Warlord Alliance Choices

A Local-Level Analysis of Economic Growth

Selim Yaman

Abstract

How does war affect economic growth? Most of the current scholarship investigates this relationship using country-level data, hence missing the local-level variation. In war-zone countries, however, regions significantly vary in terms of their exposure to war and economic destruction. We investigate the effects of civil wars in local-level economic development in the context of Afghanistan from 1993 to 2013. Using night-time light emission data as a proxy for wealth, we find that war does not necessarily affect all cities in the same way. Instead, some regions in Afghanistan even gained from the war if the the region's ruler warlords allied with the central government. Also, when government is itself involved in a conflict, then the economic consequences for that region is worse.

Keywords: warlords, GIS, economic growth, Afghanistan, political economy of conflict

Introduction

The US intervention in Afghanistan in 2001 was promoted as a way to bring democracy to underdeveloped regions. The belief among American policymakers was that if democratic institutions could be established, a decisive victory against Taliban as well as high level economic development could have been achieved (Peceny and Bosin 2011). Yet, this has not been the case in the field. On the contrary, the US found itself in an endless war with no concrete results thus far, eventually resulting in the president Joe Biden calling all troops back as of May 2021. This retrieval was also an implicit acceptance that the initial objectives were not accomplished: The conflict was not lessened, democratic institution-building failed with now even more corruption across the country, and no significant economic development was achieved. The last two decades, in a way, were *lost*. What went wrong?

The literature on war economies mostly focused on combat economies or individual actions of violent groups on the economy. The theoretical discussions on groups' management of the general economy did not account for micro-level variation. Utilizing two detailed panel datasets on a war-torn country's economic development allows us to investigate the political economy of war at micro-level. Unlike the previous literature, this study focuses on the variation between urban and rural places as well as different districts, thanks to the geocoded data sources.

I argue that the effect of war on economic growth is not the same across regions. The variation is due to the characteristics of warlord-central government relations. Those who cooperate with the weak Afghan government, which is supported by the international community, has access to state resources and international aid in return for their services in the fight against other warlords. In contrast, violent conflicts create more significant damage to the economy in districts ruled by non-cooperative warlords. In regions where government was one of the sides in conflicts, economic consequences of war was worse compared to conflicts between other rebel groups.

In terms of methodology, we utilize two sources of data: satellite images for night-time light emissions and conflict data. We then transform the image data into district-level observations using ARCMap software. In terms of analysis, we use first difference estimators and build fixed effects models. Afghan war was specifically chosen because the conflict duration greatly overlaps

with the available data from 1993 to 2013. It also provides a room for researchers because of the variation in the level of violence, region (see Figure 1), and the number of armed groups with different characteristics.

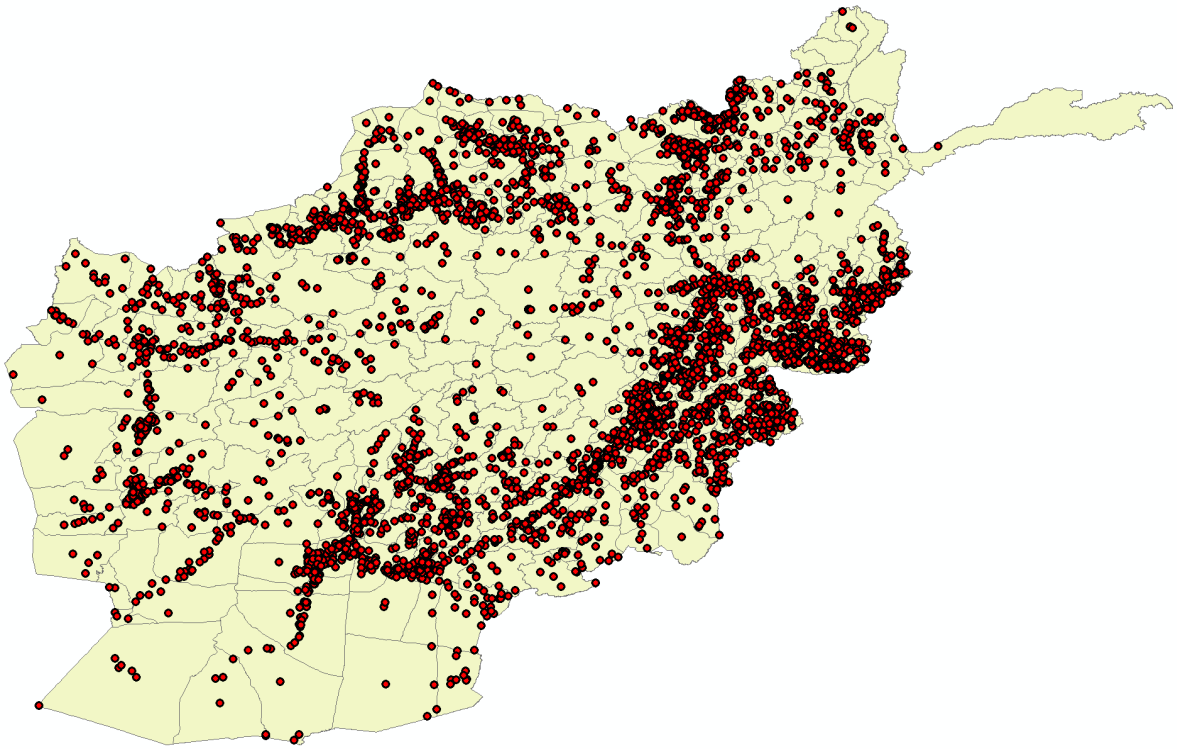


Figure 1: Afghanistan Map with Conflict Events, 1993-2013

Literature Review and Hypotheses

Even after two decades of internationally supported state-building and economic stabilization projects, Afghanistan still remains far from being a stable country with an underdeveloped economy. The country has struggled one type of conflict or another since the turn of the twentieth century. Last couple of decades have witnessed increased violence both around the capital Kabul and in rural areas. In 1992, after the collapse of the communist rule, a new interim government was supposed to be formed by the major groups but negotiations failed and infighting began. The civil war gradually spread across the country with new groups participating every year. Eventually in 1996, the war resulted in Taliban's capture of Kabul. However, the fighting did not end there as the group could

not manage to take control of the whole country. The civil war continued in a different form until the US intervention in 2001. Since then, the conflict still persists with varying degrees of violence. The Figure 1 presents all the conflict events with at least 25 casualties reported by international and local media in Afghanistan from 1993 to 2013. The figure also shows how spread the violence has been across the country.

Economic activities carried out by armed groups may include kidnapping for ransom, looting of resources, extortion, or in the context of Afghanistan, smuggling and drug trade (Goodhand 2004). Recently, a more comprehensive framework has been drawn to understand the sophisticated economies of wars. Non-state actors can gain wealth and status both for themselves and for the population they rule. This, in turn, can create a long-term 'bad' equilibrium of violence where no warlords are willing to make a peace deal (Duffield 1998, Keen 1998). Such actors can tax trade activities, control financial transactions, prohibit or encourage specific economic activities. In this sense, they may act like 'stationary bandits' (Olson 1993) or 'shadow states' that maintain their own economic structure (Reno 1999). In the following paragraphs, we use this literature to draw hypotheses.

Warlords are key to our understanding of the political economy of Afghanistan. The institution of warlords has roots in the country's history. Afghanistan had never completed its nationalization process as the rulers did not have sufficient military power to suppress external aggression (Goodhand 2004). Therefore, instead of an institutionalized, powerful, and central government, the country mostly had "multiple sovereigns including small-scale local chiefs, tribal confederations, bandits or warlords" (Goodhand 2004, 156). Throughout the conflict, these small chiefs, or warlords, had complex relations among themselves and with the central government. Some warlords, in particular, kept strong relations with the government. The government relied on these non-state actors as it did not have strong societal roots (Giustozzi 2004). The cooperation with warlords not only helped the central government to gain some legitimacy, but also helped in the fight against Taliban, an existential threat for the government. In return, state resources were shared with these actors (Pecency and Bosin 2011). However, not all warlords were in good relations with the central government. Hence, while those who were allies of the central government benefited from state resources and international aid, those who were not in the government side fell behind.

Hypothesis 1. *The provinces ruled by warlords with strong relations with the central government did better in economic development.*

Another finding by the literature was that the poor neighborhoods in city suburbs need peaceful conditions for growth whereas business districts can protect themselves from the conflict's detrimental economic effects (Shortland, Christopoulou, and Makatsoris 2013). Also, places where humanitarian agencies are located are likely to achieve significant progress (Hoffman 2004, Polman 2011). Thus, urban areas where both business districts and humanitarian agencies are located should be more resilient to destructiveness of a war, as urban areas are the main sources of extraction for the violent groups. Conflict is mostly a rational economic activity (Berdal, and Keen 1997, Collier 2000). The main source of extraction would be contested among all groups but any group aiming to control the state would refrain damaging business elites, protecting the urban areas.

Hypothesis 2. *Urban places are more protected from the war's detrimental economic effects, compared to rural places.*

Our final hypothesis is regarding the government involvement in a conflict. In terms of military force, central governments are usually better equipped compared to non-state armed groups. It also has the ability to impose economic sanctions regarding that specific city, in the pre- or post-conflict period. Therefore, in conflicts where government forces are involved, the destruction of conflict on the economy is larger.

Hypothesis 3. *If one of the sides of the conflict is government, economic impacts are worse.*

Data and Methodology

The first source of data is from the satellite images for night-time lights emissions provided by the National Oceanic and Atmospheric Administration's (NOAA) National Geophysical Data Center. We use the light emission variable as a proxy for local-level wealth. Normally, official data for economic development on local level is available for most of the EU countries and for the US. However, such data is usually not available in developing countries or even when it is available, the data quality is questionable (Jerven 2013). This is especially the case in war-torn countries where reliable information is scarce, as in Afghanistan.

Night time lights are reliable indicators of economic growth. Economists and political scientists alike increasingly use the night-time lights to estimate electricity usage as well as economic activity in developing countries (Baskaran, Min, and Uppal 2015; Min et al. 2013, Chen, and Nordhaus 2011; Henderson, Storeygard, and Weil 2011; Sutton, Elvidge and Ghosh 2007). Its accuracy even in the micro-level has been found reliable. Weidmann and Schutte (2016) find a correlation of minimum 0.73 (maximum of 0.83) between nighttime light emission and village-level wealth. This is a high correlation even when taking the 'overglow' problem into consideration; i.e. that lights may spill over across cells on the map. The nightlights can be a direct proxy for economic wealth because access to the power grid requires financial capacity. It can also indicate the level of business activities (Henderson et al. 2011). Night-time lights can also shed light into the economic growth level that does not reflect in the official figures as it accounts for informal economy as well. In Afghanistan, for example, opium trade generated across the country was at least $1.3 billion in 2002 (Goodhand 2004). Therefore, in high-density conflict zones satellite images could provide even more reliable data compared to official statistics.

In the satellite images provided by NOAA, there are three types of raster files (high-resolution images), including a cleaned up version with observations containing lights from cities, towns, or other places with *persistent* lighting. In this version, fires are excluded and background noise is cleaned. The dependent variable, *average light density*, measures the light emissions in that district on average throughout a given year, taken at every evening between 8:30pm to 10:30 pm. Its range is from 0 to 63 with higher values reflecting increased light density. Main challenge with this dataset is that in different years, different satellites were used to collect satellite images with each satellite having a slightly different measurement mechanism. This makes year-to-year comparisons more difficult but we overcome this issue by controlling satellite changes.

The second data source is drawn from the geocoded conflict data from UCDP/PRIO Georeferenced Event Dataset (GED) Global version 20.1. It involves violent events with at least 25 deaths reported by international or local media. Since they are geocoded data, we were able to match the locations of conflicts with the administrative boundaries of Afghanistan in the same way we transformed the geocoded light-data into district-level, using ARCMap. The combined data has a total of 7875 observations. Thus, it is a balanced panel data with 375 districts for each year for 21

years. After removing outliers and places where almost no habitants live, the final dataset has 1103 observations.

To understand the effect of conflicts on economic growth, we test three different measurements of conflict as the main independent variable. The first is *the number of total deaths*, which is the UCDP dataset's best estimate for total casualties. The second variable that we use to measure conflict is the *death tolls for each group* (state, rebel, or civilian). We also check the effect of war via *conflict frequency*, which is the number of conflict events with 25 or higher deaths for a district in a given year. These variables were aggregated from the data into district-year observations, except the conflict frequency. For example, if two violent events occurred in a district in a given year, then the sum of total deaths in those two cases is the new aggregated variable for total deaths. For conflict frequency, this number is only two as there have been only two conflict events for that year. In each model, we use one of these three variables to show the consistency of our results regardless of how we measure conflict.

Another variable of interest in our analyses is the type variable: 'Type:State Involvement', 'Type:Non-state', and 'Type: One-sided'. These are not mutually exclusive, with each one representing how many times that the mentioned actor was involved in a given district-year conflict observation. For example, the value for state Involvement for Kabul in 1993 is 113, meaning that the government was involved in 113 conflicts in Kabul in 1993. Table 1 shows the relevant summary statistics for the main variables.

Table 1: Descriptive Statistics

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
Light Emission	1,103	2.243	5.284	0.100	0.234	1.632	39.639
Total Death	1,103	35.147	232.550	0	0	13	6,408
Type:State Involvement	1,103	5.189	13.541	0	0	3	144
Type:Non-state	1,103	0.015	0.183	0	0	0	3
Gov. Deaths	1,103	5.588	30.823	0	0	3	900
Taliban Deaths	1,103	12.073	54.666	0	0	3	1,400
Civilian Deaths	1,103	8.411	151.530	0	0	1	5,008
Type: One-sided	1,103	0.216	0.716	0	0	0	8
Urban	1,103	0.057	0.232	0	0	0	1

In Table 2, we present three models with different independent variables. All three models in

here are estimated by OLS regression using first-differencing estimators with lagged variables. The dependent variable is *change* in night-time light emission, and the main independent variable is lagged difference of conflict (measured in three different variables in each model) *times* urban or *times* alliance. Recall that our main hyptohesis was that the effect of conflict on a region's economy depends on that region's alliance with the central government. With this interaction effect, we can see how the conflict's estimation changes when the warlord is allied with the government compared to how it changes when the warlord is *not* allied. Model 1, for example, can be written as:

$$\Delta lights_{it} = \beta_1 * \Delta deaths_{i,t-1} * alliance_i + \beta_2 * \Delta deaths_{i,t-1} urban_i + v_{it}$$

. where $\Delta lights_{it}$ represents the change of average night-time light emission in district i in year t, $\Delta deaths_{it}$ shows the change in the number of casualties from conflict events in district i in year t, $urban_i$ is a dummy variable (1 if district i is urban), $alliance_i$ is another dummy showing the warlord's alliance with the central government, and finally, v_{it} is the error term.

To control for time-invariant individual unobserved heterogeneity, α_i (part of the composite error term above v_{it}), we also use fixed effect models. Table 3's models are fixed effect models with time-demeaned-data, using different proxies for the independent variable, as we did in Table 2. Here, model 1, for example, could be re-written as:

$$\widetilde{lights}_{it} = \beta_1 \widetilde{TotalDeath}_{it} * Alliance_i + \beta_2 \widetilde{TotalDeath}_{it} * urban_i + \beta_3 \widetilde{type}_{it}$$

where variables with tilde are time-demeaned to model the time-invariant error term in the base model. In all models, standard errors are robust to clustering.

Results and Discussion

VERY IMPORTANT NOTE

In the section below, I use a binary variable called 'alliance' to measure whether a warlord is allied with the central government or not. However, crucially, this is NOT a real variable. It is merely created by myself in a way that could provide significant results in the tables. Because this is

still an unfinished project, I will need to hand-code the regions by its ruler's alliance. Overall, the alliance variable and its mentions in the discussion section are merely for demonstration purposes to show how it could be interpreted if this was the case.

Table 2: First Differencing Estimator Results with Robost Standard Errors

	Change in Night-time Light Emission		
	(1)	(2)	(3)
Change in Total Death	0.001		
	(0.001)		
Change in Government Deaths		0.007	
		(0.007)	
Change in Conflict Frequency			0.004
			(0.006)
Urban	18.671***	18.566***	20.818***
	(1.122)	(1.143)	(2.829)
Change in Taliban Deaths		−0.001	
		(0.003)	
Type: State Involvement	−0.023***	−0.017**	−0.017
	(0.008)	(0.008)	(0.011)
Type:Non-state	2.970**	2.983**	3.476*
	(1.213)	(1.207)	(1.965)
Type:One-sided	0.159	0.236	0.277
	(0.231)	(0.213)	(0.297)
Change in Total Death X Urban	0.002***		
	(0.001)		
Change in Total Death X Alliance	0.017***		
	(0.003)		
Change in Government Death X Urban		0.001	
		(0.008)	
Change in Government Death X Alliance		0.026***	
		(0.008)	
Change in Conflict Frequency X Urban			−0.165***
			(0.062)
Change in Conflict Frequency X Alliance			0.093***
			(0.015)
Satellite Dummies?	Yes	Yes	Yes
Note:			*p<0.1; **p<0.05; ***p<0.01

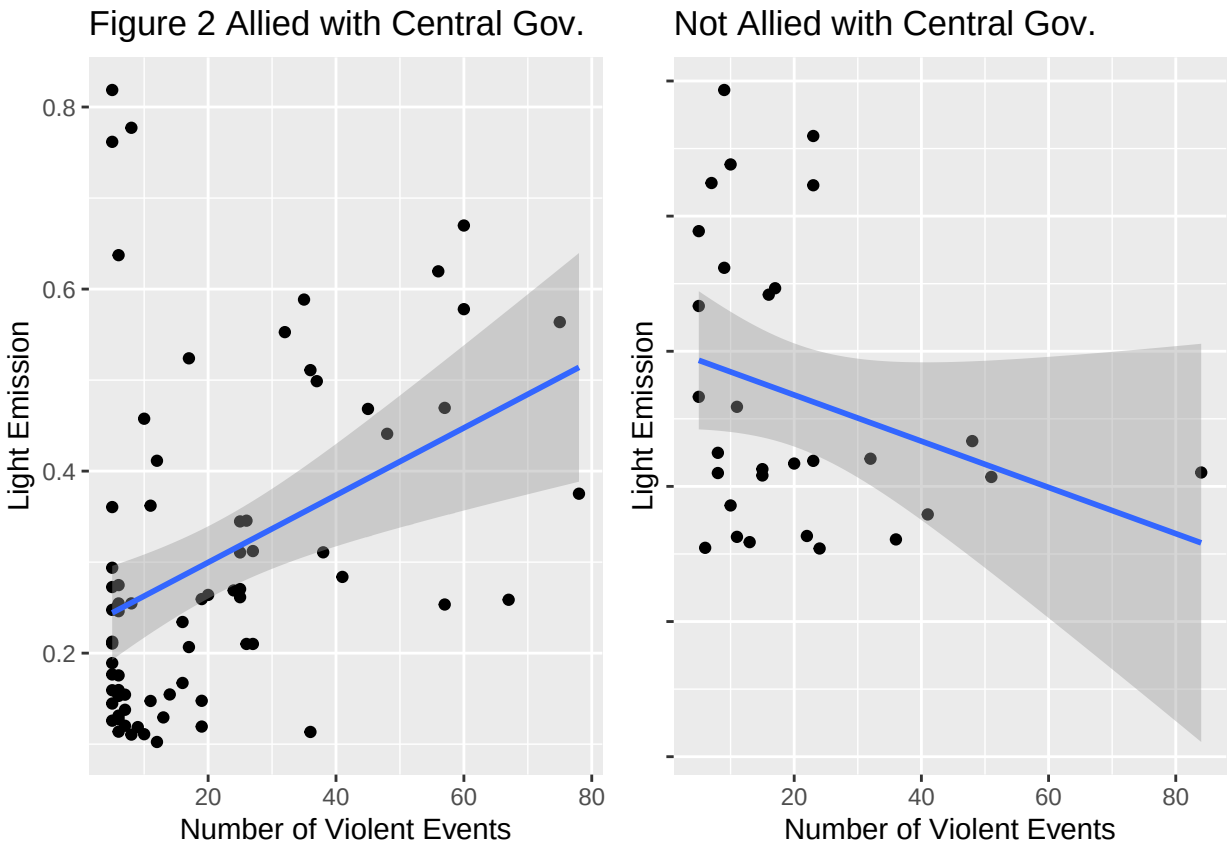
After reviewing several statistical models using different measurement for conflict, the results in the regression tables present evidence for the *warlord alliance* effect and *state involvement*

Table 3: Time-Demeaned Fixed Effect Model Results with Robost Standard Errors

	Average Night-time Light Emission		
	(1)	(2)	(3)
Total Death	−0.0001		
	(0.0005)		
Government Deaths		0.008***	
		(0.002)	
Conflict Frequency			0.393
			(0.380)
Urban	18.242***	18.231***	18.720***
	(1.049)	(0.317)	(0.949)
Taliban Deaths		−0.006	
		(0.004)	
Civillian Deaths		0.006***	
		(0.001)	
Type: State Involvement	−0.018***	−0.021***	−0.418
	(0.006)	(0.007)	(0.388)
Type:Non-state	2.917**	2.856***	2.581**
	(1.226)	(0.386)	(1.239)
Type:One-sided	−0.066	−0.089	
	(0.221)	(0.118)	
Total Death X Urban	0.003***		
	(0.001)		
Total Death X Alliance	0.002*		
	(0.001)		
Taliban Death X Alliance		0.008**	
		(0.004)	
Conflict Frequency X Urban			−0.108**
			(0.048)
Conflict Frequency X Alliance			0.018*
			(0.009)
Satellite Dummies?	Yes	Yes	Yes
Region Dummies?	Yes	Yes	Yes
Observations		1,103	
R^2		0.818	
Adjusted R^2		0.814	
F Statistic		537.537*** (df = 9; 1073)	
Note:			*p<0.1; **p<0.05; ***p<0.01

hypotheses, while there seems to be mixed evidence for *urban* argument. For the first hypothesis, we had argued that the effect of conflict on the economy depends on the districts, and more specifically, on the warlord's alliances. The results support the argument: The effect of war is not the same for all provinces. In Table 2 where we did first-differncing estimation, all of the coefficients for the interaction terms "`Change in Total Death X Alliance`", "`Change in Government Death X Alliance`", and "`Change in Conflict Frequency X Alliance`" are significantly positive. This means that the conflict's effect on night time light emission very much depends on the warlord's alliance. If that spesific region's warlord has a good relationship with the Afghan government, then the conflict makes even a positive contribution to their economy, compared to places where the warlord is not allied with the government. Results in the Table 3 also confirms this hypothesis. Here, same interaction coefficients are positive and significant. Figure 2 also clearly shows that the violent conflicts positively affect economic development in places where the ruler is allied with the government while it has adverse effects if the warlord is not allied.

Also, individual district fixed effects show this variation clearly. In some provinces, the coefficient β reaches up to 25 while in others, it can be as low as -25. Such a large contrast demonstrates underlying differences of districts. Helmand, Sare Pul, Shibkoh, Khah Safed districts, for example, are all under Taliban control and they all suffered greatly from the war in terms of economic development. On the other hand, districts where warlords have close ties with the central government gained from the conflict. Bamyan, Ghazni, Shinkay, Wakhan, Daikundi, and Maruf are examples of these districts. Because of such variation, the general effect is practically almost zero in almost all models with no statistical significance. The reason for this variation, as we argued in the previous chapters, is likely to be in the type of relationship between warlords and central government, as shown with the interaction effects with '`alliance`'. The allied warlords provide security against Taliban in exchange of government benefits.



At this point, one might think of potential reverse causality problems. The relationship between conflict and economy could be the other way around as well: conflicts could be more likely in places where economic development is already weak. Weaker state penetration and scarce security sources could leave a large room for conflict (Buhaug et al. 2011; Rustad et al. 2011). It can also be the opposite: Rich or resource-abundant districts could attract more armed groups (de la Sierra 2020). However, we overcome this problem with lagged variables: The change in the number of deaths or the change in the number of conflicts *in the previous year* is used as the independent variables in the first three models.

For the second hypothesis, our argument was that urban places are less likely to be affected by the detrimental effects of a conflict. Despite the Somali findings on urban-protection (Shortland, Christopoulou, and Makatsoris 2013), we find mixed results in Afghan conflict from 1993 to 2013. Table 1's interaction terms of conflict (change in gov. death, change in total death, and change in conflict freq.) with `urban` give us an unclear picture with some positive and negative coefficients, but all being close to 0. It is a similar situation with time-demeaned models in Table 3. When used

uniteracted, however, all of the coefficients for `urban` are significant and large. This is not surprising given that urban places are expected to grow faster than rural areas. We were investigating if that effect depends on the alliance and we only recieved mixed results so far.

For the last hypothesis, we had proposed that state involvement in conflicts would likely worsen the conflict effect on the economy. As the variable itself is indicating the conflict, we did not need to interact it with another variable. We find support for this hypothesis. Almost all models show that `state involvement` does change the economic outcomes in a negative way compared to conflicts among non-state actors.

Conclusion

This paper utilized a series of satellite images and geocoded data to investigate the local economic performance in Afghanistan, a decades-old war-torn country. The statistical results provide support for the warlord and state involvement hypotheses. The regions controlled by warlords close to the central government did well in economic performance. Our reasoning for this is based on the reciprocal relationship between those districts and the central government. Secondly, places where state is one side of the conflict urban seem to have achieved much worse growth rates compared to places where other groups fight each other. Our argumentation for this is based on the state's stronger destructive effects.

The current literature lacked micro-level analysis, and reliable economic data from conflict zones. This paper tried to fill that gap by using night-time lights as a proxy variable for economic performance. Although the results show significant relationships, there are two caveats to this analysis. The first is that Afghan civil war does provide a suitable ground to study war economy but it has three distinct periods during the period we analyzed throughout the paper: infighting between non-state actors with no clear national authority, the civil war with Taliban in power, and the foreign intervention by the U.S. An extension in which these three periods are differentiated in the analysis might be needed for future research. Secondly, we tried to demonstrate a potentially causal relationship between alliance with the central government and the level of economic destruction. However, this was only showed a hpyothethical variable called `alliance` which did not exist

empirically. As an continuation of this study, we need to either expert-code regions according to their ideological proximity to the central government (or alliance) or at least according to their religious sect/ethnicity as a proxy for the alliance measurement.

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