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# COVID-19 fatalities and internal conflict: Does government economic support matter?

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ABSTRACT

This study examines the association between COVID-19 mortality rates and internal conflict and investigates the possible moderating role of government economic support during the pandemic years of 2020 and 2021. Our main hypothesis suggests that countries with lower levels of government economic support are more likely to experience a positive correlation between higher COVID-19 mortality rates and the emergence of internal conflict. Using cross-country data from over 100 countries and controlling for various factors that may influence internal conflict, our analysis provides some support for this hypothesis. The results suggest a possible moderating role for government economic support, with the evidence indicating a weakening or elimination of the association between COVID-19 mortality rates and internal conflict when government economic support is adequate. However, the moderating effect of government economic support is not always significant, and caution is needed when interpreting the results. Our analysis also highlights the potential risks associated with low levels of government economic support during the pandemic. Specifically, we find that in countries where the government's macro-financial package in response to the pandemic is less than approximately 25% of GDP, there is a possible risk of growth in civil disorder resulting from increased COVID-19 deaths per million.

## 1. Introduction

During the two years of the pandemic (2020–2021), COVID-19 claimed the lives of around 5.5 million people worldwide (based on data on the coronavirus pandemic from Our World in Data, as documented by Mathieu et al., 2020). However, the pandemic's impact extended beyond human loss and caused a significant global economic downturn. According to the World Bank (2022a), the world's real GDP growth declined by 3.1% in 2020, with a per capita decrease of 4.1% compared to the pre-pandemic year of 2019. Although the global economy partially recovered in 2021, supply chain disruptions due to the pandemic resulted in higher and more widespread inflation (Charlton, 2022). The economic turmoil caused by COVID-19 may also raise the risk of conflicts, particularly in nations that

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have been more deeply affected by the pandemic.[1]

This study aims to explore the potential correlation between COVID-19 fatalities and the risk of internal conflicts while considering other critical factors that may contribute to internal conflicts.[2] Furthermore, we investigate whether government economic measures implemented in response to the pandemic can help alleviate the relationship between COVID-19 fatalities and internal conflicts.[3]

The International Crisis Group, in a report entitled "The Covid-19 Pandemic and Deadly Conflict" (ICG, 2020), recognized that "*the long- and short-term consequences for deadly conflict are less well understood*". Several regional studies have aimed to explore the possible implications of the COVID-19 pandemic for political instability and conflict. These studies include Africa (Fiedler et al., 2021), Southeast Asia (Harding, 2020), Latin America (Murillo, 2020), and the Middle East and North Africa (IMF, 2020). A group of other studies has examined a similar question in country case studies such as Sudan (Zaidan, 2020), Haiti (UN Security Council, 2020), and Lebanon (Asmar, 2020). The conflict consequences of COVID-19 are also reflected in several policy papers, such as Brown et al. (2020), Moyer and Kaplan (2020), and Mustasilta (2020), and in media outlets (e.g., Goldin, 2021; Marcus, 2020; Salemi, 2020). In a descriptive study, Ide (2021) examined quantitative and qualitative evidence for nine countries during the first half of 2020 and found mixed effects of the pandemic on armed conflicts, such as battles and explosive events. The likelihood of armed conflict increased in some countries (India, Iraq, Libya, Pakistan, and the Philippines), mainly due to the weakening of government institutions and the lack of international attention during the global pandemic, while it showed a decline in others (Afghanistan, Colombia, Thailand, and Yemen), possibly because of less favorable opportunity structures for military rebel groups. In general, he found that the probability of armed conflict escalation was greater than de-escalation during the initial phases of the pandemic.

Despite these efforts, a comprehensive analysis of the relationship between COVID-19 fatalities and internal conflict, including its various components (e.g., civil disorder, terrorism, and civil war) for multiple countries remains missing. This study aims to fill this gap in literature by conducting multiple cross-country regression analyses and considering the different components of internal conflict, while also considering the impact of government economic interventions and the moderating effects on conflict.

Fig. 1 shows the positive association between the logarithm of total confirmed COVID-19 deaths per million people in 2020 and 2021 and the development of internal conflict (both in relative and absolute forms) from the International Country Risk Guide (ICRG) database (ICRG, 2022) in our sample during 2020 and 2021. However, the question is how robust this association is when other potential factors are considered. Additionally, which types of internal conflict are most affected by the COVID-19 pandemic? Furthermore, do fiscal stimulus programs implemented by governments during the pandemic have an impact on this correlation?

Research has indicated that the pandemic has led to an increase in various forms of violence (Mustasilta, 2020) and has indirectly contributed to internal conflict by exacerbating economic hardship, poverty, inequality, authoritarianism, and weakening institutions (Labott, 2021; Yayboke et al., 2021). It is worth noting that the rise in internal conflict and social unrest caused by the health crisis is not unique to the COVID-19 pandemic, but has also occurred during previous pandemics such as the Black Death in the 1300s and the Spanish Flu pandemic of 1918 (Censolo and Morelli, 2020). A 2020 survey of leading economists by the Initiative on Global Markets (IGM, 2020) found that a majority believed the pandemic would worsen inequality, in part due to its disproportionate impact on low-skilled workers globally. An IMF report that compared the COVID-19 pandemic to previous outbreaks such as SARS, H1N1, MERS, Ebola, and Zika, predicted that the gap in inequality between the rich and poor will continue to widen in the future (Ostry et al., 2020).

Governments around the world have taken a variety of economic actions to curb the human and economic impact of the pandemic, such as investing in infrastructure projects and health systems, providing payroll tax relief for businesses, debt relief, tax-free cash flow assistance, as well as implementing containment and closure policies, health system, and vaccine policies (Chen et al., 2022; Diaf et al., 2022; Hauptmeier and Kamps, 2022; IMF, 2021; Leeson and Thompson, 2021; Ferraresi and Gucciardi, 2022; Rothert, 2021).[4] For example, the United States passed the $2.2 trillion Coronavirus Aid, Relief, and Economic Security (CARES) Act in March 2020, which is the largest economic stimulus bill in the country's history (Leeson and Thompson, 2021). The aim of such fiscal stimulus measures is to reduce uncertainty, bolster business and consumer confidence, and ultimately encourage household consumption and business investment (OECD, 2020). Elgin et al. (2020) conducted a review of the measures adopted by 166 countries and developed a COVID-19 Economic Stimulus Index (updated in 2021) that includes fiscal, monetary, and exchange rate measures. There is significant variation in the economic support provided by governments during the pandemic. For instance, the size of the macro-financial package (as a

[1] A significant body of literature has demonstrated the detrimental effects of internal conflicts on economic growth through various channels. For example, increased uncertainty can lead to reduced domestic and foreign investment (Alesina and Perotti, 1996; Busse and Hefeker, 2007), and disruptions in production (Alesina and Perotti, 1996) can have a negative impact on economic output. Additionally, internal conflicts can result in increased capital flight (Le and Zak, 2006), decreased international tourism (Saha and Yap, 2014), detrimental government policies (Fredriksson and Svensson, 2003), and slower growth in productivity and capital (Aisen and Veiga, 2013). A cross-country study by Collier (1999) estimates that economic growth can decrease by an average of 2.2 percentage points during periods of civil war compared to peacetime. Other research, such as Matta et al. (2019) and Farzanegan (2022), have also quantified the impact of political turmoil on economic growth, particularly in the case of the Arab Spring protests and Iran.

[2] Given the detrimental effects that political instability can have on a society's economic performance and overall well-being, there have been numerous studies dedicated to understanding the factors that contribute to its emergence. Examples of such research include Bjorvatn and Farzanegan (2015), Farzanegan and Witthuhn (2017), and Ishak and Farzanegan (2022).

[3] In this study, we only focus on the government's economic measures in response to the COVID-19 pandemic. Please see Berman et al. (2022) and Grasse et al. (2021) for evidence on the link between the shutdown policy response to the pandemic and conflict.

[4] It is noteworthy that governments' non-economic policies in response to epidemics, such as quarantines and other restrictions, were not formulated especially for the COVID-19 pandemic but have been standardized since the late Middle Ages to limit exposure to infectious diseases (Koyama, 2021).

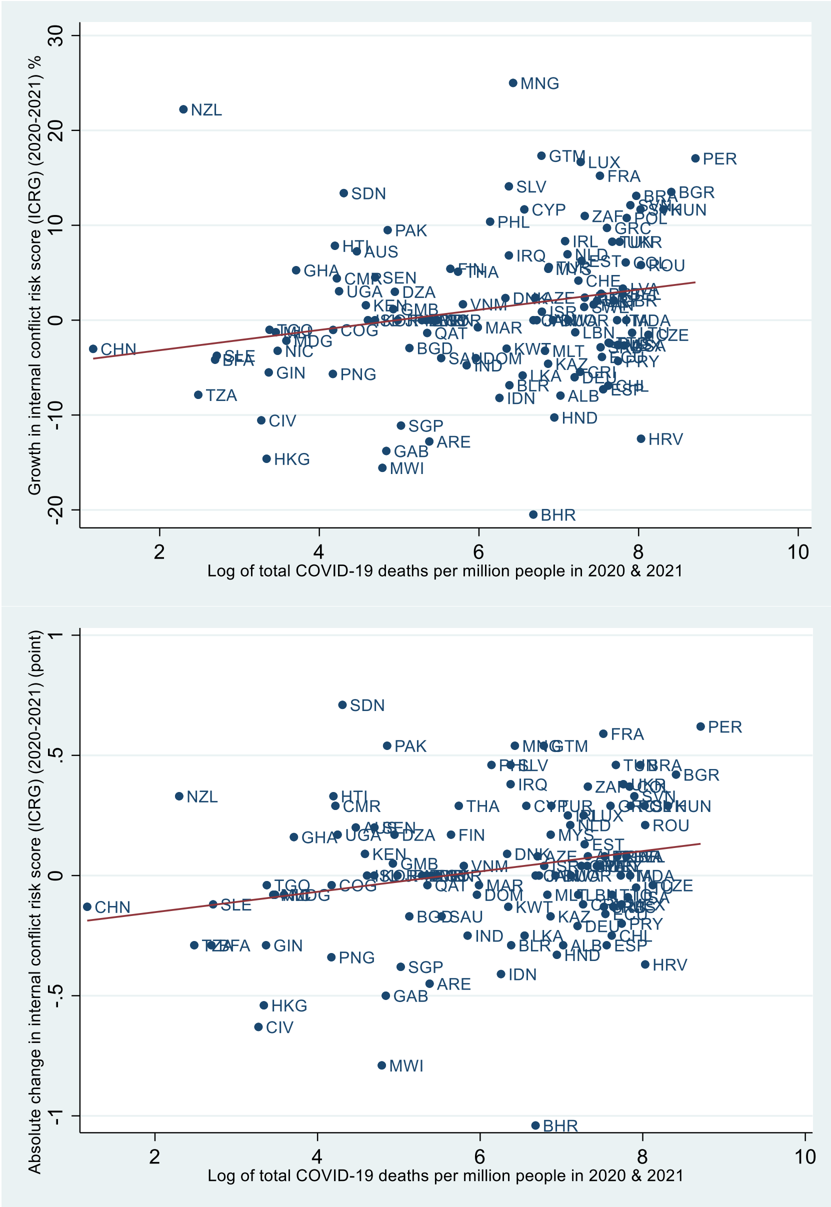


**Fig. 1.** Relative and absolute development of the ICRG internal conflict score during the pandemic and the total COVID-19 death rates by the end of 2021.

Note: Prior to calculating the changes, we rescaled the original internal conflict score, with higher values indicating a higher risk of internal conflict. Only countries included in the estimation sample were considered. The estimated coefficient for COVID-19 deaths (with no other control variables) for the case of relative development (%) of internal conflict is 1.06 with robust t-statistics of 2.16 and a p-value of 0.03 (R-sq. = 5%). The estimated coefficient of COVID-19 deaths for the case of absolute change in internal conflict is 0.04 with robust t-statistics of 2.65 and a p-value of 0.009 (R-sq. = 5.5%). It should be noted that the mean value of the relative change of internal conflict is 1.26%, while the mean of the absolute change in internal conflict is 0.024 points.

percentage of GDP) ranges from 0% (in most developing countries) to 64% (in Italy), with a median of 3.3% and an average of 7.3% in the category of monetary policy.

The contribution of our study is twofold. First, while there have been a number of descriptive and historical studies on the impact of health crises, such as the COVID-19 pandemic, on political stability and social unrest (e.g., Avetian et al., 2021; Bapat, 2020; Censolo and Morelli, 2020; Labott, 2021; Mehrl and Thurner, 2021; Koehnlein and Koren, 2021; Mustasilta, 2020; Polo, 2020; Woods et al., 2020; Yayboke et al., 2021), to the best of our knowledge, there is limited empirical research examining the association between

COVID-19 fatalities and changes in risk of internal conflict across countries in 2020 and 2021.[5] Second, we aim to add to the literature by exploring the possible moderating role of government economic measures in response to the pandemic on the link between COVID-19 mortalities and internal conflict. Despite the emerging literature on the impact of government economic measures in response to the health crisis on economic and financial variables (e.g., Demirgüç-Kunt et al., 2021; Gholipour and Arjomandi, 2021; Zaremba et al., 2020; Gholipour et al. forthcoming 2023), no studies have yet investigated the additional effects of these measures on political variables, including risk of internal conflict. This is a critical area of investigation as internal conflict can extend beyond borders and pose a direct threat to regional stability and international peace and security (Yayboke et al., 2021). In addition, as explained by the International Crisis Group (ICG, 2022), the political consequences of the pandemic are less understood and require further empirical research to fully understand the short- and long-term effects of the health crisis. With this study, we aim to address these gaps in the literature.

Our study suggests that there is a positive and statistically significant correlation between higher COVID-19 death rates and the development of internal conflict, specifically civil disorder, during the pandemic period, even after controlling for other sources of conflict, the initial level of conflict, and continent dummies. However, the relationship between COVID-19 fatalities and internal conflict can be weakened to some extent when governments provide economic support during the health crisis. Nevertheless, due to the cross-country nature of our analysis, we cannot make definitive causal inferences from our results. Furthermore, we examined the association between COVID-19 fatalities and the ICRG external conflict risk score during the pandemic years but did not find a robust and significant relationship. Overall, our findings suggest that while internal conflict may be the primary political risk factor affected by the COVID-19 crisis, further research is needed to fully understand the complex relationship between the pandemic and political instability.

The remainder of this study is organized as follows: Section 2 reviews relevant literature and proposes hypotheses, Section 3 details the data and methodology used, Section 4 presents the estimation results, and Section 5 concludes the paper.

## 2. Literature review and hypothesis development

### 2.1. Relationship between the COVID-19 burden and internal conflict

Historical evidence over the past seven centuries shows that epidemics have harmful effects on peace and political stability. In looking at 57 important epidemic episodes over the period between the Black Death (1346–1353) and the Spanish Flu (1919–1920), Censolo and Morelli (2020) show that in 53 cases, epidemics are incubators of serious social disorder. Censolo and Morelli (2020) emphasize three channels through which epidemics influence political instability: by straining the relationship between the government and its citizens with restrictive measures, contributing to widening inequality and disseminating inaccurate information about the epidemic which may stoke irrational fears. Regarding the third channel, in a recent study, Chan et al. (2021) show that a key mechanism in reducing the spread of interest in extreme ideas, like the QAnon conspiracy theory, during the COVID-19 pandemic is the government's timely provision of risk communication regarding the emergency faced. In a similar study, but with data from the first five months of the COVID-19 pandemic, Polo (2020) provides some descriptive evidence that a pandemic can amplify violent conflicts, especially in conflict-prone countries, for at least two reasons: the pandemic intensifies the original reasons surrounding the conflict, and governments and non-state actors can take advantage of the pandemic to advance their political and territorial objectives. Similar arguments provided by Mehrl and Thurner (2021) note that the COVID-19 pandemic's harmful economic consequences can worsen poverty and increase rebel group recruitment, offering opportunities for opposition movements to attack distracted and weakened incumbents, thereby triggering and intensifying armed conflicts. Menton et al. (2021) also show that the COVID-19 pandemic significantly intensified resource conflicts in Brazilian regions where indigenous peoples reside. In another study in Brazil, Calvimontes et al. (2020) argue that the spread of COVID-19 has strongly deepened pre-existing conflicts related to artisanal and small-scale gold mining communities in the Brazilian Amazon. Avetian et al. (2021) also find that changes in exposure to COVID-19 lead to an increase in the occurrence of Black Lives Matter (BLM) protests in the US. Using daily data (1 January-15 June 2020) at the country level, Koehnlein and Koren (2021) provide evidence that the spread of COVID-19 caused a noticeable increase in the number of attacks by pro-government nonstate actors (e.g., militias, paramilitaries, and mercenaries) compared with the year 2019. However, they did not find a significant link between COVID-19 and levels of violence by antigovernment groups (e.g., rebels, insurgents). There is also a strand of literature arguing that, although conflicts might be a manner to express disagreement with the government, individuals might use other channels to express their dissatisfaction with government decisions during the COVID-19 pandemic. Some studies analyze the impact of the COVID-19 pandemic on voter turnout (Picchio and Santolini, 2022; Cipullo and Le Moglie, 2022; Fernandez-Navia et al., 2021). For example, Fernandez-Navia et al. (2021) show that voter turnout is between 2.6 and 5.1 percentage points lower in those municipalities of Spain where there were a positive numbers of COVID-19 cases.

On the other hand, Mehrl and Thurner (2021) provide an opposing view by arguing that international actors (e.g., the United Nations) have called for stopping armed conflict to facilitate efforts to fight the spread of the pandemic. Apergis and Apergis (2020) also show that both the COVID-19 pandemic and oil prices (which pose a major threat to national economies and public health) mitigate political polarization and reduce political conflicts between Republicans and Democrats in the US, which, in turn, reduces political instability. Likewise, some observers (e.g., Yayboke et al., 2021) suggest that there might be opportunities for peace in

[5] Using a sample of 401 German districts from March to May 2020, Plümper et al. (2021) examined the link between the stringency of containment policies and protests.

unifying behind a common enemy (in this case, a virus).

In the present study, based on justifications from Censolo and Morelli (2020), Mehrl and Thurner (2021), and Polo (2020), we propose that COVID-19 fatality rates can lead to higher levels of political instability across countries. Our study differs from Censolo and Morelli (2020), Mehrl and Thurner (2021), and Polo (2020) in at least two aspects: first, while they provide valuable historical and case study evidence, we apply cross-sectional multivariate regressions to statistically find a more robust relationship between the health crisis, internal conflicts, and their components. Second, our study covers more than 100 countries in the analyses compared to their works, which only focus on certain countries.

Given the above discussion, in this study, we hypothesize that.

**H1**. The higher the COVID-19 death rates, the higher the risk of internal conflict, ceteris paribus.

### *2.2. Relationship between government spending and internal conflict*

Several studies have examined the impact of aggregate government expenditures on political instability. While most empirical works show a positive relationship between government spending and stability, some researchers also find an insignificant relationship between these two variables.

Using data from 141 countries over the period 1965–2006, Fjelde and de Soysa (2009) showed that countries with higher levels of government spending to GDP, as an indicator of economic capacity, and good institutions are less likely to experience intrastate armed conflict. They argued that redistributive government expenditures indicate a government's commitment to providing public goods and are popular with citizens, thereby promoting peace. Governments, through public spending, can also garner political support by offering employment or subsidies (Bratton and van de Walle, 1997; Acemoglu et al., 2004). In terms of government expenditure on social welfare services, Taydas and Peksen (2012) found that the likelihood of civil conflicts is significantly lower in countries where the government spends more on welfare policies (i.e., education, health, and social security). They argue that funding social services is seen as a gesture by governments to prioritize the needs of their citizens. As a result, there is less opposition and rebellion and more incentive to maintain peace. De Juan and Bank (2015) also showed similar results by using regional data during the Syrian civil war. Their analyses indicated that the risk of violence is lower in sub-districts that have been favored by the ruling regime, in terms of preferential access to material goods. Using a panel of 12 Latin American countries over the period 1970–2010, Justino and Martorano (2018) found that government spending on welfare has led to substantial reductions in the incidence of political conflicts. At a sub-national context, using a data set of 105 ethnic conflicts in Xinjiang, China over the period 1997–2005, Liu (2019) showed that local governments can reduce the hazard of ethnic conflicts by raising their provision of public goods (especially spending on education). He argued that growth in public spending mitigates the risk of ethnic conflicts through two channels: "(1) imposing higher opportunity costs on joining rebel groups; and (2) enhancing a state's legitimacy" (p. 741). Similar theoretical evidence was provided by Azam (1995, 2001) and Grossman (1994, 1995). For example, Azam (1995) developed a game-theoretic model to analyze a government's choice between increasing spending on national defense or giving "gifts" to their opponents as a means to stay in position. He argued that government investment in a redistribution policy can increase the chance of lower levels of conflicts in Africa.

On the other hand, Thies (2010) used data from 157 countries to show that higher levels of government expenditures do not reduce the number of civil wars. He argues that the insignificant link between government spending and internal conflict is due to a positive channel and a negative channel that neutralize this relationship.

First, a large government (measured by its expenditures) may indicate the ability to expand capacity, showing strength and preventing civil war. However, another view suggests that large expenditures do not necessarily imply a strong government and that an ineffective government may actually spur conflict if there is a struggle for the share of government expenditures. Likewise, Bodea et al. (2016) find that general government spending is not associated with a lower risk of conflict in both oil-rich and oil-poor countries from 1960 to 2009. Mayai (2020) even finds that government spending on the security sector is strongly correlated with lower public safety in South Sudan over the period of 2006–2018. He argues that the government's allocated resources to the security sector are diverted to rebel groups through corruption, which makes the public more vulnerable.

As noted by Censolo and Morelli (2020), various factors may moderate the effect of the health crisis on internal conflict, such as the degree of existing social cohesion and political stability, the duration of the epidemic, mortality rates and diffusion, and how the social costs of the epidemic are distributed among society.

In this study, we argue that the effect of COVID-19 death rates on internal conflict (especially on the civil disorder component) depends on the level of government economic response to the pandemic. We test if the impact of COVID-19 fatalities on conflict can be weakened (strengthened) in countries where governments have provided more (less) economic support to their citizens.

Expansionary fiscal policies during the crisis (through the Keynesian multiplier effect) can significantly stimulate national output and employment (at least in the short run) and mitigate the financial stress and economic difficulties that can cause social unrest and violence.

It is important to note that government expenditures have been used as a moderating variable in some studies that examine the link between macroeconomic factors and political instability. For example, Bodea et al. (2016) find that the impact of oil wealth on civil conflict depends on the size of government spending and the allocation of government expenditures for social welfare or the military. Farzanegan et al. (2018) also show that the effect of natural resource rents on internal conflict depends on the degree of expenditure decentralization (the ratio of expenditures of sub-national governments to total government expenditures).

Given that government expenditure measures are well-established moderating variables in the political instability literature, we also argue that government economic measures in response to the COVID-19 pandemic can play an important role in the relationship between COVID-19 fatality rates and the development of internal conflict.

We hypothesize that.

**H2.** *Higher levels of government economic measures in response to the COVID-19 pandemic weaken the relationship between COVID-19 fatality rates and the development of internal conflict during the pandemic.*

## 3. Data and method

The baseline econometric model (1) has the following form, and we estimate it with an ordinary least squares (OLS) regression (using robust standard errors).

$$Conflict\_growth_i = \alpha + \beta_1 .\ COVID\_death_i + \beta_2 .\ Gov\_support_i + \beta_3 .(COVID\_death_i \times Gov\_support_i) + \beta_4^{'} .\ Z_i + \varepsilon_i \quad (1)$$

*Conflict_growth* as our dependent variable measures the relative (percent change) and absolute (risk score points) development of the ICRG internal conflict index during the pandemic period of 2020–2021.2020 was the first year when people around the world experienced COVID-19 without any clear perspective regarding vaccination projects and the socio-economic impacts of the pandemic. Governments started to formulate and implement health controls, social distancing regulations, quarantine, lockdowns, and other similar restrictions on the daily lives of people and businesses. Thus, we expect to observe the effect of the pandemic and associated restrictions and controls as well as economic stimulus packages over the two years of the pandemic (2020–2021).[6]

The internal conflict measurement is from the ICRG published by the Political Risk Services Group (ICRG, 2022). We use the latest version, which covers information through 2021. The index examines political violence in a country. The original index scores range from 0 (highest internal violence) to 12 (least internal violence). We have re-scaled it by subtracting original scores from 13 (and thus higher scores mean higher internal conflict) and calculate the relative and absolute development of conflict over the pandemic years.

There is a broad range of potential conflicts and violence that may affect a country. Thus, the ICRG internal conflict index is based on three sub-categories, for which we also have 2021 information. The index is widely used in the literature (see, for example, Fredriksson and Svensson, 2003; Gupta et al., 2004; Lessmann, 2016; Busse and Hefeker, 2007, among others). The ICRG components of internal conflict are as follows (we subtracted original scores from 5 and thus higher values mean higher levels of each type of conflict):

*Civil disorder* (4 points) – This component covers behaviors that would often be contained by an efficient civilian police force in a country. Civil disorder includes "violent demonstrations and strikes, criminal activity, kidnapping for monetary remuneration (i.e., income, not for the purchase of arms or other political objectives), and extensive civil disobedience." COVID-19 has mainly raised this type of internal conflict across countries during the pandemic period.

*Civil war* (4 points) – This component measures the level of open and physical conflict between factions within a society. This conflict can be between government forces on one side and a segment of the population on the other side, or between two or more factions, tribes, or religious groups. Due to the high persistence of civil war, we do not expect to observe growth in this type of conflict within the first two years of the pandemic.

*Terrorism* (4 points) – This component measures the level of violent actions implemented by individuals or groups with a political purpose. We also expect high persistence in terrorism and a lower likelihood of significant growth in it during the first two years of the pandemic.

In our estimation sample of 114 countries, the average growth rate in the overall ICRG internal conflict index during 2020–21 is 1.22%, with a range from −20.49% in Bahrain to 25% in Mongolia, and a standard deviation of 7.9%. The average absolute change in this index during the pandemic years is 0.02 points, varying from −1.04 points in Bahrain to 0.71 points in Sudan, with a standard deviation of 0.29 points.

The risk of the civil disorder component in internal conflict in our estimation sample experienced an average growth rate of 2.46% during 2020–21, with a range from −20.21% in Singapore to 36.4% in Peru, and a standard deviation of 9.7%. The average absolute change in the civil disorder risk score is 0.04, ranging from −0.54 points in Hong Kong to 0.79 points in Peru, with a standard deviation of 0.22 points.

The average growth rate of the risk of civil war in our estimation sample during the pandemic years is −0.19%, with a range from a minimum growth of −30.8% in Bahrain to a maximum growth of 25% in Sudan, and a standard deviation of 4.89%. The average absolute change in the ICRG civil war score is −0.003 points, ranging from −0.67 points in Bahrain to 0.5 points in Sudan, with a standard deviation of 0.10 points.

Finally, the risk of the terrorism component had an average growth rate of −0.14% between 2020 and 21, with a range from a minimum growth of −18.4% in Gabon to a maximum growth of 19.7% in Bulgaria, and a standard deviation of 5.2%. The average absolute change in the ICRG terrorism index is −0.008 points, varying from −0.46 points in Gabon and Malawi to 0.42 points in

[6] We used the average of the years 2015–2019 as the base for calculating relative and absolute internal conflict development in 2021, while controlling for other variables, including the initial level of internal conflict in 2015. Despite a positive association between COVID-19 fatalities and conflict, it is not statistically significant. This may be because more significant violent periods in the past decade, such as the Arab Spring and the rise of ISIS, had a greater impact on conflict and deaths. Additionally, the actions of the Trump administration from 2017 to 2020 may have contributed to increased uncertainties in different parts of the world, such as its decision to withdraw from the Joint Comprehensive Plan of Action and reimpose economic sanctions on Iran. The period of 2010–2018 also had a higher annual death rate from conflict and terrorism per 100,000 residents.

France, with a standard deviation of 0.12 points.

Civil disorder shows the only positive average growth rate of 2.46% during the pandemic years versus a negative growth rate of −0.14% in terrorism risk and −0.19% in civil war risk and largest cross-country variation with a standard deviation of 9.7% versus 5.2% and 4.8% for the risk of terrorism and civil war, respectively. Our focus will be on overall internal conflict and the component of civil disorder. Our two hypotheses are not supported for relative or absolute changes in the risk of civil war and terrorism during the pandemic years. For the sake of brevity, the estimates for civil war and terrorism are not presented but they are available upon request.

*COVID_death* in Equation (1) denotes the total number of COVID-19 confirmed deaths per million people by the end of 2021.[7] In our sample estimation of 114 countries, it ranges from a minimum of 3.21 (China) to a maximum of 6075 (Peru), with an average value of 1107 and interquartile range of 1723.54 deaths per million people. We use a logarithmic transformation of this variable. The source of the data for COVID-19 death rates is "Coronavirus (COVID-19) Deaths" from the Our World in Data portal (Mathieu et al., 2020) and is recorded cumulatively by the end of 2021. We expect to observe a positive association between COVID-19 deaths and the relative or absolute change of internal conflict, particularly in the civil disorder component of internal conflict. According to the insurer Allianz Global Corporate & Specialty (Allianz, 2022), "*businesses should prepare for a rise in civil unrest incidents as the cost-of-living crisis follows hard on the heels of the Covid pandemic*." With reference to civil disorder, Srdjan Todorovic, who is the Head of Terrorism and Hostile Environment Solutions at AGCS, suggests that "*civil unrest increasingly represents a more critical exposure for many companies than terrorism … Incidences of social unrest are unlikely to abate any time soon, given the aftershocks of Covid-19, the cost-of-living crisis, and the ideological shifts that continue to divide societies around the world*." While our focus is on COVID-19 mortality, we also examine our results with COVID-19 confirmed cases. In general, our central finding on the positive association between the COVID-19 health burden and internal conflict (and in particular its civil disorder component) holds.

For comparison, we also check our main finding by using excess deaths per million people (*excess COVID_death*) during the COVID-19 pandemic. We use the calculation by The Economist (2021) and report by the Our World in Data portal (Mathieu et al., 2020). Excess deaths measure the difference between how many people have died from any cause during the pandemic and how many deaths would have been expected had there been no pandemic. In our estimation sample of 110 countries, the total excess deaths per million people by the end of 2021 range from a minimum of 59.77 (Madagascar) to the maximum of 8751.6 (Bulgaria), with an average of 2462.2 and a standard deviation of 1893.9. We also use the logarithmic form of this variable in the regression analysis. We refrain from using COVID-19 case fatality rates (COVID-19 deaths divided by COVID-19 confirmed cases) since its denominator depends on the test capacity of countries. In addition, it may not capture the scale of a country's problem with COVID-19. A country with one confirmed case that ultimately leads to death may show a 100% case fatality rate, while in another extreme example, a country with 10 million confirmed cases and one million deaths would show a case fatality rate of 10%. It is clear that the latter hypothetical country is experiencing more significant interaction with COVID-19 compared with the former. Thus, we rely on COVID-19 confirmed deaths (and excess deaths), adjusted for the size of a population, for a better comparison of COVID-19 burdens on countries.

*Gov_support* in Equation (1) is taken from the COVID-19 Economic Stimulus Packages Database introduced in Elgin et al. (2020) and updated for 2021. They conducted a comprehensive review of different economic policy measures across countries in response to the pandemic and generated six policy variables under three categories: fiscal policy, monetary policy, and balance of payment/exchange rate policy. The fiscal policy package covers all adopted fiscal measures and is presented as a percentage of GDP. Under the category of monetary policy, three variables are included: (1) interest rate cuts by the monetary policy authority (presented as a percentage of the ongoing rate on February 1, 2020); (2) the size of the macro-financial package (presented as a percentage of GDP); and (3) other monetary policy measures (presented as a dummy variable taking the value of 1 if there are such measures and 0 otherwise). Finally, the balance of payment (BoP) category and exchange rate policy covers two variables. The first reports specific BoP measures presented as a percentage of GDP, while the second variable is a dummy variable and takes the value of 1 if there are other reported measures and 0 otherwise. We examine each of these government support packages in our analysis and conclude that the size of the macro-financial package (presented as a percentage of GDP) under the monetary policy category is the most relevant and significant type of support in the context of the COVID-19 conflict nexus. In the rest of our analysis, we use the macro-financial package (presented as a percentage of GDP) to capture government economic support. We expect to observe a negative interaction term between COVID-19 and government economic support, implying that the COVID-19 burden increases internal conflict in countries with lower levels of government support. Countries may reduce the risk of internal conflict (especially civil disorder) by increasing their economic support for the affected population.

*Z* in Equation (1) represents a vector of control variables from recent years, such as the log of GDP per capita (PPP, 2017$), urban population (as a percentage of total population), the Human Capital Index (HCI), the inflation rate, a governance index (based on the average of control of corruption, government effectiveness, and voice and accountability, with higher values indicating higher state capacity and better governance), the COVID-19 Stringency Index during the pandemic years (2020–2021), which is a composite measure based on nine response indicators, including school closures, workplace closures, and travel bans (rescaled to a value from 0 to 100, where 100 represents the strictest measures), the initial level of internal conflict in 2020, and finally, a set of continent dummies (Africa, Asia, Europe, North America, South America, and Oceania, where Oceania is the reference category). The data for control variables are from the World Development and World Governance Indicators published by the World Bank (2022a, 2022b). For robustness checks and following Chan et al. (2020) and Farzanegan and Hofmann (2022), we collected data on trust in government and

[7] We also present the results of separating the COVID-19 death figures in 2020 and 2021. Generally, the results are not sensitive to this approach. The moderating role of government economic support is stronger when we interact it with COVID-19 deaths in the first year of the pandemic. This indicates that an early reaction by governments to the crisis is key in reducing the risk of internal conflict.

**Table 1**
Summary statistics of variables in the estimated general model.

| Notation | Variable | Obs. | Mean | Std. Dev. | Min | Max | Source |
|---|---|---|---|---|---|---|---|
| Conflict growth (relative) | Relative change of internal conflict score (%) (2020–21) | 114 | 1.23 | 7.95 | −20.49 | 25.00 | ICRG (2022) |
| Conflict growth (absolute) | Absolute change of internal conflict score (point) (2020–21) | 114 | 0.02 | 0.29 | −1.04 | 0.71 | ICRG (2022) |
| Civil disorder growth (relative) | Relative change of civil disorder score (%) (2020–21) | 114 | 2.47 | 9.76 | −20.21 | 36.41 | ICRG (2022) |
| Civil disorder growth (absolute) | Absolute change of civil disorder score (point) (2020–21) | 114 | 0.04 | 0.22 | −0.54 | 0.79 | ICRG (2022) |
| COVID_death | log of total COVID-19 confirmed deaths per million (by the end of 2021) | 114 | 6.17 | 1.63 | 1.17 | 8.71 | Our World in Data portal, Mathieu et al. (2020) |
| COVID_case | log of total COVID-19 confirmed cases per million (by the end of 2021) | 114 | 6.17 | 1.63 | 1.17 | 8.71 | Our World in Data portal, Mathieu et al. (2020) |
| Excess COVID_death | log of total excess deaths per million during the pandemic (by the end of 2021) | 110 | 7.40 | 1.06 | 4.09 | 9.08 | Our World in Data portal, Mathieu et al. (2020) |
| Gov_support | Size of the macro-financial package (as a % of GDP) in 2020–21 | 114 | 9.75 | 11.12 | 0.00 | 64.64 | Elgin et al. (2020) |
| Inflation | Inflation rate (%) (2019–2020) | 114 | 4.02 | 10.48 | −2.01 | 100.66 | World Bank (2022a) |
| HCI | Human capital index (0–1) in 2020 | 114 | 0.60 | 0.14 | 0.32 | 0.88 | World Bank (2022a) |
| Oil_rent | Oil rents in GDP (%) (2019) | 114 | 3.14 | 8.15 | 0.00 | 43.45 | World Bank (2022a) |
| Urbanization | Urban population in total population (%) (2020) | 114 | 67.06 | 20.22 | 13.35 | 100.00 | World Bank (2022a) |
| Log of GDP per capita | log of GDP per capita (PPP, 2017$) (2019) | 114 | 9.75 | 1.08 | 7.34 | 11.67 | World Bank (2022a) |
| Governance (wgi) | WGI governance (2019–2020) | 114 | 0.18 | 0.89 | −1.49 | 1.92 | World Bank (2022b) |
| Governance (icrg) | ICRG governance (2019–2020) | 114 | 4.46 | 1.07 | 2.43 | 6.58 | ICRG (2022) |
| Stringency index | Stringency index (2020–2021) | 114 | 53.78 | 11.09 | 10.09 | 74.78 | Our World in Data portal, Mathieu et al. (2020) |
| Gini index | Gini index (2015–2019) | 86 | 36.28 | 7.41 | 24.62 | 57.10 | World Bank (2022a) |
| Ethnic fractionalization | Ethnic Fractionalization in the year 2000 | 111 | 0.41 | 0.25 | 0.00 | 0.93 | Teorell et al. (2022) |
| Trust in government | Share of people who trust their national government, 2020 | 85 | 54.16 | 17.94 | 15.80 | 94.30 | Our World in Data portal, Ortiz-Ospina and Roser (2016) |
| Trust in science | Share of people who trust science, 2020 | 90 | 78.03 | 13.51 | 42.30 | 97.00 | Our World in Data portal, Ortiz-Ospina and Roser (2016) |

trust in science from the portal of Our World in Data. Trust in government is measured by the share of respondents who answered "a lot" or "some" to the question, "How much do you trust your national government?" in 2020. Trust in science is measured by the share of respondents who answered "a lot" or "some" to the question, "How much do you trust science?" Re-estimating our general model, including trust variables as an additional control variable, increases the size of the association and statistical significance of our key variables of interest (COVID-19 death and interaction term with government economic support) with similar directions. However, the sample size reduces from 114 countries to 85 after including trust variable(s). Trust variables do not show a significant association with the relative or absolute development of internal conflict, controlling for other factors.

We also collected data on the Gini index (average 2015–2019) and ethnic fractionalization index, which in theory, are mentioned to have a positive association with the risk of conflict. Of course, the net effect is not clear in the literature. Higher income inequality may hinder the coalition among different income classes. Higher ethnic fractionalization may also make coordination among opposition more costly and time-consuming, hindering a successful mobilization of people. In any case, adding these two variables in the general model does not change the positive estimated association between COVID-19 deaths and the relative or absolute development of internal conflict. The association between the Gini index and ethnic fractionalization with the development of internal conflict is statistically insignificant. The inclusion of the Gini index reduces the sample size from 114 to 86 countries. As a robustness check, we conducted an analysis in which we replaced the World Bank Gini Index with the Standardized World Income Inequality Database (SWIID) disposable Gini index average values between 2010 and 2020 (Solt, 2020). The results of this additional analysis (available upon request), using a different measure of income inequality, reinforce our conclusion that government economic support plays a crucial role in mitigating the positive correlation between COVID-19 fatality rate and the escalation of civil disorder.

The control variables included have an impact on the risk of internal conflict by influencing the opportunity cost of engaging in conflict and shaping incentives for collective action. Some variables, such as the stage of economic development, human capital, and institutional capacity (measured by the quality of governance), are also related to the management of the COVID-19 pandemic. Farzanegan and Hofmann (2021) have shown the role of public corruption (and government effectiveness) in vaccinating the population against COVID-19. Therefore, their inclusion helps to reduce the risk of omitted variable bias and assists us in better identifying the impact of COVID-19 and government economic support on the development of the risk of internal conflict during the pandemic years. The subscript i in Equation (1) refers to country i.

The list of countries used in our estimations is presented in online Appendix B. Table 1 presents the summary statistics of key variables and their sources.

**Table 2**
Growth rate (%) of the overall score of ICRG internal conflict (2020–21) and (log) cumulative confirmed COVID-19 deaths per million people by the end of 2021.

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Dependent variable: *Conflict growth (relative)* | | | | | | | |
| *COVID_death* | 1.057** | 0.995* | 1.705*** | 1.765*** | 1.989** | 2.013*** | 3.848*** | 2.213*** |
| | (2.15) | (1.82) | (3.16) | (2.71) | (2.59) | (2.77) | (3.14) | (3.30) |
| *Gov_Support* | | 0.036 | 0.615 | 0.515 | 0.619 | 0.337 | 0.836 | 0.648* |
| | | (0.44) | (1.25) | (1.23) | (1.59) | (0.89) | (1.58) | (1.79) |
| *COVID_death* × *Gov_support* | | | −0.086 | −0.078 | −0.090* | −0.051 | −0.124* | −0.092* |
| | | | (-1.27) | (-1.36) | (-1.73) | (-0.99) | (-1.74) | (-1.85) |
| *Inflation* | | | | | 0.171*** | −0.026 | −0.179 | 0.161*** |
| | | | | | (3.83) | (-0.09) | (-0.57) | (4.80) |
| *HCI* | | | | | −9.439 | −5.345 | 31.071 | |
| | | | | | (-0.71) | (-0.35) | (1.37) | |
| *Oil_rent* | | | | | −0.019 | −0.936*** | −0.756** | |
| | | | | | (-0.19) | (-3.35) | (-2.46) | |
| *Urbanization* | | | | | 0.029 | 0.080 | 0.119 | |
| | | | | | (0.50) | (1.10) | (1.38) | |
| *Log of GDP per capita* | | | | | −2.568 | −0.264 | −6.436 | −2.146* |
| | | | | | (-1.22) | (-0.09) | (-1.67) | (-1.77) |
| *Level of conflict 2020* | | | | | −1.747** | −1.295 | −1.844* | −1.802** |
| | | | | | (-2.11) | (-1.41) | (-1.71) | (-2.31) |
| *Governance* | | | | | 1.298 | −0.556 | −2.618 | |
| | | | | | (0.68) | (-0.25) | (-0.91) | |
| *Stringency index* | | | | | 0.066 | 0.096 | 0.140 | |
| | | | | | (0.83) | (1.01) | (1.25) | |
| *Gini index* | | | | | | −0.149 | −0.052 | |
| | | | | | | (-0.97) | (-0.31) | |
| *Ethnic fractionalization* | | | | | | 1.787 | −1.604 | |
| | | | | | | (0.40) | (-0.35) | |
| *Trust in government* | | | | | | | 0.078 | |
| | | | | | | | (1.04) | |
| *Trust in science* | | | | | | | 0.086 | |
| | | | | | | | (0.52) | |
| *Africa* | | | | −6.059 | −7.946 | −3.529 | 2.681 | −7.370 |
| | | | | (-1.04) | (-1.48) | (-0.75) | (0.48) | (-1.42) |
| *Asia* | | | | −8.850 | −7.166 | −3.166 | −4.013 | −7.503 |
| | | | | (-1.55) | (-1.45) | (-1.14) | (-0.93) | (-1.56) |
| *Europe* | | | | −5.637 | −4.163 | −6.185** | −6.484 | −5.513 |
| | | | | (-0.99) | (-0.81) | (-2.10) | (-1.38) | (-1.13) |
| *North America* | | | | −7.688 | −9.316* | −11.641*** | −11.888*** | −9.269* |
| | | | | (-1.26) | (-1.70) | (-3.23) | (-2.75) | (-1.74) |
| *South America* | | | | −7.049 | −7.659 | −6.126 | −8.290 | −7.258 |
| | | | | (-1.09) | (-1.28) | (-1.28) | (-1.49) | (-1.26) |
| *Constant* | −5.289* | −5.266* | −9.725*** | −2.949 | 26.180 | 0.594 | 11.346 | 21.071 |
| | (-1.67) | (-1.68) | (-2.82) | (-0.40) | (1.47) | (0.02) | (0.29) | (1.51) |
| Adj. R-squared | 0.038 | 0.032 | 0.052 | 0.053 | 0.099 | 0.085 | 0.063 | 0.130 |
| Countries | 114 | 114 | 114 | 114 | 114 | 85 | 71 | 114 |

The method of estimation is ordinary least squares. The t-statistics, presented in parentheses, are calculated using heteroscedasticity-robust standard errors. The asterisks indicate the level of statistical significance: *** indicates $p < 0.01$, ** indicates $p < 0.05$, and * indicates $p < 0.1$.

## 4. Results

### *4.1. Development of ICRG internal conflict during the pandemic period and COVID-19 death rates*

Table 2 presents the estimation results when we use “Conflict growth (relative)" as a dependent variable, which is the relative change of the ICRG internal conflict risk score between 2020 and 2021. In Model 1, we only show the association between our key variable of interest (*COVID_death*) and the growth of internal conflict. The estimated coefficient is positive and statistically significant at the 5% level. During the first two years of the pandemic, a 1% increase in the COVID-19 death rate per million people is associated with a 1.05% increase in the ICRG internal conflict growth.

When we add “government economic support” to Model 2, the magnitude of the positive association between *COVID_death* and internal conflict growth remains almost the same, and it also remains statistically significant. In Models 3 and 4, the interaction term between *COVID_death* and *Gov_support* is included. Model 4 additionally controls for continent dummies. In both Models 3 and 4, the direct association between *COVID_death* and internal conflict growth is positive and similar in size. We observe that a 1% increase in the number of COVID-19 deaths per million of population is associated with approximately a 1.7% increase in ICRG internal conflict growth.

**Table 3**
Growth rate of overall score of civil disorder (2020–21) and (log) cumulative confirmed COVID-19 deaths per million people.

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Dependent variable: *Civil disorder growth (relative)* (2020–21) (%) | | | | | | | |
| *COVID_death* | 1.656*** | 1.531** | 2.257*** | 2.859*** | 2.752*** | 3.478*** | 5.586*** | 3.271*** |
| | (2.93) | (2.56) | (3.34) | (3.55) | (3.26) | (3.50) | (3.33) | (4.29) |
| *Gov_Support* | | 0.074 | 0.665** | 0.777** | 0.574* | 0.367 | 1.057 | 0.562* |
| | | (0.98) | (2.31) | (2.18) | (1.73) | (0.76) | (1.61) | (1.88) |
| *COVID_death* × *Gov_support* | | | −0.088** | −0.103** | −0.081* | −0.052 | −0.152 | −0.080* |
| | | | (-2.13) | (-2.05) | (-1.75) | (-0.76) | (-1.67) | (-1.89) |
| *Inflation* | | | | | 0.125*** | −0.259 | −0.524 | 0.154*** |
| | | | | | (2.81) | (-0.70) | (-1.31) | (4.34) |
| *HCI* | | | | | −12.035 | −5.825 | 33.249 | |
| | | | | | (-0.74) | (-0.29) | (1.17) | |
| *Oil_rent* | | | | | −0.187 | −0.603* | −0.574 | |
| | | | | | (-1.56) | (-1.80) | (-1.30) | |
| *Urbanization* | | | | | 0.032 | 0.075 | 0.108 | |
| | | | | | (0.54) | (0.98) | (1.12) | |
| *Log of GDP per capita* | | | | | −2.708 | −3.007 | −7.539 | −4.700*** |
| | | | | | (-1.33) | (-0.98) | (-1.56) | (-3.18) |
| *Level of civil disorder 2020* | | | | | −18.402*** | −19.557*** | −19.756*** | −17.157*** |
| | | | | | (-6.21) | (-4.79) | (-4.62) | (-5.90) |
| *Governance* | | | | | −2.328 | −3.125 | −5.697 | |
| | | | | | (-1.34) | (-1.27) | (-1.57) | |
| *Stringency index* | | | | | 0.077 | 0.019 | 0.065 | |
| | | | | | (1.06) | (0.16) | (0.47) | |
| *Gini index* | | | | | | −0.325* | −0.161 | |
| | | | | | | (-1.67) | (-0.85) | |
| *Ethnic fractionalization* | | | | | | −1.077 | −3.900 | |
| | | | | | | (-0.19) | (-0.63) | |
| *Trust in government* | | | | | | | 0.091 | |
| | | | | | | | (0.90) | |
| *Trust in science* | | | | | | | 0.042 | |
| | | | | | | | (0.23) | |
| *Africa* | | | | 0.327 | −3.919 | −4.789 | 4.767 | −3.252 |
| | | | | (0.05) | (-0.76) | (-0.75) | (0.61) | (-0.66) |
| *Asia* | | | | −4.020 | −4.087 | −5.146 | −4.579 | −2.900 |
| | | | | (-0.67) | (-0.87) | (-1.61) | (-0.84) | (-0.64) |
| *Europe* | | | | −2.856 | −2.186 | −11.716*** | −10.978* | −3.096 |
| | | | | (-0.44) | (-0.40) | (-3.20) | (-1.81) | (-0.62) |
| *North America* | | | | −4.040 | −7.203 | −14.576*** | −14.583** | −5.612 |
| | | | | (-0.59) | (-1.33) | (-3.51) | (-2.55) | (-1.05) |
| *South America* | | | | −2.942 | −2.066 | −5.132 | −6.507 | −1.598 |
| | | | | (-0.37) | (-0.33) | (-0.92) | (-0.97) | (-0.26) |
| *Constant* | −7.746** | −7.699** | −12.257*** | −13.549 | 58.476*** | 75.531* | 64.753 | 69.408*** |
| | (-2.25) | (-2.27) | (-3.11) | (-1.63) | (2.96) | (1.91) | (1.19) | (3.82) |
| Adj. R-squared | 0.068 | 0.067 | 0.078 | 0.058 | 0.291 | 0.311 | 0.290 | 0.301 |
| Number of countries | 114 | 114 | 114 | 114 | 114 | 85 | 71 | 114 |

The method of estimation is ordinary least squares. The t-statistics, presented in parentheses, are calculated using heteroscedasticity-robust standard errors. The asterisks indicate the level of statistical significance: *** indicates $p < 0.01$, ** indicates $p < 0.05$, and * indicates $p < 0.1$.

Model 5 of Table 2 includes other control variables, except for the Gini index, ethnic fractionalization, and trust variables. The positive association between *COVID_death* and ICRG internal conflict risk growth increases in size (a 1.9 percent increase) and remains statistically significant. The interaction term between *COVID_death* and *Gov_support*, which was negative in earlier models, retains its negative sign and also becomes statistically significant (in line with the second hypothesis, H2). In Model 5 (which includes control variables), the inflation rate has a significant positive association with the growth of internal conflict during the pandemic years. One of the key drivers of riots and protests during the pandemic was the growth of the consumer price index across countries. Countries with higher inflation rates in 2019–2020 were more vulnerable concerning the risk of protests and disrupted supply chains under the pandemic. A 1 percentage point increase in the inflation rate at the beginning of the pandemic is associated with about a 0.17 percentage point increase in internal conflict growth during the pandemic. This relationship is statistically significant at the 1% level. We also performed a robustness check (available upon request) by removing ten countries with high inflation rates, such as Sudan and Lebanon, from our sample. The exclusion of these countries with two-digit inflation rates did not alter our primary findings on the relationship between COVID-19 mortality and civil unrest, and the impact of government economic support on these outcomes. Among other significant control variables, we can refer to the initial level of internal conflict in 2020. Countries with higher initial levels of internal conflict show lower growth of conflict during the pandemic years, which is also expected.

In Model 6, we have included two additional control variables: the Gini index and ethnic fractionalization. Their inclusion does not change our central finding regarding the positive link between COVID-19 deaths and the growth of internal conflict between 2020 and

**Table 4**
Relative & absolute development of civil disorder (2020–21) and (log) excess death rate per million during the pandemic.

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | Relative growth of ICRG civil disorder index (%) | Relative growth of ICRG civil disorder index (%) | Absolute change of ICRG civil disorder index (points) | Absolute change of ICRG civil disorder index (points) |
| | Full sample | Excluding countries with no change in civil disorder | Full sample | Excluding countries with no change in civil disorder |
| *Excess COVID_death* | 2.875** | 3.678** | 0.060** | 0.078** |
| | (2.22) | (2.21) | (2.03) | (2.04) |
| *Gov_support* | 0.939 | 1.327 | 0.016 | 0.022 |
| | (1.33) | (1.51) | (0.99) | (1.09) |
| *Excess COVID_death × Gov_support* | −0.126 | −0.177 | −0.002 | −0.003 |
| | (-1.38) | (-1.57) | (-1.00) | (-1.09) |
| *Inflation* | 0.120*** | 0.110*** | 0.003*** | 0.003*** |
| | (3.58) | (2.88) | (3.75) | (3.24) |
| *Log of GDP per capita* | −3.336** | −3.065 | −0.071* | −0.068 |
| | (-2.08) | (-1.66) | (-1.88) | (-1.57) |
| *Oil_rent* | −0.136 | −0.119 | −0.002 | −0.002 |
| | (-1.23) | (-0.78) | (-0.87) | (-0.47) |
| *Level of civil disorder in 2020* | −17.981*** | −19.609*** | −0.371*** | −0.407*** |
| | (-5.34) | (-5.45) | (-4.35) | (-4.36) |
| *Africa* | 0.813 | −0.215 | 0.105 | 0.080 |
| | (0.26) | (-0.06) | (1.35) | (0.91) |
| *Asia* | 2.618 | −0.118 | 0.145 | 0.083 |
| | (0.60) | (-0.02) | (1.40) | (0.65) |
| *Europe* | 3.398 | −0.369 | 0.141 | 0.057 |
| | (0.68) | (-0.06) | (1.18) | (0.37) |
| *North America* | 0.123 | −2.147 | 0.095 | 0.044 |
| | (0.03) | (-0.38) | (0.87) | (0.32) |
| *South America* | 7.724 | 6.436 | 0.255* | 0.225 |
| | (1.43) | (0.89) | (1.98) | (1.29) |
| *Constant* | 52.126** | 50.134** | 0.991** | 0.971* |
| | (2.62) | (2.29) | (2.05) | (1.80) |
| Adj. R-squared | 0.235 | 0.252 | 0.178 | 0.189 |
| Number of countries | 110 | 94 | 110 | 94 |

The method of estimation is ordinary least squares. The t-statistics, presented in parentheses, are calculated using heteroscedasticity-robust standard errors. The asterisks indicate the level of statistical significance: *** indicates $p < 0.01$, ** indicates $p < 0.05$, and * indicates $p < 0.1$.

2021. The size of the association has even increased to 2 percent, maintaining its high level of statistical significance. The inclusion of the Gini index in Model 6 reduces the sample size from 114 to 85 countries. In this model, among the control variables, *Oil_rent* shows a significant and negative association with the growth of internal conflict. Specifically, a percentage point increase in the share of oil rents in GDP is associated with a decline in the growth of internal conflict by about one percentage point. This indicates that oil-rich economies have higher financial leverage in dealing with pandemics, such as the COVID-19 crisis, by increasing subsidies and other fiscal and monetary support packages, thereby reducing the risk of internal conflict in the short term.

Model 7 covers the full set of control variables by including trust in government and trust in science variables. In this general specification, which has a smaller sample size (due to the inclusion of the Gini index and trust variables), the positive association between *COVID_death* and internal conflict growth becomes even larger. We observe that a 1 percent increase in the number of COVID-19 deaths per million of population is correlated with a 3.8 percent increase in the growth of the internal conflict risk between 2020 and 2021.

In Model 8, we keep the inflation rate, log of GDP per capita, the initial level of internal conflict, and continent dummies. The positive and highly significant association between COVID-19 deaths and the growth of internal conflict remains. We see that a 1 percent increase in the number of COVID-19 deaths per million people is associated with an increase in internal conflict growth by 2.2 percent. This positive association is weakened at higher levels of government economic support (in line with the second hypothesis, H2)·In this model, inflation has an expected positive link with the internal conflict growth rate, while higher initial pre-pandemic income per capita and the initial level of internal conflict show a negative impact on internal conflict development during the pandemic period. The explanatory power of Model 8, according to the adjusted R-squared, is higher than the other models, and it covers the full number of countries (114) in our estimation sample.

To what extent is our central finding sensitive to relevant omitted variables? In the sections below, we provide a sensitivity analysis (introduced by Cinelli and Hazlett, 2020 and Cinelli et al., 2020) to answer this question: How strong would an unobserved confounder (or a group of confounders) have to be to change our central conclusion with respect to the effect of *COVID_death*? As we will explain, the sensitivity analysis shows that an omitted confounder (as strong as a combined benchmark variable, such as the inflation rate and the log of GDP per capita) could not fully eliminate the point estimate of COVID-19 deaths.

In a further sensitivity exercise, we check if our observed association during the pandemic years could also be seen if we use internal conflict in the years before the COVID-19 outbreak. Logically, there should be no relationship between our key variable of interest

(*COVID_death*) and the development of internal conflict in previous years. To check this, we calculate the relative and absolute change in the ICRG internal conflict score between 2010 and 2015 and use it as our dependent variable. Our estimation shows no significant association between COVID-19 mortality and the development of (relative or absolute) internal conflict in the period before the pandemic (Results are available upon request.).

In Table 2, our dependent variable is the relative change (% growth) of ICRG internal conflict risk scores between 2020 and 2021. An alternative approach is to calculate the absolute change in internal conflict risk scores. To check the robustness of the results presented in Table 2, we use the absolute rather than the percent change in the dependent variable. The results are shown in Table A1 in the online Appendix A. We observe a consistent and robust positive association between *COVID_death* and absolute change in the ICRG internal conflict risk score. Across all eight specifications, the relationship is positive and statistically significant. The interaction term between *COVID_death* and government economic support is also negative, which is qualitatively in line with our second hypothesis. This interaction term appears to be statistically significant at a 5% level in one of our models, specifically in the general specification (Model 7 in Table A1).

Our focus is on the COVID-19 mortality rate as a significant contributor to psychological and economic frustrations of people and the mobilization of protest. However, increasing confirmed COVID-19 cases – even if that does not result in higher death figures – may amplify people's frustrations regarding their government's management of the crisis, resulting in a higher risk of internal conflict. We re-examine our results, using cumulative confirmed COVID-19 cases per million people (in log) for both the relative and absolute development of ICRG internal conflict. The results, shown in Tables A2 and A3 in the online Appendix A, indicate that a higher level of COVID-19 confirmed cases is also positively and often significantly associated with higher relative or absolute changes in the risk of internal conflict across all models. However, the effect of the pandemic on the risk of internal conflict is potentially moderated by the availability of government economic support, as indicated by the negative interaction term observed in our analysis. This finding shows that the development of confirmed cases across countries can also explain part of the cross-country variation in the development of internal conflict. There is also a high correlation between COVID-19 cases and death figures (r = 0.90). Governments around the world responded differently to rising COVID-19 infection rates – ranging from different restrictions on social interactions to different impositions on businesses. Often, governments' handling of the crisis and the economic effect of lockdowns resulted in a frustrated population, such as those in Argentina, Australia, Germany, and Lebanon.[8] There is extensive media coverage of such protests in different parts of the world in reaction to government controls. For example, the British Broadcasting Corporation (BBC, 2021) reported mass protests across Europe over new restrictions announced in November 2021 (e.g., rules on lockdown, face masks, vaccinations, among others).

Finally, we observe that, out of 114 countries, there has been no change in the development of the internal conflict risk index of ICRG in 13 of them. For instance, Egypt had a high level of internal conflict risk in 2020 that remained consistently high through 2021. In contrast, Brunei Darussalam had a low level of internal conflict risk in 2020 that remained low in 2021. If we exclude countries with no changes in their internal conflict scores, how will the results on the association between COVID-19 mortality and internal conflict differ? We will exclude 13 countries, namely Botswana, Brunei Darussalam, Canada, Egypt, Iceland, Italy, Jamaica, Japan, Jordan, Moldova, Norway, South Korea, and Zambia, from the estimation sample and re-estimate all specifications from Table 2. The results, presented in Table A4 in the online Appendix A, indicate that excluding these countries from the sample does not alter our main finding. We still observe a positive link between *COVID_death* and the development of internal conflict. Although we find some evidence that government economic support may moderate the association between COVID-19 deaths and the development of internal conflict, the results suggest a potential weakening of this association.

Next, we will examine the relationship between *COVID_deaths* and growth in the three sub-components of the internal conflict index. To save space, we will only show the estimation results for the link between *COVID_deaths* and the growth of civil disorder below. The associations between *COVID_deaths* and growth rates of the risk of terrorism or civil war during the pandemic years were insignificant (the estimation results for these analyses are available upon request).

### 4.2. Development of civil disorder during pandemic period

Frustration among citizens with the COVID-19 pandemic, sometimes reflected in their participation in anti-government demonstrations, riots, and strikes, can be explained through various channels. Throughout the COVID-19 pandemic, the mental health of both the infected and non-infected individuals has been a severe concern (Tanoue et al., 2020; Paredes et al., 2021).

Over the first two years of the pandemic, world populations faced various challenges to their happiness and mental health. These challenges include social distancing, significant restrictions on family and religious gatherings and ceremonies, the closure of leisure, educational, cultural, shopping, and sports infrastructure due to quarantine, anxiety associated with income decline, higher risk of job loss, and family loss due to the resulting economic recession, the forced combination of working from home while schooling children from home, and spending more time with partners and children. The mental side effects of the COVID-19 pandemic include anxiety, difficulty sleeping or eating, increases in alcohol consumption or substance use, and worsening chronic conditions (Panchal et al.,

[8] Please refer to the following sources for information on demonstrations related to government responses during the COVID-19 pandemic: https://www.bbc.com/news/world-latin-america-54522428 (Argentina), https://www.bbc.com/news/world-australia-58628629 (Australia), https://www.dw.com/en/covid-protests-escalate-in-germany/a-60118647 (Germany), and https://www.bbc.com/news/av/world-middle-east-55857440 (Lebanon). For more detailed references to these activities, please visit https://acleddata.com/analysis/covid-19-disorder-tracker/#1585775314361-2ee40e97-5aec.

2020). Individuals who reported a drop in household income during the pandemic experienced almost double the decline in overall life satisfaction (Cheng et al., 2020). The decline in life satisfaction due to the aforementioned government anti-COVID-19 measures and negative shock on employment and economic activities reduced the opportunity costs of engaging in violence. Inequality has become more visible during the pandemic, while feelings of relative deprivation intensified, especially among disadvantaged groups in society. During the pandemic, the chance, and sometimes obligation, of learning and working from home was more in favor of males, higher-educated, and better-paid employees (Abrams, 2021; Bonacini et al., 2021). Government interventions in a wide range of socio-economic and political areas also raised concerns about individuals' freedom and data privacy issues, contributing to the *pandemic rage* phenomenon .[9] Overall, the negative (side-) effects of the COVID-19 pandemic on people's mental and economic stability have increased collective frustration and anti-establishment protests. We aim to test this association, taking into account other drivers of civil disorder and probing the moderating effect of government economic support during the pandemic.

In Table 3, we use the growth of the civil disorder index (*Civil disorder growth (relative)*), which is one of the three components of the ICRG internal conflict index, as a dependent variable. We follow a similar approach in investigating this association which was presented and discussed for the case of the overall ICRG internal conflict. Model 1 focuses solely on *COVID_death* as an explanatory variable, excluding the control variables. It shows that a 1 percent increase in COVID-19 confirmed deaths per million is linked to approximately a 1.6% increase in civil disorder growth rate. This significant and positive association remains robust across seven subsequent specifications. This finding again supports the first hypothesis. The interaction term between *COVID_death* and government economic support is also negative and, in 4 out of 6 models, statistically significant, which is in line with the second hypothesis. Among the control variables, the inflation rate (positively), oil rents (negatively), log of GDP per capita (negatively) and the initial level of civil disorder in 2020 (negatively) are shown to be correlated with the relative development of civil disorder during the pandemic. Model 8 is our preferred specification due to its higher explanatory power (based on adjusted R-squared) and coverage of the full sample in the estimation. Included variables in Model 8 also show a statistically significant relationship with the growth of civil disorder (except the continent dummies). In this model, an increase of *COVID_death* by 1 percent is associated with a 3 percent increase in the growth of civil disorder across countries, which is weakened at higher levels of government economic support.

Are our results robust to an absolute change in ICRG civil disorder instead of its relative form used in Table 3? Table A5 in online Appendix A reports the results using absolute change as our dependent variable. It supports our central finding that there is a positive and significant association between *COVID_death* and the development of civil disorder, as well as the moderating role of government economic support. The complete marginal plots for Models 3–8 of Table A5 are reported in online Appendix C2.

Do we also observe a similar positive association if we focus on confirmed COVID-19 cases per million instead of the death rate? In Table A6 in online Appendix A, we use COVID-19 confirmed cases and re-estimate all eight specifications. The results show a significant and positive relationship between confirmed COVID-19 cases and the relative change in civil disorder during the pandemic. On average, the size of the association is less than that for *COVID_death*. For example, Model 8 in Table A6 shows that a 1 percent increase in confirmed COVID-19 cases per million is associated with approximately a 2.3 percent increase in the growth rate of civil disorder. This link was stronger in Model 8 of Table 3 with reference to *COVID_death* (3.2%). In short, higher levels of COVID-19 cases and deaths are fueling civil disorder, while controlling for several other drivers of conflict and continent dummies.

In addition, we re-examine our central finding by using the absolute change of ICRG civil disorder. The results in Table A7 in the online Appendix A suggest that the positive and significant association between COVID-19 confirmed cases and civil disorder is not sensitive to the form of its development. It remains robust across eight specifications.

Finally, we re-examine the results presented in Table 3 by excluding countries that showed no change in their ICRG civil disorder risk scores between 2020 and 2021. There are 17 out of 114 countries with no change in this score including Bahrain, Botswana, Brunei Darussalam, Canada, Colombia, Congo, Czech Republic, Egypt, Iceland, Jamaica, Japan, Norway, Paraguay, Russian Federation, Saudi Arabia, South Korea, and Zambia. The results of these tests are presented in Table A8 in the online Appendix A. Our key findings in Table 3 are highly robust to the exclusion of the aforementioned 17 countries. The complete marginal plots for Models 3–8 of Table A8 are reported in the online Appendix C3.

### 4.3. Development of civil disorder during pandemic period and excess death rate

In this section, we replace COVID-19 confirmed deaths and confirmed cases per million of population with excess COVID-19 deaths per million during the pandemic period. Excess mortality is defined as "the number of deaths from all causes during a crisis above and beyond what we would have expected to see under 'normal' conditions" (Checchi and Roberts, 2005). In the case of COVID-19, it is estimated by subtracting reported deaths during the pandemic from expected deaths based on historical mortality trends. In our analysis below, we use estimated excess mortality from The Economist, which is based on a machine-learning model. The data is available on the Our World in Data portal. There is a positive and statistically significant correlation (at the 1% level) between COVID-19 excess deaths and COVID-19 confirmed deaths per million (0.52) and with COVID-19 confirmed cases (0.37) in our estimation sample.

Given the large amount of missing data, the estimated excess mortality during the COVID-19 pandemic often has large uncertainty intervals and should be considered a complementary source of information and not the only one for COVID-19 health fatalities across countries. Moreover, the reliability of these excess death estimates depends on the quality of building a counterfactual scenario of

[9] To learn more about "Pandemic rage: Everyday frustrations in times of the COVID-19 crisis," please refer to Kubacka et al. (2021). Mohammad Reza Farzanegan is grateful to Mehdi Feizi for his input on some of these issues.

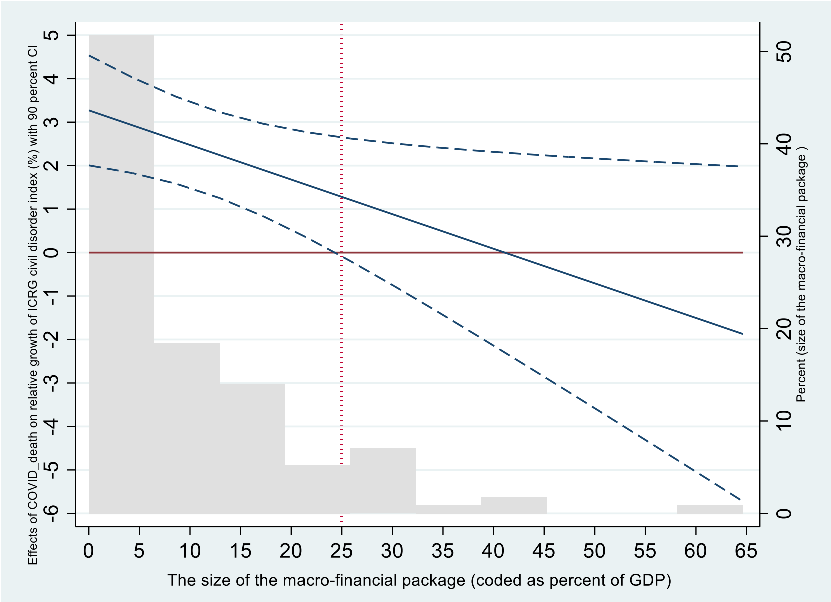


**Fig. 2.** Marginal effect of COVID-19 total deaths per million (logged) on growth rates of civil disorder scores (2020–21) at different levels of macro-financial packages (% of GDP). Dashed lines represent 90% confidence intervals. Based on Model 8 in Table 3.

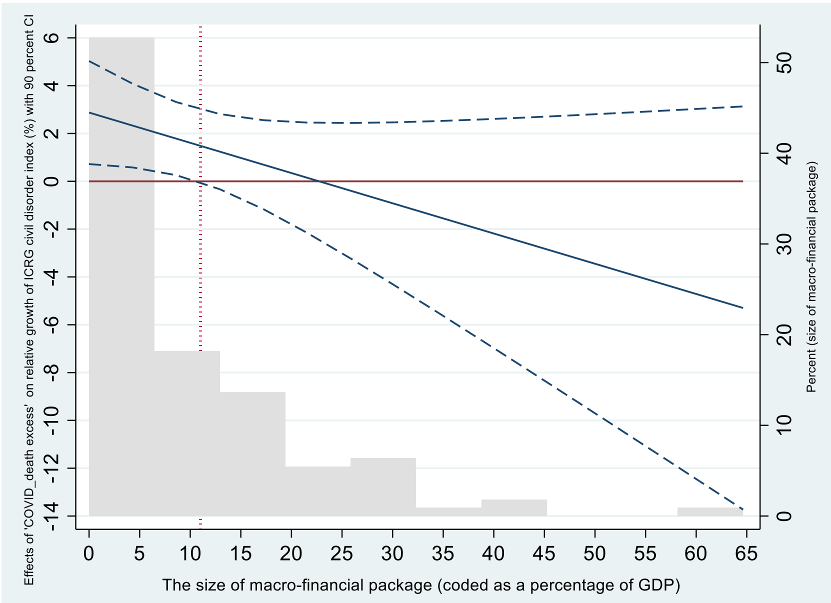


**Fig. 3.** Marginal effect of total excess deaths per million (logged) during the pandemic on growth rates of civil disorder scores (2020–21) at different levels of macro-financial packages (% of GDP). Dashed lines represent 90% confidence intervals. Based on Model 1 in Table 4.

expected mortality based on historical trends and in the absence of COVID-19. Finally, we believe that potential participants in anti-government demonstrations mainly trace data and figures related to confirmed cases and deaths, which are often reported in the media. Media outlets mainly report official statistics of cases and deaths, and thus an ordinary person in society is less likely to know about excess death calculations and their development over time. Nevertheless, we show in the parsimonious models below that the earlier positive association between confirmed cases and deaths of COVID-19 and civil disorder development still holds when we focus on excess mortality rate (see Table 4). Controlling for inflation rate, income per capita, oil rents, initial level of civil disorder, and continent dummies, we observe a positive and significant association between excess COVID-19 death rate per million people and the relative or absolute development of civil disorder risk scores during the pandemic. The estimated coefficients are also comparable to our earlier findings. Furthermore, we have also presented the models in which countries with no change in their civil disorder index

**Table 5**
Proposed minimal reporting on sensitivity to unobserved confounders (based on Model 8 in Table 3).

| | Outcome: Growth rate of ICRG Civil Disorder risk (202–21) | | | | | |
|---|---|---|---|---|---|---|
| Treatment | Est. | S.E. | t-value | $R^2_{Y\sim D\|X}$ | RV | $RV_{a=0.05}$ |
| *COVID_death* | 3.2709 | 0.8719 | 3.7513 | 12.12% | 30.88% | 15.96% |

df = 102, Bound (Z as strong as inflation and income per capita): $R^2_{Y\sim Z|D,X}$ = 3.88% (for inflation) and 14.19% (for log GDP per capita) and, $R^2_{D\sim Z|X}$ = 0.13% (for inflation) and 9.36% (for log of GDP per capita).

between 2020 and 2021 are excluded. The central finding on the positive association between COVID-19 excess mortality and development of civil disorder remains after this adjustment in the sample.

### 4.4. Marginal effect of COVID-19 death rates and excess mortality rates during the pandemic on the growth rates of civil disorder

In Fig. 2, we use Model 8, which has more explanatory power and covers our sample fully, from Table 3 to illustrate the final association between COVID-19 confirmed deaths and the development of civil disorder at different levels of government economic support. For the sake of illustration and comparison, we conduct this marginal analysis for the case of COVID-19 excess death rate in Fig. 3, using Model 1 in Table 4.

In countries where the government's macro-financial package in response to the pandemic is less than approximately 25% of GDP, there is a significant risk of civil disorder resulting from an increase in COVID-19 deaths per million (see Fig. 2). In our sample, 50% of the included countries have macro-financial packages (as % of GDP) less than 6%, and this ratio is less than approximately 25% for 90% of the included countries. In other words, the majority of countries have an increased risk of internal conflict following a rise in confirmed COVID-19 death rates. It appears that economic support may play a role in reducing the potential for civil unrest, as the effect of COVID-19 mortalities appears to be less pronounced at higher levels of economic support. However, the only statistically significant at lower levels of government support. In other words, there is no statistically significant association between COVID-19 mortalities and the development of civil disorder during the pandemic years at higher levels of government economic support.

Fig. 3 illustrates the marginal effect of total excess deaths per million during the pandemic on the growth rates of civil disorder scores (2020–21) at different levels of government economic support. It can be observed that the final effect decreases at higher levels of government economic support. However, the only positive and significant effect is observed when the size of economic support is less than 11% of GDP. This covers approximately 70% of the countries in our sample where excess death rates during the pandemic are positively and significantly associated with growth rates of civil disorder. The complete marginal plots for Models 3–8 of Table 3 are reported in online Appendix C1, and the plots for Models 1–4 of Table 4 are reported in online Appendix C4.

### 4.5. Sensitivity checks

#### 4.5.1. Omitted unobservable variables

We interpreted the above results, along with additional investigations shown in the online appendix, as an indicator of the robust association between COVID-19 deaths, cases, or excess mortality and the relative or absolute development of the risk of internal conflict (i.e., civil disorder) during the pandemic years. In this section, we aim to examine the effect of possible omitted unobservable variables. One of the barriers to establishing a causal interpretation, especially in cross-country investigations, is the risk of omitted variables. We use a sensitivity test introduced by Cinelli and Hazlett (2020) and Cinelli et al. (2020) to evaluate the minimum strength of association that an unobserved confounding variable would need to change the results of the increasing effect of COVID-19 deaths and excess mortality on the growth of civil disorder risk between 2020 and 2021.

In this section, we will calculate the bounds on potential bias in estimating our main independent variable (COVID-19 deaths or excess deaths) that could result from the selection of unobservables. According to Cinelli and Hazlett (2020), their suggested sensitivity analysis tools "*do not require assumptions on the functional form of the treatment assignment mechanism nor on the distribution of the unobserved confounder and can be used to assess the sensitivity to multiple confounders, whether they influence the treatment and outcome linearly or not*."

Their sensitivity test aims to address three key questions, as follows.

a) How strong would an unobserved confounder (or a group of confounders) have to be to change a research conclusion?
b) In a worst-case scenario, how robust are the key findings to all unobserved confounders acting together, possibly non-linearly?
c) How strong would the confounding need to be, relative to the strength of observed covariates, to change the answer by a certain amount?

In our context, the main idea of this test is that, for example, based on Model 8 in Table 3, the inflation rate and GDP per capita are critical variables in predicting the growth rate of civil disorder risk across countries. As a result, we estimate how much stronger omitted variables would need to be than the benchmark variables, inflation rate, and income per capita, to turn our main relationship between civil disorder and COVID-19 deaths into zero (both economically and statistically). In other words, we assume that the unobservable Z cannot explain more than the inflation rate and income per capita because both are established factors for the development risk of internal conflict by influencing the opportunity costs of engaging in protests and mobilization of anti-government

**Table 6**
Bounds on omitted variable bias.

| | $R^2_{D \sim Z\|X}$ (%) | $R^2_{Y \sim Z\|D, X}$ (%) | Est. | S.E. | t-value | Lower CI | Upper CI |
|---|---|---|---|---|---|---|---|
| 1 × inflation rate | 0.13 | 3.88 | 3.209 | 0.860 | 3.733 | 1.504 | 4.914 |
| 2 × inflation rate | 0.26 | 7.77 | 3.147 | 0.843 | 3.734 | 1.475 | 4.818 |
| 3 × inflation rate | 0.38 | 11.65 | 3.084 | 0.825 | 3.737 | 1.447 | 4.721 |
| 1 × log of GDP per capita | 9.36 | 14.19 | 2.205 | 0.853 | 2.586 | 0.514 | 3.896 |
| 2 × log of GDP per capita | 18.72 | 28.93 | 0.998 | 0.819 | 1.218 | −0.628 | 2.623 |
| 3 × log of GDP per capita | 28.08 | 44.41 | −0.396 | 0.770 | −0.514 | −1.924 | 1.132 |

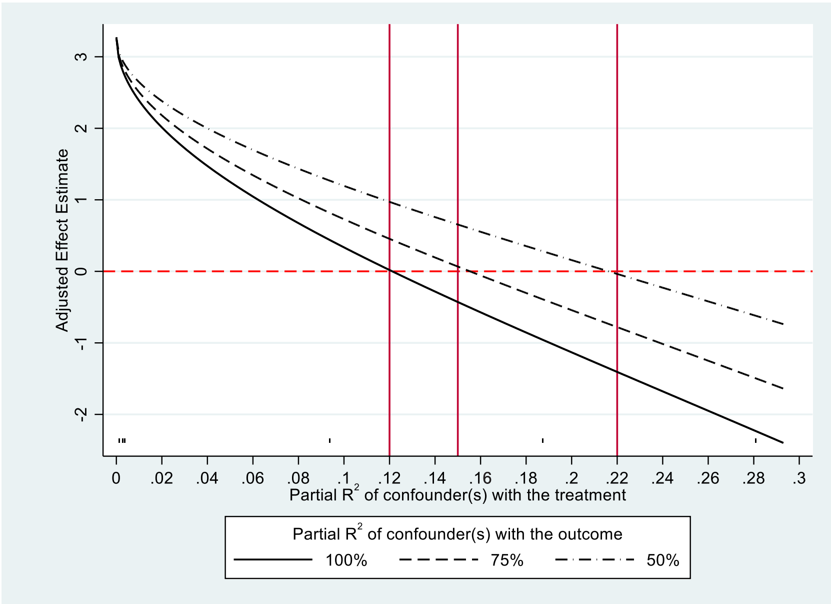


**Fig. 4.** Sensitivity analysis to extreme scenarios.
Note: The figure shows a sensitivity analysis for the regression using COVID-19 deaths per million people (in log) as the main independent variable (treatment). It assumes that unobserved omitted variable(s) explain all of the residual variance of the dependent variable (growth rate of civil disorder risk during the COVID-19 pandemic). The figure then shows how the point estimate changes when the strength of the rela-tionship between the confounding variable(s) and the treatment is varied. Three curves with confounding are produced, which explain 100%, 75%, and 50% of the residual variance of the dependent variable. The model for this sensitivity analysis includes all explanatory variables, as in Model 8 of Table 3.

forces. Thus, the inflation rate and income per capita are strong candidates for defining the maximum strength required for omitted confounders to alter our key findings concerning the relationship between *COVID_death* and the development of civil disorder.

Following Cinelli and Hazlett (2020) and Cinelli et al. (2020), Table 5 shows the first part of our sensitivity check. In addition to traditionally reported statistics, we present (a) the partial R2 of the treatment with the outcome and (b) the robustness value (RV), for where the point estimate and the confidence interval would cross zero. We also provide plausible bounds on the strength of confounders in Table 6.

In Table 5, we observe that the RV of the treatment variable (*COVID_death*) coefficient is 30.88%. This figure suggests that unobserved confounders explain at least 30.88% of the residual variance in both the treatment and the dependent variables, which would remove the estimated treatment effect of *COVID_death*. In other words, any confounding variable that explains less than 30.88% of the residual variance in the treatment and the dependent variables would not be strong enough to eliminate the effect of *COVID_death*.

Controlling for confounding variables may not bring the estimated effect of *COVID_death* to zero, but it can make it statistically insignificant. Thus, the robustness value for statistical significance ($RV_{a = 0.05}$) is also reported in Table 5. Considering the significance level of 5%, the robustness value reduces from 30.88% to 15.96%. This means confounders would need to be about half as strong to make the estimated effect of *COVID_death* statistically insignificant. In addition, Table 5 shows the partial $R^2$ of the treatment variable with the dependent variable, $R^2_{Y \sim D|X}$ which gives a sensitivity analysis for an extreme scenario. If the omitted confounding variables explained 100% of the residual variance of the dependent variable, they would need to explain at least 12.12% of the residual variance of the treatment to bring the estimated impact to zero.

The next part of our sensitivity check aims to investigate the plausibility of such confounders in changing our key results. Table 6 shows the strength of association that a confounder as strong as the inflation rate and (log) GDP per capita would have: $R^2_{Y \sim Z|D,X} =$ 3.88% (for inflation) and 14.19% (for log GDP per capita) and $R^2_{D \sim Z|X} = 0.13\%$ (for inflation) and 9.36% (for log GDP per capita). As

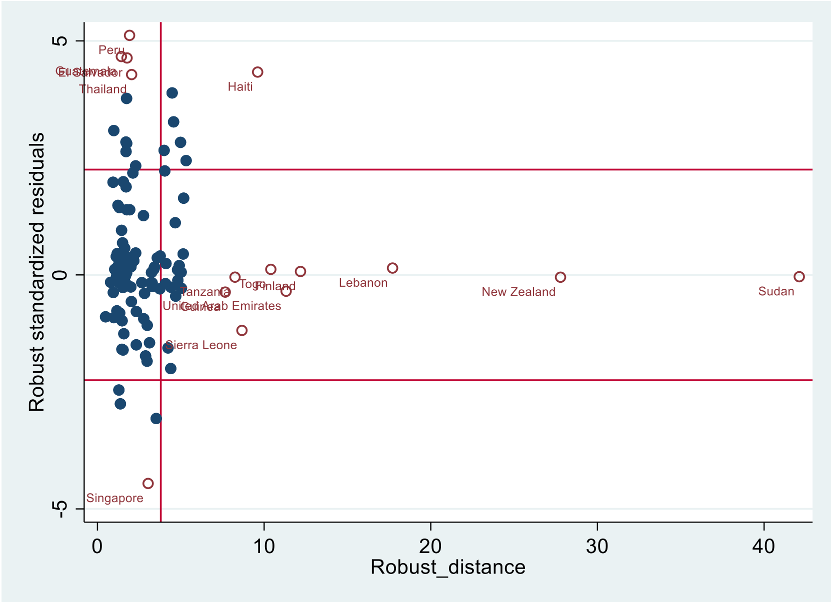


**Fig. 5.** Outliers based on Model 8 of Table 3.

the RV in Table 5 (30.88%) is higher than both quantities for inflation and income per capita, it clearly shows that such an omitted confounder could not fully eliminate the point estimate of *COVID_death*. Moreover, as the bound for $R^2_{D\sim Z|X}$ (0.13% and 9.36%) is less than $R^2_{Y\sim D|X}$ (12.12%), a "worst case confounder" scenario, would not remove the estimated effect either. A "worst case confounder" scenario may explain all of the remaining variance of the dependent variable and is strongly related to the treatment (*COVID_death*) as the inflation rate and log of GDP per capita.

Finally, Fig. 4 illustrates a sensitivity analysis under extreme scenarios. In this case, we make an extreme assumption that the omitted confounding variable explains all of the residual variance in the outcome of growth rates of civil disorder during the pandemic. Fig. 4 shows three curves with confounding variables that explain 100%, 75%, and 50% of the residual variance of the dependent variable. If we set $R^2_{Y\sim Z|D,X}$ to 1 or some other conservative value, how strongly would such a confounder need to be related to the treatment (*COVID_death*) to significantly alter our estimate?

In the first and most extreme scenario ($R^2_{Y\sim Z|D,X} = 100\%$), omitted confounding variables would need to be almost 12 times as strongly associated with the treatment as the inflation rate and log of GDP per capita to fully eliminate the effect of *COVID_death* on civil disorder growth rates since the original OLS coefficient is 3.27 (tick mark) and the estimate meets the zero line at approximately 0.12.

In the next scenario ($R^2_{Y\sim Z|D,X} = 75\%$), omitted confounding variables would need to be almost 15 times (around 0.15) as strongly related to the treatment variable (the inflation rate and log of GDP per capita) to completely explain away the point estimate of *COVID_death*.

In the third scenario ($R^2_{Y\sim Z|D,X} = 50\%$), omitted confounding variables would likely need to be 22 times as strongly associated with the treatment variable (the inflation rate and log of GDP per capita) to fully eliminate the point estimate.

The above results show that omitted variables should be substantially stronger than the benchmark variables (inflation rate and log of GDP per capita) to eliminate the effect of *COVID_death*. It seems unlikely that our estimates are fully driven by unobserved confounders or severely biased by them. Based on the sensitivity analysis recommended by Cinelli and Hazlett (2020) and Cinelli et al. (2020), we provide more evidence that the identified positive association of COVID-19 fatalities and the development of civil disorder during the pandemic reflects at least a robust stylized fact.

#### *4.5.2. Additional analyses in addressing influential outliers: robust regression & Jackknife robustness test*

In order to further refine our analysis and account for the potential presence of outliers, we reexamine our previous OLS estimations by applying robust regression techniques. These types of estimators are able to handle a high degree of contamination in the sample and still accurately estimate the true parameters. However, older versions of robust estimators such as the M-estimator introduced by Lin (1985), have lower efficiency as they can be biased and have higher variances compared to regular OLS estimates.

To overcome these limitations, we utilize more recently developed robust estimators such as the MM estimator introduced by Verardi and Croux (2009) and a procedure developed by Jann (2021, 2012). Specifically, we use high breakdown estimators from Jann that have both a high breakdown-point and high efficiency, including the Huber, Bisquare M, and S estimator. Each of these estimators also provides robust standard errors that are based on influence functions. Additionally, we compare these results with OLS estimates which are also calculated using robust standard errors. To further demonstrate the impact of outliers on specific countries, we will also follow the methodology outlined by Verardi and Croux (2009).

**Table 7**
Model 8 of Table 3, OLS and Robust regressions with robust standard errors.

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | Dependent variable: relative growth of ICRG civil disorder index (%) | | | | | |
| | OLS regression | M regression (95% efficiency) | S regression (28.7% efficiency) | MM regression (85% efficiency) | MM regression (95% efficiency) | MM regression (99% efficiency) |
| *COVID_death* | 3.271*** (4.29) | 2.972*** (4.26) | 2.963*** (5.73) | 2.974*** (4.36) | 2.880*** (4.22) | 3.100*** (4.20) |
| *Gov_Support* | 0.562* | 0.518* | 0.310 | 0.501** | 0.532* | 0.551* |
| | (1.88) | (1.97) | (1.45) | (2.23) | (1.98) | (1.89) |
| *COVID_death × Gov_support* | −0.0796* | −0.0762** | −0.0596** | −0.0786** | −0.0796** | −0.0798* |
| | (-1.89) | (-2.05) | (-2.23) | (-2.51) | (-2.12) | (-1.95) |
| *Inflation* | 0.154*** | 0.155*** | 0.180*** | 0.146*** | 0.154*** | 0.155*** |
| | (4.34) | (4.41) | (18.05) | (4.66) | (4.74) | (4.58) |
| *Level of civil disorder 2020* | −17.16*** | −16.13*** | −22.07*** | −15.47*** | −15.35*** | −16.53*** |
| | (-5.90) | (-5.85) | (-4.80) | (-4.63) | (-5.58) | (-5.62) |
| *Log of GDP per capita* | −4.700*** | −3.492** | −2.374 | −1.580 | −2.890 | −4.084** |
| | (-3.18) | (-2.45) | (-1.36) | (-1.31) | (-1.62) | (-2.57) |
| *Africa* | −3.252 | −2.104 | −1.220 | 0.119 | −1.467 | −2.680 |
| | (-0.66) | (-0.45) | (-0.45) | (0.03) | (-0.29) | (-0.53) |
| *Asia* | −2.900 | −3.456 | −5.083** | −4.909 | −3.636 | −3.124 |
| | (-0.64) | (-0.84) | (-2.23) | (-1.47) | (-0.83) | (-0.68) |
| *Europe* | −3.096 | −2.870 | −5.580* | −3.836 | −2.678 | −2.808 |
| | (-0.62) | (-0.62) | (-1.74) | (-0.94) | (-0.55) | (-0.56) |
| *North America* | −5.612 | −6.910 | −10.75*** | −9.920** | −7.485 | −6.078 |
| | (-1.05) | (-1.40) | (-2.89) | (-2.52) | (-1.34) | (-1.10) |
| *South America* | −1.598 | −3.839 | −5.664 | −7.288* | −5.785 | −3.161 |
| | (-0.26) | (-0.69) | (-1.34) | (-1.77) | (-1.09) | (-0.49) |
| *Constant* | 69.41*** | 56.90*** | 60.58** | 36.95** | 49.63** | 62.82*** |
| | (3.82) | (3.17) | (2.23) | (2.38) | (2.46) | (3.27) |
| Countries | 114 | 114 | 114 | 114 | 114 | 114 |
| R-sq | 0.37 | 0.32 | 0.25 | 0.29 | 0.3 | 0.32 |
| Breakdown point | | | 50 | 50 | 50 | 50 |
| Hausman test of S against OLS (p-value) | | | 0.116 | | | |
| Hausman test of MM against S (p-value) | | | | 0.924 | 0.727 | 0.36 |

The t-statistics reported in parentheses are calculated using robust standard errors. The asterisks indicate the level of statistical significance: * indicates $p < 0.10$, ** indicates $p < 0.05$, and *** indicates $p < 0.01$.

To ensure the robustness of our results, we also apply a Jackknife robustness test. This method systematically removes one or more countries from the estimation at a time until all countries have been excluded once, serving as a leave-one-out analysis and a conventional resampling technique for examining the robustness of estimates in the presence of outliers.

We conduct these robust estimations for Model 8 of Table 3 and Model 1 of Table 4, as these are the models for which we have selected the marginal plots. First, we identify the outliers in Model 8 of Table 3. To do this, we utilize the graphical tool described in Verardi and Croux (2009) which plots robust standardized residuals on the vertical axis and a measure of multivariate outlyingness of the independent variables (measured by Mahalanobis distance) on the horizontal axis. Following this, we use the robust MM estimator (mmregress as suggested by Verardi and Croux, 2009) to estimate Model 8 of Table 3 and illustrate the potential outliers (as shown in Fig. 5).

Upon examining the outlier figure (Fig. 5), we can see that Haiti is a significant outlier in both the horizontal and vertical dimensions, indicating that its characteristics differ greatly from the majority of sample countries. Its relative growth of civil disorder risk index during the pandemic period is higher than what would be expected according to the model. Countries such as Sudan, New Zealand, Lebanon, UAE, Finland, Togo, Tanzania, and Sierra Leone, on the other hand, are considered large good leverage cases as they are outliers in the horizontal dimension but not in the vertical dimension. This suggests that while the characteristics of these countries differ from the majority of the sample, their relative growth of civil disorder index during the pandemic is in line with what the model predicts.

Additionally, we can observe that some countries such as Peru, El Salvador, Thailand, and a few others have characteristics that are considered standard, but have experienced higher growth in civil disorder than what the model would suggest. For Singapore, however, the experience of civil disorder growth is less than what the model would predict. These countries are considered as vertical outliers.

Given the presence of several vertical outliers and a bad leverage case in our analysis, it is possible that our OLS regression results in Model 8 of Table 3 may be distorted. To investigate this possibility, we compare the results obtained from different robust estimators proposed by Jann (2021) with those obtained from the original OLS model.

**Table 8**
Model 8 of Table 3, OLS and Robust regressions with Jackknife Standard Errors.

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | Dependent variable: relative growth of ICRG civil disorder index (%) | | | | | |
| | OLS regression | M regression (95% efficiency) | S regression (28.7% efficiency) | MM regression (85% efficiency) | MM regression (95% efficiency) | MM regression (99% efficiency) |
| *COVID_death* | 3.271*** | 2.972*** | 2.963*** | 2.974*** | 2.880*** | 3.100*** |
| | (3.92) | (4.02) | (5.58) | (4.13) | (4.18) | (4.02) |
| *Gov_Support* | 0.562 | 0.518 | 0.310 | 0.501* | 0.532 | 0.551 |
| | (1.45) | (1.49) | (1.33) | (1.79) | (1.58) | (1.49) |
| *COVID_death × Gov_support* | −0.0796 | −0.0762 | −0.0596** | −0.0786** | −0.0796* | −0.0798 |
| | (-1.45) | (-1.54) | (-2.00) | (-2.02) | (-1.69) | (-1.53) |
| *Inflation* | 0.154*** | 0.155*** | 0.180*** | 0.146* | 0.154*** | 0.155*** |
| | (3.32) | (3.85) | (12.95) | (1.95) | (4.03) | (3.80) |
| *Level of civil disorder 2020* | −17.16*** | −16.13*** | −22.07*** | −15.47*** | −15.35*** | −16.53*** |
| | (-5.54) | (-5.65) | (-4.99) | (-4.47) | (-5.34) | (-5.48) |
| *Log of GDP per capita* | −4.700*** | −3.492** | −2.374 | −1.580 | −2.890* | −4.084** |
| | (-3.03) | (-2.26) | (-1.40) | (-1.28) | (-1.68) | (-2.57) |
| *Africa* | −3.252 | −2.104 | −1.220 | 0.119 | −1.467 | −2.680 |
| | (-0.40) | (-0.28) | (-0.32) | (0.02) | (-0.20) | (-0.34) |
| *Asia* | −2.900 | −3.456 | −5.083 | −4.909 | −3.636 | −3.124 |
| | (-0.38) | (-0.50) | (-1.54) | (-0.97) | (-0.55) | (-0.43) |
| *Europe* | −3.096 | −2.870 | −5.580 | −3.836 | −2.678 | −2.808 |
| | (-0.39) | (-0.39) | (-1.42) | (-0.68) | (-0.38) | (-0.37) |
| *North America* | −5.612 | −6.910 | −10.75** | −9.920* | −7.485 | −6.078 |
| | (-0.68) | (-0.91) | (-2.35) | (-1.77) | (-1.00) | (-0.75) |
| *South America* | −1.598 | −3.839 | −5.664 | −7.288 | −5.785 | −3.161 |
| | (-0.18) | (-0.47) | (-1.10) | (-1.25) | (-0.78) | (-0.36) |
| *Constant* | 69.41*** | 56.90*** | 60.58** | 36.95** | 49.63** | 62.82*** |
| | (3.39) | (2.83) | (2.28) | (2.19) | (2.42) | (3.07) |
| Countries | 114 | 114 | 114 | 114 | 114 | 114 |
| R-sq | 0.37 | 0.32 | 0.25 | 0.3 | 0.3 | 0.32 |
| Replications | 114 | 114 | 114 | 114 | 114 | 114 |
| Breakdown point | | | 50 | 50 | 50 | 50 |
| Hausman test of S against OLS (p-value) | | | 0.116 | | | |
| Hausman test of MM against S (p-value) | | | | 0.924 | 0.727 | 0.359 |

The t-statistics reported in parentheses are calculated using robust standard errors. The asterisks indicate the level of statistical significance: * indicates $p < 0.10$, ** indicates $p < 0.05$, and *** indicates $p < 0.01$.

In Table 7, we compare the initial OLS results in Model 8 of Table 3 with the results obtained from different types of robust regressions. The MM estimator (Models 4, 5, and 6 of Table 7) effectively deals with outliers by identifying and down-weighing them. These MM estimators are known to have a high breakdown point of 50% and high efficiency, and have a default level of efficiency of 85% of the efficiency of OLS while being able to deal with up to 50% contamination due to outliers (Model 4). We also provide the MM regressions with higher levels of efficiency (95% and 99% of the efficiency of OLS) for comparison.

As can be observed from Table 7, the results obtained from the MM estimator provide a robust picture of the relationship between civil disorder growth and COVID-19 fatalities, as well as its interaction with government economic support. The estimates for other covariates such as inflation and initial level of civil disorder are also robust (with the exception of income per capita, which loses significance in Models 3, 4, and 5). We also provide the results for the S-regression in Model 3. The S-estimator has a high resistance to contamination of up to 50% of outliers, although it has a lower efficiency of 28.7% compared to other estimators. However, increasing its efficiency reduces its resistance to outliers; thus, the MM-estimators were proposed by Yohai (1987) as a more robust alternative. Additionally, we report in Model 2 a highly efficient M-estimator, which is similar to the *rreg* command in Stata. It is important to note that, as previously mentioned by Verardi and Croux (2009), the *rreg* command does not possess the expected robust properties. For further illustration, the marginal plots based on MM regression, S regression, and M regression are presented in the online Appendix C5a.

In order to further strengthen the robustness of our results, we now re-examine OLS and all other robust regressions using the Jackknife resampling method. The reported standard errors in this analysis are based on the Jackknife methodology, as suggested by Hansen (2022), who found that Jackknife variance estimators are superior to conventional estimators. We can see from Table 8 that the overall picture remains robust to Jackknife resampling, especially for the estimated coefficients of the interaction term, which remain statistically significant in S and MM regressions that are robust to 50% contamination of data. Additionally, MM regressions tend to have higher degrees of efficiency than S regressions. However, even when the estimated interaction term is not significant, we should take a look at the marginal plots as they provide a more transparent comparison (as we mentioned earlier, by referring to Brambor et al., 2006). Therefore, we present the marginal plots for all models in Table 8 for a more transparent comparison in the online Appendix C5b. These plots, to some extent, indicate a mitigating role of government economic support on the final association between

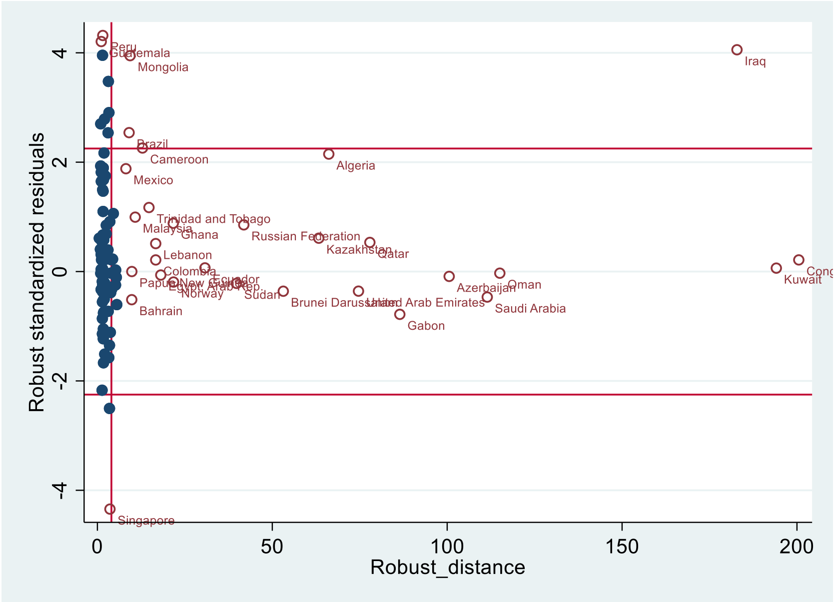


**Fig. 6.** Outliers based on Model 1 of Table 4.

COVID-19 fatalities and civil disorder development during the pandemic. The decreasing marginal effects are statistically significant up to a government economic support size of 20% of GDP. The final effect continues to decrease at higher levels of government economic support, although they are no longer statistically significant.

We examine Fig. 3, which is based on Model 1 of Table 4, by identifying outliers using the graphical tool outlined by Verardi and Croux (2009). We then estimat Model 1 of Table 4 using the robust MM estimator (mmregress, as suggested by Verardi and Croux, 2009), and illustrate the identified outliers in Model 1 of Table 4.

From Fig. 6, it is clear that Iraq is a strong outlier in both the horizontal and vertical dimensions. This indicates that its characteristics differ significantly from the rest of the sample and that its internal civil disorder growth is higher than what is predicted by the model. Additionally, there are other countries between the two red horizontal lines. These countries are large outliers in the horizontal dimension, but not in the vertical dimension. This suggests that their characteristics differ from the other countries, but their civil disorder development is in line with what the model predicts. Finally, there are some vertical outliers: countries that have standard characteristics but have higher or lower levels of civil disorder development than the model suggests. Due to the presence of Iraq as a strong outlier and several vertical outliers, there is a risk that OLS estimators may be affected. Therefore, we compare the OLS estimations of Model 1 of Table 4 with other robust estimators that account for contamination of data by outliers (see Table 9).

The marginal plots of the MM regression (95% and 99% efficiency) are presented in online Appendix C5c, and it can be seen that the results are similar to those obtained from OLS in Fig. 3.

We conduct a further examination of OLS and all other robust regressions by using the Jackknife resampling method (see Table 10). The standard errors reported are based on the Jackknife methodology. Overall, the marginal plots (presented in online appendix C5d) based on robust regressions with 95% and 99% efficiency, and capable of handling up to 50% contamination of data with outliers, result in a similar pattern as seen in Fig. 3.

## 5. Conclusion

This study examines the relationship between cross-country differences in COVID-19 mortality rates and indicators of internal conflict risk. Our findings demonstrate that higher COVID-19 mortality rates have significantly contributed to an increased risk of internal conflict during the pandemic years (2020–2021). Moreover, our analysis reveals some evidence suggesting that government economic measures may have potentially played a role in mitigating the positive association between COVID-19 mortality rates and internal conflict.

We also show that the effect of COVID-19 fatalities was primarily on the risk of civil disorder component of internal conflict, with no significant impact on the development of risk of terrorism or civil war during the pandemic. These findings align with observed conflicts in the form of anti-government demonstrations, riots, strikes, and protests during the pandemic. The conclusions of this study are supported by multiple sensitivity tests and remain robust in the presence of other factors influencing internal conflict. However, more research is necessary to better understand the role of government economic support and political institutions in mitigating the effects of pandemics on internal conflict.

International organizations could consider providing financial support to governments of low-income developing countries that have been unable to implement extensive economic measures in response to the pandemic due to financial constraints. This support

**Table 9**
Model 1 of Table 4, OLS and Robust regressions with robust standard errors.

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | Dependent variable: Relative growth of ICRG civil disorder index (%) | | | | | |
| | OLS regression | M regression (95% efficiency) | S regression (28.7% efficiency) | MM regression (85% efficiency) | MM regression (95% efficiency) | MM regression (99% efficiency) |
| *Excess COVID_death* | 2.875** | 2.464** | 2.323*** | 1.978* | 2.380* | 2.706** |
| | (2.22) | (2.08) | (2.73) | (1.73) | (1.88) | (2.11) |
| *Gov_support* | 0.939 | 0.883 | 0.185 | 0.716 | 0.895 | 0.927 |
| | (1.33) | (1.31) | (0.36) | (0.98) | (1.26) | (1.31) |
| *Excess COVID_death × Gov_support* | −0.126 | −0.121 | −0.040 | −0.102 | −0.124 | −0.126 |
| | (-1.38) | (-1.37) | (-0.63) | (-1.08) | (-1.34) | (-1.37) |
| *Inflation* | 0.120*** | 0.129*** | 0.158*** | 0.130*** | 0.128*** | 0.123*** |
| | (3.58) | (3.88) | (4.94) | (3.88) | (3.89) | (3.72) |
| *Log of GDP per capita* | −3.336** | −2.616 | −0.106 | −1.210 | −2.429 | −3.037* |
| | (-2.08) | (-1.54) | (-0.06) | (-0.49) | (-1.21) | (-1.77) |
| *Oil_rent* | −0.136 | −0.125 | −0.295*** | −0.148 | −0.123 | −0.131 |
| | (-1.23) | (-1.06) | (-4.91) | (-1.07) | (-1.04) | (-1.14) |
| *Level of civil disorder in 2020* | −17.98*** | −16.87*** | −22.80*** | −15.35*** | −16.25*** | −17.43*** |
| | (-5.34) | (-4.97) | (-3.83) | (-3.83) | (-4.34) | (-4.90) |
| *Africa* | 0.813 | 1.553 | −2.290 | 2.800 | 1.938 | 1.129 |
| | (0.26) | (0.47) | (-0.55) | (0.79) | (0.56) | (0.35) |
| *Asia* | 2.618 | 2.339 | −4.728* | 1.570 | 2.496 | 2.505 |
| | (0.60) | (0.58) | (-1.74) | (0.32) | (0.59) | (0.58) |
| *Europe* | 3.398 | 4.025 | −6.850 | 3.727 | 4.494 | 3.784 |
| | (0.68) | (0.83) | (-1.51) | (0.57) | (0.90) | (0.76) |
| *North America* | 0.123 | −0.278 | −11.85*** | −2.200 | 0.00426 | 0.121 |
| | (0.03) | (-0.06) | (-2.79) | (-0.33) | (0.00) | (0.03) |
| *South America* | 7.724 | 5.520 | −2.743 | 2.322 | 4.255 | 6.517 |
| | (1.43) | (1.13) | (-0.64) | (0.49) | (0.84) | (1.19) |
| *Constant* | 52.13** | 45.04** | 42.56 | 31.60 | 42.13* | 48.91** |
| | (2.62) | (2.28) | (1.55) | (1.31) | (1.89) | (2.38) |
| R-squared | 0.32 | 0.27 | 0.2 | 0.24 | 0.26 | 0.29 |
| Number of countries | 110 | 110 | 110 | 110 | 110 | 110 |
| Breakdown point | | | 50 | 50 | 50 | 50 |
| Hausman test of S against OLS (p-value) | | | 0.03 | | | |
| Hausman test of MM against S (p-value) | | | | 0.804 | 0.395 | 0.119 |

The t-statistics reported in parentheses are calculated using robust standard errors. The asterisks indicate the level of statistical significance: * indicates $p < 0.10$, ** indicates $p < 0.05$, and *** indicates $p < 0.01$.

would be helpful in reducing the incidence of civil disorders. Political institutions in affected countries could contribute to internal stability during pandemics by providing various forms of support to households and businesses, such as income assistance or debt relief packages. In their recent study, Gholipour et al. (2023) have shown the positive effect of government income support and debt/-contract relief on consumer confidence. Improved consumer confidence is a critical factor for household aggregate consumption, savings and investment, financial decisions, productivity, trust in government, and voters' support for the government. Improvements in these areas could increase the opportunity cost of engaging in internal conflict and help to reduce the risk of such conflicts.

It is crucial to acknowledge the limitations of our study. We note that the moderating effect of government economic support measures is not always statistically significant across all regression models, and therefore, we exercise caution in drawing definitive conclusions about their impact. Moreover, the nature of cross-sectional data used in the research, means that we cannot establish a causal relationship between COVID-19 fatality rates, government economic support, and internal conflict. Future research may examine the long-term effects of the COVID-19 pandemic on internal conflicts and the role of government economic policies, as more data becomes available. Additionally, the ICRG's internal conflict measurement is based on country expert surveys and measures the risk of internal conflict, which may not reflect the exact number of conflicts. Future studies may test our empirical model with the actual number of internal conflicts over time. Furthermore, the reliability of COVID-19 cases and mortality data is another limitation as it may not be perfectly captured by government officials due to difficulties in collecting precise information during the pandemic. Finally, it should be highlighted that the study is using macro-cross-country data to analyze the relationship between COVID-19 fatalities, economic policies, and the risk of domestic conflicts across countries. To have an alternative understanding of these important relationships, future studies may use more comprehensive case studies, nationally representative survey data on the experience of the COVID-19 pandemic at the individual level, and event data on social unrest. Despite these limitations, the results of the study can be used as robust stylized facts on the association between the COVID-19 pandemic and internal conflict and the possible moderating role of government economic support.

**Table 10**
Model 1 of Table 4, OLS and Robust regressions with Jackknife Standard Errors.

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | Dependent variable: Relative growth of ICRG civil disorder index (%) | | | | | |
| | OLS regression | M regression (95% efficiency) | S regression (28.7% efficiency) | MM regression (85% efficiency) | MM regression (95% efficiency) | MM regression (99% efficiency) |
| *Excess COVID_death* | 2.875** | 2.464* | 2.323 | 1.978* | 2.380* | 2.706** |
| | (2.08) | (1.96) | (1.22) | (1.71) | (1.88) | (2.07) |
| *Gov_support* | 0.939 | 0.883 | 0.185 | 0.716 | 0.895 | 0.927 |
| | (1.25) | (1.22) | (0.35) | (0.98) | (1.23) | (1.26) |
| *Excess COVID_death × Gov_support* | −0.126 | −0.121 | −0.0404 | −0.102 | −0.124 | −0.126 |
| | (-1.29) | (-1.28) | (-0.61) | (-1.08) | (-1.30) | (-1.32) |
| *Inflation* | 0.120** | 0.129* | 0.158 | 0.130* | 0.128* | 0.123** |
| | (2.11) | (1.95) | (1.15) | (1.98) | (1.93) | (2.04) |
| *Log of GDP per capita* | −3.336* | −2.616 | −0.106 | −1.210 | −2.429 | −3.037* |
| | (-1.96) | (-1.43) | (-0.05) | (-0.50) | (-1.21) | (-1.74) |
| *Oil_rent* | −0.136 | −0.125 | −0.295* | −0.148 | −0.123 | −0.131 |
| | (-1.03) | (-0.95) | (-1.87) | (-1.05) | (-0.96) | (-1.00) |
| *Level of civil disorder in 2020* | −17.98*** | −16.87*** | −22.80 | −15.35*** | −16.25*** | −17.43*** |
| | (-4.95) | (-4.72) | (-1.39) | (-3.67) | (-4.23) | (-4.74) |
| *Africa* | 0.813 | 1.553 | −2.290 | 2.800 | 1.938 | 1.129 |
| | (0.24) | (0.47) | (-0.16) | (0.77) | (0.56) | (0.34) |
| *Asia* | 2.618 | 2.339 | −4.728 | 1.570 | 2.496 | 2.505 |
| | (0.57) | (0.56) | (-0.55) | (0.33) | (0.58) | (0.57) |
| *Europe* | 3.398 | 4.025 | −6.850 | 3.727 | 4.494 | 3.784 |
| | (0.64) | (0.80) | (-0.57) | (0.58) | (0.87) | (0.74) |
| *North America* | 0.123 | −0.278 | −11.85 | −2.200 | 0.00426 | 0.121 |
| | (0.03) | (-0.06) | (-0.92) | (-0.34) | (0.00) | (0.03) |
| *South America* | 7.724 | 5.520 | −2.743 | 2.322 | 4.255 | 6.517 |
| | (1.31) | (1.03) | (-0.35) | (0.48) | (0.82) | (1.13) |
| *Constant* | 52.13** | 45.04** | 42.56 | 31.60 | 42.13* | 48.91** |
| | (2.48) | (2.17) | (0.77) | (1.31) | (1.87) | (2.32) |
| R-squared | 0.32 | 0.27 | 0.2 | 0.24 | 0.26 | 0.29 |
| Number of countries | 110 | 110 | 110 | 110 | 110 | 110 |
| Breakdown point | | | 50 | 50 | 50 | 50 |
| Hausman test of S against OLS (p-value) | | | 0.03 | | | |
| Hausman test of MM against S (p-value) | | | | 0.804 | 0.395 | 0.119 |

The t-statistics reported in parentheses are calculated using robust standard errors. The asterisks indicate the level of statistical significance: * indicates $p < 0.10$, ** indicates $p < 0.05$, and *** indicates $p < 0.01$.

## 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 A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ejpoleco.2023.102368.

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