

Hobbes vs. Mill: Anarchy, Development, and Demobilization in the Somalian Civil War

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One of the key problems in post-war societies is the identification of schemes that convince former combatants to hand in their weapons. Political economy models suggest that economic incentives increase the opportunity costs of fighting, while security studies rather suggest that the refusal to disarm follows from the anarchy in which the ex-soldiers have to operate. This article contrasts these two perspectives, which we trace back to the work of J. Stuart Mill and Thomas Hobbes, in a multi-level examination of more than 7000 interviews with combatants during one of the more peaceful episodes in the Somalian civil war. The statistical analysis supports the Hobbesian worldview at the individual level of analysis. Personal experiences in the form of high levels of traumatization (PTSD), the length of time spend in the armed group and the type of military unit to which a fighter belonged, shape the attitude of combatants on disarmament in a negative way. Combatants who have actual combat experience are more willing to hand in their weapon. The Millsian counterpart reveals two opposite effects on the individual and regional level. While wealthy individuals tend to be more hesitant to disarm, combatants living in economically stable regions tend to give up their weapon more often. Education does not show any significant influence on disarmament decisions. We argue that theories of civil war and demobilization should consider the level of analysis problem that our analysis uncovers.

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Introduction

Disarmament, demobilization, and reintegration (DDR) programs have become a routine practice in the national and international attempts to pacify post-conflict societies. According to the United Nations (2010), “DDR seeks to support ex-combatants so that they can become active participants in the peace process”. Proponents of this instrument hope that DDR missions improve the long-term prospects for war-torn societies and help them to escape the cycle of violence begetting many developing countries (Knight 2007). Currently, the UN is involved in 14 DDR programs in either a leading or a supportive function¹.

The starting point of any DDR mission is the disarmament of the combatants. During this first phase, the peace forces collect, document and control arms and ammunition (UN 2010). As the willingness of soldiers to hand in their weapons differs, we need to identify the factors that increase the chance of a voluntary disarmament. Such an undertaking is, however, much more difficult than the rosy self-assessments of many DDR programs often suggest. The mismatch between the often lofty goals of this form of development assistance and the more humble needs of the targeted ex-soldiers becomes apparent through a statement by a former militia member in Somalia after the conclusion of a basic skills training: “Unfortunately, now that I have skills but no job, I am afraid I have to go back to checkpoint for living” (UNDP 2004:15).

Although the limited program effectiveness of foreign aid programs that are similar to the various disarmament measures is widely documented, we know relative little about the success of DDR programs. The few studies that have systematically examined demobilization decisions so far have either assessed the program descriptively or focused on individual features of the ex-combatant, showing that ideologically committed ex-fighters and economically more resourceful soldiers have more difficulties to completely break with their past in an armed group (e.g. Humphreys and Weinstein 2007). Such micro-level examinations are a welcome departure from the macro-level research designs, which have dominated the study of civil conflict and the attempts to pacify war-torn societies until recently (e.g. Doyle and Sambanis 2000). Quite often, studies in this domain try to explain the risk of a country to experience war through the expected utility calculus of political leaders or, by extension, of the groups that they represent. The causal mechanisms to which these hypotheses resort were, however, originally developed to account for the behavior of individuals who consider joining an armed struggle. Aggregation problems of this sort are apparent in Collier and Hoeffler’s (2004) controversial work on the economic motives of war in which they explicitly refer to the micro-economic theory of rebellion by Grossman (1991)

¹ The active DDR programs in July 2010 were as part of a peacekeeping mission based in Sierra Leone (1999), the Democratic Republic of Congo (1999), Liberia (2003), Côte d’Ivoire (2004), Haiti (2004), Burundi (2004), and Sudan (2005). The UN-sponsored DDR missions without peacekeeping included the following former or current civil war locations: Aceh (Indonesia), Afghanistan, the Central African Republic, Republic of Congo, Niger, Somalia and Uganda.

or in attempts to test grievance conjectures through macro-level indicators. However, attributing the decision to fight or, as in the case of the DDR-programs, to refuse handing in weapons fails to point out the possible impact of the social and political context on such choices. In other words, advanced research on the decision to rebel fails to consider how structural factors and the incentives and disincentives stemming from them affect the individual decision to disarm or to keep the fighting possibility alive.

This problem of the current scholarship on the motivation to join armed forces or to break with them is accompanied by the limited attention researchers have paid to the local or regional insecurity as a possible trigger for the willingness to fight or to remain armed. A rich research tradition has attributed this decision to the anarchical situation in which individuals and collectives are living or from which they emerge. In other words, insecurity in its various manifestations at the individual level or in the community in which the fighters are living should be a major impediment to DDR initiatives.

This article tests whether the insecurity to which a fighter is or has been exposed to is a stronger predictor than the economic incentive and disincentive explanations that have been *en vogue* in the literature on civil war at least since Collier and Hoeffler's (1998, 2004) seminal papers. We ascribe the anarchy explanation to Thomas Hobbes' *Leviathan* and similarly trace the opportunity cost arguments apparent in Grossman (1991) as well as Collier and Hoeffler (1998, 2004) to the writing of John Stuart Mill (Stigler 1955). Our empirical tests refer to a large survey that was conducted among more than 7000 ex-combatants in Somalia in 2002 and 2003 and thus during one of the more peaceful periods in this war-ravaged country. The multilevel models that we employ allow us to consider the simultaneous influence of features of the ex-combatant and the region from which he or she is originating on the decision of whether or not to hand in the weapons. The results lend strong support to the Hobbesian model at the individual level of analysis. Personal insecurity experiences of the ex-combatants like severe traumatization in the form of the Post Traumatic Stress Disorder (PTSD), the length of time an individual spend in an armed group and the membership in regular armed units increase the resistance towards handing in the personal weapon. Combat experience on the other hand renders ex-soldiers less hesitant to disarm. The Millsian opportunity cost argument, by contrast, works differently at the individual in comparison to the regional level. The results show in contrast to the expectation of Collier and Hoeffler (2004) that economically more endowed individuals and thus those with low opportunity costs to return to civilian life refuse more often to give up their weapons than poor individuals. On the regional level, however, the Millsian model works in the direction political economy models of rebellion suggest: Individuals from economically stable regions are more willing to hand in their weapon than fighters from less turbulent areas. Regional insecurity, by

contrast, does not influence the decision calculus of the combatants to disarm. We argue based on our theoretical framework and the supporting statistical analysis that theories of civil war and disarmament should be aware of the level of analysis problem. Hence, theoretical propositions should clearly separate between the individual aspirations and possibilities of a real or potential combatant and the communal or regional constraints and opportunities that these individuals face.

Two Demobilization models

A growing body of evidence suggests that insecurity and development hang closely together. Many economists and political scientists have sought to establish whether underdevelopment increases the risk of war (e.g. Miguel et al. 2004), while another strand of research assesses the impact of violent conflict on economic growth (e.g. Murdoch and Sandler 2004). Most recently, several researchers have demonstrated that the relationship points in both direction and that establishing the net effect of conflict on the economy and vice versa is difficult (Jensen and Gleditsch 2009), if not almost impossible to establish theoretically in the first place (Besley and Perrson 2008, Fearon 2008, Schneider 2010). We believe that the difficulties in ascertaining the causal effect are not only due to econometric difficulties like finding a convincing instrumental variable, but are also conceptual. Many hypotheses that are used to test macro-level relations in conflict research are originally stated as causal mechanisms at the level of the individual who considers joining an armed organization. A case in point is the usage of the microeconomic theory of rebellion by Haavelmo (1954), Grossman (1991) and others as the conceptual basis of studies that explore how economic incentives such as resource abundance influence the risk of war (e.g. Collier and Hoeffler 2004). However, the problem of a mismatch between the level of analysis in the theoretical argument and the empirical application is also observable in studies that rely on individual-level data and seek to establish how higher-level influences like group membership influence individual decision making. If we do not control clearly between the different levels of explanations, we run into the risk of providing biased estimates of higher-level influences (cf. Weidmann 2009).

In this article, we want to break new ground by developing a multi-level explanation of the reluctance of ex-soldiers to hand in their weapons and of estimating this model appropriately through statistical models that are able to distinguish properly between the individual effects of factors situated at multiple levels of influence. Theoretically, we separate between insecurity and opportunity costs as possible motives for the refusal to hand in weapons. While we dub the former framework the Hobbesian model, we trace the latter approach to the writing of John Stuart Mill who, according to Stigler (1955:297) originally developed this concept. To address the

level-of-analysis problem in studies of civil war and disarmament, we will develop hypotheses for the Hobbesian and the opportunity cost model for a set of individual and regional factors that influence the personal decision to disarm.

Two models: The insight that an anarchical situation increases the risk of armament enjoys a rich tradition in international relations and comparative politics, referring ultimately to the work of Thomas Hobbes. The absence of the “Leviathan” leads in this realist perspective to a *bellum omnium contra omnes* - a state in which everyone fights each other (Höffe 2010: 43). Although the argument is theoretically incomplete (Fearon 1995), it has inspired research on arms races, balance of power politics and deterrence. Ironically, although Hobbes developed his argument in response to the insecurity experienced during the English Civil War, the proposed hierarchical solution has hardly ever been applied to the study of internal war.

What comes closest to the Hobbesian pessimism that weak statehood breeds anarchy is the growing literature on human security, which explores the conditions affecting “the survival of individuals, groups, and societies” (Paris 2001: 102). Indeed, there is evidence from survey research that individuals who have experienced insecurity in the past or who are living in violent neighborhoods are more mistrustful and belligerent. Colletta and Cullen (2000) as well as Born (2009) show that social capital erodes as a consequence of violent conflict, and Attanayake et al. (2009) and many others demonstrate that war experiences increase the prevalence of many illnesses. Among trauma-exposed adults, several studies support the conjecture of a positive relationship between the Post-Traumatic Stress Disorder (PTSD) resulting from extreme fear and traumatic experiences and hostile attitudes (Orth & Wieland, 2006, Schauer & Elbert 2010). Obviously, not only the individual situation, but also the wider community in which a combatant acts affects the attitudes towards demobilization that we examine in this article. We therefore suspect that the individual’s decision to disarm is shaped by his personal experiences of fear and insecurity as well as the insecurity and political instability of the social context an individual is part of.

H1: The risk that an ex-combatant will never or only under certain condition hand in his weapons grows with the amount of hardship or fear experienced in the past, his subjective feeling of insecurity and the level of violence in the region of residence.

In his groundbreaking work “Principles of Political Economy“, John Stuart Mill (1998 [1848]: 127) outlines the effect of economic systems on social unrest and conflict, stating that “...the best state for human nature is that in which, while no one is poor, no one desires to be richer, nor has any reason to fear to being thrust back, by the efforts of others to push themselves forward”.

Studies on the influence of economic factors have enjoyed a long tradition in conflict research, and recent theories are strongly inspired by the opportunity cost argument of conflict established by Haavelmo (1954). They are especially apparent in Grossman's (1991:920) model of rebellion in which he links tax policy to individual decisions to join an armed movement: "...too high a tax rate would be bad for the ruler both because it would depress the tax rate ... and because it would increase the probability of a successful insurrection." The initial contribution of Collier and Hoeffler (1998:565) to the civil war literature explicitly drew on Grossman. Their extension linked "the probability of the occurrence of war" in a decreasing fashion to per capita income and education and thus correlates of national development. If we bring this conjecture back to the individual level of analysis, for which it was originally formulated, we can expect that the risk that an individual joins a militia or the government troops grows with worsening prospects to succeed in the productive sectors of the economy. Collier and Hoeffler (2004) supplement their opportunity cost thesis with the conjecture that the presence of lootable natural resources incites quasi-criminal rebels to use political violence to enrich themselves with rents they could not garner peacefully. Collier and Hoeffler (2004) speak in this context of "greed" as a major motive of war, while they reject the view propagated in political science and sociology that individual or collective suffering – "grievance", in their terminology – increases the risk of war. In other words, the 'resource curse', which is generally interpreted as the tendency of commodity-rich states to make bad investment decisions and to under-provide their population with public goods, therefore translates according to Collier and Hoeffler (2004) into an increased risk of civil war.

It is not surprising that such a provocative thesis has triggered an intensive debate, which questioned the adequacy of crucial research design decisions and of the underlying logic of argumentation. Although development is one of the few robust influences on the risk of civil war in the meta-analysis of Hegre and Sambanis (2006), the key finding that income stemming from natural resources is key to understand the risk of civil war did not prove to be stable in alternative specifications of the regression model. To make matters worse, Besley and Perrson (2008) and Fearon's theoretical analyses (2008) put the logic of the underlying opportunity cost argument into severe doubt. To start with, Besley and Perrson's (2008) work on state capacity and civil war suggests that development like war is a social outcome that needs explanation. The attempt to treat income per capita as an endogenous concept and to establish its possible impact on the risk of war via an instrumental variable approach (Miguel et al. 2004) did not yield results that survived slight alterations of the research design (Jensen and Gleditsch 2009). The problems of the opportunity cost argument are even more fundamental, as Fearon (2008) shows. In his view, the relationship between development and war is ambiguous as higher development makes the

bounty for the contending forces more attractive, but it renders conflict also more costly as wages and other compensations for the soldiers simultaneously rise.

Weinstein's (2005, 2007) models of rebel recruitment similarly suggest that both economically and politically motivated individuals might join rebel movements. Humphreys and Weinstein (2008) tests of the extent to which grievances, selective incentives, and social sanctions can explain participation in rebel groups and local militias also exhibit that the richer respondents are less likely to give up their arms than the poorer ex-combatants interviewed in Sierra Leone. This suggests that the opportunity costs argument needs to be recast for the demobilization processes studied here. We expect that the less resourceful a soldier is, the more could he possibly gain by handing in the weapon. On the other hand, the economic environment an individual is living in can also have a severe influence on a combatant's decision to give up his weapons. Economic crises or economic insecurity are often an expression of social strain and should render individuals vigilant of possible security repercussions.

H2: The higher the opportunity costs of fighting and the better the economic situation of the region of residence of the ex-combatant, the smaller the risk that this former soldier will not hand his weapon or only conditionally do so.

We do not contend that these two classes of explanations advanced in this article are mutually exclusive. In an analysis of an extensive household survey, Justino (2009) found that both considerations – poverty and insecurity – motivate individuals to support rebel groups or to participate in them. Also, 4070 respondents in our sample named “income” and 3816 individual “self-defense” (3816 persons) as the main motivations for joining an armed group in the first place.² As these responses are, however, retrospective and allow the individual to rationalize their former decision *ex post*, we focus in the following on the individuals' current preference for remaining armed.

Research Design

Method: We test the relative importance of the two competing analytical models that are used to explain the reluctance to hand in weapons with the help of multilevel regression models (e.g. Snijders, and Bosker 1999, Jones and Steenbergen 2002, Rabe-Hesketh & Skrondal 2005). Such models are adequate for our purpose as we expect demobilization decisions to be a consequence of individual attributes as well as the wider social context in which the soldiers act.

In this analysis, we use the eighteen Somalian regions as the higher-level unit of analysis. The basic idea of multi-level models, in sociology also dubbed “hierarchical models”, is in line with our theoretical argument that individual level explanatory variables do not fully capture the

² The web-appendix summarizes the information on the reasons to join an armed movement.

variance in the attitude towards mobilization. We use multilevel ordinal logit models to test our hypotheses.³

Data: Even though Somalia is one of the few countries for which the pessimistic assessment of being a “failed state” seems fully justified (Maedl et al. 2011), it surprisingly also belongs to the most thoroughly documented conflict zones of the world. The major part of our macro level data is based on the market data gathered by the Food Security and Nutrition Analysis Unit - Somalia (FSNAU). FSNAU was founded in 1994 in order to provide evidence-based analysis of the food, nutrition and livelihood security in Somalia (FSNAU 2010). The monthly analyses offer a detailed overview of the development of the major market of every Somali region for the years between 1990 and 2010 including indicators such as price changes of main products, exchange rate developments and prices for unskilled labor. Additionally, FSNAU also offers data about the humanitarian situation in each region. A second source of macro level data is the Event Data Project on Conflict and Security (EDACS), which has enabled us to calculate the number of people killed in each region in a specific period of time.

On the individual level, we employ a dataset gathered by the NGO victims voice (*vivo*) and the German Technical Cooperation (GTZ)⁴ in the second half of 2003 in Somalia as part of the preparation for a Demobilization and Reintegration program. In a three-stage process, seven regions were selected in which trained interviewers conducted a total of 8,723 interviews with members of the militant organizations active in Somalia. 8124 of these interviews were valid. However, due to the quite extensive number of missing values in several of our variables, our analysis includes roughly 7000 respondents. Based on an expert rating, the seven regions where the interviews took place were chosen in such a way that they presented the regions with the highest militia density, including a major part of the population, important economic centers and important rural areas (Odenwald et al. 2005). In collaboration with militia leaders, a minimum of one unit of each militia was selected and, in a final step, the individual soldiers were interviewed. All but one of the main militant organizations participated (*ibid.*). While insecurity in Somalia and the sensitive issue of the inquiry prevented a complete randomization of the ex-combatants, the final data set examined in this article includes approximately 8% of the total number of armed staff in Somalia and a bit less than 50% of all armed staff in Somaliland.

³ To test whether the hierarchical model is appropriate, we performed a likelihood-ratio test to look at the between cluster variance. We can reject the null hypothesis that there is no random intercept in the model and that there is no need for a multilevel analysis ($\chi^2= 193.49, p<0.0001$).

⁴ This agency whose acronym stands for “Gesellschaft für Technische Zusammenarbeit” has in the meantime merged with two other international organizations and is now part of the „Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH“ (German International Cooperation).

Description of Variables

Dependent Variable: The first part of the analysis relies on a trichotomous ordinal variable, summarizing the responses to the question in the vivo/GTZ survey under which conditions the interviewees would be willing to hand in their weapons. 15% of the respondents stated that they would do so unconditionally (category 2), 86% mentioned their willingness to give up their weapon under certain condition (1), and 6 % answered that they would never give up their weapon (0).⁵ We also test our hypotheses with two models that attribute the conditions to hand in weapons to political or economic reasons.

Independent variables: Our theoretical argument distinguishes economic incentives and security considerations as potential drivers of the willingness to deliver weapons to national and international authorities as part of the demobilization process.

Hobbesian model: On the macro level, we rely on the intensity of violence in each region as a proxy for measuring the political insecurity that surrounds the ex-combatants. The indicator is based on the *Event Data Project on Conflict and Security* (EDACS) dataset (Chojnacki & Metternich 2007). We used the mean number of minimum fatalities (civilian and military) per region in the immediate years before the survey was conducted (2000-2002) as well as the year of the data acquisition (2003) and calculated the percentage according to the size of the population of each region. A second Hobbesian factor gauges the political stability for each region through the presence of regional authority forces. As Maedl et al (2011) suggest, the activity of these troops indicates that the state has not completely failed and especially that the government monopoly of force is still more or less intact. We measure political stability through the percentage of ex-combatants belonging to these forces of all ex-soldiers interviewed in a region (Maedl et al 2010). The webappendix to this article evinces that there are two types of regions in this regard: either the regional forces dominate the region or they are outnumbered by combatants who belong to rebel groups. We therefore coded regions with a clear dominance of regional authority forces as politically stable (=1) and regions with a clear dominance of all other forces as politically unstable (=0). The only exception is Hiraan, since there is a clear dominance of the Sharia court militia (66%) which can also be considered as providing at least some political stability. 57% of all respondents belonged to the Regional Authorities (such as Somaliland National Forces), while the rest of the interview partners were members of the Sharia court militias such as the *Hiran Court Forces* (6%), warlord militias like the *Rahanweyn Resistance Army* (21%), business militia (1%)

⁵ The middle category summarizes answers to seven categories; respondents could choose multiple responses. 55.8 of all respondents said that they would hand in the weapons if a strong central government were installed, 27,7% if the government could guarantee security, and 25,2% if there would be less crime. 21.1 of the interviewees stated their willingness in the event that there were severe penalties to keep weapons, 51.1% if the economic situation would be improved, 26.3% if giving up the weapons would be part of an agreement, and 46.3% in return for cash.

or other armed groups (13%). 1% of all interview partners could not be assigned to any clear group (Maedl et al. 2011).

On the micro level of the Hobbesian Model, we consider four variables that reflect an individual's personal war experiences: *length of stay*, *combat experience*, *militant organization* and *PTSD*. We expect that ex-combatants who have spent a long time in an armed group will be more reluctant to hand over their weapon than less experienced soldiers. The variable *length of stay* measures membership in an armed group in years. As the affiliation to a militant group says little about the violence and insecurity a person has experienced, we also include a dichotomous indicator that differentiates between interviewees without (0) and with combat experience (1). 65% of all interviewed combatants had gone through at least one active fighting episode, the remaining 35% to none at all. Again, there is a considerable variation between the regions covered in our analysis. For example, 98% of the combatants originating from Bakool had combat experience, in Sanaag only 37% of the soldiers had been actively involved in armed struggles. Obviously, individuals differ in how they deal with their experiences in an armed group and on the battlefield. Yet, the presence or absence of Posttraumatic Stress Disorder (PTSD)⁶, which is a common mental health problem in war and post-war societies, closely reflects the intensity of war experiences and the intensity of war related personal hazards. Recent studies suggest that PTSD diminishes the ability of combatants to reintegrate and to re-adjust to civilian life (Odenwald et al. 2007, Savoca & Rosenheck 2000, Prigerson et al. 2001). A study of Jakupcak et al. (2007) of war veterans in Iraq and Afghanistan suggests that PTSD raises the level of aggression and hostility. Both findings provide a solid justification for the assumption that PTSD might affect demobilization choices of the individuals and therefore justifies the inclusion of a dummy variable that measures the absence (0) or presence (1) of PTSD symptoms. PTSD was diagnosed by a standard procedure (Posttraumatic Diagnostic Scale, PDS), which had been adapted to the Somali culture by experts and tested in previous studies (Odenwald et al. 2007). At the individual level, the decision to keep a weapon also reflects the individual legitimacy of fighting. We expect that members of the regional authority forces consider themselves as soldiers, whereas fighters of militant groups face a strong pressure to hand in their weapon or to at least declare their willingness to do so in an interview session. The variable *militant organization* measures with a value of 1 if a fighter belongs to the regional authority forces, 0 otherwise.

Millsian model: Collier and Hoeffler (1998, 2004) have advanced an aggregate level version of

⁶ Symptoms of Posttraumatic Stress Disorder (PTSD) include *re-experience* (individuals re-experience their traumatic experiences in the form of nightmares, flashbacks and intrusive recollections which are so intense that the victim believes to be back amidst the atrocities), *hyperarousal* (individuals experience an exaggerated startle response and a persistent hyperarousal, have difficulties in calming down and in falling asleep), *avoidance* (individuals tend to actively avoid places or thoughts associated with traumatic experiences; passive avoidance can manifest itself in the numbing of their emotional responsiveness in order to cope with unbearable feelings) (Elbert 2006:6)

the opportunity costs model and associate underdeveloped regions and countries with a higher risk of conflict. In absence of reliable regional GDP data, we employ *malnutrition* as a substitute. This indicator was obtained through the FSNAU database and displays the percentage of people suffering acute malnutrition per region in 2002. For security reasons, no data could be collected in Baanadir. We therefore used the mean malnutrition of the three surrounding regions as an alternative. The analysis of Elbadawi and Hegre (2008) as well as Wiesehomeier et al. (2009) similarly suggests that economic shocks increase the risk of civil war. This would mean in the context of our examination that soldiers residing in regions that are economically unstable are less content to be disarmed than fighters living in relative stable regions. We consider high inflation and high deflation both as a measure of instability and consider regions in which the inflation rate ranges between -8 and +8 as stable and other regions experiencing strong inflation or deflation as unstable. We accordingly introduce a dummy variable to gauge *economic instability* with the value 1 standing for stability, 0 otherwise. The inflation rate was derived by the difference in the regional exchange rate of Somalia Shillings (or Somaliland Shillings respectively) (FSNAU) in USD in the year 2002.

On the individual level, the survey included three questions that stand for concepts that are central to the opportunity cost argument: *property*, *income*, *education* and *khat bundles*. The link between the personal economic status and the personal decision to join a militant organization (Weinstein 2005, Oyefusi 2008) as well as the reintegration success (Humphrey and Weinstein 2007) is well established in the literature. While Oyefusi (2008) concludes in line with the greed argument that low income levels encourage individuals to join rebel organizations, Humphrey and Weinstein (2007:546) find that poor individuals face fewer difficulties in reintegration than wealthier individuals. Instead of using proxies to determine the relative poverty of the combatants, we simply rely on the individual's personal estimation of their total property in USD and their monthly earning in USD. However, while *property* displays considerable variation (min. 0 USD – max. 16600USD), *income* does not share this feature: 89% of the respondents stated that they have no income, 6% live on less than 1 USD a day while only 0.5% earn more than 100 USD a month. We nevertheless include both concepts, *property* and *income*, in our estimation.

Also, we incorporated the number of *khat bundles* that the individual combatant recently received from his superiors. As it is the case for many drugs available in civil war countries, this drug holds an important economic function in the Somalian society. Many combatants obtain khat as a substitute for a regular wage of salary from their military fraction; receiving such a barter good should raise the opportunity cost of leaving the fraction in the same way as a monetary compensation would. 36% of the respondents claimed to have received 1 or more bundles of khat in the previous week.

The educational background of a respondent is a widely discussed facet of opportunity costs (Oyefusi 2008). The level of education was organized into five categories where 1 stands for no education, 2 if an individual went to a madrasa (Islamic school), 3 for receiving primary, 4 for attending secondary and 5 for completing university education. Former madrasa pupils were considered to be less educated than those who had completed primary school: the literacy rate among the later group of combatants amounted to 98%, while it only reached 57% for those coming from Islamic schools⁷. We expect that highly educated combatants have lower opportunity costs to leave the armed unit as they have better chances on the labor market.

Multilevel models for disarmament choices in Somalia

This article tests two explanatory models of the individual and contextual factor under which ex-combatants in Somalia refuse to hand in weapons or only conditionally agree to do so. Somalia suffers from one of the most long-lasting civil wars since World War II and has frequently been described as a failed state (e.g. Bates 2008, Maedl et al. 2011), especially after the 1st Battle of Mogadishu in 1993 during which several hundred Somalis and 25 soldiers of an United Nations intervention force were killed. This episode triggered the U.S. withdrawal from the state at the Horn of Africa. The internal war, which started with a revolt against the autocratic leader Siad Barre in 1986, has affected the whole country, but the intensity in which the fighting devastated the country differs considerably across the regions. This becomes obvious through the vivo/GTZ survey on which our analysis predominantly relies. The interview with more than 8000 ex-combatants took place in 2002/3 and thus one of the calmer periods of the entire conflict. Table 1 provides some summary statistics of the 18 regions that we distinguish in our analysis.⁸

*****Table 1 about here*****

To test the influence of political and security related factors as well as economic determinants on the willingness of ex-combatants to hand in their weapons, we chose a three step approach. In a first step (Table 2) we build two models that only include individual level variables. The “Hobbesian model” focuses on factors related to the personal security of the ex-combatant (*PTSD, length of stay, combat experience, militant organization*). The “Millsian model”, which is based on one of the conceptual innovations of John Stuart Mill, only includes socio-economic

⁷ Literacy rate no school education =38%, koranic school =57%, primary school =98%, secondary school 99%, university 100%

⁸ To distinguish the influence of the individual regions on demobilization willingness, we used Empirical Bayes predictions (EB) to obtain predictions of the region specific random intercepts. The results are shown in Figure 2 in the appendix.

variables (*property, income, education, khat bundles*). We also combine both models and establish a “full” model, comprising security related as well as economic variables.

After determining the factors that influence an individual’s decision to disarm on the personal level, we then move on to estimate a multilevel model by adding a variety of regional variables (Table 3). More precisely, we extend the Hobbesian model by including a variable that captures the *political violence* and *political stability* of the 18 different regions. For the Millsian model, we evaluate the possible influence of economic context factors by adding *economic stability* and *malnutrition* to the model. Lastly, we take a closer look at the subpopulation of combatants that would only hand in their weaponry under specific circumstances, separating those respondents that indicated political factors as the main precondition of their disarmament from those that gave prevalence to economic considerations (Table 4). Both sub-models obviously contain respondents who would never or unconditionally forego their weapons.⁹

*****Table 2 about here*****

*****Table 3 about here*****

As Table 2 shows, traumatization and thus the security-related fears that are associated with PTSD strongly reduce the chance that an individual is willing to disarm. The odds of giving up the weapon are 26% smaller for individuals suffering from PTSD than those showing no symptoms of PTSD, holding all other variables constant. This novel finding is, in our view, of considerable theoretical and practical importance as social scientific studies on civil war hardly ever use traumatization as an explanatory concept to explore the possibility for reconciliation and as no DDR program has, to our knowledge, systematically tried to address the psychological needs of the ex-combatants. This is all the more astonishing as a number of studies not only for Somalia (Odenwald et al., 2005), but also for the Balkans (Neuner et al. 2002), the West Nile (Karunakara et al. 2004) and Rwanda (Schaal & Elbert 2005) point to a high prevalence rates of posttraumatic stress disorder ranging from 19 to 51% in war torn areas (Elbert et al. 2006:6). On the other hand, individuals with PTSD are in a constant state of emergency and experience severe anxieties. Their feeling of insecurity is therefore significantly higher, leading to aggressive and

⁹ We tested the parallel regression assumption using a likelihood ratio and a Brant test respectively. The significant chi-square value of 93.10 obtained from the first model check suggests that the assumption has been violated or, in other words, that the relationship between each pair of outcome is not necessarily the same. Results from the Brant test detailed in Table A8 of the web-appendix show that four variables (property, militant organization, violence and malnutrition) are responsible for the violation. Excluding these variables from the model, we obtain a non-significant chi-square value of 10.12 and, very similarly, a chi-square value from the Brant Test of 9.21. The coefficients of the four variables should therefore be taken *cum grano salis*; we will not conduct comparative statics analyses for these concepts. Note that the results obtained with alternative methods (logit and multinomial logit models) led to similar results.

anti-social behavior (Elbert et al. 2006:20). Freeman et al. (2003) establish in line with our result a direct link between PTSD and firearm possession. War U.S. veterans with PTSD own in comparison to a control group four times as many weapons and behave more frequently in a dangerous fashion that involves these small arms. Combat experience, which like PTSD stands for the hardship a person endured, seems to have an equally strong impact on an individual's willingness to demobilize, even though the result runs in the opposite direction of the prediction deduced from the Hobbesian worldview: If a soldier experienced active combat, the risk that he never or only conditionally would hand in his weapons decreases almost by half. It appears that people who went through life-threatening fighting episodes are more likely to have learned the lesson that personal firearms provide incomplete security at best and that they personally want to put an end to the war. This notion of war fatigue also became apparent in a recent article of Erikson and Stoker (2011). In a natural experiment examining U.S. soldiers, which had been randomly selected to fight in Vietnam, the authors show that Vietnam veterans later held more pronounced antiwar attitudes and tended to support more liberal political views than those U.S. soldiers who were spared from fighting in Vietnam.

There is also a significant relationship between the length that an individual spent in the militant group and a combatant's willingness to disarm. For a standard deviation increase in the length spent in an armed group, the odds of being willing to disarm decreases by a factor of 0.88. Figure 1 displays the predicted probability of a combatant stating that he or she would demobilize under any or no condition in relation to the time spend in an armed group. The graph illustrates that the probability to answer "I would hand in my weapon under any condition" decreases steeply with increasing time spend in the armed group. At the same time, the probability that a combatant refuses to disarm increases the longer he remains affiliated with the armed unit. This effect is true for both, the single level ordinal logit model as well as the random intercept model. Solely supplementing the second level indicators causes the lines of the two models to deviate slightly from each other. The results suggest that the quality of one's combat experiences may be more important for the intention to disarm than the sheer time spent in militant groups. Finally, the last variable we tested, namely the type of militant organization an individual belongs to, significantly affects the willingness to disarm in the multilevel model. Soldiers, considering themselves as members of the "regional security force", seem to be less willing to give up their weapons than ex-combatants who had belonged to other militant groups. As the former armed groups are more legitimate in filling the security void the collapse of the Somali state has created, they are more likely to attract politically motivated fighters and not the opportunistic desperados who might join militias and other trouble-seeking outfits.

*****Figure 1 about here*****

The Hobbesian model further hypothesizes that living in a violence-stricken and politically unstable region increases the risk that a veteran refuses to give up his weapons. The multi-level results, reported in Table 3, however, suggest that neither *political instability* nor *political violence* are systematically related to a combatant's willingness to disarm. We believe that the lack of relationship has to do with the local nature of Somali political violence and the information barriers that exist in this war-torn society. In other words, combatants might not be necessarily aware of killings across the region of their residence and hence the number of violent deaths may be not be salient for how secure they feel and, by extension, how willing they are to hand in their weapon.

The tests of the Hobbesian model reveal that insecurity related to the personal experience but not derived from the context in which an ex-combatant is living affects the chance of individual disarmament. The opposite is visible from our analysis of the Millsian model, which focuses on the opportunity costs of possessing firearms. At the micro-level, all factors associated with this explanatory strand are significantly related to the decision to disarm, except for education. However, these factors largely work against the received wisdom and show in line with Humphreys and Weinstein (2008) that growing opportunity costs of fighting increase the risk that a soldier refuses to disarm. Every 100 USD of additional income reduces the odds that a fighter is willing to disarm by 53%. Figure 2 shows the predicted probability that an individual states that he or she would always or never hand in his weapon given the property owned by the combatant. The graphic visualizes that the respondent's willingness to demobilize decreases with increasing property. This relationship is more pronounced in the ordinal logit model (solid), excluding second level indicators, than in the random intercept ordinal logit model (dotted line). In other words, the multi-level model corrects the bias of the models that do not consider higher level influences. As there are only few individuals owning 10'000 USD or more, the confidence interval are quite large for the wealthier individuals. We must, however, acknowledge that the decision to become a fighter and the choice to possibly end such a career might differ substantially and that the opportunity cost argument appearing in many political-economy contributions to the literature might be more valid in the former decision than in the latter context. In other words, those who have joined militant groups may have had lower opportunity costs of fighting to start with so that the socioeconomic status of a combatant may be a more powerful explanatory factor for the choice to pick up weapons than to surrender them.

*****Figure 2 about here*****

Opportunity cost considerations, however, work at the contextual level in the expected direction. Of the two regional-level variables included in the analysis, only *Economic Stability* is systematically related to the chance of disarmament. The result shows that combatants living in economically stable regions are more likely to give up their weapon than those who reside in areas with recent inflation or deflation shocks. As Figure 3 visualizes, the probability of a combatant disarming unconditionally increases from below .1 to .2 if he comes from an economic stable region. At the same time, the risk that a former fighter is entirely unwilling to disarm decreases if he or she originates from an economically stable area. Poverty, which we measure through the regional incidence of malnutrition, does by contrast not decrease the chance of disarmament in a meaningful way.

*****Figure 3 about here*****

Model fit measures support our conjecture that individual decision making in war zones is affected by both personal experiences as well as the social and economic context in which the individuals are living in. To start with, all results remain similar when synthesizing the Hobbesian and Millsian models; the effect of economic stability becomes even more pronounced. The AIC is only lower for the “micro variable only” version of the Hobbesian model. We suspect that the poor performance of the full model of this explanatory strand is due to the lack of explanatory power of the macro-level factors. Unsurprisingly, we obtain a better model fit for the multi-level Millsian model in comparison to the one only including micro-level variables. The model, which combines the two perspectives on disarmament choices, provides overall the best model fit. This confirms our double assertion that the Hobbesian and Millsian worldview are complementary and that a multi-level perspective is necessary to understand individual decision making of civil war soldiers.

We want to supplement this analysis with an examination of the exact conditions under which certain ex-combatants would be poised to demobilize. As indicated in the research design section, interviewees could specify in the survey the circumstances for an eventual personal disarmament. Table 4 distinguishes whether an individual referred to at least one political or economic condition to hand in the weapon. Of the 8,124 respondents, 1,757 stated only political conditions while 1,619 persons indicated only economic conditions while the remaining interviewees stated a mixture of political and economic conditions.

In both models, ex-combatants suffering from PTSD symptoms are less likely to be among those that would give up their arms if security or economic conditions improve, even though the effect fails to reach statistical significance in the sub samples. The length of stay in the field remains uncorrelated with the intention to disarm, whereas actual combat experience increases that chance of an individual surrendering his arms. It exhibits a slightly stronger effect in the ECO conditions model, suggesting that improvements in economic conditions or an exchange for cash is an even stronger motivation for experienced fighters to hand-in their weapons than improvements in security and political conditions. As in the prior analysis, the type of militant organization a fighter belongs to remains an extraordinarily strong factor behind disarmament choices.

The importance of the macro-level political variables remains minor. The effect of violence on the odds of handing in one's weapons under certain political and economic conditions is negligible. Political stability increases the odds of an ex-combatant giving up his arms if economic conditions improve. While the effect would be in line with the "greed and grievance" argument described above, it fails to reach statistical significance.

Testing for the importance of individual opportunity costs and economic stability, we derive roughly the same pattern of micro and macro level effects as seen in the full sample. Individual socioeconomic circumstances do not have any particularly meaningful effect on the likelihood of conditional disarmament, regardless of whether the conditions would be economic or political. Ex-combatants coming from economically stable areas are, however, significantly more willing to hand in their weapons. They are almost three times more likely to be among those who would give up their weapon if the economy improves or cash is handed out in exchange for arms and close to four times for likely to figure among those that give up their weapons if the political and security situation improves. As for the full sample model, cross-level interaction effects were tested, but turned out to be insignificant. Both sub-models exhibit a convincing goodness of fit when compared to null models (McFadden's R^2 of .30 and 0.27 for the POL and ECO model respectively).

*****Table 4 about here*****

Conclusion

Contrasting of what we call the Hobbesian and the Millsian view of demobilization, we have made theoretical, methodological and practical contributions to the literature on post-conflict stabilization and civil war in this article. Theoretically, we show through a multi-level examination of survey data that both structural and individual factors influence the willingness of ex-

combatants to disarm. This implies conceptually that studies that favor either micro- or macro-level explanations at the expense of each other are incomplete and suffer from what is known in the international relations literature as the “level-of-analysis problem” (Singer 1960). Our study omits therefore in a methodological perspective the bias of studies, which only include individual attributes of the individual soldier or some structural attributes of post-conflict societies in the assessment of the readiness or reluctance of ex-soldiers to disarm. A second theoretical contribution of our article is the resuscitation of explanations that we link to the Hobbesian world view and that associate decisions to disarm or to refuse to hand in weapons to experiences and expectations of insecurity. In recent years, many studies have focused on the economic incentives and disincentives to take up arms or to hand them in after the formal conclusion of a conflict. This narrow focus has hampered theoretical progress insofar as it neglected that individual also become fighters because they feel threatened and not only because fighting offers access to economic resources. The statistical examination clearly shows that the Hobbesian perspective is much more persuasive at the individual level of explanation than the Millsian one. Opportunity cost explanations, which have first been introduced to the social science by John Stuart Mills, offer some explanatory power in our sample at the individual and regional level of aggregation. Individuals with more property either in the form of money (USD) or khat bundles are less willing to disarm than poor individuals. Soldiers and rebels who reside in areas experiencing economic shocks are much more likely to keep their weapons. This result is in our view no contradiction to the Hobbesian perspective as we can expect from a macro-perspective that economic shocks are closely linked to an increased risk of civil war (Elbadawi and Hegre 2007, Wiesehomeier et al. 2009). The practical implication of our article is finally that DDR programs need to be carefully designed and should avoid the creation of perverse incentives that increase the risk of conflict. If a program does not increase the trust of the individual soldier, there is little hope that such fighters will hand in their weapons. As many of the former fighters suffer under psychological and medical problems, an exclusive focus on the economic integration of the soldiers is equally unpromising.

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TABLE 1 Summary Statistics of Somalian Regions

Region	Interviews	PTSD (%)	% Consuming Khat	Length of Stay (years)	Combat Exp. (%)	Property (USD)	Income (USD)	Edu. (cat.)	Average Khat bundle received	Military Org. (0/1)	Violence (%)	Malnutr. (%)	Eco. Stability (0/1)	Pol. Stability (0/1)
Awdal	481	.08	39.5	16	32	644	2.3	1.3	2.57	.91	.10	33.1	1	1
Bkool	133	5	67.4	14	98	1028	2.9	1.1	6.38	.38	1.03	18.6	0	0
Banaadir	705	17	59.5	10	82	270	2.4	1.2	6.38	.20	9.61	18.6	0	0
Bari	16	0	0	16	56	700	3.5	1.2	0	.67	7.18	18.3	1	1
Bay	498	3	67.1	11	98	1366	2.6	1.2	5.01	.19	4.62	20.5	0	0
Galguduud	432	10	48.5	13	76	362	2.4	1.1	8.02	.35	2.33	12.6	1	0
Gedo	126	11	52.8	14	63	748	5.6	1.3	11.12	.72	2.33	23.1	0	1
Hiiraan	803	8	29.6	16	85	968	12.7	1.0	2.54	.13	2.46	25.3	0	1
M. Juba	14	14	35.7	16	50	705	3.5	1.3	12.71	.66	1.13	18.3	0	1
L. Juba	341	11	47	13	48	762	8.7	1.5	9.48	.78	5.81	16	0	1
Mudug	720	2	13.7	15	85	813	2.3	1.0	1.09	.28	4.08	11.5	0	0
Nugaal	46	0	6.6	17	71	743	3.4	1.2	.08	.63	.413	16.9	1	1
Sanaag	459	.2	19.3	15	37	582	2.5	1.5	.84	.88	.037	15.1	1	1
M. Shabele	213	15	41.1	13	66	512	1.6	0.9	5.19	.31	3.92	19.4	.	0
L. Shabele	65	25	67.7	15	89	593	2.6	1.2	10.11	.49	2.57	19	0	0
Sool	50	1	22	14	48	542	1.6	1.6	1.56	.92	1.26	14.9	1	1
Togdheer	793	3	29	17	52	551	2.4	1.3	1.89	.93	.12	11.7	1	1
Woqooyi Galbeed	2,053	6	28.7	15	54	680	5.2	1.1	1.57	.96	0	15.7	0	1

TABLE 2 Ordinal Logit Model comparing the Hobbesian Model, the Millsian model and a Full Model

	Hobbes Model	Mills Model	Full Model
PTSD	.69* (.12)		.84 (.14)
Combat Experience	1.46*** (.13)		1.5*** (.14)
Length of Stay	.98*** (.003)		.99*** (.004)
Military Organization	1.01 (.07)		.97 (.08)
Income		.99(*) (.002)	.997 (.002)
Education		.96 (.03)	1.0 (.03)
Property		.99*** (.00)	.99*** (.00)
Khat Bundels		.97*** (.004)	.96*** (.005)
Number of obs.	7152	7523	7151
Pseudo R2	0.0053	0.0146	0.0213
Log likelihood	-3132.3413	-3265.6578	-3081.6828

Note: Results are odds ratios. Standard errors in parentheses. Significance levels >0.001***, >0.01**, >0.05*

TABLE 3 Multilevel Ordinal Logit Model comparing the Hobbesian and the Millsian model

	Hobbes Model		Mills Modell		Full Model	
	Microvariables only	Micro-macrovariables	Microvariables only	Micro-macrovariables	Microvariables only	Micro-macrovariables
Individual effects						
PTSD	.64** (.11)	.64** (.105)			.76(*) (.10)	.75(*) (.13)
Length of Stay	.98** (.00)	.98** (.00)			.98** (.00)	.98** (.00)
Combat Experience	1.38*** (.12)	1.38*** (.12)			1.49*** (.12)	1.5*** (.09)
Military Organization	.68** (.10)	.67** (.10)			.7* (.10)	.69* (.10)
Property			.99*** (.00)	.99*** (.00)	.99*** (.00)	.99*** (.00)
Income			.998 (.00)	.998 (.00)	.99 (.00)	.99 (.00)
Education			.98 (.03)	.997 (.03)	1.00 (.03)	1.00 (.03)
Khat Bundles				.97*** (.004)	.97*** (.005)	.97*** (.004)
Regional effects						
Violence		1.02 (.08)				1.06 (.06)
Political Stability		1.18 (.63)				1.02 (.46)
Malnutrition				.964 (.02)		.97 (.02)
Economic Stability				2.00(*) (.68)		2.28** (.29)
Cut 1	-4.65***	-4.49***	-4.76***	-5.11***	-4.86***	-4.9***
Cut 2	2.04***	2.19***	1.93***	1.57***	1.8***	1.81***
N	6997	6997	7356	7154	6996	6803
Number of Regions ¹⁰	18	18	18	17	18	17
Log likelihood	-2957	-2957	-3105	-3031	-2932	-2860.7
Variances & covariances level 2	.88	.88	.67	.50	.7	.59
AIC	5928	5932	6224	6081	5887	5751
BIC	5976	5994	6272	6143	5962	5853

Note: Results are odds ratios. Standard errors in parentheses. Significance levels >0.001***, >0.01**, >0.05*

¹⁰ The number of regions varies due to the fact that no data was available for "malnutrition" the region Baanadir.

TABLE 4 Multilevel Ordinal Logit Model of Subpopulation of People handing in Weapons under Political or Economic Conditions

	Model POL Subpopulation naming political conditions for decision to disarm	Model ECO Subpopulation naming economic conditions for decision to disarm
Individual effects		
PTSD	.90 (.18)	.95 (.23)
Length of Stay	.99 (.00)	.99 (.00)
Combat Experience	1.48*** (.16)	1.6*** (.17)
Property	.99* (.00)	1.00 (.00)
Income	.99* (.00)	.99* (.00)
Education	1.00 (.03)	.93* (.03)
Military Organization	.09*** (.02)	.05*** (.18)
Khat Bundles	.96*** (.01)	.95*** (.00)
Regional effects		
Violence	.97 (.11)	1.08 (.22)
Political Stability	1.18 (.90)	1.7 (.74)
Malnutrition	.93 (.05)	.95 (.04)
Economic Stability	7.98*** (4.7)	4.4** (2.57)
Cut 1	-4.35***	-4.20 **
Cut 2	-.61	-.46
N	2896	2777
Group variable: Region	17	17
Log likelihood	-2131.3	-2000.3
Variances & covariances level 2	3.41	5.43
AIC	4292.66	4030.7
BIC	4382.226	4119.6

Note: Results are odds ratios. Standard errors in parentheses. Significance levels >0.05***, >0.01**, >0.001*

FIGURES

Figure 1: Predicted Probability for Demobilization and Years Stayed in Militant Group

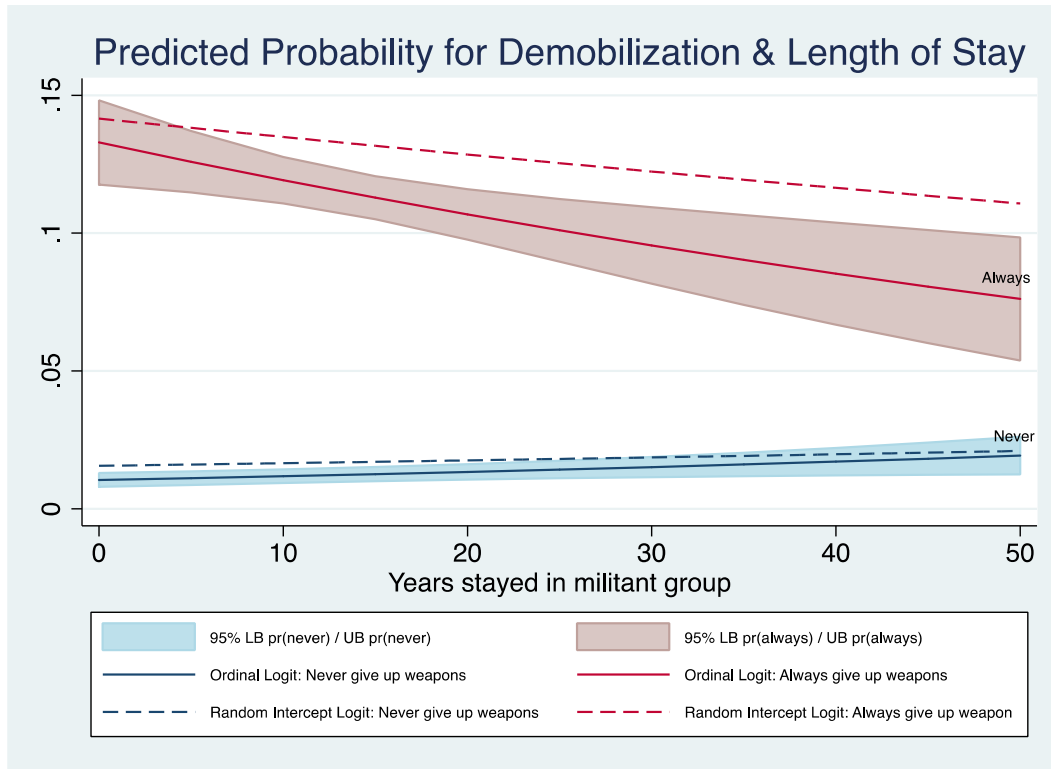


Figure 2: Predicted Probability for Demobilization and Property

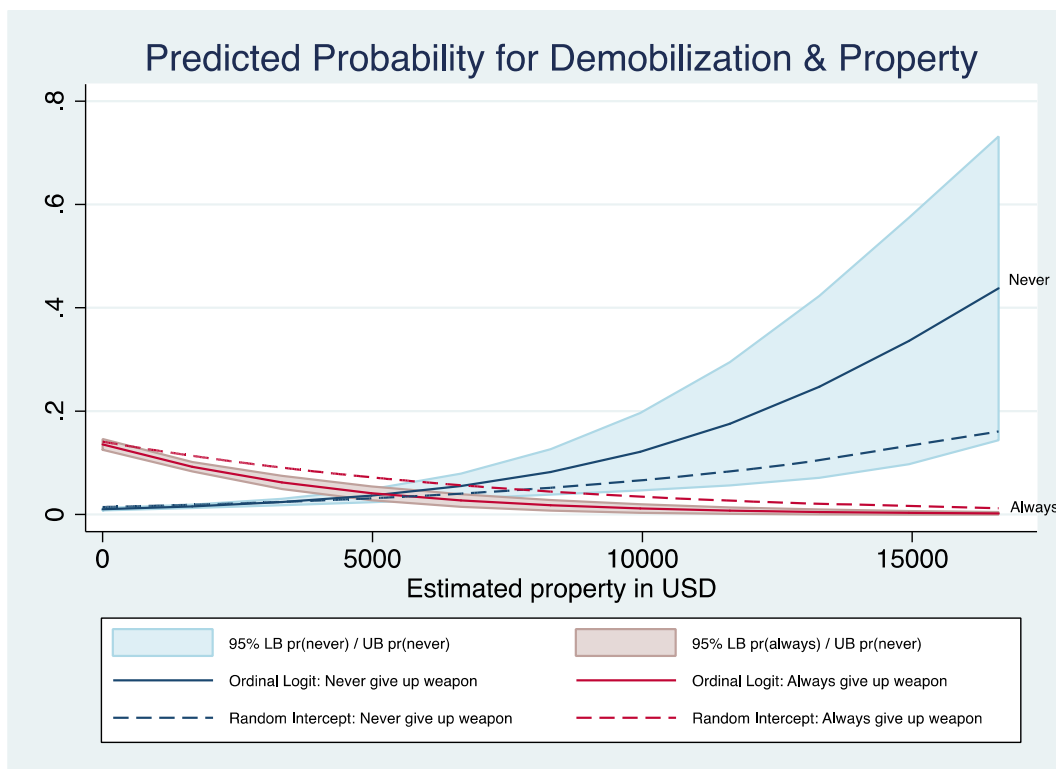
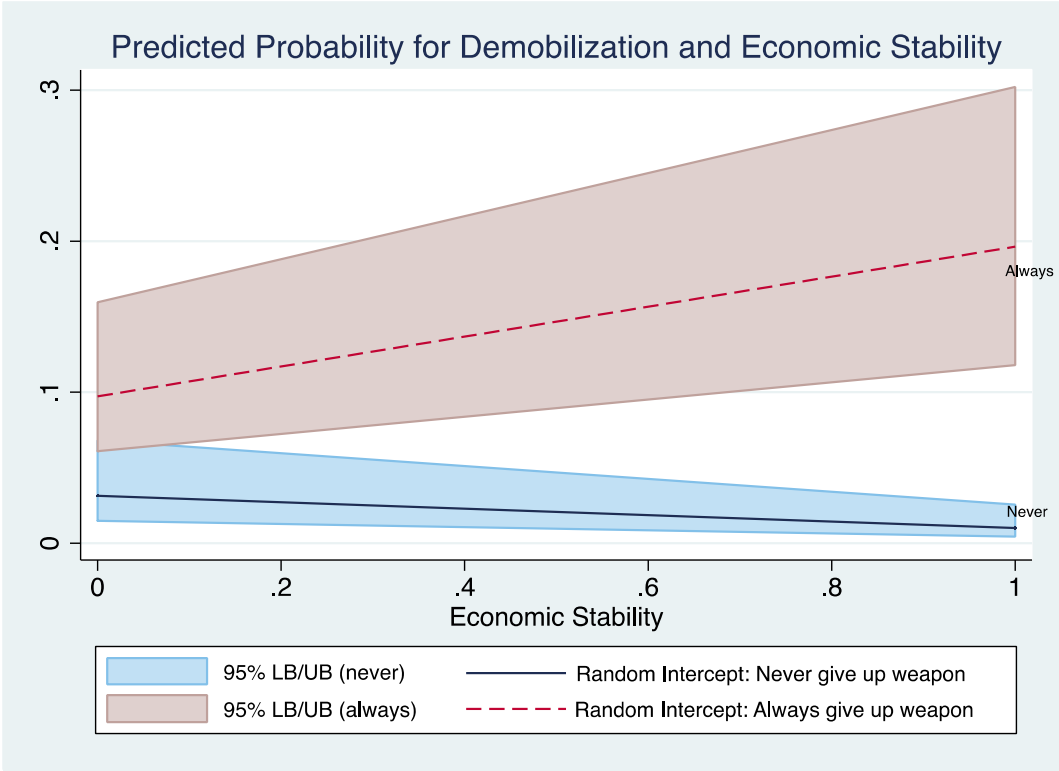


Figure 3: Predicted Probability for Demobilization and Economic Stability



“Hobbes vs. Mill: Anarchy, Development, and Demobilization in the Somalian Civil War”

This webappendix includes additional empirical material for the article “Hobbes vs. Mill: Anarchy, Development, and Demobilization in the Somalian Civil War.”

The first table (Table A1) offers a description of each variable used for the estimation of the models. We also include a reference to the source of the information. Table A2 provides descriptive statistics for all individual and regional level indicators.

TABLE A2 - Descriptive Statistics of Variables on the Individual and Regional Level

	Variable	Obs	Mean	Std. Dev.	Min	Max
Individual Level	Income	7510	4.71	18.76	0	300
	Property	7510	718.30	1007.27	0	16600
	Education	7511	1.15	1.11	0	4
	PTSD	7511	.053	.224	0	1
	Length of stay	7105	13.58	9.54	0	50
	Combat experience	7511	.650	.476	0	1
	Khat Bundels	7511	3.61	8.46	0	140
Regional Level	Military Organization	7511	.59	.5	0	1
	Violence	7344	1417	2456	19	9145
	Political Stability	7344	.64	.48	0	1
	Malnutrition	7511	17.6	7.3	9.8	38.4
	Economic Stability	7142	.29	.46	0	1

Subsequently, we present some additional information on the operationalization of the second-level variable *political stability*. Table A3 reveals the distribution of the distinct armed groups in each region and simultaneously demonstrates which regions we coded as political stable (1) or politically unstable (0).

Table A3 - Political Stability measured in terms of dominance of regional authority forces

Region	Regional authority forces	Sharia militia	Warlord militia	Business militia,	Other	Total	Political stability 0=No 1=Yes
Awdal	480	0	0	0	1	481	1
Bkool	1	2	121	0	3	127	0
Banaadir	59	10	300	19	260	648	0
Bari	12	0	0	0	3	15	1
Bay	11	2	467	0	12	492	0
Galguduud	93	12	227	1	66	399	0
Gedo	99	0	12	0	12	123	1
Hiiraan	6	450	81	1	237	775	1
Middle Juba Region	10	0	2	0	2	14	1
Lower Juba	274	0	15	0	29	318	1

Mudug	136	2	334	0	236	708	0
Nugaal	23	0	0	0	21	44	1
Sanaag	443	0	3	0	9	455	1
Middle Shabele	3	0	41	56	89	189	0
Lower Shabele	2	0	37	1	18	58	0
Sool	46	0	0	0	4	50	1
Togdheer	782	0	6	0	3	791	1
Woqooyi Galbeed	2,019	0	16	0	13	2,048	1
Total	4,499	478	1,662	78	1,018	7,735	

Table A4 and Table A5 examines more closely the relationship between PTSD and combat experience. Regressing the two variables onto each other shows that they are slightly but significantly positively correlated with a coefficient of 0.03 (Std. Err. 0.005). This is no surprise as it is well established in psychological research that more combat experience leads to a higher probability of experiencing traumatic events which in turn leads to an increased chance of suffering from PTSD. However, we are aware that we risk multicollinearity. We thus tested the model excluding only one of the two variables at the time. As displayed in the tables, the results remain robust in both cases. We additionally report the variance inflation factor for the full model using an OLS model.

Table A4 - Ordinal Logit Model excluding PTSD

Demob.	Odds Ratio	Std. Err.	z	P>z	[95% Conf. Interval]
Income	.9965042	.0021953	-1.59	0.112	.9922108 1.000816
Education	.9985962	.0317552	-0.04	0.965	.938257 1.062816
Length Stay	.9900752	.0040357	-2.45	0.014	.9821969 .9980166
Property	.9997561	.0000374	-6.52	0.000	.9996828 .9998294
Combat Exp.	1.468889	.1313209	4.30	0.000	1.232793 1.7502
Reg. Auth.	1.007776	.0786858	0.10	0.921	.8647759 1.174424
/cut1	-4.377193	.1401657			-4.651913 -4.102474
/cut2	1.954803	.1002786			1.758261 2.151346

Table A5 - Ordinal Logit Model excluding combat experience

Demob.	Odds Ratio	Std. Err.	z	P>z	[95% Conf. Interval]
PTSD	.6564438	.1087852	-2.54	0.011	.474392 .9083595
Income	.9963921	.0021816	-1.65	0.099	.9921253 1.000677
Education	.9911889	.0314418	-0.28	0.780	.9314408 1.05477
Length Stay	.9954179	.0037546	-1.22	0.223	.9880861 1.002804
Property	.9997585	.0000375	-6.43	0.000	.9996849 .9998321
Reg. Auth.	.8523953	.06091	-2.23	0.025	.7409968 .9805409
/cut1	-4.685199	.130327			-4.940635 -4.429762
/cut2	1.633445	.0776032			1.481346 1.785545

Table A6 - Variance Inflation Factor

Variable	VIF	1/VIF
comb_IV	1.30	0.767067
reg_author~y	1.25	0.798298
length_stay	1.16	0.861590
property_IV	1.13	0.883990
earning_IV	1.11	0.898260
bund_all	1.10	0.907162
pptsd	1.09	0.915973
edu_level_IV	1.03	0.971473
Mean VIF	1.15	

Working with data from conflicting countries is always messy; we therefore took some measures to detect inconsistencies. Looking at the original data revealed that combatants claimed that their length of stay in the militant group ranged from 0 years to 101 years. Obviously, some combatants had been unable to provide a credible answer or interviewers misunderstood the individual. Since 37% of the combatants indicated that they were innumerate, we believe that some had problems indicating the correct year they joined.

To improve the soundness of the data, we deleted all individuals who claimed to have joined an armed group before 1953. Consequently, we included solely individuals in our sample who stated to have been affiliated to an armed group for 50 year or less - evidently a more realistic scenario. Less than 1 percent had to be withdrawn from the sample. As can be seen from Figure A1, the majority of interviewees indicated a realistic time-range. 93 percent of the combatants spent less than 30 years in the armed group. In a second step, we further validated the variable *length of stay*, by subtracting the years spend in a militant group from the indicated age. 11 observations had a negative value, suggesting that either their age or the length of stay must be false. Rerunning the regressions reported in the full text showed that excluding the individuals with a “negative” age and those with an overly long career in an armed group did not affect the reported results.

Table A7 – Results of ologit regression with adjusted length of stay variable*

DV_3_sum	Odds Ratio	Std. Err.	z	P>z	[95% Conf. Interval]
PTSD	.8411666	.1402684	-1.04	0.300	.6066528 1.166336
Length Stay	.9864042	.0040218	-3.36	0.001	.9785529 .9943185
Combat Exp.	1.596977	.1435997	5.21	0.000	1.338933 1.904752
Military Org.	.9667138	.0757534	-0.43	0.666	.8290798 1.127196
Property	.9997384	.0000372	-7.03	0.000	.9996654 .9998114
Khat Bundels	.9680959	.0044292	-7.09	0.000	.9594536 .9768162
Income	.996587	.0022194	-1.54	0.125	.9922465 1.000946
Education	1.002795	.0319391	0.09	0.930	.9421094 1.06739
/cut1	-4.596285	.1462201			-4.882871 -4.309699
/cut2	1.828248	.1016976			1.628924 2.027571

*Results are displayed in odds ratios

Figure A1 - Graph showing the frequency of years stayed in militant group, excluding all above 50 years.

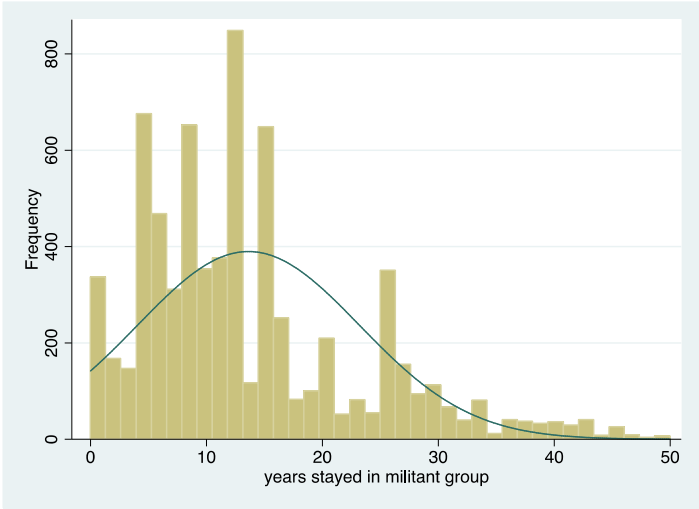


Figure A2 is a graph showing the reasons for joining for the individual combatant. The two most frequently named motivations were income and self-defense. We did not include the reason for joining in our model, since recalling motivations *ex post* is tantamount to rationalizations of former acts that do not necessarily reflect the original motivation. However, we believe that it is interesting additional information, backing our decision to differentiate between security concerns and economic inspiration.

Finally, Table A8 displays the results of the Brant Test of Parallel Regression Assumption. We tested the parallel regression assumption using a likelihood ratio and a Brant test respectively. The significant chi-square value of 93.10 obtained from the first model check suggests that the assumption has been violated or, in other words, that the relationship between each pair of outcome is not necessarily the same. Results from the Brant test detailed in Table WA-6 of the web-appendix show that four variables (property, regional authority, violence and malnutrition) are responsible for the violation. Excluding these variables from the model, we obtain a non-significant chi-square value of 10.12 and, very similarly, a chi-square value from the Brant Test of 9.21. The coefficients of the four variables should therefore be taken *cum grano salis*; we will not conduct comparative statics analyses for these concepts. Note that the results obtained with alternative methods (logit and multinomial logit models) led to similar results.

Figure A2 – Reasons For Joining An Armed Group As Stated By Respondents

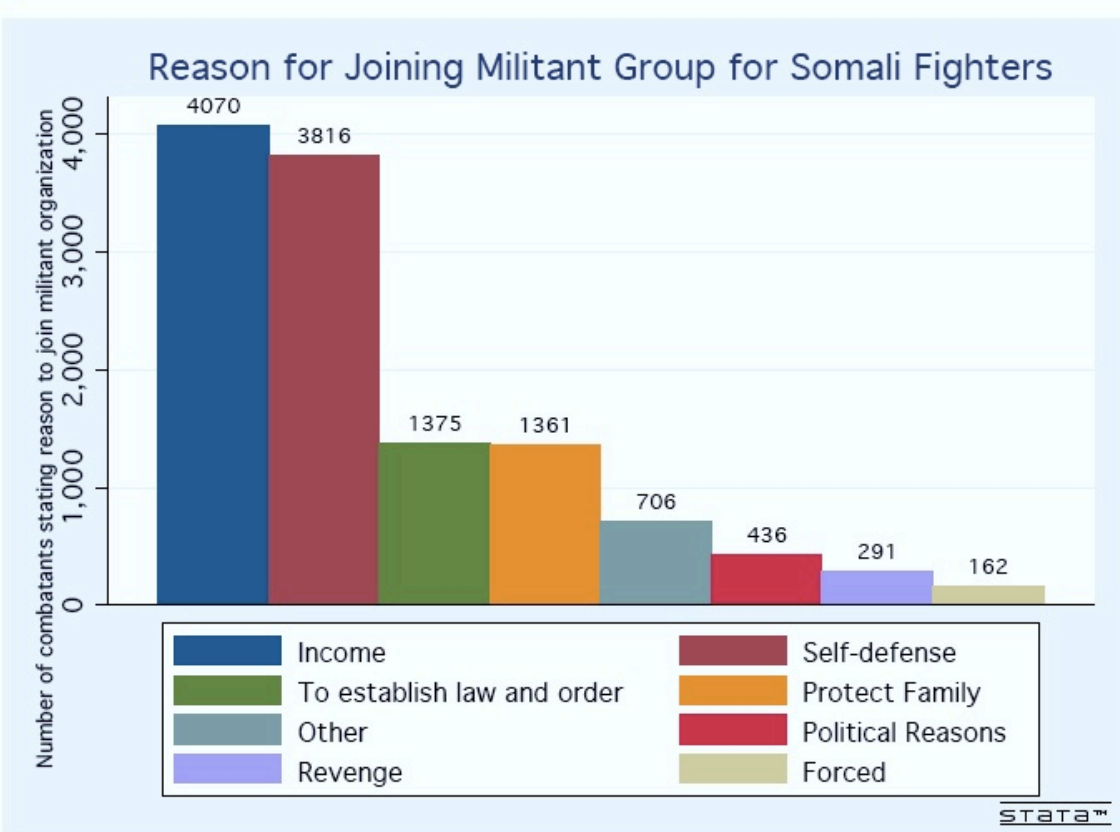


Table A8 - Brant Test of Parallel Regression Assumption*

Variable	Brant Test with all Variables		Brant Test excluding variables violating p.r. assumption	
	Chi2(12)	p>chi2	Chi2(8)	p>chi2
All	72.17	0.000	9.21	0.325
PTSD	1.20	0.274	0.28	0.596
Income	0.68	0.409	1.52	0.218
Education	2.28	0.131	0.66	0.415
Length of Stay	0.58	0.444	0.09	0.767
Khat Bundles	0.39	0.530	0.02	0.895
Property	19.36	0.000	---	---
Combat Experience	0.64	0.423	1.00	0.316
Political Violence	20.00	0.000	---	---
Political Stability	3.84	0.050	4.26	0.039
Economic Stability	0.11	0.744	0.04	0.837
Malnutrition	5.12	0.024	---	---