

Armed conflict and economic performance in Rwanda

We study whether conflict had an impact on economic performance across Rwandan administrative sectors six years after end of massive violence. Economic performance is measured using household expenditure data from a nationwide survey. Conflict intensity is measured using an index of excess mortality called WEMI (wartime excess mortality index). The findings show that economic performance was significantly lower in conflict-affected sectors, even after controlling for production factors (land, labor, education).

Marijke Verpoorten

Associate Professor at Institute of Development Policy and Management (IOB), University of Antwerp

Email: marijke.verpoorten@ua.ac.be

Pieter Serneels

Research Associate at CSAE and Reader in Economics at the University of East Anglia

Email: p.serneels@uea.ac.uk

While the human consequences of armed conflict are devastating, the effect of conflict on a country's economic performance in the medium and long term remains unclear. From an economic theory perspective there is no consensus about the impact of conflict on economic performance. Some theories predict that an economy will recover relatively quickly, while others suggest that catching up may take a long time, for instance because human capital recovers only slowly, or because countries can be trapped in a situation where conflict and poor performance coexist.

Current evidence, relying on cross-country data, provides support for either of these views. Some studies find evidence for relatively rapid recovery, while others indicate that countries may be stuck in a lowly performing economy for some time. One possible explanation for these apparent contradictory results lies in the nature of the data that is used, and because a number of factors that may affect the relationship between conflict and economic performance remain unobserved.

The speed of economic recovery may depend on the type of damage caused by the conflict: for instance whether it destroyed primarily physical capital or human capital. The identity of the parties in the conflict may also matter: in particular whether the conflict was between states, often relying on professional armies; or within a state between fractions of society, some of them non-army forces. While any of these factors may play a role, each of them remains typically unobserved in cross-country data, making estimates fragile and complicating identification of a causal relationship.

Our research is part of a wider programme that aims at improving our understanding of conflict and economic performance at the micro level. Using community and household level data from Rwanda, the research focuses on the impact of different forms of violence on economic performance within one single country six years after conflict. Exploiting the sadly unique

environment of Rwanda which experienced distinct forms of violence during the same period, the study compares the effect of genocide, which mostly destroyed human capital, and civil war, which typically affected physical capital.

Three key findings emerge from this research. Firstly, comparing high and low conflict intensity areas the research finds that households and communities that experienced more conflict have lower consumption rates six years after the end of massive violence. Secondly, further analysis suggests that the economy is still in transition, with the returns to land and labour significantly different between zones that experienced low and high intensity conflict, consistent with on-going recovery. Thirdly, the results also provide evidence that these returns, and by implication the process of recovery, depend on the form of violence. Returns to land are lower, and returns to unskilled labour are higher for genocide affected areas - a direct consequence of the decrease in labour force as the genocide targeted adult males in particular. Returns to skilled labour are also higher in genocide affected areas, because the genocide targeted the highly educated. They are lower in civil war areas, most likely because civil war damages factors that augment skilled labour, for instance transport infrastructure.

Considering a relatively short period after the conflict - six years - has both advantages and disadvantages. Research results confirm that the economy is still in transition and a new stable economic state has not yet been reached. What they do not reveal is whether the ongoing process of recovery will lead to either of the two situations outlined above: either to an economy at a similar level to the pre-war economy; or to an economy which is lower than the pre-war economy.

Ongoing research looks at a detailed analysis of the recovery timeline. Using more recent data from a 2005 household survey (instead of 2000 survey data), the first results indicate that eleven years after the end of massive violence there no longer



IOB

Institute of Development Policy and Management
University of Antwerp

is a significant difference in economic performance between administrative sectors with different conflict experiences. Currently, we are further exploring the data to understand the mechanisms of post-war catch-up.

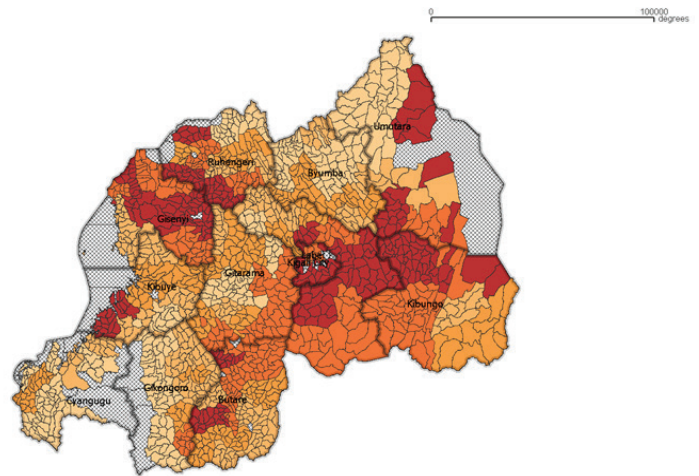
This research has lessons for policy making. Post-war countries typically experience a large in-flow of aid, and knowing the underlying mechanisms of economic recovery is useful to inform where aid is best allocated in order to maximise its effects. If pathways to recovery depend on the type of damage and violence, then appropriate policies targeting specific sector and activities are needed to promote recovery.

How we measure conflict intensity

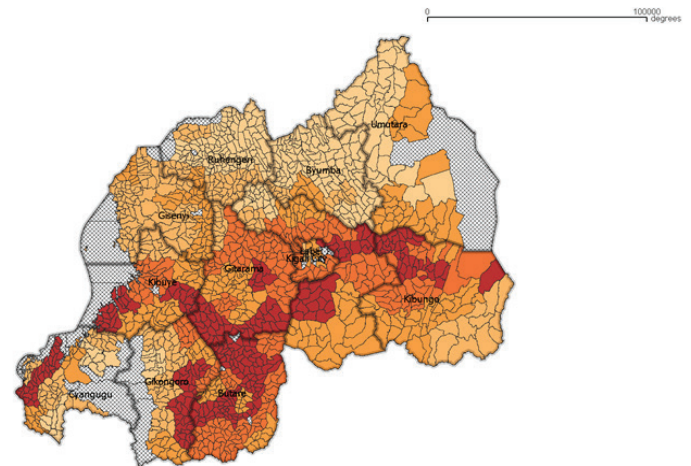
Conflict intensity is measured using three indices of excess mortality. General conflict intensity is measured by the Wartime Excess Mortality Index (WEMI), which measures commune level excess mortality in the period 1991-2002 and is the weighted sum of the first differences of five excess mortality proxies derived from the 1991 and 2002 population census, in particular, the mortality of sons, the mortality of daughters, widowhood, orphanhood, and disability due to war or genocide. To proxy for the intensity of genocide, the above set of five general excess mortality measures is augmented with six genocide proxies, namely the number of genocide suspects (using three different categories) and the number of genocide victims who survived but lost close relatives in the genocide (widowed, orphaned and disabled genocide victims); all taken proportional to the population. The part of WEMI that cannot be explained by the Genocide Excess Mortality Index (GEMI) is attributed to other causes of excess mortality, most importantly civil war (CEMI).

The maps to the right show the geographical distribution of the conflict indices (darkest shades reflect highest conflict intensity). these maps confirm that Genocide Excess Mortality (GEMI) is concentrated in the South, while Civil war Excess Mortality (CEMI) is concentrated in the centre, East and Northwest, which is consistent with findings from event data analysis on the different forms of violence.

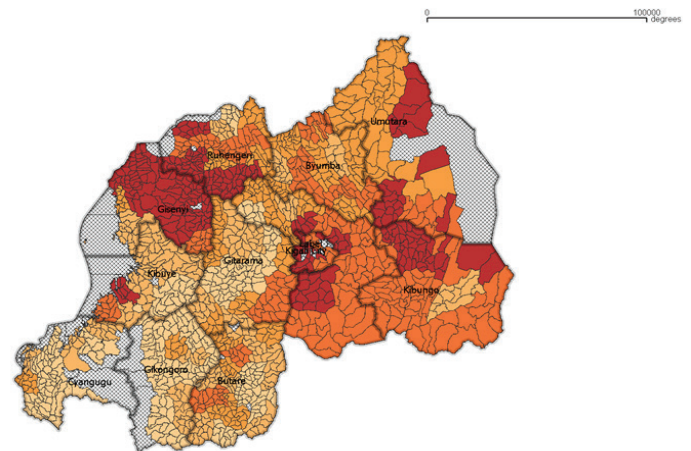
(a) War Excess Mortality Index (WEMI)



(b) Genocide Excess Mortality Index (GEMI)



(c) Civil War Excess Mortality Index (CEMI)



TO FIND OUT MORE

The study on armed conflict and economic performance in Rwanda is forthcoming in the *Journal of Conflict Resolution*. It is also available as a CSAE working paper WPS/2012-10: <http://www.csae.ox.ac.uk/workingpapers/pdfs/csae-wps-2012-10.pdf>

A related study on the spatial pattern of conflict intensity is published in *Political Geography*: <http://www.sciencedirect.com/science/article/pii/S0962629811001569>

