

## Impacts from Political Conflict and Violence

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**Abstract.** This paper examines the impacts from political conflict and violence in several empirical frameworks. First, I use a generalized least squares to study the relationship between magnitudes of political violence and growth, investment, and standards of living with a sample of 154 countries and through years 1990-2018. Given that there is a concern of reverse correlation, I use ethnic fractionalization as an instrumental variable to run two-stage least squares regressions on the correlation of intrastate acts of violence and growth and investment. Finally, I apply a panel vector-autoregression (VAR) model to study the cross-country economic effects of a shock to the magnitude of political violence in three groups of countries that have had turbulent conflicts in the late 20th century. Results show that higher levels of magnitude of violence lead to lower growth, investment, and standards of living, and these results are even more apparent with the two-stage least squares approach. Findings from the panel VARs show that cross-country effects from a political violence shock are most significant when the countries share characteristics directly related to the cause of the conflict.

*Keywords:* *political conflict, growth, investment, panel VAR*

## Introduction

On December 17th, 2010, a 26-year old Tunisian fruit vendor named Mohamed Bouazizi self-immolated as a protest to the continued abuse by local police officers.<sup>1</sup> His protest sparked a country-wide revolution for human rights and ended the 23-year dictatorship of President Zine el Abidine Ben Ali.<sup>2</sup> In the following months, protests and revolutions that became known as the Arab Spring had spread to Egypt, Libya, Syria, Yemen, and other countries in the Middle East and North Africa (MENA) region, resulting in large scale displacements and only modest amounts of political, social, and economic improvements.<sup>3,4</sup>

While the Arab Spring is a prime example of how civil unrest and its consequences can transmit across the border, it is not the only case in the postwar period. The late 20th century saw a series of political conflicts with varying degrees of magnitude, ranging from nonviolent protests, such as the Prague Spring, to episodes of mass atrocities, like the Rwandan genocide. On impact, such conflicts would intuitively create a decline in the standard of living, productivity, and investment potential. Yet how do these countries recover over time? Would the political instability and economic wellbeing of neighboring countries and trade partners be impacted as well? Do these effects differ depending on the magnitude of the conflict?

My paper aims to identify the effects of political conflicts with differing degrees of magnitude on the macroeconomy and standards of living and how these conflicts can spillover to neighboring countries and major trade partners. My empirical analysis is based on the total acts of violence variable from the Major Episodes of Political Violence database constructed by the Center for Systematic Peace (CSP) as my political conflict indicator. I combine the total acts of violence indicator with United Nation's Human Development Index,

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<sup>1</sup>Worth, Robert F. 2011. "How a Single Match Can Ignite a Revolution". The New York Times, January 21. <https://www.nytimes.com/2011/01/23/weekinreview/23worth.html>

<sup>2</sup>Abouzeid, Rania & Bouzid, Sidi. 2011. "Bouazizi: The Man Who Set Himself and Tunisia on Fire" Time, January 21. <https://web.archive.org/web/20110122064850/http://www.time.com/time/world/article/0,8599,2043557,00.html>

<sup>3</sup>NPR Staff. 2011. "The Arab Spring: A Year of Revolution". NPR, December 17. <https://www.npr.org/2011/12/17/143897126/the-arab-spring-a-year-of-revolution>

<sup>4</sup>Robinson, Kali. 2020. "The Arab Spring at Ten Years: What's the Legacy of the Uprisings?" Council on Foreign Affairs, December 3. <https://www.cfr.org/article/arab-spring-ten-years-whats-legacy-uprisings>

Polity5 Project's Political Regime Characteristics and Transitions, and select macroeconomic indicators (GDP growth and gross fixed capital formation) from the World Bank's World Development Indicators (WDI). From these combined datasets, I proceed to estimate a panel GLS model with 154 countries and 28 years (1990-2018).

To address the issue of endogeneity or reverse causation, I run two-stage least squares regressions with ethnic fractionalization as the instrumental variable. The ethnic fractionalization is often a cause of political instability and conflict, since divisions amongst ethnolinguistic and religious communities lead to competition of power, ideas, and resources. However, it is unclear why it would have a direct causal relationship on macroeconomic variables such as investment and growth, since utility maximizing actors should not be making consumption and investment choices based on polarization of ethnicities. Indeed, existing studies have shown that ethnic fractionalization only indirectly affects growth through direct factors such as political instability, rent-seeking economic policies, and bad institutions.<sup>5</sup>

Moreover, upon examining the conflict list used to compile the Major Episodes of Political Violence database used in this paper, the conflict descriptions largely confirm that a main cause of the intrastate conflicts is disputes amongst ethnic groups rather than discontent with the economic state of the country.

With a panel VAR model that admits cross-sectional heterogeneity and dynamic interdependencies, I can analyze the transmission of idiosyncratic shocks across countries and time, which is particularly useful in an increasingly global economy where the effects of shocks may transmit to other economies in different magnitudes. Using the total acts of violence variable as the political instability indicator for the panel VARs allows me to look at how a shock to the magnitude would affect the magnitudes of political instability, output, and investment of other countries in the region.

Estimates for panel GLS regressions show political violence has a significant negative correlation with economic growth, investment, and HDI. The negative correlation also holds when using a two-stage least squares approach with ethnic fractionalization as the instru-

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<sup>5</sup>Supporting literature will be revisited in detail in the Methodology and Data section.

mental variable. Results from the impulse response functions looking at effects of political violence shocks to the domestic economy and neighboring economies imply that, while generally an increase in magnitude of political violence has adverse effects on the economies, the context of the conflict must be taken into consideration and results cannot be generalized for all countries and regions.

### *Literature*

This paper builds on past literature related to the effect of political instability on the economy as well as the macroeconomic impacts of political conflict shocks.

The literature related to political instability has conceptualized political instability in several ways, but on the whole view political instability as being harmful for the economy. Barro (1991) uses number of revolutions and coups, as well as political assassinations in a year to conclude that each of these variables lead to lower growth and investment ratios. Alesina et. al. (1996) measure political instability using the propensity of government change, and find that economic growth and instability are jointly determined. Higher instability, particularly in the sense of unconstitutional government change, is a detriment to economic growth, but low economic growth also increases the propensity of coup d'états.

Alesina & Perotti (1996) use a socio-political instability index that takes into account assassinations, coups, domestic mass violence, finding that instability reduces growth mainly through the channel of lowering investment. Rodrik (1990) also finds that political uncertainty regarding the success of regime reform tends to discourage private investment, which is particularly necessary in developing countries. Other channels through which political instability affect economic growth is in decreasing total factor productivity growth and physical and human capital accumulation (Aisen & Veiga 2013). In short, political instability has unfavorable effects on economic growth, either directly or through necessary channels to growth.

Other forms of political instability that have adverse effects on the economy include regime instability, government repression, and political polarization (Chen & Feng 1996). More recently, Jong-a-Pin (2009) uses factor analysis to study the multidimensionality in political instability, finding that the the dimension of instability of the political regime,

rather than the instability within the political regime, has a direct causal relationship to low economic growth.

My paper is more in line with literature that focuses on the effects of political conflicts and violence rather than defining measurements of political instability. I believe it is important to study how varying magnitudes of political conflict and violence, which is often a consequence of institutional instability, can impact not only a country's economy but also the standard of living.

Literature that focuses on the firm-level business cycle effects within the U.S. and finds that increase political risk lowers productivity, private investment, and employment, which in turn damages the macroeconomy, (Hassan et al. 2019, Altig et al. 2019, Hoke 2019, Caldara & Iacoviello 2019). However, my paper departs from this literature since I focus on aggregate variables in a number of countries rather than firm-level data in the U.S.

My idea most closely mirrors Kent & Phan's (2013) working paper that uses a panel VAR with political disruptions, defined as campaigns with the objective of removing existing dictators or military juntas in 157 countries, and the estimated probability of these disruptions. They are able to show that such disruptions do have statistically significant impact on business cycles and countries with higher probability to disruptions are affected even more by the uncertainty factor.

However, there is a gap in existing literature that does not examine the country specific effects from political risk shocks. Moreover, to my knowledge, prior literature has not studied the cross-country effects to a political risk shock, which is crucial in an increasingly globalized world.

The rest of the paper is organized as follows: In section 2, I describe the methodology used in obtaining the necessary results for my research questions and I walk through the data used in the paper. Section 3 presents the results of the GLS fixed effects estimations, the two-stage least square estimations, and the panel VAR impulse response functions.

## Methodology and Data

### *Methodology*

**GLS estimation.** I use a generalized least squares (GLS) with fixed effects model to estimate the effects of differing magnitudes of political conflicts on the macroeconomy and standards of living. With a panel of 154 countries and 28 years (1990-2018), I use the following specification to implement the regressions:

$$Y_{it} = TAV_{it}\beta_1 + X'_{it}\beta + u_{it} \quad i = 1, \dots, N \quad t = 1, \dots, T \quad (1)$$

Here, TAV represents the total acts of violence variable, which is my main conflict indicator.  $i$  denotes the country unit, where  $N = 154$  and  $t$  is the year.  $Y_{it}$  is the macroeconomic and standard of living variable (i.e. GDP growth, investment, and the Human Development Index), and  $X_{it}$  is the vector of control variables.

Since total acts of violence includes summed magnitudes of both intrastate and interstate conflicts, I estimate the following models to see whether intrastate or interstate conflicts have a greater effect on the economy and standards of living:

$$Y_{it} = INTRA_{it}\beta_1 + X'_{it}\beta + u_{it} \quad i = 1, \dots, N \quad t = 1, \dots, T \quad (2)$$

$$Y_{it} = INTER_{it}\beta_1 + X'_{it}\beta + u_{it} \quad i = 1, \dots, N \quad t = 1, \dots, T \quad (3)$$

The intrastate conflict variable is represented by INTRA, which includes the magnitudes of all domestic conflicts involving ethnic and civil violence and warfare in a given year. The interstate variable, INTER, is the magnitude of all episodes of international violence and warfare involving the country in a given year. The other variables in the above equations are the same as in (1).

**Instrumental Variable.** Undoubtedly, there are concerns of endogeneity between acts of violence and the economy and standards of living, since economic downturns are a primary cause of conflict, particularly domestic conflict. (Londregan & Poole 1990) I use an instrumental variable, ethnic fractionalization, and implement a two-stage least squares approach

in order to address this concern.

The rationale behind using ethnic fractionalization as an instrumental variable for political conflict stems from the fact that there is substantial evidence from existing literature suggesting a correlation between ethnic fractionalization and political instability, but no strong evidence of a causal relationship between ethnic fractionalization and growth or investment. For example, Alesina et al. (2003) find that, although ethnic and linguistic fractionalization does have a negative impact on economic growth, welfare, and institutions, it is hard to know the extent of explanatory or causal power between the relationship. Alesina & Ferrara (2005) look at the link between fractionalization and public good provisions as well as productivity. They conclude that even though there is evidence to support lower public good provisions given higher fractionalization, the impact on productivity is much less clear, where in certain countries, higher fractionalization may actually be positive for growth and productivity.

Karnane & Quinn (2019) suggests a direct link between ethnic fractionalization and political instability, but no significant direct correlation between ethnic fractionalization and economic growth. Annett (2001) find evidence supporting a causal link between ethnic fractionalization and political instability, where higher fractionalization leads to more societal conflict, which then leads to increased government consumption in attempt to dampen the political instability. Hence, in addition to the robustness tests I conduct for my instrumental variable (described below), empirical evidence seems to confirm that ethnic fractionalization is a suitable for my two-stage least squares estimation.

The specification for estimating the two-stage least squares follows:

$$\widehat{TAV}_{it} = EFI_{it}\gamma + v_{it} \quad i = 1, \dots, N \quad t = 1, \dots, T \quad (4)$$

$$Y_{it} = \widehat{TAV}_{it}\beta_1 + X'_{it}\beta + u_{it} \quad i = 1, \dots, N \quad t = 1, \dots, T \quad (5)$$

where in the first stage, I use the ethnic fractionalization index ( $EFI$ ), to predict  $TAV$ , and then use the estimated values of  $TAV$  as my explanatory variable in the second stage.  $Y_{it}$  here is the two economic variables gross fixed capital formation (as % of GDP) and real

GDP per capita growth. Since the data for ethnic fractionalization ends in 2013, I estimate the two stage least squares with a panel of 144 countries and years 1980-2013.

I use the same specification and instrumental variable to obtain predicted values of intrastate acts of conflict, and use the predicted values in estimating the correlation between intrastate conflicts and the same two economic variables as stated above. I do not perform two-stage least squares regressions on the effects of interstate acts of violence, since ethnic fractionalization is related to domestic conflicts and institutions and thus should not impact state decisions on engaging in international warfare and violence.

To test whether my instrument is valid and an improvement upon the ordinary least squares method, I first use a Hausman test. The p-value from the Hausman test statistic is 0.000, providing strong support for using the two-stage least squares over OLS. Additionally, I compute the Sargan test statistic for the over-identification test in order to see if my instrumental variable is appropriate. The resulting p-value is 0.9999, which does not allow me to reject the null hypothesis that the ethnic fractionalization index is exogenous.

**Panel VARs.** In order to find if shocks to political instability in one country are propagated to neighboring countries or major trade partners, I use a panel vector-autoregression (VAR) to add a cross-sub-sectional structure to the simple VAR model. As per Canova & Ciccarelli (2013), the panel VAR will be represented as

$$Y_{it} = A_{0i}(t) + A_i(l)Y_{t-1} + u_{it} \quad i = 1, \dots, N \quad t = 1, \dots, T \quad (6)$$

$$u_{it} \sim iid(0, \Sigma_u)$$

where  $i$  denotes the country and  $t$  is the year. The other elements of the representation have the same structure as basic VAR models:  $y_{it}$  is the vector of  $G$  endogenous variables for each country,  $A_i(l)$  is a polynomial in the lag operator,  $A_{0i}(t)$  groups all the deterministic components of the data, and  $u_{it}$  is a vector of random disturbances with dimension  $G \times 1$ . Since I am looking at the variables TAV, growth, and gross fixed capital formation, it follows that  $G = 3$ .



In terms of observing how shocks to conflict magnitudes will affect the country's own economy as well as propagating to other countries, I run the panel VARs with countries grouped based on geographical region. Intuitively, the countries most likely to be affected by a shock to political conflict will be countries sharing a border or even in the same geopolitical region as the conflict origin. Hence, I perform panel VARs on the following groups of countries:

1) Rwanda, Burundi, Uganda.

1) Iraq, Iran, Turkey.

3) Colombia, Ecuador, Peru.

These groups of countries were chosen based on two main factors: 1) frequency and magnitude of engaging in political conflict in the late 20th century and 2) availability of data. Group 1 is chosen because of the 1994 Rwandan Genocide, which was one of the most severe cases of ethnic cleansing in the 1990s. Group 2 is selected based the turbulent 1990s and 2000s that has plagued Iraq, including conflicts such as the Gulf War in 1990, ethnic warfare involving the Kurds in 1996, and the Iraq War from 2003 to 2010. Group 3 looks at the the effects from political violence related to Colombia's ongoing drug trafficking.

### *Data*

To estimate the GLS regressions, I use the total acts of violence variable from the Major Episodes of Political Violence (MEPV) database as the political instability variable. Total acts of violence is based on total acts of interstate and intrastate conflict, where each interstate or intrastate conflict is scored on a magnitude between 1 (lowest) to 10 (highest). Hence, if there are multiple conflicts in a year, the magnitudes of those conflicts are summed to create total acts of violence. If there are no conflicts, then total acts of violence would naturally be coded as zero.

The magnitude score of each conflict is determined by a wide array of factors including: number of fatalities, destruction of resources and infrastructure, population dislocation, and levels of psychological trauma. The minimum number of "directly-related deaths" to

qualify as a level 1 conflict is 500, and the conflict is ongoing if there are at least 100 deaths per year. In total, MEPV dataset includes 328 episodes of armed conflict over the years 1946-2018.

Given that political regime characteristics should be taken into consideration when looking at effects of political instability, I will be including the polity2 score from the Polity5 dataset created by CSP. The polity2 score ranges from -10 to 10, where -10 is strongly autocratic, +10 is strongly democratic, and zero is anarchy. Regime transitional periods are prorated across the span of the transition.

To measure standards of living, I chose to use the Human Development Index (HDI), which scores a country's standard of living on a scale of 0 (lowest standard) to 1 (highest standard). The index assesses three dimensions of quality of life: health (using life expectancy at birth), education (expected and mean years of schooling), and GNI per capita (PPP \$). The HDI index is available for years 1990-2020. I multiply the HDI by 100 so that it is scaled as 0 to 100 instead for clearer results.

As the instrumental variable, I use the ethnic fractionalization index from Historical Index of Ethnic Fractionalization dataset (HIEF), which measures the probability that two randomly drawn individuals from a country will be from different ethnic backgrounds. A value of 0 indicates that all individuals in the country belong to the same ethnic group whereas 1 implies every individual belongs to his/her own ethnic group. I scale up this index by 100 so that the regression coefficients are more clear. Compared to existing indices on ethnic fractionalization, this new index focuses less on the ethnic polarization of a country. Rather, it aims to look at how ethnic fractionalization within a country changes over time.

Lastly, the macroeconomic variables, including gross fixed capital formation, real GDP per capita growth, inflation, consumption, foreign direct investment, exports and imports, come from the World Bank's World Development Indicators. After consolidating all the variables mentioned, I obtain a panel of 154 countries over the years 1990-2018.

## Results

I will first present my results from the GLS fixed effects estimations, followed by two-stage least squares results, and then finally the panel VAR estimates looking at the individual and cross country effects of a shock to political conflict and violence.

### *GLS estimation results*

Table 1 reports the estimates of the effect from total acts of violence, interstate and intrastate acts of violence, on real GDP per capita (% change). I chose to look at all three categories of acts of violence since total acts of violence includes both interstate and intrastate acts of violence, so it could include events with high magnitudes of conflict that are taking place in another country with little effects on the domestic country.

After controlling for durability of government, foreign direct investment, inflation, polity score, and gross fixed capital formation, I see that a unit increase in the magnitude of total, interstate, and intrastate violence all have detrimental effects on economic growth. Real GDP per capita growth decreases by 0.414 percent with a unit increase in total acts of violence, and decreases by 0.355 with a unit increase in intrastate acts of violence. However, there seems to be a higher negative impact on real GDP per capita growth, where a one unit increase in magnitude of interstate war now decreases real GDP per capita growth by 1.017 percent.

Table 2 presents the results from estimating the effects of total acts of violence, interstate acts of violence, and intrastate acts of violence, on gross fixed capital formation (% of GDP).

Comparing the effects from the three different acts of violence measures, gross fixed capital formation decreases by 0.762 percent from a unit increase in total acts of violence, and by 0.819 percent from intrastate acts of violence. When only looking at the correlation between interstate violence on gross fixed capital formation, the negative effect of 0.0302 percent is no longer robust. This result suggest that when it comes to a country's investment levels, the consequences from political conflict stems from civil violence, while international warfare has no significant impact.

Table 3 focuses on the effects of political violence on standards of living. Higher magnitudes of total acts of violence and intrastate acts of violence show similar results, since the coefficient shows a 1.046 decrease in HDI from a unit increase in total acts of violence, and a 1.028 decrease from intrastate acts of violence. The coefficient on HDI still shows a significant decrease of 0.959 with every unit increase in magnitude of interstate violence, although this decrease is less compared to the other two measures of violence.

**Table 1.** Acts of Violence and Growth

	(1)	(2)	(3)
	Real GDP per capita	Real GDP per capita	Real GDP per capita
Total Acts of Violence	-0.414*** (0.0846)		
Interstate Acts of Violence		-1.017*** (0.292)	
Intrastate Acts of Violence			-0.355*** (0.0880)
Durability of Government	-0.00634 (0.00779)	-0.00528 (0.00780)	-0.00572 (0.00780)
Foreign Direct Investment	0.0666*** (0.0126)	0.0663*** (0.0126)	0.0666*** (0.0126)
Inflation	-0.000950*** (0.000148)	-0.000907*** (0.000148)	-0.000955*** (0.000148)
Polity Score	0.0900** (0.0288)	0.108*** (0.0287)	0.0925** (0.0289)
Gross fixed capital formation	0.0986*** (0.0141)	0.107*** (0.0141)	0.0999*** (0.0142)
Constant	-0.288 (0.398)	-0.793* (0.383)	-0.386 (0.399)
Observations	3792	3792	3792

Standard errors in parentheses

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ 

NOTE. Results estimated from GLS fixed effects using a sample of 154 countries between years 1990-2018.

**Table 2.** Acts of Violence and Investment

	(1) Gross fixed capital formation	(2) Gross fixed capital formation	(3) Gross fixed capital formation
Total Acts of Violence	-0.762*** (0.0983)		
Interstate Acts of Violence		-0.0302 (0.345)	
Intrastate Acts of Violence			-0.819*** (0.102)
Polity Score	0.107** (0.0337)	0.142*** (0.0337)	0.104** (0.0338)
Durability of Government	0.0278** (0.00912)	0.0320*** (0.00918)	0.0282** (0.00911)
Foreign Direct Investment	0.177*** (0.0144)	0.180*** (0.0145)	0.177*** (0.0144)
Inflation	-0.000411* (0.000173)	-0.000378* (0.000175)	-0.000431* (0.000173)
Constant	21.15*** (0.308)	20.45*** (0.298)	21.16*** (0.308)
Observations	3794	3794	3794

Standard errors in parentheses

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ 

NOTE. Results estimated from GLS fixed effects using a sample of 154 countries between years 1990-2018.

**Table 3.** Acts of Violence and HDI

	(1) HDI	(2) HDI	(3) HDI
Total Acts of Violence	-1.046*** (0.0766)		
Interstate Acts of Violence		-0.959** (0.309)	
Intrastate Acts of Violence			-1.028*** (0.0784)
Polity Score	0.470*** (0.0266)	0.527*** (0.0269)	0.472*** (0.0267)
Durability of Government	0.234*** (0.00743)	0.238*** (0.00761)	0.235*** (0.00745)
Foreign Direct Investment	0.0348** (0.0109)	0.0337** (0.0112)	0.0345** (0.0109)
Inflation	-0.000497*** (0.000134)	-0.000401** (0.000137)	-0.000514*** (0.000134)
Real GDP per capita	-0.0177 (0.0148)	-0.00469 (0.0152)	-0.0156 (0.0149)
Gross fixed capital formation	-0.0113 (0.0211)	-0.00469 (0.0216)	-0.00856 (0.0211)
Exports	-0.0747*** (0.0201)	-0.0852*** (0.0206)	-0.0743*** (0.0201)
Imports	0.158*** (0.0191)	0.165*** (0.0196)	0.157*** (0.0192)
Consumption	-0.164*** (0.0183)	-0.177*** (0.0188)	-0.164*** (0.0184)
Constant	67.92*** (1.821)	68.01*** (1.866)	67.83*** (1.825)
Observations	3667	3667	3667

Standard errors in parentheses

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ 

NOTE. Results estimated from GLS fixed effects using a sample of 154 countries between years 1990-2018.

*IV estimation results*

Table 4 displays the results from the two-stage least squares regressions with the ethnic fractionalization index as the instrumental variable.

As Table 4 demonstrates, the effects on gross fixed capital formation from both total acts of violence and intrastate acts of violence are quite substantial. A unit increase in magnitude of total acts of violence and intrastate acts of violence decreases gross fixed capital formation by 3.547 percent and 3.607 percent, respectively. Furthermore, the effect on real GDP per capita from the predicted values of total acts of violence and intrastate acts of violence are -1.509 percent and -1.512 percent, respectively.

Compared to GLS estimates from Table 1 and Table 2, the two-stage least squares results suggest that after accounting for the possibility of endogeneity, the adverse effects of political violence on the economy are even more pronounced.



**Table 4.** Acts of Violence and the Economy

	(1) Gross fixed capital formation	(2) Real GDP per capita	(3) Gross fixed capital formation	(4) Real GDP per capita
Total Acts of Violence	-3.547*** (0.554)	-1.509*** (0.361)		
Intrastate Acts of Violence			-3.607*** (0.547)	-1.512*** (0.356)
Polity Score	-0.187*** (0.0266)	-0.0115 (0.0195)	-0.176*** (0.0249)	-0.00112 (0.0175)
Durability of Government	0.0152** (0.00531)	-0.00427 (0.00320)	0.0127* (0.00533)	-0.00618 (0.00331)
Foreign Direct Investment	0.162*** (0.0302)	0.103*** (0.0193)	0.171*** (0.0287)	0.109*** (0.0183)
Inflation	-0.000113 (0.000259)	-0.000836*** (0.000170)	-0.000160 (0.000251)	-0.000855*** (0.000167)
Constant	24.35*** (0.553)	2.709*** (0.363)	24.20*** (0.516)	2.611*** (0.336)
Observations	3877	4250	3877	4250

Standard errors in parentheses

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ 

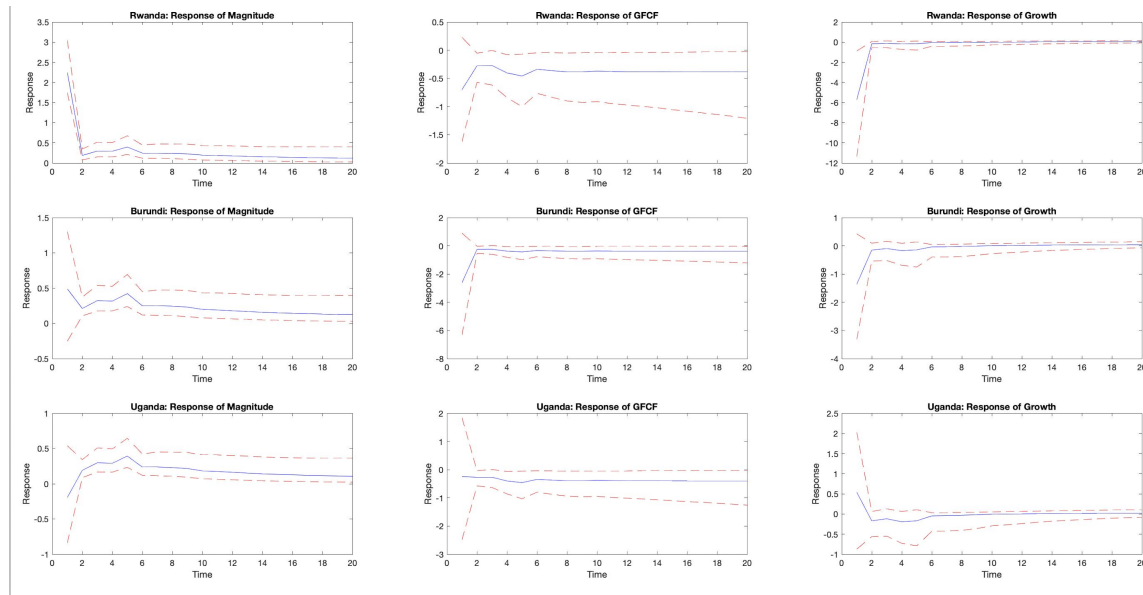
NOTE. Results estimated from two-staged least squares using a sample of 144 countries between years 1980-2013.

First stage independent variable is the Ethnic Fractionalization Index.

*Panel VAR results*

Figure 1 looks at the impulse response functions of a shock to acts of violence in Rwanda. I present the response of magnitudes of political violence, gross fixed capital formation, and growth in Rwanda, Burundi, and Uganda. The confidence bands represents 95% credibility levels.

**Figure 1.** Shock to Magnitude of Violence in Rwanda



For Rwanda, a sudden increase in the magnitude of political conflict decreases domestic gross fixed capital formation on impact by 0.5 percentage points. More concerning is the fact that over the 20 year period, the decrease does not seem to recover. The increase in political conflict also drastically decreases growth initially, but the decrease in growth rebounds quickly after a few years.

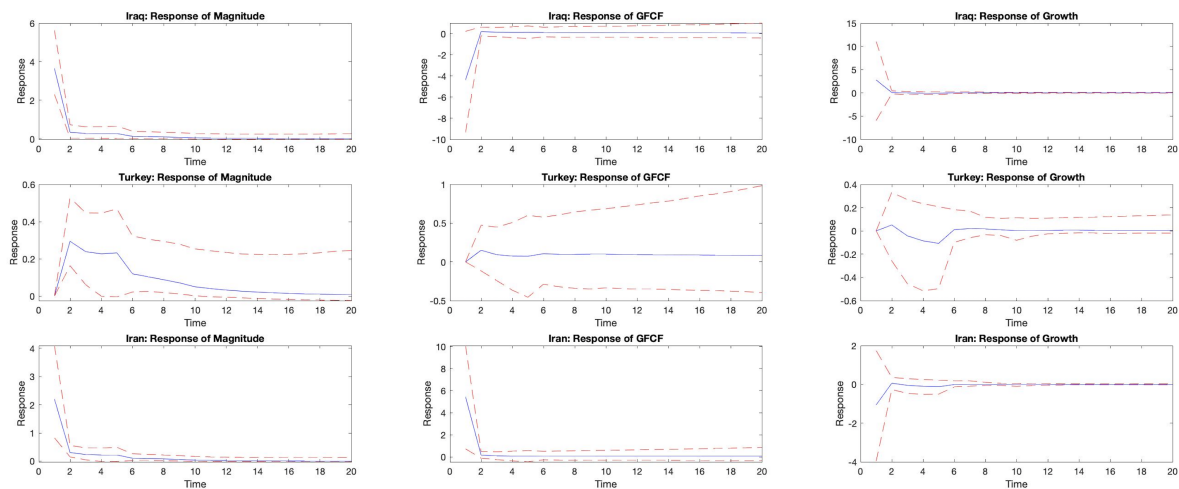
Interestingly, it seems that the shock of Rwanda's political conflict also spurs a slight increase in magnitude of political conflict in both Burundi and Uganda. Furthermore, the shock also has unfavorable effects on growth and investment of Burundi, albeit the quick recovery after a couple of years. The negative economic effects are less evident in Uganda.

These results are in line with the context of the violence, where the episode of

violence with the highest magnitude is the 1994 Rwandan genocide. The conflict mainly involved genocide of the Tutsi ethnic minority group, which has presence in Burundi as well. Therefore, the cross-country effects can be most clearly seen in Burundi but less so in Uganda, where the the Tutsi ethnic group does not exist.

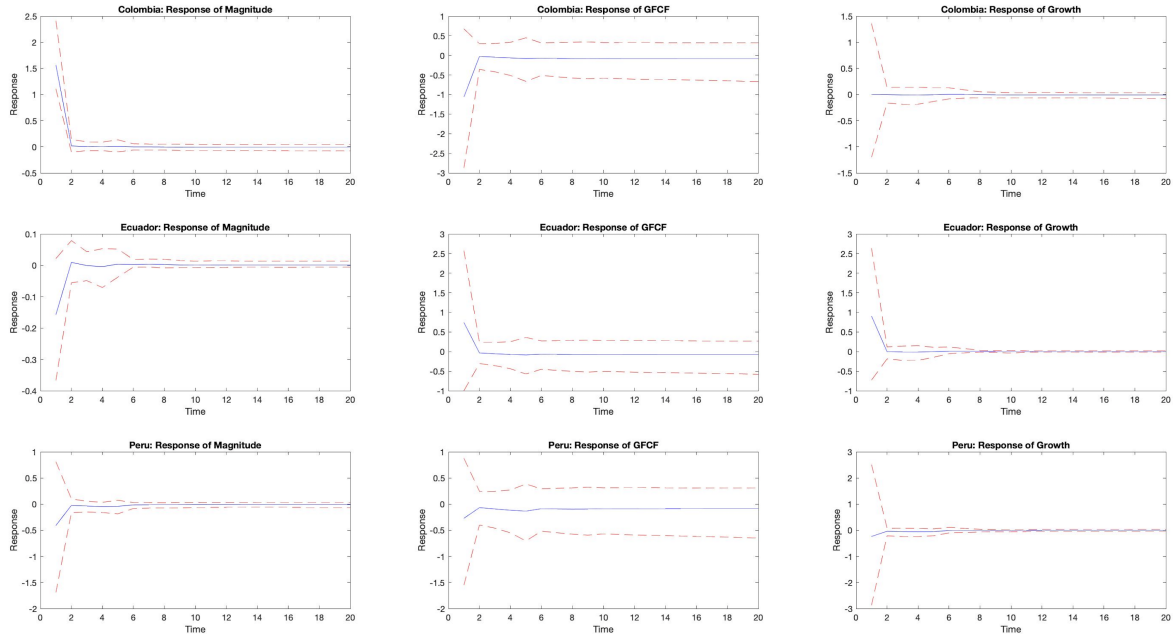
Turning to the Middle East region, I present the IRFs in Figure 2 of a shock to magnitude of political conflict in Iraq. The IRFs include responses of Iraq's growth and investment, as well as Iran and Turkey's magnitude of violence, growth, and investment. The results are considerably less clear, as can be seen in the confidence bands. Some more significant results are the increase in magnitude of political conflict in Turkey and Iran. However, the effects on the economies all three countries are puzzling (i.e. the increase in growth in Iraq and the increase in investment in Iran).

**Figure 2.** Shock to Magnitude of Violence in Iraq



These puzzling results could be related to the fact that Iraq has experienced incredibly high magnitudes of political violence since the 1980s, and during episodes of violence, it is hard to maintain accurate macroeconomic data.

Finally, I look at the spillover effects of political violence in the South American region. Specifically, Figure 3 shows the IRFs of a shock to magnitude of political risk in Colombia, and how the effects of this shock spillover to its neighboring countries, Ecuador and Peru.

**Figure 3.** Shock to Magnitude of Violence in Colombia

The case of a shock to political violence in Colombia presents some interesting results. Firstly, unlike the results above from shocks in the Middle East and East Africa, the magnitudes of political violence decrease on impact in response to a shock in Colombia. With regards to the economy in Colombia, there does not seem to be much impact on growth but it does seem that there are negative effects on investment, but the effects are not persistent. There also does not seem to be robust detrimental effects on the economies of Ecuador and Peru within the 95% credibility level.

A possible explanation for these results could be the fact that political violence in Colombia is very much contained to the violence amongst and related to drug cartels, which may not have much cross-country impacts on neighboring countries.

### Conclusion

To summarize my results, my main findings are: Firstly, political conflicts and episodes of violence have a detrimental effect on economic growth and investment, in the form of gross fixed capital formation, as well as standards of living and these results hold when using

ethnic fractionalization as a instrumental variable to address endogeneity concerns.

Secondly, when studying how different economies recover from political conflict shocks and the spillover effects into neighboring countries, the context and nature of the conflict matters. I find the most significant spillover effects in the case of Rwanda, where the conflict was ethnic genocide, and the ethnic group targeted had presence in neighboring countries. with highest magnitude is the 1994 Rwandan genocide. When considering the shock to magnitude of violence in Iraq, which has experienced the highest magnitude of violence in all countries in my dataset, the cross-country effects are not statistically robust. I believe that this may be a result of inaccurate data during times of extreme crisis. Lastly, the economic and spillover effects are least clear when looking at shock to political conflict in Colombia, where the nature of the conflict is a uniquely domestic issue.

## Appendix

### *Additional Tables*

**Table A1.** List of Countries in the Sample for GLS estimation

Country	Years			
	Total	With Interstate Conflict	With Intrastate Conflict	With All Con- flicts
Afghanistan	29	0	29	29
Albania	29	0	1	1
Algeria	29	0	14	14
Angola	29	0	16	16
Argentina	29	0	0	0
Armenia	29	4	1	5
Australia	29	0	0	0
Austria	29	0	0	0
Azerbaijan	29	4	8	8
Bahrain	29	0	0	0
Bangladesh	29	0	3	3
Belarus	29	0	1	1
Belgium	29	0	0	0

Table A1 Continued

Benin	29	0	0	0
Bhutan	29	0	3	3
Bolivia	29	0	0	0
Bosnia	29	0	5	5
Botswana	29	0	0	0
Brazil	29	0	0	0
Bulgaria	29	0	0	0
Burkina Faso	29	0	0	0
Burundi	29	0	18	18
Cambodia	29	0	8	8
Cameroon	29	0	4	4
Canada	29	0	0	0
Cape Verde	29	0	0	0
Central African Re- public	29	0	17	17
Chad	29	0	11	11
Chile	29	0	0	0
China	29	0	16	16
Colombia	29	0	27	27
Comoros	29	0	0	0
Costa Rica	29	0	0	0
Croatia	29	1	4	5
Czech Republic	29	0	0	0
Democratic Repub- lic of the Congo	29	0	27	27
Denmark	29	0	0	0
Djibouti	29	0	4	4
Dominican Repub- lic	29	0	0	0
Ecuador	29	1	0	1
Egypt	29	0	15	15
El Salvador	29	0	3	3
Equatorial Guinea	29	0	0	0
Eritrea	29	3	0	3
Estonia	29	0	1	1

Table A1 Continued

Ethiopia	29	0	2	2
Fiji	29	0	0	0
Finland	29	0	0	0
France	29	0	0	0
Gabon	29	0	0	0
Gambia	29	0	0	0
Georgia	29	1	5	6
Germany	29	0	0	0
Ghana	29	0	1	1
Greece	29	0	0	0
Guatemala	29	0	7	7
Guinea	29	0	2	2
Guinea-Bissau	29	0	2	2
Guyana	29	0	0	0
Haiti	29	0	5	5
Honduras	29	0	1	1
Hungary	29	0	0	0
India	29	1	29	29
Indonesia	29	0	13	13
Iran	29	0	4	4
Iraq	29	15	17	29
Ireland	29	0	0	0
Israel	29	2	29	29
Italy	29	0	0	0
Ivory Coast	29	0	7	7
Jamaica	29	0	0	0
Japan	29	0	0	0
Jordan	29	0	0	0
Kazakhstan	29	0	1	1
Kenya	29	0	7	7
Korea	29	0	0	0
Kuwait	29	2	0	2
Kyrgyzstan	29	0	2	2
Laos	29	0	1	1
Latvia	29	0	1	1

Table A1 Continued

Lebanon	29	2	4	5
Lesotho	29	0	0	0
Liberia	29	0	12	12
Libya	29	0	6	6
Lithuania	29	0	1	1
Luxembourg	29	0	0	0
Malawi	29	0	0	0
Malaysia	29	0	0	0
Mali	29	0	13	13
Mauritania	29	0	0	0
Mauritius	29	0	0	0
Mexico	29	0	17	17
Moldova	29	0	8	8
Mongolia	29	0	0	0
Morocco	29	0	0	0
Mozambique	29	0	3	3
Myanmar	29	0	29	29
Namibia	29	0	0	0
Nepal	29	0	11	11
Netherlands	29	0	0	0
New Zealand	29	0	0	0
Nicaragua	29	0	1	1
Niger	29	0	9	9
Nigeria	29	0	26	26
Norway	29	0	0	0
Oman	29	0	0	0
Pakistan	29	1	27	28
Panama	29	0	0	0
Papua New Guinea	29	0	8	8
Paraguay	29	0	0	0
Peru	29	1	8	8
Philippines	29	0	29	29
Poland	29	0	0	0
Portugal	29	0	0	0
Qatar	29	0	0	0



Table A1 Continued

Republic of Congo	29	0	6	6
Romania	29	0	0	0
Russia	29	1	22	22
Rwanda	29	7	10	13
Saudi Arabia	29	0	5	5
Senegal	29	0	8	8
Sierra Leone	29	0	11	11
Singapore	29	0	0	0
Slovakia	29	0	0	0
Solomon Islands	29	0	6	6
South Africa	29	0	7	7
South Sudan	29	0	29	29
Spain	29	0	0	0
Sri Lanka	29	0	20	20
Sudan	29	0	29	29
Suriname	29	0	0	0
Sweden	29	0	0	0
Switzerland	29	0	0	0
Syria	29	0	8	8
Tajikistan	29	0	8	8
Tanzania	29	0	0	0
Thailand	29	0	16	16
Togo	29	0	0	0
Trinidad and To- bago	29	0	0	0
Tunisia	29	0	0	0
Turkey	29	0	25	25
Turkmenistan	29	0	1	1
Uganda	29	7	17	17
Ukraine	29	0	6	6
United Arab Emi- rates	29	0	0	0
United Kingdom	29	0	5	5
United States	29	13	0	13
Uruguay	29	0	0	0

Table A1 Continued

Uzbekistan	29	0	1	1
Venezuela	29	0	4	4
Vietnam	29	0	0	0
Yemen	29	0	0	0
Zambia	29	0	0	0
Zimbabwe	29	0	0	0
Total	4466	66	828	870

**Table A2.** List of Countries in the Sample for 2SLS estimation

Country	Years			
	Total	With Interstate Conflict	With Intrastate Conflict	With All Con- flicts
Afghanistan	34	0	34	34
Albania	34	0	1	1
Algeria	34	0	14	14
Angola	34	0	26	26
Argentina	34	1	1	2
Armenia	34	13	1	14
Australia	34	0	0	0
Austria	34	0	0	0
Azerbaijan	34	13	8	17
Bahrain	34	0	0	0
Bangladesh	34	0	13	13
Belarus	34	9	1	10
Belgium	34	0	0	0
Benin	34	0	0	0
Bhutan	34	0	3	3
Bolivia	34	0	0	0
Bosnia	34	9	5	14
Botswana	34	0	0	0
Brazil	34	0	1	1
Bulgaria	34	0	0	0
Burkina Faso	34	0	0	0
Burundi	34	0	15	15
Cambodia	34	10	8	18
Canada	34	0	0	0
Cape Verde	34	0	0	0
Central African Re- public	34	0	12	12
Chad	34	0	21	21
Chile	34	0	1	1
China	34	3	24	24

Table A2 Continued

Colombia	34	0	34	34
Comoros	34	0	0	0
Costa Rica	34	0	0	0
Croatia	34	1	4	5
Czech Republic	34	0	0	0
Democratic Republic of the Congo	34	0	0	0
Denmark	34	0	0	0
Djibouti	34	0	4	4
Dominican Republic	34	0	0	0
Ecuador	34	1	0	1
Egypt	34	0	10	10
El Salvador	34	0	13	13
Eritrea	34	3	0	3
Estonia	34	9	1	10
Ethiopia	34	3	21	22
Fiji	34	0	0	0
Finland	34	0	0	0
Gabon	34	0	0	0
Gambia	34	0	1	1
Georgia	34	10	5	15
Germany	34	0	0	0
Ghana	34	0	2	2
Greece	34	0	0	0
Guatemala	34	0	17	17
Guinea	34	0	2	2
Guinea-Bissau	34	0	2	2
Guyana	34	0	0	0
Haiti	34	0	5	5
Honduras	34	6	11	11
Hungary	34	0	0	0
Indonesia	34	0	23	23
Iran	34	9	14	14
Iraq	34	24	22	34

Table A2 Continued

Ireland	34	0	0	0
Israel	34	10	34	34
Italy	34	0	3	3
Ivory Coast	34	0	7	7
Jamaica	34	0	1	1
Japan	34	0	0	0
Jordan	34	0	0	0
Kazakhstan	34	9	1	10
Kenya	34	0	7	7
Korea	34	0	1	1
Kuwait	34	2	0	2
Kyrgyzstan	34	9	2	11
Laos	34	0	11	11
Latvia	34	9	1	10
Lebanon	34	10	14	15
Lesotho	34	0	0	0
Liberia	34	0	13	13
Libya	34	0	1	1
Lithuania	34	9	1	10
Malawi	34	0	0	0
Malaysia	34	0	0	0
Mali	34	0	8	8
Mauritania	34	1	0	1
Mauritius	34	0	0	0
Mexico	34	0	12	12
Moldova	34	9	8	17
Mongolia	34	0	0	0
Morocco	34	0	10	10
Myanmar	34	0	34	34
Namibia	34	0	0	10
Nepal	34	0	11	11
Netherlands	34	0	0	0
New Zealand	34	0	0	0
Nicaragua	34	6	10	10
Niger	34	0	8	8

Table A2 Continued

Nigeria	34	0	31	31
Norway	34	0	0	0
Oman	34	0	0	0
Pakistan	34	1	29	30
Panama	34	1	0	1
Paraguay	34	0	0	0
Peru	34	1	16	16
Philippines	34	0	34	34
Poland	34	0	0	0
Portugal	34	0	0	0
Qatar	34	0	0	0
Republic of Congo	34	0	6	6
Romania	34	0	1	1
Russia	34	10	18	27
Rwanda	34	7	10	13
Saudi Arabia	34	0	5	5
Senegal	34	1	8	9
Sierra Leone	34	0	11	11
Singapore	34	0	0	0
Slovakia	34	0	0	0
Solomon Islands	34	0	6	6
South Africa	34	0	14	14
Spain	34	0	0	0
Sri Lanka	34	0	27	27
Sudan	34	0	31	31
Sweden	34	0	0	0
Switzerland	34	0	0	0
Syria	34	1	6	6
Tajikistan	34	9	8	17
Tanzania	34	0	0	0
Thailand	34	8	15	19
Togo	34	0	0	0
Trinidad and To- bago	34	0	0	0
Tunisia	34	0	0	0

Table A2 Continued

Turkey	34	0	30	30
Turkmenistan	34	9	1	10
Uganda	34	7	26	26
Ukraine	34	9	1	10
United Arab Emi- rates	34	0	0	0
United Kingdom	34	1	15	15
United States	34	13	0	13
Uruguay	34	0	0	0
Uzbekistan	34	9	1	10
Venezuela	34	0	0	0
Yemen	34	0	13	13
Zambia	34	0	0	0
Zimbabwe	34	0	7	7
Total	4896	285	948	1163

**Table A3.** Summary Statistics for the Conflict (Magnitude of Violence) Variables

Conflict Variable	Observation	Mean	Std. Dev.	Min.	Max.
Interstate	4,460	0.0439462	0.4132224	0	6
Intrastate	4,462	0.6463469	1.581524	0	10
Total	4,462	0.6902734	1.645571	0	13

NOTE. Conflict Variables taken from Major Episodes of Violence dataset for years 1990-2018.



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