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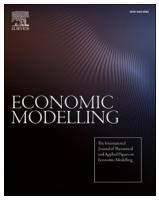

Economic and social impacts of conflict: A cross-country analysis

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ABSTRACT

It is important to understand how conflicts within or between countries impact national economic and social development pathways, requiring policymakers to design effective mechanisms to counter the regressive effects of conflict. We explored the relationships between conflict and different types of development outcomes: economic growth, life expectancy, and educational attainment. We applied a dynamic fixed effects estimator to an autoregressive distributed lag model using 1996–2019 panel data for 109 countries. This method enabled us to identify the different short- and long-term effects of conflict on development by mitigating the endogenous effects of the variables. Subsample analyses according to the income levels of countries produced interesting results: the higher a country's income level, the less significant the negative effects of conflict on its development.

1. Introduction

In recent decades, the number of conflict-related deaths (both military and civilian) has fluctuated, but, on average, has risen since the early 2000s (Novta and Pugacheva, 2021), giving the impression that the world is experiencing continual manmade chaos. The deadly conflicts in the Middle East, particularly in Afghanistan, Iraq, and Syria, and a greater number of less-deadly conflicts (mostly civil conflicts within states) reflect the growing discontent among world populations (Pettersson et al., 2021). Historical evidence shows that conflict causes enormous human suffering and has substantial economic and social costs (Rodrik, 1999) due to the loss of human life, destruction of infrastructure, disruption of the labor force and human capital, weakening of government institutions, political instability, and increased uncertainty. The effects of these losses persist for years in the aftermath of conflicts, making it difficult for affected populations to escape the "conflict trap" (Cerra and Saxena, 2008). This study focused on analyzing the socioeconomic costs of conflict.

The extant literature on conflict and development is nascent in terms of theoretical design and robust empirical implementation. Most qualitative papers only discuss observable trends based on descriptive statistics; the empirical approaches are somewhat simplistic, using methods such as pooled ordinary least squares (OLS), fixed effects, and instrumental variables (IV) regressions; and many of them focus on topics such as "resource curses" (i.e., oil; Jalili et al., 2019) or conflicts' effects on economic factors, including income, consumption, investment, trade, and financial markets (Amodio and Di Maio, 2018; Fang et al., 2020; Novta and Pugacheva, 2021). Currently, few studies have considered the social impacts of conflict, except for Novta and Pugacheva (2021) regarding the number of refugees seeking shelter in neighboring countries and Akresh et al. (2012) regarding adult status in Nigeria. Most studies in this field have been based on national case studies, limiting their generalization to other countries.

Another shortcoming of the literature is that the traditional criterion used to classify whether a country has experienced a major conflict has been the absolute number of battle-related deaths (usually 1000 people killed; Blattman and Miguel, 2010). Thousands of people being killed in a conflict within a single year certainly constitutes a major incident. In terms of macroeconomic impact evaluation, a conflict that claims the lives of 1000 people may not have serious macroeconomic implications in a densely populated country; however, it could be a significant destabilizing force in a small country (Novta and Pugacheva, 2021). Indeed, if a conflict is defined based on 1000 deaths, the effects of conflict are likely to be seriously underestimated (Novta and Pugacheva,

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2021). Hence, from a macroeconomic perspective, it would be more appropriate to define conflict as the proportion of a country's total population killed in a conflict. Our research provides further empirical evidence to address these research gaps.

In this study, we examined the nexus of conflict and development for 109 countries during the 1996–2019 period. Because wars and conflicts are increasing, the COVID-19 pandemic may exacerbate resource issues and hinder resource redistribution across regions and countries. This paper contributes to the literature in three ways. First, we provide further insights into the conflict–development relationship by considering both economic and social development (measured by economic growth, life expectancy, and educational attainment). The conflict–social development nexus and its outcomes have been greatly neglected in the empirical literature, partly due to a lack of sufficient, relevant data on educational attainment and life expectancy in conflict-prone regions in recent decades (Diwakar, 2015).

Second, we analyzed a global panel of 109 countries, which we divided into four subsamples according to the World Bank's income group categories,[1] and covered an extended period (1996–2019; 24 years). Therefore, our study provided far more comprehensive insights than previous research in this field by examining a rich set of information through a historical lens. This approach enabled us to perform a thorough analysis of the links between conflict and development—two variables that have critical policy implications—across different country-income groups. Third, we applied an advanced econometric technique—a dynamic fixed effects (DFE) estimator—to an autoregressive distributed lag (ARDL) model, which helped us identify the short- and long-term effects of conflict and other regressors on development while dealing with both endogenous variables and fixed effects.

Finally, to address the conceptual weaknesses in the traditional definitions of conflict, we employed a measure of conflict intensity as a proxy for the conflict variable. Specifically, we constructed this proxy based on data from the Uppsala Conflict Data Program (UCDP) Georeferenced Event Dataset (GED; Pettersson and Öberg, 2020). Using these data, we derived the best estimates for the total number of people killed in conflicts, including civilians, combatants, and unknown deaths. We computed the conflict intensity based on the ratio of total conflict-related deaths in a country per year by total population, and then multiplied by 1000 to obtain the conflict-related deaths per 1000 people. Although any and all loss of life is tragic, we decided, as suggested by Mueller (2016) and Novta and Pugacheva (2021), that using the proportion of the population killed in a conflict as a measure of conflict was a better approach for studying the socioeconomic impacts of conflict.

Our empirical results revealed that, for the full sample, in the short term, a high level of conflict intensity hindered economic growth, reduced life expectancy, and shortened the duration of education. We observed similar long-term patterns with greater impacts. Furthermore, government effectiveness had a significant and favorable effect on economic growth and life expectancy in both the short- and long-term. Although population growth seemed to have a negative effect on economic growth and educational attainment, the opposite effects were evident in the long-term despite some of the coefficients not being statistically significant. Notably, both the short- and long-term impacts of population growth on life expectancy were significantly positive and consistent.

Subsample analyses depict varying patterns. Specifically, although the negative impact of conflict on economic growth occurs across subsamples, it is only statistically significant for the low-income and upper-middle-income groups. Furthermore, conflict intensity has a negative impact on the longevity of the citizens for all income groups in the long term, but the degree of statistical significance varies significantly between subsamples of low-income countries (LICs) and lower-middle-income countries (LMICs), and insignificantly between upper-middle-income countries (UMICs) and high-income countries (HICs). Regarding the impact of conflict on education, our results revealed significant negative effects for LICs, negative but insignificant effects for LMICs and HICs, and positive but insignificant effects for UMICs. In summary, we concluded that the higher the income level, the less significant the impact of conflict. The empirical results of this study have implications for future studies on how different types of conflict affect economic growth and social development across the world.

The remainder of this paper is organized as follows. Section 2 reviews the definitions of conflict and the different proxies used to measure conflict in previous studies. It also discusses the nexus between conflict and development, based on theories and empirical evidence found in the literature. Section 3 presents the baseline model, data, and methodology. Section 4 reports and discusses the empirical results. Section 5 concludes with our key findings and their implications.

2. Literature review

In this section, we review the definitions of conflict given in the literature and consider the different proxies for conflict used in previous studies. We also consider different strands of the nexus between conflict and development.

2.1. Concepts of conflict

Although conflict is generally regarded as a collision of opposing parties, the concept of conflict has not been consistently defined. Ghani and Iyer (2010) divided conflict into internal and external conflicts. Specifically, external conflict refers to interstate incidents (among countries), whereas internal conflict generally implies conflict within a state (for instance, civil war or terrorism) or people-to-people conflict (for instance, ethnic and religious conflicts, common violence, or crime).

The Uppsala Conflict Data Program (UCDP)—the world's leading provider of data on organized violence and armed conflict—uses three categories of conflicts: state-based armed conflict, non-state conflict, and one-sided violence. The classification is based on the actors involved and the spatial and temporal locators of "battle deaths." State-based conflict covers all conflicts in which at least one of the parties involved is the government, regardless of whether the conflict is between states or within a state. Non-state conflicts occur among ethnic groups (such as the Pokot and Turkana populations in Kenya), clans, religions, and other groups, none of which are government entities. These types of organizations may be formally organized groups, informally organized supporter groups, and/or informally organized identity groups. The third category (one-sided violence) refers to the use of armed force or violent behaviors by the state government and/or non-state formally organized groups, targeting civilians and leading to at least 25 deaths. This type of conflict excludes extrajudicial killings in custody.

Based on the UCDP definitions, Martin-Shields and Stojetz (2019) differentiated between four types of conflict: interstate conflict, intrastate conflict, internationalized intrastate conflict, and one-sided violence. Interstate conflict is a traditional type of conflict among countries. Intrastate conflict is an internal conflict between government and non-state groups. If intrastate conflict significantly involves other countries, it is defined as internationalized intrastate conflict (Pettersson and Wallensteen, 2015).

Evidence shows that internal conflict has been an increasing cause of conflict-related mortality since World War II (Ray and Esteban, 2017, Fig. 1). However, state-based violence continues to be the major cause of

[1] The four subsamples were classified based on the World Bank's income group categories, using the gross national income (GNI) per capita in 2019 calculated by the World Bank Atlas method. These figures were US$1035 or less in 2019 for low-income economies, between US$1036 and US$4045 for lower-middle-income economies, between US$4046 and US$12,535for upper-middle-income economies, and US$12,536 or more for high-income economies.

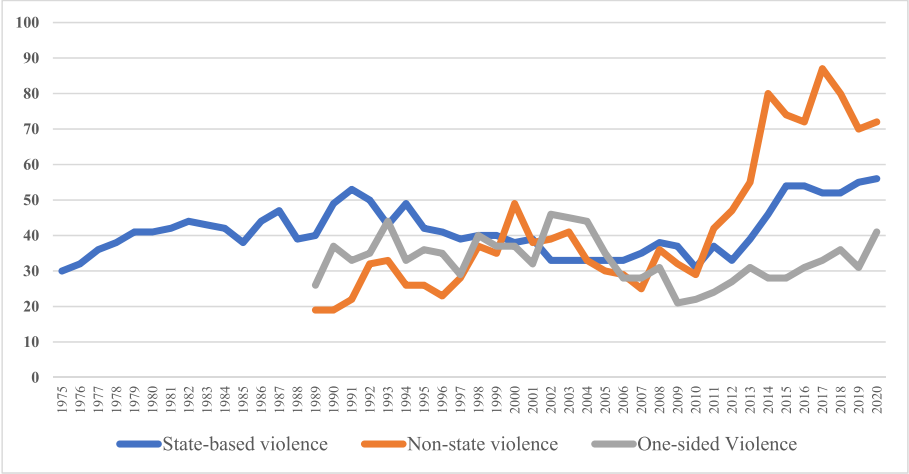

Fig. 1. Number of conflicts by type (1975–2020).
Source: Authors' work based on Pettersson et al. (2021).

conflict-related deaths (Fig. 2), thus receiving considerable attention from policymakers and academics. Intrastate conflicts persisted as the most common and continuous conflicts among the different categories of state-based conflicts during the period 1946–2020 (Fig. 3). However, the number of internationalized intrastate conflicts is increasing as countries become more involved in the intrastate conflicts of other countries. Nevertheless, this period witnessed a decline in one-sided violence, and interstate conflict is rare, mostly represented by long-term legacy conflicts.

The literature on the nexus between conflict and development has shown that the distributional characteristics of conflicts often reflect fractionalization and polarization indices. Fractionalization is the degree of diversity in a society, measured as the probability of two random individuals not being from the same group, whereas polarization refers to the distances among individuals or groups within a society (Drazanova, 2019; Duclos et al., 2004). Fractionalization and polarization are common channels for seeking the causes of conflicts in which the diversity and/or differences of ethnicities, religions, and languages are vital sources of tension (Arbatlı et al., 2020; Bleaney and Dimico, 2017; Esteban et al., 2012; Nazara et al., 2019). They are also employed as proxies to measure the potential effects of conflicts on development (Ager and Brückner, 2013; Montalvo and Reynal-Querol, 2003; Ying et al., 2017).

The focus of this study was on the severity of conflict at the national level. Although conflict intensity can be used to directly examine the severity of a conflict, fractionalization and polarization are usually applied to identify the underlying core of a conflict, which is an indirect approach to investigating the nexus of conflict and development. The choice of suitable proxies in a study should be based on the research objective (i.e., whether the aim is to examine the degree of conflict severity or diversity and difference in the nature of a conflict). This study focused on the former, exploring the direct consequences of conflict on economic and social development, so it was appropriate to use conflict intensity as a measure.

2.2. *The nexus between conflict and development*

The literature on the economic costs of conflict is conclusive; in general, conflicts harm economic development. In particular, conflict affects economic productivity by devastating cities and infrastructures, interrupting economic activities, deterring investment, and curtailing government spending (Collier, 1999), thus hindering economic growth

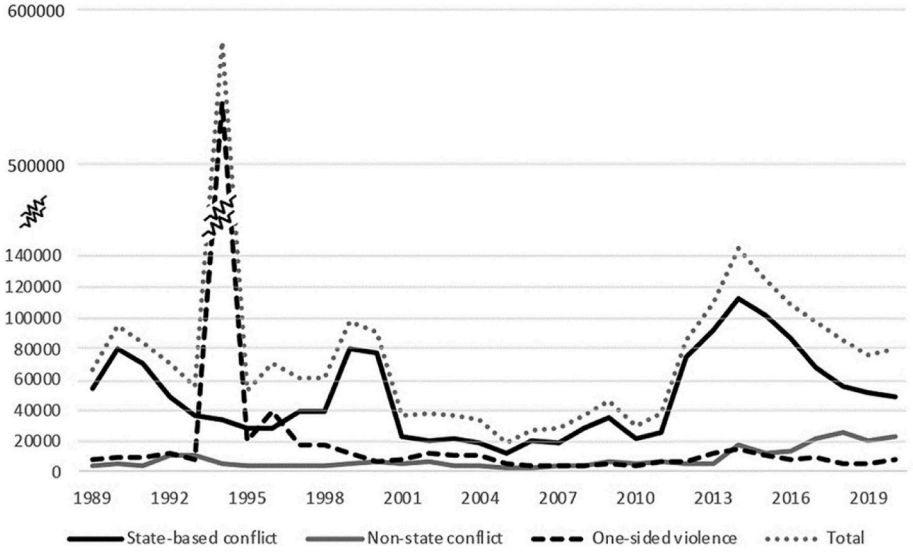

Fig. 2. Fatalities due to organized violence by type, 1989–2020.
Source: Pettersson et al. (2021).

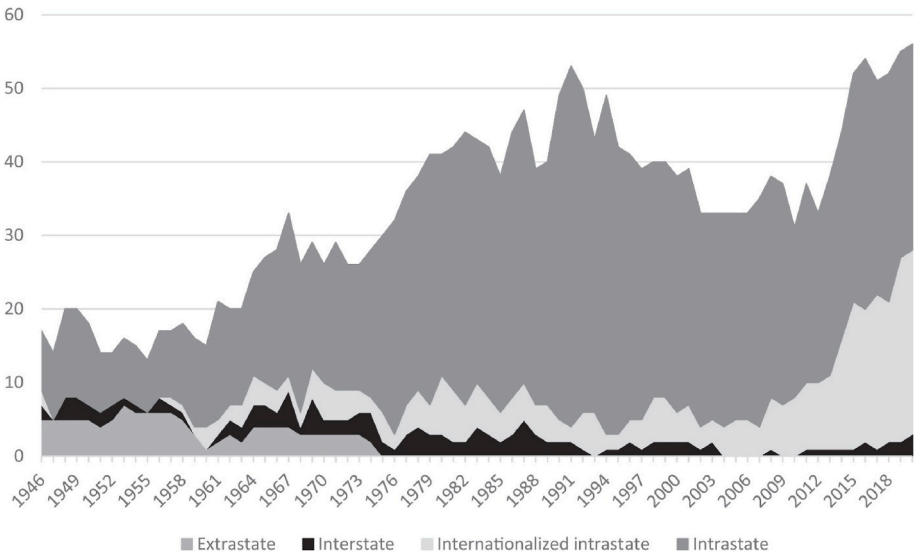

Fig. 3. Number of state-based conflicts by type, 1946–2020.
Source: Pettersson et al. (2021).

(Hoeffler and Reynal-Querol, 2003; Ray and Esteban, 2017). The effects of conflict may have long-term consequences (Cerra and Saxena, 2008). Indeed, Novta and Pugacheva (2021) showed that their impacts continued beyond the conflict period (up to ten years after the conflict outbreak) and had significant long-term consequences for economic growth, reducing private consumption, investment, sector value addition, and trade. Hence, we predicted the following:

Hypothesis 1. Conflict has a long-term negative impact on economic growth.

The macroeconomic costs of conflicts are reflected in financial and structural losses, which have negative influences on tax revenues (Gupta et al., 2004). This assertion resembles Fang et al.'s (2020) findings, which also suggested an impact on fiscal management, particularly public expenditure allocation, shifting between growth priorities and security priorities. High conflict intensity appears to be associated with high military expenditure and low capital expenditure.

Conflicts have spillover effects, not only due to their likelihood of spreading to neighboring countries (e.g., the Arab Spring in the early 2010s) but also due to their ability to disturb regional and international economic activities by amplifying uncertainty and trade disruption (Fang et al., 2020). Amodio and Di Maio (2018) argued that conflicts distort markets' functionality and accessibility, negatively affecting both final product trading and the demand for inputs, such as imported goods. Hence, they reduce the performance and value of firms. Novta and Pugacheva (2021) documented that the macroeconomic costs of conflict apply to those countries experiencing conflict, but also spill over to neighboring countries through migration and refugees. Conflicts are associated with mass migrations, as refugees seek shelter in neighboring countries, often remaining there for ten years or more following conflict onset. The number of refugees may be large enough to strain labor markets, imposing social constraints on neighboring countries.

Comparted to the literature on the effects of conflicts on economic development, the number of studies that consider their social aspects is limited. Besides the above-mentioned migration issue, conflicts have a negative influence on household welfare and net income (Singh et al., 1986). During violent events, citizens usually face a trade-off between welfare and security. Several empirical analyses have highlighted the impact of conflicts on human development, particularly on education, health, and labor market outcomes (Akresh et al., 2012; Brück et al., 2019). Akresh et al. (2012) found that adult status depends on the grown-up environment, especially during adolescence. Catch-up growth is associated with nutritional deficiencies in childhood and is only achievable in nonemergency environments. Brück et al. (2019) indicated that conflict negatively affects educational outcomes, including test results and university admission. Violence and conflicts worsen the quality of the school environment and the mental health of students. Thus, they hinder academic achievement and have possible long-term negative consequences for human capital accumulation:

Hypothesis 2. Conflict has an adverse long-term effect on social development outcomes.

3. Model, data, and methodology

3.1. Baseline models

To examine the nexus between conflict and development, we applied Novta and Pugacheva's (2021) model specification; however, we included an additional control variable to account for institutional quality, which we believed could impact the relationship between the two variables of interest (see Besley and Persson, 2009).

Our two model specifications were as follows:

$$economic\ \ development = f(conflict, population, instituional\ \ quality) \quad (1)$$

$$social\ \ development = f(conflict, population, instituional\ \ quality, GDP) \quad (2)$$

Many studies have documented the critical roles of population and institutional quality in economic growth and social development (Becker et al., 1999; Peterson, 2017). Government institutions greatly affect the economic development of countries and act at all societal levels because they establish frameworks for the countries' economic and social affairs. Good institutions foster economic and social development by creating an environment that promotes economic activity, human skills, innovation, creativity, and growth. However, poor institutional quality leads to economic stagnation (Butkiewicz and Yanikkaya, 2006). The positive nexus between institutional quality and socioeconomic development has been documented in many studies; for example, for Asian countries (Le et al., 2016) or using a panel of 100 countries (Butkiewicz and Yanikkaya, 2006).

The effects of population growth on economic growth and social development are controversial. Low population growth in HICs appears to contribute to reduced economic growth, because it leads to a high portion of older people in the populations. An increasing number of retirees implies an increased burden on the working population that is

expected to support them. Immigration may overcome this issue by increasing the working-age population, but it also creates other social and economic problems (Peterson, 2017). In contrast, rapid population growth induced by high levels of fertility in populous LICs is likely to slow their development and reduce general well-being, because it results in large numbers of dependent children (Peterson, 2017). Moreover, the law of diminishing returns, with a growing labor force making intensive use of fixed resources, means that high population growth rates have negative consequences for per-capita income growth (Becker et al., 1999). Meanwhile, although one can attribute greater specialization to the favorable impacts of population growth on productivity, more complex production processes due to larger populations may offset these influences.

The positive impacts of gross domestic product (GDP) on social development have been well documented in the literature (Dixon and Smith, 2002; Newman and Thomson, 1989; Sylwester, 2000). Social development is regarded as a product of economic growth because economic growth is "the basis for the massive economic commitments of institutions" and also "the impetus for passage through various stages of development to the fully modernized society" (Newman and Thomson, 1989). Or (2000) found strong collinearity between GDP and health expenditure (both in per capita terms), suggesting that economic growth positively affects health outcomes by leading to lower rates of premature mortality. Meanwhile, a positive association between GDP growth and education outcomes was found for a sample of 24 countries (Teulings and Van Rens, 2008) and for African countries (Eggoh et al., 2015).

The empirical representations of Equations (1) and (2) for the panel data setting were as follows:

$$Y_{it} = a_0 + a_1 CF_{it} + a_2 POP_{it} + a_3 GOV_{it} + \partial_i + \theta_t + \varepsilon_{it} \quad (3)$$

$$SocDev_{it} = \beta_0 + \beta_1 CF_{it} + \beta_2 POP_{it} + \beta_3 GOV_{it} + \beta_4 Y_{it} + \partial_i + \theta_t + \varepsilon_{it} \quad (4)$$

where *it* refers to country *i* in year *t*; a and β are estimated coefficients; ∂ and θ are country fixed effects and year fixed effects, respectively; and ε is the residual term. *Y, CF, POP, GOV,* and *SocDev* represent real domestic output, conflict, population, institutional quality, and social development, respectively. To mitigate some effects of heteroscedasticity, we used GDP per capita and total population in natural logarithmic forms.

3.2. Data

The data for this research were compiled from various sources. First, we measured economic development by using the per capita GDP (constant 2010 price in billions of US$). Meanwhile, we proxied social development using two indicators: life expectancy at birth (in years) and expected years of schooling. We drew the data for per capita GDP and life expectancy at birth, along with demographic information (population), from the World Development Indicators (WDI) database (World Bank, 2021a). We converted real per capita GDP and population into natural logarithmic forms for estimation at a later stage. We collected data on expected years of schooling from the Human Development Report (UNDP, 2021).

For the conflict variable, we used a measure of conflict intensity. Specifically, we used data from the Uppsala Conflict Data Program (UCDP) Georeferenced Event Dataset (Pettersson and Öberg, 2020) to derive the best estimates for the total number of people killed, including civilians, combatants, and unknown deaths. We calculated conflict intensity according to the ratio of total conflict-related fatalities in a country per annum relative to the total population, and then we multiplied by 1000 to obtain the conflict-related deaths per 1000 people. This approach was based on those of Fang et al. (2020) and Novta and Pugacheva (2021). This definition (and calculation) of conflict was beneficial compared to the traditional definition of conflict based on the absolute number of deaths, since the latter tends to skew the sample toward low-intensity conflicts in countries with large populations (Novta and Pugacheva, 2021).

Finally, as a proxy for institutional quality, we used the Government Effectiveness Index from the Worldwide Governance Indicators (WGI; World Bank, 2021b). We chose the WGI for this study because the index measures perceptions of the quality of public services, the civil service, policy formulation and implementation, its level of independence from political pressures, and the credibility of the government's commitment to its policies (World Bank, 2021b). We decided that this index would capture the impacts of institutional quality on socioeconomic development outcomes. In fact, the Government Effectiveness Index has been widely used in studies as a proxy for the governance/institutional factor when considering social and/or economic development (e.g., Alam et al., 2017; Arora and Chong, 2018; Guisan, 2009; Jonasson, 2012; Montes and Paschoal, 2016; Yanikkaya and Turan, 2020).

Detailed descriptions of the variables are presented in Table 1. Due to the availability of WGI data, we constructed a balanced panel of 109 countries for the period 1996–2019 (see Appendix 1 for the list of countries). To consider variations in the relationship between conflict and socioeconomic progress, which can depend on the country's development stage, we divided the total sample into four subsamples based on the World Bank's income groups: low-income countries (LICs, 21 countries), lower-middle-income countries (LMICs, 38 countries), upper-middle-income countries (UMICs, 29 countries), and high-income countries (HICs, 21 countries).

Table 2, showing the descriptive statistics by subsample, indicates positive correlations between income levels and economic and social outcomes. Generally, high economic levels foster greater real per capita GDP, higher life expectancy at birth, and higher expected years of schooling. There are vast differences in the nature of conflict, with less developed countries witnessing high rates of conflict-related mortality and conflict intensity (i.e., the number of conflict-related fatalities per 1000 people). Additionally, governments' performance in LICs is generally less effective. Based on these trends, we decided that subsample estimations would facilitate meaningful cross-sample comparisons and generate further insights into the conflict–development relationship.

Table 3 presents Pearson's correlation matrix for our selected variables. The results showed strong and positive associations among the variables for per capita GDP, life expectancy, expected years of schooling, and government effectiveness. In contrast, conflict intensity had weak negative correlations with government effectiveness and economic and social outcomes.

3.3. Methods

We began our empirical analyses with some data diagnostic tests: a cross-sectional dependence (CD) test, unit root tests for stationarity, and panel cointegration tests. First, we carried out Pesaran's (2021) CD test to study the presence of cross-sectional dependence on our variables. The results in Table 4 provide evidence of cross-sectional dependence across all variables, regardless of whether they were level or first-difference variables. We then applied Pesaran's (2007) cross-sectionally augmented Im-Pesaran-Shin (CIPS) Z(t-bar) unit root test to examine the stationarity of the variables because the test accounts for the issue of cross-sectional dependence. For cross-checking, we also employed some additional tests: the Im–Pesaran–Shin unit root test (Im et al., 2003), the Fisher-type unit root test (Choi, 2001), the Levin–Lin–Chu unit root test (Levin et al., 2002), and Harris and Tzavalis's (1999) unit root test. The results showed that all the variables were stationary (i.e., I(0) in the first difference, with the conflict and government effectiveness variables also stationary at the level). Overall, we concluded that our variables were stationary at different levels, but there was no risk of I(2) variables.

Next, we performed Westerlund's (2005) cointegration test to examine the cointegration relationships among the variables. This test

Table 1
Descriptive statistics.

Variables	Labels	Definition & Calculation	Source	Unit	Obs	Mean	Std. Dev.	Min	Max
tdeath	Conflict-related deaths	Total conflict-related fatalities	UCDP	Deaths	2616	341.721	1694.809	0	48,666
pop	Population	Total population (as a logarithm later - *lpop*)	WDI	People	2616	55,311,688	1.715e+08	379,905	1.398e+09
conflict	Conflict measurement indicator	Ratio of conflict-related fatalities and total population	–	Deaths per 1000 people	2616	0.014	0.096	0	3.631
life	Life expectancy at birth	"Number of years a newborn infant would live if prevailing patterns of mortality at the time of its birth were to stay the same throughout its life"	WDI	Years	2616	66.863	9.861	35.38	83.485
eys	Expected years of schooling	"Number of years of schooling that a child of school entrance age can expect to receive if prevailing patterns of age-specific enrolment rates persist throughout the child's life"	HDR	Years	2616	11.44	3.265	2.5	23.3
govef	Government efficiency	"Quality of public services, quality of civil service, and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies"	WGI	–	2616	−0.247	0.869	−2.279	2.122
rgdp	Real gross domestic product per capita	Gross domestic product divided by population, constant 2010 US$ (as a logarithm later - *lrGDP*)	WDI	Billion US $	2616	8583.833	13,840.038	187.517	64,864.699

Note: UCDP = Uppsala Conflict Data Program by Department of Peace and Conflict Research, Uppsala University, WDI = World Development Indicators of the World Bank, WGI = Worldwide Governance Indicators of the World Bank, HDR = Human Development Report of the United Nations Development Program (UNDP).
Source: Authors' calculations

Table 2
Descriptive statistics by country income level.

Variable	LIC	LMIC	UMIC	HIC
Number of countries	21	38	29	21
Conflict-related deaths (tdeath)	744.528	310.416	321.756	23.135
Population (pop)	18,676,833	61,971,540	86,367,856	37,008,296
Conflict measurement indicator (conflict)	0.038	0.012	0.008	0.002
Life expectancy at birth (life)	56.084	63.449	71.101	77.966
Expected years of schooling (eys)	7.96	10.306	12.614	15.352
Government Efficiency (govef)	−1.021	−0.593	−0.156	1.027
Real Gross Domestic Product per capita (rgdp)	637.831	1722.717	5584.39	33,087.275

Note: Mean values are reported. LIC = low-income country, LMIC = lower-middle-income country, UMIC = upper-middle-income country, and HIC = high-income country.
Source: Authors' calculations

Table 3
Pearson's Pairwise correlations.

Variables	lrGDP	life	eys	conflict	lpop	govef
lrGDP	1.000					
life	0.780 *(0.000)*	1.000				
eys	0.819 *(0.000)*	0.800 *(0.000)*	1.000			
conflict	−0.105 *(0.000)*	−0.150 *(0.000)*	−0.124 *(0.000)*	1.000		
lpop	0.058 *(0.003)*	0.123 *(0.000)*	0.090 *(0.000)*	−0.023 *(0.243)*	1.000	
govef	0.812 *(0.000)*	0.649 *(0.000)*	0.708 *(0.000)*	−0.139 *(0.000)*	0.085 *(0.000)*	1.000

Note: The significance level (p-value) for each entry is in parentheses. The p-values are less than 1%, implying the rejection of the null hypothesis that the correlation between two variables is statistically significantly different from zero.
Source: Authors' calculations

was suitable for our panel because it also addressed the cross-sectional dependence issue. For robustness checking, we employed Kao's (1999) and Pedroni's (1999) cointegration tests. The results in Table 5 show that, overall, long-run cointegrations existed in all the equations we estimated. Estimations for dynamic panel data are often conducted using first-difference or system generalized method of moments (GMM) estimators. However, in our case, the presence of cointegration made these estimators inappropriate. In fact, the existence of cointegration among the variables, along with the stationarity of the variables at different levels, justified the use of the ARDL model as the most suitable estimator. Additionally, the ARDL model enabled us to detect short- and long-term effects because we could include lags of the dependent and independent variables in the estimation, regardless of whether the regressors were endogenous or exogenous (Pesaran and Shin, 1995; Pesaran and Smith, 1995).

We measured unrestricted error correction model (UECM) regressions as follows:

$$\begin{aligned}\Delta \mathrm{Y}_{\mathrm{it}} = {} & \mu_{1\mathrm{i}} + \varphi_{1\mathrm{i}}.\left(\mathrm{Y}_{\mathrm{i,t-1}} - \gamma_{11}.\mathrm{CF}_{\mathrm{i,t}} - \gamma_{12}.POP_{\mathrm{i,t}} - \gamma_{13}.GOV_{\mathrm{i,t}}\right) \\ & + \sum_{\mathrm{j=1}}^{\mathrm{k}} \delta_{11\mathrm{ij}}.\Delta \mathrm{Y}_{\mathrm{i,t-j}} + \sum_{\mathrm{j=0}}^{\mathrm{m}} \delta_{12\mathrm{ij}}.\Delta \mathrm{CF}_{\mathrm{i,t-j}} + \sum_{\mathrm{j=0}}^{\mathrm{n}} \delta_{13\mathrm{ij}}.\Delta \mathrm{POP}_{\mathrm{i,t-j}} \\ & + \sum_{\mathrm{j=0}}^{\mathrm{p}} \delta_{14\mathrm{ij}}.\Delta \mathrm{GOV}_{\mathrm{i,t-j}} + \xi_{1\mathrm{it}}\end{aligned} \tag{5}$$

$$\begin{aligned}\Delta \mathrm{SocDev}_{\mathrm{it}} = {} & \mu_{2\mathrm{i}} + \varphi_{2\mathrm{i}}.\left(SocDev_{\mathrm{i,t-1}} - \gamma_{21}.\mathrm{CF}_{\mathrm{i,t}} - \gamma_{22}.POP_{\mathrm{i,t}}\right. \\ & \left. - \gamma_{23}.GOV_{\mathrm{i,t}} - \gamma_{24}.\mathrm{Y}_{\mathrm{i,t}}\right) + \sum_{\mathrm{j=1}}^{\mathrm{q}} \delta_{21\mathrm{ij}}.\Delta \mathrm{SocDev}_{\mathrm{i,t-j}} \\ & + \sum_{\mathrm{j=0}}^{r} \delta_{22\mathrm{ij}}.\Delta \mathrm{CF}_{\mathrm{i,t-j}} + \sum_{\mathrm{j=0}}^{\mathrm{s}} \delta_{23\mathrm{ij}}.\Delta \mathrm{POP}_{\mathrm{i,t-j}} + \sum_{\mathrm{j=0}}^{\mathrm{t}} \delta_{24\mathrm{ij}}.\Delta \mathrm{GOV}_{\mathrm{i,t-j}} \\ & + \sum_{\mathrm{j=0}}^{\mathrm{u}} \delta_{25\mathrm{ij}}.\Delta \mathrm{Y}_{\mathrm{i,t-j}} + \xi_{2\mathrm{it}}\end{aligned} \tag{6}$$

where *Y, CF, POP, GOV,* and *SocDev* represent the real domestic output, conflict, population, institutional quality, and social development, respectively; *i,t* refers to country *i* in year *t*; Δ is the first difference operator; k, m, n, p, q, r, s, t, and u are lag lengths; $\mu_{1\mathrm{i}}$ and $\mu_{2\mathrm{i}}$ are the

Table 4
Cross-sectional dependence and stationarity test results.

Statistics	CD test	CIPS test	IPS test	Fisher test	LLC test	HT test
	CD test	CIPS*	Z(t-bar_	Inverse chi-squared	Adjusted t*	Rho (Z)
Variables by level						
lrGDP	230.813***	−1.759	10.2166	177.9593	−4.4350***	8.0006
life	345.023***	−2.478***	3.0871	1918.7505***	−44.5853***	9.3144
eys	262.835***	−1.826	2.7718	341.3904***	−7.5952***	6.1060
conflict	4.581***	−3.084***	–	1386.3144***	−1.0e+02***	−43.9283***
lpop	252.18***	−2.235***	6.5627	2275.6825***	−13.3045***	9.3993
govef	3.67***	−1.669	−2.1430**	284.8802***	−4.5164***	−2.0276**
Variables by first difference						
Δ lrGDP	42.524***	−3.383***	−17.5423***	1249.9625***	−22.3417***	−53.4826***
Δ life	47.187***	−2.255***	−2.0537**	1020.9742***	−42.2736***	−10.6625***
Δ eys	7.995***	−3.772***	−20.1899***	1540.8831***	−13.4683***	−61.4872***
Δ conflict	0.848	−4.534***	–	3847.6143***	−27.6107***	−90.5746***
Δ lpop	7.533***	−1.690	0.2711	502.5234***	−24.6103***	2.2035
Δ govef	10.137***	−4.394***	−24.7200***	2144.3149***	−23.8178***	−74.5672***

Notes: *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively. Δ is the first difference. In the CD test, under the null hypothesis of cross-section independence, CD ~ N(0,1), p values close to zero indicated that data were correlated across panel groups. In the CIPS test (Pesaran panel unit root test), H0 (homogeneous nonstationary): bi = 0 for all i. In the IPS test (Im–Pesaran–Shin unit root test), Ho = all panels contain unit roots and Ha = some panels are stationary. In the Fisher test (the Fisher-type unit root test), Ho = all panels contain unit roots and Ha = at least one panel is stationary. In the LLC test (the Levin–Lin–Chu unit root test), Ho = panels contain unit roots and Ha = panels are stationary. In the HT test (the Harris–Tzavalis unit root test): Ho = panels contain unit roots and Ha = panels are stationary.
Source: Authors' calculations

Table 5
Cointegration tests.

Model	Kao test	Pedroni test	Westerlund test
	Dickey–Fuller t	Phillips–Perron t	Variance ratio
lrGDP	−27.9048***	−20.1380***	−2.3170**
Life	−6.4644***	7.2797***	26.4511***
Eys	−33.1221***	−20.8797***	1.0505

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. n/a means that the test could not be performed.
- For the Kao test for cointegration, H = no cointegration and Ha = all panels are cointegrated.
- For the Pedroni test for cointegration, Ho = no cointegration and Ha = all panels are cointegrated.
- For the Westerlund cointegration test, Ho = no cointegration and Ha = some panels are cointegrated.
Source: Authors' calculations

drifts; and ξ_{1it} and ξ_{2it} are white noise errors. γ_{1i} and γ_{2j} (i = 1–3; j = 1–4) are the coefficients indicating long-term causal relationships; δ_{1i} and δ_{2j} (i = 1–4; j = 1–5) are the coefficients indicating the short-term causal dynamics of the model. φ_1 and φ_2 are the error correction coefficients, or the speed of adjustment parameters, showing the degree of short-term disequilibrium corrected to achieve long-term equilibrium. φ_1 and φ_2 must not be zero; otherwise, there is no long-term relationship. We determined the optimal lag lengths using the Akaike information criterion (AIC).

For the potential presence of country and time fixed effects, we employed the DFE estimator for the ARDL model because it could not only identify the short- and long-term impacts of regressors, but also account for fixed effects in the estimation. The bias of this estimator is reduced to zero when the time dimension of a panel is large, which was suitable in our case because our panel covered a relatively long period (24 years). The assumption underlying the DFE estimator is the heterogeneous slope of the estimates. Accordingly, we performed slope heterogeneity tests for our panels using the recent technique developed by Bersvendsen and Ditzen (2021), which considers cross-sectional dependence. The results revealed that our panels did not suffer from this problem. Furthermore, we conducted Ditzen et al.'s (2021) structural break test to consider cross-sectional dependence. The results revealed that there were no breaks in the social development (life expectancy and years of schooling) models or the economic output (GDP) model.[2] Hence, we concluded that for our global panel data for 1990–2019, the estimated coefficients of the models remained stable.

Table 6
DFE–ARDL estimation results.

	D.lrGDP	D.life	D.eys
Long-term effects			
conflict	−1.6752***	−6.5183**	−2.0442**
	(0.4300)	(2.8018)	(1.0300)
lpop	0.2788	12.7335***	2.4582***
	(0.2017)	(1.6681)	(0.6330)
govef	0.4457***	−9.7067***	0.6914*
	(0.1393)	(1.6174)	(0.4067)
lrGDP		5.8541***	0.8852**
		(1.0892)	(0.4230)
Short-term effects			
EC terms	−0.0293***	−0.0295***	−0.0707***
	(0.0041)	(0.0036)	(0.0069)
D.conflict	−0.0081	0.1064	0.0534
	(0.0091)	(0.0706)	(0.0617)
D.lpop	−0.7411***	4.6169***	−2.4293***
	(0.1168)	(0.9098)	(0.7969)
D.govef	0.0207***	0.2139***	−0.0483
	(0.0077)	(0.0593)	(0.0519)
D.lrGDP		0.6850***	−0.0450
		(0.1567)	(0.1371)
Constant	0.1378	−5.4537***	−2.3791***
	(0.0943)	(0.9775)	(0.8309)
N	2507	2507	2507

Note: Standard errors are in parentheses; *, **,and*** denote statistical significance at the 10%, 5%, and 1% levels, respectively. "." = first difference, "L" = first lag, EC = error correction.
Source: Authors' calculations.

For comparison, we considered three types of development to address the economic and social impacts of conflict. Furthermore, we performed analyses based on four subsamples of countries. For robustness checking, we also estimated the baseline models using different indicators of governance quality.

[2] The heterogeneity and structural break test results are not presented in this paper due to space limitations, but they are available upon request.

4. Results and discussion

4.1. Full sample analysis

Table 6 presents the results of the DFE–ARDL estimation. In general, this estimation for the whole sample provided consistent results regarding the economic and social impacts of conflicts in both the short- and the long-term. Specifically, high levels of conflict intensity appeared to reduce both economic growth and quality of life by shortening life expectancy and expected years of schooling. However, the long-term effects were much more statistically significant. Our results confirmed the findings of Hoeffler and Reynal-Querol (2003) and Ray and Esteban (2017), showing that conflicts hurt economic growth, as well as those of Akresh et al. (2012) and Brück et al. (2019), revealing that conflicts have negative social outcomes (i.e., by shortening lives and interrupting education). Thus, conflicts not only affect economies directly by damaging infrastructures and disrupting production and investment flows but also affect the availability and quality of human resources for economic activities. Furthermore, the results supported Cerra and Saxena's (2008) and Novta and Pugacheva's (2021) findings regarding the devastating impacts of conflict, which last far beyond the conflict period.

Government effectiveness had a positive and significant effect on economic growth in both the short-term and long-term estimations.[3] In the same vein, the impact of governance quality on life expectancy progress was significant and positive. Furthermore, we found similar patterns for educational attainment, despite the results being statistically insignificant. Our results for the positive impacts of governance quality on economic growth and social development resembled those of Butkiewicz and Yanikkaya (2006) and Le et al. (2016): countries with effective government institutions are likely to benefit from social stability and equality, contributing to the mental (and probably also the physical) health of the public. Furthermore, if healthcare services are effectively provided to the public, they play a critical role in increasing life expectancy. Our findings also aligned with Dasgupta et al. (2001, p.173), who noted the importance of having "institutional development, with significant roles for private property protection, [the] effectiveness of the legal/judicial system and efficiency of public administration."

The results also showed that population growth tended to have a short-term negative influence on economic growth and educational improvement. However, the long-term estimation produced opposite effects: the impact was positive but only statistically significant in the case of educational advancement. This result can be explained as follows: Due to inflexible resources, rapid population growth may reduce productivity in the short-term because of diminishing returns on labor (Peterson, 2017). Furthermore, educational infrastructures can rarely be improved within a short period. Consequently, higher population growth rates may have negative impacts on economic and social outcomes.

In contrast, in the long-term, if the supply of resources becomes flexible, the larger population may result in greater specialization and productivity induced by increases in capital, land, machinery, technological advancement, or economies of scale. Hence, the positive impacts of population growth on a country's economic and social development may be more pronounced in the long-term. However, population growth's effect on life expectancy was consistently positive and statistically significant in both the short- and long-term. Our results imply that population growth at the global level may not be caused by higher fertility rates but by improvements in worldwide economic and social conditions (including health facilities and medical care services), leading to an increase in average life expectancy.

Our results also reaffirmed the positive impact of economic growth on quality of life. We expected this result because economic growth affects a population's well-being (Polachek and Sevastianova, 2012): higher living standards associated with better health and education service delivery lead to significant improvements in citizens' longevity and educational attainment. Our results were consistent with those of Or (2000), who documented a strong positive link between GDP and health expenditure per capita, implying that economic growth promotes health and well-being for citizens by resulting in lower premature mortality rates.

For all three equations applied to the full sample panel, the absolute values of the estimated error correction terms were negative and statistically significant but relatively small (see Table 6), implying a relatively slow speed of adjustment toward equilibrium in response to short-term shocks. Specifically, about 2.93%, 2.95%, and 7.07% of the disequilibrium caused by previous year shocks converged back to long-term equilibrium in the economic growth (D.lrGDP), life expectancy (D.life), and years of schooling (D.eys) equations, respectively. In other words, it took about 34.13, 33.90, and 14.14 years to correct the disequilibrium revealed by these equations, respectively. Therefore, overall, the correction of an equilibrium distortion in any of these three cases happened relatively slowly.

4.2. Subsample analysis

Table 7 presents the DFE–ARDL estimation results by subsample according to the income levels of countries. Interesting results emerged regarding the influence of conflict on development. We found that although the negative impact of conflict on economic growth was evident for all subsamples, it was only statistically significant for LICs and UMICs. Remarkably, in the long-term, conflict intensity had a significant negative effect on improving longevity for the LIC and LMIC subsamples, and an insignificant negative effect for UMICs and HICs. Regarding the educational impact of conflict, the results showed a significant negative effect for LICs, a negative but insignificant effect for LMICs and HICs, and an insignificant positive effect for UMICs. Most of the results were consistent in both the short-and long-term estimations, but the coefficients were generally more statistically significant in the long-term. This suggests that the impacts of conflict may not only be felt at the time of the conflict but may last (and probably worsen) for many years thereafter. Overall, the results suggest that the higher the income level of a country, the less significant the impact of conflict on its development.

Our results regarding the negative impacts of conflict on education in LICs align with Diwakar's (2015) and Gates et al.'s (2012) findings, showing that an increase in conflict has devastating effects on cumulative education for both genders. In particular, armed conflict destroys educational resources, leading to the destruction of school infrastructure and the displacement or death of students, teachers, and educational personnel. Furthermore, parents may lose their jobs due to conflicts, negatively affecting their income and deterring them from sending their children back to school. Additionally, our results regarding the unfavorable impacts of conflict on life expectancy in LICs and LMICs were supported by Gates et al. (2012). Because civil wars mostly take place in such countries, with battle deaths being the most obvious source, local populations are directly exposed to conditions that increase mortality and disability (Gates et al., 2012).

The results also revealed a positive impact of government effectiveness on economic growth. This influence was statistically significant for LMICs and UMICs in the short-term, but for LICs and HICs in the long-term. Regarding educational attainment, the influences of governance quality were positive for all the groups of countries, but only significant for LICs and HICs. Similarly, the impact of governance quality on the longevity of citizens was consistently positive in the short- and long-term and statistically significant for LICs and LMICs.

[3] We also used alternative indicators of governance quality (rule of law, control of corruption, and regulatory quality) based on the WGI for robustness checking. The estimation results were qualitatively robust when using different proxies for the governance quality variable. The results are available upon request.

Table 7
DFE–ARDL estimation results by income-level.

	Low-Income Countries			Lower-Middle Income Countries			Upper-Middle Income Countries			High-Income Countries		
	D.lrGDP	D.life	D.eys	D.lrGDP	D.life	D.eys	D.lrGDP	D.life	D.eys	D.lrGDP	D.life	D.eys
Long-term effects												
conflict	−1.5796***	4.3128*	−3.8854**	−0.1701	−18.2699**	−1.6774	−3.2061*	−58.8852	6.5675	−5.9812	−2.4391	−3.8116
	(0.4687)	(2.3294)	(1.9114)	(0.5446)	(8.1545)	(1.3746)	(1.8429)	(58.3275)	(5.0271)	(5.5500)	(14.8690)	(14.8425)
lpop	0.6598***	16.4279***	4.2122***	1.3425***	27.6266***	4.8006***	−0.0631	31.8720	−4.8272***	−1.1004**	3.2796***	4.1364***
	(0.1787)	(1.4724)	(1.3101)	(0.4312)	(6.8388)	(1.3341)	(0.4890)	(20.3823)	(1.6321)	(0.4634)	(0.8915)	(0.8981)
govef	0.6151***	−2.1718*	2.1498***	−0.1507	−29.2854***	0.6640	0.3431	−16.8739	0.9395	0.6606*	−0.7734	−1.5915*
	(0.1657)	(1.2625)	(0.8098)	(0.3261)	(10.7128)	(0.7770)	(0.2169)	(13.0207)	(0.6967)	(0.3704)	(0.8386)	(0.8788)
lrGDP		2.2747*	−3.1148**		1.8860	−0.2675		20.3713*	3.2215***		4.4910***	0.9196
		(1.2862)	(1.2691)		(3.2627)	(0.8424)		(12.3786)	(0.6457)		(0.9660)	(0.9585)
Short-term effects												
EC terms	−0.0706***	−0.0642***	−0.0704***	−0.0196***	−0.0191***	−0.0574***	−0.0395***	−0.0112	−0.0849***	−0.0271***	−0.0755***	−0.1212***
	(0.0148)	(0.0088)	(0.0153)	(0.0061)	(0.0065)	(0.0119)	(0.0090)	(0.0080)	(0.0133)	(0.0087)	(0.0129)	(0.0208)
D.conflict	−0.0397*	0.0741	0.0922	−0.0046	0.1526*	0.0451	−0.3123***	0.1931	−0.5580	0.0756	0.6723	0.5066
	(0.0230)	(0.1254)	(0.1126)	(0.0087)	(0.0850)	(0.0606)	(0.0673)	(0.4962)	(0.4041)	(0.1090)	(0.8599)	(1.3732)
D.lpop	0.1857	17.6656***	−1.2469	−0.5779	29.1184***	−3.3943	−0.9767***	−0.2473	−10.1706***	−0.9420***	−1.6596*	−1.2924
	(0.4087)	(2.4065)	(1.9959)	(0.3611)	(3.5878)	(2.5149)	(0.3143)	(2.2900)	(1.8723)	(0.1089)	(0.9440)	(1.4919)
D.govef	−0.0046	0.2137*	−0.0403	0.0363***	0.2958***	−0.0187	0.0383**	0.1394	−0.1102	−0.0174	−0.0617	−0.0003
	(0.0202)	(0.1122)	(0.0996)	(0.0101)	(0.0990)	(0.0705)	(0.0174)	(0.1266)	(0.1035)	(0.0134)	(0.1062)	(0.1693)
D.lrGDP		0.5630**	0.1271		1.9017***	0.2597		0.1275	−0.6093***		−0.6488*	0.3741
		(0.2510)	(0.2249)		(0.3366)	(0.2395)		(0.2848)	(0.2321)		(0.3717)	(0.5850)
Constant	−0.2518	−14.6103***	−2.5072	−0.2602*	−8.3302***	−3.6586**	0.4179	−6.8542***	5.8240***	0.7751***	−1.3668	−7.1856***
	(0.2161)	(2.6933)	(1.9686)	(0.1558)	(2.1706)	(1.5968)	(0.2903)	(2.3441)	(1.7608)	(0.1590)	(1.5178)	(2.3299)
N	483	483	483	874	874	874	667	667	667	483	483	483

Note: Standard errors are in parentheses; *, **,and*** denote statistical significance at the 10%, 5%, and 1% levels, respectively. "D" = first difference, "L" = first lag, EC = error correction.
Source: Authors' calculations

We also examined the potential interaction between conflict and institutional quality to investigate whether governance quality helped mitigate the negative impact of conflict.[4] However, the results of the interaction terms were mostly insignificant and inconsistent across the samples. Arguably, institutional quality is unlikely to ease the consequences of conflicts.

Our findings were consistent with Polachek and Sevastianova (2012), who argued that the impacts of conflict vary greatly between rich and poor countries. The descriptive data indicated that conflicts or wars in LICs are more severe than those in HICs. A possible explanation is that LICs in Africa, Asia, and Latin America mostly engage in civil wars, which have pronounced negative effects on the economic prospects of all affected countries and the living conditions of local populations, and the adverse impacts of civil wars on economic growth are substantial in nondemocratic countries. In contrast, HICs mostly engage in international wars, which do not necessarily lead to reduced growth and social development in their own territories (Polachek and Sevastianova, 2012). In HICs, citizens have more peaceful ways of voicing their demands and do not have to resort to violent conflict. Since government effectiveness indices are higher in HICs, their governments are more responsive to citizens' needs and more effective in delivering public services. A government with high governance and institutional quality is likely to lessen the incidence of conflicts rather than mitigate the consequences of conflicts. However, this is open to debate and requires further investigation.

The effect of population growth also appeared to vary among the four subsamples. The evidence confirmed the long-term positive and significant impacts of population growth on economic and social development in LICs, LMICs, and HICs. However, in the short-term, these effects were positive and significant mostly for the longevity of citizens. Meanwhile, the influences of population growth on UMICs were negative and mostly significant in the short-term but mostly insignificant (and positive for life expectancy) in the long term, except educational attainment, for which the effect remained significant and negative. Overall, our research suggests that some unfavorable influences of population growth on economic and social development may lessen or vanish over time.

The impact of economic growth produced mixed results across the subsamples. High per capita GDP appeared to lead to a significant short- and long-term improvement in life expectancy in LICs and HICs. For LMICs, the impact was significant in the short-term but insignificant in the long-term, and for UMICs, the influence was significant in the long-term but not in the short-term. The results also varied for the impact of economic growth on educational attainment across subsamples of countries. In the short-term, the influence was positive but only significant for UMICs, whereas it was insignificant for LICs, LMICs, and HICs. In the long-term, the influence was significant and positive for LICs and UMICs but insignificant for the two remaining groups.

Based on the subsample estimation results, the LICs experienced the fastest adjustment according to the economic growth (D.lrGDP) equation, suggesting a correction of 7.06% for the discrepancy in this estimation. This implies that economic growth for LICs, followed by UMICs, HICs, and LMICs, are sensitive to deviations from equilibrium. However, the greatest speed of adjustment was observed for HICs according to the life expectancy (D.life) and years of schooling (D.eys) equations, revealing corrections of 7.55% and 12.12% for disequilibrium to reach a long-term steady state for these two estimations, respectively.

5. Conclusion and policy implications

This study examined the conflict–development link by differentiating the results according to the development paths of countries. Besides economic growth, our study focused on the important but underresearched nexus between conflict and social outcomes (i.e., life expectancy and educational attainment). The empirical construct that embedded a DFE estimator in an ARDL model offers some new insights into the intricate and dynamic relationship between development and conflict. We empirically analyzed the 1996–2019 global panel data of 109 countries and investigated four subsamples, classified according to their levels of economic development. The DFE–ARDL approach helped us identify various policy-relevant short- and long-term effects of conflict on development while dealing with endogeneity issues in the regression.

Our study found that, for the global sample, a high level of conflict intensity reduced long-term economic growth, life expectancy, and expected years of schooling. In particular, in the long-term, despite the unfavorable effect of conflict on economic growth across all subsamples of countries, it was only significant for the LICs and UMICs. Furthermore, conflict intensity appeared to reduce the longevity of citizens in LICs and LMICs (significantly) and in UMICs (but insignificantly). With regard to education, the results showed a significant negative effect of conflict for the LICs, but an insignificant negative effect for the LMICs and HICs. For the UMICs, this impact was positive but insignificant. The findings indicate that the higher the income level, the less significant the impact of conflict on development. In other words, LICs may suffer more from conflict than HICs.

Our results have some policy implications. First, since conflict can have long-lasting and devastating effects on a country's economic and social development, the risk of armed conflict and violence should be considered in sustainable development policies and plans. Efforts should be made to reduce the incidence of conflict (e.g., through policy reforms and increased aid; Collier and Hoeffler, 2002). Policymakers should be aware of the immediate and persistent consequences of conflict on a country's key development indicators so that appropriate policy responses can be implemented promptly. As the results indicate, in some cases, it may take a long time for conflict-affected countries to overcome, and thus a clear understanding of the sources of resilience is important, especially for LICs. Ensuring equal access to basic services, such as healthcare, social protection, and education, is essential for maintaining people's trust and confidence in governments. Moreover, because conflict is likely to have a disproportionate impact on people, prompt support should be given at the local level to the most vulnerable and marginalized groups, such as minorities, displaced people, refugees, and the communities that host them.[5] Furthermore, since LICs appear to suffer more from the negative impacts of conflict than HICs, a source of post-conflict recovery for poor countries is significant international assistance from rich nations.

Also, while not all states experiencing conflict are considered fragile states (e.g., India, which has many internal conflicts), evidence suggests that most of them are. In conflict-affected countries, citizens' trust in government and public institutions and their capacity to deliver public services has declined (Novta and Pugacheva, 2021). Fragile states often rely on aid inflows to promote economic growth and social development. Specifically, aid is claimed to account for more than 10% of the GDP of several fragile states (Caselli and Presbitero, 2020). However, due to their absorptive capacity constraints, aid given to fragile states is

[4] Estimation results are available upon request.

[5] See https://www.un.org/en/un-coronavirus-communications-team/covid-19-fragile-settings-ensuring-conflict-sensitive-response for further details.

likely to be more sporadic and less effective than elsewhere. Since governance and the control of corruption are often weaker in fragile states than in other countries, investing in policies to tackle corruption is crucial for increasing the stability and effectiveness of aid inflows (Caselli and Presbitero, 2020).

Policymakers in countries affected by conflict and fragility also need to introduce inclusive approaches to help their economies recover from current conflicts and prevent the prospect of conflict eruption and persistence (World Bank and United Nations, 2018). Hence, financing and knowledge support from the World Bank's International Development Association (IDA) may play a vital role in helping fragile and conflict-affected states rebuild resilient institutions and economies during active conflict and throughout their recovery and transition. This is especially relevant in the current context because this group of countries has been hit hard by a combination of the COVID-19 pandemic, shrinking domestic economies, falling exports, rising world food prices, and increasing foreign debt. IDA-financed operations have demonstrated their effectiveness in helping people resume peaceful and productive lives in conflict-affected areas.[6]

A potential limitation of this research is the measurement of conflict according to fatalities. Thus, the results reflect such trends and do not account for the impacts of non-fatal conflicts, such as protests or social and cultural fragmentation. Nevertheless, it would be useful to consider various kinds of conflict—not only battles or wars but also non-fatal conflicts. This would be a promising avenue for extensive future research, subject to data availability.

Declaration of competing interest

The authors **declare** that they have no known competing financial **interests** or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

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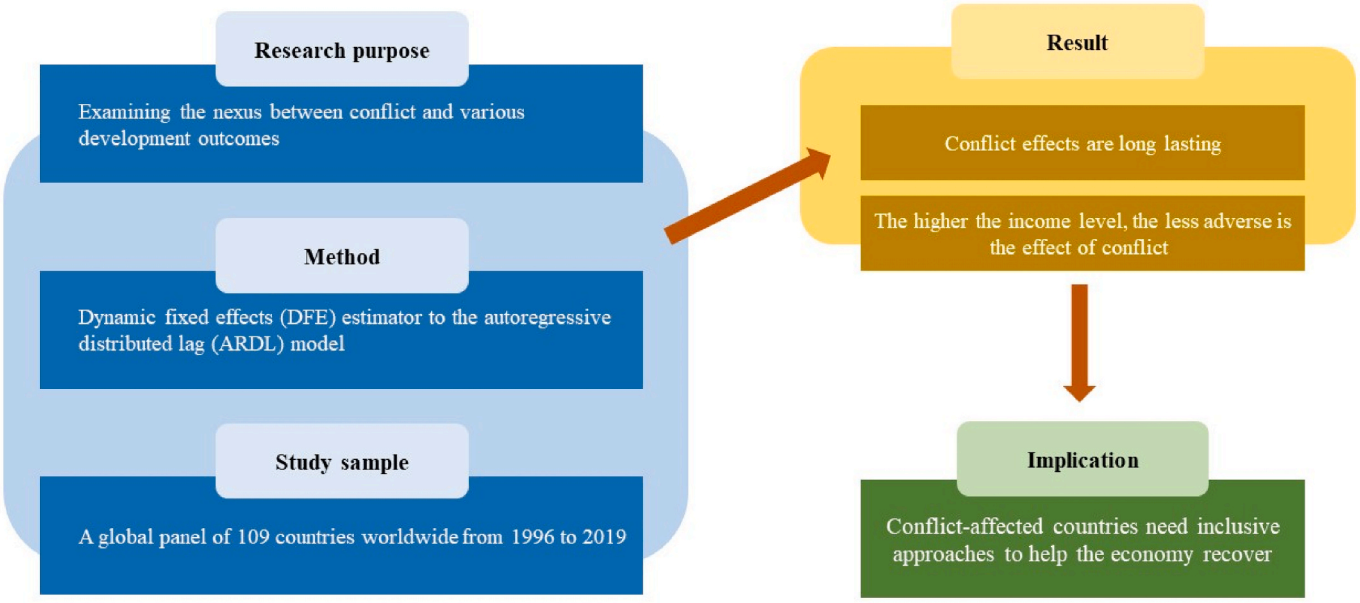
Appendix 1. List of Countries

Low-income countries (LICs)						
Burkina Faso	Burundi	Central African	Chad	DR Congo	Ethiopia	Gambia
Guinea	Guinea-Bissau	Haiti	Madagascar	Mali	Mozambique	Niger
Rwanda	Sierra Leone	Sudan	Tajikistan	Togo	Uganda	Yemen
Lower-middle-income countries (LMICs)						
Algeria	Angola	Bangladesh	Benin	Bhutan	Bolivia	Cambodia
Cameroon	Comoros	Congo	Egypt	El Salvador	Ghana	Honduras
India	Ivory Coast	Kenya	Kyrgyzstan	Laos	Lesotho	Mauritania
Moldova	Morocco	Myanmar	Nepal	Nicaragua	Nigeria	Pakistan
Papua New Guinea	Philippines	Senegal	Sri Lanka	Tanzania	Tunisia	Ukraine
Uzbekistan	Zambia	Zimbabwe				
Upper-middle-income countries (UMICs)						
Albania	Argentina	Armenia	Azerbaijan	Botswana	Brazil	China
Colombia	Ecuador	Georgia	Guatemala	Guyana	Indonesia	Iran
Iraq	Jamaica	Jordan	Lebanon	Malaysia	Mexico	Namibia
Paraguay	Peru	North Macedonia	Russia	Serbia	South Africa	Thailand
Turkey						
High-income countries (HICs)						
Australia	Bahrain	Belgium	Canada	Croatia	France	Germany
Israel	Italy	Kuwait	Malta	Netherlands	Panama	Romania
Saudi Arabia	Spain	Sweden	Trinidad and Tobago	United Arab Emirates	United Kingdom	United States

[6] See https://ida.worldbank.org/en/abcs/abcs-ida-fragile-conflict-and-violence for further details.



Research Summary Diagram

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