The Cost of Wars

A quantitative approach to the relation between war and economic growth

Colophon

Title: *The Cost of Wars*

Subtitle: *A quantitative approach to the relation between war and economic growth*

Author: *J.G. van Kleef*

Studentnr.: *s2976730*

Supervisor: *Prof. dr. Dimitris Ballas*

E-mail: *vkleefjordi@gmail.com*

Date: *02/04/2022*

Abstract

As the recent outbreak of warfare in Ukraine shocked Europe and the world at large, it reminds us once again that wars are not merely a prominent part of human history but also constitute the reality of the twenty-first century. Wars have indeed been a prevalent topic in recent history and its eradication does not currently seem within reach. They do however come with significant financial costs and physical destruction of economic activity. This paper proposes an empirical study with panel data on the economic impact of wars. Wars are seen as open conflict in countries with direct consequences on their national economic performance. GDP is analysed for nearly all UN member countries over the past sixty years and the results are compared between countries with and without war. Wars are then classified according to their intensity and geographical scale, adding to the depth of the analysis. The same economic measures are applied to the resulting different typologies of war, with different results. The models are also improved by using GDP per capita and GDP growth rates as dependent variables instead of GDP. Since GDP is influenced by many other factors than war, a total of seven control variables are added to the statistical models in order to achieve better accuracy for their results. Additionally, we look at potential spill-over effects on neighbour countries.

Based on the results, we draw the conclusion that war does indeed have a direct negative effect on GDP (per capita) growth rate, as well as negative consequences for the economic growth of neighbouring countries. Moreover, there seem to be important differences of economic impact between various wars and conflict intensity appears to be a major denominator for these. While low-intensity conflicts clearly have a lesser impact on economic performance, the case for geographical scale as a determinant of economic impact does not appear to be strongly vindicated by the results.

Keywords: *War, GDP, Conflict intensity, Geographical extent, Economic performance, Spill-over effects*

Table of contents

Introduction

Background

The recent Ukrainian crisis once again brings large-scale warfare to Europe. On the 24th of February, Russia launched a full-scale invasion of Ukraine, a military operation considered the largest in Europe since the Second World War. A major war in Europe has been unthinkable *(at least)* since the end of the Cold War in 1991, but this is now rapidly changing (European Council on Foreign Relations, 2022). Meanwhile, wars have been far from extraordinary on other continents such as Africa and Asia. While most of these remained confined to specific regions or countries, Cold War hotspots, civil wars, genocides, inter-state wars, drug wars and other conflicts have continuously ravaged populations and economies after the Second World War up until today (Heuser, 2005) and if the end of the Cold War was briefly thought to bring global peace (Mueller, 1989), this has proven to be an illusion. The number of wars does not seem to decrease anymore (Thies & Baum, 2020). In fact, the year 2017 even counts as one of the most violent years after the Cold War (Dupuy & Rustad, 2018). Recent examples of the international resurgence of war and violence are conflicts like the Libyan and Syrian civil wars, the War on Terrorism, the Nigerian Boko Haram crisis, or the creation of IS caliphates in different parts of the Arab world.

The deadlock of war: a case for analysing the impacts of war

On the 24th of march 2022, the UN warned that the war in Ukraine cuts global economic growth prospects by 1% (UNCTAD, 2022), while the IMF reported an expected economic contraction of about 10% in Ukraine itself, with economic output potentially decreasing by as much as 35% (BBC News, 2022). In economic literature about the impact of wars, there are two different currents of thought: The "War Renewal" school, and the "War Ruin" school. While the war renewal school states that war can be potentially beneficial for the economy, the war ruin school supports a view where war is entirely undesirable and inherently detrimental (Kang & Meernik, 2005).

This thesis largely follows the second school as it seems to be better supported by historical evidence. Preventing war has in fact been the focus of international cooperation since the foundation of the League of Nations after the First World War, and arguably well before that. Already in 1795, in *Perpetual Peace: A Philosophical* Sketch, German Philosopher Immanuel Kant outlined the idea that war has to be avoided and standing armies should be abolished. In addition, while war retards development, development also retards war. This double causality creates vicious and virtuous circles that accentuate pre-conditions (Collier et al., 2003). Countries with lower development are thus more likely to experience war, which again hampers their development, making war an even more serious threat to economic performance. Yet, war has always been part of human history and in light of the most recent geo-political developments its eradication might appear further away than ever. In a 2016 article structured around five main arguments, John Feffer (Director of FPIF) correspondingly argues that lasting peace is currently out of range for a large number of countries.

If war seems to be essentially impossible to prevent, we need to look at its impacts in order to learn how to limit these. Plümper and Neumeyer (2006) mention diverse indirect effects of wars on agriculture, infrastructure, public health, and social order. Collier (1999) studied the economic impact of civil wars and found them to reduce annual growth rate by 2,2% annually, for a per capita GDP reduction of around 30% for a 15-year long civil war. These results were further investigated and confirmed in a study on civil wars by Imai & Weinstein (2000). Several wars are known to have been even more severe in their economic damage (including the Rwandan genocide and the wars in the DRC). Indeed, while the Rwandan civil war only lasted for a total of four years, Lopez & Wodon (2005) estimate that Rwandan GDP today would be "*between 25 and 30% higher if the conflict had not taken place*". Other wars on the contrary seem to have relatively less impact on economic performance. Categorization of wars is therefore essential to better understand their effect on the economy and will be an essential part of this paper with the intension of differentiating wars along their scale and scope rather than based on their causes and nature. This new and unique approach is expected to yield valuable insight in the assessment of war consequences.

Research outline

This thesis presents an analysis on the economic impact of different wars. A large number of previous studies have provided evidence for the linkage between political instability and war, and the macro-economy (Fielding, 2004). Building on these, this paper aims to confirm (or disprove) the War Ruin point of view on wars, but also to quantify the magnitude of the economic effects of war. Many of the core studies on this subject however have focussed at civil wars (Collier, 1999; Imai & Weinstein, 2000), which this study will expand with the inclusion of interstate wars. At the same time, it stresses the necessity of classifying wars in a meaningful way that can accurately predict their economic consequences. The complexity of war is indeed vast and simplified classification is a much-needed tool to help understand the different impacts war can have. Gray & Martin (2008) argue that the many difficulties encountered when comparing wars are best overcome with a systematic approach that establishes categories before choosing the wars to compare. This approach has been implemented as a critical part of the analysis which differentiates wars into three typologies according to their geographical spread and their casualty rates, two important indicators for the intensity of war, as cited by Imai & Weinstein (2000). These three typologies together form the core independent variable of the analysis presented below.

The three main typologies of war are described and rationalized in detail in the methodology, but they deserve to be shortly covered here in order to clarify the approach taken for this research. Wars are very different in magnitude and in nature and it would be unreasonable to expect a similar economic effect from all these various conflicts. Fielding (2004) lists a number of important indicators that are conventionally used to measure the intensity of wars, including casualty numbers, democracy or freedom indexes, incidence of political violence, and major changes of government. Further indicators are the earlier mentioned geographical extent, as well as the size of insurgent groups, both mentioned by Imai & Weinstein (2000). This study uses a categorical variable based on individual research for each war. Its three categories represent the three typologies of war: Low-intensity conflicts, Localized high-intensity conflicts, and full-scale conflicts. These typologies are mainly divided along geographical extent and monthly casualty rates, but the allocation of each war is also (partly) based on the other factors mentioned above, according to their particular contexts. While not every war can be distinctly covered in this paper, examples will be provided further on to illustrate the outlines and main components of each typology. Furthermore, a definition of war will be provided in the theoretical framework. This leads to the following research question:

What direct impacts do the three typologies of war have on economic growth?

Resulting sub-questions are:

- *How much impact do wars have on economic growth?*
- *What is the impact of wars on inflation?*
- *Which part of economic growth is endogenous?*
- *Are there significant differences between wars with different geographical extents?*
- *Do the economic impacts of war increase proportionally with the number of casualties?*
- *How is the economy of neighbouring countries affected by war?*

Structure

This paper is further structured along five major sections: the Theoretical Framework, the Methodology, the Results, a Discussion and the Conclusion. The Theoretical Framework covers earlier academic studies on the economic impact of war and the definitions of important concepts within this topic, as well as the conceptual model and the hypothesises. The Methodology follows with a general outline of the dataset and the way in which it is analysed, as well as the reasoning behind its variables. The result section then shortly recapitulates the statistical models before describing their outcomes. It also demonstrates how the various expansions of the base model improve the estimations and permit to draw useful conclusions. At las, the discussion aims to clarify a number of strengths and weaknesses of this study and presents some recommendations for further research, while the conclusion summarizes the main results of the analysis.

Theoretical Framework

Setting proper delimitations

Academic research on any subject implicates the use of clear definitions for its key concepts. This not only serves to construct a clear image of the topic, but it can also be of vital importance for data gathering, as it sets limits to which data is considered useful. By extension, definitions have to be adapted to the context of the study. In this case, the context is a clearly economic one, as we specifically zoom in on the economic consequences of war, but war is evidently impacted by non-economic factors which need to be taken into account. Moreover, outside of war there are various non-economic or semi-economic factors that can greatly impact the economy and need to be taken into account by means of their inclusion as control variables where possible. Examples of these are education and political stability, which were both included in a model for economic growth conceptualized by Vijayaraghavan and Ward (2001).

As stated previously, wars can have different natures and scales and the classification of wars along these differences has been the object of previous studies such as an analysis on scale provided by Richardson in 1960 (Hayes, 2002) and a study on the categorization of inter-state wars by Vasquez & Valeriano (2010). This divergence severely limits the use of a dummy variable for war (simply marking years with war and years without war) and asks for a more complex approach. However, simplicity has the benefit of clarity and as such, a binary war variable has been used as a basic structure on which a more elaborated categorical variable is built. It is also used in the base model for comparison purposes.

When assembling the data for such a binary variable, the need for a clear definition becomes manifest: numerous wars spring to mind for which it is evidently going to be very difficult to measure the economic impact. This is especially true and obvious for wars with low levels of destruction or very short durations, such as the 6-day war between Israel and its neighbour countries (*June 1964)* or the Romanian revolution that brutally ended Ceausescu's communist regime (*December 1989)*. About the economic costs of the 6-day war for Egypt, Kanovsky (1968) pointed out that, while there was verifiable economic damage, *"the loss in terms of diminished civilian production was probably very small"*. This illustrates how difficult it is to justify the selection of such conflicts when looking for direct impacts on the economy with macro-economic data on a yearly basis. Naturally the assumption is not that short wars such as uprisings or coup d'états do not have any economic impacts. In fact, the economic impacts of coup d'états were found to be mostly negative (Fosu, 2002), although these results were tied to a set of Sub-Saharan countries only and relied on a number of independent variables unavailable for this study. Importantly however, as illustrated by the case of the 6-day war, the direct consequences of very short wars and coups will in most cases not be discernible and certainly not comparable to major wars when looking at annually recorded economic parameters.

In parallel, Collier (1999) pointed at private investment as the driving force behind the negative effects of (civil) war on economic growth. Although of course investment and production are not the same thing, they are certainly linked to each other and in fact, Smith (1959) concludes that investment is a function of the output level, while Dieppe et al. point at productivity as a key factor of economic growth (2021).

Theory thus supports that production is the main driver of the economy and its destruction is the main factor behind the negative impacts of war. This consideration is equally confirmed by the use of GDP as the most important indicator to capture economic activity (OECD, 2022). Consequently, GDP (in current dollars) and variations thereon will be the main dependent variables in this study. Yet, other factors such as trade dependency are also at stake, as war negatively impacts trade, but those factors were demonstrated to be of temporary nature (Barbieri & Levy, 1999). While economic and political sanctions tied to war can also lead to severe strains on the economic growth of the belligerents (Neuenkirch & Neumeier, 2014), the fact that only a limited share of the countries that experienced war in the past sixty years has effectively been the object of such sanctions makes it a difficult factor to integrate in the data.

The overall complexity of the estimation of economic consequences of war requires a clear distinction that establishes which wars then have enough impact to be recorded in the dataset. In addition to better accuracy, a limit on the number of wars included in the data provides the necessary limitation to the length and scale of the data-gathering process.

Defining wars

Correctly defining war is so important that the lack thereof has been one of the main failures of the League of Nations and played a role in the Sino-Japanese war that preceded the Second World War (Eagleton, 1933). While not as detrimentally consequential for academic research, defining war is nonetheless a crucial theoretical step to initialize this study.

Wars in this context are defined in their traditional sense of open armed conflict between several parties, of which at least one is a (semi-)governmental instance, in accordance with the definition provided by J. Long (2012). This interpretation is an expansion on the basic dictionary definitions of war and results from a discussion about the recent developments of warfare. It should be clear that in recent wars, non-state actors are involved more often than not, whether they be insurgent groups, criminal organizations, mercenary companies, political parties, religious or ethnic minorities, or else (Heuser, 2005; Ravichandran, 2011). War is also increasingly dominated by irregular warfare rather than conventional warfare (Jones, 2021), which we attempt to encompass in the low-intensity conflict typology of war. In addition to the given definition, this paper poses some supplementary boundaries based around expected economic impact which are described hereunder. For a more comprehensive discussion on the definitions of war, see *A Study of War* by Q. Wright (1964).

Mueller & Tobias (2016) state that duration and intensity are the two main dimensions on which the economic impact of a war depends. Consequently, duration and intensity are the two delimitations that were used to assemble the data on wars. Since the base model uses a binary model based on annual data, it was decided to only include wars spanning at least a total of six months, which can be rounded up from 0.5 to 1 year. This facilitates measurement and also excludes short irruptions of violence such as the examples mentioned above, which are expected to be of lesser direct impact on annual GDP. The assumption derived from the study by Mueller & Tobias is that half a year of war should be noticeable in the data. Whether shorter durations can be included remains a topic for further research because the scope of this paper does not allow for that investigation, especially since each war needs individual research to be allocated to one of the typologies of the categorical variable. It would nevertheless be interesting to see how the inclusion of short conflicts such as coups would influence the results of the models proposed in this study.

The other dimension taken into account for the selection of wars is their intensity. While for purposes of categorization, intensity has been handled as a combination of different factors, for the selection process it has been purely defined as an annual casualty rate, in line with the aforementioned *Scale of Deadly Quarrels* by Richardson, which established the use of casualties as a means to classify wars according to their magnitude (Richardson, 1960; in Hayes, 2002). The starting point for this analysis was the usage of the minimum annual casualty rate of one thousand battle-related deaths such as defined by the Correlates of War project (Sarkees et al., 2010), with the slight alternative however of also taking into account non-battle-related casualties because those are expected to equally impact economic activity, as Rocco & al. (2021) found that mortality negatively impacts economic growth. Moreover, most estimates of war casualties also include indirect victims (from famine, disease or else), an approach followed by all main sources on war casualties used for our dataset (although the data sources vary heavily among different wars). Indirect casualties are also part of the Modern Conflicts Database, which is another reason to include them (PERI, 2008). The result is a database that includes all wars since 1960 that lasted for at least six months and made at least one thousand casualties in a given year. One notable exception has been made for the 2001 Gulf war, of which the duration was less than 6 months. This war was however so destructive that it is expected to have a significant economic impact regardless of its short duration (Alnasrawi, 1992) and it is also part of a series of conflicts within the same country.

Conflict intensity

Conflict intensity is one of the most essential concepts of this analysis, since as aforementioned it is a key determinant of the economic impact. For instance, a genocidal wave of violence such as those that occurred in Cambodia and Rwanda is clearly more destructive than a slow-paced low-intensity conflict such as the Mexican drug war. This is very simply illustrated by the fact that Rwanda lost 70% of its GDP between 1990 and 1995 (Lopez & Wodon, 2005), while Mexico has experienced economic growth over the last decade (World Bank, 2022).

Nevertheless, conflict intensity can be difficult to evaluate for wars of different nature and can also vary among different regions or continents. Mueller & Tobias (2016) measured conflict intensity in numbers of casualties. Similarly, a key study in the field of military history by Richardson used the base-10 logarithm of the number of deaths to assign orders of magnitude to wars (Richardson, 1960; in Hayes, 2002). While casualty rates are a sensible proxy-variable for conflict intensity used in many academic studies, frequency of battles, mode of warfare (conventional or irregular warfare, guerrilla activities, terrorism), and the size of non-governmental parties involved are also important measures of intensity (Imai and Weinstein 2000). All of these factors are taken into account as much as possible and observed individually for each war, in order to correctly determine for each war whether it is a low- or a high-intensity conflict. A total of 80 different validated sources have been employed to this effect, comprising compilations of casualty estimations, individual academic studies, news reports and others. The difference between low- and high-intensity conflicts is well established in academic literature and the characteristics of low-intensity conflicts have been extensively described by Carey (1996), and Guštin (2021). As a reference to well documented examples of low intensity conflicts, Magyar (1993) named and described a list of these in the Journal of Third World Studies. Differentiation of intensity based on these examples forms the basis of the categorization of war used for this study. Low-intensity conflicts are sometimes considered not to be "real wars", as they seldom involve large outbursts of conventional warfare (Cann, 2006), but they do in fact constitute a large share of the wars after 1945. Low-intensity conflicts are seen as different from other wars not only in their form, but also in their expected impacts on the economy. Geographic scale is not seen as a factor in conflict intensity, but rather as a factor of its own that impacts the amounts and the spread of the destruction caused by war. It is taken into account for its effect on the economic impacts of war and used in the categorization of wars, based on the idea that the negative effect of a war on the economic growth rate increases with its geographical spread (Imai & Weinstein, 2000).

Defining the impact of war

Since measuring the economic impact of different wars is the principal purpose of this study, it is quite essential to properly define what this constitutes and how it can be measured. In their study on the comparison of wars, Gray & Martin (2008) state that the economic impact of wars *"includes the costs of war, in a financial sense, and the economic effects on groups and individuals, such as higher profits for some companies, bankruptcy for others, job opportunities for some individuals, unemployment for others and so forth."* A notable contrast to their study however is that they use economic impact as merely one characteristic of a war, while it constitutes the main topic of research here.

In this paper, the economy is defined as the totality of production, consumption, and exchange activities for goods and services in a country (Kenton, 2021). Importantly, this thesis focuses on the direct impacts of war on the economy which consist of any change to production, consumption or exchange activities that directly results from war, be it positive or negative. In order to determine these changes however, a clear measure needs to be used for economic activity.

GDP is arguably the most commonly used metric for this and is generally considered one of the best measures of economic performance, capturing upward and downward movements of the economy (NZIER, 2022). it is an excellent measure of production, but it does come with some weaknesses. One of those is that it does not show the social distribution of wealth, which can be very different between countries with similar GDP. Moreover, it doesn't capture the geographical distribution of economic activity, which is often asymmetric (Henderson et al., 2017). GDP will nevertheless be the main dependent variable in this study, but it will be expanded on with the inclusion of a population correction (GDP per capita) and a measurement of its growth rate in percentages. Aside from the intuitive way it captures economic performance, a good case in favour of using GDP as the dependent variable for this study is data availability. In fact, GDP is available for most countries over the entire covered period, while other possible dependent variables often have large quantities of missing observations. Furthermore, the dominant aspect of wars is their physical destruction and disruption of economic activity, through closures, mobilization, active combat, emigration, death, disease and inflation. These disruptions are relatively well measured by GDP. Correspondingly, Collier (1999) describes how civil wars lower national income (GDP) in four major ways: destruction, disruption, diversion, and depletion of national resources.

Neighbours of war

An additional part of this analysis is the study of spill-over effects of wars. As established by previous academic research, wars tend to have detrimental economic consequences beyond state borders (Murdoch & Sandler, 2002; Sundström, 2014). Murdoch & Sandler found civil wars to have a significant negative effect on GDP per capita growth rate, both for countries directly involved and neighbouring countries. Sundström concludes that the trade of neighbouring countries is disrupted, even without direct involvement in war. This study will attempt to confirm these views by comparing GDP per capita and its growth rate between countries that are in proximity of war. Neighbouring countries are defined as countries with a direct border to a nation at war, but some further delimitations are exposed in the methodology.

Antecedent research

Empirical findings on the impact of war on GDP however have been inconsistent, with several studies (Barro & Lee, 1993, and Jong-A-Pin, 2009, in Thies & Baum, 2020) concluding that the impact is insignificant, while others (Murdoch & Sandler, 2004, in Thies & Baum, 2020, and Collier, 1999) find very significant impacts of (civil) war on GDP. Even when a significant impact is found, the results are unanimous: Rasler and Thompson (1985) found that war involves some *"obvious and subtle mixture of destructive and constructive effects on states, and the net war impact on economic growth may be positive, negative, variable, or simply insignificant."* Other studies have since pointed at both negative and positive consequences of war (Sevastianova, 2009), but some ambiguity remains: *"While wars are destructive of physical and human capital, the impact of war on GDP per capita is unclear. This ambiguity is fundamentally due to the way national income accounting deals with killing people and destroying things during war. Producing weapons and munitions is counted positively, while killing people and destroying things is not counted at all."* (Thies & Baum, 2020). Thies & Baum do however conclude that war ultimately has a negative impact on GDP, due to a decrease in productivity, a reduction in trade, and the destruction of human and physical capital and the lack of investments therein. Glick & Taylor (2010) similarly find large and persistent impacts of war on trade, national income, and global economic welfare. Koubi (2005) concludes that war has a direct negative impact on the economy, but also finds a positive impact on post-war economic performance. Moreover, a large number of the currently available academic research on the consequences of war are solely focussed on civil wars. In general, we can conclude that the economic impact of war is not easily generalizable (Kang & Meernik, 2005), which supports the idea that different wars can have different outcomes. This study aims at addressing these differences between wars and their implications for their economic consequences.

Conceptual model and hypothesises

As the main constituent concepts of this research are now identified, this section will summarize them into the conceptual model shown in figure 1. The model shows the breakdown of wars and their categorization in the top left box. It mentions the casualty rate as the main determinant of conflict intensity, together with the other measures which are left out of the diagram for the sake of readability but have been listed in the section on conflict intensity. Then it points to geographical extent as the second important delimitator of war. These factors together classify wars into the three typologies of war which are each expected to have different effects on GDP.

GDP will also be replaced by GDP per capita and by its growth rate for the improved statistical model but in the diagram, GDP is used as a representation for the economy following its definition by the New Zealand Institute of Economic Research (NZIER, 2022), as well as to represent the dependent variables as a whole.

The focus of this study lies on the link between war and GDP, as represented by the three arrows that suggest a causal effect on GDP for each of the three typologies of war. Additionally, inflation will be explored as an alternative to GDP and is shown to have a direct impact on GDP (as established by Smith, 2019), while its causal relation with war was established by Hamilton (1977) and will be verified with an extra model.

The punctuated box on the right shows the factors outside of war that are expected to influence a country's GDP, regardless of the applicability of war in that country. Although many of them can hardly be described as purely economic factors, they are marked as such in the sense that they are known to have a direct impact on GDP, as explained in the second and third methodology sections which expand in more detail on the academic grounds for their inclusion. They represent different control variables that will be included in the more advanced statistical models of the analysis and serves to render the economic effects of war more accurate.

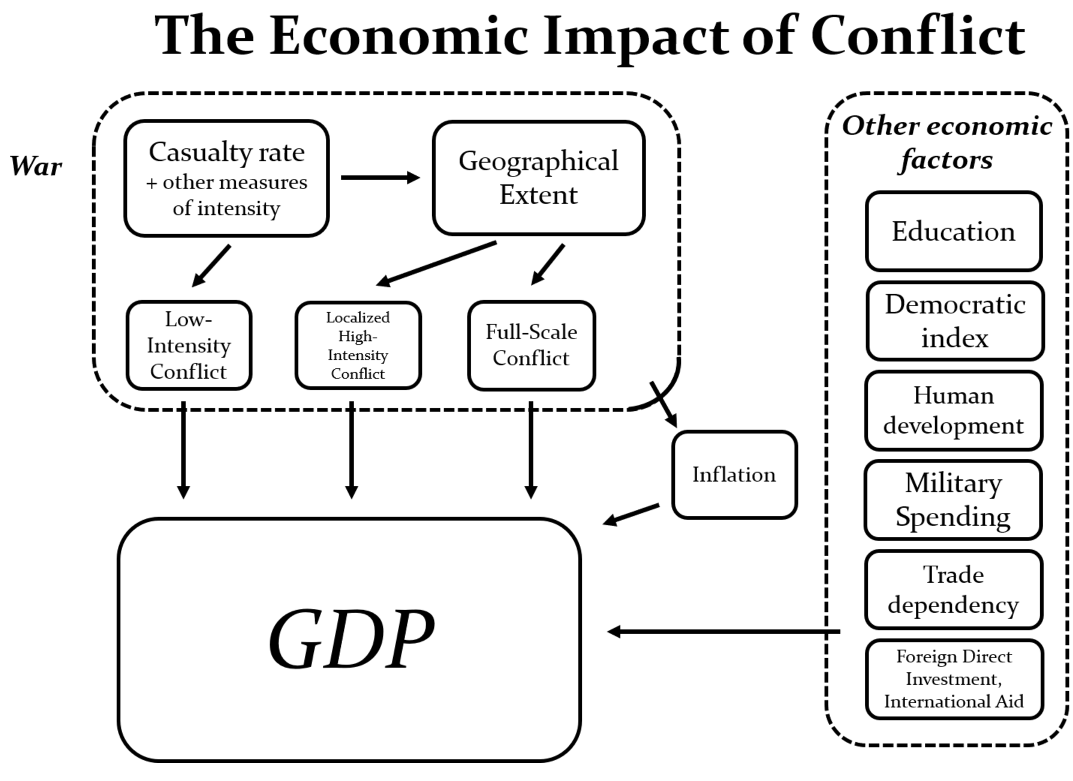

Figure 1: Conceptual Model, own creation

This model advances two main hypotheses. The first one is that there is a direct impact of war on GDP. In line with the school of War Ruin, we expect a negative impact on GDP for wars. The second hypothesis is the claim that the impacts are different for each of the three war typologies. More specifically, we expect that there is a crescent effect of war along the typologies, with low-intensity conflicts having the lowest impacts on GDP, while full-scale war is expected to have the most important economic consequences. The effect of wars on inflation is expected to be positive, as wars cause scarcity of goods and a rise of prices (Hamilton, 1977). Moreover, the different determinants for each category imply the expectation that the differences between low-intensity conflicts and localized high-intensity conflicts are not the same and probably higher than the differences between localized high-intensity conflicts and full-scale conflict. At last, we expect the impact of wars on neighbouring countries to be negative, but with a lower coefficient than the impact on directly involved countries.

Methodology

Introduction to the database and main sources

The data for this study has been compiled from different sources into an extensive body of panel data. Panel data is defined by a set of three specific properties. Firstly, it observes the same cases (countries) repeatedly, secondly it measures multiple variables for these cases, and lastly its observations take place at multiple points in time. This is also the structure of the database used for this study, with the aim to give a comprehensive overview on the economic impacts of war, combining the most possible cases of war with the most continuous and reliable economic data available.

Starting in 1960, the data spans over the last six decades, from the peak of the cold war well into the twenty-first century (with 2020 as the most recent year included), and comprises data for a total of 184 countries on all continents. The reason for starting the data set in 1960 is a lack of proper (inflation-corrected) economic data for a large number of countries before that date.

The dataset comprises three main groups of variables: Economic dependent variables, (semi-)economic control variables, and variables related to war. The control variables serve as a correction for endogenous economic growth and decline unrelated to war and are inspired on a model for economic growth suggested by Vijayaraghavan and Ward (2001) that notably included several scales of freedom (political and economic), as well as investment share, oil exports, and size of government displayed significant correlations with economic growth. Modelling endogenous economic growth will enhance the accuracy of our previous models, and hopefully increase their explanatory value.

Most of the economic data originates from the World Bank and is readily available for insight (World Bank, 2022). Data on HDI, State of Democracy and Education are based on UN data provided by Ourworldindata.org (2022). The data on wars has been collected individually for each country and counts a total of 80 different sources of which an overview is available in Annex 5. The most notable source on war casualties is the Modern Conflict Database from the Political Economy Research Institute of the University of Massachusetts Amherst that provided casualty data from different sources for various wars (PERI, 2008). In absence of better sources, Wikipedia has been used to get primary information such as the starting date, end-date or duration of a war, and as a means to find the various sources listed in Annex 5. Its overview of casualties serves as a death toll source for a few wars with no other verifiable data, and its use can equally be checked for each war in Annex 5, but most of the war data originates from a wide variety of individual and validated sources.

Economic control variables

The economic control variables mostly consist of data from World Bank (2022). They include GDP, GDP per capita, the growth rates of both of these, Foreign Direct Investment, Net International Aid, Exports as a percentage of GDP, Military expenditures and Inflation. GDP is seen as the main dependent variable representing the state of a national economy, while GDP per capita functions as a correction for provisional loss of GDP due to temporary migration and refugees. GDP per capita growth rate is the second main dependent variable. As mentioned above, Hamilton (1977) established an important causal link between war and inflation. Consequently, a model with inflation as an alternative dependent variable will equally be explored in this thesis. Moreover, increasing inflation is known to have a direct negative impact on GDP (Barro, 2013; Smith 2019) and can thus be considered as a means to measure indirect impacts of war on GDP. Foreign direct investment, net international aid and exports as a percentage of GDP are the economic part of a set of seven control variables. Foreign direct investment and net international aid represent the two main sources of influx of foreign capital, and while the first could also be a dependent variable as it is affected by war, the latter is historically more of a consequence of war (Kanbur, 2006). Foreign direct investment was demonstrated to have a direct positive impact on GDP (Abbas et al., 2011) and is thus treated as an explanatory variable for economic growth. Exports as a percentage of GDP is a proxy variable that aims to approximate the importance of trade for each country and is an important control variable, as exports have a significant positive effect on economic growth (Jaffee, 1985). Petrol producing countries are expected to have a larger percentage by reason of the petrol market structure, but outside of these exceptions, World Bank data shows that fully industrialized countries have a much higher percentage of exports relative to GDP than countries that are still in a phase of economic development, while they also represent a much higher share of global trade (World Bank, 2022). Military expenditures represent an additional explanatory variable of wars and are expected to negatively impact economic growth (Azam, 2020).

Other control variables

As much as we can expect wars to impact an economy, it will never be the only factor to determine economic performance or growth. Therefore, different control variables are introduced into the models as to more comprehensively model this. This also helps ensuring that the impact of war is measured as tightly as possible, hopefully securing that our war variables do not measure anything outside of their own impact. Some of these have already been listed above. Further control variables are OECD membership, Subcontinent, Average years of schooling, HDI, Population and Population growth, Net Migration, Homicide rate and State of Democracy. The goal of these socio-economic variables is to better model the drivers behind differences in GDP while also making sure that we can somewhat correct for the difference in GDP between well developed countries of the Triad (US, EU, Japan) and its relative countries, and countries in the global south with lesser development. These variables are not expected to be strongly explanatory when it comes to economic growth, as countries from the global south often have higher growth rates than developed countries, but rather to have a large effect on the simple GDP dependent variable. The three main variables focused on development are constructed in different ways: OECD membership is a simple binary variable, while Average years of schooling and HDI are continuous variables counted in years and in index points respectively. The Level of Human development was proven to positively impact GDP per capita in a study on ASEAN member countries by Elistia & Syahzuni (2018) and is also included in this study. Years of Schooling are shown to be correlated with GDP by Our World in Data (2022) as displayed in Annex 4 and this is supported by Bils & Klenow (1998), who concluded that "*the* *evidence favours a dominant role*" for education and its effect on economic performance. Population was used exclusively to construct the GDP per capita for reasons outlined earlier. The State of Democracy variable is a categorical variable that counts five categories, ranging from Authoritarian regime to High performing Democracy. There is a large number of studies that examine the correlation between democracy and economic growth and there are different outcomes to this day, but there seems to be some consensus recently that democracy at least has a positive indirect impact on economic growth (Koubi, 2005 and Acemoglu et al., 2017). Especially weak democracies and hybrid regimes are expected to have a negative impact on the economy as they are susceptible to be less politically stable. In fact, Cox & Weingast (2017) argue that *"the health of legislatures is more important than the health of elections."* Homicide rate simply acts as a proxy variable for crime, but had to be omitted from the analysis for missing too many values. The subcontinent variable was included as a means to account for regional differences in GDP, but unfortunately has collinearity problems.

Modelling war

A few considerable challenges are encountered when trying to accurately model the impact of wars. War data is not readily available and suitable for use like economic data often is. It has to be assembled from different sources, which can prove rather difficult when measurements and requirements are not standardized through the field. Besides this, measuring the impact of war requires a variable that defines the scope and scale of a war which in and by itself is not a simple task.

This thesis proposes two different categorical variables to represent war. The first one is a simple binary variable that checks for each year since 1960 whether a country has been at war for any duration in that year, no matter what the nature of that war is. The second one is an ordinal variable that is slightly more complex and employs two different measures of scale in order to create four categories. Its conception is detailed in the following sections. In previous studies one can find various methods to measure the impact of war, using different proxy-variables. As mentioned earlier, the three main measurements outlining the scale of wars cited by Imai and Weinstein (2000) are: Geographical extent, number of casualties, and strength of insurgent groups. Especially the first two are much used measurements of scale for warfare, with casualty strength being used by many different academic studies, as established by Richardson in his *Scale of Deadly Quarrels* (Richardson, 1960; in Hayes, 2002).

As for the geographical extent, Cederman (2003) found that the spread of a war is a key to the determination of its scale, and Imai and Weinstein chose to employ the topographical method for their research, with which they found that greater geographical extent comes with an increased negative effect of war on economic growth. This study will explore a hybrid method consisting of an ordinal variable that accounts for both geographical extent and number of casualties. By how it is constructed, it intrinsically assumes the number of casualties to be the more important measure of scope, while the geographical extent still remains defining for the final economic impact of a war as it determines whether the impact goes on to be largely confined to parts of a country or is generalized on national scale.

Previous research has in fact found a strongly negative relationship between the number of battle-related deaths per 1000 population and GDP per capita growth (Mueller & Tobias, 2016).

For this analysis, the casualty rate has been calculated per month, dividing the total number of casualties by the duration of the wars in months. The maximum estimate of casualties is used as standard, except if estimations for a war differ widely or seem highly unplausible, in which case extra research on the war in question determined an eventual casualty total. In the available dataset, casualties have been totalled per country as opposed to a count per war, as countries are the individual cases that will be examined in the statistical simulation. This does have the downside of combining casualty rates of different war typologies in cases where a single country has experienced multiple wars of different nature (of which there are a lot), but that shouldn't be a significant problem as the casualty variable is only used to determine overall intensity of war for each country as to give a general idea for the classification of its wars and will not be used in any statistic model, while for the final elaboration of the categorical war variable, all wars have been examined individually to ensure they would be classified correctly.

Mueller & Tobias also established that war duration, while naturally being an important factor, does not exponentially increase the economic impact, but rather does so by the same factor every year, which seems to be supported by Collier's analysis of civil wars (1999). War duration is assumed to be somewhat taken into account by the nature of panel data which counts each year of war separately. Importantly, wars are only counted for the countries in which they physically took place.

The three typologies of war and according examples

The first category of the main war variable comprises all countries that have not experienced war between 1960 and 2020 and is to be used as the reference category for all statistical purposes. The other three categories constitute the three typologies of war. The first typology (*Low-Intensity Conflicts*) is made up of all wars with a low overall casualty rate and includes mainly so-called brushfire wars and separatist conflicts, or wars related to criminal activity. Wars that started before 1960 have been reckoned with in their totality as the impact is expected to last into the studied period, and prolonged effects of war were demonstrated by Thies & Baum (2020). This implies the inclusion in the dataset of several decolonization wars that started in the late fifty's, such as the Cameroon war for independence and the Malayan Emergency. The second and third typologies (*Localized High-Intensity Conflicts* and *Full-Scale Conflicts* respectively) have high casualty rates, but differ in their geographical extent, where the first is confined to a delimited area within a country, while the latter is a generalized war on a national scale.

A global overview of all nations and the classification of their wars is displayed on figure 2. Note that there are several countries that might have experienced different wars of totally different nature (such as Iraq, Nigeria or Bangladesh). In such cases the highest applicable category is applied on the map as its two dimensions are not sufficient to capture chronological alternation. In the database however these cases are treated separately for each year and will be counted towards their respective typology. As specified before, wars are only counted for the countries in which they took place physically.

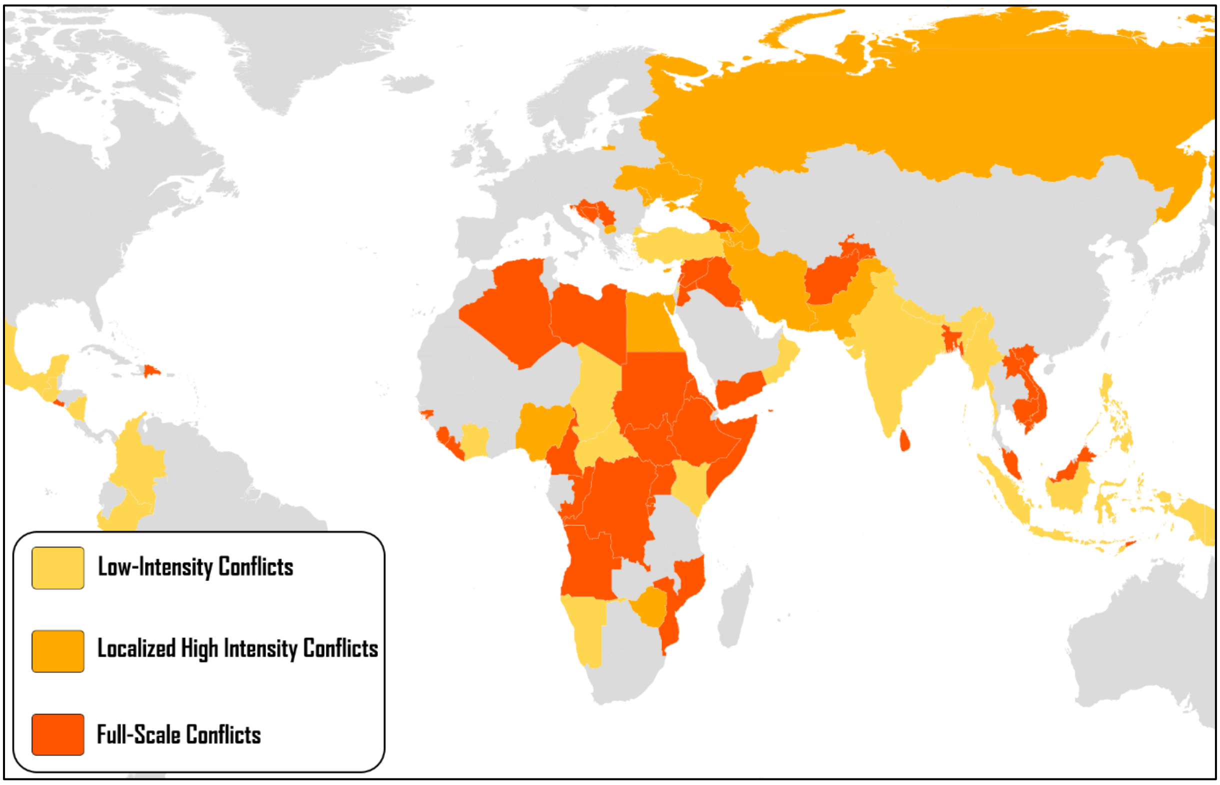

Figure 2: The world at war since 1960 with categorization, own creation

Low-intensity conflicts most often drag on for very long periods (Guštin, 2021), but are much less deadly and expected to have a lesser economic impact. Some notable examples of low-intensity conflicts are the Colombian conflict with the FARC *(1964 – present)* and the protracted Myanmar internal conflicts *(1948 – present),* which have been going on for extended periods as is often the case with this type of wars, but without extreme peaks of casualties or physical infrastructure damage. The Colombian conflict is estimated to have caused close to 220 000 casualties between 1958 and 2012 (Centro Nacional de Memoria Histórica, 2012), which amounts to a monthly casualty rate of about 320 (rounded up). Note the discrepancy between the durations, which is often a problem with low-intensity conflicts as they are often on the edge of the definition of war, depending on the thresholds described earlier. The case of Myanmar is even more extreme as it has already lasted over seventy years with no end in sight, but yet its total death toll of approximately 130 000 is even lower than the Colombian war, and has less than half its monthly casualty rate. Two other interesting cases are the Kurdish conflict in Turkey *(1984 – 1999)* and the Papua separatist movement in Indonesia *(1962 - present*). These are also labelled as low-intensity conflicts because their casualty rates are very low, at respectively 194 and 444 casualties per month, but they are much more geographically restricted. I estimate however that geographical restriction is secondary to intensity of war which limits the damage that is done overall, while geographical extent only limits the impact for a part of the affected country. Therefor there are no separated categories of low-intensity conflicts with different geographical scopes in this study While of course these low-intensity conflicts are humanitarian disasters, their average casualty rates always remain well under the 1 000 deaths per month threshold and do not compare to wars in the two other categories. Poignant examples of full-scale conflicts include the Cambodian genocide *(1967 – 1989)* with a gruesome total of 11 750 casualties monthly and a total death toll well over two and a half million, or the Angolan civil war *(1961 – 2002)* which has a "vastly lower" casualty rate of 1 681 deaths per month, but lasted much longer with a nevertheless equally appalling total death toll of 800 000 as a result. The Iran-Iraq war *(1978 – 1988)* is a good example of a localized high-intensity war – a border conflict – and has similar statistics: a monthly casualty rate of 6 343 for a total amount of over 600 000 casualties, although its casualty rate is slightly deflated by the inclusion of a two-year period of skirmishes before the war. Another prominent instance is the Biafra war in Nigeria *(1967 – 1970)*, which took place within a single country but has an even heftier death toll, good for somewhere between one and two million casualties in total in spite of its short duration. In this case however, the uncertainty of the total amount of deaths makes a monthly estimation very difficult, in addition to which the accumulated casualty data used in this dataset does not allow to establish the exact death rate here as it is combined with the more recent Boko Haram insurgency.

Proximity to war

A binary variable was employed in order to measure the spill-over effect of wars on economic growth in neighbouring countries. It is based on the binary war variable that constitutes the basis of war data for this analysis. At first, the binary war variable for each country with a war in the past 60 years was applied to all its neighbouring countries. However, this causes some illogical situations when taking into account physical distance to a war, as pointed out in previous studies: "*conflict in a neighbouring country might not be expected to have an impact if it is hundreds of kilometres away from the shared border*" (Gleditsch, 2007, in Phillips, 2015). Especially in cases of localized wars, this would not make any sense: for example, Norway and Mongolia would be counted as neighbours to the Chechen war, even though being thousands of kilometres away from it. In consequence, the variable has been adjusted so that only neighbours relatively close to the war have been marked as being in the proximity of war. For full-scale conflicts, this still includes all neighbour countries, whether they have been directly involved or not.

Missing data and deliberate omissions

For better consistency, eight Pacific and Caribbean island-nations as well as the five European micro-states have been omitted from the data set in reason of their unavailable or severely limited economic data. An important consideration for these omissions is the fact that Stata will entirely remove most of these countries' data as a result of their missing values. Countries affected by this decision are listed in table 1. Furthermore, no non-independent entities (such as for instance Hong Kong, Puerto Rico or Gibraltar) have been included in the dataset. One exception has been made for the territories of West Bank and Gaza, which are of interest for this study as they have experienced warfare during the intifada periods that started in 1987. It's worth mentioning that former USSR and Warsaw Pact members, as well as some other smaller countries totally lack economic data before 1990.

Omitted Countries
Andorra
Bermuda
Federation of Micronesia
Grenada
Liechtenstein
Marshall Islands
Monaco
Nauru
Palau
San Marino
Solomon Islands
Tuvalu
Vatican City

Table 1: Omitted countries

Moreover, a small number of countries had gaps in their data for certain years. This is the case of Angola for example, which missed GDP data for three years during their civil war, or Eritrea, of which some population data was missing. Where this was possible, these gaps have been filled by method of interpolation, using formulas that assume equal change for each year. This method was used only in cases where the number of missing years is relatively small (6 years maximum), and with available data from years before and after the missing years. After factoring in all of the missing cases, the base model used for this analysis counts a total of 8 982 observations.

Results

Regression tools

For their study *The Effect of War on Economic Growth*, Thies & Baum (2020) used the Arellano-Bond estimator for their statistical models. This estimator is likely too complex for the current analysis. Alternatively, there are three main types of more accessible models that can be used to analyse panel data: the Pooled OLS model, the Fixed effects model, and the Random effects model (Park, 2015). Although it was used by Imai & Weinstein (2000), the Pooled OLS model is not the preferred option for this study, as it assumes there are no unique attributes to countries and no universal effects across time. Fixed effect models go a step further by also taking into account the inherent difference between observed cases, while random effect models test for variables that are constant across cases but change over time. All three effect models are usable for this study, but the observed variables are expected to vary quite heavily between countries, which would make the fixed effect model preferable. This has been verified by running a Hausman test based on the most basic model including only GDP per capita and the categorical war variable, of which the p-value is significant (Annex 2), thereby rejecting the hypothesis that the random effects model is of better utility for this study.

Four separate main models were constructed for this analysis, based on two different sets of both dependent and independent variables. The two dependent variables that have been used for this are GDP (in current dollars) and GDP per capita, while the two independent variables are the binary and the categorical war variables. Additionally, both dependent variables are replaced by their respective growth rates in further variations of the models. For each of these models I then progressively add control variables. The construction of these various statistical models is displayed in Annexes 2 and 3.

The base-model

The most basic model is a model that simply tests for a difference in GDP between countries in years with war, and countries in years without war, using the binary war variable as independent variable. Its result is displayed in table 2, and it does not suggest there to be a significant difference in GDP between countries with or without war. This is largely explainable by the fact

GDPcurrent~s	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
Warbinary	1.30e+10	3.25e+10	0.40	0.690	-5.07e+10	7.67e+10
_cons	1.93e+11	8.06e+09	23.96	0.000	1.77e+11	2.09e+11
sigma_u	6.654e+11					
sigma_e	6.939e+11					
rho	.47908966	(fraction of variance due to u_i)				

Table 2: GDP and War (binary), result from Stata

that we are looking at a database on global scale, with inherently different countries. For instance, even during and after the Yugoslavian war, the former Yugoslavian republics are expected to have a higher GDP than most countries in Africa, also if the latter did not experience war. While expected to reduce GDP, there are no known observations of wars that crashed it to the point where such pre-existing differences were erased. This however indicates that even though some countries that experienced warfare had in fact large drops in GDP (e.g., Rwanda, Kuwait and Angola), changes in GDP might not correctly represent the economic impact of a war.

A variation of this first model aims to address this issue by replacing GDP with its growth rate as the dependent variable. While GDP growth rate might not achieve a complete representation of physical damage inflicted by war, it is well capable of measuring the cutback or even temporary cessation of economic activity. The results of this new model indeed suggest that war does in fact have a significant negative impact on the economy, as shown in table 3:

GDPGrowthr~e	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
Warbinary	-.0294535	.0082598	-3.57	0.000	-.0456445	-.0132624
_cons	.0856541	.0020344	42.10	0.000	.0816662	.089642
sigma_u	.03057111					
sigma_e	.17302975					
rho	.0302713	(fraction of variance due to u_i)				

Table 3: GDP growth rate and War (binary), result from Stata

The explanatory value of this model is still quite insignificant however as its R^2-value is below 0.05 but this should improve when adding more control variables. Further adjustments to the model can still improve the accuracy of the coefficients but the results of this model are supported by previous studies, notably a 2007 paper that describes the cost of wars in Africa and demonstrates for 23 countries at war how economic growth was impacted by their wars (IANSA, Oxfam and Saferworld, 2007). Table 4 discloses some of their evidence, showing a number of countries and their respective projected growth as opposed to their actual growth, with South Africa added as a reference case without war. Of course, while the coefficients in the model might be small, in order to measure the economic impact in gross value, they are multiplied by GDP which usually values several, if not hundreds of billions of current dollars. This implies that the cost of war frequently amounts to billions of dollars, even for the loss of a single percentage point in GDP growth rate.

Country	Conflict years	Number of years	Projected growth*	Actual growth*
Burundi	1993–2005	13	5.5%	-1.1%
Rwanda	1990–2001	12	4.5%	2.8%
DRC	1996–2005	10	5.4%	0.10%
Eritrea	1998-2000	3	4.8%	-3.8%
Republic of Congo	1997–99	3	3.3%	0.03%
South Africa	1990-96	7	1.2%	1.2%

Table 4: War and Economic growth in Africa (IANSA, Oxfam and Saferworld, 2007)

Further corrections

With the basic model established, we now replace its binary independent variable by the categorical war variable that accounts for the scope of warfare. The results are similar overall, with a non-significant effect on GDP, but a significant effect on its growth rate. However, in contrast to the two intense warfare typologies, low-intensity conflicts do not appear to significantly impact GDP growth rate (see table 5).

GDPGrowthrate	Coefficient	Std. err.	t	P>|t|	[95% conf. interval]	
war						
Full-Scale Conflict	-.0434956	.0126588	-3.44	0.001	-.0683098	-.0186814
Localized Large-Scale Conflict	-.0476385	.0180924	-2.63	0.008	-.0831038	-.0121732
Low Intensity Conflict	-.010531	.0118952	-0.89	0.376	-.0338484	.0127864
_cons	.0852007	.0020445	41.67	0.000	.0811931	.0892084

Table 5: GDP growth rate and War (categorical), result from Stata

For localized high-intensity conflicts and full-scale conflicts, the coefficients are also comparatively higher than the overall coefficient for war in the binary model, which is the result of separating them from the less impactful low-intensity conflicts. Interestingly, localized high-intensity conflicts appear to have a slightly larger impact than full-scale wars. This could be the result of a small bias in the data that is due to full-scale conflicts still having a large range of intensity, as for example the Yugoslavian war, while being a full-scale conflict, was by far not as destructive as some major civil wars such as the Vietnam war or the Rwandese Genocide.
As stated above, a part of the wartime decrease in economic activity is expected to be a result of population decline, whether it be temporary or permanent. The permanent population decline (mostly resulting from war casualties, famine and disease) has a lasting economic impact and is much easier to account for than temporary population decline (due to provisional migration and refugees). Temporary population decline implicates a loss of total GDP that can be recuperated at least partly if and when this population comes back, as it happened in Burundi which repatriated hundreds of thousands of refugees between 2000 and 2010 (Ruiz & Vargas-Silva, 2021). This means that it is necessary to correct the GDP for population in order to measure a decrease of economic performance per capita, rather than total. GDP is thus replaced as dependent variable by GDP per capita. The results are displayed in table 6 for the relation between GDP per capita growth rate and the categorical war variable to reflect the earlier improvements on the model. They are very similar to the results of the previous version of the model, but the coefficients are slightly lower, which indeed suggests some excess measurement when the model is not corrected for population.

GDPcapitagrowthrate	Coefficient	Std. err.	t	P>|t|	[95% conf. interval]	
war						
Full-Scale Conflict	-.0385586	.0123391	-3.12	0.002	-.0627462	-.0143711
Localized Large-Scale Conflict	-.0480126	.0176355	-2.72	0.006	-.0825822	-.0134429
Low Intensity Conflict	-.0108069	.0115948	-0.93	0.351	-.0335355	.0119216
_cons	.0661046	.0019929	33.17	0.000	.0621982	.0700111

Table 6: GDP per capita growth rate and War (categorical), result from Stata

Adding control variables

In the models presented above, GDP per capita growth rate has become the main dependent variable. Economic growth however is impacted by many more factors than war alone. As aforementioned, Vijayaraghavan and Ward (2001) suggested a model with different variables which impact economic growth, out of which several scales of freedom (political and economic), as well as investment share, oil exports, and size of government displayed significant correlations with economic growth. This model has been a guideline for adding a number of control variables that account for factors of economic growth and are expected to increase the overall accuracy of this analysis. The models that result from this will be called "corrected models". All of these have been run both with the four different dependent variables used previously (GDP, GDP growth rate, GDP per capita, GDP per capita growth rate), and with both the binary and the categorical war variables, but considering their fairly analogous results, we will focus on the model that uses GDP per capita growth rate and the categorical war variable. All the relevant models can however be consulted in Annexes 3 and 4 (including the ones shown within the main text). For this analysis, a set of seven control variables has been used to model endogenous economic growth. They are added to the model progressively and have been listed beforehand in the methodology. The first model enhanced with a control variable simply consists of the base model with the addition of the ordinal variable representing democratic index. Note that this already makes the number of cases (years for each country) shrink from 8 982 to 6 526, as the data for democratic index only starts in 1975. Other variables such as average years of schooling and human development index have a similar or even amplified effect on the size of the database, as a large number of countries only have these data available yearly since 1990 (as opposed to every five years before that). Since the democratic index is the most complete (non-economical) control variable available, this is the one that is included in the first corrected model. With this model (see Annex 4), results for the different categories of war remain similar to previously shown results, but the difference in magnitude between localized high-intensity conflicts and full-scale conflicts seems to have increased. Another point of interest is the fact that the control variable does not in fact have a significant impact on GDP per capita growth rate. Conversely, when looking at GDP as a dependent variable, it is the war variable that does not have significant impact, while the control variable does.

Full model and main results

Adding more control variables to the model does not seem to change its output much, although there are some interesting additional notes. Economic control variables (export as part of GDP, military spending, and international aid) seem to have more significant impacts on economic growth as a whole, while socio-economic variables like democratic index, years of schooling, and human development index seem to be of lesser impact. Particularly military spending seems to have a strongly negative impact on GDP. If GDP per capita is taken as the dependent variable (see table 7), all control variables except HDI have significant impact.

GDPpercapita	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
war						
Full-Scale Conflict	2493.953	786.66	3.17	0.002	951.5932	4036.313
Localized Large-Scale Conflict	724.1015	1324.029	0.55	0.584	-1871.847	3320.05
Low Intensity Conflict	776.6063	669.1567	1.16	0.246	-535.3713	2088.584
schoolingyears	2694.934	178.6659	15.08	0.000	2344.634	3045.235
HDI	5733.483	3853.428	1.49	0.137	-1821.715	13288.68
ExportsaspercentageofGDP	9183.947	1095.879	8.38	0.000	7035.319	11332.58
FDIcumulativeofGDPcumulat	20449.05	3154.313	6.48	0.000	14264.57	26633.54
democraticindex						
Authoritarian Regime	7947.13	965.8879	8.23	0.000	6053.368	9840.892
Hybrid Regime	7122.24	973.1177	7.32	0.000	5214.304	9030.177
Mid-range performing democracy	5767.3	813.5472	7.09	0.000	4172.224	7362.376
Weak democracy	5918.705	934.5915	6.33	0.000	4086.304	7751.105
NetInternationalAidReceived	-7.84e-07	1.68e-07	-4.67	0.000	-1.11e-06	-4.55e-07
MilitarySpendingaspercentage	-26469.76	4465.33	-5.93	0.000	-35224.68	-17714.84
_cons	-22549	1746.346	-12.91	0.000	-25972.96	-19125.04
sigma_u	12810.561					
sigma_e	5507.3971					
rho	.84400778	(fraction of variance due to u_i)				
F test that all u_i=0: F(149, 3493) = 48.93				Prob > F = 0.0000		

Table 7: GDP per capita and War (categorical) with all control variables, result from Stata

Importantly however, when using the complete corrected model with GDP per capita as a dependent variable as opposed to GDP per capita growth rate, there is a notable difference with previously shown models: there is a significant but positive effect for full-scale wars, but not for the other two war typologies. This seemingly surprising result can be ascribed to the wide range of values possible for GDP per capita which depend on a large number of different factors and vary widely per (sub-) continent, but it also corroborates the results of Sevastianova (2009) who found both positive and negative effects of war on GDP per capita. Replacing GDP per capita with its growth rate however shows a different picture as shown in table 8. Equally noticeable is that this model is hampered by the various missing data among the control variables and only counts a total of 3 656 observations. Another point of interest is the R^2-value (see Annex 4) which is considerably higher for the models that do not have a growth rate as the dependent variable. The highest R^2-value amounts to a total of 0.34 for the fully corrected model of the relations between GDP per capita and the categorical war variable. It's worth mentioning that although that is a modest result, it is almost three times higher than the R^2-value from models with the binary war variable, strongly underlining the importance of differentiating wars of divergent nature or scope. The models with growth rates as their dependent variables consistently display significant results for both localized high-intensity conflicts and full-scale conflicts and insignificant results for low-intensity conflicts. In contrast with the non-growth-rate models however their R^2-square values are structurally below 0.05 which makes them markedly less convincing. Nevertheless, they do confirm the negative impact on economic growth for high-intensity wars, in accordance with many core studies such as the study on civil war by Collier (1999) and the study on *the Effect of War on Economic Growth* (Thies & Baum, 2020).

Table 8 displays the results for the effects of war on GDP per capita growth rate in the fully corrected model. It shows the negative impact on economic growth measured for high-intensity wars and demonstrates the insignificance of the impact of low-intensity wars. As previously noted, the localized high-intensity conflicts indeed seem to have a higher impact on the economy, which is quite contrary to expectations but is most probably a result of the types of countries that have experienced these, as civil wars are more prevalent in poorer countries. This is however difficult to correct for with the current statistical method and needs extra investigation.

GDPcapitagrowthrate	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
war						
Full-Scale Conflict	-.0672438	.0217629	-3.09	0.002	-.1099131	-.0245745
Localized Large-Scale Conflict	-.1270901	.0363057	-3.50	0.000	-.1982727	-.0559075
Low Intensity Conflict	.0027067	.0183521	0.15	0.883	-.0332753	.0386887
schoolingyears	-.0045774	.0049218	-0.93	0.352	-.0142273	.0050724
HDI	-.1641902	.1060398	-1.55	0.122	-.3720967	.0437162
ExportsaspercentageofGDP	.0642625	.0303641	2.12	0.034	.0047294	.1237957
FDIcumulativeofGDPcumulat	-.0701726	.0868984	-0.81	0.419	-.2405497	.1002044
democraticindex						
Authoritarian Regime	.0065317	.026598	0.25	0.806	-.0456176	.058681
Hybrid Regime	-.0146272	.0267864	-0.55	0.585	-.0671458	.0378915
Mid-range performing democracy	.0052854	.0224148	0.24	0.814	-.038662	.0492328
Weak democracy	.0030402	.0257436	0.12	0.906	-.0474339	.0535144
NetInternationalAidReceived	8.70e-12	4.60e-12	1.89	0.059	-3.16e-13	1.77e-11
MilitarySpendingaspercentage	-.4179932	.1225064	-3.41	0.001	-.6581848	-.1778015
_cons	.1874184	.0481865	3.89	0.000	.0929418	.281895
sigma_u	.05452888					
sigma_e	.15101018					
rho	.11534873	(fraction of variance due to u_i)				
F test that all u_i=0: F(149, 3483) = 1.14				Prob > F = 0.1266		

Table 8: GDP per capita growth rate and War (categorical) with all control variables, result from Stata

Inflation

An extra base-model with inflation as its dependent variable results in significant positive results for low-intensity conflicts and localized large-scale conflicts, but not for full-scale conflicts (see Annex 3). When adding the control variables to this model, the results for localized large-scale conflicts lose their significance, while the R^2-value does not exceed 0.015. Low-intensity conflicts keep a significant impact on inflation however. We can conclude that inflation probably is at least somewhat positively impacted by war, but that it is not clear how large that impact really is. Moreover, this model demonstrates that low-intensity conflicts do have an indirect impact on GDP, as inflation is known to have a negative impact on GDP (Smith, 2019).

Spill-over effects

To measure the spill-over effects of wars, the same methods have been used as the ones described previously for the economic impact of wars on countries involved in them. The difference resides in the dependent variable which has been replaced by a binary variable that assesses whether a country is neighbouring a war in each given year. The results are consultable along with previous models in Annexes 3 and 4, and the fully corrected model with proximity to war as dependent variable is displayed in table 9. The main result of this model is a significant negative impact of proximity to war, although it is lower than the impacts measured in countries with direct involvement in war, which is in line with expectations. Therefrom we can conclude that wars do have significant geographical spill-over effects beyond their impact on the host country. This result shows that the economic consequences of war are to be taken even more seriously and cannot be captured within the frame of a single country.

GDPcapitagrowthrate	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
Neighboringconflictspilloveri	-.0440573	.0101786	-4.33	0.000	-.064014	-.0241007
schoolingyears	-.0058562	.0048689	-1.20	0.229	-.0154023	.0036899
HDI	-.1271681	.1033922	-1.23	0.219	-.3298834	.0755473
ExportsaspercentageofGDP	.0490173	.0303645	1.61	0.107	-.0105167	.1085513
FDIcumulativeofGDPcumulat	-.0765296	.08689	-0.88	0.379	-.24689	.0938308
democraticindex						
Authoritarian Regime	.017581	.026695	0.66	0.510	-.0347584	.0699203
Hybrid Regime	-.0013067	.026844	-0.05	0.961	-.0539383	.0513249
Mid-range performing democracy	.0076691	.0224266	0.34	0.732	-.0363016	.0516398
Weak democracy	.0066689	.0257477	0.26	0.796	-.0438133	.057151
NetInternationalAidReceived	9.08e-12	4.57e-12	1.98	0.047	1.10e-13	1.80e-11
MilitarySpendingaspercentage	-.5083898	.120376	-4.22	0.000	-.7444045	-.2723751
_cons	.1821416	.0471212	3.87	0.000	.0897536	.2745296

Table 9: GDP per capita growth rate and Proximity to conflict including all control variables, result from Stata

Discussion

Several major conclusions can be drawn from the results presented above. Firstly, the negative direct impacts of war on the GDP per capita growth rate established by previous studies are found to be validated. In addition, different results are obtained for the three typologies of war which mainly confirm the importance of the distinction between wars of different intensity in line with previous studies on war such as the analysis by Mueller & Tobias (2016), but do not provide a conclusive difference in impact between wars of geographical extent similar to Imai & Weinstein (2000) due to limitations in the data on localized high-intensity conflicts. In contrast to high intensity conflicts, low-intensity conflicts are shown not to have a significant direct impact on GDP, but invertedly they do impact inflation significantly. Moreover, GDP per capita is also proven to be negatively impacted by proximity to wars, including low-intensity conflicts, in accordance with the earlier study by Murdoch & Sandler (2002).

While the statistical results of the fully corrected model with GDP as its dependent variable do present a higher explanatory value (R^2) than the results of the model that used GDP per capita growth rate, they seem less accurate in predicting the economic impacts of war. Firstly, GDP does not account for a country's population size and is therefore hardly a suitable dependent variable to compare the impacts between different countries, and is thus replaced with GDP per capita. However, since we are using a fixed effects model for comparison between countries in different stages of development with a wide range of GDP per capita value, a large number of wars is expected to not sufficiently affect a dependent variable with such a large span to show a significant difference with countries without war. Sevastianova (2009) demonstrated that studying the impact of wars on GDP per capita generally provided heterogenous results between different countries. Similarly, our model with GDP per capita as its dependent variable finds no significant results for the first two typologies of war, but significant positive results for full-scale conflicts. It seems that GDP per capita growth rate is a better tool for the measurement of the impact of war on economic performance, and it is employed in the final model.
Nevertheless, it also has its imperfections. Models using GDP per capita growth rate obtain a much more limited R^2-value and the control variables model the total growth rate less effectively. As a consequence, while the coefficients obtained with GDP per capita growth rate are much closer to expectations, they also have less explanatory power. They do establish the negative consequences of war, but it is difficult to quantify these consequences because the control variables mostly do not have significant effects and this means that the coefficients are likely susceptible to variations not explained by the model. As such, this study does confirm earlier results by Collier (1999), Lopez & Wodon (2005), Thies & Baum (2020) and others who found that war has a damaging effect on economic growth, but it does not result in a satisfying evaluation of this damage.

As previously mentioned, this study establishes new insight into the differences in impact between low-intensity conflicts and intense war. Interestingly however, low-intensity conflicts are found not to have a significant impact on economic growth as compared to the reference category, which is the peaceful scenario without any war. While the large difference with other wars is an expected result in accordance with previous studies that established a link between the number of casualties and mortality as a whole and economic growth (Mueller & Tobias, 2016; Rocco et al. 2021) and provides good perspective of the different economic outcomes that wars can have, it seems slightly odd to conclude that low-intensity conflicts do not have a significant direct economic impact. On the other hand, in accordance with Hamilton (1977) we conclude that low-intensity conflicts have a positive effect on inflation, and therefore an indirect negative effect on GDP, as argued by Barro (2013) and Smith (2019). Yet, for the link between high intensity conflicts and inflation the results are inconclusive. Further research on the direct impacts of low-intensity conflicts is recommended, as it seems unplausible that protracted conflict, even on smaller scale, does not significantly impact economic activity.

Another restricting factor on this study is the amount of missing data. In fact, the fully corrected models drop 5 326 observations, which is over half of the total amount. This is due mainly to the fact that the missing data is spread out between variables and not confined to certain years or countries only. Core data such as GDP, Population and War is reasonably complete, but many of the control variables only have data for the more recent decades (notably starting in 1975 and 1990). For certain countries this is true for all data, as described earlier. Due to this limitation, the expanded models lose some credit relative to their simpler counterparts.
These missing values also caused the research to focus on years individually as opposed to time periods. Longer term effects of war are thus not included in the analysis and this should be kept in mind when considering its results. While the coefficients might seem small, they are cumulative and likely to be considerably higher when applied to periods of five or ten years.

Furthermore, data on wars has been collected individually for each country. While specific research benefits the accuracy of the data, it also brings along the inconvenient absence of a universal threshold of casualties that defines each typology of war. Instead, the decision is based on multiple factors which do not limit only to the number of casualties, but also to the duration of war, its cause and development, and the presence (or not) of large-scale battles and violence, based on earlier studies by Imai & Weinstein (2000) and Fielding (2004), and on definitions of low-intensity conflicts provided by different scholars (Magyar, 1993; Carey, 1996; and Guštin, 2021). This naturally implies that several wars with lower casualty rates are included in one of the more intense typologies, but this has to do with their expected economic damage which is influenced by more than casualties only. Because of limitations in time and scale though, the typologies assigned to each distinct war cannot be discussed individually in this paper. Specific research on the classification of wars can give extra insight on the topic and is recommended.

Conclusion

The many different ways in which wars affect the economy complicate the construction of a comprehensive overview of their damage. This paper attempts to consolidate existing academic findings on the economic impacts of war, centred around the question *"what direct impacts do the three typologies of war have on economic growth?"* It emphasizes that wars can hugely vary in scale and intensity, and addresses this fact with a new approach that categorizes wars into three general typologies, analysing their economic consequences according to these typologies with the assumption that wars with lower intensity generate less economic decline. The results show significant differences among wars with different intensities, but no significant difference between wars of different geographical extent. We also find that low-intensity conflicts seem to have a more important impact on inflation and that all types of war confounded have important spill-over effects on neighbouring countries. The effects of adding control variables for endogenous economic growth are limited, but significantly increase the explaining value of all models with GDP and GDP per capita as dependent variables.

The construction of a hybrid categorical war variable that classifies wars into three different typologies according to their intensity and scale was a key component of this study, with the aim of complementing previous literature that either focussed solely on civil wars or treated wars of different nature, geographical extent and magnitude as a single phenomenon. Alongside a binary variable, this variable served as the main independent variable for the statistical analysis. Its three typologies have been built on the bases of parameters advanced by earlier studies, such as casualty rates (Mueller & Tobias, 2016) and geographical spread, among others. They were expected to show different impacts on the dependent variables (GDP, GDP per capita, GDP growth rates), as formulated in the hypothesis presented above.
Indeed, the hypothesis that economic damage is proportional to intensity has been largely confirmed by the results. Moreover, the explanatory value of the models with the categorical variable is much higher than that of the models with the binary variable which confirms the importance of this differentiation. A distinction of impacts for wars of different geographical extent has also been researched, theorizing that more narrowly localized wars are expected to be of lesser economic impact than widespread conflict on national scale, as advanced by Imai & Weinstein (2000). This last expectation is however not clearly vindicated by the results.

An important methodological conclusion arising from this research is the preferability of GDP per capita as a dependent variable for the impact of war. In fact, it permits to correct for excess measurement due to temporal losses of population in relation to provisional migration and refugees. This outcome also introduces the notion that the economic impact of war seems to be most effectively measured by using GDP per capita growth rate. This finding is in accordance with the studies on civil war by Collier (1999 and 2003).

Furthermore, the control variables used in this study seem to be of lesser importance for GDP per capita growth, compared to their impact on simple GDP. Most of the control variables do not display a significant result for GDP per capita growth rate, with the exception of military spending and export, which both have significant effects on GDP per capita growth rate (negative and positive respectively). Naturally, the militarily expenditure variable having a negative impact on GDP also provides for a further argument in supporting the view that consequences of wars are mainly unfavourable.

Low-intensity conflicts are shown to have less direct impacts on the economy than the other two categories and countries experiencing them do not appear to significantly differ in economic performance from countries without any war at all. In contrast, they do seem to have a positive effect on inflation. The other two categories are shown to have significant negative impacts on economic growth, but do not impact inflation significantly. This can be partially explained by the negative relation between inflation and GDP, as a decreasing GDP would also negatively affect inflation. The effect of high-intensity wars on economic growth also demonstrates their opportunity cost, as in absence of war growth is expected to be higher (or positive at all, in some cases). In addition, we measure important negative spill-over effects of wars on countries in their vicinity, in accordance with earlier findings by Murdoch & Sandler (2002). A useful expansion of this analysis would be to equally distinguish between different wars when looking at the spill-over impacts of war. The insights provided by this analysis certainly improve the general knowledge on the impacts of war and encourage further study on the impacts of current ongoing wars such as the wars in Syria and Ukraine, which both certainly belong to the full-scale conflict typology and are known and expected to have serious (further) economic repercussions, not only on the affected countries but also on their neighbours and on the world as a whole. Moreover, the conflict in Ukraine might give new insight on the way global market integration and trade dependency change the economic impacts of war, not only for the country itself but also at a global scale, as direct economic consequences (such as product shortages and rising prices) have already become exceptionally apparent in all of Europe and even beyond.
Overall, this study confirms the standpoints of the War Ruin school and defends its assessment that wars are purely destructive, but also establishes that this might only be applicable for high-intensity wars. The final conclusion is that, if wars might be inevitable, everything must be done to limit their intensity.

References

Abbas, Q. et al., 2011. Impact of Foreign Direct Investment on Gross Domestic Product. *Global Journal of Management and Business Research*, 11(8).

Acemoglu, D., Naidu, S., Restrepo, P. and Robinson, J., 2014. Democracy Does Cause Growth. *SSRN Electronic Journal*.

Alnasrawi, A., 1992. Iraq: Economic consequences of the 1991 Gulf war and future outlook. *Third World Quarterly*, 13(2), pp.335-352.

Azam, M., 2020. Does military spending stifle economic growth? The empirical evidence from non-OECD countries. *Heliyon*, 6(12).

Barbieri, K. and Levy, J., 1999. Sleeping with the Enemy: The Impact of War on Trade. *Journal of Peace Research*, 36(4), pp.463-479.

Barro, R., 2013. Inflation and Economic Growth. *Annals of Economics and Finance*, 14(1), pp.85-109.

BBC News. 2022. *IMF: Ukraine economy could shrink as much as 35%*. [online] Available at: <https://www.bbc.com/news/business-60743592> [Accessed 31 March 2022].

Bils, M. and Klenow, P., 2000. Does Schooling Cause Growth? *American Economic Review*, 90(5), pp.1160-1183.

Cann, J., 2006. Low-intensity conflict, insurgency, terrorism and revolutionary war. *Palgrave Advances in Modern Military History*, pp.107-130.

Cederman, L., 2003. Modeling the Size of Wars: From Billiard Balls to Sandpiles. *American Political Science Review*, 97(01), pp.135-150.

Centro Nacional de Memoria Historica. 2012. *Voxpopuli - ¡Basta ya! Colombia : memorias de guerra y dignidad*. [online] Available at: <http://www.centrodememoriahistorica.gov.co/micrositios/informeGeneral/estadisticas.html> [Accessed 26 January 2022].

Collier, P., 1999. On the economic consequences of civil war. *Oxford Economic Papers*, 51(1), pp.168-183.

Collier, P., et al., 2022. *Breaking the Conflict Trap: Civil War and Development Policy*. Washington DC: World Bank.

Cox, G. and Weingast, B., 2017. Executive Constraint, Political Stability and Economic Growth. *SSRN Electronic Journal*.

Data.worldbank.org. 2022. *World Bank Open Data | Data*. [online] Available at: https://data.worldbank.org/.

Dieppe et al., 2021. *Global Productivity: Trends, Drivers, and Policies*. Washington DC: World Bank [online] Available at: https://openknowledge.worldbank.org/.

Dupuy, K. and Rustad, S., 2018. *Trends in Armed Conflict, 1946–2017*. Oslo: PRIO.

Eagleton, C., 1933. *The Attempt to Define War*. LLC.

Elistia, E. and Syahzuni, B., 2018. The Correlation of the Human Development Index (HDI) towards Economic Growth (GDP per capita) in 10 ASEAN Member Countries. *JHSS (Journal of Humanities and Social Studies)*, 2(2), pp.40-46.

Feffer, J., 2016. *To end no wars*. [online] FPIF. Available at: <https://fpif.org/end-no-wars/> [Accessed 7 February 2022].

Fielding, D., 2004. How Does Violent Conflict Affect Investment Location Decisions? Evidence from Israel during the Intifada. *Journal of Peace Research*, 41(4), pp.465-484.

Fosu, A., 2002. Political Instability and Economic Growth: Implications of Coup Events in Sub-Saharan Africa. *American Journal of Economics and Sociology*, 61(1), pp.329-348.

Glick, R. and Taylor, A., 2010. Collateral Damage: Trade Disruption and the Economic Impact of War. *Review of Economics and Statistics*, 92(1), pp.102-127.

Gray, T. and Martin, B., 2008. *Comparing Wars*. University of Wollongong, Australia.

Guštin, T., 2021. Some aspects of the low-intensity conflict1. *Strategos*, 5(1), pp.219-241.

Hamilton, E., 1977. The Role of War in Modern Inflation. *The Journal of Economic History*, 37(1), pp.13-19.

Hayes, B., 2002. Statistics of Deadly Quarrels. *American Scientist*, 90(1), p.10.

Henderson, J., Squires, T., Storeygard, A. and Weil, D., 2017. The Global Distribution of Economic Activity: Nature, History, and the Role of Trade1. *The Quarterly Journal of Economics*, 133(1), pp.357-406.

Heuser, B., 2005. Wars since 1945. *Zeithistorische Forschungen*, 4(16).

Imai K. and Weinstein, J., 2000. "Measuring the Economic Impact of Civil War." CID Working Paper Series. 51, Harvard University, Cambridge, MA.

IANSA, Oxfam, and Saferworld, 2007. Africa's missing billions: International arms flows and the cost of conflict. [online] *Oxfam*. Available at: <https://oxfamilibrary.openrepository.com/bitstream/handle/10546/123908/bp-africas-missing-billions-111007-en.pdf?sequence=1> [Accessed 30 January 2022].

Jaffee, D., 1985. Export Dependence and Economic Growth: A Reformulation and Respecification. *Social Forces*, 64(1), p.102.

Jones, S. G., 2021. *The Future of Competition: U.S. Adversaries and the Growth of Irregular Warfare*. [online] Csis.org. Available at: <https://www.csis.org/analysis/future-competition-us-adversaries-and-growth-irregular-warfare> [Accessed 29 March 2022].

Kanbur, R., 2006. Chapter 26 The economics of international aid. *Handbook of the Economics of Giving, Altruism and Reciprocity*, pp.1559-1588.

Kang, S. and Meernik, J., 2005. Civil War Destruction and the Prospects for Economic Growth. *The Journal of Politics*, 67(1), pp.88-109.

Kanovsky, E. (1968). The Economic Aftermath of the Six Day War. *Middle East Journal*, *22*(2), 131–143.

Kant, I., 1795. *Perpetual Peace: A Philosophical Sketch*.

Kenton, W., 2021. *Economy*. [online] Investopedia. Available at: <https://www.investopedia.com/terms/e/economy.asp#:~:text=Key%20Takeaways-,An%20economy%20is%20the%20large%20set%20of%20inter%2Drelated%20production,living%20and%20operating%20within%20it> [Accessed 21 February 2022].

Koubi, V., 2005. War and Economic Performance. *Journal of Peace Research*, 42(1), pp.67-82.

Krastev, I. and Leonard, M., 2022. *The crisis of European security: What Europeans think about the war in Ukraine*. European Council on Foreign Relations.

Long, J., 2012. *What is War? A New Point of View*. [online] Small Wars Journal. Available at: <https://smallwarsjournal.com/jrnl/art/what-is-war-a-new-point-of-view> [Accessed 15 February 2022].

Lopez, H. and Wodon, Q., 2005. The Economic Impact of Armed Conflict in Rwanda. *Journal of African Economies*, 14(4), pp.586-602.

Magyar, K. P., 1993. Low-intensity Conflicts: A two worlds perspective. *Journal of Third World Studies*, 10(2), pp.377-397.

Mueller, H. and Tobias, J., 2016. The cost of violence: Estimating the economic impact of conflict. [online] London: *International Growth Center*. Available at: <https://www.theigc.org/wp-content/uploads/2016/12/IGCJ5023_Economic_Cost_of_Conflict_Brief_2211_v7_WEB.pdf> [Accessed 3 February 2022].

Mueller, J., 1989. The Obsolescence of Major War. *Bulletin of Peace Proposals*, 21(3), pp.321-328.

Murdoch, J. and Sandler, T., 2002. Economic Growth, Civil Wars, and Spatial Spill-overs. *Journal of Conflict Resolution*, 46(1), pp.91-110.

Neuenkirch, M. and Neumeier, F., 2015. The impact of UN and US economic sanctions on GDP growth. *European Journal of Political Economy*, 40, pp.110-125.

NZIER, 2022. Measuring the economy, *New Zealand Institute of Economic Research*. [online] Available at: <https://nzier.org.nz/about/economics-explained/measuring-the-economy/> [Accessed 21 February 2022].

OECD, 2022. *GDP and spending - Gross domestic product (GDP) - OECD Data*. [online] Available at: <https://data.oecd.org/gdp/gross-domestic-product-gdp.htm#:~:text=Gross%20domestic%20product%20(GDP)%20is,and%20services%20(less%20imports)> [Accessed 14 February 2022].

Our World in Data. 2017. Average years of schooling vs. GDP per capita. [online] Available at: <https://ourworldindata.org/grapher/average-years-of-schooling-vs-gdp-per-capita> [Accessed 31 January 2022].

Park, H. M., 2015. Linear Regression Models for Panel Data Using SAS, Stata, LIMDEP, and SPSS. [online] Available at: <https://scholarworks.iu.edu/dspace/handle/2022/19739> [Accessed 28 March 2022].

PERI, University of Massachusetts Amherst, 2008. *Alternative Estimates for Death Tolls*. Modern Conflict Database.

Phillips, B., 2015. Civil war, spill-over and neighbours' military spending. *Conflict Management and Peace Science*, 32(4), pp.425-442.

Plümper, T. and Neumayer, E., 2006. The Unequal Burden of War: The Effect of Armed Conflict on the Gender Gap in Life Expectancy. *International Organization*, 60(03).

Rasler, K. and Thompson, W., 1985. War Making and State Making: Governmental Expenditures, Tax Revenues, and Global Wars. *American Political Science Review*, 79(2), pp.491-507.

Ravichandran, s., 2011. *Non-State Conflict and the Transformation of War*. [online] E-International Relations. Available at: <https://www.e-ir.info/2011/08/29/non-state-conflict-and-the-transformation-of-war/> [Accessed 29 March 2022].

Rocco, L., Fumagalli, E., Mirelman, A. and Suhrcke, M., 2021. Mortality, morbidity and economic growth. *PLOS ONE*, 16(5), p.e0251424.

Ruiz, I. and Vargas-Silva, C., 2020. The impacts of refugee repatriation on receiving communities. *Journal of Economic Geography*, 21(2), pp.169-194.

Sarkees, Meredith Reid and Frank Wayman (2010). Resort to War: 1816 - 2007. *Washington DC: CQ Press*

Sevastianova, D., 2009. Impact of War on Country per Capita GDP: A Descriptive Analysis. *Peace Economics, Peace Science and Public Policy*, 15(1).

Smith, M., 2019. *The relationship between inflation and economic growth (GDP): an empirical analysis*. Msc. Ivory Research.

Smith, V., 1959. The Theory of Investment and Production. *The Quarterly Journal of Economics*, 73(1), p.61.

Sundström, J., 2014. War and its Spill-overs. *Master Thesis*. Uppsala University.

Thies, C. F. and Baum, C. F., 2020. The Effect of War on Economic Growth. *Cato Journal*, [online] Available at: <https://www.cato.org/cato-journal/winter-2020/effect-war-economic-growth#conclusion> [Accessed 21 February 2022].

UNCTAD. 2022. *Ukraine war cuts global growth prospects by 1%*. [online] Available at: <https://unctad.org/news/ukraine-war-cuts-global-growth-prospects-1> [Accessed 31 March 2022].

Vasquez, J. and Valeriano, B., 2010. Classification of Interstate Wars. *The Journal of Politics*, 72(2), pp.292-309.

Vijayaraghavan, M and Ward, W. A., 2001. Institutions and Economic Growth: Empirical Evidence for a Cross-National Analysis, Working Papers 112952*, Clemson University, Center for International Trade.*

Wright, Q., 1964. *A study of war*. Chicago: The University of Chicago Press.

Annexes

Annex 1 – Stata data preparation (code)

```
DATA PREPARATION
-------------------------------------------------------------------------------
destring Year, replace
destring Unemploymenttotaloftotal, generate(unemployment) force
drop Unemploymenttotaloftotal
destring AverageTotalYearsofSchooling, generate(schoolingyears) force
drop AverageTotalYearsofSchooling
drop CountryCode
encode WarCategorical, generate(war)
drop WarCategorical
encode StateofDemocracy, generate(democraticindex)
drop StateofDemocracy
encode RegionSubcontinent, generate(subcontinent)
drop RegionSubcontinent
encode Country, generate(country)
drop Country
replace NetInternationalAidReceived = 0 if (NetInternationalAidReceived >= .)
xtset country Year
-------------------------------------------------------------------------------


HAUSMAN TEST
-------------------------------------------------------------------------------
xtreg GDPcapitagrowthrate ib4.war, fe
estimates store fixed
xtreg GDPcapitagrowthrate ib4.war, re
estimates store random
hausman fixed random
-------------------------------------------------------------------------------
```

Annex 2 – Hausman test

```
. hausman fixed random

                 ---- Coefficients ----
             |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
             |     fixed        random       Difference       Std. err.
-------------+----------------------------------------------------------------
         war |
           1 |  -.0385586    -.0359022      -.0026564        .0066912
           2 |  -.0480126    -.0239337      -.0240789         .009132
           3 |  -.0108069     .0009419      -.0117488        .0086278
------------------------------------------------------------------------------
                          b = Consistent under H0 and Ha; obtained from xtreg.
           B = Inconsistent under Ha, efficient under H0; obtained from xtreg.

Test of H0: Difference in coefficients not systematic

    chi2(3) = (b-B)'[(V_b-V_B)^(-1)](b-B)
            =   8.33
Prob > chi2 = 0.0396
```

Annex 3 – Statistical base models

This showcases the basic method of working with every statistical model. In further annexes, only GDP per capita/War (categorical) and GDP per capita growth rate/War (categorical) will be shown, as they were the ones mainly used in the analysis.

GDP/War (binary)

```
Fixed-effects (within) regression               Number of obs     =      9,173
Group variable: country                         Number of groups  =        184

R-squared:                                      Obs per group:
     Within  = 0.0000                                         min =          8
     Between = 0.0031                                         avg =       49.9
     Overall = 0.0009                                         max =         61

                                                F(1,8988)         =       0.16
corr(u_i, Xb) = -0.0458                         Prob > F          =     0.6896

------------------------------------------------------------------------------
GDPcurrent~s | Coefficient  Std. err.      t    P>|t|     [95% conf. interval]
-------------+----------------------------------------------------------------
   Warbinary |    1.30e+10   3.25e+10     0.40   0.690    -5.07e+10    7.67e+10
       _cons |    1.93e+11   8.06e+09    23.96   0.000     1.77e+11    2.09e+11
-------------+----------------------------------------------------------------
     sigma_u |  6.654e+11
     sigma_e |  6.939e+11
         rho |  .47908966   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(183, 8988) = 54.74                  Prob > F = 0.0000
```

GDP growth rate/War (binary)

```
Fixed-effects (within) regression               Number of obs     =      8,982
Group variable: country                         Number of groups  =        184

R-squared:                                      Obs per group:
     Within  = 0.0014                                         min =          7
     Between = 0.0128                                         avg =       48.8
     Overall = 0.0002                                         max =         61

                                                F(1,8797)         =      12.72
corr(u_i, Xb) = -0.2381                         Prob > F          =     0.0004

------------------------------------------------------------------------------
GDPGrowthr~e | Coefficient  Std. err.      t    P>|t|     [95% conf. interval]
-------------+----------------------------------------------------------------
   Warbinary |   -.0294535   .0082598    -3.57   0.000    -.0456445   -.0132624
       _cons |    .0856541   .0020344    42.10   0.000     .0816662     .089642
-------------+----------------------------------------------------------------
     sigma_u |  .03057111
     sigma_e |  .17302975
         rho |   .0302713   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(183, 8797) = 1.32                   Prob > F = 0.0027
```

GDP/War (categorical)

```
Fixed-effects (within) regression               Number of obs     =      9,173
Group variable: country                         Number of groups  =        184

R-squared:                                      Obs per group:
     Within  = 0.0001                                         min =          8
     Between = 0.0000                                         avg =       49.9
     Overall = 0.0000                                         max =         61

                                                F(3,8986)         =       0.24
corr(u_i, Xb) = -0.0145                         Prob > F          =     0.8661

------------------------------------------------------------------------------------------------
              GDPcurrentUSdollars | Coefficient  Std. err.      t    P>|t|     [95% conf. interval]
----------------------------------+-------------------------------------------------------------
                              war |
              Full-Scale Conflict |  -5.05e+09   4.93e+10    -0.10   0.918    -1.02e+11    9.17e+10
Localized Large-Scale Conflict |  -1.24e+10   7.17e+10    -0.17   0.863    -1.53e+11    1.28e+11
           Low Intensity Conflict |   3.85e+10   4.71e+10     0.82   0.414    -5.38e+10    1.31e+11
                                  |
                            _cons |   1.93e+11   8.10e+09    23.77   0.000     1.77e+11    2.08e+11
----------------------------------+-------------------------------------------------------------
                          sigma_u |  6.653e+11
                          sigma_e |  6.939e+11
                              rho |  .47897426   (fraction of variance due to u_i)
------------------------------------------------------------------------------------------------
F test that all u_i=0: F(183, 8986) = 54.68                  Prob > F = 0.0000
```

GDP growth rate/War (categorical)

```
Fixed-effects (within) regression               Number of obs     =      8,982
Group variable: country                         Number of groups  =        184

R-squared:                                      Obs per group:
     Within  = 0.0020                                         min =          7
     Between = 0.0008                                         avg =       48.8
     Overall = 0.0008                                         max =         61

                                                F(3,8795)         =       5.89
corr(u_i, Xb) = -0.1676                         Prob > F          =     0.0005

------------------------------------------------------------------------------------------------
                    GDPGrowthrate | Coefficient  Std. err.      t    P>|t|     [95% conf. interval]
----------------------------------+-------------------------------------------------------------
                              war |
              Full-Scale Conflict |  -.0434956   .0126588    -3.44   0.001    -.0683098   -.0186814
Localized Large-Scale Conflict |  -.0476385   .0180924    -2.63   0.008    -.0831038   -.0121732
           Low Intensity Conflict |   -.010531   .0118952    -0.89   0.376    -.0338484    .0127864
                                  |
                            _cons |   .0852007   .0020445    41.67   0.000     .0811931    .0892084
----------------------------------+-------------------------------------------------------------
                          sigma_u |  .02994412
                          sigma_e |  .17300083
                              rho |  .02908753   (fraction of variance due to u_i)
------------------------------------------------------------------------------------------------
F test that all u_i=0: F(183, 8795) = 1.30                   Prob > F = 0.0048
```

GDP per capita/War (binary)

```
Fixed-effects (within) regression               Number of obs     =      9,170
Group variable: country                         Number of groups  =        184

R-squared:                                      Obs per group:
     Within  = 0.0002                                         min =          8
     Between = 0.0835                                         avg =       49.8
     Overall = 0.0238                                         max =         61

                                                F(1,8985)         =       1.77
corr(u_i, Xb) = 0.1968                          Prob > F          =     0.1829

------------------------------------------------------------------------------
GDPpercapita | Coefficient  Std. err.      t    P>|t|     [95% conf. interval]
-------------+----------------------------------------------------------------
  Warbinary |  -564.9637   424.1184    -1.33   0.183    -1396.332     266.405
      _cons |   6923.893   105.2556    65.78   0.000     6717.568    7130.218
-------------+----------------------------------------------------------------
    sigma_u |  8836.5236
    sigma_e |  9056.2429
        rho |  .48772207   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(183, 8985) = 49.88                  Prob > F = 0.0000
```

GDP per capita growth rate/War (binary)

```
Fixed-effects (within) regression               Number of obs     =      8,982
Group variable: country                         Number of groups  =        184

R-squared:                                      Obs per group:
     Within  = 0.0013                                         min =          7
     Between = 0.0002                                         avg =       48.8
     Overall = 0.0005                                         max =         60

                                                F(1,8797)         =      11.88
corr(u_i, Xb) = -0.1783                         Prob > F          =     0.0006

------------------------------------------------------------------------------
GDPcapitag~e | Coefficient  Std. err.      t    P>|t|     [95% conf. interval]
-------------+----------------------------------------------------------------
  Warbinary |  -.0277511   .0080509    -3.45   0.001    -.0435327   -.0119694
      _cons |   .0665082    .001983    33.54   0.000     .0626211    .0703952
-------------+----------------------------------------------------------------
    sigma_u |  .02886123
    sigma_e |  .16865461
        rho |  .02845102   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(183, 8797) = 1.20                   Prob > F = 0.0384
```

GDP per capita/War (categorical)

Fixed-effects (within) regression		Number of obs =	9,170
Group variable: **country**		Number of groups =	184
R-squared:		Obs per group:	
Within = **0.0002**		min =	8
Between = **0.0815**		avg =	49.8
Overall = **0.0231**		max =	61
		F(3,8983) =	0.63
corr(u_i, Xb) = **0.1927**		Prob > F =	0.5933

GDPpercapita	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
war						
Full-Scale Conflict	-677.2221	643.936	-1.05	0.293	-1939.483	585.0393
Localized Large-Scale Conflict	-289.9807	936.4467	-0.31	0.757	-2125.63	1545.668
Low Intensity Conflict	-569.2173	614.7516	-0.93	0.355	-1774.271	635.836
_cons	6923.779	105.8047	65.44	0.000	6716.378	7131.18
sigma_u	8836.3825					
sigma_e	9057.1871					
rho	.487662	(fraction of variance due to u_i)				

F test that all u_i=0: F(183, 8983) = 49.86 Prob > F = 0.0000

GDP per capita growth rate/War (categorical)

Fixed-effects (within) regression		Number of obs =	8,982
Group variable: **country**		Number of groups =	184
R-squared:		Obs per group:	
Within = **0.0018**		min =	7
Between = **0.0043**		avg =	48.8
Overall = **0.0012**		max =	60
		F(3,8795) =	5.42
corr(u_i, Xb) = **-0.1170**		Prob > F =	0.0010

GDPcapitagrowthrate	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
war						
Full-Scale Conflict	-.0385586	.0123391	-3.12	0.002	-.0627462	-.0143711
Localized Large-Scale Conflict	-.0480126	.0176355	-2.72	0.006	-.0825822	-.0134429
Low Intensity Conflict	-.0108069	.0115948	-0.93	0.351	-.0335355	.0119216
_cons	.0661046	.0019929	33.17	0.000	.0621982	.0700111
sigma_u	.02833046					
sigma_e	.16863191					
rho	.02744983	(fraction of variance due to u_i)				

F test that all u_i=0: F(183, 8795) = 1.17 Prob > F = 0.0622

Inflation/War (categorical)

```
Fixed-effects (within) regression               Number of obs     =      7,887
Group variable: country                         Number of groups  =        177

R-squared:                                      Obs per group:
     Within  = 0.0013                                         min =          8
     Between = 0.0074                                         avg =       44.6
     Overall = 0.0012                                         max =         61

                                                F(3,7707)         =       3.46
corr(u_i, Xb) = -0.0962                         Prob > F          =     0.0155
```

Inflationrateconsumerprices	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
war						
Full-Scale Conflict	.4376848	.302662	1.45	0.148	-.155615	1.030985
Localized Large-Scale Conflict	.8190828	.3843122	2.13	0.033	.0657264	1.572439
Low Intensity Conflict	.6134299	.2798949	2.19	0.028	.0647599	1.1621
_cons	.1855483	.0431351	4.30	0.000	.1009918	.2701047
sigma_u	.70715527					
sigma_e	3.3649552					
rho	.04229628	(fraction of variance due to u_i)				

GDP/Proximity to conflict

```
Fixed-effects (within) regression               Number of obs     =      9,170
Group variable: country                         Number of groups  =        184

R-squared:                                      Obs per group:
     Within  = 0.0001                                         min =          8
     Between = 0.1189                                         avg =       49.8
     Overall = 0.0401                                         max =         61

                                                F(1,8985)         =       0.56
corr(u_i, Xb) = -0.2900                         Prob > F          =     0.4546
```

GDPpercapita	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
Neighboringconflictspilloveri	259.9165	347.6054	0.75	0.455	-421.4694	941.3024
_cons	6795.084	130.5244	52.06	0.000	6539.226	7050.942
sigma_u	8901.6655					
sigma_e	9056.8553					
rho	.49135908	(fraction of variance due to u_i)				

```
F test that all u_i=0: F(183, 8985) = 48.22                  Prob > F = 0.0000
```

GDP per capita growth rate/Proximity to conflict

```
Fixed-effects (within) regression               Number of obs     =      8,982
Group variable: country                         Number of groups  =        184

R-squared:                                      Obs per group:
     Within  = 0.0011                                         min =          7
     Between = 0.0237                                         avg =       48.8
     Overall = 0.0011                                         max =         60

                                                F(1,8797)         =      10.11
corr(u_i, Xb) = -0.1412                         Prob > F          =     0.0015

------------------------------------------------------------------------------
 GDPcapitagrowthrate | Coefficient  Std. err.      t    P>|t|     [95% conf. interval]
---------------------+--------------------------------------------------------
Neighboringconflictspilloveri |  -.0211166   .0066396    -3.18   0.001    -.0341317   -.0081014
               _cons |   .0689775   .0024782    27.83   0.000     .0641196    .0738355
---------------------+--------------------------------------------------------
             sigma_u |  .02798127
             sigma_e |  .16867152
                 rho |  .02678311   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(183, 8797) = 1.16                  Prob > F = 0.0732
```

Annex 4 – Statistical models with correction

GDP per capita/War (categorical), Democratic index

```
Fixed-effects (within) regression               Number of obs     =      6,579
Group variable: country                         Number of groups  =        162

R-squared:                                      Obs per group:
     Within  = 0.0218                                         min =          8
     Between = 0.5109                                         avg =       40.6
     Overall = 0.2657                                         max =         46

                                                F(7,6410)         =      20.43
corr(u_i, Xb) = -0.7564                         Prob > F          =     0.0000
```

GDPpercapita	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
war						
Full-Scale Conflict	-809.7722	702.8979	-1.15	0.249	-2187.687	568.1424
Localized Large-Scale Conflict	-516.2662	980.3385	-0.53	0.598	-2438.057	1405.525
Low Intensity Conflict	-797.7152	707.1154	-1.13	0.259	-2183.898	588.4672
democraticindex						
Authoritarian Regime	7894.121	1029.422	7.67	0.000	5876.11	9912.132
Hybrid Regime	9041.308	1078.821	8.38	0.000	6926.457	11156.16
Mid-range performing democracy	10407.09	951.3691	10.94	0.000	8542.086	12272.09
Weak democracy	8300.368	1055.718	7.86	0.000	6230.807	10369.93
_cons	957.9896	849.8574	1.13	0.260	-708.015	2623.994
sigma_u	13598.829					
sigma_e	8473.2356					
rho	.72033873	(fraction of variance due to u_i)				

```
F test that all u_i=0: F(161, 6410) = 34.35                  Prob > F = 0.0000
```

GDP per capita growth rate/War (categorical), Democratic index

Fixed-effects (within) regression			Number of obs	=	6,526	
Group variable: country			Number of groups	=	162	
R-squared:			Obs per group:			
Within = 0.0038			min	=	7	
Between = 0.0014			avg	=	40.3	
Overall = 0.0012			max	=	46	
			F(7,6357)	=	3.51	
corr(u_i, Xb) = -0.3114			Prob > F	=	0.0009	

GDPcapitagrowthrate	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
war						
Full-Scale Conflict	-.0314904	.014109	-2.23	0.026	-.0591489	-.0038319
Localized Large-Scale Conflict	-.0735448	.0194765	-3.78	0.000	-.1117254	-.0353642
Low Intensity Conflict	-.0264972	.013911	-1.90	0.057	-.0537675	.0007731
democraticindex						
Authoritarian Regime	-.013712	.0203295	-0.67	0.500	-.0535647	.0261406
Hybrid Regime	-.027788	.0213077	-1.30	0.192	-.0695583	.0139823
Mid-range performing democracy	-.0142509	.0187712	-0.76	0.448	-.0510487	.022547
Weak democracy	-.0159452	.0208431	-0.77	0.444	-.0568048	.0249144
_cons	.0747038	.0167562	4.46	0.000	.041856	.1075516
sigma_u	.03161972					
sigma_e	.16664172					
rho	.03475259	(fraction of variance due to u_i)				

F test that all u_i=0: F(161, 6357) = 1.14 Prob > F = 0.1052

GDP per capita/War (categorical), Democratic index, HDI, Average years of schooling, Exports as a percentage of GDP

Fixed-effects (within) regression		Number of obs =	4,065
Group variable: country		Number of groups =	155
R-squared:		Obs per group:	
Within = 0.3307		min =	6
Between = 0.2684		avg =	26.2
Overall = 0.2820		max =	30
		F(10,3900) =	192.67
corr(u_i, Xb) = -0.2295		Prob > F =	0.0000

GDPpercapita	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
war						
Full-Scale Conflict	1397.1	729.287	1.92	0.055	-32.72007	2826.92
Localized Large-Scale Conflict	616.7508	1260.284	0.49	0.625	-1854.128	3087.63
Low Intensity Conflict	325.7936	684.5833	0.48	0.634	-1016.381	1667.969
schoolingyears	3062.014	180.1657	17.00	0.000	2708.786	3415.242
HDI	3588.351	3890.637	0.92	0.356	-4039.526	11216.23
democraticindex						
Authoritarian Regime	8588.893	1025.872	8.37	0.000	6577.598	10600.19
Hybrid Regime	7548.163	1034.121	7.30	0.000	5520.693	9575.633
Mid-range performing democracy	5532.005	882.6099	6.27	0.000	3801.584	7262.425
Weak democracy	5999.719	1001.411	5.99	0.000	4036.38	7963.058
ExportsaspercentageofGDP	15303.59	1013.448	15.10	0.000	13316.65	17290.53
_cons	-26499.6	1773.51	-14.94	0.000	-29976.7	-23022.51
sigma_u	12318.024					
sigma_e	5979.0922					
rho	.80931875	(fraction of variance due to u_i)				

F test that all u_i=0: F(154, 3900) = 41.56 Prob > F = 0.0000

GDP per capita growth rate/War (categorical), Democratic index, HDI, Average years of schooling, Exports as a percentage of GDP

```
Fixed-effects (within) regression               Number of obs     =      4,045
Group variable: country                         Number of groups  =        155

R-squared:                                      Obs per group:
     Within  = 0.0145                                         min =          6
     Between = 0.0012                                         avg =       26.1
     Overall = 0.0029                                         max =         30

                                                F(10,3880)        =       5.70
corr(u_i, Xb) = -0.5887                         Prob > F          =     0.0000
```

GDPcapitagrowthrate	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
war						
Full-Scale Conflict	-.0553054	.0207392	-2.67	0.008	-.0959662	-.0146445
Localized Large-Scale Conflict	-.1977479	.0356734	-5.54	0.000	-.2676883	-.1278075
Low Intensity Conflict	-.0285327	.0190911	-1.49	0.135	-.0659623	.0088969
schoolingyears	-.0060871	.0050678	-1.20	0.230	-.016023	.0038487
HDI	-.1036832	.1092711	-0.95	0.343	-.3179174	.1105511
democraticindex						
Authoritarian Regime	.0001755	.0287614	0.01	0.995	-.0562135	.0565645
Hybrid Regime	-.0258845	.0289877	-0.89	0.372	-.0827171	.030948
Mid-range performing democracy	.0061097	.0247245	0.25	0.805	-.0423645	.0545839
Weak democracy	-.0133347	.0280618	-0.48	0.635	-.0683519	.0416826
ExportsaspercentageofGDP	.0270287	.0285704	0.95	0.344	-.0289857	.083043
_cons	.1739029	.0498552	3.49	0.000	.0761581	.2716477
sigma_u	.05057232					
sigma_e	.1666844					
rho	.08429313	(fraction of variance due to u_i)				

```
F test that all u_i=0: F(154, 3880) = 1.43                  Prob > F = 0.0005
```

GDP per capita/War (categorical), Democratic index, HDI, Average years of schooling, Exports as a percentage of GDP, Net international aid received, FDI as a percentage of GDP (cumulative), Military expenditures as percentage of GDP

```
Fixed-effects (within) regression               Number of obs     =      3,656
Group variable: country                         Number of groups  =        150

R-squared:                                      Obs per group:
     Within  = 0.3367                                         min =          4
     Between = 0.2696                                         avg =       24.4
     Overall = 0.2790                                         max =         30

                                                F(13,3493)        =     136.36
corr(u_i, Xb) = -0.1412                         Prob > F          =     0.0000
```

GDPpercapita	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
war						
Full-Scale Conflict	2493.953	786.66	3.17	0.002	951.5932	4036.313
Localized Large-Scale Conflict	724.1015	1324.029	0.55	0.584	-1871.847	3320.05
Low Intensity Conflict	776.6063	669.1567	1.16	0.246	-535.3713	2088.584
schoolingyears	2694.934	178.6659	15.08	0.000	2344.634	3045.235
HDI	5733.483	3853.428	1.49	0.137	-1821.715	13288.68
ExportsaspercentageofGDP	9183.947	1095.879	8.38	0.000	7035.319	11332.58
FDIcumulativeofGDPcumulat	20449.05	3154.313	6.48	0.000	14264.57	26633.54
democraticindex						
Authoritarian Regime	7947.13	965.8879	8.23	0.000	6053.368	9840.892
Hybrid Regime	7122.24	973.1177	7.32	0.000	5214.304	9030.177
Mid-range performing democracy	5767.3	813.5472	7.09	0.000	4172.224	7362.376
Weak democracy	5918.705	934.5915	6.33	0.000	4086.304	7751.105
NetInternationalAidReceived	-7.84e-07	1.68e-07	-4.67	0.000	-1.11e-06	-4.55e-07
MilitarySpendingaspercentage	-26469.76	4465.33	-5.93	0.000	-35224.68	-17714.84
_cons	-22549	1746.346	-12.91	0.000	-25972.96	-19125.04
sigma_u	12810.561					
sigma_e	5507.3971					
rho	.84400778	(fraction of variance due to u_i)				

F test that all u_i=0: F(149, 3493) = 48.93 Prob > F = 0.0000

GDP per capita growth rate/War (categorical), Democratic index, HDI, Average years of schooling, Exports as a percentage of GDP, Net international aid received, FDI as a percentage of GDP (cumulative), Military expenditures as percentage of GDP

```
Fixed-effects (within) regression               Number of obs     =      3,646
Group variable: country                         Number of groups  =        150

R-squared:                                      Obs per group:
     Within  = 0.0174                                         min =          4
     Between = 0.0014                                         avg =       24.3
     Overall = 0.0047                                         max =         30

                                                F(13,3483)        =       4.75
corr(u_i, Xb) = -0.6936                         Prob > F          =     0.0000
```

GDPcapitagrowthrate	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
war						
Full-Scale Conflict	-.0672438	.0217629	-3.09	0.002	-.1099131	-.0245745
Localized Large-Scale Conflict	-.1270901	.0363057	-3.50	0.000	-.1982727	-.0559075
Low Intensity Conflict	.0027067	.0183521	0.15	0.883	-.0332753	.0386887
schoolingyears	-.0045774	.0049218	-0.93	0.352	-.0142273	.0050724
HDI	-.1641902	.1060398	-1.55	0.122	-.3720967	.0437162
ExportsaspercentageofGDP	.0642625	.0303641	2.12	0.034	.0047294	.1237957
FDIcumulativeofGDPcumulat	-.0701726	.0868984	-0.81	0.419	-.2405497	.1002044
democraticindex						
Authoritarian Regime	.0065317	.026598	0.25	0.806	-.0456176	.058681
Hybrid Regime	-.0146272	.0267864	-0.55	0.585	-.0671458	.0378915
Mid-range performing democracy	.0052854	.0224148	0.24	0.814	-.038662	.0492328
Weak democracy	.0030402	.0257436	0.12	0.906	-.0474339	.0535144
NetInternationalAidReceived	8.70e-12	4.60e-12	1.89	0.059	-3.16e-13	1.77e-11
MilitarySpendingaspercentage	-.4179932	.1225064	-3.41	0.001	-.6581848	-.1778015
_cons	.1874184	.0481865	3.89	0.000	.0929418	.281895
sigma_u	.05452888					
sigma_e	.15101018					
rho	.11534873	(fraction of variance due to u_i)				

```
F test that all u_i=0: F(149, 3483) = 1.14                   Prob > F = 0.1266
```

GDP per capita growth rate/Proximity to conflict, Democratic index, HDI, Average years of schooling, Exports as a percentage of GDP, Net international aid received, FDI as a percentage of GDP (cumulative), Military expenditures as percentage of GDP

```
Fixed-effects (within) regression               Number of obs     =      3,646
Group variable: country                         Number of groups  =        150

R-squared:                                      Obs per group:
     Within  = 0.0166                                         min =          4
     Between = 0.0022                                         avg =       24.3
     Overall = 0.0041                                         max =         30

                                                F(11,3485)        =       5.35
corr(u_i, Xb) = -0.6832                         Prob > F          =     0.0000
```

GDPcapitagrowthrate	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
Neighboringconflictspilloveri	-.0440573	.0101786	-4.33	0.000	-.064014	-.0241007
schoolingyears	-.0058562	.0048689	-1.20	0.229	-.0154023	.0036899
HDI	-.1271681	.1033922	-1.23	0.219	-.3298834	.0755473
ExportsaspercentageofGDP	.0490173	.0303645	1.61	0.107	-.0105167	.1085513
FDIcumulativeofGDPcumulat	-.0765296	.08689	-0.88	0.379	-.24689	.0938308
democraticindex						
Authoritarian Regime	.017581	.026695	0.66	0.510	-.0347584	.0699203
Hybrid Regime	-.0013067	.026844	-0.05	0.961	-.0539383	.0513249
Mid-range performing democracy	.0076691	.0224266	0.34	0.732	-.0363016	.0516398
Weak democracy	.0066689	.0257477	0.26	0.796	-.0438133	.057151
NetInternationalAidReceived	9.08e-12	4.57e-12	1.98	0.047	1.10e-13	1.80e-11
MilitarySpendingaspercentage	-.5083898	.120376	-4.22	0.000	-.7444045	-.2723751
_cons	.1821416	.0471212	3.87	0.000	.0897536	.2745296
sigma_u	.05309551					
sigma_e	.15102914					
rho	.10999807	(fraction of variance due to u_i)				

```
F test that all u_i=0: F(149, 3485) = 1.16                   Prob > F = 0.0971
```

Annex 5 – Extra Bibliography: Data sources for the War variables, sorted by country

General Remarks about the war data	*Total war duration has been calculated as the total amount of months between the onset of hostilities and their ending, or until january 2021*	*Conflicts are required to have lasted at least for 6 months and to have made at least 1000 casualties in a calendar year. They're only counted for the countries where they physically took place.*	*Casualty estimates are to be a proxy of destruction. For simplification purposes, only deaths are counted as casualties. They use the most recent data available (which means that it can include 2021 figures). They are rough estimates and should be treated as such.*
Country	**Sources on War duration**	**Additional notes**	**Sources on Casualties**
Afghanistan	https://en.wikipedia.org/wiki/Afghanistan_conflict_(1978%E2%80%93present)	https://adst.org/2016/04/the-saur-revolution-prelude-to-the-soviet-invasion-of-afghanistan/	https://en.wikipedia.org/wiki/Afghanistan_conflict_(1978%E2%80%93present)
	https://www.npr.org/2021/08/19/1028472005/afghanistan-conflict-timeline?t=1636206957797		
Angola	https://www.jstor.org/stable/10.7249/j.ctt5hhsjk.29?seq=1#metadata_info_tab_contents	https://en.wikipedia.org/wiki/Angolan_War_of_Independence	https://web.archive.org/web/20110720091321/http://www.peri.umass.edu/fileadmin/pdf/dpe/modern_conflicts/death_tolls.pdf
	https://en.wikipedia.org/wiki/Angolan_Civil_War		
	https://peri.umass.edu/fileadmin/pdf/Angola.pdf		
Armenia	https://en.wikipedia.org/wiki/First_Nagorno-Karabakh_War		https://omnilogos.com/civil-war-azerbaijan-and-nagorno-karabakh-republic-1992-1994/
	https://en.wikipedia.org/wiki/2020_Nagorno-Karabakh_war		
Azerbaijan	https://en.wikipedia.org/wiki/First_Nagorno-Karabakh_War		https://omnilogos.com/civil-war-azerbaijan-and-nagorno-karabakh-republic-1992-1994/
	https://en.wikipedia.org/wiki/2020_Nagorno-Karabakh_war		
Burundi	https://www-jstor-org.proxy-ub.rug.nl/stable/20648907?seq=2#metadata_info_tab_contents		https://web.archive.org/web/20110720091321/http://www.peri.umass.edu/fileadmin/pdf/dpe/modern_conflicts/death_tolls.pdf

Bangladesh	https://spsindia.in/wp-content/uploads/2016/02/SPS-Insight-4-2015.pdf		https://en.wikipedia.org/wiki/Chittagong_Hill_Tracts_conflict
	https://en.wikipedia.org/wiki/1972%E2%80%931975_Bangladesh_insurgency		https://en.wikipedia.org/wiki/1972%E2%80%931975_Bangladesh_insurgency
	https://en.wikipedia.org/wiki/Bangladesh_Liberation_War		https://www.bbc.com/news/world-asia-16207201
Bosnia and Herzegovina	https://en.wikipedia.org/wiki/Yugoslav_Wars		https://web.archive.org/web/20110720091321/http://www.peri.umass.edu/fileadmin/pdf/dpe/modern_conflicts/death_tolls.pdf
Central African Republic	https://www.ohchr.org/Documents/Countries/CF/Mapping2003-2015/2017CAR_Mapping_Report_FR.pdf		https://en.wikipedia.org/wiki/Central_African_Republic_Civil_War
China			China has had some wars, but not on its own territory
Côte d'Ivoire	https://www.blackpast.org/global-african-history/events-global-african-history/second-ivorian-civil-war-2010-2011/		https://en.wikipedia.org/wiki/Second_Ivorian_Civil_War
Cameroon	https://www.editionsladecouverte.fr/la_guerre_du_cameroun-9782707192141	This war started in 1955. It is taken into the dataset because it spilled well into the 60s	
Dem. Rep. Congo	https://en.wikipedia.org/wiki/Congo_Crisis		https://web.archive.org/web/20110720091321/http://www.peri.umass.edu/fileadmin/pdf/dpe/modern_conflicts/death_tolls.pdf
	http://news.bbc.co.uk/2/hi/africa/8471147.stm		
	https://en.wikipedia.org/wiki/First_Congo_War		
	https://en.wikipedia.org/wiki/Second_Congo_War		
	https://en.wikipedia.org/wiki/Kamwina_Nsapu_rebellion		
Rep. Congo	https://en.wikipedia.org/wiki/Republic_of_the_Congo_Civil_War_(1993%E2%80%931994)		https://en.wikipedia.org/wiki/Republic_of_the_Congo_Civil_War_(1993%E2%80%931994)

	https://en.wikipedia.org/wiki/Republic_of_the_Congo_Civil_War_(1997%E2%80%931999)		https://en.wikipedia.org/wiki/Republic_of_the_Congo_Civil_War_(1997%E2%80%931999)
Colombia	https://en.wikipedia.org/wiki/Colombian_conflict		https://www.cfr.org/backgrounder/colombias-civil-conflict
			http://www.centrodememoriahistorica.gov.co/micrositios/informeGeneral/estadisticas.html
Cyprus	https://uca.edu/politicalscience/dadm-project/europerussiacentral-asia-region/cyprus-1960-present/	Cyprus data is only sufficient from 1975. This war has taken place mostly before that date.	Only the conflict cases were counted as war (as it was a mostly diplomatic crisis outside of those)
Dominican Republic	https://liberalarts.utexas.edu/hemispheres/_files/pdf/newsletters/cold_war_docs/DominicanCrisis.pdf		https://en.wikipedia.org/wiki/Dominican_Civil_War
Algeria	https://www.larousse.fr/encyclopedie/divers/guerre_d_Alg%C3%A9rie/104808		
	https://journals.sagepub.com/doi/full/10.1177/2347798919889781		
Eritrea	https://www.newworldencyclopedia.org/entry/Eritrean_War_of_Independence		https://en.wikipedia.org/wiki/Eritrean_War_of_Independence
	https://en.wikipedia.org/wiki/Eritrean_Civil_Wars#First_Civil_War		https://en.wikipedia.org/wiki/Eritrean_War_of_Independence
	https://core.ac.uk/download/pdf/232767004.pdf		https://core.ac.uk/download/pdf/232767004.pdf
Egypt	https://www.jstor.org/stable/2535528		https://www.ynetnews.com/articles/0,7340,L-3611617,00.html
Ethiopia	https://www.newworldencyclopedia.org/entry/Eritrean_War_of_Independence		
	https://core.ac.uk/download/pdf/232767004.pdf		https://core.ac.uk/download/pdf/232767004.pdf
	https://warwick.ac.uk/fac/arts/history/students/modules/hi277/programme/t2w13/hi277_tareke.pdf		https://en.wikipedia.org/wiki/Ogaden_War
	https://historica.fandom.com/wiki/Ethiopian_Civil_War		
	https://en.wikipedia.org/wiki/Tigray_War		

Georgia	https://en.wikipedia.org/wiki/Georgian_Civil_War		https://www.manchesteropenhive.com/downloadpdf/9781526137586/9781526137586.00012.pdf
Guinea-Bissau	https://www.jstor.org/stable/4185371		https://en.wikipedia.org/wiki/Guinea-Bissau_War_of_Independence
	https://fr.wikipedia.org/wiki/Guerre_civile_de_Guin%C3%A9e-Bissau		
Guatemala	https://www.jstor.org/stable/23616030		https://en.wikipedia.org/wiki/Guatemalan_Civil_War
Croatia	https://en.wikipedia.org/wiki/Croatian_War_of_Independence		https://web.archive.org/web/20110720091321/http://www.peri.umass.edu/fileadmin/pdf/dpe/modern_conflicts/death_tolls.pdf
Indonesia	https://en.wikipedia.org/wiki/Papua_conflict		https://books.google.nl/books?id=iDg9oAkwsXAC&pg=PA287&redir_esc=y#v=onepage&q&f=false
India	https://en.wikipedia.org/wiki/Insurgency_in_Punjab		https://journals.lib.unb.ca/index.php/jcs/article/view/4293/4888
	https://www.jstor.org/stable/2539071		
	https://en.wikipedia.org/wiki/Insurgency_in_Northeast_India		
	https://www.justice.gov/sites/default/files/eoir/legacy/2014/02/25/India_Maoist.pdf		
Iran	https://en.wikipedia.org/wiki/1974%E2%80%9375_Shatt_al-Arab_conflict		
	https://www.proquest.com/docview/1953856986		
	https://en.wikipedia.org/wiki/Iran%E2%80%93Iraq_War		https://www.globalsecurity.org/military/world/war/iran-iraq-7.htm
Iraq	https://en.wikipedia.org/wiki/First_Iraqi%E2%80%93Kurdish_War		https://uca.edu/politicalscience/dadm-project/middle-eastnorth-africapersian-gulf-region/iraqkurds-1932-present/
	https://en.wikipedia.org/wiki/Second_Iraqi%E2%80%93Kurdish_War		http://www.war-memorial.net/wars_all.asp
	https://en.wikipedia.org/wiki/1974%E2%80%9375_Shatt_al-Arab_conflict		
	https://en.wikipedia.org/wiki/Iran%E2%80%93Iraq_War		https://www.globalsecurity.org/military/world/war/iran-iraq-7.htm

	https://www.statewatch.org/media/documents/cia/documents/medact-Iraq-report-collateral-damage.pdf	An exception for the required duration is made for the Gulf war as it was particularly destructive	https://www.statewatch.org/media/documents/cia/documents/medact-Iraq-report-collateral-damage.pdf
	https://en.wikipedia.org/wiki/1991_Iraqi_uprisings		https://www.statewatch.org/media/documents/cia/documents/medact-Iraq-report-collateral-damage.pdf
	https://en.wikipedia.org/wiki/Iraqi_Kurdish_Civil_War		https://halldulivre.com/ebook/9781137034083-iraqi-kurds-and-nation-building-mohammed-m-a-ahmed/
	https://en.wikipedia.org/wiki/1998_bombing_of_Iraq	(Considered part of the Iraq war)	
	https://en.wikipedia.org/wiki/Iraq_War		https://web.archive.org/web/20150907130701/http://brusselstribunal.org/pdf/lancet111006.pdf
	https://en.wikipedia.org/wiki/Iraqi_insurgency_(2011%E2%80%932013)		
	https://en.wikipedia.org/wiki/War_in_Iraq_(2013%E2%80%932017)		
	https://en.wikipedia.org/wiki/Islamic_State_insurgency_in_Iraq_(2017%E2%80%93present)		
Israel		Israel's wars were mostly fought on Egyptian and Palestine territory, and thus count only for those countries	
Jordan	https://en.wikipedia.org/wiki/Black_September		
Kenya	https://www.jstor.org/stable/23353682		https://en.wikipedia.org/wiki/Shifta_War
Cambodia	https://en.wikipedia.org/wiki/Cambodian_Civil_War		https://lib.ugent.be/nl/catalog/rug01:000361432
	https://en.wikipedia.org/wiki/Cambodian_genocide		https://www.nap.edu/read/10086/chapter/7#124
	https://en.wikipedia.org/wiki/Cambodian%E2%80%93Vietnamese_War		
Kuwait	https://www.statewatch.org/media/documents/cia/documents/medact-Iraq-report-collateral-damage.pdf	https://en.wikipedia.org/wiki/Invasion_of_Kuwait	https://www.statewatch.org/media/documents/cia/documents/medact-Iraq-report-collateral-damage.pdf
Laos	https://en.wikipedia.org/wiki/Laotian_Civil_War		https://www.newworldencyclopedia.org/entry/Laotian_Civil_War

Lebanon	https://en.wikipedia.org/wiki/Lebanese_Civil_War		https://web.archive.org/web/20110720091321/http://www.peri.umass.edu/fileadmin/pdf/dpe/modern_conflicts/death_tolls.pdf
Liberia	https://www.jstor.org/stable/26382621		https://en.wikipedia.org/wiki/First_Liberian_Civil_War
	https://en.wikipedia.org/wiki/Second_Liberian_Civil_War		
Libya	https://en.wikipedia.org/wiki/First_Libyan_Civil_War		https://www.reuters.com/article/us-libya-un-deaths-idUSTRE7584UY20110609
	https://en.wikipedia.org/wiki/Second_Libyan_Civil_War		
Sri Lanka	https://en.wikipedia.org/wiki/Sri_Lankan_Civil_War		https://www.reuters.com/article/sri-lanka-rights-un-idUSKBN2BF1DF
Moldova	https://studenttheses.universiteitleiden.nl/access/item%3A2627078/view		https://en.wikipedia.org/wiki/Transnistria_War
Mexico	https://en.wikipedia.org/wiki/Mexican_drug_war		https://www.vaticannews.va/en/world/news/2021-04/mexico-drug-war-85000-victims-governement-report.html
North Macedonia	https://archive.org/details/macedonia00john/page/161	The Yugoslavia war of 1991-1992 did not take place on Macedonian territory	
Myanmar	https://en.wikipedia.org/wiki/Internal_conflict_in_Myanmar		https://web.archive.org/web/20110720091321/http://www.peri.umass.edu/fileadmin/pdf/dpe/modern_conflicts/death_tolls.pdf
Mozambique	https://en.wikipedia.org/wiki/Mozambican_War_of_Independence		https://web.archive.org/web/20110720091321/http://www.peri.umass.edu/fileadmin/pdf/dpe/modern_conflicts/death_tolls.pdf
	https://en.wikipedia.org/wiki/Mozambican_Civil_War		
	https://en.wikipedia.org/wiki/Insurgency_in_Cabo_Delgado		
Malaysia	https://en.wikipedia.org/wiki/Malayan_Emergency		
Namibia	https://en.wikipedia.org/wiki/South_African_Border_War		https://web.archive.org/web/20161110230352/https://repository.unam.edu.na/bitstream/handle/11070/732/waking%20the%20deadocr.pdf?sequence=1
Nigeria	https://www-jstor-org.proxy-ub.rug.nl/stable/2613824?seq=11#metadata_info_tab_contents		https://munuc.org/committees/united-nations-security-council/

	https://en.wikipedia.org/wiki/Boko_Haram_insurgency		https://www.reuters.com/world/africa/northeast-nigeria-insurgency-has-killed-almost-350000-un-2021-06-24/
Nicaragua	https://en.wikipedia.org/wiki/Nicaraguan_Revolution		https://en.wikipedia.org/wiki/Nicaraguan_Revolution
Nepal	https://en.wikipedia.org/wiki/Nepalese_Civil_War		https://reliefweb.int/report/nepal/17800-people-died-during-conflict-period-says-ministry-peace
Oman	https://en.wikipedia.org/wiki/Dhofar_Rebellion		https://en.wikipedia.org/wiki/Dhofar_Rebellion
Pakistan	https://en.wikipedia.org/wiki/Insurgency_in_Balochistan	With exception of the Bangladesh Liberation war, the Indo-Pakistani wars have been discounted because of their short durations,	http://www.europe-solidaire.org/spip.php?article4120
	https://en.wikipedia.org/wiki/Insurgency_in_Khyber_Pakhtunkhwa		https://watson.brown.edu/costsofwar/files/cow/imce/papers/2016/War%20in%20Afghanistan%20and%20Pakistan%20UPDATE_FINAL_corrected%20date.pdf
Peru	https://books.google.fm/books?id=_vOEi4Xf5FMC&printsec=frontcover#v=onepage&q&f=false		https://rpp.pe/peru/actualidad/grafico-que-fue-la-cvr-y-que-dijo-su-informe-final-noticia-990203
Philipines	https://www.eastwestcenter.org/publications/moro-conflict-landlessness-and-misdirected-state-policies		https://web.archive.org/web/20110720091321/http://www.peri.umass.edu/fileadmin/pdf/dpe/modern_conflicts/death_tolls.pdf
	https://ploughshares.ca/pl_armedconflict/philippines-cppnpa-1969-first-combat-deaths/		
Papua New Guinea	https://en.wikipedia.org/wiki/Bougainville_conflict		https://www.aph.gov.au/parliamentary_business/committees/house_of_representatives_committees?url=jfadt/bougainville/bv_chap2.pdf
West Bank and Gaza	https://en.wikipedia.org/wiki/First_Intifada		https://www.btselem.org/statistics/first_intifada_tables

	https://en.wikipedia.org/wiki/Second_Intifada		https://web.archive.org/web/20070703195937/http://212.150.54.123/casualties_project/stats_page.cfm
Russia	https://en.wikipedia.org/wiki/First_Chechen_War		https://web.archive.org/web/20110720091321/http://www.peri.umass.edu/fileadmin/pdf/dpe/modern_conflicts/death_tolls.pdf
	https://en.wikipedia.org/wiki/First_Chechen_War		
Rwanda	https://en.wikipedia.org/wiki/Rwandan_Civil_War		https://medialibrary.uantwerpen.be/oldcontent/container2143/files/Publications/Annuaire/1996-1997/10-Reyntjens.pdf
Sudan	https://www.blackpast.org/global-african-history/events-global-african-history/first-sudanese-civil-war-1955-1972/		https://www.blackpast.org/global-african-history/events-global-african-history/first-sudanese-civil-war-1955-1972/
	https://en.wikipedia.org/wiki/Second_Sudanese_Civil_War		https://web.archive.org/web/20110720091321/http://www.peri.umass.edu/fileadmin/pdf/dpe/modern_conflicts/death_tolls.pdf
	https://en.wikipedia.org/wiki/War_in_Darfur		https://web.archive.org/web/20110720091321/http://www.peri.umass.edu/fileadmin/pdf/dpe/modern_conflicts/death_tolls.pdf
Sierra Leone	https://www.jstor.org/stable/26382621		http://web.undp.org/evaluation/documents/thematic/conflict/SierraLeone.pdf
El Salvador	https://en.wikipedia.org/wiki/Salvadoran_Civil_War		http://www.derechos.org/nizkor/salvador/informes/truth.html
Somalia	https://web.archive.org/web/20110720091321/http://www.peri.umass.edu/fileadmin/pdf/dpe/modern_conflicts/death_tolls.pdf		https://web.archive.org/web/20110720091321/http://www.peri.umass.edu/fileadmin/pdf/dpe/modern_conflicts/death_tolls.pdf
Serbia	https://en.wikipedia.org/wiki/Yugoslav_Wars	Serbian death toll is very difficult to estimate. Total Yugoslavian death toll was used instead.	https://www.ictj.org/publication/transitional-justice-former-yugoslavia
South Sudan	https://en.wikipedia.org/wiki/South_Sudanese_Civil_War		https://www.reuters.com/article/us-southsudan-unrest-toll/study-estimates-190000-people-killed-in-south-sudans-civil-war-idUSKCN1M626R
	https://en.wikipedia.org/wiki/Second_Sudanese_Civil_War		https://web.archive.org/web/20110720091321/http://www.peri.umass.edu/fileadmin/pdf/dpe/modern_conflicts/death_tolls.pdf
Syria	https://en.wikipedia.org/wiki/Islamist_uprising_in_Syria		https://www.npr.org/2012/02/01/146235292/30-years-later-photos-emerge-from-killings-in-syria
	https://en.wikipedia.org/wiki/Syrian_civil_war		https://www.syriahr.com/en/217360/

Chad	https://en.wikipedia.org/wiki/Chadian%E2%80%93Libyan_conflict		https://en.wikipedia.org/wiki/Chadian%E2%80%93Libyan_conflict
	https://en.wikipedia.org/wiki/Chadian_Civil_War_(2005%E2%80%932010)		https://web.archive.org/web/20110720091321/http://www.peri.umass.edu/fileadmin/pdf/dpe/modern_conflicts/death_tolls.pdf
Tajikistan	https://en.wikipedia.org/wiki/Tajikistani_Civil_War		https://web.archive.org/web/20110720091321/http://www.peri.umass.edu/fileadmin/pdf/dpe/modern_conflicts/death_tolls.pdf
Timor-Leste	https://www.jstor.org/stable/27908293		https://web.archive.org/web/20110720091321/http://www.peri.umass.edu/fileadmin/pdf/dpe/modern_conflicts/death_tolls.pdf
Turkey	https://web.archive.org/web/20110720091321/http://www.peri.umass.edu/fileadmin/pdf/dpe/modern_conflicts/death_tolls.pdf		https://web.archive.org/web/20110720091321/http://www.peri.umass.edu/fileadmin/pdf/dpe/modern_conflicts/death_tolls.pdf
Uganda	https://en.wikipedia.org/wiki/Lord%27s_Resistance_Army_insurgency		https://ploughshares.ca/pl_armedconflict/uganda-1987-2010/#Deaths
	https://en.wikipedia.org/wiki/Uganda%E2%80%93Tanzania_War		
	https://en.wikipedia.org/wiki/Ugandan_Bush_War		https://www.amazon.com/Uganda-Tarnished-Africa-Nations-Modern/dp/0813337240
Ukraine	https://en.wikipedia.org/wiki/Russo-Ukrainian_War		https://www.ohchr.org/Documents/Countries/UA/29thReportUkraine_EN.pdf
Vietnam	https://en.wikipedia.org/wiki/Vietnam_War		http://www.hawaii.edu/powerkills/SOD.TAB6.1B.GIF
	https://en.wikipedia.org/wiki/Sino-Vietnamese_conflicts_(1979%E2%80%931991)		https://books.google.nl/books?id=vY4tBfqGvZ4C&pg=PA114&redir_esc=y#v=onepage&q&f=false
Kosovo	http://www.kosovomemorybook.org/wp-content/uploads/2015/02/Expert_Evaluation_of_Kosovo_Memory_Book_Database_Prishtina_04_02_2015.pdf		http://www.kosovomemorybook.org/wp-content/uploads/2015/02/Expert_Evaluation_of_Kosovo_Memory_Book_Database_Prishtina_04_02_2015.pdf
Yemen	https://en.wikipedia.org/wiki/North_Yemen_Civil_War		https://web.archive.org/web/20120320134414/http://www.humansecuritygateway.com/documents/WINEP_YemensWarOnTerror.pdf
	https://en.wikipedia.org/wiki/Houthi_insurgency_in_Yemen#Phase_1:_June.E2.80.93September_2004		https://books.google.nl/books?id=Sj81Eaxz-2kC&q=Regime+and+Periphery+in+Northern+Yemen:+The+Huthi+Phenomenon&redir_esc=y
	https://en.wikipedia.org/wiki/Yemeni_Civil_War_(2014%E2%80%93present)		https://news.un.org/en/story/2020/12/1078972
Zimb	https://en.wikipedia.org/wiki/Rhodesian_Bush_War		https://www.globalsecurity.org/military/world/war/zimbabwe.htm

ab we			
	https://en.wikipedia.org/wiki/Gukurahundi		https://www.goodreads.com/book/show/830311.Battle_for_Zimbabwe