned a circular conflict zone, which leads to the dataset reporting that the conflict is covering more territory than actually affected. Crafting a more specfic approach to the spread of conflict would, however, eliminate important cases from our analysis. In total this dataset provides us with almost 800 geo-referenced conflict-year cases.

The key theory that we advance here is that the effects of conflict on economic per-

[4] Alternative measures of economic performance would have included changes in FDI inflows or changes in GDP per capita, in using either of these measures are results remain relatively the same.

[5] We only include examine the effect of internal armed conflicts.

formance are conditional on the proximity of those conflicts to major city centers. Thus a crucial part of our work here involved determining major city centers by year. The only data source we found with enough geographical and temporal coverage on major cities was The World Alamanac. To gather data from these textbooks we hired several undergraduate students to identify the major cities listed for each country within a yearly edition of the Almanac from 1989 to 2008. Major cities are classified as those that have relatively large shares of a country's population and/or are economic centers. Typically, the Alamanacs listed at least three major cities for each country and year from 1989 to 2008. After we had gathered a yearly list of major cities by country, we determined the centroid location of each city using Google's Geocoding API.

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.

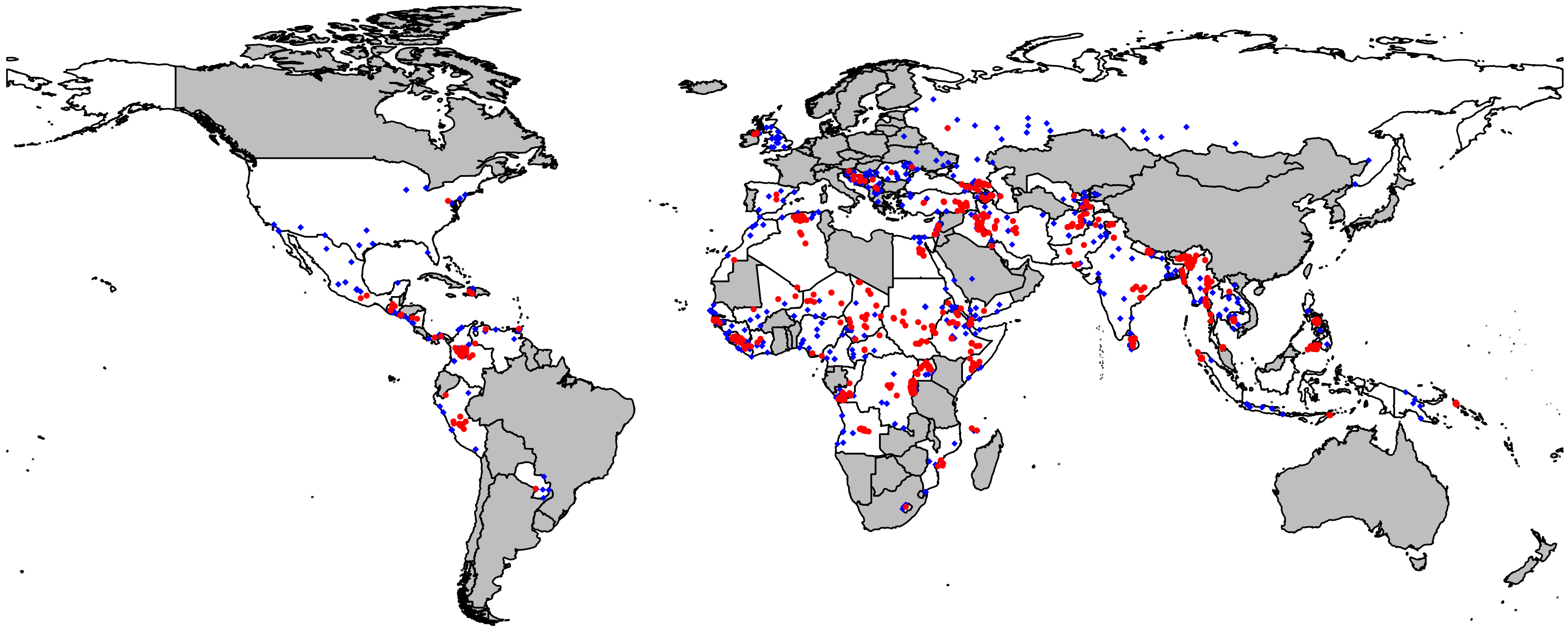

Figure 1: This map illustrates the geographic distribution of all conflicts, according to the PRIO Conflict Site Dataset, and major cities listed in The World Almanac from 1989 to 2008. Countries for which no armed conflicts are recorded are shaded in grey.

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 red, and the major cities therein, blue diamonds.[6] For Colombia each of the red dots represents the same conflict but a different year, with earlier years shaded in light red and later years shaded in dark red. Thus for every year we made six distance calculations – one for every city.

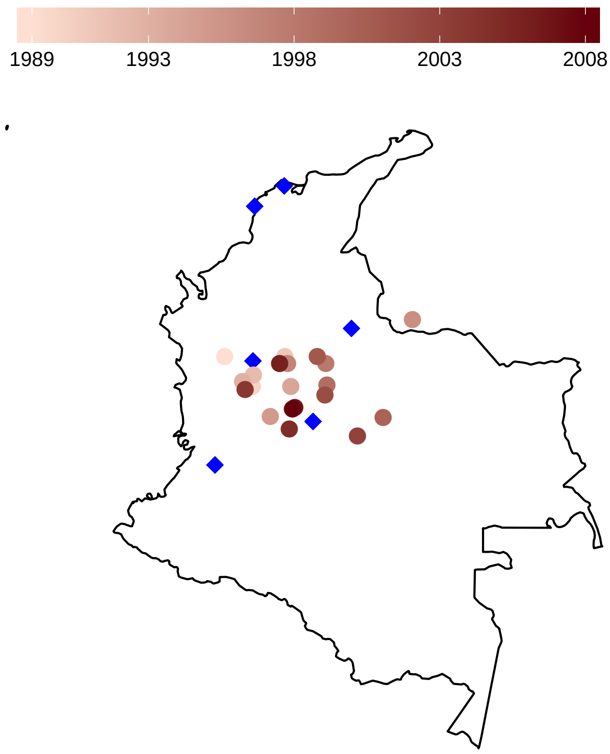

Figure 2: This map illustrates the geographic distribution of all conflicts, according to the PRIO Conflict Site Dataset, and major cities listed in The World Almanac from 1989 to 2008. Countries for which no armed conflicts are recorded are shaded in grey.

A key problem we face in conducting this analysis is reconciling the unit of analysis for our key independent and dependent variables. Our dependent variable is at the country-year and our key independent variable, distance between conflicts and major cities, is at

[6] One armed conflict involving rebel actors and the Colombian government occurred outside of Colombia's borders.

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:

- Conflict intensity
- Ln(Conflict Area)
- Civil Conflict Type (e.g., territory or non-territory dispute)
- Conflict Duration (Years)

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 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.

3.2 Estimation Method

To estimate the model we use random effects clustered on countries and years. Results using a fixed effects estimation approach are similar. The model we estimate is shown below:

$$
\begin{aligned}
\%\Delta GDP_{i,t} = \beta_1(Upper\ Income_{i,t}) \\
&+\ \beta_2(Conflict\ Intensity_t)\ +\ \beta_3(Ln(Conflict\ Area)_t) \\
&+\ \beta_4(Ln(Min.\ Conflict\ Dist.)_t)\ +\ \beta_5(Conflict\ Type_t) \\
&+\ \beta_6(Conflict\ Duration_t)\ +\ \beta_7(Inflation_{t-1}) \\
&+\ \beta_8(Ln(Land\ Area)_t)\ +\ \alpha_i + \gamma_t + \mu_{i,t}
\end{aligned}
$$

3.3 Results

We depict the results of our model in figure 3. 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.

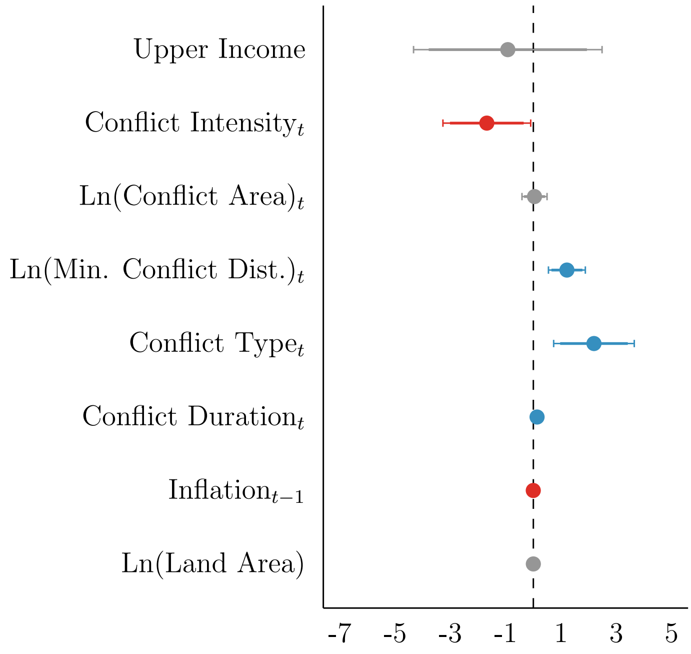

Figure 3: Here we show the random effect regression results on GDP growth. Darker colors indicates that the coefficient estimate is significantly different from zero at a 95% CI, while lighter the same for a 90% CI. Grey indicates that the estimate is not significantly different from zero at either of those intervals.

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 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.

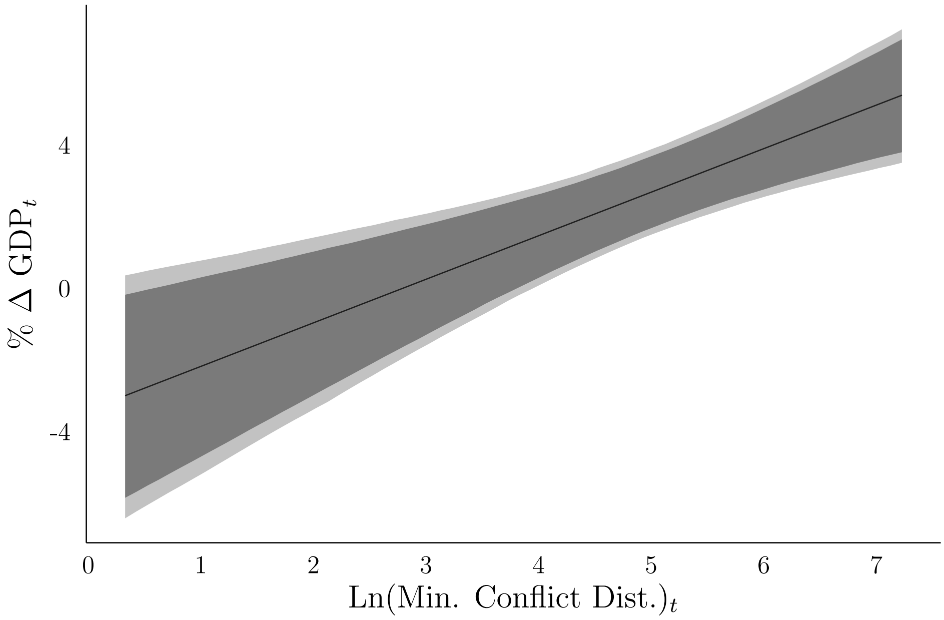

Figure 4: Expected values for GDP growth based on scenarios where all variables are held to their constants but Ln(Min. Conflict Dist.) varies from its minimum to maximum. The 90% interval of each distribution is shaded in dark grey and the 95% in a lighter color.

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 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 Conclusion

Contributed to our understanding of why some civil conflicts impact economic performance more severely than others using a novel spatial approach.

Note that sub-state conflict location may have implications for contagion. Are regional economic consequences of civil war not a function of civil war existence but proximity of the conflict to cities or resources in neighboring states?

References

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