

# The determinants of internal conflict in the world: How to estimate the risks and better target prevention efforts?

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Preface by Jean-Pierre Raffarin  
Foreword by Patrick Guillaumont



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# Preface

## ***War and Peace within Nations***

One of the essential tasks of the Leaders for Peace Foundation is to identify the risks of tensions and imbalances that can lead to armed conflict and the breakdown of civil and international peace.

The pandemic which has hit the planet in recent months and the strong calls for ceasefires to devote effort to fight against the virus and not against one's neighbour, or anyone designated as an enemy, have had little effect. Attacks, mistreatment, active and latent wars have not abated. The planet itself is not doing well, not only because of the COVID-19 pandemic, but also because of the gears set in motion by certain countries by their rejection of multilateralism, dialogue, and the search for the new balances that humanity needs.

Predicting is not prevention, because the factors which cause conflict can be more powerful than those that help to contain or eliminate them. However, knowing the determinants of these dangerous situations helps to awaken people's minds, to make them aware of the potential for degradation of a situation that is badly controlled because it is poorly understood. The study entrusted to FERDI by the Fondation Prospective et Innovation (FPI) is intended to enlighten national decision-makers and their international partners about the reasons and causes of these internal conflicts in the world, which after a lull in the last decade of the 20th century, have recently multiplied and spread beyond borders and continents. FERDI's study makes a clear distinction between the long-term structural factors (economic under-development, vulnerability to climate change, fragility of society) which provide a favourable ground for shocks, be they political, economic, or environmental, that may trigger internal conflicts. This study puts the means of economic science at the service of politics and hence of peace. On a subject such as this, analyses and opinions may differ in good faith. Each person weighs the parameters and the remedies to be administered according to his or her convictions and objectives. However, it is clear that without balanced, inclusive development, without a mode of intervention adapted to reality, and without the taking of responsibilities by those in charge, nothing effective and sustainable is possible. The Sahel - and ultimately the whole of West Africa, which can be contaminated by the ferments of division - is a perfect illustration of this evil which is gaining space and depth.

Apart perhaps from the rivalry of foreign powers, all the ingredients are present for the crisis to worsen. The clashes are as much economic as they are social, ethnic, religious, or cultural. Above all, they call for national responses so that a call to arms can be followed by a call for harmony and peace. A wait-and-see attitude and procrastination can lead to deadlocks that may be beyond the capacity of local actors to resolve them on their own. This can be seen in Mali and in the Sahel, where with the involvement of local actors, the European Union and France are in the forefront of supporting regional efforts to restore the conditions for peace. Acting earlier, with full knowledge of the facts thanks to a mapping of the old and present factors of the descent into confrontation, could certainly have helped to limit the scale of the conflict and the resulting damage. As such, this book, based on the FERDI study, is intended to be a guide for politicians and aid agencies. Men and women of good will, the Leaders for Peace intend to contribute by sharing their experience in a disinterested effort of foresight, anticipation, and prevention. This FERDI study is one of the instruments in their hands to serve peace through prevention.

*Jean-Pierre RAFFARIN*



# Foreword

This book is the result of a long-standing ambition of FERDI, at the crossroads of two main programmes. One deals with security and development issues in the Sahel, a programme which, following the publication of the book “Linking security and development. A Plea for the Sahel” was followed by the creation of the FERDI “Sahel Chair” at Ouagadougou, under the direction and impetus of Tertius Zongo, former Prime Minister of Burkina Faso. The other programme deals with “innovative development indicators”, in which various indicators have been designed, and measured, in particular on structural economic vulnerability and physical vulnerability to climate change. An indicator of structural political violence, or more precisely of internal conflicts, had yet to be established, while in this area it was particularly difficult to isolate what is structural from what is not. The authors of this book, Sosso Feindouno and Laurent Wagner, have already published, in collaboration with Michaël Goujon, a FERDI working paper which presented an indicator of internal violence based on the identification and measurement of past events, supposedly exogenous and aggregated in a discretionary manner. In this work, they identify objective factors for the occurrence of conflicts by trying precisely to isolate those that are structural from those that are not structural but more related to the present policy.

This conceptual distinction is essential if the indicators of vulnerability in its various dimensions are to be used for the allocation between countries of concessional resources. This is the operational ambiguity of the concept of political fragility: high fragility calls for strong support from the international community, but also reveals a policy weakness that for many donors should lead to a limited level of aid. The conflict risk index presented here makes it possible to identify the factors that contribute to the risk of civil conflict between countries. It differs from many indicators of political fragility, which because they combine structural factors and factors linked to current policy, cannot be used for allocation purposes.

The existence of a conflict risk indicator makes it possible to target prevention policies on factors, that depending on the country, threaten internal peace. This index does not lead to a prediction. It only measures a probability that is based on objective factors, and which fortunately is generally low. But as low as the probability of conflicts may be, their cost is such that it justifies a prevention policy targeted on its determining factors.

In the final lines of *War and Peace*, mentioned in the introduction to this book, Tolstoy evokes the relationship between individuals' freedom of choice and their “dependence on the outside world, time and causality”. The conflict risk index

presented in this book seeks to explore this dependence on the structural factors of conflict. It can also shed light on freedom of choice to overcome it. This index will no doubt be subject to improvement and will need to be monitored over time, like FERDI's main vulnerability indicators. The support of the Fondation Prospective et Innovation has been particularly valuable in developing this index and showing how it can be used in a prevention policy. We would like to thank its president, Jean-Pierre Raffarin (Prime Minister of France 2002-2005), who created the Leaders for Peace Foundation, warmly for this support.

*Patrick Guillaumont*

# Executive Summary

## **Why this study?**

*Within the framework of its activities, the Foundation Prospective & Innovation aims to bring an international perspective on strategic issues, to understand and appreciate the reality of emergencies, especially in Africa, in order to participate in the design of new global, national, and local governance. For many developing countries, this reality is today characterised by an increase in the number and intensity of armed civil conflicts, and their human, economic, and political stakes. In this context, it seems necessary to increase the awareness of the various actors but also think ahead about the challenge posed by peacekeeping in the face of the changes in the contemporary world. This report, prepared by the Foundation Prospective & Innovation in partnership with FERDI, aims to help political decision-makers, governments, and other actors to develop an informed strategy for preventing violence and insecurity all over the world, and promoting sustainable peace.*

*Recent years have seen an increase in the number and intensity of armed conflicts, which has been accompanied by two new phenomena - an increase in the number and intensity of terrorist incidents and an increasingly important part played by organised crime in the dynamics of conflicts. At the same time, the fragility of some States has increased, particularly in Africa. Despite the complexity of the concept of fragility, most experts associate it with communities caught in a trap of violence leading to the ineffectiveness of the State and the breakdown of the social contract with citizens. In this context, tools for measuring and assessing state fragility are increasingly being demanded to give a supposedly objective basis for the identification of prevention actions. The prevention of armed conflict and violence in general is therefore at the heart of the debate on political action to combat situations of fragility. It is also necessary to draw on the wealth of economic and statistical work about the determinants of conflict, and on the effectiveness of preventive policies conducted in fragile states.*

*Empirical evidence shows that numerous factors, economic, social, demographic, climatic, geographic, or neighbouring countries, can contribute to the outbreak of new conflicts. For the most part, both micro- and macro-economic studies are not directly anchored in theory, and the multitude of econometric results tends to make it impossible to reach a real consensus, in particular by not making it possible to prioritise "rival" theoretical explanations. This discrepancy between theory and application also means that it remains very difficult to distinguish correlation from causality. Some variables may not be causes but simply associated factors (e.g. infant mortality, life*

expectancy). Other variables, such as income and GDP growth, are endogenous to the risk of civil war. Thus, it is probably preferable to talk about factors correlated with the onset of conflict rather than the causes of conflict to describe the results of this empirical literature.

In this context, assessing or estimating the risk of conflict is obviously not to predict its onset, but is to assess for each country the probability of conflict, with a view to reducing it by identifying the factors associated with it and the policies to be implemented. Consequently, understanding the risk of conflict calls for mobilisation of a large mass of data and processing the data using appropriate statistical methods in order to grasp the mechanisms which trigger conflicts or violence. Similarly, the heterogeneity of situations has led to a multitude of different approaches to prevention policy. The targeting of key sectors and the sequencing of reforms appear to be factors which determine the quality of the political response to security crises in developing countries. This study has 4 distinct objectives: (i) to present the state of violence in the world, (ii) to present the mechanisms developed in the economic literature to explain the emergence of violence, (iii) to analyse the political opportunities for action in favour of peace and the return to peace, (iv) to develop an instrument to better target these interventions. This report firstly provides a description of the recent evolution of violence in its various forms in developing countries to clearly define the notion of conflict based on the analysis of the most complete and representative cross-sectional data of the current context. Secondly, the report provides a retrospective review of the key theoretical and empirical studies which identify the main factors of conflict. Thirdly, the study proposes various general policy approaches through which structural and non-structural factors of conflict can be addressed in the context of conflict prevention. Fourthly, for better targeting of these actions, the study proposes a new conflict risk index, identifying for each country and for each year the structural and non-structural risks of conflict outbreaks. This part proposes in particular a review of the econometric methods available, the justification of the model chosen, and a presentation of the various variables and their basis in the literature on conflicts. The analysis of these results, in a fifth and final part, makes it possible to guide the targeting of opportunities for preventive action, and to set up a dynamic approach that makes it possible to tackle the risk factors well before the outbreak of conflicts.

### **What does the analysis of the current context reveal?**

Major civil conflicts, i.e. those generating at least 1,000 deaths per year, declined by 72% between 1990 and 2003. Since then, the trend in the number of major conflicts has started to rise again, particularly with the resurgence of tensions in Afghanistan, Iraq, Nigeria, Pakistan, Somalia, Sudan, Syria, Ukraine and Yemen, bringing the number of major conflicts recorded in recent years back to its level in the mid-1990s. In 2018, 82% of the world's conflict-related deaths were the result of 6 major episodes in 4 countries: Yemen, Syria, Somalia, and Afghanistan.

However, these different episodes of major conflict hide a different reality. Minor internal conflicts, i.e. generating between 25 and 999 deaths during the year, and involving at least one national state actor, have increased rapidly, particularly during the period 2015-2018. 46 minor conflicts were recorded in 2018 in 32 countries. This rebound in the number of conflicts was partly caused by the expansion of Daesh, Al Qaeda, and affiliates around the world, particularly in Africa and more particularly in the Sahel, radically changing both the nature of conflicts and their dynamics.

The detailed conflict data reflect another recent phenomenon, the internationalisation of internal conflicts. A number of conflicts that were initially presented as internal conflicts have seen a foreign actor added to them. In 1991, 4% of conflicts were considered to be internationalised; this number increased tenfold to around 40% in 2015, and is particularly the case today with the conflicts in the Democratic Republic of Congo and Syria.

In addition to the internationalisation of conflicts, two other developments considerably complicate the peacemaking efforts of international actors. Firstly, organised crime, especially transnational crime, has become a major stress factor which exacerbates the fragility of States and makes conflicts more complex and difficult to resolve. Although organised crime has long existed, the proliferation of new transnational "criminal markets" and illicit flows exacerbates its corrosive impact on the legitimacy of states. The growth of illicit trade has lowered the barrier to entry for organised violence. Secondly, the growing presence of jihadist groups in conflict situations poses a significant challenge to peacemaking and peacekeeping. An important part of the changing nature of conflicts relates to the growing influence of jihadist groups in present-day conflicts. Since 2010, there has been a significant increase in the number of jihadist/salafist fighters, while at the same time terrorist actions involving Daesh, Al-Qaida, and their affiliates have resulted in many more deaths.

In the face of this upsurge and the emergence of new phenomena, understanding the root causes of conflicts, analysing them, and being able to anticipate their outbreak is an essential step towards better understanding the dynamics of civil wars in order to prevent violent conflicts in the future.

### **How does the economic literature explain the emergence of violence?**

While it is difficult to prioritise "rival" theories and to consider empirical findings as indicative of the empirical "causes" of conflict, this report argues that the synthesis of existing work provides a better understanding of the risk of the occurrence of violence, and has the potential to prevent it by facilitating the targeting of preventive intervention.

Models of armed conflict depart from the assumptions of standard economic theory in at least 3 ways: property rights are neither well defined nor automatically protected,

*contracts between parties cannot be enforced, leaders can be replaced by means other than elections. In this framework where the force of law is limited and agents operate in an environment of interactions marked by the impossibility of establishing optimal contracts in the Pareto sense, both predation and defence are alternatives to directly productive activities.*

*In a civil war, rebels defy the government, and rebellion can be considered to be a public good in the sense that if the rebellion is successful, the entire population will live under the new regime, regardless of whether or not the population have actively supported the rebellion. This violent confrontation requires the formation and maintenance of a rebel army. The initial motivation to rebel is at the centre of much debate, which has focused on the "greed versus grievance" argument. The need to respond to religious, ethnic, or class grievances is among the common motives for rebellion. At the same time, rebels may also be motivated by the opportunities for private gain that organised violence can offer. In this context, the roles of political, economic, climatic, and social vulnerabilities as factors that make conflict more likely are particularly important.*

*Previous statistical work has focused on validating these theoretical assumptions. Although the limitations of this research do not currently allow consensus about a unified model and a definitive list of factors which influence the outbreak of conflicts, the results are rich in terms of information. The factors highlighted can be grouped into 7 main groups: demography, geography, climate, natural resources, history of conflict and violence, economic characteristics, and political institutions. Each of these groups is composed of multiple variables with channels that sometimes have opposite or non-linear effects. This multiplicity of factors associated with the outbreak of violence makes it difficult to establish a prevention strategy at the national and international levels.*

### **What actions for development and stability in countries at high risk of conflict?**

*Prevention involves combining both security and development objectives. By directing resources to addressing the root causes of violence, societies can begin to invest in the long term in creating a virtuous cycle of peace and economic prosperity. Preventing violence is a key factor in development strategies today. The cost of inaction on prevention would be considerable. Reducing violence requires a combination of long-term, structuring actions, which combine security objectives with inclusive development objectives to achieve a better perception of the "peace dividend" by the population.*

*The most structuring actions in favour of development, however necessary, have little effect in the very short term. The institutional reforms necessary to restore the role of the State, and to ease tensions, must consist of restoring or strengthening the social contract by helping the authorities of countries caught in a 'conflict trap' to fulfil their basic sovereign functions: defence, security, justice, administration of public policies, legislation and regulatory framework, public management and taxation; to deliver*

throughout the territory the basic public services expected by the population, both in number and in sufficient quality; to ensure the establishment of constructive and democratic relations, both between the governing class and civil society for concerted decision-making within the different parts of society.

The hope for progress and confidence in the role of the State lies in the implementation of actions with a focus on education, mobility of people, and food safety. Mobility of people and food safety are also the foundation on which development actions can be based, particularly those that put people back to work immediately and offer them longer-term vocational training prospects. Thanks to the phasing of activities, small, visible projects can be carried out quickly within the framework of local investment programme which can be taken over by the public authorities in the medium term.

Employment, particularly youth employment, is a priority for development and stability in fragile and conflict situations. Employment plays a very important role in fragile environments, given its contribution to poverty reduction and productivity growth, but also its effect on social cohesion and on reducing the risk of violence.

The targeting of the beneficiary population is therefore crucial to the success of these programmes. Targeting action around value chains, sectors, or geographical regions can help to limit the complexity of implementation, deliver results and provide practical ways to guard against possible misuse of funds. Projects in sectors such as the agro-industry are likely to offer more opportunities for the working poor. The selection of value chains can also be guided by their inclusiveness, especially if there are gender or ethnic gaps. Within this framework, Community Driven Development (CDD) can become an appropriate approach in fragile or violence-affected situations to strengthen the social contract. This approach not only ensures that projects selected by the community generate broad benefits, but also promotes social cohesion through joint decision-making. If designed with a long-term perspective, CDD programmes can lay the foundations for participatory planning and boost local development through decentralised governance.

Successful decentralisation involves empowering local governments and providing them with sustainable financial resources. For economic and social development to reduce the temptation of criminality and violence, projects must start from the needs expressed by the population. Villages and small rural communities can be organised to define and manage these small community development programmes. The question of financing these communities is then linked to a reform of public finances towards greater transparency. This means helping the local authorities to assume their responsibilities in mobilising local fiscal resources, but also helping the central government to make this decentralisation a success.



### **What does conflict risk analysis teach us?**

*In this report we take an innovative and rigorous approach to estimate separately the long-term or structural risk and the short-term or non-structural risk of triggering new conflicts in developing countries. The idea behind our approach is that the outbreak of a new conflict is the result of the interaction of two types of factors: structural risk and non-structural risk. Structural risk is considered to be long-term risk, changing slowly over time, and capturing the structural characteristics and vulnerability of a country. Non-structural risk, which fluctuates more, is mainly related to short-term shocks or a change in the national, regional, or international context. The accumulation or intensification of structural risk influences and reinforces the impact of non-structural risk, which in turn contributes to the outbreak of conflict. Our approach makes it possible to synthesise empirical work from the economic literature by classifying the determinants of conflict into these two categories, making it easier to identify and understand the risks. For a given country, the results provide additional information on the time trend of structural risk, and non-structural risk. Such a tool can be used as a powerful warning system, while remaining simple to analyse and use, and it could enable preventive conflict reduction actions to be taken, particularly through the allocation of more targeted resources.*

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*Although both structural and non-structural factors contribute significantly to the outbreak of conflicts, the results show that structural factors have a greater effect than non-structural factors. Different regions of the world have very different levels of conflict risk. The countries with the highest structural risk of conflict are India, Pakistan, Nigeria, the Democratic Republic of the Congo, and Iraq. These countries are characterised by large population size, relatively high ethnic fragmentation, and by their location in highly turbulent geographical areas where terrorism and armed conflict are commonplace. For example, countries such as Pakistan and Iraq have been mired in conflicts that have lasted for several decades; several minor and major conflicts are still active in India and the Democratic Republic of Congo; Nigeria has for several years been facing the terrorist attacks perpetrated by Boko Haram, not to mention internal armed rebellions that maintain high tension in some areas of the country. After South Asia, the Middle East, and North Africa, Sub-Saharan Africa is the region with the highest structural risk. The region appears very heterogeneous in terms of the level of structural risk. Different areas with different levels of conflict can be distinguished, and countries in conflict do not experience violence everywhere on their territory. Sub-Saharan Africa experienced a sharp increase in its structural risk between 2003 and 2008, and again after 2014. The factors affecting structural risk in the region mainly revolve around per capita GDP, human capital, and ethnic fragmentation, but also the fact that the region is marked by the risk of conflict contagion.*

*Compared to the structural risk of conflict, the non-structural risk fluctuates more. The countries with the highest structural risk scores on average over the period 2013-2017*



are Central African Republic, Nigeria, Egypt, Bahrain, and Singapore, while Burundi, Uzbekistan, Zimbabwe, Bolivia, and Benin are among the countries with the lowest scores.

The countries with the highest structural risks are not necessarily those with the highest non-structural risks, and vice versa. Conflict is therefore not the result of structural risk alone, but of a combination of structural and cyclical elements. The analysis of these two types of risk provides a clear picture of the likelihood of the outbreak of violence in the world and thus helps to target action for enhanced prevention.

### **What lessons can be drawn from this analysis to understand the impact of the Covid-19 pandemic?**

The current context linked to Covid-19 threatens the stability of countries and risks generating additional internal tensions in fragile states. A spread of the virus in these states, already marked among other things by failing health structures, fragile social equilibria, and low economic resilience to shocks, would be difficult to contain and would have even more dramatic consequences than those observed elsewhere. While the virus cannot directly generate conflict, it could exacerbate the factors known to be at the root of violence and conflict. While lockdown seems to be the ideal strategy against the spread of the virus, its implementation requires considerable resources on the part of the public authorities. However, public resources are insufficient or even non-existent in fragile states, and the forced lockdown of populations could lead to protests, riots, and violent conflict, particularly when the army is deployed to enforce the lockdown guidelines. Because of endemic poverty and low levels of savings, the populations of these countries live from day to day. They are forced to travel to markets and sometimes in the streets in order to earn a daily income, thus potentially contributing to the spread of the virus.

High population density, malnutrition, poor sanitary conditions, and low vaccination rates in fragile states, and especially in refugee camps, create an explosive environment conducive to the spread of the virus but also to conflict. Refugee camps are often established at borders; porous borders facilitate not only the spread of viruses but also the circulation of weapons, and borders increase interactions between civilians and rebel fighters, who are known for their high-risk behaviour. This situation further erodes the already fragile social contract between populations and their rulers, thereby promoting political instability and recruitment by different rebel groups.

The destabilising impact of the health crisis is likely to be reinforced by the likely economic impact of the slowdown of world economic growth. At a time when global value chains are at a standstill, severely handicapping industrial companies, massive layoffs and the possible collapse of migrant remittances would increase the decay of fragile states. Deteriorating financial capacities of States, especially those with relatively

*high oil revenues, may lead to reduced investment in social, education, and public health programmes, heighten social tensions, and risk further undermining of the social contract.*

*While some believe that the pandemic will help to calm the fighting spirit in theatres of conflict, the opportunity is too good for rebel forces and jihadist groups to act without attracting the attention of the international community. For rebel groups, it is an opportunity to strike at a time when the central state is weakened and challenged by the difficult management of the health crisis and its corollaries in terms of economic repercussions. At this rate, if the crisis were to take a dramatic turn, the cards in the most unstable regions could be reshuffled, and the many efforts made in recent years by the international community to contain outbreaks of violence could quickly be undermined.*

# Introduction

In the final lines of *War and Peace*, Tolstoy evokes the relationship between individuals' freedom of choice and their "dependence on the outside world, time and causality". This dependence does not imply any determinism. The 'laws' that govern it appear to be uncertain when it comes to conflict. Nevertheless, conflict prevention involves knowing the factors that increase the risk of conflict.

Recent years have seen an increase in the number and intensity of armed conflicts. This has been accompanied by two new phenomena, the increase in the number and intensity of terrorist acts and the growing role of organised crime in the dynamics of conflicts. At the same time, the fragility of some States has increased, particularly in Africa. In this context, tools for measuring and assessing state fragility are increasingly in demand, particularly in order to target preventive action. Despite the complexity of the concept of fragility, most experts associate it with communities caught in a trap of violence which leads to state ineffectiveness and fosters the breakdown of the social contract with citizens. The prevention of armed conflict and violence is therefore at the heart of the debate on political action to combat fragility, and requires drawing on the wealth of economic and statistical work about the determinants of conflict, but also on the effectiveness of preventive policies conducted in fragile states.

Empirical work on conflicts and their determinants shows that a plurality of factors, economic, social, demographic, climatic, geographical, or related to the region, can contribute to the outbreak of new conflicts. For the most part, this work, both micro- and macro-economic, has not been directly anchored in theory, and the multitude of econometric results tends to mask the impossibility of reaching a real consensus, in particular by not making it possible to prioritise "rival" theoretical explanations. This discrepancy between theory and application also implies that it remains very difficult to distinguish correlations from causality. Some variables may not be causes but simply associated factors (e.g. infant mortality, life expectancy). Other variables (e.g. income, GDP growth) are endogenous to the risk of civil war. Thus, it is probably preferable to speak of factors correlated with the onset of conflict rather than factors causing war to describe the results of this empirical literature.

In this context, to assess and estimate the risk of conflict is not to predict the outbreak of conflict, but to assess for each country the likelihood of conflict with a view to reducing it, identifying the factors associated with it, and the policies to be implemented. This requires drawing on the large body of economic work on conflicts and their determinants. Consequently, understanding the risk of conflict

requires the mobilisation of a large amount of data and its processing using appropriate statistical methods to understand the processes that trigger conflicts or violent events. Similarly, the heterogeneity of situations has led to a multitude of different approaches in terms of prevention policy. In this context, the targeting of key sectors and the sequencing of reforms appear to be factors which determine the quality of the political response to security crises in developing countries. However, the indicators of fragility or conflict available today remain descriptive or are based on variables that have an uncertain relationship with the risk of conflict. This report provides an empirical framework which aims to help policy makers reflect on the different trade-offs involved in prevention. Underlying it is the idea that true prevention is difficult without a definition and assessment of conflict risk. Research work has often avoided this issue by focusing on ongoing conflicts or post-conflict scenarios where the risk of conflict is inherent in the experience of the recent past or present. However, the ambition to maintain and consolidate sustainable peace requires the identification of high-risk countries in order to focus efforts on them. This report therefore draws on empirical as well as theoretical literature on the determinants of conflict as well as on recent advances in the field of civil war prediction. In this report prevention will consist of defining actions to be taken in high-risk conflict environments. Of course, a policy based on risk assessment considers certain situations to be high risk without these situations turning into conflict situations.

However, prevention is not about preventing a possible year of civil war, it is about taking action to alter a future trajectory of repeated episodes of conflict that may continue. An advantage of risk assessment and prevention is that the political response would take place in a peaceful environment, or at least in a setting where violence has not yet reached a critical level that could limit the scope for action. Measures such as diplomatic efforts, mediation, and capacity-building through a wide range of reforms can therefore be used to address hotbeds of tension in societies that have not yet experienced large-scale armed violence.

This report proposes an index of the risk of internal conflict, based on the analysis and processing of data correlated with the emergence of conflicts. The development of this index is characterised by the use of a large number of comparable variables from reliable sources, and by the treatment of these variables using appropriate econometric techniques. In addition, the index systematically distinguishes between two types of risk related to conflict triggers, structural and non-structural. Structural risk is likely to keep countries in a long-term conflict dynamic; it is exogenous to the current economic and political situation. Non-structural risk is linked to the current economic situation and feeds structural risk to the point of facilitating the outbreak of conflict. This distinction makes it possible to adapt the index to its intended use. Only a composite (structural and non-structural) risk index makes it possible to capture the complexity of the process underlying the

emergence of conflicts. However, this complexity makes it impossible to resort to a simple addition or juxtaposition of variables, which would make the resulting risk measurement illegible and offer a naïve view of interactions and the prioritisation of effects. The index developed for this report offers a clear synthesis of the literature on conflict risk by making it possible to distinguish the impact of long-term factors from short-term factors on the risk of conflict.

The first part of this report presents the recent evolution of violence in its various forms in developing countries, while emphasising the new trends and dynamics that have emerged in recent years. The second part presents the conclusions in both theoretical and empirical terms that can be drawn from the economic literature on the risk of internal conflict. The third part proposes a panorama of possible preventive actions that can contribute to reducing the risk of conflict in fragile countries. The fourth part is devoted to the conflict risk modelling developed by FERDI and describes the variables used and their basis. The fifth part of the report presents the results of the conflict risk modelling, analyses the risks at the regional level, and discusses a case study from the Sahel region.



# Part I: Recent Developments in Conflict and Violence in the World

The significant drop in the number of conflicts between the early 1990s and the mid-2000s<sup>1</sup>, which was widely reported in the media and in various international forums, had given rise to optimism about the international community's ability to prevent the emergence of new conflicts, and to promote a return to lasting peace.

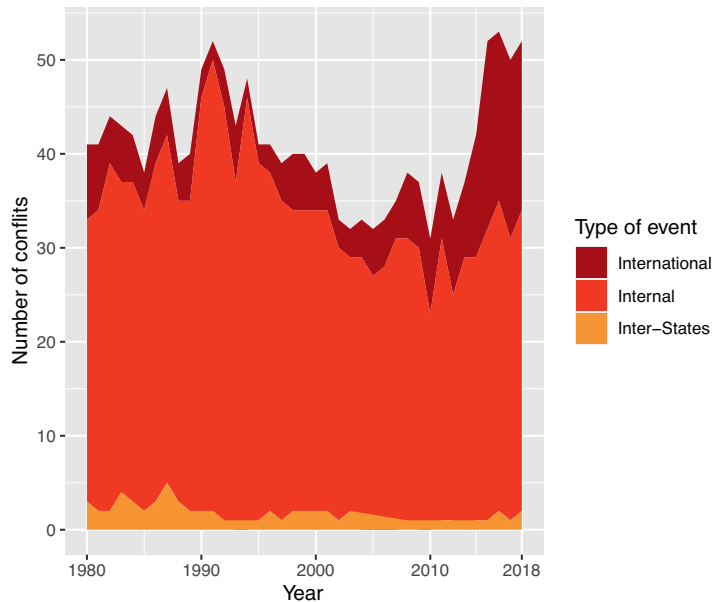
The number of major civil conflicts, i.e. those generating at least 1,000 deaths per year, declined by 72% between 1990 and 2003. Unfortunately, this improvement was short-lived, as the number of major conflicts began to rise again. Thus, with the resurgence of tensions in Afghanistan, Iraq, Nigeria, Pakistan, Somalia, Sudan, Syria, Ukraine, and Yemen, in recent years the number of major conflicts has returned to its level of the mid-1990s. In 2018, 82% of the world's conflict-related deaths were the result of 6 major episodes in 4 countries: Yemen, Syria, Somalia, and Afghanistan.

However, these different episodes of conflict hide different realities. Minor internal conflicts (which generate between 25 and 999 deaths during the year and involve at least one national state actor) have increased, particularly during the period 2015-2018. 46 minor conflicts were recorded in 2018 in 32 countries. This rebound in the number of conflicts was partly caused by the expansion of Daesh, Al Qaeda and their affiliates around the world, particularly in Africa and more particularly in the Sahel, radically changing both the nature of conflicts and their dynamics.

Detailed conflict data compiled from the Peace Research Institute of Oslo (PRIO) database reflect another recent phenomenon, that of the internationalisation of internal conflicts. Indeed, a number of conflicts that were initially presented as internal conflicts have now been joined by a foreign actor. An internal conflict is considered internationalised if one or more third party governments are directly involved in the fighting in support of one of the belligerents.

1. The decrease in conflicts in the decade 2000 was mainly due to the end of the Cold War and the strengthening of conflict-reduction mechanisms such as international peacekeeping and security missions.

**Figure 1:** Number of conflicts in the world from 1980 to 2018

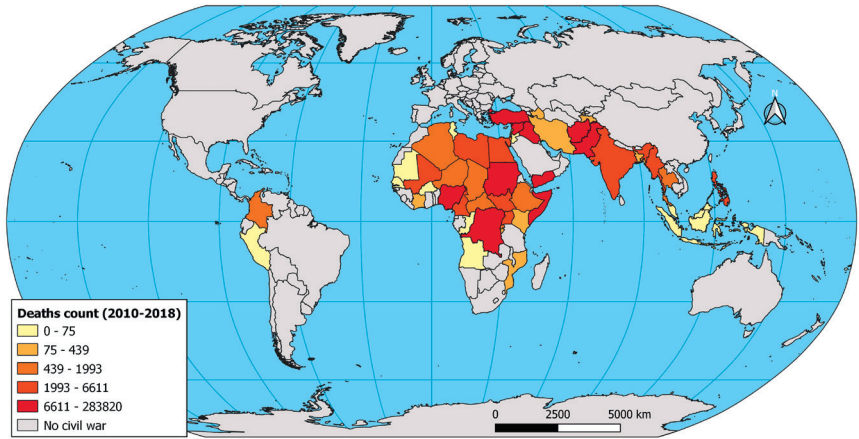


Source: Authors' calculations based on the database from the Peace Research Institute Oslo (PRIO).

In 1991, 4% of the conflicts were considered internationalised according to the PRIO database, this number was multiplied by 10 to nearly 40% in 2015. The conflict in the Democratic Republic of Congo is an example. The mining and military interests of neighbouring countries, such as Rwanda and Uganda, contributed to the spread of the Congolese conflict for many years, with both countries supporting different parties over time in accordance with their own objectives. These external actors act almost as parties who are separate to the conflict, creating additional challenges to peace negotiations. The Syrian conflict is another example. In this case, the military involvement of several foreign actors is complicating the prospects for a negotiated solution to the conflict. Depending on their mandates, peacekeeping operations can also count as internationalised, but do not automatically transform an internal conflict into an internationalised conflict. This is the case for example in Mali, where the intervention of a coalition of 59 countries transformed the Malian conflict into an internationalised conflict according to the PRIO coding.

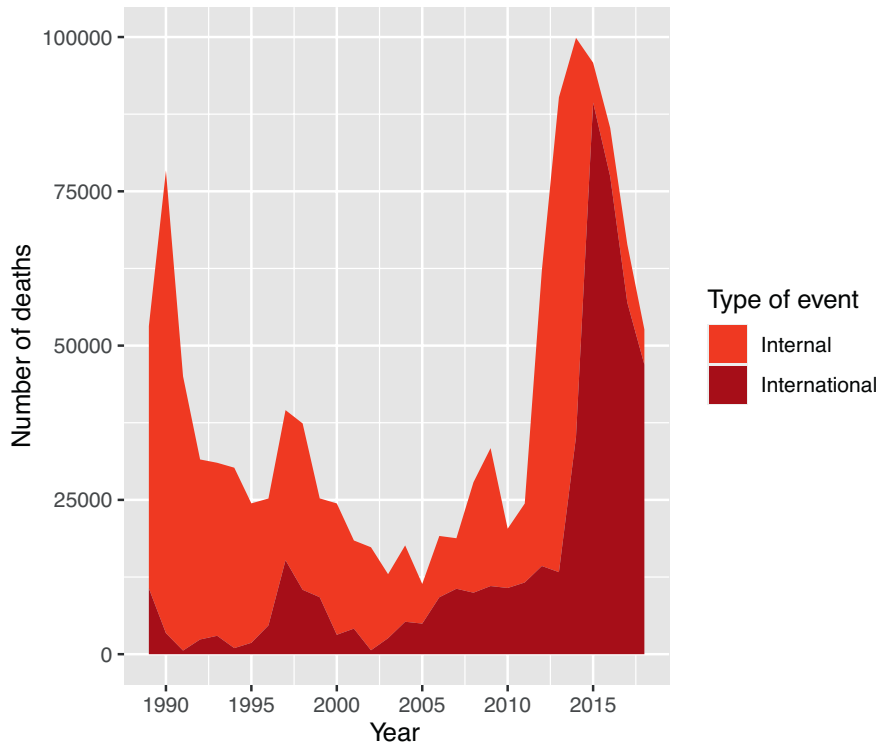


**Figure 2:** Cumulative number of deaths due to conflicts (internal and international) over the period 2010-2018



Source: Source: Authors' calculations based on the database from the Peace Research Institute Oslo (PRIO).

**Figure 3:** Changes in the number of deaths due to conflicts (1989-2018)

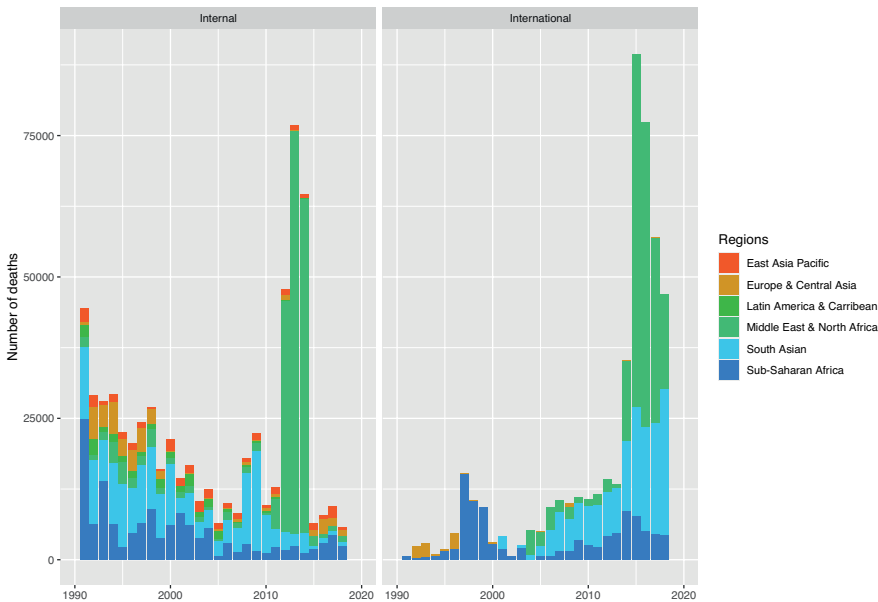


Source: Source: Authors' calculations based on the database from the Peace Research Institute Oslo (PRIO).

Looking only at the number of deaths in internal conflicts, Figure 4 shows that the increase in violence after 2012 is largely due to localised conflicts in the Middle East and North Africa region, particularly the Syrian, Iraqi, and Libyan conflicts. It is also interesting to note a downward trend in the number of deaths in internal conflicts in Sub-Saharan Africa compared to the 1990s.

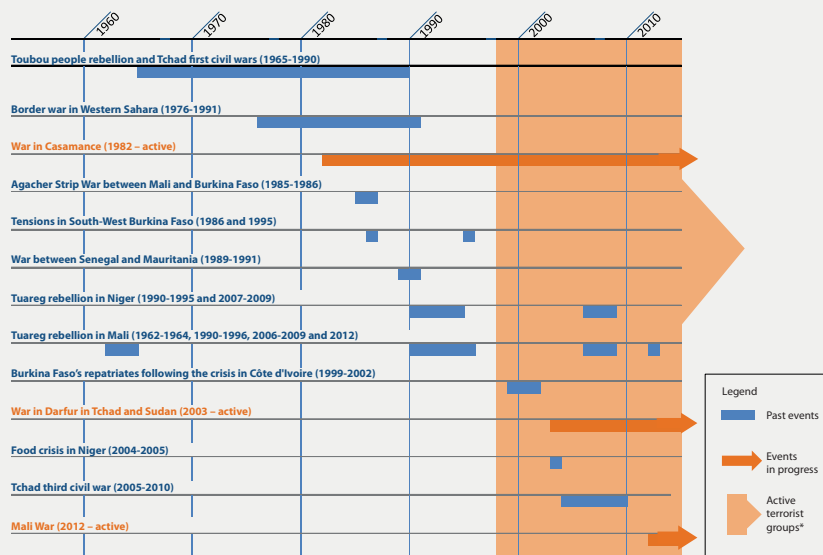
Thus, if we exclude internationalised conflicts and major conflicts (civil wars), there were 46 conflicts in 2018, for a total of 9,360 deaths. However, these figures do not give any indication of the "indirect deaths" due to conflicts caused by forced displacement of people and loss of access to basic services such as clean water and medical care. These indirect deaths are likely to far exceed the number of combat deaths reported on the database.

**Figure 4:** Number of conflict-related deaths by region



Source: Authors' calculations based on the database from the Peace Research Institute Oslo (PRIO).

## Box 1: Time chart of security events in the Sahel from 1960 to 2015



\*AQIM (1998 - active), MOJWA (2011 - active), Ansar Dine (2012 - active), etc.

Burkina Faso, Chad, Mauritania, Niger, and Mali, because of their geographical position and the similarity of the challenges they face, have grouped together in an institutional framework, the "G5 Sahel". In this part of Africa, as in the whole of West Africa, the nature of violence has changed over the last decade. Other forms of violence have taken over from, or have been added to, civil wars and inter-state conflicts. Electoral violence, conflicts, terrorism, cross-border trafficking, religious extremism, community violence, and criminality are all scourges that punctuate current events in the Sahelian region. The security situation in the Sahel momentarily improved after the catastrophic situation in January 2013, which justified Operation Serval, and after the 20 June 2015 agreement between the Government of Mali and the armed movements in northern Mali, but then deteriorated again, particularly in Burkina Faso. The governments of the various States in the region have become aware that the fight against terrorism is a regional issue. Faced with increasingly well-organised terrorist organisations, the G5 Sahel countries have therefore decided to act in concert, with the support of the international community.

Source: Guillaumont Jeanneney S. avec C. Angely, A. Brachet, P. Collier, M. Garenne, P. Guillaumont, B. Joubert, C. Laville, J. de Melo, S. Michailof, B. Miribel, O. Ray et T. Zongo, *Linking security and development. A plea for the Sahel*, Ferdi, 2016.

Nevertheless, there are fewer direct victims in major conflicts, which are themselves becoming fewer. On the other hand, the number of low-intensity conflicts, which can potentially spiral out of control, has been increasing sharply over the past decade. This situation clearly highlights the role of enhanced conflict prevention and management, and indicates a change in the nature of the conflict dynamics observed today.

Since the beginning of the millennium, the international community has been struggling to bring stability to a number of countries, especially those that are mired in protracted crises. Compared to the 1990s, United Nations peacekeeping operations now tend to be deployed for much longer periods of time with uncertain results. These various elements seem to indicate that the nature of conflicts has changed over the past decade, becoming less soluble and less conducive to political settlements.

In addition to the phenomenon of the internationalisation of conflicts, two new developments have considerably complicated the peacemaking efforts of international actors:

► **1. Organised crime, especially transnational crime, has become a major stress factor which exacerbates state fragility and makes conflicts more complex and difficult to resolve**

Although organised crime has long existed, its corrosive impact on state legitimacy is exacerbated by the proliferation of new transnational "criminal markets" and illicit flows. The growth of illicit markets has lowered barriers to entry for organised violence. The means for organising violence have become more easily accessible through transnational arms supply lines and illicit sources of financing, and advances in communication and information technology. Such a context facilitates the recruitment of combatants and gives violent actors easier access to the weapons and the financial resources essential to the survival of their activities.

As we will see in the second part of this paper, rent-seeking by rebel groups is one of the fundamental factors that can influence conflict dynamics. Criminality plays a role both in the onset of conflicts and the duration of conflicts. Rent-seeking, facilitated by criminality, can reduce the incentives of rebel groups to enter into ceasefires or peace agreements. Studies show that civil wars in which rebel groups have access to smuggled funds tend to last longer than others. In addition to changing the political economy of conflict, organised crime has a particularly detrimental effect on governance because it corrupts state and security institutions,

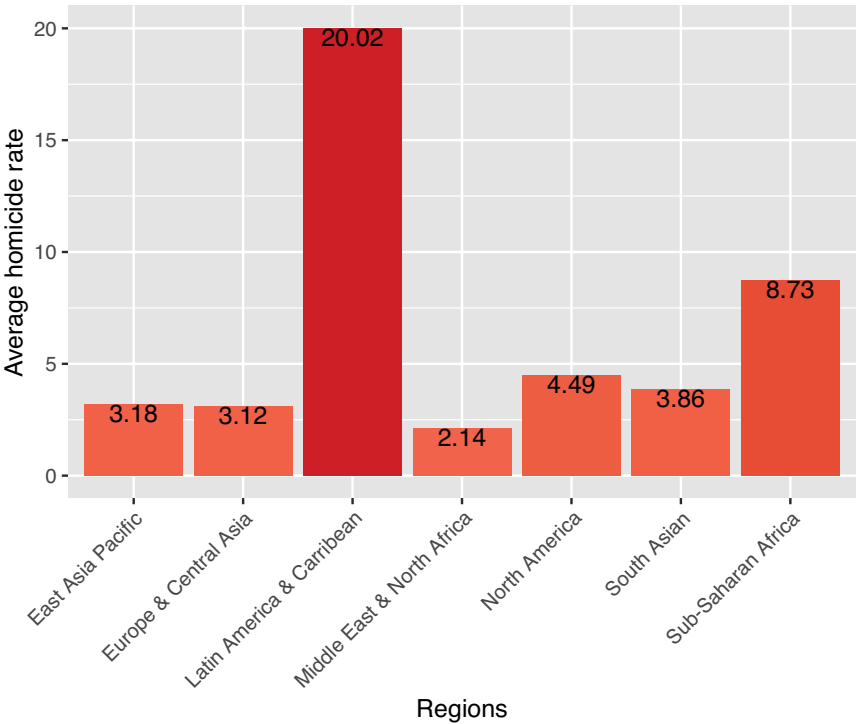
and allows non-state actors to emerge as rivals to the state in the provision of protection services.

Of particular concern is the emergence of West Africa and the Sahel as a major transit region for cocaine on route to Europe and other parts of Africa. This increases fears of the emergence of narco-states in the region, and contributes to the resurgence of coups d'état. Similar dynamics are at play in Central Asia.

Crime is a multifaceted phenomenon (homicide, theft, aggression, etc) and should therefore be measured using several variables. However, the data coverage for comparing countries over time is still limited. The most reliable data are available only for homicides, which however constitute the major facet of crime.

Figure 5 highlights the disparity in homicide rates between regions of the world.

**Figure 5:** Average homicide rate by region over the period 2000-2017 (per 100,000 population):



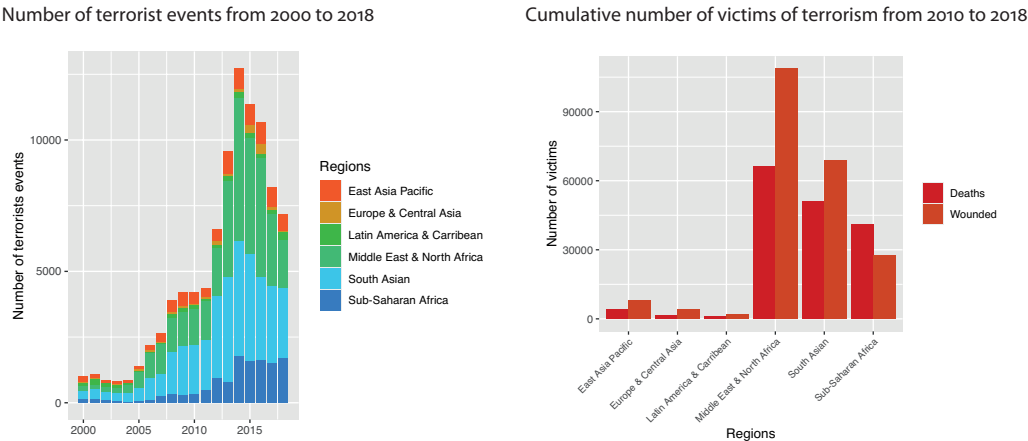
Source: Authors' calculations based on data from the United Nations Office on Drugs and Crime (UNODC).

Latin America and the Caribbean, with an average rate of 20 homicides per 100,000, have the highest homicide rates in the world, followed by Sub-Saharan Africa (8.7) and North America (4.5). However, these figures are heterogeneous within the different regions, higher in some countries than others, and with some particularly high homicide rates. Central American countries are particularly violent, as shown by the rates in Honduras (68) and El Salvador (66). In Africa, the average homicide rate is highest in 3 countries with high crime rates - Lesotho (35), South Africa (32) and the Central African Republic (20).

► **2. The increasing presence of jihadist groups in modern conflict situations is a major challenge to peacemaking and peacekeeping**

An important part of the changing nature of conflicts concerns the growing influence of jihadist groups in modern conflicts. Since 2010, the number of jihadist/salafist fighters has significantly increased, and terrorist actions involving Daesh, Al Qaeda and their affiliates have resulted in many more deaths.

**Figure 6:** Terrorism in the world on the rise



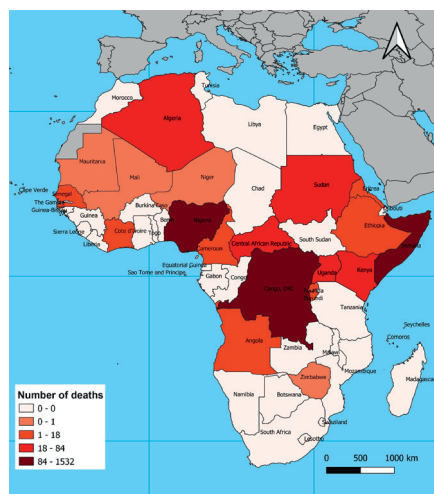
Source: Authors' calculations from the Global Terrorism Database (GTD).

There was a first phase of increase in the number of terrorist events from 2005, and a second phase of increase from 2012. The Middle East and North Africa, South Asia, and Sub-Saharan Africa are the regions most affected by the increase in the number of events. This increase is clearly seen in Sub-Saharan Africa from 2014 onwards. The 3 regions mentioned are also the regions with the highest number of casualties, i.e. deaths plus injuries. The casualty toll has been rising in these regions since 2010 and is extremely high.

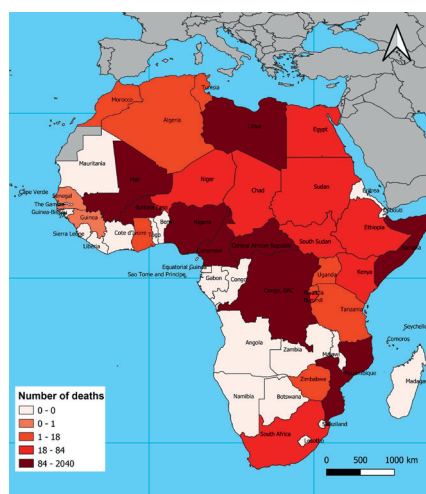
The countries of the Sahel saw a significant increase between 2010 and 2018 in the number of deaths caused by terrorist acts, with Mali and Burkina Faso being the most affected countries in 2018. The various hotbeds of violence, stemming from particular local and historical contexts, have gradually become interconnected, either through trafficking (arms, drugs, smuggled goods, or migrants), or through shared interests in the destabilisation of a region. Local conflicts (e.g. between families over land use) interact with national conflicts (e.g. Tuareg claims), which acquire a regional dimension through contagion (e.g. the flow of fighters between Libya and North Mali), or even global by the mobilisation of fighters through a discourse with a religious veneer (e.g. Al Qaeda and Daesh affiliates who provide powerful relays for media coverage).

**Figure 7:** Terrorism in Africa

Number of deaths caused by terrorism in 2010



Number of deaths caused by terrorism in 2018



Source: Authors' calculations based on Global Terrorism Database (GTD).

The fact that the majority of such violence occurs in conflict situations suggests that the rise of jihadist groups in recent years is more a product of instability than its main driver. This means that counter-terrorism efforts are likely to have to lie in conflict prevention, peacebuilding or peacekeeping in countries where terrorist groups take advantage of widespread instability.

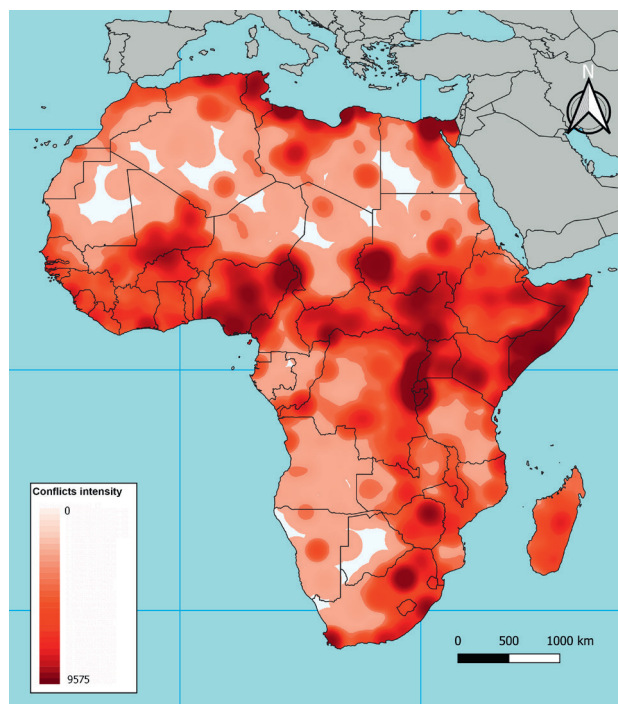
The trend towards an increase in the number of deaths due to terrorism is also a reality for the countries of Central and East Africa, leading to the necessity of the adoption of a holistic approach to the phenomenon of the contagion of terrorism and the problem of cross-border violence in Africa.

"Conflict systems" develop on both sides of State borders, hampering licit trade and the actions of States, which are being replaced by smuggling and the action of traffickers or armed groups. Large areas of territories thus fall into a "conflict trap" whose knock-on effects make the outcome all the more complex and uncertain because these territories, already caught in a "poverty trap", suffer from a combination of deficiencies: weak human capital, strong demographic pressure, strong ecological pressure, and extremely weak public institutions.

Figure 8 illustrates on a "heat map" the location of violent events in Africa based on the Armed Conflict Location and Event Data Project (ACLED)<sup>2</sup>. This figure shows the transnational and regional nature of the violence, with pockets of violence stretching across the borders of several countries. Examples include the border between Mali and Burkina Faso; the borders between Nigeria, Niger, Chad, and Cameroon; the borders between the Democratic Republic of Congo, Uganda, Rwanda, Burundi, and Tanzania. Furthermore, a comparison of the number of violent events between 2010 and 2018 shows that the number of violent events has increased sharply and that conflicts in the areas most affected in 2010 have spread to neighbouring localities.

2. Violent events, as defined by ACLED, are battles (armed combat, battles to regain territory by the government, struggles for control of territory by non-state actors), explosions and violence from a distance (chemical weapons, attacks by drones, bombs, missiles, artillery, mines, grenades), violence against civilians (sexual violence, attacks, kidnappings), and riots (violent demonstrations, violent revolts). The heat map represents each geo-localised event as a point scattered within a radius of 200km with a decreasing value from 1 (at the point) to 0 (at the limit of the radius). The map is the result of the addition of all the conflict points. In the darkest areas, the total number of conflicts within a radius of 200km corresponds to approximately 9,575 conflicts at that location for the period 2010-2018.

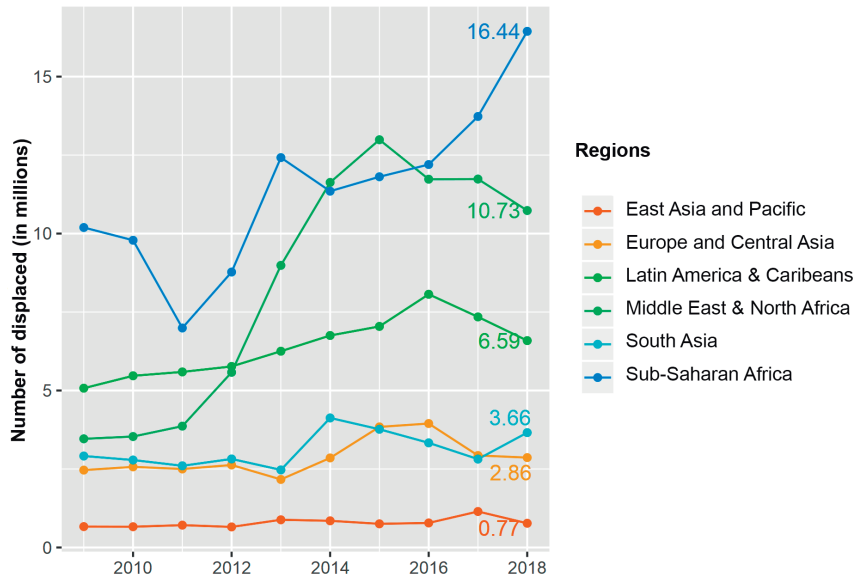


**Figure 8:** Map of violent events (cumulative 2010 to 2018)

Source: Authors' calculations based on ACLED.

In the short term, violence has a significant impact on the social and economic capital of the countries concerned, the effect of which is felt in the long term. The immediate consequences of violence are death, injury, and displacement. One of the many effects of conflict is the increase in the number of displaced people fleeing areas where violence becomes unsustainable. This has a significant impact on the stability of countries as it is a vector of additional internal tensions leading to new conflicts, particularly in neighbouring countries due to emigration. For the period 2010-2018, Sub-Saharan Africa has the highest number of Internally Displaced People (IDP) due to armed conflict, with the exception of the years 2014 and 2015 which were dominated by the MENA region. The MENA region, after having experienced a significant and continuous increase between 2010 and 2015, recorded a decline in the number of its displaced people from 2016 onwards. The MENA situation seems to be the opposite of what happened in Sub-Saharan Africa, which saw the number of its conflict-related IDPs rise steadily from 2014, with higher number from 2016 onwards.

**Figure 9:** Number of IDPs due to conflicts by region



Source: Authors' calculations based on data from the Internal Displacement Monitoring Centre (IDMC).

**32** In the medium term, violence affects people's health and survival, as well as their productive capacity. In the long term, it becomes a structural handicap for the development of countries, hindering any initiatives for social and economic progress, as well as the general well-being of populations (in particular negatively affecting the good psychological health of individuals). Preventing such violence requires a better understanding of the structural characteristics and the deep-rooted mechanisms that can lead to war.

## Part II: How can economics analyse the causes of internal conflicts?

Understanding the root causes of conflicts, analysing them, and being able to anticipate their outbreak is an essential step to better understand the dynamics of civil wars in order to prevent violent conflicts in the future. What are the causes of civil wars? What are the factors that can lead individuals, often the youngest, to take up arms and risk their lives in an insurgency? What are the reasons why violent and costly conflicts can occur when the vast majority of people are in favour of peaceful conflict resolution? Social scientists, including economists, have studied these major issues for development using both economic theory and econometric analysis.

This section provides a synthesis of existing research efforts, highlighting the main trends and consensus from this literature, and distinguishes between theoretical approaches to conflict and results from empirical work. For the most part, empirical work at both the micro and macro levels is not directly anchored in theory, and the multitude of econometric results tends to negate the possibility of reaching a real consensus on the issues raised above by not allowing, in particular, the prioritisation of "rival" theoretical explanations. Although there is still a gap between theory and empirical results for studies of the causes of the outbreak of civil wars, there are now a large number of recent empirical studies examining the behaviour of individuals, social groups, and nations as a whole. These cross-cutting studies on the causes of conflict constitute the bulk of the work. The discrepancy between theory and application implies that even when econometric regressions highlight certain factors linked to the outbreak of civil war, it is still very difficult to distinguish between correlation and causality. Many variables, such as income and growth, are endogenous to the risk of civil war. These problems of endogeneity are rarely addressed directly in studies, which implies that it is probably preferable to speak of factors correlated with the onset of conflict rather than the causes of war when describing the results of this empirical literature.

While it is impossible to prioritise "rival" theories and to consider empirical findings as indicative of the empirical "causes" of war, this report argues that the synthesis of existing work can provide a better understanding of the risk of violence occurring, and so has the potential to prevent it by facilitating the targeting of preventive intervention.

What theoretical assumptions have been developed to explain the outbreak of civil war? This section provides a brief overview of the main theoretical approaches<sup>3</sup>.

3. Excellent overviews of this literature provided by Blattman & Miguel (2010), Collier & Hoeffler (2007), Garfinkel et al (2012), Couttenier & Soubeyran (2015), Laville (2018), Rohner (2018) and Vergne & Laville (2018) have been used for this section.

## ► 1. Traditional theoretical determinants of the outbreak of internal conflicts: a review of the literature

Models of armed conflict deviate from the assumptions of standard economic theory in at least 3 ways: property rights are neither well-defined nor automatically protected, contracts between the parties cannot be enforced, leaders can be replaced by means other than elections. In this framework where the force of law is limited, and agents operate in an environment of interactions marked by the impossibility of establishing optimal contracts in the Pareto sense, both predation and defence are alternatives to directly productive activities.

For these models rivalry theory is the most commonly used analytical framework, allowing the notion of conflict to be understood within an economic analysis framework. It considers two rival parties, a rebel group and a government, and analyses their allocation of resources between productive activities and appropriation activities. It sheds light on the choices made by individuals. Production is modelled in a standard way, and appropriation depends on the "success function of confrontation". This function describes the relative military capability of the two groups and captures the probability of successful appropriation by both sides.

According to the basic assumptions of these models, the emergence and outcome of a conflict depend on the potential gain and its success function. In a conflict between a rebel group and state forces, actors will, or will not, resort to violence depending on 3 key factors:

- the military capacity of the state (which depends on state revenues),
- the value of the gain from state overthrow and capture (which depends on state revenues),
- the trade-off for civilian agents between productive activities and conflict activities (which depends on agents' incomes).

The sense of the relationship between agents' incomes and the risk of conflict is technically negative: the poorer the individuals the greater the incentive for them to join armed groups. However, the link between state income and the risk of conflict is ambiguous. On the one hand, an improvement in state income allows the government to spend more on security, leading to a decrease in the number of conflicts. On the other hand, a richer state is also more attractive and implies that more armed groups will be created with the aim of conquering power by force. Conversely, in situations where incomes are low, security spending is low, which facilitates conflict, but the gains in terms of appropriation by rebel groups are also lower, which ultimately makes fighting less likely.

One of the drawbacks of models derived from rivalry theory is that insurgency is never completely deterred; improving military capacity and fighting always take place in equilibrium. There is usually no explicit decision to fight: improving military capacity and fighting are one and the same thing. This prediction of perpetual conflict is not satisfactory. Although political competition for control of power and resources is present everywhere, violent conflict is not. Theoretical research has therefore focused on the determinants of compromise rather than conflict. If opposing groups are rational, they should prefer a negotiated solution to the destructive conflict, since the creation and arming of military organisations is expensive and conflicts themselves are destructive and risky. The literature proposes a number of mechanisms that can explain the failure of negotiations about the sharing of resources.

This literature offers two major mechanisms compatible with rationalist explanations of war.

First, a war can occur when one side overestimates its ability to win or underestimates the strength of its opponent. However, information asymmetry is generally not a sufficient condition for the outbreak of a conflict. If both sides have an incentive to reach an agreement, they should also have an incentive to gather sufficient information and provide a realistic picture of their forces. In order for asymmetry issues to provoke war between rational actors, the accurate disclosure of information must also be hampered. The incitation to distort one's strength is the most often theorised mechanism, for instance when a state exaggerates its strength and engages in war in order to deter future insurgents. Similarly, if agents are overly optimistic, then there is no longer a peaceful solution that both groups recognise as optimal in the Pareto sense. This is analogous to the winner's curse; when the fighting begins, the actors find that they have overestimated their respective strengths and that the cost of the war has been underestimated. Thus, asymmetric information models are better suited to explain short-lived civil wars.

A second reason for the failure of negotiations relates to the fulfilment of commitments on the part of the different parties. Commitment problems are often due to major changes in the power structure. Parties are more likely to renege on an agreement when their relative power has changed. For example, when a government becomes stronger as a result of a conflict, it is likely to renege on the settlement negotiated during the ceasefire, when it did not have the same bargaining power. This effect limits the credibility of the commitments in terms of transfer of power made during the initial negotiation process. So, if the outbreak of a new conflict weakens or eliminates the rebel group in a lasting way, the state will benefit by being able to reduce its military spending necessary to deter future conflicts. Thus, the state has incentives to conduct bloody but short-lived conflicts if peace agreements are not credible. The problem of engagement directly suggests

that civil war is more likely to occur when there are limits to conflict resolution and contract enforcement. Since formal legal and state institutions are likely to help enforce commitments over the long term, societies with weak institutions and inadequate separation of powers are more likely to face violent civil conflict.

Rational models of rivalry and negotiation which seek to explain the mechanisms associated with the outbreak of civil wars are based on the assumption that different groups behave homogeneously, a questionable assumption given the problems associated with collective action. To understand the causes of war, it is also necessary to understand how groups form and persuade their members to risk their lives.

In a civil war, rebels defy the government and rebellion can be seen as a public good in the sense that if the rebellion is successful, the entire population will live under the new regime, whether or not the population have actively supported the rebellion. This violent confrontation requires the formation and maintenance of a rebel army. Rebellions usually form around a small group of rebels and later grow into large, autonomous organisations which need to secure a source of funding, and a common ideological base to maintain the cohesion of the group.

The initial motivation to rebel is at the centre of many debates which have focused on the "greed versus grievance" issue. The need to respond to religious, ethnic, or class grievances is among the common grounds for rebellion. Economic inequality also provides a possible basis for conflict, because seizure of the state will bring material and pecuniary gains to the victor. At the same time, rebels may also be motivated by the opportunities for private gain that organised violence can offer. In this framework, the role of political vulnerabilities (with a financially, institutionally, and politically 'weak' central government) as elements that make conflict more likely is particularly important. The analysis of the occurrence of disorder consists of studying its economic feasibility, i.e. determining the factors that facilitate its financing (e.g. the presence of easily mobilised raw materials, a diaspora capable of financing a rebellion, etc), and organisation or recruitment (e.g. the opportunity cost of entering 'conflict', the proportion of young men in the total population, the absence of the state, etc). Individuals would be encouraged to join armed groups because they are offered financial incentives (salaries, opportunities for looting, physical protection, etc). Thus, the theories explaining the emergence of rebellions must consider common interests as well as private gain as possible motivations. The table below summarises the different mechanisms of the grievance models.

**Table 1:** Main hypothesis of the grievance models leading to rebellion.

<i>Grievances</i>	<i>Hypothesis</i>
<b>Religious or ethnic tensions</b>	<p>Resentment arising from religious or ethnic hatred arises in highly polarised societies. Ethnic and religious diversity within rebel organisations reduces their ability to function. They will therefore tend to recruit from within the same ethnic or religious group. A highly diverse society makes the opportunity for such recruitment rarer, thus reducing the risk of conflict outbreaks.</p> <p>Ethnic or religious diversity is associated with more civil conflicts. The effect of ethnic diversity on the risk of conflict increases when per capita income levels are high.</p> <p>In countries where there is an ethnic minority representing at least 5% of the population, greater ethnic diversity is associated with a greater risk of ethnic civil conflict.</p> <p>Countries with a significant ethnic majority and minority are more likely to experience conflict.</p>
<b>Political repression</b>	<p>Political repression is more common in countries with weak political rights (autocracies) and increases resentment.</p> <p>Measures of democracy and civil liberty should be associated with lower risks of conflict outbreaks.</p>
<b>Political exclusion</b>	<p>Political allegiance based on ethnicity increases the risk of political exclusion of ethnic minority groups by the majority, even in democracies.</p> <p>Policies that discriminate in favour of one ethnicity or religion increase the risk of conflict.</p>
<b>Economic or geographical inequalities</b>	<p>Economic or geographical inequalities increase the risk of rebellion by the poor to obtain better redistribution of income, and increase the risk of secessionist rebellion by the richest regions in order to avoid this redistribution.</p>

Sources: Laville (2018) from Fearon and Laitin (2003) and Collier and Hoeffler (2004).

Since motivation is generally not directly observed, it is difficult to determine whether the grievances set out above are at the root of the rebellion, or whether private gain and greed play an important role in it, particularly when natural resources are abundant and the economy is heavily dependent on their exploitation. Rebellions may also emerge as a response to different grievances, but may turn into a form of rent-seeking during war. These economic models assume that potential recruits make a rational decision to join, based on a comparison of costs and benefits. However, many rebel armies use coercion in their recruitment process. Threats and sanctions can also be used as incentives for rebellion.

Finally, the discussion on the causes of conflict focuses on rational models of civil war that tend to emphasise economic motivations. Psychological, sociological, or ideological factors are less well integrated into formal approaches. However, a growing body of work suggests that ideology has proven effects on various forms of armed conflict. In this context, ideology corresponds to a more or less systematic body of ideas through which individuals, groups, or organisations see the world.

Recent research has identified many effects of ideologies on the risk of conflict. In particular, ideology determines the tactical choice of groups by establishing the appropriate set of means and targets to achieve desired political objectives. Unless they are motivated by a pure desire for power and the advantages that this position can confer, most armed or political groups are motivated by ideology. The choice to join terrorist groups, for example, is a shared ideology of a group, but is often determined by other strategic factors, such as the failure of non-violent methods to achieve the group's objectives, or the violent repression perpetrated by state or non-state agencies against individuals using non-violent approaches. Ideologies affect the willingness to use violence in the first place, but they also shape the propensity of actors to use specific violence strategies, such as targeting civilians or gender-based violence. Finally, ideologies often prove to be essential for the initial mobilisation of recruits and to the maintenance of their commitment, thus also highlighting the role of extremism. Indeed, an extremist ideology could help rebel groups to mitigate the problems of collective action in the formation and dynamics of rebellions, giving the most radical rebels an organisational advantage. As salafist jihadists have shown, groups such as the Islamic State, Jabhat Fatah al-Sham, Al-Qaida, Al-Shabaab, and Boko Haram have all managed to gain an advantage over other, more moderate rebel groups in the conquest and control of different territories. Within this framework, taking into account the ideological context could help to explain some of the conflict dynamics that models purely oriented towards strategic and economic incentives, miss.

The various theories presented above offer a wide range of predictions. Collective action approaches suggest that common interests as well as specific incentives can lead to large-scale violent conflicts. Rivalry theory models are more ambiguous in their predictions. Negotiation models suggest that state capacity should reduce credibility problems and thus facilitate peaceful resolutions.

## ► 2. The empirical literature: what variables for what consensus on the correlations of the outbreak of civil wars?

Econometric work has focused on validating the theoretical hypotheses developed in the previous section. Although the limits of this research do not today make it possible to come up with a unified model and a definitive agreed list of factors influencing the outbreak of conflicts, the results are rich in terms of information. The factors highlighted can be grouped into 8 major groups: demography, geography, climate, natural resources, history of conflict and violence, economic characteristics, and political institutions.



## Demographics, population diversity and the outbreak of conflict

One of the variables most widely recognised to be correlated with the outbreak of civil conflict is the size of the population of the country concerned. The logarithm of the population appears as a significant variable in a large number of studies. Population size is important because large countries have large distances over which a government must be able to exercise control, long international borders, and a large number of distinct groups living in the territory. These factors can increase the number of conflict-related deaths above the probability of death for a larger population.

After population size, one of the most frequently cited causes appears to reflect differences due to ethnicity, religion, or class, which may provide validation for grievance models. Generally, the literature on conflict combines two types of measures of ethnic diversity in its analyses: ethnic polarisation, and ethnic/religious/linguistic fragmentation. Ethnic polarisation measures, in terms of percentage of the total population, the gap between the biggest ethnic group and the second biggest group. Countries with a bipolar population distribution have the highest rate of polarisation. This definition is based on the assumption that the existence of a majority ethnic group is not in itself sufficient to explain violence, the minority ethnic group must also be large and not divided into many different groups. Fragmentation is the probability that two randomly selected individuals in a society belong to two different social groups; it increases the more the number of groups (ethnic, religious or linguistic) in a society increases. High fragmentation has two assumed effects on the risk of conflict:

- Positive effect: it increases tensions based on religion, ethnicity, or language between geographically close groups of individuals,
- Negative effect: the greater the fragmentation, the smaller the groups and the less the polarisation, it is unlikely that they will manage to organise themselves to enter into conflict.

The empirical literature nowadays almost systematically integrates indicators of fragmentation and polarisation into models. Nevertheless, many empirical works do not find a relationship between the level of fragmentation and the risk of civil conflict. A first explanation is that there is a problem with the construction of the classification of ethnic groups and that the indicators used do not reflect reality. A second explanation is that cultural differences between groups are poorly taken into account. A third explanation is that the fragmentation index is not appropriate because the relationship between ethnic diversity and the risk of conflict is potentially not monotonous. Indeed, the presence of a majority group, representing between 45% and 90% of the population, is associated with a higher risk of conflict

when the minority is itself large and not divided into many different groups. Thus, there is less violence in highly heterogeneous and highly homogeneous societies, and more violence in polarised societies. This dimension is better reflected by separate indicators of polarisation. The nature of the complex and potentially non-linear relationship between these three dimensions (fragmentation, cultural differences and polarisation) of diversity (ethnic, religious or linguistic) may explain the difficulty in finding robust results.

### **Geography and the outbreak of conflict**

In addition to the question of the size of the territory, which is closely linked to the demographic problems explained above, certain geographical characteristics are likely to encourage rebellion. As noted above, the links between ethnicity, demography, and geography seem crucial in determining whether certain characteristics make countries more or less prone to conflict. Mountainous and densely forested terrain is more difficult to control, as shown by studies indicating that mountainous terrain makes countries more prone to conflict. Another geographical characteristic that can make government control difficult is "non-contiguity" and concerns those countries with territories that are physically separated from the capital. These countries are significantly more prone to conflict.

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Finally, there is a consensus that the presence of unrest in neighbouring countries influences the risk of conflict in other countries in the region. Countries neighbouring unstable countries are vulnerable to spillover effects of socio-political unrest. Violence is particularly affected by this phenomenon of contagion. Indeed, the development of cross-border criminal and terrorist networks means that armed actors reinforce this effect and find themselves at the heart of various conflicts today. The presence of violent conflict also implies an increase in tension among the populations of neighbouring countries due to the influx of refugees. In addition, there may be a more political spillover effect at the regional level, involving socio-political unrest at the regional level, as was the case with the Arab Spring.

### **Climate and the outbreak of conflicts**

The results of a recent but growing body of rigorous and multidisciplinary quantitative research suggest that past climate events have had a significant influence on conflict throughout history. This influence appears to extend across the world, across history, and at all scales of social organisation. Climate is obviously not the only or even the main factor influencing the emergence of conflict, but when large climatic variations occur, they can have significant effects on the incidence of conflict in various contexts.

Although there is a convergence of quantitative findings across disciplines, many questions remain. Previous research has succeeded in establishing a causal relationship between climate and conflict, but has not yet been able to fully elucidate the mechanisms. The many theories proposed all seem to be consistent with at least some existing findings. It seems likely that climate change influences conflict through multiple channels that may themselves differ according to context. Climate change affects all the variables which are theoretically at the origin of internal conflicts through its impact on economic activity and income, the institutional characteristics of the country, or social cohesion and ethnic diversity due to the resulting migrations of populations. In particular, the research shows that climatic conditions influence the risk of conflict in regions that are good for agricultural production. Thus, in regions heavily dependent on agriculture, which have socio-economic and political factors such as a low level of economic development and strong ethnic polarisation, climatic shocks (e. g. rainfall and temperature) increase the risk of conflict. Future research should be able to show how the interaction of climate change with different socio-economic, political, and demographic characteristics contributes to conflict and thus shed light on the causal mechanisms linking climate and conflict.

### **The presence of natural resources and the outbreak of conflicts**

There is a very large literature analysing the relationship between an economy's dependence on primary products and a risk of conflict. Dependence on primary products generates rents but also instability, it makes growth volatile and lowers income in the long term. Dependence on primary commodities is generally associated with the presence of a large share of specific "rents" in national income. These rents are associated with significant non-tax revenues for the state, or any other organisation that may control the territory in which they are generated. Dependence on primary commodities is also associated with a propensity to shocks: world prices of primary commodities are much more volatile than the prices of other goods. These shocks imply volatile growth rates, making macroeconomic management more difficult and ultimately weakening the State. This mechanism, well known to economists, is often described as the concept of the "resource curse". In addition to the problem of macroeconomic management found under this "curse" theme, income instability is a factor of frustration for economic agents who cannot maintain, in periods of negative shock, the committed expenditures they have become accustomed to in times of prosperity.

Thus, rents and shocks imply the presence of multiple channels through which natural resources can be linked to the risk of conflict. It is therefore not surprising that studies dealing with the link between natural resources and conflict present ambiguous results. Natural resources may be involved in both increasing and decreasing the risk of civil conflict emergence. When they improve local incomes,

they increase the opportunity cost for agents to join an armed group and thus decrease the risk of conflict. When they improve state revenues, their effect is twofold and divergent. On the one hand, they can enable the state to improve its military capacity and act as a deterrent to any rebel enterprise, thus reducing the risk of conflict. On the other hand, they make conquest of the state more attractive to armed groups and increase the risk of conflict. Natural resources therefore have potentially different impacts on the risk of conflict.

It is also widely believed that abundant natural resources are a windfall for the financing of armed groups, however, armed groups often do not have the technical capacity to exploit all types of resources. Resources which are easy to extract can be exploited with simple or artisanal methods by individuals or small groups; they do not require investment in expensive equipment and the material collected can be smuggled easily. Analysis of the link between conflict and natural resources, using the opportunity cost mechanism, requires an inventory of these easily exploitable resources. Some resources can themselves be divided into several sub-categories (e.g. primary and secondary diamonds, or "onshore" or "offshore" oil deposits), not all of which are exploitable by armed groups.

Thus, even if in some particular cases the presence of natural resources appears to be a fundamental element of conflict, the effect of rents, shocks, and type of resources implies that it is difficult today to reach a clear consensus on the link between natural resources and the risk of conflict, or that this relationship can be easily observed through a single measure or indicator.

### **The history of violence and the outbreak of conflict**

Numerous studies have shown that countries which have experienced one civil war are more at risk of experiencing another. In most of these countries, one civil war tends to follow another within 10 years of the end of the fighting. The vicious circle of violence becomes part of the daily lives of the people in these countries who are caught in a trap of violence, despite the hope of one day achieving lasting peace. Conversely, the longer the peace lasts, the lower the risk of renewed conflict. Moreover, in a post-conflict situation, economic recovery is strong, growth is usually at levels much higher than before the conflict, and the opportunity cost of participating in the insurgency increases, making it more difficult to recruit a rebel army.

### **Socio-economic characteristics and the outbreak of conflicts**

The relationship between the characteristics of the economy and the risk of conflict has been examined in its many aspects. Researchers have analysed the correlation between the risk of conflict and the level, growth, structure, and distribution of income, and international trade and education.

The level of per capita income is included in most empirical studies on civil war. The relationship between per capita income and the risk of civil war is assumed to be negative, i.e. a low level of income makes civil war more likely and vice versa. Although this is one of the most common findings in this literature, it is very difficult to interpret it as a causal relationship. Conflicts have significant economic and social costs, so that on average a civil conflict costs the countries concerned 30 years of GDP growth according to World Bank estimates. Low income levels in countries caught in a trap of violence could be the consequence of a previous conflict. Moreover, the anticipation of a new civil war could further depress economic activity and incomes. Thus, these different relationships do not distinguish between grievance models and models based on rent-seeking theory.

Income growth is another variable which can be strongly correlated with the onset of civil war. Studies generally show that economic growth is low, or even negative, before the outbreak of a civil war. However, the actual direction of causality is questionable, growth rates may be low because economic agents perceive and internalise a high risk of conflict.

A final income-related component, namely inequality, has also been analysed many times in the empirical literature. The idea that conflicts are linked to a perception of inequality and injustice has given rise to a large number of econometric works with very varied results, and there is no consensus on this issue today. The reasons for this disparity in the results are easily explained. Firstly, the available measures of income inequality are questionable because they are unreliable and measured at very irregular intervals. Secondly, the poorest, who are more likely to feel frustration, may lack the financial means to mount a major rebellion. Thus, even if there is no shortage of grounds for rebellion, it is simply not feasible. Finally, it is increasingly recognised that commonly used measures of inequality, such as the Gini coefficient, capture only "vertical" inequalities and not inter-group or "horizontal" inequalities, which are far more important in explaining the occurrence of violence as we have seen with ethnic fragmentation and polarisation.

Many authors investigating rent-seeking and greed-based explanations of civil war have included trade or trade policy variables in their models. The most frequently included variable is primary commodity exports as a proportion of GDP, which is generally considered, as we have seen, either as a general indicator of a "resource curse", and in particular of instability, or as an indicator of ease of access to rents. While the link between international trade and peace between States has been the subject of extensive reflection by economists and philosophers over the past two and a half centuries, the link between trade and the risk of civil conflict is relatively unexplored by economic work, whether in theoretical or econometric models. Yet, while internal conflicts disrupt trade relations between communities, successful trade discourages war by increasing its opportunity cost. Moreover, trade could

potentially be a source of social cohesion between people through the bonds of trust it implies. In fact, several studies have shown that the ratio of trade to GDP is negatively and significantly related to the risk of conflict and state failure.

Finally, the presence of a large proportion of young adults in the total population is a risk factor for conflict. Although this relationship is not fully agreed upon, behavioural and participation research indicates that young men are more likely to join rebellions. When youth cohorts are particularly large, opportunities for young people in the labour market are limited and therefore recruitment costs for rebels are lower. Similarly, the resentments and grievances of these young people are reinforced when they face, in addition to unemployment, institutional bottlenecks and overcrowding in urban centres. In this context, there seems to be a consensus on the role of education. Both high primary and high secondary school enrolment rates seem to reduce the risk of civil war. Given that young men make up the majority of rebel armies, male education plays a mitigating role and appears particularly significant in many studies. Moreover, there does not seem to be a need for a fully-fledged higher education system if primary and secondary education is almost universal.

### **Political institutions and the outbreak of conflicts**

Given that many rebellions claim to pursue ideals of freedom and democracy, researchers have questioned whether institutional factors can predict civil war. The presence of democracy or, conversely, autocracy is generally negatively correlated with the outbreak of civil war. This literature generally defines democracies as states where the common interest is paramount, whereas autocracies are marked by strong and generally repressive political regimes. However, although the correlation between each of these two types of regimes and civil war is negative, the result is the opposite when intermediate regimes are considered. In other words, extreme democracy and extreme autocracy both reduce the risk of civil war, while "anocracy" increases it. Under a pure dictatorship, opportunities for dissident groups to organise are limited and the likelihood of failure is high. Democracies offer the possibility of peaceful collective action. Anocracies are caught in the middle of this pattern. They provide opportunities for dissenting groups to organise, but non-violent actions may be ineffective.

However, the relationship between the type of regime and the risk of conflict is not perfectly symmetrical: democracies experience fewer civil conflicts than autocracies. Indeed, democracy tends to reduce the risk of violent civil conflict through its mechanisms for the peaceful resolution of internal conflicts. Conversely, autocratic regimes often have long periods of apparent stability, but can be subject to rapid and radical political crises. The risk of civil war tends to be higher for anocracies because they have neither the repressive capacity of dictatorships nor sufficient democratic institutions for the peaceful expression of popular dissent.

A number of studies have attempted to assess the relationship between political instability or regime change and the risk of civil war. The majority of the results support the consensus that a political crisis or sudden regime change is positively associated with the risk of conflict. The only real disagreement today concerns the magnitude of this relationship.

Finally, state ineffectiveness is often cited as a cause of civil war. This ineffectiveness is most often seen today as a combination of 3 main factors. First, it is expressed in the inability of the government and the central administration (the State) to deliver basic services. Second, it is influenced by the lack of legitimacy of the State over the totality of its territory, in particular because of its inability to include the entire population in the public decision-making process. Third, it is reflected in the State's inability to ensure the security of its citizens and to have a "monopoly on violence". In these 3 dimensions, the weakness of the State can be temporary, structural, over the totality of territory, or localised in part of the territory. These institutional and territorial specificities, which are difficult to measure make it difficult to analyse statistically the link between these factors and the risk of conflict, and as a result, formal statistical analysis is limited.

### **Box 2: The Sahel, a fertile economic, social, and political breeding ground for violence**

*Violent conflicts in the Sahel have diverse and complex origins, some of which are deeply rooted in the history of Sahelian countries, as in the case of the Tuareg revolts linked to the sense of exclusion from political life that these communities feel. Other factors include the transformation of the region into a hub for cocaine trafficking from 2005 onwards (in addition to other more 'traditional' goods) and the return of thousands of armed men from Libya in 2013 following the fall of Muammar Gaddafi. These two events, aided by the porous borders, have also encouraged the penetration of sophisticated weapons into the Sahel. Added to this are family conflicts over land, national grievances (Tuareg claims), and struggles linked to various forms of trafficking (arms, drugs, smuggling, and migrants). The situation worsened when Algeria expelled members of Al-Qaeda in the Islamic Maghreb (AQIM) from its territory, bringing dangerous actors to the Sahel and changing the pattern of conflicts around the borders. Armed banditry has spread and the insecurity of daily life has increased. Ethnic, linguistic, and religious fragmentation erodes identity and makes governance more difficult.*

*Rapid population growth and an increasing share of young people have slowed per capita income growth, fuelling existing social, educational, and*

*political vulnerabilities. As elsewhere, primary school enrolment rates are increasing, but the time spent in school is decreasing. In addition, public education sector is failing to meet the training needs of the agricultural sector. At the same time, employment in the public sector is increasingly scarce, while the bulk of jobs in industry and services remain reserved for those with secondary or higher qualifications. Many young people do not wish to find a job in agriculture, are pushed aside by the entrenched intergenerational hierarchies, and feel excluded from economic, social, political, and civic life. Salafist koranic schools (supported by religious organisations financed by Persian Gulf countries) make up for the lack of supply and confidence in the public education system, particularly in the Sahel, where states no longer exercise their sovereign functions over the totality of the territory. Many koranic schools prepare their pupils for integration into a society dominated by religion.*

### ► 3. Structural risks of conflict - vulnerability and fragility

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This discussion highlights a number of problems in the literature about the 'causes' of civil war. There is a gap between theoretical models and statistical models. Theory suggests a number of causes of civil war, but econometric models are often ad hoc, and the results, which are difficult to interpret, do not distinguish between the different theories. Many explanatory variables are endogenous and it is probably more appropriate to refer to correlations with war rather than causes. Explanatory factors, such as grievances, are difficult to assess. Some variables are subject to several interpretations: poor countries are more exposed to conflict, but is this due to lower opportunity cost to join a rebellion or to low state capacity? Some explanatory factors, such as inequality and ethnicity, receive a lot of attention, but there is no evidence that they are strongly correlated with the outbreak of civil war. Other explanatory variables are highly correlated with the outbreak of civil war, for example, there is a strong relationship between income, democracy, and natural resources and the outbreak of civil war. This makes it difficult to disentangle the transmission mechanisms.

It is also important to note that most of the explanatory variables are invariant or change little over time. They are also mostly exogenous to countries' current economic policies. Thus, the risk of conflict associated with these factors is more a structural risk which evolves slowly over time and seems unlikely to predict the imminence of a new conflict. The triggering factors that generally precipitate the onset of civil war are difficult to list exhaustively, as their specific nature to the situation of each country or region is difficult to grasp by cross-cutting macroeconomic



analyses. Nevertheless, the role of shocks, whether economic (price shocks, drop in income), climatic (rainfall and temperature shocks), or societal (regime change, terrorism), seems fundamental to understanding the risk of conflict.

Shocks are a major source of macroeconomic instability in most countries of the world, and are one of the fundamental reasons why the countries of the South are lagging behind in their development. Although each shock is unique, it is easy to classify them into two broad categories: exogenous shocks, whether economic (a fall in the price of raw materials) or climatic (a hurricane or drought) and endogenous shocks (political crises, transitions, or terrorism).

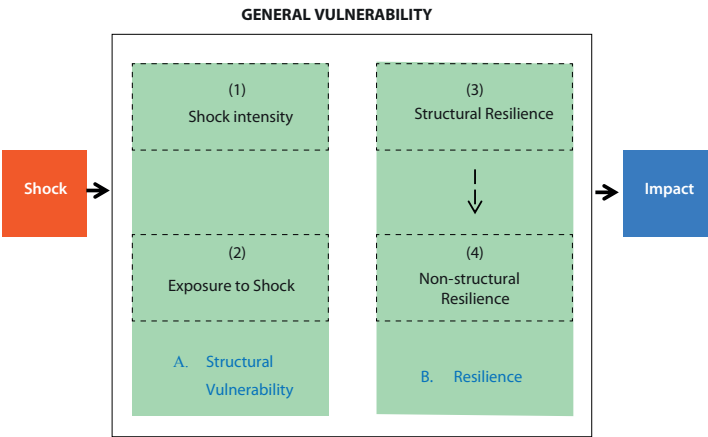
The expected impact of each type of shock is variable. Indeed, various characteristics, both structural and non-structural, tend to influence the stages and propagation path of the shock on the economy. This is particularly the case for those relating to the general vulnerability of countries.

General vulnerability, at the macroeconomic level, is the risk of being impacted by exogenous shocks. Structural vulnerability includes only factors which are not dependent on a country's present will or policies, and are entirely determined by exogenous and persistent factors. General vulnerability also includes the effect of present and future policies, and therefore changes more rapidly. In order to understand the economic impact of a shock and thus determine the overall vulnerability of countries, it is important to distinguish between structural vulnerability and lack of resilience.

Resilience refers to the capacity to cope with exogenous shocks by implementing appropriate policies. From this perspective, there are two main dimensions of a country's overall vulnerability: the intensity of the shocks and the exposure of the economy to them, which reflect structural vulnerability, and a resilience dimension, related to the measures taken to improve a country's mitigation capacity in the event of a shock. Thus, the 3 key elements to capture for each type of shock are the size of the exogenous shocks, the country's exposure to the shocks, and the country's resilience to the shocks.

Structural vulnerability is a function of the size of the shocks and the country's exposure to them. General vulnerability, as shown in the figure below, also depends on the country's resilience to the shock; this resilience is more related to current policy than to structural factors, and reflects the capacity of the economic system to recover and rebuild. However, there are also structural factors in a country's resilience, such as its level of human capital and more generally its level of development or per capita income. Vulnerability is the sum of the expected impacts of shocks in terms of economic losses and well-being over a given period.

Figure 10: Vulnerability to shocks

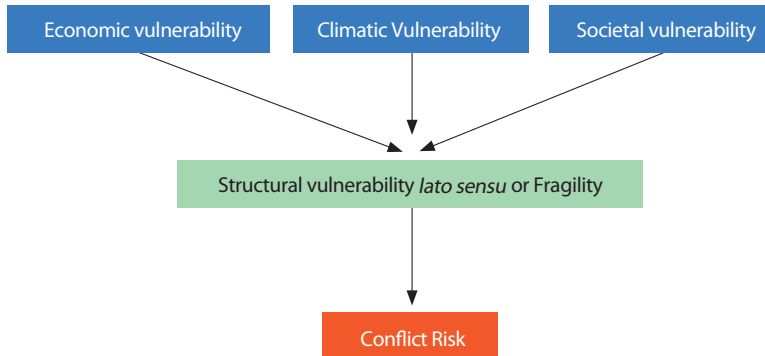


Source: Authors' development.

Vulnerability is understood here in a broad sense, encompassing political or societal vulnerability (in its structural component), economic vulnerability (again structural) and (physical) vulnerability to climate change. Political or societal vulnerability is partly determined by factors that are exogenous to the present will of countries. In concrete terms, it translates into situations of population insecurity, marked by various forms of violence. Structural economic vulnerability or climatic shocks exacerbate conflict situations, illustrating the links between different forms of vulnerability and conflict.

Failure to take account of these different structural vulnerabilities, as summarised in Figure 11 below, would lead to a truncated picture of the challenges facing developing countries. This sum of structural vulnerabilities, which corresponds to what can be defined as country fragility, directly influences the risk of conflict. This approach to conflict risk through vulnerability separates the factors of exposure and the intensity of shocks into two components. It allows us to reconcile the theoretical and econometric results of the literature on the determinants of conflict with the more diffuse notion of fragility, which is today at the heart of multilateral discussions and action for the development and security of the populations of the South.

**Figure 11:** The different forms of structural vulnerability and the risk of conflict



Source: Authors' development.

Originally, the notion of political fragility was used to refer to a lack of will, a lack of legitimacy of states to implement policies in favour of the majority of the population, or simply not exercising their sovereign functions. This concept has led to the construction of various indices. The OECD in its Fragility Report 2015 distinguishes three types: "function-based indices", indices that aim to capture "constraints and stressors" that can lead to war and institutional collapse, and "event-based" indices. The problem with the function-based and constraints/stressors indices is that they are difficult to differentiate from more general performance indices. Generally speaking, they have two major flaws: 1) They cover a very large number of factors for which there is little or no evidence of a link to conflict risk; the aggregation of these different sub-components is often ad-hoc and thematic (security, health, education) and is not anchored in a framework of analysis based on scientific evidence, 2) They are largely based on subjective measures; expert or civil society opinions. In addition, these indices do not take into account the fragility of neighbouring states: the existing fragility indicators only measure fragility at the national level. The regional level of fragility due to spillover effects is therefore underestimated. Fragile states can have a direct negative impact on their neighbours. The case of the Central African Republic (CAR), presented by most indices as one of the most fragile countries in the world, is a good example. It is hard to believe that the unstable environment in which the country exists has not played a role in the various episodes of conflict it has experienced. Indeed, CAR has seen all of its neighbours, except Cameroon, experience violent conflicts. With porous borders, weapons of war circulate illegally from one territory to another. Hence, the importance of integrating the regional dimension or at least the neighbourhood dimension, into the construction of indicators of fragility.

For example, the State Fragility Index (SFI of the Centre for systemic peace), one of the most widely used indicators of fragility, has these aforementioned drawbacks.

It focuses on the effectiveness and legitimacy of the state, and is an index which is closely linked to the state's capacity to: (i) manage conflicts, (ii) establish and implement public policies, (iii) provide services that are essential to the well-being of the population. The SFI takes into account a country's systemic resilience through social cohesion and quality of life, depending on whether the State provides an effective response to the challenges and crises that threaten the existence of societies. The SFI is the result of 8 indicators of the effectiveness and legitimacy of States in the areas of security, politics, economy, and social well-being. A value from 0 to 3 is given to each of the indicators. The scores are combined at the two levels of effectiveness and legitimacy. The SFI is calculated by the sum of the scores at both levels. However, among the 8 indicators, there are indicators which are weakly correlated with the central notion of conflict risk, and reflect both economic and human needs and the structural resilience of states. Moreover, the SFI does not reflect the hierarchy of these different factors in terms of their impact on conflict risk. The aggregation of these variables is therefore more akin to a broad development indicator than to a specific indicator of fragility reflecting the risk of future conflict. An additional consequence of this aggregation is that the correlation between these different indicators and governance indicators such as the Country Policy and Institutional Assessment (CPIA) of the World Bank or the African Development Bank is high, with a risk of redundancy. Indeed, as it is difficult to disentangle the structural components from those reflecting the will of the countries, these general indicators of fragility or conflict risk reflect the risks faced by developing countries in a very imprecise manner. This criticism can be levelled at most of the available indicators, particularly when their purpose is to guide international action.

## Part III: What kind of actions for development and stability in countries with a high risk of conflict?

Violence has a significant and lasting impact on the social and economic capital of countries facing prolonged periods of conflict. Its short-term consequences are deaths, injuries, and displacements. In the medium term, violence impacts people's health and survival, as well as their productive capacity. In the long term, it impedes social and economic development, and the general well-being of populations (including the psychological health of individuals). Preventing such violence, particularly with the help of tools such as the one developed in this report, is today a key factor in the development strategies of the main international organisations.

### ► 1. Cost and benefit of prevention

In their latest joint report on fragility and conflict, the World Bank and the United Nations (2018) estimate the costs of avoidable damage to conflict-affected countries, and what the "savings" to the donor community would be if more resources were devoted to prevention, that is, if additional resources were dedicated to high-risk situations before violence erupts. This would mean committing mechanisms and funds to prevention before violence occurs, *i.e.* before humanitarian assistance, peacekeeping, or peacebuilding becomes necessary. According to their main scenario, such targeted prevention in just 5 countries per year would avoid about \$US 34 billion in economic losses per year at a cost of \$US 2.1 billion. In addition, the donor community would save nearly \$US 1.2 billion annually on global peacekeeping. The same report also estimates that this new preventive approach would reduce the number of refugees by more than 1.5 million in 15 years. Its conclusions are strongly in favour of prevention, stating that it would become "cost-effective" within 15 years. Indeed, the report estimates that substantial cost savings would still be observed even if preventive action only worked in 25% of cases.

The cost of inaction is considerable. Reducing violence requires a combination of long-term structuring actions, and short-term effect actions, so that the population receives a "peace dividend".

The most structuring actions in favour of development, however necessary they may be, have little effect in the very short term. The institutional reforms needed

to restore the role of the state and ease tensions are difficult and time-consuming to implement. Such reforms may consist of helping the state to fulfil its sovereign power: defence (army), security (police, gendarmerie), justice; administrating and implementing public policies: legislation and regulatory framework, public management and taxation; delivering over the whole territory the basic public services expected from the populations, both in quantity and in quality; ensuring the establishment of constructive and democratic relations, both between public authorities and the civil society for concerted decision-making (citizens, users, representatives of the private sector, civil society organisations, professional organisations, trade unions), and within the different segments of society (political under-representation of certain socio-cultural groups, strong inequalities between social classes, management of the elderly in the face of a young and silent majority).

In order to deal with the rise in violence in regions of fragility such as the Sahel, it is necessary to combine development-related actions with security-related actions. Insecurity should not be a pretext for not acting in favour of development. This implies collaboration between military forces and development actors through the sharing of information. However, each must remain within its area of competence - to avoid confusion in the eyes of the population between belligerent forces and international aid actors. Attempts to restore order may help to destroy jihadist bastions and their refuges, but it does not eliminate the endogenous causes of violence. The use of weapons does not strengthen the bonds of trust between security forces and the population, nor does it solve economic problems. However, strengthening the social contract allows people to regain hope for progress and to quickly regain confidence in the role of the state. This is why actions leading to short-term results must be combined with long-term reforms to ensure that the population receives the benefits of the end of violence, the "peace dividend".

Restoring and maintaining security inevitably involves structural prevention and the reconstruction of the state apparatus. Structural prevention is based on long-term policies which promote the strengthening of the social contract between public or local authorities and the population. Strengthening the institutional capacities of countries is one of the important pillars of structural prevention. It involves improving basic services and the access to them, strengthening judicial systems, combating criminality and corruption, and building effective, inclusive, and equitable institutions which are capable of improving public services and citizen engagement. One of the underlying causes of violence, particularly in the Sahel, is that young people are vulnerable to radicalisation and violence. Any long-term solution should involve ensuring fair laws, equal opportunities, and the well-being of all citizens. Similarly, any neutralisation of terrorist groups should be accompanied by a rapid reoccupation by the sovereign power of the vacated territory. Lack of opportunity, lack of justice, or repression against a community could push it into the arms of jihadists offering protection, or traffickers

offering gainful employment. Civil servants in the administration of the territory, security officials, and justice officials must be in sufficient numbers throughout the territory, and have the necessary means to carry out their duties, since many local conflicts need to be mediated by a reliable and non-corrupt justice system, particularly conflicts between herders and farmers. The vicious circle of insecurity cannot thus be broken without significant investment in the fight against crime and trafficking, particularly in rural areas where the police is either absent or does not have sufficient means to carry out its work effectively. International donors, who are generally less inclined to fund the strengthening of the police and the judicial system, must review their strategy and commit to fund these sectors, which are as vital as those of health or education, because there can be no development without security, and no security without development.

## ► 2. Restoring a social contract and increasing resilience

To foster a sense of belonging to a Nation, a unifying force must be found to bridge different geographical and historical areas and different identities within a State. The complementarity of cultural identities within a country strengthens national ties and reduces inter-group friction. Educational, cultural, and sports programmes should be adopted to create stronger social and cultural links between groups, institutionalise cooperation, and promote reconciliation between ethnic or religious groups with a history of conflict.

Initiatives aimed at restoring or strengthening the social contract must necessarily provide a profound and rapid response to demands for social justice. Citizens' movements are growing in number to fight corruption, and improve transparency on budgets and public spending. Corruption, nepotism, and fraud prevent resources from reaching vulnerable populations, thus increasing inequality, poverty, and frustration. The digitalisation of tax administration would, for example, strengthen the capacity to mobilise tax revenues which could be invested in social programmes for education and public health care.

Given the important role of the agricultural sector in the economies of many fragile countries, the establishment of fair and equitable agricultural and livestock policies which provide work, income, and living opportunities for all those who make a living from these activities help to strengthen the resilience and food security of the population. At the same time, environmental and climatic factors should not be underestimated. Drought, desertification, inadequate rainfall, and unreliable rainfall distribution in time and space are a harsh reality in many countries. These manifestations of climate change are part of the problem as well as pointers to solutions to the fragile situation of these countries. Measures for rapid adaptation to climate change must be strengthened. They will enable the most vulnerable populations to cope with exogenous shocks, to invest in riskier but more productive

crops, and to increase their resilience and security by having the means to take control of their own destiny rather than remaining eternally dependent on aid.

Conflict afflicted countries generally have few means to restore real prosperity. Regional integration would enable these countries to mutually strengthen their institutions with strong structures and improve the quality of their governance. The monetary stability, low inflation rates, budgetary discipline, and a business environment, which is less risky for investors, made possible by regional integration help to maintain an atmosphere of trust between leaders and their populations, to ease identity-based tensions and to foster cohesion around a national and regional project. In the same vein, strengthening cooperation and pooling security expenditure for countries located in high-risk areas would make it possible to ensure better control of the entire territory, and effective action against smuggling and cross-border criminality.

Actions with a predominantly social focus in terms of education, human mobility, or food security can be carried out primarily in vulnerable areas where pockets of poverty remain. Since nature abhors a vacuum, the absence of the State in the field of social progress throws young combatants into the hands of rebels or jihadists who are prepared to make them attractive offers. Social progress must be the core of all development action. For example, public infrastructure projects can incorporate components of labour-intensive work that put people back to work immediately and offer them longer-term vocational training opportunities. Phasing of activities allows small, visible projects to be carried out quickly as part of local investment programmes, which can be taken over by the public authorities in the medium term.

### ► 3. Promoting decent employment

Employment, especially youth employment, is a priority for development and stability in fragile and conflict situations. Jobs play a very important role in fragile environments, given their contribution to poverty reduction and productivity growth, but also their effect on social cohesion and on reducing the risk of violence. However, the business climate is particularly difficult in countries with high structural risks of conflict, various combinations of political, economic, and social risks, weak institutional capacity, and significant constraints in terms of the financial resources needed for economic recovery and reconstruction.

Poor households generally have a portfolio of occupations rather than a single job. In low-income countries, few adults are unemployed in the sense of zero hours worked. Instead, they are under-employed and would like to work more hours. Typically, each member of a household receives income from many sources (from agriculture, casual informal work, small-scale businesses, and formal work), because



this diversity mitigates the risks inherent in the seasonality of a single source of income, and because it is often impossible to get sufficient income from a single activity. In this context, one way to increase household income is to improve work portfolios rather than to create full-time jobs. Thus, helping the working poor to increase productivity in their current occupations appears to be a short-term priority, and helping them to move into new occupations with higher incomes appears to be a medium-term priority. The creation of traditional, stable employment is necessary because poverty reduction largely depends on the dynamic development of the private sector, but this societal shift demands a long-term structural change. Programmes and policies which can be implemented immediately and produce rapid results include two major elements: (i) direct financial support to restore livelihoods not only for short-term income but also to increase productivity and reduce vulnerability by providing a social safety net, (ii) labour-intensive public works programmes to meet immediate employment needs and provide improved infrastructure that will also support the expansion of private sector employment opportunities. The mode of participation in these activities can itself make an essential contribution. Indeed, enhanced social dialogue, community-driven development, and strong private sector engagement reinforce the virtuous circle between reducing the risk of violence and economic growth.

Studies suggest that programmes which focus on direct in-kind injections, whether conditional or not, can be effective tools for getting people back to work quickly. Injections of cash, capital equipment, or livestock appear to stimulate self-employment and increase long-term income potential, often when combined with complementary interventions such as training programmes. Evaluation of these programmes suggests that the working poor transform these funds into sustainable assets, cash savings, or income-generating activities, thereby increasing their incomes permanently. In the least favourable cases, they temporarily increase household consumption, especially during negative shocks. Moreover, the results of these programmes do not seem to indicate that this type of cash transfer create dependency among the population.

Public works, for their part, seem to be able to respond to the urgency of creating short-term employment, and creating a sense of community and self-worth in fragile states. In theory, these programmes can be engines capable of restarting local economic dynamics. In environments where uncertainty and instability are persistent, such programmes involving an exchange of money for community service appear in theory to be one of the best interventions to increase incomes. To the extent that households then increase their consumption, this new labour income can also have a significant multiplier effect on the local economy. Such programmes may also be politically easier to implement; they involve disbursing funds to pay wages rather than simply making transfers, especially when the programme leads to the creation of public infrastructure, such as roads or irrigation

systems. These investments have the added advantage of making self-employment more productive through the provision of new infrastructure. Finally, community-based public works play an important role in the development of social cohesion.

#### ► 4. Targeting territories

Targeting the beneficiary population is essential for the success of these programmes. Targeting action around value chains, sectors, or regions can help limit the complexity of implementation, provide results, and offer practical ways to guard against possible misuse of funds. Projects in sectors such as the agro-industry are likely to offer more opportunities for the working poor than those in other sectors. The selection of these value chains should also be influenced by their inclusiveness, particularly if there are gender or ethnic gaps in their participation. Within this framework, Community Driven Development (CDD) can become an appropriate approach in fragile or violence-affected situations to strengthen the social contract. This approach promises not only to ensure that projects selected by the community generate broad benefits, but also to foster social cohesion through collective decision-making. If designed with a long-term perspective, CDD programmes can lay the foundations for participatory planning and boost municipal and local development through decentralised governance.

Successful decentralisation involves respecting the responsibility of local authorities and providing them with sustainable financial resources. For economic and social development to reduce the temptation of criminality and violence, projects must start from the needs expressed by the populations. Villages and small rural communities can be organised to define and manage small community development programmes, provided that mini-local councils or development committees are set up in accordance with democratic procedures to avoid the takeover of these actions by the local power-brokers. In any case, local authorities, and village communities at the grassroots level are in the best position to understand the priorities of the populations. This is why it is necessary to avoid bypassing them and delegitimising them. The issue of financing local municipalities is linked to a reform of public finances towards greater transparency over which donors, the IMF in particular, exercise control. This implies helping the local municipalities to assume their responsibilities in the mobilisation of local fiscal resources, but also helping the central State to make a success of this decentralisation.

Effectively targeting actions for peace and the return to peace requires, as detailed in this report, being able to effectively target those countries where the risk of conflict is the highest, while at the same time allowing an understanding of the underlying factors which influence this risk. It is necessary to construct a conflict risk indicator that synthesises the mechanisms detailed in Part II and Part III of this document.

## Part IV: Measuring the risk of conflict to guide international action

The interest in understanding and measuring the risk of conflict has increased in recent years, in parallel with debates about development challenges and state fragility. Measuring the risk of conflict is emerging as a necessary precondition for large-scale evaluation and monitoring of conflict-related interventions. This section first presents the state of the art of conflict risk forecasting and estimating and demonstrates the usefulness of the approach chosen in this study. It then presents various methodological and econometric tools required to measure the risk of conflict. Finally, it presents the various variables used for risk estimation and shows their basis in the literature and the availability or reliability of the data.

### ► 1. Do not predict the occurrence of a conflict, but estimate the risk of conflict.

This is a key semantic issue. Much of the literature on conflict is based on explaining the causes and origins of conflicts. However, in recent years, with the development of new efficient classification models and advances in data collection, more and more research has been trying to predict the beginning or the end of conflicts, with some researchers going so far as to extend the time horizon of their prediction to several decades in the future. As a result, the concepts of prediction, risk assessment, and early warning systems are confused. This semantic confusion reflects the close link between these concepts and the means capable of alerting political decision-makers to the advent of imminent crises. Most initiatives to predict political violence are at the country level. They range from looking at armed conflict to changes in national leadership, and from violent to non-violent demonstrations.

In the conflict literature, three generations of conflict prediction studies can be recognised:

The first generation of work was strongly influenced by the Correlates of War project in 1963 aimed at collecting accurate data for the establishment of a real-time conflict early warning system. Enthusiasm for this first generation of conflict prediction faded in the 1970s and early 1980s because statistical tools and models were not sufficiently developed at that time.

Significant progress was made from the late 1980s onwards with the second generation of work which developed statistical methods based on various sources of information to predict conflict. These artificial intelligence and machine learning methods, including neural networks, are now increasingly used for conflict

prediction and allow the use of increasingly finer data at the daily, weekly, or monthly level. This is reflected in the growing demand for production of high frequency and highly disaggregated event data.

The third generation has been mainly driven by the political community's desire to set up early warning systems. It is in this context that initiatives such as those of the Political Instability Task Force (PITF) of the US Holocaust Museum and One Earth Future were launched<sup>4</sup>. Since the second half of the 2000s, conflict prediction has become a common exercise in conflict literature. However, this exercise can be dangerous and have unfortunate consequences for several reasons outlined below: Firstly, unlike research to explain the causes of conflict, prediction uses the so-called cross-validation method, which consists of dividing the data into two groups: the learning sample used for model estimation and calibration, and the test sample used for evaluating the model and the prediction. However, this method has the caveat of causing a break in historical sequences and the loss of information on long-term trends; moreover, the "test" sample, to which the coefficients from the training sample are applied, is used to validate the estimated model without this implying in any way that it can be predictive.

Secondly, the prediction of violence is associated with the uncertainty inherent in the prediction of rare events. There is always a time lag between the time of the study and the last year available in the databases used. Furthermore, predicting future violence by a model estimated from past data, however reliable they may be, amounts to considering history and the world as linear parameters. However, a shifting <sup>5</sup> and increasingly unpredictable international context more or less governs the life of nations, as no country now operates in a vacuum.

Thirdly, prediction, as emphasised above, is dependent on model performance and prediction error. To predict well, one must first explain well. A conflict is the result of a myriad of interacting factors and variables. Some are quantifiable and are in available databases, others are neither observed nor theorised. This complexity of the conflict phenomenon, although better dealt with by the use of new, high-performance models, is still subject to significant prediction errors.

Fourthly, since prediction is based on a probability threshold (often 50%), it may seem absurd when the estimation of a model leads to consider that a country is in a 'peaceful' situation with a probability slightly below the threshold (for example 49%), and a country at risk of conflict with a probability slightly above the threshold (for example 51%). Such a threshold could be misleading.

4. The Political Instability Task Force (PITF) aims to provide a one to four-year assessment of the risk of violent conflict at the national level; the US Holocaust Museum uses quantitative and qualitative methods in a warning system highlighting countries where the risk of genocide or mass atrocities is high. The One Earth Future produces forecasts on the risk of coups d'état.

5. Based on recent developments, even the most sworn actors and experts could not predict, for example, Brexit, the election of Donald Trump in 2016 or the coronavirus crisis.

Fifthly, the prediction of conflicts, apart from the scientific curiosity it generates, can become a futile exercise hindering the effectiveness of policies aimed at alleviating the suffering of populations. In addition to the credibility of the researcher, saying that a country will be in conflict in a given year may create unrest among its inhabitants and in neighbouring countries; or, conversely, "predicting" that the country will be "at peace" may lead political actors to be overconfident and to take no political action to preserve peace.

Political actors and decision-makers, aware of the uncertainty surrounding their decisions, are not asking for a prediction of conflict, but rather for a risk assessment tool. This enables them, over time, to reduce the risk of potential conflict through preventive intervention and resource allocation, assuming of course that the effects of political intervention are well known.

In view of these various limitations of the conflict prediction exercise, we propose a new index that allows us to observe the dynamics of structural conflict risk and non-structural conflict risk on a country-by-country basis. As resources for prevention are often scarce, any information that can help identify the structural risk and non-structural risk factors of countries should be useful to political actors.

## ► 2. Statistical tools and model

In the empirical treatment of research questions, the data often present peculiarities which make analysis sensitive: time gaps in the data (i.e. data whose time coverage varies according to the country), scarcity of events, covariates acting in a complex or non-linear way, etc. The science of predicting or estimating the risk of conflict outbreaks has benefited in recent years from advances in statistical methods. The ability of a statistical method to lead to accurate estimates remains as important as its ability to explain causal processes.

Many new models have overcome the limitations of the usual probabilistic models (probit, logit, etc.) widely used in the literature. Among these models, can be cited machine learning techniques such as neural networks, random forest, or lasso. These methods have proved their worth and can be adapted to many cases, such as when regressors are highly correlated with non-linear or interactive relationships. Below we briefly present two methods that are representative of this literature and often used in conflict prediction work, and highlight their advantages and limitations.<sup>6</sup>

6. In the preliminary phase of this study, we undertook an exercise to compare the performance of logit, penalised logit, and random forest models. The results showed the superiority in terms of performance (predictive power) and accuracy of the random forest. Analyses included performance indicators such as ROC curve, sensitivity, specificity.

## The logit model

When the dependent variable is dichotomous and probabilities need to be estimated, the model often used is the logit (or probit) model. This model owes its popularity in particular to its simplicity and familiarity. However, it has several drawbacks:

- It requires a functional form imposed by the researcher and in particular a linear relationship between the explanatory variables and the dependent variable,
- It only allows the inclusion of a limited number of variables and interactions between variables. It is based on the respect of hypotheses such as the absence of collinearity, linearity in the parameters, or homoscedasticity<sup>7</sup>. Several of these assumptions, due to their limiting nature, are most of the time not respected,
- When an imbalance exists at the class level of the dependent variable, or, as here, when events are rare<sup>8</sup> and the class "absence of new conflict" is much more important than the class "presence of new conflict", the probability estimates are biased in favour of the larger class.
- The lack of robustness of the method for outliers.

## The random forest

As the name suggests, the Random Forest is an aggregation of decision trees. A decision tree sorts the observations into subgroups (or nodes) by first identifying the risk factor that most accurately distinguishes between conflict and non-conflict cases; secondary risk factors are then identified, followed by tertiary risk factors, and so on, until the root mean square error within each node is minimised. Each observation is passed through the tree until it reaches a terminal node where a prediction is made based on the modal outcome predicted at that node. The forest of decision trees is simply a set of decision trees estimated over many random subsamples of data using many random subsets of predictors. The output of the process is the average predictions of all trees, thus increasing stability.

The popularity of random forest, which is highly regarded and praised for its performance, stems, among other things, from the ease of interpretation of the results, the possibility of including an unlimited number of variables and their interactions, its flexibility, its robustness in the presence of outliers, and its good consideration of the class imbalance of the dependent variable<sup>9</sup>. Like all non-parametric models,

7. A property that requires the variance of the error terms to be the same for each observation.

8. What is the case with conflicts, especially the conflict onset variable, there are more « 0 » than « 1 ». Penalised logit is sometimes used to reduce this bias.

9. Thanks to multiple resampling methods such as downsampling, upsampling, pink, and smote. Muchlinski et al (2016) applied these techniques in the prediction of civil wars over a sample period from 2001 to 2014. Their model correctly predicted 9 out of 20 civil wars, whereas conventional logit or probit regression models predicted none.

the use of random forest is data intensive, and the performance of the model depends on the sample size. However, the method requires full datasets, which are not easy to obtain as many relevant variables often contain missing data for some years or for some countries, although it is now possible to fill in data gaps in an increasingly robust and efficient way.

In addition to the logit and random forest models, other methods such as neural networks, lasso, or discriminant analysis exist. However, the logit model and the random forest are among the most widely used models in the field of conflict prediction.

Since our aim is to construct a structural conflict risk index, should we use only the structural factors of violence as explanatory variables? This question is a matter of statistical inference. Since conflict is a multifactorial phenomenon, including only structural variables, however numerous they may be, would lead to a bias due to the omitted variables, which can affect both the onset of new conflicts and the structural factors in the long term. One option would be to have each variable associated with structural risk interact with each of the variables associated with non-structural risk. This would result in countless variable/interactions, making estimation and interpretation of the results impossible. In this context, the logit model and the random forest are not able to handle this modeling satisfactorily. We hypothesise that the trigger of conflict would be the result of two groups of factors - structural and non-structural. It is therefore simpler to deal with the interaction of the two groups of factors through a Boolean logit model.<sup>10</sup>

### **The Boolean logit method: what is it, what does it bring?**

Understanding and anticipating violent conflict is a complex exercise. This complexity is poorly handled by most standard statistical techniques. It involves the non-additionality that results from the cumulative and interactive process of the influence of explanatory variables on whether or not conflicts are triggered.

Multiple variables and their interactions contribute to the risk of conflict. The idea behind the use of the Boolean logit model is that the onset of a new conflict would be the result of the interaction of two types of factors: structural risk and non-structural risk. The structural risk is considered to be the long-term risk capturing the structural characteristics and vulnerability of a country. The non-structural risk which fluctuates more, is related to contemporaneous conditions and shocks caused by bad policy or external circumstances. The accumulation or intensification of structural risk prepares and feeds non-structural risk, which in turn contributes to the outbreak of conflict.

<sup>10</sup>. See Braumoeller (2003).

The Boolean logit model is better suited to capture the causal complexity of this phenomenon than the models mentioned above. Consequently, it improves the predictive power (or risk assessment) of conflict outbreaks. Its main disadvantage, like the logit model presented above, lies in the subjective or arbitrary choice of the explanatory (or latent) variables, which is left to the researcher depending on his, or her, knowledge or conception of the phenomenon to be explained or predicted (in this case, conflict).<sup>11</sup>

### Box 3: The Boolean logit model

*If the dependent variable  $Y$  is the product or the combination of structural factors (structural risk) and non-structural factors (non-structural risk), respectively  $R_S$  and  $R_{NS}$ , the probability of conflict arising from structural risk is determined by  $\Pr(R_S)=p_S$ ; the probability of non-structural risk is determined by  $\Pr(R_{NS})=p_{NS}$ . Each of these probabilities can be expressed using a logit model.*

$$\text{With } \Pr(R_S) = \frac{\exp(\beta_S X)}{1 + \exp(\beta_S X)} \text{ and } \Pr(R_{NS}) = \frac{\exp(\beta_{NS} X)}{1 + \exp(\beta_{NS} X)}$$

*Each risk is associated with its own explanatory variables with the parameters  $\beta_S$  for structural risk and  $\beta_{NS}$  for non-structural risk. If the conflict is triggered by a single risk type, the Boolean logit becomes identical to the standard logit model.*

*Structural risk and non-structural risk are not directly observed.<sup>12</sup> They can be treated as unobserved latent variables. Their impact on the conflict onset is estimated through the inference of multiple variables, each measuring a part of each risk. Similarly, the impact of each of these variables on the conflict onset is determined by the unobserved latent variable. Consequently, each of the two risks can be estimated separately. For a given country, this property makes it possible to measure the changes over time in the structural risk and the non-structural risk.*

11. In addition, the likelihood function of the Boolean model can be highly irregular with sometimes erroneous p-values. Therefore, inference across confidence intervals is performed using the bootstrap method, which is time consuming to execute.

12. If both structural and non-structural risk are observed, they can each only be integrated into a logit or probit model by means of a proxy variable. However, both risks measure multidimensional phenomena; it would therefore be a pity to reduce them to a single dimension by using a proxy variable.



### ► 3. Variables and their rationale

#### Dependent variable

The definition of conflicts is related to the way events are coded in the database to be used. Three data sources (mostly geo-referenced) are mainly used in the conflict literature: the UCDP/PRIO, ACLED, and SCAD databases. These databases are different in terms of their constitution and codification, but also in terms of their geographical and historical coverage. Since the sample for our study covers a wide range of developing countries, we use internal conflicts from the UCDP/PRIO database because of its wide geographical and historical coverage. This database, created by the Centre for Civil War Studies of the International Peace Research Institute Oslo (PRIO), contains information on conflicts since 1946. In the PRIO database, a violent event is only coded as a conflict if it generates at least 25 deaths per year. The database also distinguishes between conflicts according to their intensity. Minor conflicts are those that generate at least 25 deaths per year, whereas major conflicts (i.e. civil wars) are considered to be major conflicts when the threshold of 1,000 deaths per year is crossed. The PRIO database is by far the most complete and most widely used in the literature. It covers all countries of the world, which makes its use necessary here. However, the PRIO database has limitations, including the very restrictive threshold of 25 deaths per year used for coding conflict (see Box 4). Our conflict variable is a dichotomous variable indicating whether or not a new conflict has occurred.

#### Box 4: How do we measure conflict? What are the options?

##### **Limitations of the dependent variable used in the study**

*The UCDP/PRIO database, because of its geographical and historical coverage, is the most widely used in conflict studies. However, in most conflict prediction studies using the UCDP/PRIO database, the risks of armed conflict outbreaks are relatively low. There are two main reasons for this. First, the study focuses on the outbreak of new conflicts, measured by "onset" and not on whether or not there is a conflict ("incidence") in the country in a given year. This creates the rarity of the event in the database. Some countries, which are known to be in constant conflict, often due to a single conflict that lasts for years or even decades, are nevertheless marked with a "o" except for the year in which the conflict started.*

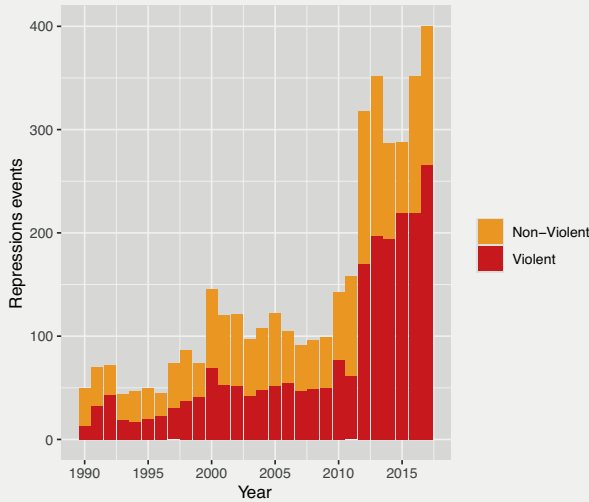
*Second, the "scarcity of conflicts" in the database is made worse by the very restrictive threshold for the inclusion of conflicts in the UCDP/PRIO database. According to this database, an event is only considered as a conflict if it generates at least 25 deaths during the year. This is a relatively high threshold, all the more so since conflicts involving armed belligerents and likely to cause many deaths are less and less numerous. In a chaotic world*

where people aspire to greater democracy, social justice, and well-being, the social contract and the legitimacy of the State are constantly under threat in most countries, particularly in fragile States. Social pressure is growing, and there are many protests, social and political demonstrations that are more or less violently repressed. These events, because they often result in fewer deaths, are generally not considered in the UCDP/PRIO database. However, because of their occurrence, they can sometimes have the same dramatic consequences as the high mortality armed conflicts present in the UCDP/PRIO database.

To overcome this limitation of the UCDP/PRIO database, the Social Conflict Analysis Database (SCAD) is often used when its geographical targeting allows. SCAD provides information on demonstrations, riots, and other social unrest, whether violent or non-violent, spontaneous or organised. Although the SCAD database has changed since its implementation,<sup>13</sup> it still has a disadvantage compared to UCDP/PRIO in terms of geographic and historical coverage.

The Armed Conflict Locations Database (ACLED) is also increasingly used. It collects data on internal political conflicts disaggregated by date, location and actors involved (governments, rebel groups, military and organised political groups). ACLED distinguishes between "rebel violence", which provides information on confrontations between rebels and government, and "civil violence", which deals with riots, protests and violence against civilians.

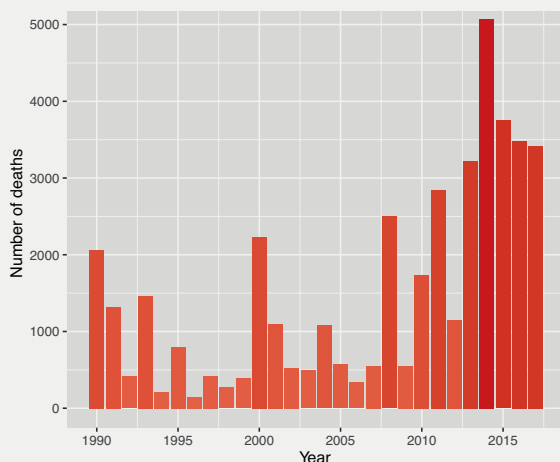
**Changes in the number of repressive events (with or without violence) following social conflicts in Africa**



Source: Authors' calculations based on SCAD database.

13. At the time of its implementation, the SCAD database only covered African countries. Now, in addition to Africa, it covers Mexico, Central America, and the Caribbean.

### Number of deaths due to social conflicts in Africa



Source: Authors' calculations based on SCAD database.

### Differences in coding of the conflict variable in UCDP/PRIO and ACLED

The first difference lies in the definition of the event. There is no threshold for inclusion in the ACLED dataset. It simply records events occurring between designated actors in a specific location on a specific day. The actors considered in the ACLED include, among others, rebels, militias, and organised political groups. In contrast, UCDP/PRIO defines a conflict event as "a contested incompatibility that concerns government and/or territory where the use of armed force between two parties, of which at least one is the government of a state, results in at least 25 battle-related deaths in a calendar year".

Restricted to events resulting in at least 25 deaths, UCDP/PRIO therefore has fewer events than ACLED. This restriction of lethal events comes at the expense of many important events that are excluded. However, the vast majority of conflicts do not necessarily result in fatalities or do not reach the threshold of 25 fatalities. The ACLED therefore makes it possible to take into account these non-lethal and non-violent events. However, this absence of a lethality condition in the ACLED makes it difficult to identify what a "real conflict" is. Indeed, attacks on livestock, for example, are also considered in the database. Moreover, the events are the same: a murder committed by a sniper is considered a conflict event in the same way as the massacre of populations in a given locality. Both events are categorised as "acts of violence against civilians".

*ACLED codes events day by day. For example, a 3-week conflict in a given region would be coded as 21 events, 1 per day, whereas in the UCDP/PRIO database, the same conflict would be counted as a single event, specifying that it lasted 3 weeks.*

*Finally, it should be stressed that UCDP/PRIO is superior in terms of precision and rigor in defining the actors involved in the conflicts. For example, for inter-State conflicts, internal conflicts, and attacks against civilian populations, the actors involved must be the government of a country or an identified organised group. This rigor is lacking in the ACLED.*

### **Explanatory variables related to structural risk of conflict**

This section presents the characteristics and structural factors used in the model that would be triggering the outbreak of conflicts. They are selected from the literature review on the causes of conflict presented above. These factors capture the structural characteristics of the countries and do not change (or change little) over time. In order to easily ensure the stability and the possibly of future updates of the index, only indicators that are regularly updated are used as explanatory variables. They mainly originate from the various statistical services of international organisations, in particular the United Nations and the World Bank.

#### ***GDP per capita***

Among the factors that expose countries to the risk of conflict are economic mechanisms. Poor countries tend to experience more conflict than prosperous countries. As a proxy for the level of prosperity of countries, we use GDP per capita. This variable (in constant 2010 dollars) is taken from the World Bank's World Development Indicators (WDI).

#### ***The population***

The literature on conflict considers population size to be a determining factor in the outbreak of conflict. Countries with large populations may face the difficulty of controlling activities at the local level and thus allow insurgent groups to recruit new combatants. Similarly, large population size creates an increased demand for resources, which if insufficient, generates violent conflict. Another justification for including population size as a structural explanatory variable is that the armed-conflict dependent variable, derived from the PRIO database, is designed using the threshold of 25 deaths. This threshold is more likely to be reached quickly when the population size is high than when it is low. The population variable is derived from the United Nations Population Division database.

## **Human Capital**

Policies which ensure the growth of human capital could lead to a reduction in the risk of conflict. The hypothesis is that individuals with low levels of human capital are more likely to be unemployed and can therefore be easily mobilised for violent demonstrations or recruited by rebels for military operations. We use here the Human Capital Index (HAI)<sup>14</sup>, established by the United Nations Committee for Development Policy and used as one of the three criteria for identifying least developed countries (LDCs). The historical series of this indicator are obtained from FERDI.

## **Structural economic vulnerability**

We believe that countries facing structural economic handicaps are more exposed to the risk of conflict than others. Structural economic vulnerability is the result of countries' recurrent exposure to exogenous shocks, whether natural or external. We use a revised version of the Economic Vulnerability Index (EVI) developed by the UN Committee for Development Policy and used with HAI and per capita income to identify LDCs. In the exposure components of the index<sup>15</sup>, we use variables relating to the structure of the economy (concentration of exports of goods and the share of agriculture, forestry and fisheries of GDP), while the shock components include natural shocks (victims of natural disasters and instability of agricultural production), and instability of exports of goods and services. The EVI retrospective series are produced by FERDI.

## **Vulnerability to climate change**

The issue of climate change as a risk to the security of Nations is increasingly present in the international political discourse. The manifestations of climate change confront humanity with new scenarios, affect the ability of countries to govern themselves, and generate violent conflicts. As a measure of climate change, we use FERDI's Physical Vulnerability to Climate Change Index (PVCCI). This composite index has the advantage of taking into account various manifestations of climate change (floods, drought, hurricanes, etc) with totally exogenous physical components that are calculated based on very long time frames.

14. We use the 2015 review of the HAI that includes, two health variables (infant and child mortality rate, prevalence of undernourishment) and two education variables (secondary school enrolment rate and adult literacy rate). Since the triennial review of 2018, an additional variable (maternal mortality) has been added by the CDP.

15. In its official version, the EVI is composed of two components: exposure and shocks. The exposure component includes the small size of the population, remoteness from world markets, share of the population living in sea level areas, structure of the economy (concentration of exports of goods and the share of agriculture, forestry and fisheries of GDP). The shock component includes natural shocks (victims of natural disasters and instability of agricultural production) and the instability of exports of goods and services.

### ***Social fractionalization***

We take into account the possibility that ethnolinguistic and religious fractionalization may have an effect on the outbreak of conflicts. This hypothesis is widely discussed in the conflict literature with varying results for the effect of ethno-linguistic and religious fragmentation on the triggering of conflicts. The data used come from the work of Fearon and Laitin (2003).

### ***Regional terrorism***

The resurgence of conflicts in the world in recent years has been occurring at a time when the phenomenon of terrorism is on the rise. Terrorism is emerging as a cross-border phenomenon. Countries close to the hotbeds of terrorism are more exposed to armed conflict. We capture regional terrorism by the level of structural (long-term) exposure to terrorism of each country and its neighbours. We use the terrorism sub-index derived from the Internal Violence Index (IVI)<sup>16</sup> produced by FERDI. This standardised sub-index takes into account terrorist incidents and the number of deaths and injuries they generate. Regional terrorism is determined by the geometric mean of the terrorism sub-index of each country and its neighbours. Explanatory variables related to non-structural conflict risk

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In contrast to structural risk variables, non-structural conflict risk variables are more volatile and reflect current conditions and shocks caused by bad domestic policies or international imbalances. For most of these variables, we estimate non-structural conflict risk from their variation between year  $t-5$  and year  $t-1$ .

### ***Change in GDP per capita***

When the economic situation worsens, the risk of internal tensions and conflicts increases. This hypothesis is pervasive in the conflict literature. We attempt to estimate the risk of conflict in year  $t$  from the change in GDP per capita between  $t-5$  and  $t-1$ .

### ***Change in the level of foreign direct investment (FDI)***

Foreign direct investment is likely to reduce the likelihood of the outbreak of civil conflict in the host country. These investments can become a force for peace and stability, creating economic and social opportunities which minimise grievances against the authorities and reduce the risk of young people enlisting in rebellion. Our variable here is the change in FDI between year  $t-5$  and year  $t-1$ . The FDI data come from the United Nations Conference on Trade and Development (UNCTAD).

<sup>16</sup>. It is an index that measures internal violence in its various forms in developing countries. It is composed of four sub-indices: armed conflict, crime, terrorism, and political violence (see Feindouno et al., 2016).

### ***Change in the level of exports***

It is estimated that trade flows, especially exports, could have a negative effect on the risk of new conflicts. The variable used here captures the variation in exports between year  $t-5$  and year  $t-1$ . Data on exports of goods and services are taken from the United National Statistics National Accounts Main Aggregates Database.

### ***Extreme weather shocks***

Extreme weather shocks are likely to lead to conflict through a number of causal mechanisms, including slower growth for countries whose economies are highly dependent on climatic conditions. Shocks are defined in terms of the deviation of current levels of climate variables from their long-term trend. The climate variables considered are temperature and rainfall, for which data are provided by the Climate Research Unit of the University of East Anglia.

### ***Political instability***

Political instability could increase the level of conflict risk. In the conflict literature, the hypothesis of an inverted U-shaped relationship between democracy and conflict is often accepted. Consolidated democracies and autocracies have a lower risk of conflict than intermediate or transitional regimes. We identify political instability by a change of three or more points over the last three years in the Polity2 Index<sup>17</sup> from the Polity IV database<sup>18</sup>.

### ***International food price shocks***

Rising international food prices could lead to increased food insecurity and generate conflict in countries with low levels of food self-sufficiency. For example, the rise in international food prices in 2007 and 2008 led to various demonstrations and riots in several African countries such as Burkina Faso, Cameroon, Côte d'Ivoire, Senegal, and Mauritania. The shocks are calculated from the deviation of the food price index from its long-term trend. The food price index used here is that established by the Food and Agriculture Organization of the United Nations (FAO).

### ***Conflicts in neighbours***

This variable takes account of neighbour effects through the contagion effect of civil conflicts. The literature indicates that one of the main risk factors for conflict in a country is the presence or outbreak of conflict in neighbouring countries.

17. This index, which varies between -10 (total autocracy) and 10 (total democracy), indicates the type of political regime in a country at a given time.

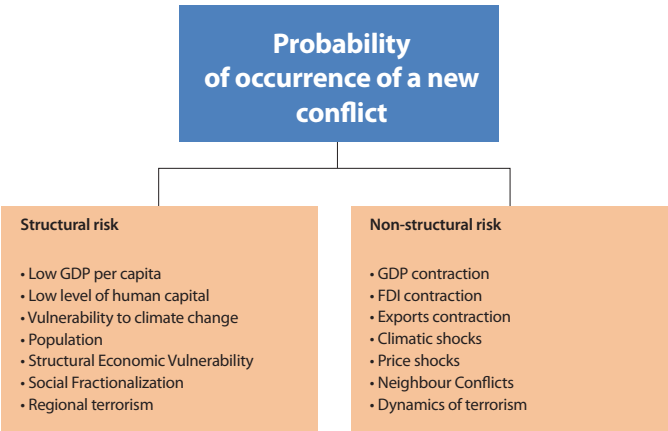
18. See Marshall, Gurr, and Jaggers (2018).

This risk is exacerbated by the proliferation of weapons of war in the presence of porous borders. For each country, we construct a dichotomous variable indicating the presence of conflicts in neighbouring countries between year t-5 and year t-1.

**Regional dynamics of terrorism**

We believe that the recent dynamics of terrorism in a State and its neighbours have the potential to generate armed conflict. This dynamic is captured here by the variation between year t-5 and year t-1 of the quadratic mean of the terrorism sub-index, taking into account terrorist incidents and the number of deaths and injuries they generate in each country and its neighbours.

**Figure 12:** The risk estimation model



Source: Authors.



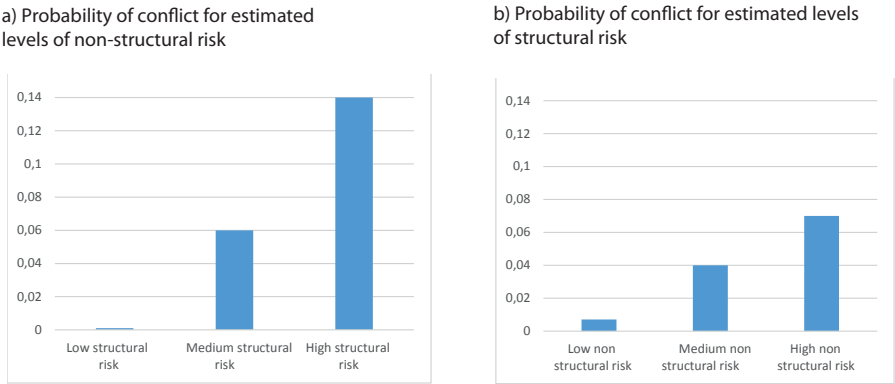
## Part V: The Risk of Internal Conflict in Developing Countries

This section presents the results of the approach presented above. A preliminary analysis is carried out on the modelling of structural risk and non-structural conflict risks, which also shows how the two risks can be combined to obtain a synthetic index of conflict risk, which provides a clearer reading of the overall conflict risk and allows its assessment in different developing countries. Finally, the section deals with a case study, focusing on the Sahel region considered by experts as one of the most vulnerable to conflict risk.

### ► 1. Analysis of modelling

Figure 13 shows the changes in the risk of conflict outbreak as a function of the levels of structural risk and non-structural risks of conflict. The left-hand side of Fig 13 (a) shows a bar chart of the predicted probability estimates of conflict based on the estimated values of the non-structural risk equation for: 1. the structural risk from a standard deviation below the mean (low structural risk), 2. at the level of its mean (medium structural risk), 3. a standard deviation above the mean (high structural risk). The right-hand side of Fig 13 (b) shows a bar chart of the predicted probability estimates of conflict based on the estimated values of the structural risk equation for: 1. the non-structural risk from a standard deviation below the mean (low non-structural risk), 2. at its mean (medium non-structural risk), 3. a standard deviation above the mean (high non-structural risk). The values displayed are median probabilities. It can be observed that the probability of conflict initiation increases with structural risk. For low levels of structural risk, the probability of conflict initiation is almost zero. This probability, which is set at 6% for medium levels of structural risk, increases to 14% when the structural risk is very high. Similarly, non-structural risk increases the probability of conflict, but less than structural risk. The probability of triggering conflict is estimated at 0.7%, 4% and 7% for low, medium, and high levels of non-structural risk respectively. This shows that structural risk is more important than non-structural risk in the outbreak of violent conflict.

**Figure 13:** Probability of conflict as a function of structural and non-structural risks



Source: Authors' calculations.

The coefficients<sup>19</sup> derived from the estimates indicate that vulnerability to climate change, population size, ethno-linguistic fragmentation, and regional terrorism have a positive impact on the structural risk of conflict. The coefficient associated with human capital is negative and significant, showing that the structural resilience of countries contributes to reducing their structural risk of conflict. However, it appears that per capita income, a proxy for countries' prosperity, does not significantly affect structural risk. This variable is still significant with a negative coefficient when introduced into the regression without the human capital variable. This indicates a correlation between the two variables. Prosperous nations are often also those with high human capital and vice versa.

An increase in GDP per capita and foreign direct investment (FDI) between year t-5 and year t-1 reduces the non-structural risk of conflict. In contrast, conflicts in the region over the last five years, political instability, positive temperature shocks, and rising international food prices all contribute to increasing the non-structural risk of conflict. The impact on non-structural risk seems to be most important for increase in GDP per capita, increase in FDI, and presence of conflicts in the region during the last five years. Economic factors seem to take precedence over other factors that could trigger conflict. For example, countries whose economies are highly dependent on FDI are less prone to violent conflict because they have little incentive to engage in it, or simply do not have sufficient resources to spend on costly military operations.

19. Several estimates were made and two specifications very close in terms of the magnitude of the coefficients were chosen. The choice of the final model is based on the Akaike information criterion.

## ► 2. Combining the two risks into a synthetic index of conflict risk

For a better understanding of the risk of conflict triggering, it is important to be able to combine structural risk and non-structural risk into a single synthetic index of overall risk. Since the triggering of conflict is the result of the interaction of structural risk with non-structural risk, the overall risk can be obtained by multiplying the two risks. This multiplicative relationship to aggregate the two risks is similar to that of a geometric mean. However, once the two risks have been estimated, it is possible to envisage other choices. Indeed, there is no universal method for aggregating the components; the choice of aggregation method and weighting depends on the objective assigned to the index.

### **Box 5: How can the two types of risk be combined?**

*Here we use the root mean square to aggregate structural and non-structural risk. In order to take into account the large fluctuations in non-structural risk from one year to the next, we apply a three-year moving average to non-structural risk. The quadratic mean approach has the advantage of combining the properties of multiplicative aggregation (geometric mean) and additive aggregation (arithmetic mean). While the aggregation essentially reflects the degree of substitutability between the two risks estimated in the overall index, the weighting indicates the relative importance of each risk in their contribution to triggering conflicts. An overall index, with a value between 0 and 1, for each country,  $i$ , and each year,  $t$ , can then be calculated using the following formula:*

$$Index_{it} = \sqrt{\frac{(\widehat{\text{non structural risk}}_{it}^2 + \text{structural risk}_{it}^2)}{2}}$$

The overall index resulting from this combination of structural risk and non-structural risk may fluctuate over time in line with the dynamics of non-structural risk. While structural risk, which stems from factors inherent in the structure of countries, is stable in nature, it is sustained by non-structural risk, which is more responsive to the economic situation and factor contingencies.

The result of this combination and the rankings for the 27 countries<sup>20</sup> with the highest risks are presented for the year 2017 in Table 2 and Chart 14.<sup>21</sup> These 27

20. This corresponds to the first quartile of the overall risk distribution in 2017.

21. Most countries have data for the latest year (2017), with the exception of Venezuela (2015) and Libya (2014). Sudan, Syria, and Singapore, lacking sufficient observations, were excluded from the analysis.

countries, for which the risk of conflict is highest, are also those with the greatest need for prevention. Their rigorous identification is a prerequisite for any large-scale political action. However, the results for 2017 only reflect a one-off situation of global risk. Overall risk, due to the fluctuating aspect of the non-structural risk that it comprises, can vary enormously from one year to the next, as we will see in greater detail below in the case of the Sahelian countries. For this reason, the last column of Table 2 also shows the rate of increase<sup>22</sup> of aggregate risk over the past 10 years. In contrast to the fixed situation of risk in a given year, these rates of increase better reflect the dynamics of conflict risk in countries. In this sense, they highlight countries that do not necessarily present the highest conflict risks, but those with high rates of increase which deserve special attention. These countries are mainly in Sub-Saharan Africa, the Middle East, Central America, and Latin America.

The overall conflict risk varies from 0.04 to 0.87 with a nearly-symmetric distribution (mean of 0.48 and median of 0.49) and a standard deviation of 0.2. The countries with the highest risk are Iraq, India, Nigeria, Egypt, Niger, and Chad. Of the 10 countries with the highest conflict risk, 6 are in Sub-Saharan Africa. On the other hand, among the countries in Table 2 with a significant increase in their overall risk over the 2008-2017 period, are Libya, Saudi Arabia, Yemen, Iraq, and Bahrain. However, some countries not included in Table 2, due to their relatively low overall risk, show fairly significant rates of increase in their risk. These include Djibouti, Madagascar, Haiti, Peru, Ecuador, Honduras, and Brazil.

Figure 14 shows the structural risk for the year 2017 and the average non-structural risk over the last 3 years. Only those countries with a structural risk greater than 0.25 are named on the graph. Countries such as Iraq, Niger, Nigeria, Egypt, Chad, India, and the Democratic Republic of Congo have high scores for both types of risk (scores above 0.5 and close to 1). The majority of countries in this configuration are in Sub-Saharan Africa.

22. These growth rates, calculated by regressing the overall risk of conflict over time, take into account all values over the last ten years.

**Table 2:** Conflict risk indicator in 2017 and rate of increase from 2008 to 2017 for countries with the highest risk

Rank	Country	Conflict risk index	Rate of increase of risk between 2008 et 2017
1	Iraq	86,95	7%
2	India	86,11	2%
3	Nigeria	86,01	3%
4	Egypt	85,38	3%
5	Niger	81,90	4%
6	Chad	80,65	0%
7	Pakistan	78,07	0%
8	Central African Republic	77,40	6%
9	Kenya	74,21	3%
10	Democratic Rep. of Congo	74,17	-1%
11	Tanzania	73,15	1%
12	Mali	70,59	4%
13	Libya	70,51	12%
14	South Africa	69,95	5%
15	Saudi Arabia	69,46	7%
16	Myanmar	69,30	1%
17	Bangladesh	69,05	-1%
18	Bahreïn	68,63	7%
19	Yemen, Rep.	67,92	6%
20	Turkey	67,52	5%
21	Afghanistan	67,13	3%
23	Tunisia	66,61	6%
24	China	66,13	-1%
25	Guyana	65,54	7%
26	Lebanon	65,44	2%
27	Cameroon	64,83	4%

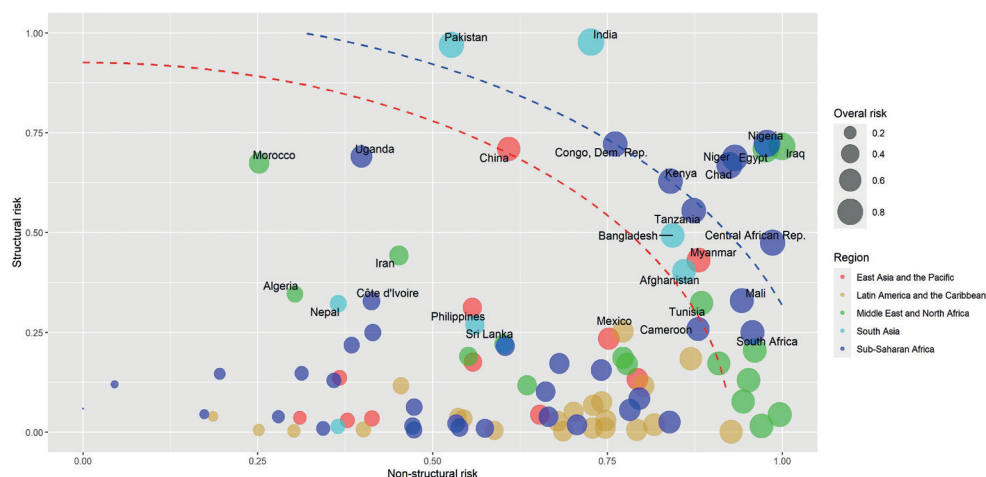
Source: Authors' calculations.

The overall level of risk for some countries may be questionable. This situation, which generally concerns small countries, is mainly due to two reasons: (i) the coding of conflicts in the UCDP/PRIO database based on the limit of 25 deaths per year, which has the effect of increasing the risk of conflict in large countries and reducing it in small countries<sup>23</sup>, ii) the discrepancy between the latest years available for the data and the often rapid change in the international geopolitical

23. The PRIO database was nevertheless chosen because of the broad geographical and temporal coverage it offers. Following this study, a new analysis is planned in which less restrictive conflict databases will be used in terms of coding. These are, for example, the ACLED and SCAD databases, even though with the latter, the geographical and temporal coverage will be weaker. In this case, the analysis could be based on a small sample of African countries (see discussion in Box 4).

context; this, added to the significant contribution of non-structural risk, makes the results of overall risk more volatile (as shown below in Figure 17 over time for the Sahel countries).

**Figure 14:** Overall risk as a function of structural and non-structural risk in 2017

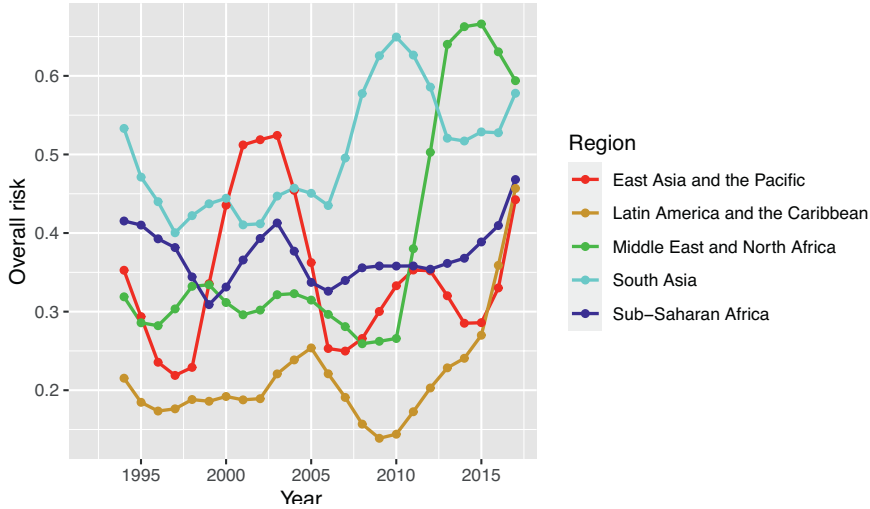


Note: The blue and red dashed lines indicate the last decile and the last quartile of the overall risk distribution, respectively. Countries such as Syria, Sudan, South Sudan have been excluded as they do not have sufficient data for the estimates.

Source: Authors' calculations.

Analysis at the regional level, as presented in Figure 15, reveals that the overall risk is not the same everywhere.<sup>24</sup> Its level and dynamics differ from one region to another, with a higher risk for South Asia over the whole period except for the first 3 years of the 2000s, but especially after the year 2012, when the Middle East and North Africa, due to the big increase in their non-structural risks over the period, show a higher overall risk. It should be noted that the overall risk for all regions increased significantly during the 2010 decade, particularly for Latin America and the Caribbean, the Middle East and North Africa, Sub-Saharan Africa and, since 2015, strongly for East Asia.

24. For the sake of clarity, the 10 countries in the Europe and Central Asia region present in the sample are not represented in the figures in this section. These are Armenia, Azerbaijan, Cyprus, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Turkey, Uzbekistan.

**Figure 15:** Changes in average conflict risk by region, 1992 to 2017

Source: Authors' calculations.

This regional reading of the overall risk, although fundamental in the strategy of conflict resolution at the regional level due to contagion, hides disparities between countries in the same region. To better understand the overall risk of conflict, it is important to understand the dynamics of structural and non-structural risks within each region (or country).

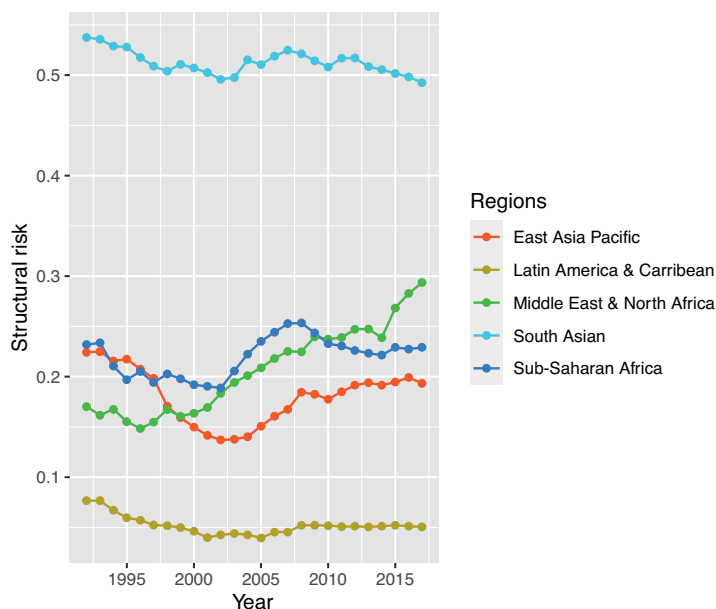
### Analysis of structural risk dynamics

The structural risk of conflict ranges from 0 to 0.98 with a right-spread distribution (mean 0.20 and median 0.11) and a heterogeneous distribution with a standard deviation of 0.23. The countries with the highest structural risk of conflict are India, Pakistan, Nigeria, the Democratic Republic of the Congo, and Iraq. These countries are characterised by a large population size, relatively high ethnic fragmentation, and are located in highly turbulent geographical areas where terrorism and armed conflict are commonplace. Countries such as Pakistan and Iraq have been mired in conflicts that have lasted for several decades. Several minor and even major conflicts are still active in India and the Democratic Republic of Congo. For several years Nigeria has been facing the terrorist attacks perpetrated by Boko Haram, not to mention internal armed rebellions that maintain high tension in some parts of the country.

In contrast, Guyana, Trinidad and Tobago, Georgia, Armenia, Uruguay, and Paraguay are among the countries with the lowest structural risks (near zero). These countries are generally characterised by their relatively small size. They are not necessarily free of social tensions and upheavals which often generate few deaths, which explains

their low level of structural risk. Such events are not considered in the UCDP/PRIOD database used in this study. In addition, some countries, such as Georgia, have experienced conflicts in the past, which have been resolved by reducing the internal structural factors that contributed to their outbreak. Nevertheless, Georgia continues to occupy a significant place in the media or in expert judgements due to the general context prevailing in the Caucasus region.

**Figure 16:** Changes in average structural risk by region, 1992 to 2017.



Source: Authors' calculations.

Structural risk, which captures the intrinsic structural characteristics of countries, has very small fluctuations over time, as shown in Fig 16. An analysis was carried out by observing the changes in the structural risk of conflict in different regions of the world. We observe that structural risk is not the same everywhere. Over the entire period, the results for South Asia are higher than the other regions (with no intersection with the other curves), even if we note a continuous decline in the structural risk after 2010. The high risk in this region is mainly driven by Afghanistan, Pakistan, and Afghanistan, which have the highest scores.

In contrast to South Asia, the structural risk of conflict in Latin America and the Caribbean appears very low and stable, especially after 2010. This may seem paradoxical as the region is considered to be one of the most violent in the world. However, a particular form of violence characterises Latin America and the Caribbean, namely crime. The countries of the region have the highest homicide rates in the world. Latin America and the Caribbean seem less exposed to the structural risk of conflict,



especially when conflict is defined in the sense of UCDP/PRIO. Indeed, few episodes of conflict outbreaks were recorded in the region during the period under study.<sup>25</sup> In recent years, the region has been shaken by social manifestations whose reasons are as diverse as the countries themselves. The simultaneous social unrest in Bolivia, Chile, and Ecuador bears many similarities to the Arab Spring in North Africa. These demonstrations, although violently repressed most of the time, often do not meet the criteria for inclusion as a conflict in the UCDP/PRIO database.

In the Middle East and North Africa, the structural risk is less stable over time. For this region, we note a continuous increase in structural risk over the decade 2010, and again after 2014. Similarly, the levels of structural risk and their change are heterogeneous. While Morocco saw its structural risk fall continuously and sharply in the 2000s, countries such as Egypt, Iran, and Iraq saw their structural risk increase over the same period. For Middle East and North Africa the increase in structural risk after 2014 is particularly due to Iraq. This increase could have been even greater if Syria's structural risk was taken into account, unfortunately this could not be estimated due to the lack of reliable data on Syria per capita GDP after 2007.

After South Asia and the Middle East and North Africa, Sub-Saharan Africa is the region with the highest structural risk. The region is very heterogeneous in terms of the level of structural risk. Different areas, with different levels of conflict, can be distinguished, and countries in conflict do not experience violence everywhere on their territory. Sub-Saharan Africa experienced a sharp increase in its structural risk between 2003 and 2008 and after 2014. The factors affecting structural risk in the region are mainly related to low per capita GDP, human capital, and ethnic fragmentation, as well as the neighbour context, which is marked by the risk of conflict contagion.

### Analysis of non-structural risk dynamics

Compared to the structural risk of conflict, the non-structural risk fluctuates more. Looking at the average scores over the last 5 years, non-structural risk varies between 0.05 and 0.99, with a mean of 0.56, a median of 0.57, and a standard deviation of 0.24. The countries with the highest scores, on average, for the period 2013-2017 are the Central African Republic, Nigeria, Egypt, Bahrain, and Singapore, while Burundi, Uzbekistan, Zimbabwe, Bolivia and Benin are among the countries with the lowest scores. The countries with the highest structural risks are not necessarily those with the highest non-structural risks and vice versa. This is illustrated by the case of Bahrain and Singapore which are among the countries with high non-structural risks while their structural risk scores are very low or close to zero. Singapore's high non-structural risk can be explained by the country's exposure to regional terrorism. Singapore is the country in the Southeast Asian region that

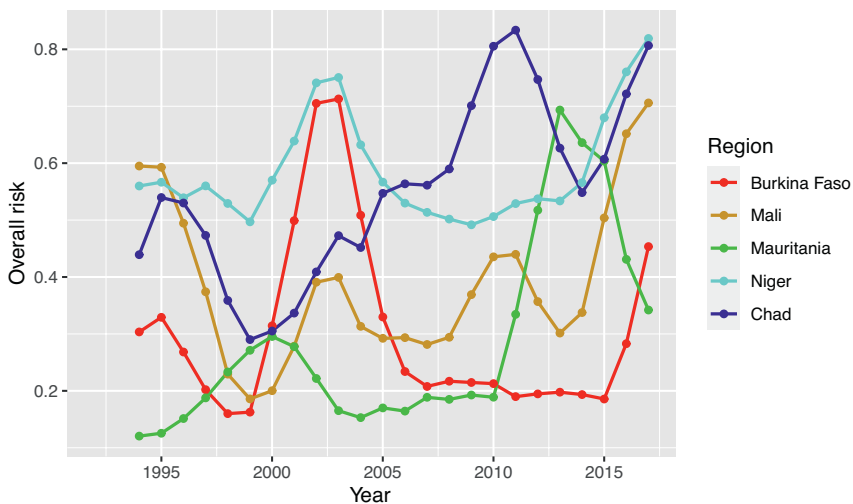
25. These include El Salvador, Colombia, Guatemala (in 1980), Nicaragua, Peru (in 1982). Other episodes lasting less than 3 years have been recorded in Mexico (1994), Panama (1989), Paraguay (1998), Venezuela (1992).

takes the strongest stance against terrorism, making it a target for terrorist groups, particularly because of its pro-USA stance. Like Singapore, Bahrain was in the midst of violent political demonstrations during this period, but also faced the threat of terrorism. The conflict is therefore not the result of structural risk alone, but rather a combination of structural and economic factors. For example, Latin America and the Caribbean, a region recently affected by numerous violent phenomena and social conflicts, have a low structural risk but their non-structural risk has increased significantly after 2009, exceeding in 2017 those of Sub-Saharan Africa and the Middle East.

### ► 3. Case Study: G5 Sahel countries

The risk indicators identified in this study, as noted above, are not designed for predictive purposes. They do, however, provide a snapshot over time of the structural and non-structural risks of conflict outbreaks, and can therefore be an interesting source of information for early warning because of their ability to show situations that have worsened over time. The case of the G5 Sahelian countries of Burkina Faso, Chad, Mali, Mauritania, and Niger is illustrative in this respect. The Sahel, a region as large as Western Europe, faces many security and development challenges. Because of the porous borders and the failure of the States that make up the region, the Sahel region has for several years been a zone of instability and insecurity marked by transnational religious terrorism, various types of trafficking, and the proliferation of actions by armed insurgent groups which are trying to extend their influence. The causes of the recurrence of security crises in the region are multiple, intertwining structural and non-structural factors.

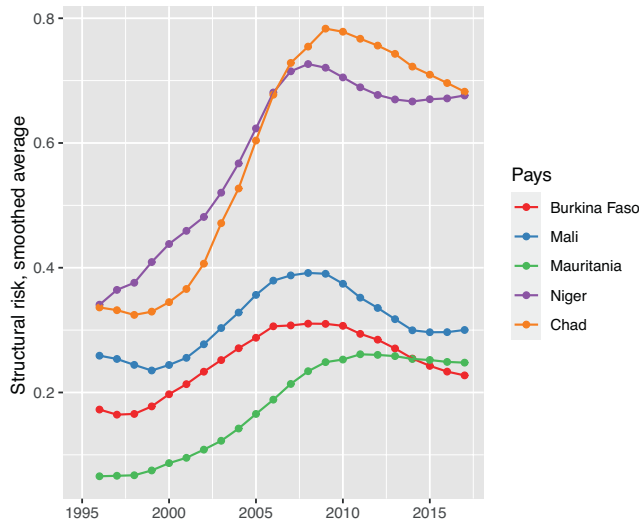
**Figure 17:** Changes in the average conflict risk in the Sahel, 1992 to 2017



Source: Authors' calculations.

Figure 17 shows the change in the overall conflict risk in the Sahelian countries. The different curves clearly show the interaction between structural and non-structural factors and the very significant role played by the latter, which fluctuate more, in triggering conflicts. Overall, while the decade of the 2000s was marked by an overall decline or stagnation in the risk of conflict in the Sahelian countries, the curves rise after 2010 due in particular to the increased fragility of the states in the region, which has been shaken by terrorist incidents. Understanding the global risk of conflict requires an exploration of the dynamics relating to each of the risks that make it up.

**Figure 18:** Smoothed structural risk of the G5 Sahel countries



Source: Authors' calculations.

Smoothed curves (over 5 years) of the structural risk dynamics of the G5 Sahel countries show that Chad and Niger have the highest scores (Fig 18). Chad, whose structural risk increased sharply in the 2000s, has had one of the highest scores since 2007. This risk, like that of the other G5 Sahel countries, declined during the first years of the 2010 decade, to reach that of Niger. The context of political uncertainties, armed conflicts, and security deterioration dominating the Sahel has contributed to slowing down this decline as of 2015, since when the structural risk has stabilised overall and increased in some countries of the region.

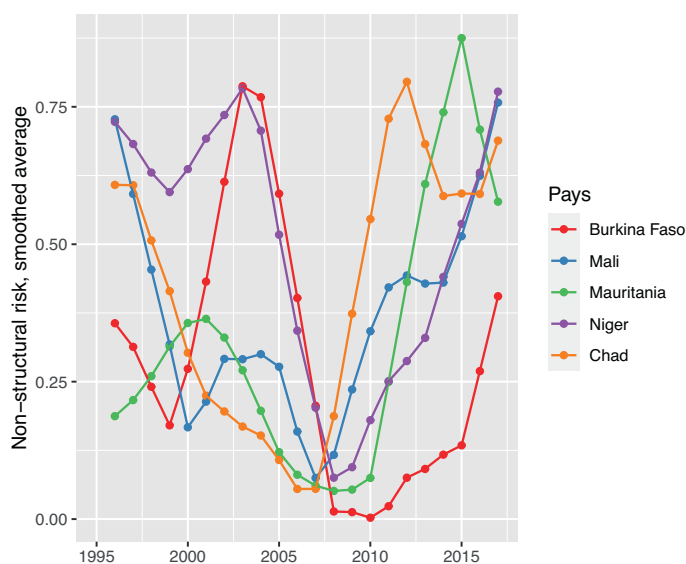
The Sahelian countries are among the most fragile and poorest states in the world, and all belong to the category of Least Developed Countries (LDCs).<sup>26</sup> They are

<sup>26</sup> Similarly, the Human Development Index (HDI), a composite index which measures the average level achieved by the world's countries in 3 key dimensions of human development (health and longevity, access to education, and a decent standard of living) ranks the Sahelian countries among the lowest scores.

characterised by immense structural handicaps, vulnerable economies, low of human capital, and low per capita income. The economies of these countries lack diversification, and are dominated by the production and export of raw materials, exposing them to external shocks related to climatic conditions or commodity prices. The population growth observed in the Sahelian zone is exacerbating social tensions related to access to resources, particularly food production.

Structural vulnerability to climate change, manifested in the region by the advancing desert and increasingly long and severe droughts, is reducing arable land and agricultural yields. This situation is leading to an overexploitation of the available agricultural land, with the corollary of conflicts between farmers and herders. Farmers and herders, who come from different communities, in the absence of any state authority in some areas<sup>27</sup> resort to ethnic militias that are often responsible for killings. The inter-community massacres in 2019 in Mali between Fulani herders and Dogon farmers are an illustration of this, showing the extent to which the ethnic question is a major issue in the Sahelian region, which is made up of several hundred ethnic groups.<sup>28</sup> This community, linguistic and religious mosaic is, in the eyes of observers, far from being a force; on the contrary, it is a source of tension in the region.

**Figure 19:** Smoothed non-structural risk of the G5 Sahel countries



Source: Authors' calculations.

27. As can be seen in the north of Mali, where a kind of Islamist administration is replacing the state administration, including raising taxes.

28. Ethnic tensions and economic rivalries also add to the Islamist insurgency, with accusations that members of the predominantly Peul Muslim ethnic group are linked to Islamists.

The G5 Sahel countries are also exposed to episodic shocks which, combined with structural factors, increase their risk of conflict. These include income shocks, political instability, temperature shocks, the presence of recent conflicts in neighbouring countries, or regional terrorism. Overall, since the late 2000s, there has been a steady increase in non-structural risk in all 5 countries. With the exception of Mauritania (which experienced a significant increase during the 2010-2015 period), the non-structural risk of all other countries in the region increased after 2015. The overall dynamics of Burkina Faso and Niger are similar and instructive. In the second half of the 2000s, the non-structural risks of both countries declined sharply before increasing continuously from 2010 onwards, driven in particular by the sharp increase in the frequency of terrorist acts.

While the ancestral conflicts between herders and farmers are structural, they are exacerbated by climatic shocks. Similarly, the effect of structural economic vulnerability on conflicts in Sahelian countries is undoubtedly amplified by commodity price shocks on the international market. Far from being self-sufficient in food, particularly because of the manifestations of climate change, the countries of the Sahelian region import food, especially cereals. Any rise in the prices of these commodities leads to riots in most countries. For example, rising food prices led to violent demonstrations and riots in late 2007 and early 2008 in several African countries, including the Sahelian countries. The authorities reacted more or less violently to these riots, sometimes resulting in deaths.



## Conclusion

Recent years have seen an increase in the number and intensity of armed conflicts. This has been accompanied by two new phenomena, the increase in the number and intensity of terrorist acts, and the growing role of organised crime in the dynamics of conflicts. However, violence and its intensity are not evenly distributed between and within regions. There are different regions with different levels of conflict based on multiple factors. Most violent conflicts today are located in Asia, the Middle East, and Sub-Saharan Africa. Beyond these trends, this report focuses on violence in its different forms in developing countries.

It is now commonly accepted that conflicts are the result of a plurality of factors, economic, social, demographic, climatic, geographical. By understanding the main drivers of violence, decision-makers can better understand the costs and benefits of certain social and economic investment programmes. Also, by efficiently directing resources and also the attention of decision-makers towards addressing the root causes of violence, countries have a greater chance to begin to invest in a sustainable way in creating a virtuous circle of peace and economic prosperity. In this sense, this study proposes, on the one hand, a retrospective review to identify the main factors that trigger conflict and, on the other hand, different policy approaches through which structural and non-structural factors of conflict can be addressed through prevention.

Finally, in order to better target prevention efforts, the study led to the development of a conflict risk index for developing countries. This index provides a snapshot over time of the structural and non-structural risks of conflict outbreaks, thus constituting an interesting source of information for early warning because of its ability to show situations that have worsened over time. In general, the control of violence is an important factor in the ability of States to provide basic public services to their populations. Thus, exogenous factors can alter the international geopolitical context and exacerbate the factors that trigger conflicts. Such situations, like Covid-19, remain difficult to grasp in the models used to construct conflict risk indicators, even though the various mechanisms detailed in this report make it possible to act on the conflict risk factors linked to the pandemic.

Covid-19 is shaking up the world and appears to be a global tragedy. Its destabilising impact is likely to be felt in the most fragile regions of the world where an increase in violence appears to be one of the likely consequences.

This is "the greatest crisis the world has seen since the Second World War" according to UN Secretary General Antonio Guterres, who has called for making fragile states a priority. A spread of the virus in these states, marked by, among other things,

failing health structures, would be difficult to contain and would have even more dramatic consequences than those observed elsewhere. Fragile states develop endemic conflict against the backdrop of a breakdown in the social contract between those who govern and those who are governed. Social tensions exacerbated by inadequate management of the health crisis and its unprecedented economic repercussions could lead to the flare-up of various latent sources of conflict.

In the absence of a vaccine against Covid-19, governments around the world are trying to stem the spread of the virus. Most of them have decided to use the containment strategy. While lockdown strategy appears to be the most appropriate solution against the spread of the virus, its implementation requires considerable resources on the part of the state. However, public resources are insufficient or even non-existent in fragile states, and the forced lockdown of populations could lead to riots and violent conflict, especially when the army is deployed to enforce the containment guidelines. Because of endemic poverty and low levels of savings, the populations of these countries live from day to day. They are forced to travel to markets and sometimes to the streets to earn a daily income, thus contributing to the spread of the virus.

Since the virus appears to affect young people less, the age structure of the population in fragile states may be an intrinsic factor in resilience to the virus. However, this demographic advantage should be strongly tempered by the high vulnerability of these countries to chronic diseases such as malaria, AIDS or tuberculosis, due in particular to the lack of material and human resources in the health sector. The high population density, malnutrition, poor health conditions, and low vaccination coverage in fragile states, particularly in refugee camps, create an explosive environment conducive to the spread of the virus, but also to conflict. In addition, refugee camps are often established at borders; borders, when porous, facilitate not only the spread of viruses but also the circulation of weapons and increase interactions between civilians and rebel fighters, who are known for their high-risk behaviour. This situation further erodes the already fragile social contract between populations and their rulers, thereby promoting political instability and the recruitment of different rebel groups.

The destabilising impact of the health crisis may be reinforced by the likely economic impact of the slowdown in world growth. At a time when global value chains are at a standstill, severely handicapping industrial companies, massive layoffs and the possible collapse of migrant remittances could increase the decay of fragile states. Deteriorating financial capacities of States, especially those with relatively high oil revenues, may lead to reduced investment in social, education, and public health programmes, heighten social tensions, and risk further undermining the social contract.



While some believe that the pandemic will help to calm the fighting spirit in theatres of conflict, the opportunity is too good for rebel forces and jihadist groups to act without attracting the attention of the international community. For rebel groups, it is an opportunity to strike at a time when the central state is weakened and challenged by the difficult management of the health crisis and its corollaries in terms of economic repercussions. The latest events in the Sahel region bear witness to this, where terrorist groups affiliated to Boko Haram have recently launched deadly offensives in Mali, Chad, and northern Nigeria. The losses for the Chadian army were such that President Idriss Déby Itno declared three days of national mourning from 25 to 27 March 2020.

At this rate, if the crisis were to take a dramatic turn, the cards in the most unstable regions could be reshuffled and the many efforts made by the international community in recent years to contain outbreaks of violence could quickly be undermined.



# References

- **Blattman, C., et Miguel, E.** (2010). Civil war. *Journal of Economic Literature*, 48(1), 3-57.
- **Braumoeller, B.** (2003). *Causal Complexity and the Study of Politics*. *Political Analysis*. 198. 209-233.
- **Collier, P., et Hoeffler, A.** (2004). Greed and grievance in civil war. *Oxford economic papers*, 56(4), 563-595.
- **Collier, P., et Hoeffler, A.** (2007). Civil war. In Sandler, T. and Hartley, K. (Eds.) *Handbook of defense economics*, 2, 711-739.
- **Couttenier, M., et Soubeyran, R.** (2015). A survey of the causes of civil conflicts: natural factors and economic conditions. *Revue d'économie politique*, 125(6), 787-810.
- **Fearon, J., et Laitin, D.** (2003). Ethnicity, Insurgency and Civil War. *American Political Science Review*, 97(1), 75-90.
- **Feindouno, S., Goujon, M. et Wagner, L.** (2016) "Indice de la Violence Interne : une mesure composite et quantitative de la violence et de la criminalité internes dans les pays en développement", *Ferdi Working Paper* P151, avril 2016.
- **Garfinkel, M., et Skaperdas, S.** (Eds.) (2012), *The Oxford Handbook of the Economics of Peace and Conflict*.: Oxford University Press.
- **Guillaumont Jeanneney S.** avec **C. Angely, A. Brachet, P. Collier, M. Garenne, P. Guillaumont, B. Joubert, C. Laville, J. de Melo, S. Michailof, B. Miribel, O. Ray et T. Zongo** (2016), Allier sécurité et développement Plaidoyer pour le Sahel, FERDI.
- **Laville C.** (2018) "L'analyse économétrique des conflits internes par l'approche causale : les évolutions d'une littérature en expansion" *FERDI Working paper* P243, décembre 2018.
- **Laville, C. et Vergne, C.** (2018) "Comment analyser le risque sociopolitique ? Une composante clé du risque-pays", *MacroDev*, n°25, AFD.
- **Marshall M.G., T. Gurr et K. Jaggers** (2018), "Polity IV Project: Political Regime Characteristics and Transitions, 1800-2017: Dataset Users Manual", Center for International Development and Conflict Management, University of Maryland.
- **Muchlinski D., D. Siroky, J. He et M. Kocher,** (2016) Comparing random forest with logistic regression for predicting class imbalanced civil war onset data, *Political Analysis* 24(1), 87-103.
- **Rohner, D.** (2018) Économie des conflits : revue de la littérature et guide à l'intention des acteurs de l'aide extérieure, *Revue d'économie du développement*, De Boeck Université, vol. 26(4), pages 5-25.
- **United Nations, World Bank.** (2018). Pathways for Peace: Inclusive Approaches to Preventing Violent Conflict. Washington, DC: World Bank.



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# **The determinants of internal conflict in the world: How to estimate the risks and better target prevention efforts?**

Recent years have seen an increase in the number and intensity of armed conflicts. The dynamics of conflicts have been fuelled in particular by an increase in the number and intensity of terrorist incidents and an increasingly important part played by organised crime. However, the intensity of violence differs between regions of the world and the countries within them. These conflicts are the result of a variety of economic, social, demographic, climatic and geographic factors.

This book, based on a retrospective basis, makes it possible to identify the main factors that trigger conflicts and to distinguish between structural and non-structural factors. It thus makes it possible to target prevention efforts on the root causes of violence.

To this end, it presents an original index of conflict risk in developing countries. Distinguishing between structural risk and non-structural risk factors, the conflict risk index differs from most indices of political fragility.

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