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**THE ELUSIVE PEACE DIVIDEND OF  
DEVELOPMENT POLICY: FROM WAR  
TRAPS TO MACRO-  
COMPLEMENTARITIES**

Dominic Rohner and Mathias Thoenig

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## Abstract

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JEL Classification: D74, F51, H56, O10

Keywords: conflict, Civil War, poverty, Development, policy

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# THE ELUSIVE PEACE DIVIDEND OF DEVELOPMENT POLICY\*

– From War Traps to Macro-Complementarities –

Dominic ROHNER<sup>†</sup> Mathias THOENIG<sup>‡</sup>

December 1, 2020

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# 1 Introduction

In the last decade, the world has experienced an increase in the number of violent intra-state conflicts. Reported battle-related deaths reached in 2014 their highest numbers recorded in 20 years (Allansson et al. (2017)). As hotspots of violence are typically located in low-income countries, the question of the two-way causation between poverty and conflict has been deeply scrutinized in the recent academic literature. Unfortunately, the policy aspects have been widely over-looked in spite of their paramount importance. This is regrettable because pacification is a subtle and complex process where both economic and political considerations matter: Policies that combat poverty do not automatically eradicate conflict, and can spectacularly backfire when they fail to take into account conflict dynamics.

Drawing on the existing literature reviewed below, the current paper formulates four key messages. First, the literature is likely to *underestimate the actual costs of conflict*. The main reason is that, in many contexts, the mere risk of conflict entails costly actions that ultimately prevent conflict. Hence, the quantitative assessment of these, often very substantial, costs of prevention is challenging because conflict remains an off-equilibrium threat and won't appear in the datasets on conflict incidence. Another reason for under-estimating is that most quantitative studies focus on the visible and measurable costs, namely material damages, that are relatively short-term. By contrast, a full range of costs –from depleted social capital to generation-specific scars (education, mental health, labor-market prospects)– are much harder to price in spite of being pervasive for a longer time period. Put differently, destroyed buildings and roads are quick to reconstruct and the incurred price of reconstruction is tangible; mending the social fabric of a society torn apart by violence is an open problem for which reliable price estimates are typically missing. Second, we identify a series of *war-traps* where self-reinforcing dynamics lead to vicious cycles of poverty and violence. Most prominently, conflicts deteriorate material conditions and social ties, which in turn constitute a powerful breeding ground for future violence. Hence, studying the question on the "impact of conflict on development" without taking into consideration such self-reinforcing dynamics may lead to seriously wrong conclusions. Third, the policy response should be calibrated such as to address jointly the peace and development objectives since there exists a strong *macro complementarity* between them. In particular, it would be a mistake to believe that the toolkit of anti-poverty policies will mechanically and automatically translate into a reduction of violence and social tensions. On the contrary, economic policies should be complemented with political and institutional interventions –taking on board lessons from political science. This also calls for a more integrative development model with "no-one left behind" in terms of territories and population segments. Our fourth message is that the *evaluation of development policies* in violent context should be encouraged. In particular, this macro-complementarity calls for the use of structural models that enable to quantify counterfactual interventions and the extent of general equilibrium feedback effects – which makes them a crucial complement to other study designs such as randomized control trials and (quasi-)natural experiments.

While there exists several surveys studying the general drivers and consequences of war (see e.g. Blattman and Miguel (2010)), the current review is, to the best of our knowledge, the first of its kind

focusing specifically on the developmental consequences of political violence, its associated conflict traps and the appropriate policy responses.<sup>1</sup>

The remainder of the paper is organized as follows: We start in Section 2 to present an array of overall cost estimates of armed conflict, before discussing in Section 3 the channels at work through which conflicts deploy their main effects. Section 4 describes how the aforementioned consequences of fighting can give birth to vicious cycles and war traps. In Section 5 we discuss particular policies that have the potential to break the aforementioned traps and we provide a perspective for the evolution of the research field, highlighting the role of external validity and quantitative models of conflict and development. Finally, Section 6 concludes.

## 2 Estimates of overall costs of war

### 2.1 Stylized facts on conflicts

To start with, we briefly outlay some well-known facts on the prevalence of different types of conflict. From the UCDP-PRIO Armed Conflict Dataset ([Themnér and Wallensteen \(2012\)](#)) we see that between 1946 and 2019, about 76 percent of all wars were civil conflicts, and only 10 percent either interstate or colonial (extrasystemic) wars, with the remainder being hybrid internationalized civil wars. In terms of evolution, since 1946 there has been an upward trend in civil wars from 8 per year in 1946 to 30 per year in 2019, and over this time period also internationalized interstate wars have risen sharply from 2 to 22 per year. Overall, 54 distinct conflicts have taken place in 2019 – with no other year since 1946 having recorded a higher number of conflicts per year.

### 2.2 Human costs

First and foremost, let's keep in mind the high levels of human fatalities generated by conflict. Aside of deaths of combatants, a specificity of civil conflicts pertains to the high vulnerability of civilian populations and the high prevalence of sexual violence ([Cohen \(2013\)](#)). Between 1945 and 1999 an estimated 16.2 million people have perished in 127 civil wars ([Fearon and Laitin \(2003\)](#)), and according to [Ghobarah et al. \(2003\)](#), on average, for each person killed in a civil war, there is one additional indirect fatality due to e.g. disrupted health services, diseases, food insecurity, contaminated water, etc. By way of comparison, since 1945 an estimated 3.3 million people got killed in 25 interstate wars ([Fearon and Laitin \(2003\)](#)). Further, taking into account all types of political violence (also purges and mass killings, not just civil wars), [Bae and Ott \(2008\)](#) compute even bigger numbers: "The 20th century is replete with incidents of civilian killings by the state. Conflict-related deaths in that century were put at 109.7 million or 4.35 % of the world population" (p.107). A large-scale deleterious impact

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<sup>1</sup>The insightful survey of [Ray and Esteban \(2017\)](#) studies the opposition direction of causality, namely investigating the impact of poverty and ethnicity on conflict, and, in contrast to the current contribution, does not focus on conflict traps and the assessment of particular policies.

of conflicts on civilian populations relates to forced displacements, representing 65.6 million persons in 2016. Over the 2005-2016 period, this amount has increased by a factor of five and more than half of them being children (UNHCR (2017)).

## 2.3 Economic costs

The macroeconomic impact of conflicts can be large. When it comes to economic costs in terms of foregone growth, the survey of Bozzoli et al. (2010) summarizes existing cost estimates of war as follows: "Mass violent conflicts have a negative effect on annual GDP growth of between one to three percentage points. Neighboring countries, meanwhile, suffer around one third of the costs that directly affected conflict countries have to endure. Post-conflict countries can expect a recovery period with generally higher growth rates than before the war. Some studies find an ongoing recovery over the medium term, but even these countries do not necessarily catch up completely" (2010: 166).<sup>2</sup> Cerra and Saxena (2008) and Mueller (2012) are among the few papers that assess the macroeconomic costs of conflicts in a cross-country quantitative framework. Mueller (2012) finds that the average civil war leads to a permanent loss in output of 18 percent, making civil wars more devastating than economic crises (financial, banking, currency). According to Collier (2008) the average seven year war lowers GDP by about 15 percent.

When it comes to prominent evidence for a single country, Abadie and Gardeazabal (2003) find that GDP per capita in Spain's Basque Country dropped about 10 percentage points relative to a synthetic control region without terrorism, and Besley and Mueller (2012) compute a very substantial cost of conflict for Northern Ireland, with the peace dividend raising house prices by several percentage points.

Concerning the impact of inter-state conflicts on growth, Organski and Kugler (1977) conclude that major inter-state wars lead to a gap of 10-15% of lower wealth during 15-20 years before catching up. Following a cost accounting rather than regression approach, Stiglitz and Bilmes (2008) provide a cost estimate of the Iraq war corresponding to 3 trillion US Dollars. Glick and Taylor (2010) assess the trade costs of inter-state wars, finding that war reduces trade by 80% and that this reduction is persistent (i.e. trade is still reduced by 42% after 5 years). The trade costs of war are estimated to be about 3% of the permanent GDP flow for major wars (while taking into account also fatality costs would more than double this estimated cost).

Conflicts exert negative spillovers on the economic development of other countries. At the regional-level, in the case of Middle-East conflicts (e.g. Irak, Syria), Rother et al. (2016) find that, on average, countries that border these high-intensity conflicts (e.g. Jordan) experience an annual decline of 1.4 percentage points in their GDP. Part of the spillover is channelized by the aforementioned well-studied violence-driven disruption of international trade (Martin et al. (2008a), Martin et al. (2008b) and Glick and Taylor (2010)). A striking example of a global negative spillover of violence has been studied by Besley et al. (2015); they show that the 2008 surge of attacks by Somali pirates in the Indian Ocean

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<sup>2</sup>Smith (2014) and Hoeffler (2017) provide other surveys of this literature.

led to a 8%-12% increase in shipping costs and an estimated world welfare loss of 630 USD millions.

## 2.4 The shadow costs of containing violence: "Si vis pacem, para bellum"!

The economic burden of conflict and violence is not limited to actual war outbreaks. The containment and prevention of fighting has substantial costs. According to the World Bank's World Development Indicators (<https://data.worldbank.org>), an average country currently spends slightly above 2 percent of its GDP for military expenditures. For illustration, take the example of the astronomical costs of major powers around the world maintaining an arsenal of nuclear missiles. These are not meant to be ever actually used but constitute a costly deterrence device. This logic is in line with a series of game-theoretic models of politics and conflict where war is –at least for a range of parameter values– an off-equilibrium threat point that does not materialize in equilibrium but still affects a variety of choices to prevent it (see e.g. [Acemoglu and Robinson \(2001\)](#); [Laurent-Lucchetti et al. \(2019\)](#)).

In addition to these tangible monetary costs, in countries with draft or militia armies, one needs to take into account the opportunity cost of time not spent for production. In Switzerland, which has a general draft for young men, the accounting cost in the budget would typically underestimate the actual cost of maintaining the armed forces, as also the opportunity cost of time of those enrolled would have to flow into the equation. This opportunity cost of time is of course much larger in countries that are actually at war, given that a much larger share of population is drafted.

We are not aware of any academic paper that attempts to assess these shadow costs of containing violence in a quantitative setup –a very challenging task given its "off-equilibrium path" flavor. One unfortunate consequence of this lack of credible estimates of shadow costs is that in survey articles and policy documents the overall *costs of conflicts are (potentially severely) under-estimated*.

However, indirect estimates of the order of magnitude of such shadow costs draw a bleak picture. Accounting exercises factoring in the public and private expenditures required to contain, prevent and deal with the consequences of violence suggests massive costs at the world level, as large as US\$ 14.7 trillion PPP in 2017, roughly 12.4% of the world GDP ([IEP, 2018](#)). Similarly, the costs of Humanitarian assistance targeting conflict responses and post-conflict reconstruction are large and have been rising over the last two decades –representing the majority of overall assistance. Note that total funding requirements for humanitarian action in 2016 reached US\$22.1 billion, with 86 percent of total requests for UN humanitarian assistance targeting conflict zones.<sup>3</sup>

## 3 The main channels through which conflict affects development

Beyond the aforementioned aggregate costs, we study in this section through what mechanisms wars may affect development. A better understanding of these channels of transmission linking war to

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<sup>3</sup>See <https://news.un.org/en/story/2016/12/546932-global-humanitarian-appeal-2017-requires-record-222-billion-funding-un>



development slowdown is important to guide policy measures in a post-conflict environment. In particular, assessing the temporality is key because some wars continue to deploy effects long after fighting has ceased while, for other conflicts, the economic and social recovery can be surprisingly fast.

### 3.1 Physical destruction and infrastructure

Physical destruction during war has only been studied by a handful of papers, mostly with the purpose of using conflict as a natural experiment for testing theories of economic growth and economic geography. The overall punchline of this literature is that destroyed buildings can be reconstructed, and that physical destruction does not have lasting consequences (contrary to destruction of human and social capital, as discussed below). These studies look at historical episodes of reconstruction in a given country and exploit spatial variations in the intensity of destruction across areas (e.g. cities) as exogenous shocks on post-war indicators of local development (e.g. city size). For example, the influential paper by [Davis and Weinstein \(2002\)](#) on post-1945 Japan find evidence of mean reversion in the sense that most cities returned to their relative position in the distribution of city sizes within about 15 years (Davis and Weinstein, 2002). In the same vein, [Brakman et al. \(2004\)](#) look at post-1945 Germany and detect no long-term impact on city growth in West Germany. Interestingly, they find a negative and persistent impact in East Germany. They impute this contrast to the fundamental role played by economic and political institutions in post-war reconstruction, a point that we will discuss further below in the section dedicated to reconstruction policies. In another context, [Miguel and Roland \(2011\)](#) find that while the large-scale bombing campaign of Vietnam had a huge humanitarian cost in the short-run, they do not detect any local poverty traps in the long run. An important distinction is pointed out by [Collier \(1999\)](#) who argues that the extent of destruction strongly depends on the structure of the economy: War-vulnerable sectors are the ones that are intensive in transactions and assets, while sectors featuring only very limited transactions and assets, such as e.g. subsistence farming, are more likely to recover quickly.

In short, *economic loss due to physical capital destruction can be substantial but is temporary*. To some extent, this conclusion comes at no surprise: There is a widespread consensus among economists and historians that the period of high growth in the aftermath of the second World War was mostly due to a catch-up effect of countries that experienced severe physical capital loss on their territory ("Trentes Glorieuses" in France, the German "Wirtschaftswunder", the spectacular Japanese post-war economic recovery, the "boom economico" in Italy, etc.). This conclusion is also in line with the macroeconomic growth literature that quantifies the speed of conditional convergence in models of physical/human capital accumulation and typically predicts this kind of catch-up (see the seminal contributions by [Mankiw et al. \(1992\)](#) and [Barro and Sala-i Martin \(1995\)](#)).

### 3.2 Impact of war on institutions and the social fabric

Social and institutional legacies of conflict, despite being "arguably the most important", remain the "least understood of all war impacts" ([Blattman and Miguel \(2010\)](#)). As highlighted above, wars

–at least in the short-run– destroy physical infrastructure. It is quite intuitive that this could harm state capacity, as if for example a hospital or administration building gets targeted by bombing, the state’s means of carrying out its missions get harmed. At the same time, a substantial literature from economics and other social science disciplines has found that states in war are obliged to build up a strong army machinery and in this way external threats and wars can also trigger investments in state capacity, as stressed by [Tilly \(2017\)](#) and [Voigtländer and Voth \(2012b\)](#) –most of their supportive evidence being based on European history. As far as Africa is concerned, [Osafo-Kwaako and Robinson \(2013\)](#) do not detect any effect of conflict fostering future state building and political centralization.

Beyond state capacity, a sizable series of papers looks at the consequences of wars on meta-level social structures, reaching mixed conclusions. Some evidence supports the view that conflict can result in heightened political participation and fostered local collective action ([Bellows and Miguel \(2009\)](#), [Blattman \(2009\)](#), and [Gilligan et al. \(2014\)](#)). By contrast, military intervention from external countries is associated with very different effects: [Kocher et al. \(2011\)](#) and [Dell and Querubin \(2018\)](#) show that US bombing in Vietnam weakened local governance, reduced non-communist civic engagement, and shifted local control in favor of the Viet Cong insurgents. There is also a fair amount of research (based on experiments and observational data) on the impact of warfare on trust and social capital at the individual-level. There, too, results are contrasted and [Bauer et al. \(2016\)](#) provide a comprehensive survey and a meta-analysis for navigating into this large literature. Importantly, several studies find that conflicts tend to increase parochial altruism and in-group trust within communities ([Voors et al. \(2012\)](#), [Gilligan et al. \(2014\)](#), [Cacault et al. \(2015\)](#)) and deplete generalized trust, especially out-group trust between communities ([Rohner et al. \(2013a\)](#), [Cassar et al. \(2013\)](#), [Besley and Reynal-Querol \(2014\)](#)).

All these intangible elements are key long-run determinants of growth and development – social capital and trust in particular ([Algan and Cahuc \(2010\)](#)). Moreover, designing policies and interventions aiming at reconstructing or fostering inter-group trust is not straightforward, as suggested by the literature on the historical persistence of anti-semitism, inter-group grievances and military rivalries ([Goertz and Diehl \(1993\)](#); [Voigtländer and Voth \(2012a\)](#); [Fouka and Voth \(2013\)](#)). Thus, in many cases the depletion of social capital after a war is likely to have long-standing consequences on development. However, as discussed further below, enduring distrust and grievances are not a fatality and some policy measures have led to promising results.

Finally, forced migration is a channel through which conflicts are likely to impact the social fabric of society. As discussed above, millions of people are displaced each year from their home regions due to interstate wars, civil conflicts, and natural disasters –a phenomenon already present at various points in history (think e.g. of the so-called "Migration Period" or of the mass population movements after WWII), and still common today (e.g. Syrian civil war refugees, Rohingya expelled from Myanmar). There exists a small and expanding literature studying the long-run impact of conflict-driven migration on development ([Becker et al. \(2020\)](#) for a key contribution) that points towards massive quantitative effects. Actually, even relatively short historical episodes may have long lasting effects, among others through inducing migration. For example, [Ochsner \(2017\)](#) studies the economic consequences of the

Red Army's misdeeds in 1945 in Southern Austria (dismantling, pillaging and sexual crimes). He looks at differences in spatial economic activity across the arbitrarily drawn and only for 74 days lasting liberation demarcation line between the Red Army and the Western Allies. His RDD results show that the Red Army occupation is associated with a relative population decline by around 26 to 31 percent and a drop in labor productivity more than 70 years after, a first-order driver of persistence being selective migration pattern across the demarcation line.

### 3.3 Destruction of human capital

One particularly important consequence of warfare exposure is that schooling gets in many cases partly or fully suspended, with wide-ranging and long-lasting consequences. In particular, several papers find that fighting substantially reduces human capital accumulation ([Chamarbagwala and Morán \(2011\)](#), [Shemyakina \(2011\)](#); [Verwimp and Van Bavel \(2013\)](#); [Leon \(2012\)](#)). This contrasts, though, with the impact of interstate conflicts. It has been found that, at the same time, international military rivalries can drive up education investments ([Aghion et al. \(2019\)](#)).

Further, a recent literature focuses on the impact of Jewish persecution during WWII as a shock to the human capital and the skill composition of the population. [Acemoglu et al. \(2011\)](#) document that, within Russia, cities that experienced the Holocaust most intensely have worse economic and political outcomes since the collapse of the Soviet Union, this lasting impact of the Holocaust being partly attributable to a permanent change in the social structure (i.e. size of the middle class). [Waldinger \(2016\)](#) finds that while scientist exodus during World War II had persistent negative effects, the actual bombing of German cities had no lasting impact. In particular, a 10 percent shock to physical capital reduced output by 0.05 SD in the short run, and the reduction did not persist. [Akbulut-Yuksel and Yuksel \(2015\)](#) find that German children who were of school age during the persecution of Jews have fewer years of schooling in adulthood, and are less likely to have finished high school or gone to college.

Importantly, war does not only directly affect human capital through the destruction of educational facilities and the like, but it also indirectly hinders human capital accumulation, both through economic deprivation (as discussed above) and through the impact of war exposure on health and behavior, as discussed right below in the next subsection.

### 3.4 The impact of war on health and behavior

There is a further array of individual-level effects of war exposure. Crucially, there are negative health impacts: [Bedard and Deschênes \(2006\)](#), [Akresh et al. \(2012b\)](#), [Akresh et al. \(2012a\)](#) and [Minoiu and Shemyakina \(2014\)](#) show that war-exposed children suffer from adverse health effects, both in the short- and long-run, with economic losses being an important channel through which armed conflict negatively impacts child health. In the same vein, [Barenbaum et al. \(2004\)](#) and [Derluyn et al. \(2004\)](#) find that wars have adverse consequences on mental and psychological health.

Another important dimension is how war exposure early in life affects future behavior later in the life cycle. [Miguel and Roland \(2011\)](#), [Cecchi et al. \(2016\)](#) and [Couttenier et al. \(2019\)](#) show that conflict exposure leads to a higher propensity for competitive, aggressive or violent behavior later in life. It has also been found that army enlistment can favor political radicalization and aversion to peace building, at least in extreme circumstances. In particular, [Vlachos \(2016\)](#) has found a political radicalization effect for forced conscription to the German army for men from Eastern France during WWII, and [Hirsch-Hoefler et al. \(2016\)](#) shows that individual conflict exposure reduces the support for peace building in Israel.

## 4 War Traps

### 4.1 Evidence on vicious cycles of war recurrence

Wars tend to recur in ever the same countries, and past wars are strong predictors of future wars. [Collier and Hoeffler \(2004\)](#) find that, in the post-1945 period, two thirds of all conflict outbreaks take place in countries where multiple civil conflicts were recorded; [Derouen and Bercovitch \(2008\)](#) document that more than three quarters of all civil conflicts stem from enduring rivalries among ethnic groups that repeatedly enter into conflicts with each other. As shown in [Rohner et al. \(2013b\)](#), persistence of conflict is still detected even when controlling for country fixed effects. Thus, war recurrence is unlikely to be solely due to persistent triggers (say, natural resource abundance) and logics of self-reinforcing dynamics are likely drivers of persistence – a war today is planting the seeds for war tomorrow – unless policies are put in place to break such war traps.

Several vicious cycles may drive persistence of civil conflict. Conceptually, we can think of two categories of cycles: (i) A positive feedback loop between war and poverty where economics and politics are intertwined (e.g. poverty and violence mutually reinforcing each other); (ii) a positive feedback loop from current conflicts on future conflicts where political motives (e.g. grievances) become "autonomous" drivers of the perpetuation of violence and economic interests are not central anymore. One immediate implication is that the diagnosis of the nature of the vicious cycle is essential for calibrating the development policy response. Indeed, in the case of the second, politics-only, type of vicious cycle, interventions targeting only economic objectives tend to be particularly inefficient: Not only they are inoperative at bringing back peace, but they are also more at risk of not reaching their primary objectives because their full effects are heavily constrained by the perpetuation of violence. As argued below, some political measures (e.g. institutionalized power-sharing) can help preventing the self-perpetuation of these "autonomous" non-economic vicious cycles of mounting inter-group grievances.

## 4.2 Feedback loop – Poverty to future conflict

The war-poverty trap takes place when political problems self-perpetuate because of poverty/economic issues. To simplify, conflicts are the political manifestation of under-development, while in turn under-development is the economic manifestation of conflicts. We discuss below a couple of mechanisms explaining why the nexus between poverty and war features a bi-directional causality such that conflicts fuel poverty and, in turn, economic deprivation is a powerful breeding ground for future conflicts.

**Mechanism 1: From poverty to conflict.** We have already discussed the abundant evidence on conflict harming economic growth and development. Thus, we now survey the empirical literature interested in the other direction of causality, namely from poverty to conflict (see also the survey of [Ray and Esteban \(2017\)](#)). In the early studies, based on country-level data, several concerns about identification issues were raised as exemplified by the discussions on weather-related instrumental variables in [Dell et al. \(2014\)](#) and [Burke et al. \(2015\)](#). Some results were unstable, even with conflicting findings between studies on the impact of commodity price shocks on conflict outbreak ([Brückner and Ciccone \(2010\)](#) and [Bazzi and Blattman \(2014\)](#)). This state of affairs led some scholars to question the validity of the relationship between poverty and conflict ([Djankov and Reynal-Querol \(2010\)](#)). Recent data-related improvements settled most of this empirical controversy. Causal analysis is now often based on unexpected income shocks at the subnational-level. Following the seminal contribution by [Miguel et al. \(2004\)](#), a frequently used source of exogenous variations corresponds to adverse weather conditions that are clearly associated, in the data, with a reduction of economic growth and an increase in fighting ([Hidalgo et al. \(2010\)](#), [Dell \(2012\)](#), [Hsiang et al. \(2013\)](#), [König et al. \(2017\)](#), and [Vanden Eynde \(2018\)](#)). An alternative exogenous source of income variations is the one induced by commodity price fluctuations. In particular, [Dube and Vargas \(2013\)](#) find that a drop in coffee prices in Columbia puts pressure on wages and can induce conflict events. In line with this, [Berman et al. \(2017b\)](#) show that spikes in fertilizer prices can increase the likelihood of conflict.

Two main channels have been envisioned for interpreting these empirical regularities. The first one relates to the opportunity cost of fighting and basically states that individuals trade-off the economic returns to violence against opportunity costs. The second one emphasizes how economic deprivation harms state capacity. The two channels have been perceived as observationally equivalent by many researchers, with adverse income shocks significantly and substantially increasing the risk of conflict in both cases. Though challenging, the question of disentangling these two channels is important because their policy implications differ drastically (i.e. targeting populations vs infrastructures). Very recently, [McGuirk and Burke \(2017\)](#) have made substantial progress on the question; their findings point toward the prominent role of the opportunity cost.

In a nutshell, the literature has highlighted both an effect of, on the one hand, war causing impoverishment and, on the other hand, poverty fueling social tensions and political violence. We expect a series of vicious cycles linked to conflict and economic deprivation (and their covariates, such as low social and human capital) mutually reinforcing each other. Such vicious cycles can result in enduring

war-poverty traps.

**Mechanism 2: Conflict-human capital/health nexus.** Low education (Rohner and Saia (2019)) and precarious health conditions (Cervellati et al. (2017)) can be powerful drivers of conflict. Because war exposure drives down both human capital and health indicators (see section 3), this can lead to a "human capital/health – conflict" vicious cycle. Again, the logic is similar to the first mechanism above – war harms the economic potential, this time by destroying education and physical health, which leads to a depletion of human capital. In turn, reduced human capital has been found to increase the risk of conflicts, both due to lower opportunity costs of fighting but also through fueling social tensions and grievances (see De la Briere et al. (2017); Rohner and Saia (2019)), which is the focus of our next section.

### 4.3 Feedback loop – Grievances and inter-group trust

In this subsection we develop the notion that the logic of violence can self-perpetuate through grievances, distrust and activation of latent cleavages (ethnic, cultural, linguistic, religious). By grievances we understand perceptions of exclusion (political, economic or social), a sense of injustice and the blaming on other groups or the state for it, which manifests itself, among others, in distrust between groups. Economic mechanisms linked to development and human capital are not at the forefront of the vicious cycles and war traps related to grievances. This obviously does not deny any role to poverty in these cycles, but it simply implies that beyond purely economic factors, a series of social and political mechanisms are at work and that breaking such war traps requires moving beyond strictly economic policies.

Put bluntly, the mechanism we have in mind is that inter-group conflict leaves political scarves and grievances, which may facilitate the mobilization of fighters, fueling the risk of future wars. In terms of game-theoretic models, these types of vicious cycles of self-perpetuating war have been studied e.g. in Rohner et al. (2013b); Acemoglu and Wolitzky (2014). Rohner et al. (2013b), for example, have constructed a rational choice model where the outbreak of a war results in lower inter-group trust and less frequent business relationships; by decreasing the opportunity cost of a war, this, in turn, increases the likelihood of future violence. This bi-directional relationship can give birth to what one can call a "social capital – conflict" vicious cycle.

In terms of the empirical evidence, the idea that grievances lead to conflict has been present in political science for many decades (see e.g. the seminal work of Gurr (1970) and Horowitz (2000)).<sup>4</sup> The activation of grievances can be engineered by elites, e.g. through the mobilization of collective memories, emotions (anger, frustration), and narratives. While there has been a series of qualitative studies on the persistence and re-activation of grievances, there still only exists relatively little quantitative work on this (see e.g. Cederman et al. (2010); Fouka and Voth (2013); Ochsner and Roesel (2017)). This

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<sup>4</sup>See Shesterinina (2016) for a case study of the Georgian-Abkhaz war of 1992–93 and a survey of the political science literature on social structures for civil war mobilization.

relative lack of quantitative assessment on the activation of grievances is surprising, given how crucial it is for designing the reconciliation process (on the role of narratives in reconciliation, see next section).<sup>5</sup> We foresee here an avenue for future research at the cross-road of the conflict and media literature, drawing on machine learning and text analysis. Studying how grievances can persist over time, be re-activated, or be strategically manipulated by group leaders is of paramount importance.

A crucial factor can be horizontal inequalities between groups: The persistence and re-activation of grievances is often facilitated by the presence of economic disparities across groups (Fearon and Laitin (2003); Collier and Hoeffler (2004); Østby (2013); Huber and Mayoral; Stewart (2016)). This implies that economic and redistribution policies can help in curbing the grievance feedback loop on violence. Up to now the empirical evidence on this is quite slim (see e.g. Crost et al. (2016)) and pursuing this research question constitutes in our view a fruitful avenue for future work.

Last but not least, a further grievance-related vicious cycle is plausible: Namely, wars often imply the calling of a state of emergency suspending parts of constitutional rights and fighting frequently often entails violations of civil liberties and political rights. In turn, as discussed below, the lack of rule of law and of democratic political processes can be a powerful driver of grievances and insurgency. The resulting type of "institutional break-down and conflict" vicious cycle constitutes a further mechanism through which grievance-related war traps can arise.

## 5 Policies to Break the War Trap

### 5.1 First principles: Fostering development AND peace

We start the current section by formulating general first principles of how to tackle war traps, before studying a battery of particular policies. A key point concerns the dual facet of development policy: Poverty and conflict should be addressed simultaneously, due to the presence of a *strong complementarity* between the economic and political objectives. If problems of under-development and political instability are treated disjointly, this entails a large risk of being stuck in a conflict trap, as argued below. In particular, it would be a mistake to believe that the toolkit of anti-poverty policies will mechanically and automatically translate into a reduction of violence. A fascinating study by Blattman et al. (2017) illustrates the empirical relevance of this complementarity between policy interventions (at the individual-level in their paper). In Liberia, they recruited criminally engaged men –incl. former ex-combatants from two civil wars – and randomized a cognitive behavioral therapy designed to foster a battery of non-cognitive skills. They also randomized \$200 grants. Their results point toward a reinforcement effect: While the effects of cash alone and therapy alone dissipate over time, they find that, when cash followed therapy, crime and violence decrease dramatically for at least a year. Thus, if just disbursing cash does not suffice, the key question becomes what the most promising policies are

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<sup>5</sup>A likely reason for this lack of empirical works on the question is that the first generation of empirical studies dismissed the role of grievances. In particular, the seminal study by Humphreys and Weinstein (2008) finds that evidence on participation to conflict is more consistent with explanations based on economic motives rather than on grievances. We advocate for a re-examination of the question at the light of the now-available large micro-level datasets.

that can simultaneously foster development and peace? Let us start with discussing some examples of successful versus unsuccessful policies before setting up a simple formal model.

**Policy macro-complementarity** There is no doubt that a well-designed development program can curb poverty and violence. International trade is an area where this dual facet of development policy ("economics-politics") has been long recognized. In the aftermath of WWII, the construction of the European Union was based on the dual purpose of pacifying Western Europe and promoting economic reconstruction in an impoverished Europe. As shown by [Martin et al. \(2012\)](#), this logic explains the signature of many FTAs across the world since 1945 – the reverse of the medal is that e.g. the US-China trade war is both an economic and geopolitical conflict. These reconstruction efforts after WWII were mirrored in the Marshall plan aiming at restoring production capacities in Europe. As discussed above, this productive investment has been followed by an unprecedented economic boom of 30 years with growing human capital, surging wages and a historically long span of peace in Europe.

A similar example of a policy aiming at raising human capital and productive efficiency has been the INPRES school construction program in Indonesia in the 1970s, leading to a historical boost in educational attainment. While the primary purpose of the program was to raise human capital, productive capacities and wages, it achieved the "double dividend" of not only fostering economic advancement but also curbing conflict ([Rohner and Saia \(2019\)](#)). Interestingly, many of the desirable consequences of the program –both in terms of economic and political outcomes– have increasingly surged over many years, not just affecting the first but also second generations of pupils.

One common feature of the aforementioned policies generating a powerful macro-complementarity between development and peace is that they aim at fostering development not by disbursing one-off cash but by promoting *long-run* productive capacity, e.g. through human capital investments or the building up of trade networks or production joint ventures. We shall revisit this feature in the simple formal model below.

**Policies that backfire** By contrast, policies that fail at addressing jointly the two facets of poverty and political conflict may backfire. Examples are manifold of potentially counter-productive aid policies when they are detached from local knowledge and do not take into account ground conditions and local ethnic politics. In a fascinating and controversial paper [Nunn and Qian \(2014\)](#) causally find that an increase in US food aid may raise the incidence of armed civil conflict in recipient countries. Although their macro-level analysis prevents them from an in-depth investigation of the channels, they provide substantial evidence that aid stealing by the fighting groups is likely to be the main driving force of their findings. Interestingly, they detect no effect of food aid on conflict in countries without a recent history of civil conflict. This means that a given policy can work well in a set of peaceful countries, but transposing it without adaptation to a context of conflict may result in worse outcomes. In other words, ill-designed development policy can be detrimental to peace in contexts with latent cleavages where the country is already trapped in a poverty-violence spiral.



Related to this, [Crost et al. \(2014\)](#) document how insurgents in the Philippines have sabotaged a large World Bank funded development program because its prospective success could have weakened their support in the population. Their RDD estimations point towards an increase in insurgent-initiated incidents in the early stages of program preparation. Quite surprisingly, it is because the program is potentially successful that it was actually sabotaged, leading in this context to a positive correlation between foreign aid and conflict. One lesson from this is that state capacity and the means to guarantee public security can be necessary pre-conditions for some types of policies.

Similar results have been found e.g. in [Weintraub \(2016\)](#), [Wood and Molfino \(2016\)](#), [Sexton \(2016\)](#); for a literature survey see [Findley \(2018\)](#). Strikingly, these countervailing effects of aid have typically most often been detected in contexts where one major consequence of a policy intervention has been to increase the overall amount of lootable financial liquidities in a given region, without affecting individual returns to productive activities. Drawing on this pattern, [De la Briere et al. \(2017\)](#) have advocated to invest mineral rents in human capital rather than in appropriable financial assets.

While the World Bank is aware of this dual aspect of development policy ([World Bank \(2018\)](#)), (unsurprisingly) there are only few quantitative evaluations of pacification policies and post-conflict interventions. This is a pervasive problem in the political economy literature; magnified here by the fact that implementing RCTs is notoriously difficult in a violent context. Collecting further, well-identified empirical evidence on the impact on conflict of various anti-poverty policies constitutes a fruitful avenue for future work.

## 5.2 A simple model on the economics and politics complementarity

Before zooming in on particular promising policies, we want to take one step back and formalize in an extremely simple setting the main forces at work. Formal models of contest have been developed already several decades ago (see e.g. [Hirshleifer \(2001\)](#) and the survey of [Konrad et al. \(2009\)](#)), but have only quite rarely been linked to particular economic policies. An exception is the theoretical paper by [Dal Bó and Dal Bó \(2011\)](#) that illustrates how conflict exerts a social constraint to policy analysis: They show how a (first best) desirable economic policy in times of peace may turn to be detrimental in reality because of its impact on conflict.

In what follows, we consider (without any claim of novelty) the simplest possible workhorse model of contest from this literature and illustrate in this extremely simple and transparent setting the contrasting effects of particular anti-poverty policies that may promote peace or backfire. Consider a framework where two risk-neutral players (groups), A and B, fight to appropriate a "prize"  $R$ . Each player  $i \in \{A, B\}$  optimally allocates its effort between a productive activity paid at a market price  $w$  (e.g. farming) and fighting for  $R$  (e.g. rents from natural resources) under the time constraint  $l_i + f_i = 1$  where  $l_i$  and  $f_i$  stand for the time dedicated to laboring and fighting respectively. Fighting success of  $i$  –to be interpreted as its probability of victory or alternatively the appropriated share of the prize– is modeled with a standard contest success function

$$\mathbb{P}_i = \frac{\rho_i f_i}{\rho_i f_i + \rho_{-i} f_{-i}} \quad (1)$$

where the non-negative  $\rho$ 's capture fighting efficiencies of  $A$  and  $B$ . The payoff function of  $i$  is given by

$$\pi_i(f_i, f_{-i}) = \mathbb{P}_i(f_i, f_{-i}) \times R + (1 - f_i) \times w \quad (2)$$

In this setting, the Nash equilibrium is unique and the equilibrium level of fighting is given by

$$f_i^* = \frac{B}{4} \times \frac{R}{w} \quad (3)$$

where  $B \equiv \frac{\rho_A \rho_B}{(\frac{\rho_A + \rho_B}{2})^2}$ . This parameter captures the balance of fighting power between the two players; it lies between 0 (fully unbalanced) and 1 (fully balanced). A well-know feature of the contest success function setup is that fighting efforts increase with the balance of power –a direct consequence of strategic interactions. More importantly for our purpose, we see that more fighting takes place when the prize is larger (high  $R$ ) and when the opportunity cost of fighting is small (low  $w$ ).

Aggregate welfare is given by  $\mathcal{W} \equiv \pi_A + \pi_B = R + 2w - (f_A + f_B)w$ . In words, the welfare loss attached to conflict stems from the fact that aggregate violence (i.e. total fighting effort  $f_A + f_B$ ) diverts labor from production to appropriation. Note that in a slightly more evolved setting, one could add further direct costs of conflict by adding a term consisting of multiplying fighting efforts with some linear destruction cost  $d$ ; however, this would not affect our main conclusions (but would simply reduce somewhat the equilibrium fighting efforts).

Combined with equation (3), we obtain that the equilibrium level of welfare is given by

$$\mathcal{W}^* = R + 2w - B \times \frac{R}{2} \quad (4)$$

The social optimum is reached when the welfare loss is minimized. This corresponds to a case where a benevolent social-planer imposes a peaceful arrangement where the rent is shared between the two players with no fighting (i.e. the limit case  $f_A = f_B \approx 0$ ). In that case

$$\mathcal{W}^{\text{peace}} = R + 2w \quad (5)$$

Let us assume that a development agency has to decide between allocating an amount  $\Delta$  of aid towards increasing the rent (i.e.  $R + \Delta$ ) or towards increasing labor income (i.e.  $w + \Delta/2$ , as the amount is divided between the two groups). If the agency is able to enforce peace, then it is indifferent between the two policies. But if peace cannot be maintained, then the policies have drastically diverging consequences on fighting incentives and welfare. The rent-oriented policy (e.g. disbursing cash without any support or program attached) exacerbates violence (see equation 3), there is some crowding out of

production such that the resulting increase in aggregate welfare represents only a fraction  $(1 - B/2)$  of the initial aid (see equation 4). By contrast, the productivity-enhancing policy (e.g. entailing the promotion of trade or human capital) will reduce violence and its benefits will be fully transmitted to aggregate welfare. In words, the economic facet of development policy must factor in the social and political constraints linked to conflict. Ignoring this macro-complementarity between economics and politics leads to mis-calibrated policies that can have a detrimental impact on violence.

What does this mean in terms of the aforementioned anti-poverty policies? When policies aim to tackle under-development by distributing one-off aid, a main effect can be to increase  $R$ , thereby triggering additional fighting effort, which could crowd-out at least partly the initial positive effect of cash injection. In contrast, when policies aim at fostering productive capacity, e.g. by increasing human capital, and eventually also wages  $w$ , this leads to a higher opportunity cost of appropriation and is hence expected to lead to the "double dividend" of reduced poverty and reduced fighting.

These straightforward implications of a canonical contest model have, surprisingly, only rarely been confronted within a unified empirical test. One exception is [Dube and Vargas \(2013\)](#) who show that in Colombia a boom in the labor-intense coffee industry (being associated with higher wages for workers) has a pacifying effect, while higher oil prices increase the spoils of appropriation and are associated with greater fighting efforts.

Put in simple terms, one implication is that economic policies should be complemented with political and institutional interventions that call for a more integrative development with productive investments in human and physical capital instead of one-off cash payments, and with "no-one left behind" in term of territories and population segments. If each group in society has promising production perspectives, the incentives for leaving the labor force to join armed rebel forces are slim.<sup>6</sup>

In what follows, we briefly highlight a series of particular policies that have been found promising to promote peace, by increasing the opportunity cost of conflict, improving institutional quality, and attenuating grievances.

### 5.3 Policies that increase the opportunity cost of conflict

**Labor Market Access** A recent study by [Blattman and Annan \(2016\)](#) experimentally shows for Liberian ex-fighters that the persistence of violence can be attenuated by economic opportunities. In line with this evidence, [Couttenier et al. \(2019\)](#) find that adult asylum seekers who have been exposed during childhood to civil conflict and/or mass killing in their origin country, tend to perpetrate more violent crimes in Switzerland; crucially, this deleterious effect vanishes almost entirely for those who are granted an access to the Swiss labor market.

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<sup>6</sup>For the incentives of left-behind individuals and groups to engage in enduring fighting, see [Esteban et al. \(2012, 2020\)](#) and the literature cited therein.

**Education and Human Capital** Schooling construction has been found to be a major peace-promoting force in Rohner and Saia (2019). This paper exploits arguably exogenous variation in the intensity of the INPRES school construction during the 1970s in Indonesia, finding that a one standard deviation increase in schools built (1.25 more schools per 1000 school-aged children) results in a drop of a quarter of the baseline conflict risk.

**Weapons embargo** Restricting the access to weapons through Arms Trade Treaty (ATT) and international embargoes could be another policy that makes engaging in fighting more costly. There exists indeed ample evidence that weapons availability fuels violence (Dube et al. (2013); Benson and Ramsay (2016); Hultman and Peksen (2017); Gallea et al. (2019)). One caveat concerns the implementation: While weapons embargoes are seen as less costly for the general population compared to general trade sanctions, it has been found that they are typically not easy to enforce (Moore (2010)).

## 5.4 Policies that improve institutional quality

**Role of democracy and power-sharing** There is a substantial body of evidence that sound institutions and mature democracy reduce considerably the scope for conflict (see e.g. Hegre (2001); Besley and Persson (2011); Laurent-Lucchetti et al. (2019)). In line with the argumentation above, Collier and Rohner (2008) have found indeed a macro-complementarity between development and democracy, with the conflict-reducing effect of democracy above all present for higher levels of development.

**Breaking the natural resource curse** The literature linking natural resources to conflict ranges far back (see e.g. Fearon and Laitin (2003); Collier and Hoeffler (2004); Mehlum et al. (2006); Morelli and Rohner (2015); Berman et al. (2017a)). Importantly, detrimental political instability effects of resource abundance are not a fatality, as good institutions can make sure that natural resources are a blessing and not a curse (Mehlum et al. (2006)). As far as specific mining characteristics are concerned, Berman et al. (2017a) find that transparency / traceability initiatives and corporate social responsibility are key ramparts against potentially harmful impacts of the mining industry on peace.

## 5.5 Policies that attenuate grievances

As shown in Cilliers et al. (2016), truth and reconciliation processes can foster reconciliation and strengthen social capital, but at the price of worsened psychological health. As stressed by Cantoni et al. (2017), school curricula can affect people's beliefs and attitudes, and may play a role in reconciliation processes, which could be a fruitful avenue for future research.

## 5.6 Policy Evaluation

Our reading of the literature shows that the evaluation of policy interventions in conflict and post-conflict contexts is still in its infancy. One obvious reason is that the frontier toolkit for evidence-based policy evaluation (e.g. Randomized Control Trials) is notoriously hard to implement when violence is pervasive. We believe that future studies should try to tackle this challenge. Indeed, our previous discussion on the macro-complementarity between economic and political objectives suggests that the lessons drawn from interventions (and their evaluations) designed in a peaceful context should be transposed with great caution into a conflictual environment. In other words, the optimal design of anti-poverty policies in peace and in war may drastically differ.

A powerful way of addressing this challenge is to set up and estimate structural models of conflict and development that allow for quantifying counterfactual policy interventions. Following such an approach can yield additional insights as the structural estimation toolkit is able to deal with general equilibrium effects and assess non-linear effects of policy changes of variable magnitude, contrary to Randomized Control Trials (RCT), Regression Discontinuity Design (RDD) etc. Thus, it seems important to complement pure theory and reduced-form estimation with structural models englobing both theory and empirics, especially given the two-way causation between conflict and development. This methodology has so far only rarely been used in the economics of conflict. There exist though a few exceptions of recent papers making first steps in this direction. [Esteban et al. \(2012\)](#) start out from a model of contest to derive predictions on indicators of diversity and inequality that are directly taken to the data. [König et al. \(2017\)](#) structurally estimate a contest-network model using data of the Second Congo War, which allows to predict the impact of keyplayer removal, embargoes and bilateral pacification between armed groups (see also the recent related paper of [Amarasinghe et al. \(2020\)](#)). Following a trend similar to the one observed recently in other fields (e.g. labor economics or trade), we expect structural estimations to become useful additions to the toolkit in the conflict literature in the coming years.

## 6 Conclusions

From the above discussion arise several conclusions. One key reason why conflict is still often overlooked as major factor in development policies is that, *conflict costs are often under-estimated*, as shadow costs of costly deterrence spending are typically disregarded by policy makers. Once the true costs of political tensions are taken into account, anti-poverty measures are more likely to adequately take into consideration their impact on political stability. This would typically shift the focus away from one-off cash transfers to longer-run investments in human capital, sound institutions and productive capacities. While the former (cash) constitutes spoils to appropriate, the latter (increased productive capabilities) raises wages and drives up the opportunity cost of leaving the work force to join an armed group. Moreover, there exists a series of *conflict traps*, some related to vicious cycles and poverty, and others linked to the persistence and activation of grievances. In order to break these conflict traps, policies

need to *address jointly both poverty and social tensions, as there exists a strong macro complementarity* between the two. Policies that only focus on poverty or only on conflict are in many cases doomed to fail, and the most promising policy measures typically both advance peace and development at the same time. The idea that development policies should be combined with conflict-prevention is now well rooted in the doctrine of the international agencies, as testified by the joint United Nations-World Bank initiative on "Pathways for Peace: Inclusive Approaches to Preventing Violent Conflict". Still, the macro-complementarities highlighted in the current paper are not well-enough understood yet and the particular policies proposed above are still under-used.

In terms of an outlook of the evolution of this literature, we expect machine learning and geographical information systems to play an increasingly important role. Digitally-driven data design, geo-localized data and remote sensing data, machine learning, web scrapping and text analysis will all constitute increasingly helpful tools to generate novel data to answer novel research questions. Beyond this evolution of the data collection tools, we also predict a return of theory and an increasing importance of external validity considerations. While exploiting exogenous variation around some small scale thresholds in well-defined micro-settings can be extremely valuable and insightful, they need to be combined with larger scale studies that cover larger areas and that are micro-founded in theory. In many contexts –and this is our fourth and last major conclusion– *structurally estimated quantitative models* can play a useful role.

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