Protecting Civilians in Conflicts

International Interventions, Arms Embargoes and Refugee Flows

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Summary

In this paper I present a model of civilian protection in conflicts. Protecting civilians has been an increasingly important objective for international organizations after the end of the Cold War. The fact that civilians seem to be suffering more in modern conflicts than ever before makes it important to think clearly about modern conflicts and how international interventions affects them. International interventions are on the other hand not automatic responses to suffering civilian populations. There are many cases where the international community does not actively participate in either military actions or real diplomatic talks. My ambition is to characterize the motivation to intervene with military force in a conflict and present arguments for when we should expect such interventions. In order to accomplish this goal I will use the Bosnian War as a case study to guide the modeling process and as a resource for justifying the restrictions I place on the international communities' behavior. The devastating conflict in the Balkans is a telling example of international failure to protect civilians because it resulted in massive civilian causalities on European soil. It is also difficult to see how international institutions have changed in systematic ways since that time, which makes the Bosnian War instructive for the purpose of discussing future interventions today.

Specifically, I argue that the level of civilian and territorial protection is in large part a consequence of the asymmetric valuation of a country's own soldiers and foreign civilians. E.g. if a country does not value a foreign civilian life as much as a home-grown soldier, then one should expect a low protection level. Secondly, domestic political pressure to help suffering civilians will positively contribute to higher civilian protection, but diplomatic pressure from a powerful country to not intervene too strongly will lower territorial protection. Depending on the exogenous parameters, the strength of the warring parties and the amount of civilian inhabited areas in a country, there may be no international intervention, a small intervention or protection of civilian inhabited and uninhabited areas.

The model is further extended to evaluate the effect of an arms embargo on an ongoing conflict. Since arms embargoes are a much discussed and a fairly common policy instrument, it is important to have a clear idea about its consequences. My proposition is that arms embargoes will affect the winning-probability of the parties in a conflict and by extension the level of civilian protection except in very special circumstances. It may also have

consequences for the welfare of the different populations after the war in terms of production opportunities. My claim is that one must be very careful with such a policy, since it may be the case that an arms embargo benefits the aggressor and lowers the post-war welfare of the attacked nation. Lastly, the model is further extended to discuss the strategic use of civilians when the attacking party knows or is able to fairly accurately estimate the reaction of international forces at a later stage. Strategic use of civilians may be the creation of refugee flows or civilian massacres. In either case there are circumstances where it is a dominant strategy to kill or displace civilians since it will increase the territorial gain for the attacking party. In other words, ethnic cleansing may be rational under the threat of international intervention.

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1 Introduction

In today's conflicts civilians are sitting ducks. Protection of civilians is therefore an increasingly important objective. It has been estimated that on average ten civilian lives are lost for every soldier killed in battle (Beadle, 2010/2011). Fighting occurs mostly in civilian inhabited areas and civilians are targeted for different purposes (Smith, 2005). A rogue state may target civilians in order to suppress upheavals and force a population to support a dictator. Ethnic conflicts may lead to ethnic cleansing where territory is won and civilians purposely killed, and terrorist organizations use civilians for political purposes or hide in densely populated areas. The fact that civilian suffering has increased in conflict-areas has lead the United Nations to officially address the importance of civilian protection. The result is the creation and occasional deployment of peacekeeping forces (Beadle, 2010/2011). Such operations are a fairly recent phenomenon and the current research on civilian protection is largely inspired by the lack, or failure, of peacekeeping operations in the former Federation of Yugoslavia, Rwanda and Somalia. In light of the growing economic literature on conflicts, past peacekeeping failures and the importance of civilian protection, this paper will address international intervention and protection of civilians in conflicts.

I emphasize the complex nature of the decision to intervene in conflict-areas by focusing on non-material costs. Insufficient civilian protection primarily occurs because of the asymmetric valuation of human lives. A country is rarely willing to sacrifice a soldier for a civilian life. This is a subjective valuation that partly determines the level of protection. Furthermore, political pressure to intervene and diplomatic pressure to stay out of a conflict affects civilian protection levels and causes variations in the amount of civilians that are actually protected. The main result of the simple model presented below is that these types of cost, even when international forces have the ability to protect all civilians, will in certain circumstances cause the international community to accept civilian deaths.

The simple model is also extended to evaluate the *effectiveness of arms embargoes*. I show and defend the proposition that arms embargoes will under certain circumstances benefit the aggressor, cause poorer civilian protection and post-war welfare for the victims of aggression. The result is important in the sense that it questions the supposition that arms embargoes are a neutral policy that only reduces the social waste of a conflict. It gives support to the claim

that policies that are often considered to be substitutes for intervention may cause adverse effects on civilian protection. Further, I address the *strategic use of civilians*. My proposition is that creating refugee flows or massacring civilians, given that this reduces the amount of territory they inhabit, might be a dominant strategy for an aggressor when the international community's decision to intervene is restricted in the manner outlined in the model. This result gives implicit support to the claim that territorial protection is important if the goal is to protect civilians.

The main ideas of the paper are inspired by the Yugoslavian War of Dissolution and more specifically the Bosnian War. In the early 1990s, Europe experienced a brutal and massive war in the Balkans that put immense pressure on the international community to intervene. The conflict is especially interesting since it involved large civilian casualties and occurred on European soil. The diplomatic and political climate at that time resembles the situation today and is therefore in my view an important case study. Moreover, since it happened on European soil and media coverage was extensive, it highlights that civilian protection may be insufficient even when the most important players on the international arena, knows and cares about the conflict. The whole operation is now considered to be a massive failure and resulted in the greatest civilian massacre since World War 2 in Europe. For these reasons the conflict in Bosnia is especially instructive.

This paper relates to the economics of conflict literature by modeling a contest-game or rent-seeking game, first introduced by Haavelmo (1954), Tullock (1980) and surveyed by Nitzan (1994). Esteban and Ray (2010), Esteban, Mayoral and Ray (2012) and Robinson (2001) focus on ethnic conflicts. In Esteban and Ray's model two ethnicities fight over an ethnic public good. Their theory predicts that within-group income heterogeneity in a polarized society with few ethnic groups is a petri dish for conflicts, but they do not address international intervention in ethnic conflicts. I will not focus on the ethnic aspect, but it could be interesting to model intervention in an explicitly ethnic conflict. More specifically my model relates to Esteban, Morelli and Rohner's (2010) study of *strategic mass killings*. In their theory international intervention puts a limit on the extent of massacres, but they do not explicitly include the decision to intervene. Mehlum and Moene (2006) also address intervention and bring forth arguments that intervention in a non-collapsed state with

inheritable incumbency advantages may increase fighting intensity. Instead I focus on collapsed states and explicitly model the decision to intervene.

In the next section I will present a short history of the Yugoslavian War of Dissolution and the Bosnian War. I will focus on the aspects that highlight the variables in my model and stress the importance of such costs and restrictions. I will then explicitly discuss the problem of intervention and argue that the variables included are reasonable. In Section 3 I will briefly survey contest-functions, explain some of their properties and stress the variation one may get if they are chosen with care. Although I concentrate on a specific contest function later on, many of the main results are compatible with other and more general contest functions. In Section 4 I present a simple model of civilian protection and solve a three-player game where international forces intervene on the side of one party. Many different comparative statics results may be derived and I present some of them. In Section 5 I extend the model to evaluate arms embargoes and present two propositions that questions the effectiveness and fairness of such a policy. Then I construct a three-stage game and show that under certain circumstances civilians may be used strategically to increase territorial war-spoils. Lastly I conclude.

2 The Bosnian War and Intervention

The Bosnian War provides an interesting case study of international protection of civilians. The Yugoslavian war of dissolution involved many agents and many diplomatic and political aspects, but the war in Bosnia mainly consisted of Serbs and Bosnians. The war ended with the largest civilian massacre in Europe since World War Two. That such a failed civilian protection scheme happened is discouraging, since the world's most powerful nations where directly involved in a time where peacekeeping operations were important. This section will provide a short introduction to selected aspects of the war in Bosnia and present the historical background and the political and diplomatic situation that surrounded the conflict. This will to some extent justify the variables and parameters in the model presented later. I will then discuss why the death-cost of international soldiers, domestic sympathy and the diplomatic cost of being overly aggressive from the point of view of other international agents is important and why it was considered important at that time.

2.1 Bosnia: Massacres, Diplomacy and Intervention

After the death of Josip Broz Tito in 1980, many feared the future of the Socialist Federative Republic of Yugoslavia. Yugoslavia was originally constituted by six republics and two autonomous provinces: Bosnia and Herzegovina, Croatia, Macedonia, Montenegro, Serbia, Slovenia and the provinces Kosovo and Vojvodina. In 1987 Slobodan Milošević became the leader of Serbia with a clear Nationalistic agenda. The consequence was that in the early 90's Slovenia and Croatia claimed their sovereignty. Both feared Serb domination and many would say acted without considering the fact that this would affect Bosnia tremendously. The Serbs were especially hostile to the secession of Croatia, mainly because a large Serb population resided there. When secession seemed impossible to stop the Serb Nationalist agenda was to create a *Greater Serbia*. Greater Serbia was the idea of a unitary Serbia where all Serbs live under pure Serbian rule (Gow, 1994). This also nurtured the idea of an *ethnical clean* territory, devoid of Croats and the Muslim Bosnians. Unfortunately, the ethnic composition of Yugoslavia did not adhere to any established borders. There were significant Serb enclaves in Croatia, Croatian enclaves in Bosnia and Muslim Bosnian enclaves in the provinces of Serbia (Glenny, 1996; Gow, 1997)

At the same time, Serbs living in Croatia became increasingly scared when the nationalist leader Franjo Tuđman came to power. A Croatian nationalist leader was considered a bad omen. Many still remembered the fascist groups called *Ustasha* in the Second World War and how these groups terrorized the Serb population (Gow, 1997). Violence started to escalate when Serbian paramilitary groups were established in Croatia, and these cut-off predominantly Serbian villages in those territories. These paramilitary groups were backed by Belgrade. A war soon broke out between Serbia and Croatia and later leaked into Bosnia. Both Croats and Serbs thought that they had a claim to large Bosnian territories and this pushed Bosnia into the abyss (Glenny, 1996).

Only a few years earlier the Berlin Wall was torn down and the end of the Cold War was a fact. This constituted the important international climate during the conflict. Yugoslavia had been of strategic interest for both of the two main adversaries during the Cold War. Since Tito was a communist and Yugoslavia a communist federation, they were closely linked to the Soviet Union. Still, the Yugoslavian Federation had always been reluctant to being dictated by the Soviet Union, thereby creating a wedge for Western influence. The West on the other hand had a strategic interest in Yugoslavia since the Adriatic Sea was a direct line to the Italy and Slovenia borders to Austria. Establishing good communications with Yugoslavia was important for security purposes. The end of the Cold War therefore changed an important strategic concern with Yugoslavia. Territories and borders became less important when the two fronts were melted into one large international community under the presidency of Boris Yeltsin. As James Gow writes: "*Yugoslavia became a laboratory rat in experiments of collective international diplomacy*" (Gow, 1997, p. 31).

The diplomatic conditions at the start of the war campaign were confused. Nationalist Russians who identified themselves with the South-Slavs did not endorse the break-up of the Yugoslavian Federation, although the cooperative attitude towards the West in the Kremlin was at its peak. France interpreted the conflict in state-centric terms and did not initially endorse the break-up and therefore supported the Serbian side as protectors of the Federation. The United Kingdom which played a key role during the whole conflict was attacked as being pro-Serbian by the Bosnian president Alija Izetbegovic and by the Clinton administration. Germany on the other hand, having recently experienced unification, fairly quickly supported the right to self-determination. Considering the German situation during the Cold War, their

interpretation was that Slovenia and Croatia was just two European countries wanting what Germany wanted – to free itself of communism. The US did not endorse the secession of Slovenia as it would cause turmoil in the Balkans, but considered Bosnia as an innocent victim and was therefore largely pro-Bosnian (Gow, 1997).

The international community agreed to an arms embargo 1991. In Yugoslavia, as most countries, they had a stock of military capacity. The JNA (*Jugoslovenska Narodna Armija*) constituted this stock of military capacity and was quickly captured by the Serbs. The international arms embargo therefore made this stock of military capacity crucial, since Bosnia could not arm themselves to any significant degree. Of course, weapon smuggling and mercenaries entered the conflict and added to the military strengths of all sides, but the JNA constituted the significant military capacity in the conflict. The Serbs in the JNA were mainly officers, Croats and Bosnians were soldiers. Serbia therefore had limited ground forces and preferred to shell cities, resulting in large civilian loses – the siege of Sarajevo being a case in point. Bosnia on the other hand had many soldiers, but because of the arms embargo, they were considerably weaker and fought with far more inferior weaponry. The UNPROFOR (the UN peacekeeping troops) was supposed to create stability for a political solution to the conflict, but they could only use force if they were attacked. So if the shelling from the Serbs did not hurt UN soldiers, they could not really intervene (Burg & Shoup, 1999; Glenny, 1996; Gow, 1997).

As the war evolved, evidence of civilian massacres and internal refugee flows became abundant. Civilian protection was increasingly important to all nations and politicians felt the pressure from the public opinion. In 1992 the Vance-Owen plan showed that there was no international intention to let Serbian borders expand, but the diplomatic climate and different attitudes made the situation problematic. Civilian protection was primary and borders secondary (Gow, 1997). They did not condone that borders should be changed by force, but the idea of the Federation of Yugoslavia and the support for a "Greater Serbia" in parts of the international community made international intervention to protect borders problematic. At the same time, the public opinion in the countries mentioned was eager to help the suffering civilian population, but the loss of their own soldier's lives is equally unpopular. These factors lead to a prolonged war, where civilians were driven out of their homes and in many cases simply executed by all sides, although an international peace-keeping force was present.

On Saturday 8th of July 1995, the international safe-area of Srebrenica had received sporadic firing from Bosnian Serb forces. The Dutch minister of defense received news that a Dutch soldier had died and that the Dutch troops had been driven from their posts after heavy Serbian shelling. By Sunday the Serbian forces were just outside Srebrenica and the Dutch started evacuating civilians to the main Dutch military base. The Bosnian Army strongly opposed the evacuation, since this entailed that they would give up the enclave, instead they wanted the UN to intervene and defend their territory. The Bosnian Serb general Ratko Mladić rode into an abandoned town and from there to the Dutch main base. He promised that every civilian was safe as long as they cooperated. He then demanded to use UN trucks to escort the Bosnian civilians out of the area to a safer place. The Serbs separated the boys and men from the women and children. The boys and men were never seen again. At the same time Bosnian Serbs shelled the mountainous terrain where men and boys were trying to escape to Bosnian held territories. Many Bosnians either died from the shelling, committed suicide (sometimes by blowing themselves up with a hand grenade communally), or they became crazy and paranoid, attacking each other, fearing their friends were Serbian spies. The Dutch UN soldiers were escorted home to the Netherlands. During the attack on Srebrenica one Dutch soldier died, 8000 Bosnian civilians were massacred (Both & Honig, 1997).

2.2 The Problem of Intervention

During the Cold War territorial borders was important for containing communist ideology and having a strong defensive front against the Soviet Union. In the post-cold war-era there was only one superpower left: the United States. International interventions followed, first the Gulf War which was a short, efficient campaign and assembled a multinational coalition. Shortly after, the world witnessed the infamous intervention in Somalia and then the intervention in Yugoslavia (Mandelbaum, 1994). An important feature of all three interventions was that they were all approved by the United Nations. The diplomatic climate had clearly changed. Even Russia and The United States were cooperating on the international arena, discussing interventions to protect civilians. The military interventions were so-called "peace-keeping operations". The fact that many international military interventions today are peacekeeping operations provides the background for this paper. It is therefore important to

characterize the factors that affect the decision-problem of international forces and thereby the strategic elements in modern, international interventions.

The most important factor determining the level of international involvement, I would argue, is the fact that wars kill people. To deploy military personnel demands that the participating countries must consider how many soldiers they are willing to sacrifice to protect civilian populations. In my view, many political debates discussing whether or not to intervene are not clear-cut strategic or tactical arguments, as much as they are implicit justifications for the valuation of civilian lives politicians and the public have got. Few wants to explicitly answer how many soldiers one is willing to sacrifice for a civilian, but it is an important questions to answer since wars demand human lives. David Gombert, who worked for the Bush administration during the Yugoslavian conflict, expresses a natural human attitude when he writes: "*[O]ur military superiority and international leadership role do not obligate us to sacrifice our sons and daughters to combat brutality wherever it occurs*" (Gombert, 1994, p. 30). He explicitly states that the reason the Bush administration did not allow ground forces to play a significant role in the war in Bosnia, although it precluded large-scale intervention in Yugoslavia, was simply that the American people would not support the commitment and casualties that were expected (Gombert, 1994).

The public, and by extension the politicians, value lives *asymmetrically*. The life of a home-grown soldier is worth more than a foreign civilian. One may speculate about what determines the value the public and politicians place on a soldier's life. The US trauma over Vietnam and Somalia probably played an important role in the 90's. The Iraqi and Afghan wars last decade will probably play a similar role in later conflicts. In this sense the valuation is a function of war-tiredness. In a static setting on the other hand, cultural polarization, I would argue, in large part determines the value of a soldier's life. I would assume that if Sweden was attacked, Norway would be willing to sacrifice more soldiers to save civilians than they would in Rwanda. A strategic dimension would of course play a role as a war in Sweden would have huge spill-over effects in Norway. Still, a feeling of "brotherhood" and "likeness" should not be underestimated. If this assumption is correct, then a war in New Zealand would lead us to deploy more soldiers and risk larger losses of Norwegian soldiers than in Rwanda. The point is that "polarization" summed up by values, ideology, religion and

ethnicity plays a static role in the public valuation of civilian lives apart from dynamic concerns about previous warfare and geo-strategic issues.

There is a further domestic aspect, namely the political pressure to actually intervene. Historically there have been many reasons for military intervention in foreign countries. Economic gains was the most important one in earlier centuries, glory and the belief in Western cultural superiority another. During the Cold War security was important, but in today's world one of the strongest reasons for intervention is plainly *sympathy* (Mandelbaum, 1994). Seeing children being slaughtered by warlords on television is unpleasant, to say the least. In addition, the belief in human rights makes the public receptive to the idea of an intervention. The Bosnian war is very interesting in this regard, since the war was documented extensively. Indeed, the warring parties used the media to create sympathy for their cause. Ratko Mladić actually filmed his entry into the Srebrenica enclave and the clips are available on YouTube. (Of course, he did not film the execution of boys and men). This creates a demand for "muscular" intervention by the public. The public want leaders who help suffering civilians. If they don't contribute, it is a possibly large political cost for them. There is therefore often some political benefit of protecting civilians and most Western countries experience this attitude when conflicts are televised. Yet, international forces are ultimately not responsible for civilian killings and refugee flows. Although there might be a political pressure to intervene, one could always restrict the amount of death one will endure by focusing on this.

The third and perhaps the politically most paralyzing effect on international intervention in practice is the diplomacy cost when a country intervenes "too strongly" from someone else's perspective. The United Nations is often acknowledged for being a forum where countries can communicate and solve international issues. A problem with the UN is that the most powerful countries in the world must be in agreement and agreement is often scarce when dealing with *important* and *costly* issues. That said, most countries (at least the ones that matter) will not protest too strongly to peacekeeping operations when the conflict is not conducted on their territory, as was the case with Bosnia. If some countries agree to engage in a conflict, some other countries might stay out for domestic reasons. This is not a diplomatic problem per se, but difficulties occur when different countries sympathize with the different adversaries goals. Of course, nobody sympathized with civilian killings in the Yugoslavian War, but there was

an important difference between Washington and Moscow. Washington sympathized with Bosnians and wanted to protect their borders, Moscow wanted to a larger degree to be neutral with regard to politics and borders. To engage "too strongly" in the eyes of Moscow would be to deploy ground-forces and retake territory (Gow, 1997). There are two aspects to this cost. Firstly, it may seriously diminish the prospect of defending territory when a country is attacked. Secondly, it restrains the available tactics. The efficiency of fighting is often affected by the wish to be politically neutral. For example, instead of ground forces, the international community implements no-fly zones or economic sanctions, but this does not usually change the behavior of paramilitaries ravaging the countryside and may therefore be futile in protecting civilians.

War is expensive, both in monetary terms and in the far more valuable currency, namely human lives. The asymmetric valuation of domestic soldiers and foreign civilians is a cost that matters hugely, and the valuation is affected by some sort of static "polarization". For innocent civilians it is a relief that the public in many countries respond to their suffering and wants to help, but the amount of losses they will endure puts a restraint on their helpfulness. In addition diplomatic costs in today's world are important for every national leader: nobody wants to upset a powerful nation. The question is how these factors interact and could possibly help explaining when one should expect forceful international protection and when one should not. The military tactics could be close to perfect and the world could know how to stop a conflict, but even then, the decision to intervene would not necessarily be compatible with full protection of civilians or territory.

3 The Economic Theory of Conflict-Games

In this section I will briefly survey some typical contest functions. Conflict games often use functional forms that are analogues to production functions in standard economic theory. In order to understand economic modeling of conflicts it is important to be aware of the properties of these functions and the variation one may create be applying specific functional forms. The first economist that formulated the important trade-off between production and appropriation and thereby included conflict in economic modeling was Trygve Haavelmo (1954). Appropriation occurs when an economic agent tries to take some resource from another agent, or two agents' competes to win a resource that is exogenously given. Often the decision to invest against or in favor of appropriation depends on the behavior of other agents. In this sense the economics of conflict is intimately linked to game-theory. This section will introduce the basic building blocks of the model that is presented in the next section and focus primarily on contest-functions.

3.1 Contests and Contest-Functions

The effort or raw materials in conflicts are objects like bombs, AK-47's, arguments (in a court room) or money (to pay off politicians). The inputs in a conflict are chosen to be *adversarial*. Agents use guns to kill the enemy, lawyers use arguments to weaken the opponents case and lobbyist use money to persuade politicians to give them some benefit at the expense of other interest groups. When a coalition decides to defend civilians, they use soldiers, logistics, air-planes, humanitarian aid and their adversaries use military power to kill coalition forces, bombs to destroy infrastructure so humanitarian aid is stopped etc. If the outcome is uncertain, then an agent invests to increase a probability of success. Investing one soldier increases the likelihood of protection, but an enemy-soldier decreases that probability. An expression for a contest may therefore be of the form:

$$s_i = \frac{f(x_i)}{\sum_{j=1}^{N} f(x_j)} \qquad (1)$$

The win-probability for each agent must of course sum to one. One may have n-parties in the conflict with this form. One important property of the contest-function is called *The Independence of Irrelevant Alternatives* (Clarke & Riis 1997; Rai & Sarin 2011). The win-probability and outcome of the conflict depends solely on the amount of effort produced by the agents in the conflict. So for example the win-probability depends on the amount of guns two groups have, not on the amount of guns an agent that does not compete in the contest has.

A more specific functional-form is the *additive power form*, which will be employed in my model. Then the acquired share by agent *i* in the contest is:

$$s_i = \frac{x_i^r}{\sum_{j=1}^{N} x_j^r} \tag{2}$$

where r is some positive number. This function is *homogenous of degree zero* in effort. It is solely the ratio of inputs that determines the win-probability. Although this seems restrictive, the power of the inputs might differ and yield different efficiencies in a conflict. The larger the power, the higher is the marginal return for the first units of effort, making the curvature steeper. Still, this is often not realistic enough. The reason is that there might be cases where some agent has an inherent advantage. One functional form that is used to approximate this situation is:

$$s_i = \frac{\alpha_i x_i^r}{\sum_{j=1}^{N} \alpha_j x_j^r} \tag{3}$$

A higher alpha yields a higher win-probability for any given level of conflict inputs. Clarke and Riis calls a contest that employs a function like the above an *unfair* contests, since advantages affect the probability of success independent of effort (Clarke & Riis, 1998).

There are multiple contests that employ other forms of contest-functions. There might be cases where an agent does not compete in the contest but still wins a rent or that the difference between efforts decides the outcome, where the agent that invests more effort than the others win the prize. An example of a difference-form function is:

$$s_i = \frac{e^{kx_i}}{e^{kx_i} + e^{kx_j}} = \frac{1}{1 + e^{k(x_j - x_i)}} \qquad (4)$$

The win-probability depends on the difference in effort as seen from the denominator. An important characteristic is that the win-probability is not one when the adversary chooses zero effort (Hirshleifer, 2000).

The different functional forms have important consequences for the contest-games and one must be careful to choose a function that fits the application. In the case of protection of civilians, there may be multiple contest situations where different functions can reasonable be applied, especially since protection is not an all-out-battle but a dynamic and multidimensional situation that is affected by many different factors. To mention some examples: You could protect a population under "ideal" conditions where the amount of effort is the only factor that affects the protection-share. There might be low marginal protection until you invest a lot of troops in a battle, thereby having a contest with logistic properties. Protection may very well depend on territorial aspects where having a defensive stand gives the protectors an inherent advantage or disadvantage. Lastly, weather conditions may affect the battle and thereby "nature" contributes with noise, making the contest depend on other factors than effort. The contest may of course also have a different structure; see Konrad & Kovenock (2006) for an interesting contest-type. Even simple settings have a lot of variation that may affect the outcome of protection, even when abstracting from strategic concerns, political constraints on behavior and the often neglected aspect of massive destruction in military conflicts.

Nash-equilibrium is the solution concept employed in most static contest-games. A static contest consists of agents that interact and chooses actions simultaneously. They maximize their effort to win a prize. If the agents are risk-neutral they may either maximize a win-probability or a share of the prize, being equivalent in this case (Garfinkel & Skaperdas, 2007; Jia, Skaperdas & Vaidya, 2011). Both the prize and properties of the prize matter for the results one gets, as Mehlum & Moene (2006) points out, so in applications it is important to think clearly about what the contestants actually are fighting over. The existence of a Nash-equilibrium in ordinary rent-seeking contests (or sometimes the multiple mixed or pure Nash-equilibriums) is provided by Szidarovsky & Okuguchi (1995), Treich (2009), Cornes &

Hartley (2005) and Yamazaki (2009). The peculiar nature of contest-functions makes the calculations and best-responses very messy to work with, so the games are often extremely simplified. This does not necessarily imply that the results are far off and my hope is that this is correct for the model I present as well.

4 Civilian Protection: A Simple Model

Below I present a simple model of civilian protection. It is a three-player game, but when the international community intervenes they do so on the side of Bosnia. I abstract from collective decision problems and dynamics[1], making the game a simultaneous-move game with three representative agents. The only interesting behavior stems from NATO's decision problem and there are four different civilian protection levels that arise under varying circumstances. It explains in a simple way why international forces although being more than capable of protecting civilian populated areas may fail to secure them. This happens even though NATO's military effort does not induce civilian casualties and thereby are able to protect with "surgical precision".

4.1 The Conflict Environment and Behavior

In the following game there are three players: Bosnia, Serbia and NATO, they are denoted $i = b, s, n$. All countries and military coalitions are considered to be individual agents. The starting point is a conflict between Serbia and Bosnia, where Serbia attacks Bosnian territories. The whole Bosnian territory is denoted A. The *amount* of the territory inhabited by civilians is denoted C, so $\frac{C}{A}$ is the share of civilian inhabited area of the total territory. Both parties want to win or protect as much territory as possible, so they maximize the share they own at the end of the conflict taking NATO effort as given. The maximization problem of Serbia and Bosnia is therefore:

$$\max_{x_j} s_j(x_i, x_j; x_n)A - c(x_j) \qquad (5)$$

For $j = s, b$. The share-function is the contest-function and they derive utility solely from capturing more territory. The utility is therefore the first term in the maximization problem.

I further assume that all of the players have a given stock of military capacity. In a more general model it could be represented by a vector of different weapons, logistic technology and food-supplies. To begin with I treat military effort as one single good. The stock of

[1] For these issues, see for example Hartley & Sandler (2001), Konrad & Kovenock (2006) and Mehlum & Moene (2006).

military capacity is denoted: $\mathbf{X}_i$, which can be used in the conflict in incremental sizes denoted x_i. Since this is a static model I will therefore abstract from investments and planning of future war-effort. I also abstract from the fact that in modern warfare governments often hire mercenaries or other non-country specific military effort.

The model concerns political, diplomatic and valuation issues and not military material problems, so for simplicity the cost function of all agents are:

$$c(x_i) = \begin{cases} 0 \; if \; x_i \leq \boldsymbol{X}_i \\ \\ \infty \; if \; x_i > \boldsymbol{X}_i \end{cases} \tag{6}$$

The cost of investing one unit of military effort from the given stock of military capacity in the conflict is zero, while increasing military capacity in this one-period static model is impossible. Since NATO is so powerful, I assume that their military capacity tends to infinity. NATO does not lose a one-period conflict if nothing else prohibits them. These assumptions are applicable to conflict where the warring parties are small.

The contest function is the Tullock ratio-form. If one uses a probabilistic interpretation then each agent may invest more than the adversary in the contest and still lose the whole territory. If the conflict is just a one-period battle as in ancient times, where warring parties met on a battle-field, this is not too unrealistic. If one uses the share-interpretation, which I will do, then one may think about the conflict as a long war where at the end the borders have shifted. This is not generally realistic, but it suffices for the main purposes in this model. The general version of the Tullock contest function is:

$$s_i = \frac{f(x_i)}{\sum_{j=1}^{N} f(x_j)} \tag{7}$$

Later, in order to solve for an explicit version of the model I will use a contest function that is linear in contest effort, but concave in the share. The behavior of Serbia and Bosnia on the other hand does not depend on anything else than the property that the contest-function is over-all increasing.

4.2 International Forces and the Protection of Civilians

In this set-up NATO gets utility from protecting Bosnia. Bosnia wants to protect the whole territory and Serbia wants to capture the whole territory. One difference between NATO and the two warring parties is that the "utility" of protecting civilians is higher than protecting mountains. One could imagine that Serbia first attacks unpopulated areas and then civilian inhabited areas and only if the latter happens will NATO intervene. When they intervene on the other hand, they have some utility from protecting and recapturing territory. This story, in a static setting, is represented by a concave, kinked function. The kink occurs where the share of Bosnia inhabited by civilians is protected.

$$u_n(s_b) = \begin{cases} b_1 s_b & if \quad s_b \leq \frac{C}{A} \\ a + b_2 s_b & if \quad s_b > \frac{C}{A} \end{cases} \tag{8}$$

Where $b_1 \geq b_2$ and $a = b_1 \frac{C}{A}$. The utility of NATO increases linearly in the protected share until the share protected is equal to the amount of civilians. From there on, the marginal utility of protecting is weakly lower. An example of NATO's utility function is depicted in figure 1:

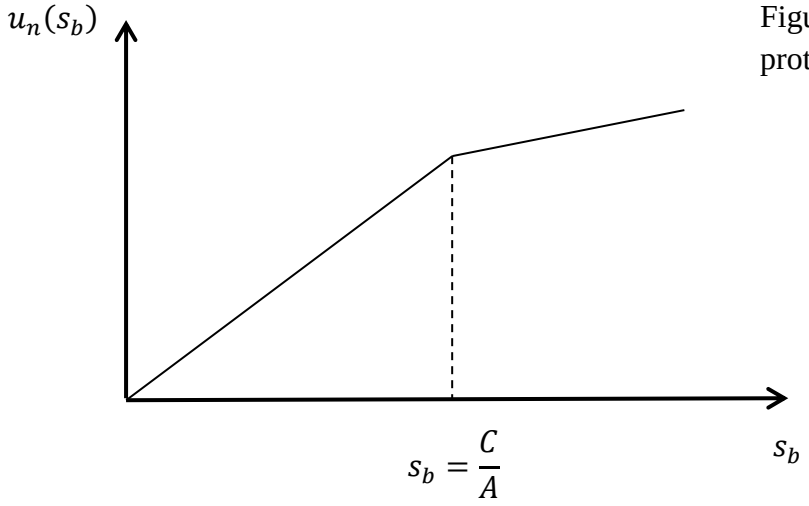

Figure 1: Utility of protection

One important thing to note is that NATO's utility depends on the ratio of Bosnian and Serbian military capacity. The important variable is the share protected, not the military effort of NATO, that is: the amount of military effort can vary, and utility stay the same.

Conflict induces a multitude of costs that need to be made explicit in order to characterize NATO's decision problem. The most obvious cost is the cost of equipment like bombs, tanks, humanitarian aid supply-chains etc. They have practical consequences, but in my view they are conceptually uninteresting and I have therefore assumed a very simple structure to material costs as described above – essentially making them zero. Instead I focus on the three types of costs that are much more conceptually interesting: the death-costs, the political benefit of protection and the diplomacy costs of intervention.

The valuation of own soldiers' lives relative to foreign civilians is the most basic cost in the setup. There is a limit to how large a loss of soldiers a nation or coalition will endure. The basic idea is that cultural polarization has some effect on this implicit valuation as explained earlier. To formally address this in the simplest possible way, I assume the following closed-form death-cost structure:

$$c_n(x_n;\theta) = \gamma\theta x_n \qquad (9)$$

Where $0 \leq \gamma \leq 1$. For every incremental increase in military effort, some fraction γ of that unit is destroyed and I will for notational simplicity set $\gamma = 1$. It can be interpreted as the expected average death-toll of soldiers. The value of θ corresponds to "polarization": a high θ implies that the valuation of the death of one's soldiers is high; therefore the slope of the cost is steeper. One could model the death-cost as a kinked function too. The valuation of the cost of losing a soldier when the soldier protects civilians would then be lower than the case where the soldier fights over territory, but this would not change the results in any interesting way.

The second type of cost is the *political cost*. The basic idea is that not protecting civilians may cause political turmoil. One could imagine that this was a function of media-coverage, but I will not include it as a variable. The cost is then induced either by media-coverage that causes turmoil if the country does not intervene, since a possibly large part of the population thinks their own country should help the suffering civilian population in Bosnia. Or another

interpretation is that other countries might cause political problems if your country does not help. Consequences can be lack of trust or a worsening reputation which may cause problems in the future, especially if there is a significant probability that your own country will have a conflict at some point in the near future. In both cases, not intervening is costly and increasing involvement creates a marginal benefit. To formulate it simply:

$$D_1(s_b) = \begin{cases} d_1(C - s_b A) & if \quad s_b \leq \dfrac{C}{A} \\ 0 & if \quad s_b > \dfrac{C}{A} \end{cases} \tag{10}$$

The political cost is induced by not intervening until the share of the conflict-area protected equals the share of civilian inhabited area. For simplicity I assume that after civilians are protected this specific cost drops to zero.

The third cost is the *diplomacy cost* of being "overly" aggressive from the point of view of another nation in the international community. Imagine a UN meeting where all nations discuss an ongoing conflict in some corner of the world. If there is proof of displacements of the civilian population, famine and possibly massacres, even countries who are sympathetic with the perpetrators may not have a problem with protecting civilians in that area. Now, say that Russia is an ally of Serbia. They do not veto the protection of civilians by setting up safe-zones like in Srebrenica, since this would make them look extremely inhumane. On the other hand, if soldiers from the Netherlands and US troops get involved with occupying territory that Russia considers being the territory of "Greater Serbia" and believes this has no effect on the protection of civilians, there are suddenly diplomatic problems. This is in essence the diplomacy cost, and the more powerful an ally of the aggressive country is, the higher one would expect the cost to be. To formulate it in a similar fashion as the political cost, I assume the following structure:

$$D_2(s_b) = \begin{cases} 0 & if \quad s_b < \dfrac{C}{A} \\ d_2(s_b A - C) & if \quad s_b \geq \dfrac{C}{A} \end{cases} \tag{11}$$

For simplicity, this diplomacy cost is zero up until the share protected equals the civilian population. After that point, there are increasing diplomacy costs. This is very simplified; the reason is that there are many different ways to "veto". In the model there is one input, namely "military effort". A more nuanced model would incorporate different protection schemes: weapon embargoes, economic sanctions, air strikes, ground forces et cetera. where the diplomatic climate affects the available methods of protection. I extend the model later to account for a situation where this occurs, and sometimes depending on the conflict, have an effect on the protection of civilians. At the time being, with the diplomacy-cost above, figure 2 below pictures the political and diplomatic cost together:

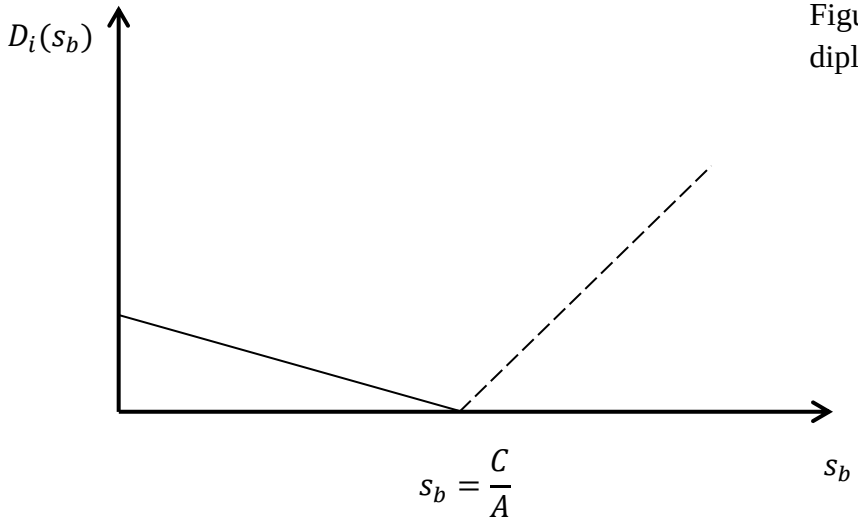

Figure 2: Political and diplomatic costs

The political cost is the solid line and the dashed line is the diplomacy cost. It is important to note, that the steepness of the curves are an exogenous parameter that may vary. In the graph above, the media coverage may be interpreted as being moderate, while a powerful country shows high support for the perpetrator.

To summarize: the point of the setup is to explore the logic of civilian protection. I focus on other costs than material costs in peace-keeping campaigns. Newspapers often cover wars and focus especially on the deaths of soldiers from their own country and this affects the public. Also, for politicians the loss of for example Norwegian soldiers may hurt them politically. Not least, they probably find it personally hard to order men and women into a conflict and later attend their funerals. A valuation of domestic lives is therefore an important cost when

deciding whether or not to enter a conflict. The interest in protecting civilians is represented among people in most countries and groups try to lobby the politicians into at least get them humanitarian aid and military protection if there is a risk of huge civilian displacements or massacres. These sorts of interventions are not considered to be a problem among the relevant members of the Security Council. But there are cases where helping "too much" is a problem. This poses a diplomatic cost.

4.3 The Behavior of International Forces

I assume a specific functional form for tractability, namely a function with linear contest technology: $f(x_i) = \alpha_i x_i$. The constant is the efficiency of transforming military effort into increased shares of territory, but I assume that $\alpha_i = 1$. I also assume that NATO has perfect information about the military capacity of both players. The maximization problem of NATO is then:

$$\max_{x_n} \{u_n(s_b) - c_n(x_n) - [D_1(s_b) + D_2(s_b)]\} \qquad (12)$$

NATO takes the military effort by the other parties as given. The functions are not over-all differentiable, so we have four different solution-types to this problem. The exogenous parameters and behavior of the other players will give the conditions for when the different solutions hold. To make it simpler to follow the arguments below, a graphical representation of the decision problem may be helpful:

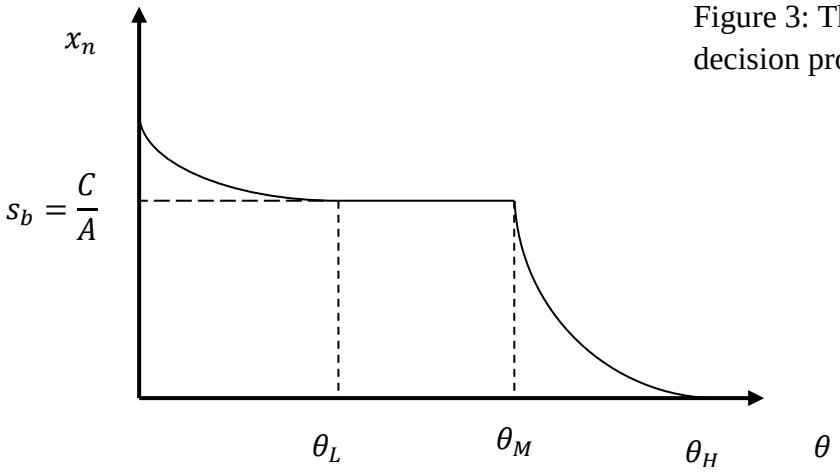

Figure 3: The decision problem

The first falling part of the curve and the corresponding death-costs represent the case where international forces protect more than the civilian share of the area. The straight part corresponds to the amount of military effort that gives full civilian protection and is compatible with a whole interval of death-costs. The last falling part of the curve represents the case where the death-cost is so high that the optimal behavior is to protect less than the whole civilian territory. If the death cost is sufficiently high, NATO will not intervene.

The main result is summarized in proposition 1:

Proposition 1. *There are four different outcomes of the game. They may be defined in relation to the valuation of international soldiers' deaths. Specifically there are numbers* θ *such that:*

- *For* $\theta \in [\theta_H, \infty)$*, NATO will not intervene in the conflict and no civilian protection will be conducted by international forces.*
- *For* $\theta \in (\theta_M, \theta_H]$ *NATO forces will intervene and protect at least a fraction of the civilian inhabited areas.*
- *For* $\theta \in (\theta_L, \theta_M)$ *all civilian inhabited areas will be protected, but uninhabited territory will fall into the hands of the aggressor.*
- *For* $\theta \in [0, \theta_L)$*, there will be full-scale civilian protection and some fraction of uninhabited territory will be defended.*

PROOF. If the marginal benefit is lower than the valuation of the death cost for every value of x_n, there is a corner-solution where NATO will not intervene and this constitutes an entry condition. It is straightforwardly given by:

$$\theta_H \equiv (b_1 + d_1 A)\frac{x_s}{(x_s + x_b)^2} \tag{13}$$

This is the solution to the problem evaluated at $x_n = 0$. This implies that NATO will not intervene for $\theta \in [\theta_H, \infty)$, taking the military effort of the other agents and political cost as given.

Assuming a positive amount of military effort, there exist a solution where the political cost is positive and the diplomatic cost is zero. If this is to hold the optimal military effort lies in the interval $[0, x_n < s_b = \frac{C}{A})$, and the first-order condition is given by:

$$(b_1 + d_1 A)\frac{\partial s_b}{\partial x_n} = \theta \tag{14}$$

Then θ_M is the limit that is compatible with this solution yielding the range $(\theta_M, \theta_H]$. The corresponding military effort can be explicitly solved to be:

$$x_n = \sqrt{\frac{(b_1 + d_1 A)x_s}{\theta}} - (x_b + x_s) \tag{15}$$

To have a positive solution, the aggregate military effort of Bosnia and Serbia cannot be too large, but if the entry-condition is satisfied for $x_n^o > 0$ it is easily seen that this holds.

Assuming a positive amount of military effort, there exist a solution where the political cost is zero and the diplomatic cost is positive. If this is to hold the optimal military effort lies in the interval $\left(x_n > s_b = \frac{C}{A}, \infty\right)$. The first-order condition is then:

$$(b_2 - d_2 A)\frac{\partial s_b}{\partial x_n} = \theta \tag{16}$$

The military effort is:

$$x_n = \sqrt{\frac{(b_2 - d_2 A)x_s}{\theta}} - (x_b + x_s) \tag{17}$$

To have a positive solution, there is a parameter-constraint, namely: $b_2 > d_2 A$. If this does not hold, then protecting more than civilians increases the marginal cost to such a level that it exceeds the marginal benefit for every square-foot that is not inhabited by civilians. The upper-limit where this solution holds is θ_L yielding the range $\theta \in [0, \theta_L)$.

Lastly there is a kink, which constitutes the boundaries of the interval where NATO military effort is:

$$x_n = \frac{x_s C - (A - C)x_b}{(A - C)} \tag{18}$$

This is solved implicitly by the equation $s_b = \frac{C}{A}$. It needs to be shown that $\theta_M > \theta_L$ to establish the existence of an interval of $\theta's$ that is compatible with such a solution. Since s_b is continuous, the marginal utility difference between a solution in the interval $(\theta_M, \theta_H]$ and $[0, \theta_L)$ is $(b_1 + d_1 A) - (b_2 - d_2 A)$ when x_n tends to the same value. Because of the parameter constraints this cannot be zero. Therefore $\theta_M > \theta_L$ and the difference $\theta_M - \theta_L$ constitutes an interval compatible with full protection of civilians.

■

There are four different solution-types to the maximization problem of NATO. There is no guarantee that they will enter the conflict, they might protect less than the civilian share of the territory, they might protect only the civilian share of the territory or they might protect more. The amount of military resources they expend in the conflict depends on the valuation of the death-cost interpreted as increasing in polarization, on the political benefit from intervening and protecting civilians and on the diplomacy cost of protecting "too much". Lastly, their behavior depends on the ratio of military effort expended by the other parties in the conflict. The next step is to characterize the properties of the equilibrium and best response behaviors with the conditions above.

4.4 Equilibrium

Are there behaviors that would make it beneficial to Bosnia and Serbia to not expend all their military resources $\boldsymbol{X}_i \; for \; i = s, b$ in the conflict? One assumption is that NATO knows the military stock and costs of both Serbia and Bosnia and since this is a static game they move simultaneously. So NATO will act as if Bosnia expends full effort, if Bosnia for some reason drops their effort, they will always win a smaller share. Bosnians knows that NATO knows about their military capacity and will therefore spend their entire military stock. The same goes for Serbia. If they drop their effort level below full military capacity, then NATO and Bosnia will win more territory. And assuming Serbia wants to maximize the share, they use

their full capacity. So the equilibrium choices of the three players are characterized by: $x_s^* = \boldsymbol{X}_s$ and $x_b^* = \boldsymbol{X}_b$ for Serbia and Bosnia respectively. And for NATO:

$$x_n^*(\theta) = \begin{cases} 0 & when \quad (b_1 + d_1 A)\dfrac{x_s^*}{(x_s^* + x_b^*)^2} < \theta \\ \sqrt{\dfrac{(b_1 + d_1 A)x_s^*}{\theta}} - (x_b^* + x_s^*) & when \quad x_n > 0 \; and \; s_b < \dfrac{C}{A} \\ \dfrac{x_s^* C - (A - C)x_b^*}{(A - C)} & when \quad x_n > 0 \; and \; s_b = \dfrac{C}{A} \\ \sqrt{\dfrac{(b_2 - d_2 A)x_s^*}{\theta}} - (x_b^* + x_s^*) & when \quad x_n > 0 \; and \; s_b > \dfrac{C}{A} \end{cases} \tag{19}$$

This summarizes all the solutions to the three-player game. The next section will look at some comparative statics results.

4.5 Comparative Statics

There are five main factors that affect the solution to the game: the death-cost, the political cost, the diplomatic cost, the amount of civilian inhabited areas and the ratio of the military stocks of Bosnia and Serbia. There are many results that may be deduced from the model since there are many exogenous parameters, but I will draw attention to the following three:

(i) NATO presence is non-increasing in the valuation of international soldiers' deaths.

(ii) An increase in the political cost, increases NATO presence. An increase in the diplomacy cost, decreases NATO presence.

(iii) If civilian inhabited areas decrease, then NATO's military effort may either stay unchanged or decrease, but it will never increase.

The simplest way to see this is to look at a graphical example where the marginal political cost of not intervening and the marginal diplomacy cost of protecting bare territory increase.

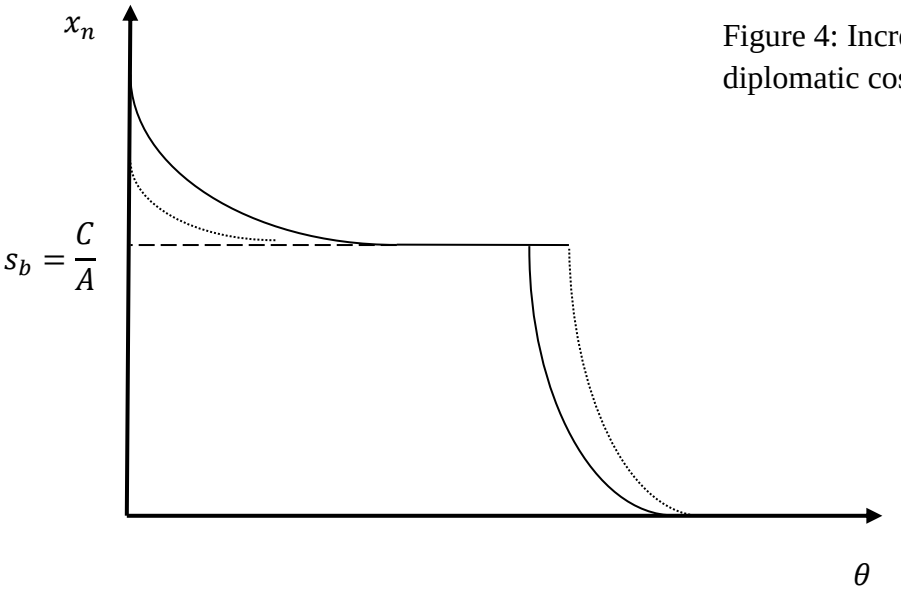

Figure 4: Increased political and diplomatic costs

Military effort is continuous, and the military effort compatible with "perfect" civilian protection is independent of the death-cost and stays the same if the ratio of Bosnian and Serbian military effort is held constant. An increase in d_1, the political cost of intervening less than the military effort needed to protect all civilians, increases the military effort for every value of the death-cost compatible with such a solution, because of the cost reducing effect of increased NATO presence. An increase in d_2, the diplomacy cost of intervening with more military effort than needed to protect all civilians reduces the amount of military effort for every value of the death-cost compatible with this solution. In such a case, the interval of death-costs compatible with full protection of civilians increases. The mathematical reason is that the angel of the kink decrease. The economic interpretation is that the marginal utility increases in the interval where the share of Bosnian territory is less than the civilian inhabited areas and the marginal utility decreases in the interval where the share of Bosnian territory is higher than the civilian inhabited areas. If such changes occur this could be interpreted as "good news" for Bosnian civilians, but "bad news" for Bosnian territorial sovereignty.

What if the civilian inhabited areas decrease? Then the amount of effort needed for full protection of civilians will be reduced for constant Serbian and Bosnian military capacity. In the graphical example I use lines instead of curves for simplicity, but in relation to Proposition 3, I will prove the result.

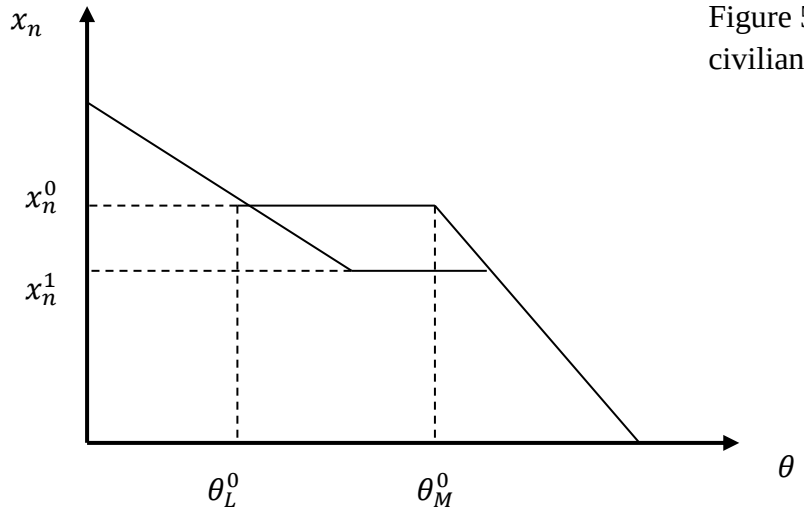

Figure 5: Reduced civilian territories

If civilian inhabited areas a smaller in square-feet, then for earlier effort-levels in the interval $[\theta_L^0, \theta_M^0]$ marginal utility will change and for every other effort level stay unchanged. This interpretation is fairly simple. For example: if NATO initially would help to protect 10% of Bosnia, but civilians inhabited 40% and then this change to 30%, they will still only protect 10%. It is only for values where the marginal utility of protection changes that will affect the solution and for these levels, everything else held constant, protection will decrease.

The simple model presented above gives a fairly simple and tractable description of international forces decision problem when confronted with the problem of protecting civilian inhabited areas in a conflict. The main message of the model is that the valuation of own soldiers' lives, the political cost of not intervening and the diplomatic cost of intervention have important consequences for protection. The model set-up has essentially branded Serbians as the perpetrators and Bosnians as the innocent victims, but this historically oversimplified and in certain cases just plain wrong. *The Yugoslavian war of Dissolution* and particularly the *Bosnian War* are infamous for the share amount and brutality of war-crimes. It is important to remember that all sides committed war-crimes against civilians (Mojzes, 2011). The horrific war-crimes of paramilitary groups were especially terrible. Examples of Serbian paramilitary groups are: *Tigrovi* (Tigers), *Beli Orlovi* (White Eagles), *Osvetnici* (Avengers) and *Zute Ose* (Yellow Wasps). Croatian groups were the pro-fascist and pro-Ustasha HVO (Hrvatsko Vijece Obrane) who actually saluted each other with "Heil Hitler", *Crna Legija* (Black Legion) and *Jastrebovi* (Falcons). And lastly many Bosniaks were no better: *Green Berets*, *Patriotska Liga* (Patriotic League) and *Crni Labudovi* (Black Swans) -

many of them extremist Muslims and mujahideens from foreign countries. In addition Bosnian hero Naser Oric destroyed fifty Serb villages near Srebrenica and often massacred the civilian population (Mojzes, 2011). That said, Serbs wanted to take over maximal amount of territory and actually had 70% of Bosnia-Herzegovina at one point. That borders and control of territory was the most important motive for the war is indisputable. A more accurate model for civilian protection should incorporate the fact that all sides often commit war-crimes. That on the other hand does not change the fact that civilian protection often is poor because of the main variables in my model, it just stresses that one should expect even poorer civilian protection than what the model predicts.

5 Extensions

The decision to intervene has been simplified in many ways. Some of the simplifications make it easier to intervene and some makes it more difficult. For example: The UN Security Council does not directly choose the fairly mysterious "military effort" of the simple model, but has an arsenal of policies they might use to affect a conflict. Important and often used policies are *arms embargoes* and *no-fly zones*. Extending the model might help clarifying when and if such policies are efficient for civilian protection or how it might affect the contest and productive capabilities in a conflict area. Secondly, *refugee flows* and *mass killings* are a recurring phenomenon in conflicts. An interesting question is whether the factors that affect international intervention create strategic gains from such endeavors.

5.1 Why Weapon Embargoes may Benefit the Aggressor During and after a War

International forces might not actually join the deadly fight, but choose a policy that affects the fight by enforcing limitations on fighting resources. Such a policy could be an arms embargo. In Yugoslavia the JNA was the given stock of military capacity and the UN enforced an embargo, limiting the available amount of military resources to the warring parties. As Mojzes writes:

> On September 25, 1991, the UN Security Council passed resolution 713 placing an arms embargo on all Yugoslavian territory. This had minimal impact on the Serbs, as they inherited the JNA's arsenal. The Croats successfully bought arms on the black market and smuggled them in. Initially, the Army of B&H was most negatively affected by the embargo, and Muslims pleaded that they should at least have weapons to fight back if they were attacked and threatened by extinction (Mojzes, 2011, p. 170).

The point of an arms embargo is probably two fold. First, it may reduce the extent of the fight, which is how much resources are used on fighting. Secondly, it may keep the amount of deaths low, since warriors need weapons to kill civilians in addition to the fact that an abundance of for example bombs will supposedly create massive collateral damage. By giving Serbs and Bosnians different military capacity endowments one could assess such a policy in simple cases.

Assume that the military capacity of both groups is produced by the following technology:

$$X_i = x_{iM}^{\alpha} x_{iT}^{(1-\alpha)} \tag{20}$$

M stands for manpower and T for high-technology weapons and $0 < \alpha < 1$. The available amounts of the different military inputs yields the amount of effort they put into the battle. Assume the simple cost-structure in equation (6) for both types of military inputs. The maximization problem for the groups is then:

$$\max_{x_{im}, x_{iT}} \frac{x_{iM}^{\alpha} x_{iT}^{(1-\alpha)}}{\sum_{j=1}^{2} x_{jM}^{\alpha} x_{jT}^{(1-\alpha)}} A - c(x_{iM}) - c(x_{iT}) \tag{21}$$

Because of the cost-structure there is a corner-solution to both military inputs, so they invest $x_{iM} = X_{iM}$ and $x_{iT} = X_{iT}$, where the large X's are the given stock of capacity for each input.

An arms embargo will restrict the amount of weapons in the fight. One could interpret the embargo as restricting the smuggling of high-technology weaponry. Smuggling of soldiers does occur in the form of for example mercenaries or mujahedeen warriors, but I will focus on smuggling of weapons.

> **Proposition 2**: *If military inputs are concave and an arms embargo restricts one of these inputs, the policy will be neutral to the contest only if it the military stocks of the adversaries are initially equal and reduces the military stocks proportionally. Otherwise, an arms embargo will be a non-neutral policy and may benefit the aggressor.*

PROOF. Assume that $X_i = x_{iM}^{\alpha} x_{iT}^{(1-\alpha)}$ and $X_b = X_s$, but $x_{bM} > x_{sM}$ and $x_{bT} < x_{sT}$. In that case the win-probability is $\frac{1}{2}$. Assume that it was possible to increase x_{iT}, while holding the other input constant. Because of concavity, the marginal win-probability of increasing x_{iT} is higher for Bosnians than Serbs, implying that they would benefit more from increasing high-technology weaponry than the Serbs would, everything else constant. The win-probability would increase for Bosnians, since we would now have: $X_b > X_s \Rightarrow x_{bM}^{\alpha}(x + \epsilon)_{bT}^{(1-\alpha)} >$

$x_{sM}^{\alpha}(x+\epsilon)_{sT}^{(1-\alpha)}$ if that happened, where ϵ is a small positive number. In addition, since $x_{bM} > x_{sM}$ which is multiplied with the new high-technology military stock, the win-probability would increase even more because of the positive constant. It is easy to see that if the military stocks were identical in each input, then the win-probability would not change.

■

The neutrality of an arms embargo is therefore a special case. If an arms embargo reduces the amount of high-technology weapon-smuggling, but has no effect on the amount of soldiers, the policy will favor the party with initially more high-technology weaponry. In the Yugoslavian case, this would be Serbia. If the military effort technology in addition has the property that the two types of military effort are positively interdependent, this is particularly devastating for the Bosnians when the endowments are as described – and which they were.

Further, arms embargos may have an effect on production as well and may easily be modeled here. One additional reason to restrict the extent of the fight is the concern that the higher the fighting-intensity the lower production will be and this leads to less welfare for all parties after the war. To have a simple expression for the approximation to the waste of resources, assume that without a war the conflict-area would produce consumption goods according to the function:

$$Y = \delta A^{\beta} N_M^{(1-\beta)} \qquad (22)$$

$0 < \beta < 1$. Where Y is production, δA is the productive part of the territory with $0 < \delta < 1$ and $N_M = N_b + N_s$, is the total work-force. In a war on the other hand some fraction of the population are soldiers and some die, and for simplicity assume that the whole Serbian and Bosnian army die, but $x_{iM} < N_{iM}$, thereby securing that there are producers after the war. The difference between production without war and production after the war is then:

$$\delta A^{\beta} N_M^{(1-\beta)} - \delta (A - A_w)^{\beta} (N_M - x_{bM} - x_{sM})^{(1-\beta)} \qquad (23)$$

Where A_w is the "wasted territory", meaning that during after a war a part of the territory would be too dangerous to use or unusable in production because of bombing or mines. I also

assume that A_w increases in the extent of the fight, so the more weaponry involved in the fight, the higher is the wasted territory.

Another way to characterize the production opportunities is to divide production into Serbian and Bosnian production. This might be realistic since the warring parties' fights over territory and they use the territory they win to produce goods independently:

$$Y_i = \delta A_i^{\beta} N_i^{(1-\beta)} \tag{24}$$

In that case, the aggregate peace versus war difference would be:

$$(Y_b + Y_s) - \left[\delta(A_b - A_{bw})^{\beta}(N_b - x_{bM})^{(1-\beta)} + \delta(A_s - A_{sw})^{\beta}(N_s - x_{sM})^{(1-\beta)}\right] \tag{25}$$

If international forces uphold a weapon-embargo and thereby decreases the extent of the fight, then the aggregate production difference between peace and post-war production goes down. This is supposedly a positive effect of a weapon-embargo, but the following result questions this:

> **Proposition 3**: *If an arms embargo affects the outcome of the fight, then one group may get lower production that they would if there was no arms embargo.*

This follows from Proposition 2 and that post-war production is $Y_b = \delta(A_b - A_{bw})^{\beta}(N_b - x_{bM})^{(1-\beta)}$. If the share of productive territory won is sufficiently reduced because of the weapon-embargo, then the lower level of wasted territory (and possibly the amount of soldiers killed) might not out-weigh the effect and production would be less.

How does this affect civilian protection and welfare? First of all, in the case above a weapon-embargo might reduce the income of ordinary Bosnian civilians after the war. There are also reasons to believe that massive bombings do not affect productive capabilities after a war. In a Vietnam case-study by Edward Miguel & Gérard Roland (2011), they find that although no territory has been bombed as much as certain areas in Vietnam, this did not have negative effects on poverty traps, consumption levels, infrastructure and much more. If this holds, then

an arms embargoes' positive effect on production is that a weapon-embargo will prevent killings of soldiers (and civilians). This on the other hand is questionable for two reasons. Firstly, the arms embargo reduces the Bosnian military capacity to protect civilian inhabited areas. Secondly, if you have plenty of high-technology weapons you use bombs and gasses to fight, this may cause more collateral damage since bombs and gasses are undiscriminating weapons i.e. difficult to kill only soldiers and not civilians. Increasing the amount of high-technology weapons to Bosnians may or may not decrease collateral damage. It may do so if you can target the warring parties' long-range gun-stations, but the Bosnians might target Serbian civilian-inhabited areas with high-technology weapons. It is therefore difficult to decide. Still, there is no clear cut, unambiguous argument to why civilian protection and post-war welfare will fare significantly better with an arms embargo in the case studied here. It may just benefit the aggressor.

5.2 Strategic Refugee Flows and Civilian Massacres

Often two groups enter a conflict and only after a while, especially if the conflicts escalate, do international forces intervene. It is therefore important to consider how the "first-mover advantage" from an aggressor might affect both the outcome of the conflict and the behavior of the groups. A phenomenon that often occurs is *refugee flows* and *civilian massacres*. In the Bosnian war, the Serbs drove Bosnian civilians away from their villages on purpose. This behavior is what is often referred to as *ethnic cleansing*. The question I pose is: is it any strategic advantage to be had by creating refugee flows from the side of the aggressor, beside the fact that a group may get utility from an ethnic clean territory? If there is also a strategic dimension to refugee flows and massacres, then the international authorities should incorporate this aspect in their policy towards peacekeeping operations.

To explore the problem, consider a three-stage game. In the first stage Bosnians and Serbs fights a battle and the territory is divided by the contest-function. So both groups have the following decision problem:

$$\max_{x_j} s_j(x_i, x_j)A - c(x_j) \tag{26}$$

This does not depend on NATO effort, since international forces are not contestants in the first-stage battle. I assume for simplicity, that there is no destruction of military effort or they can replenish their stock until the next battle.

In the second stage Serbs decide if they want to displace civilians from their newly won territories, i.e. create refugee flows or kill civilians. In the third stage, NATO decides how much to intervene and all agents act as in the simple model. Serbia and Bosnia maximize:

$$\max_{x_j} s_j(x_i, x_j; x_n)A - c(x_j) \tag{27}$$

And NATO:

$$\max_{x_n} \{u_n(s_b) - c_n(x_n) - [D_1(s_b) + D_2(s_b)]\} \tag{28}$$

The question is then: are there circumstances where the Serbs may increase their share of territory over the three-stages by creating refugee flows and massacres given the behavior of NATO? The result is given in Proposition 4.

> **Proposition 4**. *It is a dominant strategy to displace civilians, i.e. create refugee flows, if it comes at zero costs and does not affect the political cost or diplomatic cost of international forces.*

PROOF. I will show the zero cost case. Assume a given $\theta = \bar{\theta}$. If the military effort necessary to protect the civilian inhabited areas decreases from x_n^{*0} to x_n^{*1}, where $x_n^{*0} > x_n^{*1}$, then marginal utility changes for the interval $x_n \in [x_n^{*0}, x_n^{*1}]$, but is unchanged for every other value of x_n. It needs to be shown that a marginal utility drop will for every value of x_n either stay unchanged or decrease. Firstly, if marginal utility does not drop for some value of x_n, then the behavior of NATO will not change. Secondly, if marginal utility drops, then the marginal utility difference is: $[(b_1 + d_1A) - (b_2 - d_2A)]\frac{\partial s_b}{\partial x_n}$. By assumption $b_1 + (d_1 + d_2)A > b_2$, implying that the marginal utility difference cannot be zero. Then since $\bar{\theta}$ is held constant and determines behavior, $\frac{\partial s_b}{\partial x_n}$ must increase. Because of the concavity of the

contest-function with respect to NATO-effort, this implies that x_n must be reduced. Together this implies that NATO effort either stays constant or is reduced when civilian inhabited areas decreases. If civilian displacements come at zero costs, this constitutes a dominant strategy.

■

The result is easily seen from figure 5. Still, it is natural to assume that if aggressors create refugee flows, then it has political and diplomatic costs. If for example NATO prepared to defend more than civilians and sufficient territory, and the diplomatic cost decreased if massive civilian displacements were happening, then it might not be rational to displace civilians. On the other hand, the assumption that civilian displacement comes at zero costs for the aggressor might be defended, since intimidation is often enough and attacking to win territory is inherently intimidating. Neighboring countries and other nations would also probably shoulder the cost of massive civilian displacements because humanitarian aid is expensive and refugees often flee to other countries, thereby diverting some resources that could have gone into military action to refugee camps. In any case, it is in certain circumstances quite possible that it is rational to use civilians to win more territory because of the known reactions of international forces.

6 Conclusion

Protecting civilians in conflicts has been an increasingly important task after the end of the Cold War and is an important objective for international organizations like the UN and NATO. Civilians have of course always been the main victims in wars, but in later years warfare and conflicts have been mainly conducted in urban areas and civilians have been used for military purposes. Rogue states may target civilians in order to suppress revolutions and upheavals, ethnic fractions may have an explicit goal to cleanse areas of other ethnicities and terrorists may use civilians for political purposes. Warfare between sovereign states is no longer the most common type of military conflicts; it is rather war amongst the people. This realization has caused peace-keeping operations to be one of the main uses of military force. It is therefore important to explore the logic of international interventions and systemize the constraints international organizations face when confronted with modern conflicts.

I have developed a model that systemizes some of the constraints and factors that affect the decision of international organizations when confronted with a conflict between two countries. The model is simple in the sense that it is tractable and fairly easy to explore. It also abstracts from many important issues like collective decision-making, different dynamics and many policy instruments, but it is a prototype approximation to the problem and may be used as a benchmark for thinking about international interventions. The advantages are that strategic considerations can be made explicit and behavior varies in a sensible and hopefully realistic way. It is also easy to extend in different directions without making it overly complicated. Some extensions have been presented which brings forth important issues in the real-world such as arms embargoes and strategic uses of civilians. Because of the strategic element in international interventions these operations create new problems that have to be made explicit for international organizations to succeed in protecting civilians.

I have used the Bosnian War as a case study. There are few modern conflicts that are equally complicated and confusing as the multitude of problems the Yugoslavian War of Dissolution presented to the world. First of all, civilians on all sides were trapped by the ruthless political agenda of different political leaders. The political and ideological scheme developed in the different capitals brought different groups into a prolonged war where one of the main political goals was to change the population structure in the area. Secondly, the international and diplomatic scene is fairly similar to the diplomatic world we see today. There were no

ideological rifts as seen during the Cold War and the conflict was intensely discussed in the most prominent diplomatic arenas in the world today. Thirdly, different policies and military interventions were agreed upon and implemented with varying results and sometimes with devastating effects. Why intuitively good ideas fail in practice is important to answer, and the war in Yugoslavia is arguably one of the most important sources for exploring such issues.

I have argued that there are at least three important non-material costs that determine the behavior of an international agent. The expected death-toll of soldiers and cultural polarization between the conflict area and the participating countries, constitute an important constraint on international helpfulness. Furthermore, media coverage, and by extension political pressure to help suffering civilians will increase international involvement, but it is rarely the case that sympathy for civilians will help a country to protect uninhabited territory. Lastly, the diplomatic climate varies and affects the willingness to intervene. A country will rarely condemn civilian protection and humanitarian aid, but it will condemn military action that is not used for the purpose of civilian protection. Such diplomatic conditions will restrict the territorial protection level. The main result in the model is that these costs will under different circumstances yield four different levels of protection. In some cases, where polarization is high and political pressure to intervene is low, it is possible that the international community will not intervene at all and therefore not help in protecting civilian inhabited areas. The international community may also intervene and protect some civilian inhabited areas. An example would be to create safe-zones in certain areas, but not help any further. Still in other cases, the international community will protect all civilian inhabited areas or they may protect inhabited and uninhabited territory.

The simple framework of the model has been extended to evaluate the effectiveness of an *arms embargo*. An arms embargo limits the available resources that can be used in a conflict. Such a policy will not demand any international military action except the enforcement of the embargo, and is for this reason an appealing policy. I have presented a proposition that questions the neutrality and effectiveness of an arms embargo for the purpose of protecting civilians. It is only in the special case where the initial stock of different types of military material is equal and the arms embargo reduces the stocks proportionally that such a policy will only limit the extent of the fight. In some cases it may very well be the case that an arms embargo benefits the aggressor. If post-warfare production is included there may also be serious welfare effects. The civilians one was supposed to protect might get lower welfare

after a conflict if an arms embargo is enforced. The main message of this extension is therefore that an arms embargo must be used with care and is rarely a neutral policy.

Lastly, I constructed a three-stage game where an aggressor has a first mover advantage and acts under the threat of international interventions. The main result was that it is in certain circumstances a dominant strategy to create refugee flows or kill civilians if this reduces the amount of civilian inhabited areas. Such strategic use of civilians would not be very fruitful if the threat of international interventions were not present. Often a group has some utility from hurting another group and would hurt civilians no matter what, but there is also a strategic dimension to refugee flows and civilian massacres. The strategic element is in part a consequence of the threat of intervention when an international agent is restricted in the manner outlined. Such arguments should lead to a re-thinking of the importance of territorial protection and the importance of forceful intervention that varies more with adversaries' behavior.

Conflicts are rarely innocent contests over a prize, but rather induce damage, destruction and hurt many people. Producing conflict and disutility for other people happens every day and it is important to take such endeavors and actions seriously. The strategic element in contests will lead to flexible behavior and the adaptability of perpetrators. Protecting civilians is therefore tactically difficult and often expensive in many ways. Still simple policies may hurt more people than it is worth, because the strategic element is not taken into account. Developing models that address interventions, more complex cost-structures and political policies may therefore help and lead to better thinking about difficult problems.

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