CONFLICT AND PEACE ECONOMICS

ECONOMIA DE CONFLITO E PAZ

Charles H. ANDERTON[1]
Jurgen BRAUER[2]

ABSTRACT: We present an overview of the field of conflict economics. We begin by explaining important distinctions between standard textbook economics and conflict economics regarding assumptions, subject matter, and interrelations between economics and conflict. We then provide summaries of selected economic theories and empirical evidence that together help reveal important aspects of conflict – and peace – through an economics lens. Among the topics covered in the theoretical and empirical overview are why violence is sometimes chosen over peaceful approaches to address intergroup disputes, why it is "rational" for political leaders to sometimes mass kill civilians (and what can be done to prevent this), how social norms of committing harm against outgroups can propagate (or be stopped), why it can be difficult to develop laws and institutions to promote stable peace, and how third-party efforts to promote peace can sometimes make things worse. Lastly, we provide samples of data resources, working paper archives and journals, and readings consisting of major textbooks, handbooks, and edited books in the field of conflict economics.

KEYWORDS: Exchange economy. Appropriation economy. Conflict economics. Peace economics. Rational choice model. Game theory. Network economics.

[1] College of the Holy Cross, Worcester – MA – USA. Professor of Economics and Distinguished and Professor of Ethics and Society. canderto@holycross.edu.

[2] Augusta University, Augusta – GA – USA. Emeritus Professor of Economics. Chulalongkorn University, Bangkok - Thailand Visiting Professor of Economics. brauer.jurgen@gmail.com.

Introduction

Conflict economics studies (1) *economic* aspects of violent conflict such as wars, genocides, terrorism, gang warfare, and the forceful appropriations of assets (e.g., land and mineral resources, human trafficking, cyber theft, criminal syndication) as well as (2) short-term methods of conflict resolution (e.g., third-party mediation) and (3) long-term norm- and institution-building toward irreversible, stable peace. There is some thought that the field may, in time, simply include the whole of safety and security, public and private. Despite being routine, recurring, widespread, long-lasting, and often severe, violence or the threat thereof is generally ignored even in advanced textbook treatments in standard economics. Yet economic analysis of violence is as essential as any other academic discipline in analyzing *why* violent conflicts happen, *how* they are carried out, and *what can be done* to mitigate, resolve, and prevent them.

In this overview of the scope of conflict economics we provide, first, three diagrams that illustrate (1) important distinctions between standard textbook economics and conflict economics, (2) define critical concepts in the field (e.g., conflict, peace, war, security, defense), and (3) highlight some interrelations between economics and conflict. Second, we discuss an illustrative selection of economic theories complemented by examples of empirical evidence that together help reveal important aspects of conflict and peace. They reveal, among other things, how third-party efforts to promote peace can sometimes make things worse, why violence is sometimes chosen over peaceful approaches to address intergroup disputes, why it is "rational" for political leaders to sometimes mass kill civilians (and what can be done to prevent this), how social norms of committing harm against outgroups can propagate (or be stopped), and why it can be difficult to develop laws and institutions to promote stable peace. And third, we provide samples of data resources, working paper archives and journals, and readings consisting of major textbooks, handbooks, and edited books in the field of conflict economics.

Economic aspects of conflict and peace

The four economies

For the past nearly 250 years, standard economics since Adam Smith (1776) and Alfred Marshall (1890) has highlighted the individual and social wel-

fare gains available from the mutually beneficial exchange of goods and services (see Box 3 in Figure 1). The *exchange economy* best functions in a free, private, and competitive environment. Free means voluntary and not coerced; private means in the absence of government laws, rules, regulations, or intervention; and competitive means that for any good or service any buyer can freely switch to purchase from any of a multitude of suppliers and, vice versa, any supplier can freely switch to sell to any of a multitude of buyers. Even as account has since been taken of numerous market imperfections and market failures such as asymmetric information that can benefit one side of an exchange more than the other, monopolization of markets that can lead to unduly high prices and lower quantity or quality of goods and services, or of undesirable social side-effects of private consumption or production (e.g., pollution and environmental destruction), this ideal of free, private, competitive markets still dominates standard economics.

A second economy is the *grants economy* (Box 1 in Figure 1), characterized not by two-sided mutually beneficial exchange but by one-sided beneficial giving (see, e.g., BOULDING; PFAFF; HORVATH, 1972). For example, parents routinely provide huge amounts of resources – and over very many years – to their children without asking for anything directly in exchange. Similarly, people voluntary surrender large amounts of resources to help fund their favorite charities or nonprofit organizations. Likewise, migrant workers remit vast amounts of their earnings to their families back home. Even countries at times provide genuine foreign aid, without asking for anything directly in return. This grants economy is very large – and usually ignored in standard economics.

Figure 1 – The four economies.

	Voluntary (peace & security)	**Involuntary (conflict & violence)**
One-way	**1. The grants economy** (one-sided giving away of resources; voluntary)	**2. The appropriation economy** (one-sided taking of resources; violent or nonviolent coercion)
Two-way	**3. The exchange economy** (two-sided voluntary & mutually beneficial exchange)	**4. The mutual threat economy** (reciprocal threats and violence such as war)

Source: Author's own elaboration.

A third and fourth economies are the *appropriation economy* and the *mutual threat economy* (Boxes 2 and 4 in Figure 1.) These are characterized by the coerced or violent appropriation, or threat of appropriation, of someone else's resources. These, too, are largely ignored in standard economics even as violence, or the threat thereof, obviously is a widespread phenomenon in human social relations. Conflict and peace economics concern themselves with best how to understand boxes 2 and 4 on the right-hand side of Figure 1 and how best to move toward boxes 1 and 3 on the left-hand side.

The borders between the four boxes are drawn with dashed lines to indicate that the four economies are not sharply distinct or mutually exclusive. Instead, the borders are permeable and the economies can "shade" into each other. For example, because of the high likelihood of the one-sided taking of resources, people, communities, companies, and countries invest heavily in defense and security but such investment often is made within the two-sided, mutually beneficial economy.

Key concepts

Within the field, one sees the phrases "conflict", "conflict resolution", "defense", "security", "military", "war", and "peace" economics. These tend to be used interchangeably, as if they all meant the same thing, but there is a structured order among them (see Figure 2). *Conflict economics* is the overarching name of the field, where "conflict" refers to the possibility or actuality of contest and threat of appropriation, and "economics" refers to the method of study, that is, the application of economic theory and tools such as mathematical and statistical modeling. Nowadays, the theory of course includes standard economics, behavioral economics, social (network) economics, and political economy, that is, the inclusion of knowledge from other scholarly disciplines (see Section 2).

Distinct subfields within conflict economics have emerged. Obviously, in order to threaten appropriation some credible force must be available to carry out the threat. This implies funding the needed labor and capital of (armed) forces, such as soldiers and weapons, and also implies opportunity costs, which is what perhaps best characterizes *military economics*, a critical economics prominent as from the 1980s but already seen in Marxist-inspired works on exploitation and imperialism and, later, in "dependency theory" in development economics. Today, it is more tightly focused on the opportunity cost of military expenditure and on government budgetary trade-offs in particular.

Figure 2 – Conflict economics.

CONFLICT ECONOMICS
(The application of economic theories and tools to the possibility or actuality of contest and threat of appropriation)

1. Military economics
➔ Prominent since the 1980s; focused on the opportunity cost of spending economic resources on threat, appropriation, and defense therefrom.

2. Defense & security economics

Public sector
Defense economics
➔ Prominent since the 1960s; mostly focused on *external* perceived or actual enemies.
Security economics
➔ Prominent since the 2000s; mostly focused on *internal* concerns, including homeland defense and the economics of crime & punishment.

Private sector
➔ Includes economics of crime avoidance, mitigation, prevention and (private) punishment; may include aspects of the economics of insurance.

3. War economics
➔ Prominent since pre-World War I; dealt primarily with the anticipated conduct & consequences of "traditional" state-on-state warfare.

4. Conflict and conflict resolution economics
➔ Prominent since the 1980s and 1990s; concerned with the de-development of developing economies due to civil war environments, especially following decolonization of the 1960s.

5. Peace economics
➔ Becoming more distinct and prominent since the 2010s; focused on norm- and institution-building toward stable, irreversible peace, also beginning to theorize the role of the private (business) sector.

Source: Author's own elaboration.

Military economics arose, in part, out of the *defense economics* of the 1960s, which was concerned with topics such as defense budget management, military manpower recruitment (e.g., conscripted versus volunteer forces), bilateral monopolies in defense equipment contracting, and studying free-riding behavior with defense alliances such as NATO. This shaded over into the study of arms production and dual-use technologies, arms rivalries and arms races, and the arms trade and associated arms offset deals. Not yet quite as prominent is the extension, and even merging, of defense economics into public sector *security economics*, especially since 9/11, concerned with intelligence services, cybersecurity, homeland security, and the security of public assets, infrastructure, utilities, and other installations. This, in turn, melds into the separately, well-established *economics of crime*, first made prominent by Gary Becker in the

late 1960s. The private sector, likewise, faces innumerable security concerns and often deals with these through the exchange economy with the acquisition of goods such as perimeter fences, security cameras, biometrics and ID cards, locks, alarms, and firearms as well as the hiring of vast numbers of private sector security guards at schools, workplaces, and entertainment venues. This can also include private retaliation and vigilante justice and, very broadly, some aspects of the *economics of insurance*.

War economics emerged prior to, but in the growing anticipation of, World War I. It dealt primarily with the anticipated conduct and consequences of "traditional" state-on-state warfare in continental Europe and Great Britain as well as with the needed postwar reconversion and reconstruction of economic resources, from a wartime economy back to a peacetime economy. (Incidentally, this was the origin of the International Bank for Reconstruction and Development, IBRD, founded in 1944, better known today as the most principal element of the World Bank Group). Initially, much of the debate among economists had to do with frictions in international trade relations (e.g., countries' mercantilist economic policy postures) and, as such, war economics also studied also the causes of war.

While the term conflict economics can already be seen in the 1950s, it became more salient when economists and quantitative political scientists joined to study the seeming explosion of civil wars following the completion of the era of decolonization in the 1970s, especially in Africa and Asia. The subfield became prominent in the 1990s, with the end of the Cold War and the spectacularly horrific violence in the DR Congo and Rwanda. Much of the underlying concern regarded the effective de-development of economically developing countries so that *conflict economics* and *conflict resolution economics* shaded into each other.

But this type of more narrowly understood conflict economics, while studying causes, conduct, and consequences of civil war in particular, seemed more concerned with short-term conflict resolution and postwar economic reconstruction than with longer-lasting, permanent, and irreversible solutions to achieve peaceful cooperation, preventing war in the first place. Depending on how one counts, one-half of all civil war peace agreements collapse within five years' time and led to renewed violence.

Peace economics, then, essentially asks about stability in the social contract between and among populations. As such it is, in part, concerned with constitutional law (and the economics of such law) as well as with broader norm- and institution-building. Precedents of this type of thinking are already in evidence

in the 1950s and 1960s in the early works of giants of economic thought such as Kenneth Boulding, Walter Isard, and Thomas Schelling.

Interdependencies

Figure 3 displays six interdependencies between economics and conflict. The numbered boxes in the diagram display the interdependencies while the lower boxes provide additional information.

Economics is a social science that focuses on the *choices* actors make, subject to various constraints they face (e.g., budget and time constraints). Box 1 thus highlights that conflict, and peace, are *choices*. Conflict economics assumes that choice theoretic models available in standard economics, such as constrained rational choice and game theory, also can be applied to choices in allegedly non-economic contexts. These include choices for war or peace, choices to intervene in a violent conflict in an effort to promote peace, and even the disturbing choice to target civilians for mass elimination. The lower box indicates that such choices involve the rational weighing of costs and benefits in the usual mode of rational choice modeling and acknowledges that nonrational elements affect choices, too. The latter include phenomena discovered at the intersection of psychology and economics such as reference dependence, loss aversion, and framing effects and those at the intersection of sociology and economics such as peer effects, diffusion of ideologies over social networks, the roles of key players in social contexts, and identity utilities.

The second box indicates that economic conditions can affect the risk, seriousness, and recurrence of violent conflicts. Conversely, economic conditions can affect the likelihood that *non*violent approaches to conflicts are pursued among disputing actors and whether fragile or unstable peace can be reinforced to help bring about stable peace. For example, many empirical studies have found that low economic development or low economic growth correlate to a greater risk of war or mass atrocity (COLLIER; HOEFFLER, 2004; EASTERLY; GATTI; KURLAT, 2006). Some studies have also found that income inequality, particularly *horizontal* inequality, leads to a greater risk of civil war (BUHAUG; CEDERMAN; GLEDITSCH, 2014). As a last example, some studies have found that states that have a relatively high degree of trade integration with the rest of the world are less likely to become involved in war (POLACHEK; SEIGLIE, 2007; KINNE, 2012), although the effects of trade on conflict, or peace, are by no means uniform in the empirical literature (see SCHNEIDER; BARBIERI; GLEDITSCH, 2003 for diverse views).

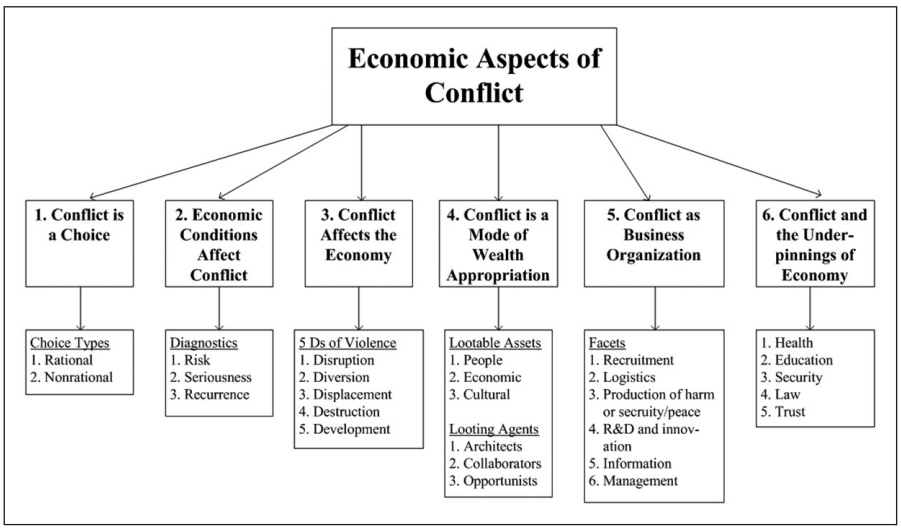
Box 3 highlights that conflict and peace affect economic outcomes. The lower box shows the "5Ds" associated with violent conflict and represents important economic costs of violence. The first D is *disruption*, which includes, for example, war's disruption of trade, education, and growth. The next D, for *diversion*, represents the reallocation of resources away from civilian investment and goods to support attack, defense, or flight during violent conflict. Next are the costs of violence associated with *displacement*, both of people (e.g., refugees) and of capital (e.g., capital flight). *Destruction* of people, property, and land (ecological resources) associated with violent conflict is the next D, followed lastly by the redevelopment *difficulties* faced in post-violence settings such as the economic, political, and socio-cultural reconstructions necessary for a society to move forward. Not shown, but implied, are the economic effects of peace promotion including, for example, the investment costs of disarmament and demobilization, of peacekeeping and peacebuilding missions and operations, and of the general security and peace benefits of peace promotion.

The fourth box shows that conflict can be a mode of wealth acquisition. As shown by the lower box, examples of lootable assets for instance include people (e.g., human trafficking and other forms of slavery), economic assets (e.g., land, minerals, gems), and cultural assets (a people-group's social bonds, history, language, and existence). Throughout human history, various actors have made choices to attack the assets held by others through wars of conquest, empire building, people-group elimination, and the like. Such agents include the architects of conquest and their collaborators as well as opportunists who take advantage of violent circumstances to enrich themselves. At the same time that such attacks occur, other agents allocate resources to defend territory, businesses, farms, and trade routes. As noted, standard textbook treatments of economics assume that production, trade, and wealth accumulation are peaceful activities, but conflict economics explicitly recognizes and models how appropriation possibilities occur alongside of, and often interact with and jointly determine, the standard exchange economic activities of specialized production and trade.

Box 5 emphasizes, as a practical matter, that the prosecution of war or other forms of violent conflict, as well as efforts to promote peace, involve a variety of business- and management-related practices such as those shown by the lower box. The items in the box imply that subdisciplines such as industrial organization, business, and management science have much to offer to the field of conflict economics to better understand how violence is planned and conducted and how those working on peace promotion can improve upon their efforts.

Finally, Box 6 highlights selected societal underpinnings of an economy, which can be undermined by war and supported (or reconstituted) by peace efforts. Those conducting violence often seek to undermine these facets of a rival's economy (or their own, if the rival is internal), while peacekeepers and postwar peacebuilders typically work to rebuild them.

Figure 3 – Interdependences between economics and conflict.
Source: Adapted from Anderton and Brauer (2016a, p. 6).



Source: Based on Anderton e Brauer (2016a, p.6).

Selected examples of conflict economics theory and evidence

The rational choice model

The rational choice model (RCM) is likely the most widely applied theoretical model in economics. By "rational" economists mean the weighing up of expected costs and benefits given a decisionmaker's *subjective preferences* (desired goals) and *objective constraints* such as the costs (the prices) to be paid for needed goods and services in the pursuit of the goals and the limited resources such as money, time, and mental or physical energy available to the decisionmaker. Put simply, to be economically rational uncontroversially means that people are expected to "do the best they can, given their circumstances." The weighing up of goals (expected benefits, to be maximized) and constraints (expected costs, to

be minimized) then leads to the actual choices made. Of course, people make decision mistakes from time to time but are not expected to repeat them endlessly either.

One of the predictions of the RCM is that decisionmakers will optimally adjust their choices when their constraints change. This prediction applies to consumers and producers in the marketplace, of course, but also to those making conflict-related choices. For example, Anderton and Brauer (2016b, p.158–163), apply the RCM to an in-group that has decided to eliminate an out-group (i.e., genocide). Assume that the in-group's objective (the "benefit") is to maximize an out-group's destruction and that the in-group has limited resources to pay the cost of its destruction enterprise. But note that the perpetrators may have *many* "inputs" available to choose from such as shooting, starvation, or work-to-death enslavement. *Each of these* carries its own cost or "price" and would drain the in-group's resources to a different degree. Thus, if shooting is "too expensive" given the cost of bullets relative to the cost of the other means of destruction (and including the cost of not having bullets available for other purposes, such as warfighting), then – the RCM predicts – one or more non-shooting methods of destruction will be chosen.

Distasteful as it may be, this way of modeling genocide can lead to useful insights into the degree of destructiveness, what counter-policies might be implemented, and even how certain policy interventions can lead to unintended outcomes in which the problem can become worse. For example, under normal circumstances, reducing regime resources (perhaps through asset freezes, sanctions, etc.) diminishes the means available for genocide. Or by providing victims with safe havens and/or escape routes, the "productivity of killing" will in effect be lowered. Moreover, the RCM reveals that policy interventions also can backfire. For example, in October and November of 2008, violence escalated between the main rebel group, the National Congress for Defense of the People (CNDP), and Democratic Republic of the Congo (DRC) government forces in which the rebels threatened a provincial capital, Goma. Most of the UN forces stationed in the region focused on protecting Goma because the UN mission itself faced severely limited resources. It "[…] was confronted with competing priorities, as the mission was facing the dilemma to choose whether to prioritize the defence of a small community residing in Kiwanja or to protect the larger area around Goma." (REYNAERT, 2011, p.18). An analysis based on the RMC then predicts that a rebel attack on civilians in relatively well-protected Goma is more expensive than attacking them in substitute locations. And indeed, rebel attacks

were diverted to the relatively unprotected village of Kiwanja and approximately 150 people were killed (HUMAN RIGHTS WATCH, 2008).

Examining choice behavior is immensely important for the field of conflict economics because it means that the RCM can be adapted to many arenas of conflict, and peace, in which choices are being made. That is, the choices of state leaders, rebel groups, terror organizations, mass atrocity architects and perpetrators, third-party intervenors, peacekeepers, and the many other actors involved in conflict contexts can be analyzed and partly understood as choices meant to achieve actors' objectives (even heinous objectives) subject to the constraints that they face.

The foregoing is not "just theory". Concrete empirical evidence is available to document substitution behavior in the face of changing constraints. For example, the behavior of terror organizations is one arena of research in conflict economics to which the RCM has been applied empirically. For instance, following a rash of airline hijackings in the 1960s and early 1970s, metal detectors were placed in airports around the world as from 1973 onward. Data provided by Mickolus (1980) for the period 1968–77 demonstrates, as expected, a subsequent, post-1973 significant decline in terrorist hijackings worldwide. Nevertheless, terror groups then shifted their behavior in new directions, just as the RCM would predict. Thus, research by Enders and Sandler (1993, 1995) showed that the metal detectors had the unintended consequence of significantly increasing assassinations and hostage-taking events. In another example of substitution behavior, Enders and Sandler (2012) report evidence that, since 2001, as governments in Europe and the Western Hemisphere allocated more resources to homeland protection, terror organizations have directed relatively more attacks toward Asia and the Middle East where protections are comparatively weak.

Game theory perspectives

Game theory analyzes decisions when each actor's choice depends upon the choices his or her counterparts make. For example, if you and a counterpart are bidding on the same item at an auction, each of you will likely consider how your bids affect the other's bids. As in a game of chess, you and your counterpart are strategically interdependent and game theory provides a wide range of concepts and models for analyzing choices in strategically interdependent decisionmaking situations.

Consider, for example, two nation-states that are disputing territory over items such as mineral deposits, maritime resources, or a land border. The two actors could arrive at a negotiated peaceful settlement for dividing up the disputed item, avoiding the costs of war, but both would have to agree to the settlement. Thus there remains a risk that they will fight over the item – and it takes only one of the two actors to make this choice, as Schelling points out (1960). The fates of the two actors are intertwined, and this strategic setting is highly amenable to game theoretical analysis. In this regard, an important theory here is *the bargaining theory of war and peace*, important because it shows that war is *not* necessarily (and perhaps not usually) irrational.

Superficially, one could believe that war is always irrational. For example, one might reason that (1) wars are costly (see the 5 "D"s of Figure 3); (2) that when actors fight over territory, say, then war must lead to postwar territorial (re)distribution; and (3) that the same (re)distribution could have been achieved prewar under a peaceful, negotiated settlement. War is therefore irrational. While premises (1) and (2) are uncontroversial, the bargaining theory of war and peace has shown premise (3) to be flawed. Indeed, a least nine distinct "rationalist" causes of war have been identified (see ANDERTON; CARTER, 2019, p.184–194). To illustrate, we provide three examples of reasons why war may become a rational choice.

War can be chosen due to *incomplete information*. Fearon (1995), for example, maintains that the Russo-Japanese war of 1904/05 was caused in part by incomplete information. Leading up to the war, Russia and Japan were disputing control of territory (parts of Manchuria and the Korean Peninsula) as each side sought a greater geographic buffer relative to its rival. Unbeknownst to Russia, Japan believed that it could launch a devastating surprise attack against the Russian naval forces at Port Arthur and thus achieve its territorial ambitions through war. Knowing what it could achieve through war, Japan's demand for territorial control under peaceful negotiations was higher than Russia was willing to accept. Furthermore, Japan could not tell Russia about its advantage because the Russians might believe that Japan was manipulating information to extract a better settlement. Alternatively, Russia might believe the information and take countermeasures, which would cause the Japanese information advantage to disappear. Under these circumstances, Japan believed that, despite the costs of war, it would do better by launching an attack than by peacefully settling, and so it "rationally" chose war.

A second rationalist source of war is *preemption*. For example, Fischer (1984) maintains that the 1967 Egypt/Israel war was due in part to the incentive

of each side to launch an aircraft attack against the air forces of the other side before the other side did the same. According to Fischer (1984, p.19): "Both Israel and Egypt had vulnerable bomber fleets on open desert airfields. Each side knew that whoever initiated the first strike could easily bomb and destroy the hostile planes on the ground, thereby gaining air superiority." On the brink of war, Aharon Yariv, head of Israeli intelligence, and General Yeshayahu Gavish, chief of Israeli Southern Command, "[…] believed that if Israel did not strike soon, the Egyptians might strike first, gaining the attendant benefits of delivering the first blow." (BETTS, 1982, p.150).

Third, an actor can choose war under the logic of *preventive war*. For example, on June 7, 1981, Israel launched a surprise attack against Iraq's nuclear reactor southeast of Baghdad. Israel perceived that the nuclear reactor was being used by Iraq to help develop nuclear weapons. From Israel's perspective, the threat of a future shift in Iraq's weapons capabilities caused Israel to use violence to prevent such a shift. (The difference between preemptive and preventive war lies in the difference between *current* as opposed to expected *future* capabilities.)

The bargaining theory also provides insights into sources of *peace*, for example, how certain forms of third-party interventions can help turn what would otherwise be a war outcome into a negotiated, peaceful settlement and how numerous policy interventions can help improve upon each of the sources of peace (for details see ANDERTON; CARTER, 2019, p.198–200 and p.392–394). The theory has been subjected to empirical inquiry, including incomplete information (BAS; SCHUB, 2016), preemptive military technologies (ADAMS, 2003/2004), and power shifts and preventive war (BELL; JOHNSON, 2015). In an important empirical analysis of humanitarian assistance, Narang (2015) draws upon the theory to analyze how humanitarian aid during civil wars can "backfire". In particular, he reasons and hypothesizes that "[…] humanitarian assistance can inadvertently prolong fighting by slowing down the accrual of information, [which] [...] prevents opponents from coordinating expectations about what each is prepared to accept in a settlement." (NARANG, 2015, p.185). Based on a sample of civil wars from 1945 to 2004, Narang then finds that greater aid significantly increases the likelihood of war continuing, even after controlling for the selection of aid into harder and easier wars to settle. This study is but one of many examples of how economic theory combined with statistical analysis can reveal unintended, "backfire" outcomes.

Network economics perspectives

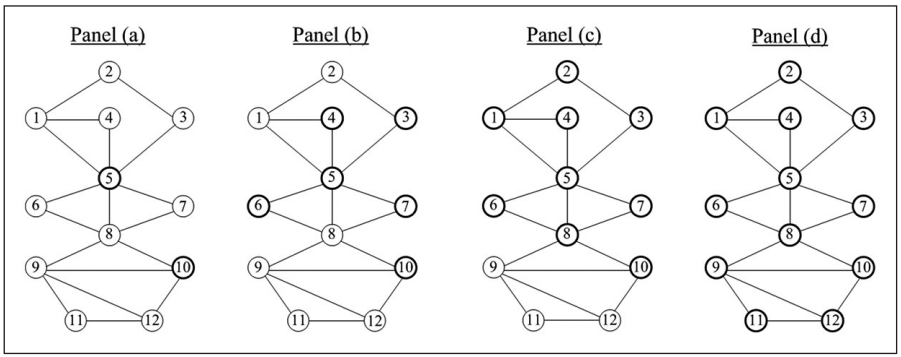
Social and economic networks are part of human life (from family and work relations to transportation and communications networks), and increasingly so in the modern electronic age (e.g., Facebook, Twitter, LinkedIn, and counterparts in Brazil, China, India, Russia, and other countries). Networks also are important in understanding conflicts because many violence-producing organizations (e.g., rebel groups, terrorist organizations, criminal syndicates) exploit networks to advance their violence-prone agendas. Meanwhile, many intergovernmental organizations, nation-states, and nongovernment organizations form networks to promote more peaceful outcomes in many parts of the world. The rapidly developing and rich field of network economics thus offers valuable concepts and models that can be applied to better understand conflict, and peace. For illustration, we offer one intuitive example here.

Consider a neighborhood of 12 villagers (see Figure 4), Panel (a) of which shows a specific *spatial* structure by which the neighbors are networked. Suppose that neighbors 5 and 10 (the darkened circles) are "aggressive" toward members of an out-group and also that there is a "propagation" rule such that when at least one-half (1/2) of one's neighbors are "infected" then one will become infected oneself. For example, since neighbor 4 has two neighbors – 1 and 5 – one of whom is infected, neighbor 4 will also become infected, as do neighbors 3, 6, and 7, all shown in Panel (b). Over time, the infection spreads throughout the entire village, as seen in Panels (c) and (d). But if one makes exceedingly trivial changes either in the village structure or in the propagation rate, *completely* different outcomes can occur. For example, if instead of neighbors 5 and 10, it is neighbors 4 and 10 who are initially infected, then the infection will not spread at all! This is a shocking, complete reversal of the initial result and can help explain why some villages, towns, or regions in a society appear "immune" to infection while others succumb to ideological illness. The difficult part is to acknowledge that such randomness in the initial location condition of the spatial structure of neighborhood networks can have such a profound influence on the final outcome.

One can also model "partial immunity." Suppose one adds a neighborhood tie between neighbors 3 and 4 in Panel (a) of Figure 4 (still with the same propagation rate of 1/ 2). Now the infection spreads only to the middle and bottom part of the village but the top (or "northern") part – neighbors 1, 2, 3, and 4 – stays uninfected. Thus, "clusters" of infected and uninfected parts of a population in a society can emerge, a phenomenon readily seen in real-world

societies. Theoretical analysis of network models such as the one shown in Figure 4 obviously can be made much more complex to help understand real-world outcomes and simulate (predict) potential outcomes. Moreover, network models can be combined with evolutionary game theory (EGT) and agent-based models (ABM) to simulate, for example, where "hotspots" of aggression might develop and where best to insert "peacekeepers" into the spatial structure of a village, or else help to develop additional ties between neighbors (such as those between 3 and 4 in Figure 4) that may help prevent or reduce the spread of aggressive behavior.

Figure 4 – A simple neighborhood network.



Source: Author's own elaboration.

Empirical research on conflict based upon networking theory already is prevalent in the terrorism (ENDERS; JINDAPON, 2010; ENDERS; SANDLER, 2012), war risk (MAOZ, 2011; KINNE, 2012), and genocide propagation (MCDOOM, 2014a, 2014b) literatures. An example of network perspectives on war is König, Rohner, Thoenig, and Zilibotti (2017) (hereafter KRTZ), who theoretically and empirically analyze the "Great War in Africa," which the Correlates of War project calls "Africa's World War of 1998–2002" (SARKEES; WAYMAN, 2010, p.468). KRTZ's study focuses on the 80 armed actors that made up the network of allies and enemies fighting in the DRC from 1998 to 2010. Among the many possible actor pairs that can be constructed for the network, KRTZ code 192 ally dyads, 236 enemy dyads, and 5,892 neutral dyads. Based upon empirical estimation of network externalities among allied and enemy dyads, KRTZ find that each group's fighting effort increases when total fighting of its enemies is greater and decreases when total fighting of its allies is greater. KRTZ then use their empirical estimates to assess the

effects of various pacification policies. One such policy is to neutralize selected enemy links that exist between the DRC army and other actors in the network. Interestingly, KRTZ find that neutralization of such links not only reduces the bilateral conflict between the two members of the dyad (obviously), but pacification ripples through the network leading to multiplied reductions of fighting efforts of other actors in the network. Once again, however, they also find that the thoughtless adoption of an intervention policy aimed at eliminating a "key player" can backfire in that substitute actors who replace the (former) key player may make the situation worse than before.

Additional economics perspectives

In addition to rational choice, game theory, and network models, economics has long since added insights from other scholarly disciplines, such as law, psychology, politics, and sociology, and the resulting body of work can be leveraged to help understand conflict phenomena more completely than has been possible before. For example, the field of law and economics has vastly increased over the past 50 years and now is a standard teaching field in faculties of economics and in faculties of law. Much as law is about conflict resolution – for example, in contract law – but surprisingly little of it has been applied to the kind of systematic conflict that conflict economics covers. For instance, at the level of the United Nations, why does international intervention in cases of very serious mass atrocities appear to come so often in the form of "too little, too late"? One answer is that the UN is, in essence, a contractual organization of sovereign states. Nation-states join when the expected benefits from membership outweigh the expected cost, and this applies to specific examples of international human rights law as well. Thus, nation-states easily sign on to Declarations of Human Rights or Genocide Conventions when either the costs are not spelled out or when the enforcement mechanism is left out. When these become more specific, however – such as in the case of the establishment of the International Criminal Court (ICC) – nation-states either do not join at all or they ratify with crucial self-exemptions noted in their ratification documents or else withdraw from a treaty altogether when it becomes inconvenient, all of which have happened in the case of the ICC. Thus, economics readily offers "obvious" insights into the design and construction of international human rights and other treaties relevant to conflict economics.

Similarly, the fields of behavioral economics and identity economics, drawing on insights in psychology and sociology, respectively, have become very

prominent in economics and can help to understand better not just "ordinary" economic behavior in financial, labor, trade, or housing markets, but also conflict (and peace) behavior. For example, concepts such as cognitive bias, framing, reference dependence, and loss aversion readily lend themselves to application in conflict economics and help explain for instance why nation-state, or other, leaders so often appear "intransigent" in their warfighting positions. Why would they not "rationally" conclude that they will lose a battle, or an entire war, given an opponent's overwhelming firepower? Nonrational, psychological elements may simply make them more resistant to change than the rational choice model alone might suggest. Likewise, identity economics focuses, *inter alia*, on relations and status in human social hierarchies and incorporates explicit, relational cost-benefit perspectives into economists' usual utility functions, showing for instance that relational costs and benefits can overpower economists' prototypical monetary focus. Thus, relational aspects such as family, linguistic, religious, ethnic, or other bonds help to cluster humans into tightly-knit groups that facilitate intra-group monetary trade and exchange even if it were monetarily *more* beneficial to also trade with outsiders. Ideas such as these readily can be transported into the realm of conflict economics whereby intra-group bonds can overpower any "rational" consideration of peacemaking, peacebuilding, and peacekeeping between groups. Much the same "translational" ideas apply to the well-established fields of political economy and public choice models, which can easily be extended to incorporate aspects specifically related to violent conflict or threat thereof.

In sum, modern economics – with its adoption of knowledge gained in other fields such as psychology, anthropology, sociology, politics, law, management, logistics, mathematics, and statistics – has become (or is becoming) a *comprehensive quantitative social science* able to probe ever deeper into human behavior, including conflict behavior. Despite the violence we still continuously witness all over the world, this development offers considerable hope for the future.

Resources: Data, working papers, journals, and for further reading

Data

A sampling of readily available dataset web sites includes the following: Armed Conflict Location and Event Data (ACLED) on intergroup conflict in Africa and parts of Asia, the Middle East, and Europe (www.acleddata.com);

the Uppsala Conflict Data Program/Peace Research Institute Oslo (UCDP/PRIO) data on wars, sub-war conflicts, and violence against civilians (ucdp.uu.se); the Stockholm International Peace Research Institute (SIPRI) data on military spending, arms transfers, and intergovernmental peace missions (www.sipri.org/databases); the Political Instability Task Force (PITF) dataset on intrastate wars, state failures, and genocides and politicides (http://www.systemicpeace.org/inscrdata.html); the Global Terrorism Database (GTD) on worldwide domestic and international terrorism incidents (www.start.umd.edu/gtd/about); the Correlates of War (COW) project data on wars, interstate alliances, and militarized interstate disputes (http://www.correlatesofwar.org); and the Global Peace Index and Positive Peace Index (GPI) put out by the Institute for Economics and Peace (http://economicsandpeace.org). In addition, and yet fully to be discovered and globally compiled, there are numerous datasets in existence at the country level and often accessible only in the local working languages, thus encouraging collaboration with local researchers from around the world. In our own work we have encountered fascinating country-specific datasets concerning Colombia, India, Pakistan, Rwanda, and Vietnam for example.

Working paper series and journals

For up-to-date research in working paper format, consult standard resources such as the American Economic Association's EconLit database, Research Papers in Economics (RePEC) and associated services, the National Bureau of Economic Research (NBER), the Households in Conflict Network (HiCN), the Social Science Research Network (SSRN), ResearchGate, Academia, and others. All can readily be searched by keywords such as "conflict", "war", "peace", and so on. Regarding published research, the following alphabetical list of journals either focuses specifically on *economic* aspects of conflict and peace, or else frequently carry contributions by economists: *Conflict, Security & Development*, *Defence and Peace Economics*, *Economics of Peace and Security Journal*, *International Journal of Development and Conflict*, *International Journal of Peace Economics and Peace Science*, *Journal of Conflict Resolution, Journal of International Relations and Development*, *Journal of Peacebuilding & Development*, *Journal of Peace Research*, *Peace, Conflict and Development: An Interdisciplinary Journal*, *Peace Economics, Peace Science and Public Policy*, and *Stability: International Journal of Security & Development*. All these are in addition, of course, to general economics journals such as the *Quarterly Journal of Economics*, the *Economic Journal*, the *Review of Economics & Statistics*, or the set of journals published by the American

Economic Association which increasingly publish papers related to conflict and conflict resolution.

For further reading

Apart from some classic works (e.g., BOULDING, 1962, 1978; SCHELLING, 1960, 1966), the following is mostly a list of handbooks, textbooks, and edited books in the field of conflict and peace economics. We hope it assists the interested reader to design their own course of readings. List of handbooks, textbooks, and edited books:

ANDERTON, C. H.; BRAUER, J. (ed.). **Economic aspects of genocides, other mass atrocities, and their orevention.** New York: Oxford University Press, 2016.

ANDERTON, C. H.; CARTER, J. R. **Principles of conflict Economics:** the political Economy of war, terrorism, genocide, and peace. 2.ed. New York: Cambridge University Press, 2019.

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RESUMO: *Apresentamos uma visão geral do campo da economia de conflito. Começamos explicando distinções importantes entre a economia padrão de livros didáticos e economia de conflito em relação a suposições, assunto e inter-relações entre economia e conflito. Em seguida, fornecemos resumos de teorias econômicas selecionadas e evidências empíricas que, juntos, ajudam a revelar aspectos importantes do conflito - e da paz - por meio de uma lente econômica. Entre os tópicos abordados na visão teórica e empírica estão a razão pela qual a violência é escolhida em vez de abordagens pacíficas para lidar com disputas entre grupos, por que é "racional" que líderes políticos às vezes matem civis em massa (e o que pode ser feito para evitar isso), como normas sociais de cometer danos contra grupos externos podem se propagar (ou ser interrompido), por que pode ser difícil desenvolver leis e instituições para*

promover a paz estável e como os esforços de terceiros para promover a paz podem às vezes piorar as coisas. Por último, fornecemos amostras de recursos de dados, arquivos e periódicos de trabalho, e leituras que consistem em grandes livros-texto, manuais e livros editados no campo da economia de conflito.

PALAVRAS-CHAVE: *Economia de troca. Economia de apropriação. Economia de conflito. Economia de paz. Modelo de escolha racional. Teoria dos jogos. Economia de redes.*

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