

Wartime Networks and the Social Logic of Crime

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Abstract

Failure of ex-combatants to reintegrate into legal, civilian life is a source of disorder around the world. Leading explanations for such failure focus on individualistic decisions based on economic or psychological factors. Yet, ex-combatants are embedded in networks that persist following demobilization. We contrast an individual to a social logic of ex-combatant criminality, combining administrative data from Colombia with original survey data that accounts for the challenges of studying sensitive subjects. The results show that conflict networks predominate in explaining criminality while individual factors do not. Further analysis suggests that commanders enter into crime first, recruiting rank-and-file from their networks. As criminal behavior pervades a network, peer relations drive individual crime while peer and commander relations drive gang-related crime through norms, status-seeking, and social pressure. These results provide some of the first evidence of how wartime networks evolve following demobilization, with important implications for understanding reintegration and social stability.

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1 Introduction

During transitions from civil war to peace, criminality often runs rampant (Call, 2007). A principal source of criminality in many post-conflict countries is wartime specialists in violence: ex-combatants (Collier, 1994; Spear, 2002; Muggah, 2009). Getting these former fighters to pursue their interests through legal means, rather than through illegal ones, proves critical not only to their successful reintegration into civilian life but also to ensuring law, order, and stability in post-conflict environments (UN, 2000, 11). Despite the importance of preventing a turn to crime among ex-combatants, there remain unanswered questions about why some former fighters become involved in illicit activity while others do not. This paper addresses one such question: To what extent is illicit behavior by ex-combatants driven by an individual versus a social logic of crime?

A number of leading explanations for criminality view entry into crime as an individualistic decision, divorced from social factors. In the seminal model developed by Becker (1968), a person will turn to crime if expected individual material benefits are greater than expected costs, including possible punishments and the opportunity costs of working in the legal sector. Several studies have shown empirically that increasing the opportunity costs to crime, for instance by improving wages and employment in the legal sector, reduces illicit behavior (Dube and Vargas, 2013; Blattman and Annan, 2015; for a review see Draca and Machin, 2015).

A second leading account, building on the pivotal work on general strain theory by Agnew (1992), locates the impetus for criminality in psychological factors. According to this literature, individuals will engage in crime when they harbor powerful emotions such as anger or sadness (for a review, see Agnew, 2005; Froggio, 2007). Anger is thought to be a particularly important driver of violence (Petersen and Daly, 2010). These emotions are prevalent among ex-combatants, who have often experienced extensive conflict exposure and trauma (Elbogen et al., 2012).

Despite the prominence of these explanations, it is possible that individuals do not make atomized calculations about crime based on personal material and emotional conditions. A social logic of crime acknowledges that individuals often turn to illegal activities as a result of interactions within their networks (Glaeser, Sacerdote and Scheinkman, 1996; Papachristos, Hureau and Braga, 2013). The role of social factors is particularly applicable to ex-combatants as they are often embedded in enduring wartime networks (Petersen, 2001; Wood, 2008; Daly, 2016; Staniland, 2012; Bateson, 2013; Parkinson, 2013). Insofar as these networks continue to structure ex-combatants' behaviors and choices following demobilization, the decision to engage in crime—whether as an individual or with a gang—can be a function of ties to ex-combatant peers or commanders and the opportunities, channels for social pressure, or social validation that they afford. Moreover, if a social logic takes precedence, then ex-combatants embedded in strong networks might enter into crime regardless of their economic or psychological welfare. Few studies to date, however, have examined conflict networks following demobilization and the relative importance of a social logic of ex-combatant criminality vis-a-vis these alternative, individualistic accounts.

This paper performs such an investigation and finds evidence that strongly favors a social logic of crime. Our empirical context is Colombia, a country that has experienced one of the longest and bloodiest civil wars in modern history. A central obstacle to studying illegality in Colombia and elsewhere arises from the challenges of data collection. While administrative data on arrests and convictions exist, these data are often imperfect (Blattman et al., 2015). Moreover, many of those who resort to crime remain beyond the detection of the criminal justice system. While survey data can be an important complement to administrative data, conducting surveys on criminality also presents challenges associated with sampling a hard-to-reach population and eliciting honest responses about sensitive and incriminating behavior.

We take several steps to overcome these obstacles. We supplement confidential administrative data obtained from the Colombian Attorney General's office (the Fiscalía) with

original survey data from a random sample of 1,158 demobilized combatants both in and out of prison. Owing to extensive assistance from Colombian authorities and the timing of our project, our sample is likely the best that one could obtain.¹ We address measurement challenges by using a self-administered survey to elicit honest responses to sensitive questions (Tourangeau and Yan, 2007). This approach provides us with a wealth of information on different aspects of criminal activity and allows us to construct more nuanced outcome measures than would be possible with administrative data alone. Overall, whereas about 11 percent of our ex-combatant population is classified as criminal according to official data, approximately 24 percent of our population should be considered criminal when we combine the administrative and survey data. This suggests that our survey succeeded in eliciting self-reported admissions of criminal activity from a population of ex-combatants that has remained beyond the reach of the Colombian criminal justice system. We also take several steps in our analysis to address concerns about omitted variable bias and endogeneity.

Our main results are highly robust and somewhat surprising. Contrary to expectations, we find no evidence that entry into crime is an individualistic decision. The data does not support the logic of the economic opportunity cost story. These null results are robust to additional checks and subgroup analysis for the populations most likely to turn to crime for economic reasons. The lack of evidence for economic factors is particularly unexpected given the prominence of this hypothesis in the theoretical, empirical, and policy literatures Kalyvas (2015). Nor do we find robust support for the individual psychological story in our data.

Instead, we observe clear evidence for the role of conflict networks in explaining ex-combatant criminality. We find that ties to both ex-combatant peers and former commanders

¹We opted not to use the data from the 2008 survey of ex-combatants conducted by our partner organization, *Fundación Ideas para la Paz*, and used, for example, in Kaplan and Nussio (2016), because our inquiries raised concerns about the representativeness of the sample.

are strongly associated with criminal behavior in general and violent crime in particular. Our results are consistent with a story in which former commanders act as ‘first-movers’, entering into crime for a broader range of economic, psychological, or social reasons. They subsequently pull lower ranking soldiers in their networks into crime, especially gang-related crime. As the number of former combatants involved in crime increases in a network, ties to ex-combatant *peers* become an increasingly powerful driver of group crime *and* individual crime. We also find evidence that norms change, status validation, and social pressure help to explain why rank-and-file soldiers get pulled into crime through their conflict networks.

These findings make several contributions to research on crime and post-conflict reintegration. First they provide some of the first quantitative evidence that durable armed group ties are strongly linked to criminal behavior and, moreover, that these social ties are important relative to other leading individualistic explanations. As such, they support qualitative accounts of the importance of combatant networks to post-demobilization violence (Thermer, 2011). These findings add to a growing literature on crime mitigation in post-conflict societies that has found support for economic and psychological interventions (Blattman and Annan, 2015; Blattman, Jamison and Sheridan, 2015) but has not yet directly confronted the challenges posed by enduring wartime networks. This paper also advances recent work on ex-combatant criminality in Colombia by Kaplan and Nussio (2016), using improved sampling and measurement strategies to conduct a more nuanced investigation into leading explanations. Finally, in developing a social logic of ex-combatant criminality, this study stands at the intersection of important literatures on networks and crime in sociology and on networks and recruitment into rebel groups in political science (Wood, 2008; Staniland, 2012; Parkinson, 2013). As such, it is one of the first quantitative studies to provide insights into how wartime networks evolve following demobilization and the consequences of that evolution for ex-combatant reintegration and post-conflict peace and stability.

2 Hypotheses

The main goal of this paper is to examine the extent to which ex-combatant criminality is driven by an individual versus a social logic. Criminal activity can take a variety of forms, ranging from individual crime to small group crime to large-scale organized crime (Kalyvas, 2015). While political science has traditionally focused more on armed conflict, there is a growing interest in understanding the determinants and dynamics of crime as a source of general disorder (Kalyvas, 2015; Osorio, 2015; Holland and Rios, 2015) and among ex-combatants in particular (Themner, 2011; Kaplan and Nussio, 2016). This is central to ex-combatant reintegration and thus is at the heart of understanding successful transitions from war to peace at the micro-level. At a more macro level, the transition of ex-combatants from armed conflict to criminal activity can present a threat to the security, stability, and capacity of the state (Lessing, 2015).

We motivate three main hypotheses about the role of individualistic economic and psychological versus social factors in explaining ex-combatant criminality. We focus on these factors because they are widely viewed as leading causes of criminal behavior. Moreover, unlike correlates of criminality like gender or conflict exposure, these are potentially actionable by reintegration programs and thus especially important to understand from a policy perspective. Importantly, much of the research to date has tested these hypotheses in isolation, making it difficult to ascertain the relative importance of these different accounts of criminality.

Before proceeding, we note that our hypotheses are relevant to explaining criminality broadly defined. It is difficult to make *a priori* predictions on the determinants of individual versus group crime, or violent versus non-violent crime. For instance, economic insecurity could be linked to non-violent property crime or violent gang crime. While our hypotheses are thus general, we explore them empirically with respect to different types of criminal activity. Ultimately, understanding the drivers of different types of crime is important to

obtaining a broad picture of the nature of ex-combatant criminality in post-conflict contexts, and thus its likely consequences for reintegration and the establishment of post conflict social stability.

Individualistic explanations for crime

First, it is widely believed that economic motivations are central to decisions to engage in criminal behavior. A large literature on the economics of crime, following in the tradition of Becker (1968), posits that the decision to participate in criminal activity is based on an individualistic calculation of material costs and benefits under uncertainty (Draca and Machin, 2015). In this general framework, individuals engage in licit or illicit activities for monetary reward and opt for criminality if the benefits of crime exceed what can be obtained in the legal sector, taking into account the potential costs associated with getting caught and the severity of the punishment. Factors like unemployment, low legal sector wages, and low levels of human capital can all increase the relative attractiveness of crime. Numerous studies—mostly from developed countries—have provided support for this story, finding for instance that negative economic shocks increased crime rates in the United States (Raphael and Winter-Ebner, 2001).

The notion that individuals respond to economic opportunity costs has also featured centrally in research on political violence. Dube and Vargas (2013) show that increases in the price of a labor intensive agricultural goods like coffee reduced conflict in Colombia, attributable to the improvement in income generating opportunities. In a rare experimental test of this argument, Blattman and Annan (2015) find that agricultural training and capital inputs reduced illicit logging and mining, and interest in mercenary activity by high-risk men (including ex-combatants) in post-conflict Liberia. While there is some evidence that unemployment might actually be associated with lower levels of political violence (Berman et al., 2011), there nevertheless remains a prevailing belief that economic opportunity costs matter. As Kalyvas (2015, 1527) notes, whereas the conflict literature points to a large set

of motivations for joining rebel groups, “the dominant assumption about criminal groups is that the key motivation for joining is profit.”

The opportunity cost logic is especially important because it underpins a substantial share of the assistance for reintegration interventions in post-conflict countries (Gilligan, Mvukiyehe and Samii, 2013). Reintegration programs typically offer cash assistance or in-kind material benefits and vocational training, skill development, and employment so as to induce demobilized combatants to take up legal civilian occupations (Bryden and Hanggi, 2005; Muggah, 2009). It is also highly relevant to the Colombia context where the increase in violence and illegality in recent years is widely considered a result of poor economic opportunities, rampant criminality, and mercenary soldiers who will sell their services to the highest bidder (Rangel Suárez, 2016). The first major hypothesis is thus that:

H1 Higher levels of economic welfare (employment, income, wealth, or human capital) reduce the likelihood of entry into crime.

A second leading individualistic explanation locates the roots of criminality in psychological factors. A vast body of research in the tradition of general strain theory (GST), catalyzed by Agnew (1992), holds that individuals who experience enduring negative emotions like anger, depression, or anxiety are more likely to engage in criminal behavior (Agnew, 2005; Froggio, 2007). Anger is considered an especially powerful emotion because it “increases the individual’s level of felt injury, creates a desire for retaliation/vengeance, energizes the individual for action, and lowers inhibitions” (Agnew, 1992, 60). Other empirical research finds that depression and anxiety also contribute to strain (Agnew, 2008, 105). This explanation for crime is particularly relevant for ex-combatants due to the conflict exposure, stressful environments, and trauma that they often experience. Consistent with this, Elbogen et al. (2012) find an association between post-traumatic stress disorder (PTSD) and violence, aggression, and criminality in war veterans in the United States. While the empirical literature on the relationship between conflict exposure, negative affect and crime is scant in developing countries, recent research by Blattman, Jamison and Sheridan (2015)

shows that cognitive behavioral therapy (CBT)—designed in part to address psychological and emotional distress—reduced crime and violence among criminally-engaged men in Liberia. The belief that crime is often intimately associated with emotional factors deriving from wartime experience yields the second major hypothesis:

H2 Former combatants experiencing persistent anger or depression will be more likely to enter into crime.

A social logic of crime

In deciding between reintegration and illegality, former combatants are likely motivated not only by individual considerations but also by social ones. There are good reasons to believe that social factors—particularly ties to former commanders and ex-combatant peers—play a critical role in entry into crime following demobilization. An important literature in political science has argued that social networks play a major role in recruitment into rebellion and violence and in the operational effectiveness of armed groups (Wood, 2008; Parkinson, 2013; Staniland, 2012; Kenny, 2010). A largely separate research tradition in sociology and criminology has established that family, community, or neighborhood networks are associated with crime entry, especially recruitment into gangs (Densley, 2015; Papachristos, Hureau and Braga, 2013). Still others have pointed out that social networks matter not just for gang crime but also for individual crime and that the high variance in crime rates must result from highly social processes (Glaeser, Sacerdote and Scheinkman, 1996).

It is likely especially true that social networks matter for ex-combatant crime, as demobilized combatants are embedded in cohesive and hierarchical networks that can persist into the reintegration period (Daly, 2012). It is therefore not surprising that breaking up command-and-control structures is often viewed as a central goal of reintegration interventions in order to prevent conflict recurrence (Spear, 2002; Humphreys and Weinstein, 2008). Yet, command-and-control relationships are only part of the story. Not only do strong social networks serve as channels of social pressure (Densley, 2015), they also can transmit criminal

skills, knowledge, or technology; alter social norms of acceptance for criminal behavior; provide status, esteem, or a sense of belonging that motivate action on behalf of the group; and offer protection (Cullen, Wright and Blevins, 2008; Gaviria, 2000; Petersen, 2001). These mechanisms plausibly explain why some ex-combatants embedded in strong networks turn to criminal activity with gangs while others enter into crime on their own. They also underscore that both vertical ties to commanders and horizontal ties to ex-combatant peers could be important drivers of criminality.

Despite the potential importance of social factors for ex-combatant criminality, there is little empirical evidence about the role that conflict networks play in criminality following demobilization. While both Blattman and Annan (2015) and Blattman, Jamison and Sheridan (2015) consider social factors, neither study explicitly tests the effect of conflict networks on criminal entry or examines the downstream effects of social factors for economic or psychological interventions.² In the Colombia context, Kaplan and Nussio (2016) find that living in a municipality with criminal gangs is associated with crime but the role of ex-combatant peers and commanders, mechanisms, and relations to different types of crime remain unclear. Further empirical investigation into the relationship between conflict networks and criminality is especially important as some have argued that strong conflict networks can actually facilitate reintegration (Themner, 2015). This could be true if those former combatants who had relatively positive experiences following demobilization or were more successfully reintegrated could potentially provide support, information, or monitoring to others in their networks that could reduce the appeal of a turn to crime. We thus test as our final hypothesis:

²Blattman and Annan (2015) find no evidence that agricultural training and capital inputs interventions reduce crime by altering conflict networks as a *mediating* factor, possibly because of the residential nature of their intervention. Blattman, Jamison and Sheridan (2015) acknowledge that a limitation to the generalizability on their findings is that there were no gangs or armed groups trying to recruit their sample.

H3 Stronger horizontal ties to ex-combatant peers or vertical ties to former commanders will be more likely to enter into crime.

3 The Colombia Context

We test these hypotheses in the Colombian context. The contemporary Colombian conflict has its roots in La Violencia, the civil war that raged from 1948-1958 between the Liberal and Conservative Parties. In the 1960s, left-wing guerrilla organizations like the Revolutionary Armed forces of Colombia (FARC) and the National Liberation Army (ELN) emerged. With the introduction of the drug economy to Colombia in the late 1970s and the adoption of kidnapping and extortionary financing tactics, the guerrillas began to pose a serious threat to the military, landowning elite, drug barons and political class. Accordingly, these diverse sectors of society formed regional paramilitary forces (Romero, 2003). Over the course of the subsequent decades, both the rebels and militias extended their power over nearly the entire country (Lopez, 2010). The conflict has left over 220,000 dead in its wake and displaced 4.7 million (Grupo de Memoria Histórica, 2013).

In 2002, Alvaro Uribe won the Colombian presidency and commenced a process of negotiation with the paramilitary leaders, resulting in peace accords between the government and each of the 37 paramilitary groups and the disarming of their 31,870 combatants between 2003 and 2006. Concurrently, Uribe continued an individual demobilization process whereby paramilitary and guerrilla combatants could desert their armed groups and receive amnesty and reintegration benefits. Between 2003 and 2013, 29,238 paramilitaries and guerrillas disarmed under this process, bringing the total number of registered demobilized combatants in Colombia to over 55,000. The peace agreements also developed a comprehensive demobilization, disarmament, and reintegration (DDR) program to transition the ex-combatants back into civilian life (Daly, 2016).

Colombia has witnessed the successful reincorporation of many of its former fighters into

civilian life. At the same time, a large number of ex-combatants have also turned to crime, either as individuals or with gangs (Daly, 2016). Since 2005, Colombia’s security landscape has become populated with emerging criminal gangs (bandas criminales emergentes or BACRIM), which is the Colombian government’s term for all contemporary, illegal non-state armed actors, including remilitarized paramilitaries and guerrillas and narco-trafficking entities. Their activities are associated with a sharp increase in violence and criminality, including targeting of civilians, massacres, rape, extortion, assassinations, kidnappings, displacement, and trafficking (Human Rights Watch, 2010).³

Addressing questions about how to prevent a recurrence of violence and criminality is of particular relevance in Colombia at present as the government finalizes negotiations with the FARC and potentially engages in peace talks with the ELN rebel armies. Moreover, due to the timeliness of this research for Colombia, we were afforded the rare opportunity to collect data on criminality with significant collaboration from the Colombian Government and international organizations. We describe our data next.

4 Data, Measurement, and Estimation

We test our hypotheses using data from an original survey of 1,158 demobilized combatants representing both right- and left-wing military organizations in Colombia.⁴ The survey

³There is an ongoing debate within Colombia about whether BACRIM are new organizations that are purely criminal and unrelated to the demobilized paramilitary or guerrilla groups or whether they are actually re-armed (counter) insurgent organizations (Human Rights Watch, 2010). We control for political motivations to address this gray area between crime and political violence.

⁴This study was conducted in collaboration with the Colombian think tank, *Fundación Ideas para la Paz* (FIP) and implemented by trained enumerators working for a reputable survey firm. All interviews were conducted face-to-face, except for the self-administered portion

provides not only our measures of the correlates of criminality and a rich set of controls but also self-reported data on criminal behavior. We use the survey to complement a confidential dataset obtained from the office of the Fiscalía that contained current information on former combatants who had been charged or convicted of criminal activities.⁵ While most studies of criminality rely on such official data, it is not uncommon in developing countries such as Colombia for such data to be flawed and incomplete (Blattman et al., 2015), or for some criminals to have evaded entirely detection by the state. In what follows we describe the procedures taken both to sample systematically a hard-to-reach population and to elicit survey responses about highly sensitive criminal behavior.

4.1 The Sample

One of the central challenges of studying criminality includes collecting data on a hard to reach population, insofar as those demobilized combatants who are most likely to be criminal also may have disassociated with the reintegration agency or be in prison. We took several steps to obtain a representative sample of the demobilized population (for more detail, see Appendix A). To construct as complete a sampling frame as possible, we gained access to a database of the entire population of ex-combatants who had surrendered their weapons and demobilized. Our study was conducted in 2012, shortly after the passage of Law 1424 in 2010, which mandated that all ex-combatants participate in the ACR reintegration program in exchange for a suspension of their judicial sentences. This law created robust positive incentives for the hidden population of demobilized combatants to become ‘locatable’ to the

described below.

⁵We rely on administrative data on actual convictions rather than on the police arrest data used in Kaplan and Nussio (2016) as a substantial portion of those arrested are ultimately never charged or convicted.

ACR and thus enter our sampling frame.⁶ Our sampling frame was thus the best that one could likely obtain in Colombia for studying ex-combatants.

We used this database of all demobilized combatants to construct a list of all municipalities in Colombia that had at least 50 ex-combatants and that were accessible to the OAS Peace Mission (MAPP-OEA).⁷ We collaborated with the MAPP-OEA because they are a respected third-party organization charged with keeping the 2005 peace agreement.⁸ Of the 136 municipalities with 50-or-more ex-combatants, 83 were covered by the MAPP-OEA and from these we sampled 47.⁹ Given that ex-combatants tend to relocate often, we had local ACR psychologists update our database in order to generate a current list of ex-combatants in our selected localities. We then drew a random sample of these participants, stratifying on former armed group (rebel or paramilitary), demobilization year, whether charged with a crime, department of residence, and whether they registered after Law 1424.

We also randomly sampled 268 individuals in prison. To construct the prisoner sample, we generated a list of 18 medium and high security prisons associated with the selected municipalities and that contained at least 25 ex-combatant prisoners. We drew our sample of prisoners from lists of ex-combatant inmates who were residing in these prisons, excluding those who had been imprisoned for crimes committed before demobilizing. The prisoners were selected in a manner that balanced, as much as possible, ex-guerrilla versus ex-paramilitary status. Overall, the prison sample represents about 11 percent of the

⁶Approximately 4110 ex-combatants identified themselves to the ACR following the passage of Law 1424 (authors calculations).

⁷Excluding municipalities with fewer than 50 ex-combatants implied a coverage loss of only 15 percent of the ex-combatant population.

⁸All invitations to participate in the study came from the MAPP-OEA rather than the ACR.

⁹MAPP-OEA had a mandate to operate in locations where the greatest violations of the peace deal occurred, which included municipalities that experienced high crime following demobilization.

population of ex-combatants. While the prison sample increased our likelihood of including criminal ex-combatants in this study, it cannot be assumed that all individuals in prison are criminals as some who are arrested and charged are later exonerated. Likewise, those who have engaged in criminal behavior in our study do not come exclusively from our prison sample, as some individuals who have been convicted of crimes have since been released *and* there remains a population of ‘hidden’ criminals who so far have gone undetected by the criminal justice system. We take these nuances into consideration when constructing our measures of criminality, described next.

4.2 Measuring Criminal Behavior

The second major challenge involved eliciting self-reported responses to survey questions on a subject as sensitive as criminal activity. It is widely appreciated that asking about sensitive behavior on surveys can introduce bias through item non-response and systematic misreporting. The potential for dishonest reporting was heightened, in our case, by wanting to measure behavior that could result in criminal investigation if disclosed to Colombian authorities. Our main survey measures of criminal activity were therefore obtained through a self-administered survey accompanied by an elaborate confidentiality procedure to protect respondents. Self-administered surveys have proven to elicit higher self-reporting on a range of sensitive behaviors in comparison to enumerated surveys (Tourangeau and Yan, 2007); they also enabled us to measure more aspects of illegality more precisely than could easily be accommodated by list experiments and other indirect questioning techniques.

The self-administered module was implemented following the completion of the enumerated survey. At that point, the interviewer erected a privacy screen and proceeded to read the questions aloud (to assist with focus and literacy) while the respondent privately recorded his responses. Before providing consent, respondents had been informed about the confidentiality procedures, which were designed to ensure that no one in Colombia would be able to link the two surveys to each other or to the respondent (for details, see Appendix B). Panel

A of Table 1 presents summary statistics on criminal behavior from both the administrative and survey data using weighted data and multiple imputation to account for missing items (see Section 4.5 for details).¹⁰ We code a respondent as criminal if they have been *convicted* of a crime in the administrative data, which corresponds to about 11 percent of our population. We believe this is the most defensible way to operationalize illicit behavior in the administrative data given that some of those arrested or charged are exonerated. We determine that a respondent has engaged in illegal behavior according to the survey if they self-report having engaged in criminal activity on their own or with a gang, stated the nature of at least one crime committed, *or* revealed a gang affiliation. According to the survey data, about 20 percent of our population is criminal.

We construct a binary measure of ‘proven’ illegality by combining the administrative and survey measures, coding as criminal any respondent who is classified as criminal according to at least one of the two data sources. As can be seen in Table 2, this yields 369 ex-combatants in our sample who are criminal, corresponding to about 24 percent of our population. Bringing the two data sources together leverages the fact that, while there is some correlation between these measures ($\rho = .401$), they also appear to capture somewhat distinct segments of the criminal population.

Comparing our administrative and survey data also sheds light on the size of the ‘hidden’ population of criminals and the extent to which the survey succeeded in eliciting admissions from respondents outside of the criminal justice system. As Table 2 shows, 190 respondents (13 percent of our population) who admit to criminal behavior on the survey have not been convicted, meaning that they are not considered criminal in the administrative data.¹¹ If we were to make the (questionable) assumption that all ex-combatants who are charged with crimes are also criminal, then the survey identifies 98 respondents (8.0 percent of our population) who do not appear as such in the administrative data. Finally, there are 77

¹⁰All summary statistics can be found in the Appendix C.

¹¹Of these 190, 117 come from our non-prison sample and 73 from our prison sample.

respondents (8.4 percent of our population) who admit to criminal behavior on the survey but who have not been charged with or convicted of a crime *and* are not in prison, implying that they are truly ‘hidden’ to the criminal justice system. Overall, these numbers suggest that the survey succeeded in identifying a subpopulation of ex-combatants who self-report criminal activity and who have not been identified by the state.

In addition to the binary measure of criminality described above, we create an outcome measure that incorporates more nuanced information on illegal behavior *risk* obtained from the self-administered survey. There is good reason to believe that those who have expressed sympathy with criminal activity or who have been targeted for recruitment are more at risk of being criminal than those who have not. We seek to develop a broader measure of criminal proclivity because many former combatants may operate in a ‘gray zone’ where they are vulnerable to becoming criminal. It could also be the case that measures of sympathy and targeting are proxies for actual criminality for ex-combatants who are reluctant to admit directly to illegal behavior.

We therefore construct a scale that takes a value of “3” for the proven criminality described above; a value of “2” for respondents who are not proven criminals but are both sympathetic *and* have been subject to recruiting attempts; a value of “1” for respondents who are either sympathetic *or* vulnerable to recruitment; and a value of “0” for respondents that can be considered fully in legality. We code as sympathetic to illegality any respondent who indicated that criminal behavior would be an acceptable response to at least one scenario, including lack of money, security threats, and social pressures (see Table 1, Panel B). An individual is considered vulnerable to recruitment if he has been targeted to join an illegal armed group or do something illegal on behalf of an armed group. Overall, the criminality scale is revealing. In addition to the 24 percent that is certainly criminal, about 11 percent is both sympathetic to criminal activity and has been targeted for recruitment while 33 percent is either sympathetic or vulnerable to recruitment. Only about 32 percent of our population appears to be firmly in legality. We employ both the binary measure of

criminality and the scale as our main measures in the analysis below.

4.3 Independent Variables

The main measures for our independent variables come from the enumerated survey. To avoid endogeneity and ensure that our independent variables are measured temporally prior to any criminal activity following demobilization, we continually prompted all respondents to answer the relevant survey questions as they pertained to their lives *one year following demobilization*. We selected this time point because piloting suggested that ex-combatants were readily able to recall their living conditions on the one year anniversary of their demobilization and because official data indicated that former combatants rarely committed crimes within the first year.¹² To minimize concerns about recall bias, where possible we limited ourselves to direct questions about objective conditions or highly salient circumstances that piloting suggested were easy for respondents to remember.

We also collected multiple survey measures for our key hypotheses, which we combine into indices using inverse covariance weighting (Anderson, 2008). Summary statistics for all independent variables and index components can be found in Appendix C. To test the notion that improving economic welfare will increase the opportunity costs of crime (H1), we use measures of employment status and education as well as indices of objective and subjective economic welfare one year following demobilization. The index of objective well-being combines 12 measures of income, household conditions, and asset ownership, whereas the index of subjective well-being employs three measures about satisfaction with one's economic situation one year following demobilization. To test our psychological hypotheses (H2) we use seven measures that capture whether an ex-combatant was angry or depressed one year following demobilization. Specifically, we code as 'angry' anyone who listed anger or a related emotion to a question on how they feel when they reflect on their participation in

¹²Forty-four respondents in our sample admit to having committed crimes within the first year of demobilization. All results are robust to excluding these respondents (see Appendix D).

an armed group; we code as ‘depressed’ anyone who exhibited depression or PTSD symptoms using a battery adapted from the World Health Organization.

We examine the role of conflict networks (H3) using measures of the extent to which a former combatant maintains ties to other former or current combatants and commanders one year following demobilization. Our index of ties to other combatants comprises seven measures that capture the proportion of a respondent’s friends who are former or current combatants; the amount of time spent with other former or current combatants; and the likelihood that a respondent would turn to a former or current combatant for help in an emergency. We use six measures to proxy for the closeness of ties to former commanders, including regularity of communication, how quickly a former combatant could get a message to his former commander(s), and whether a respondent would lend money to his former commander(s) if asked.

4.4 Control Variables

Our analysis also uses a rich set of controls obtained from the enumerated survey to mitigate concerns about confounding. We incorporate as controls nearly 110 variables that capture individual, household, and contextual circumstances prior to first joining an armed group; various facets of experience with the armed group; and the nature of the demobilization experience. We also control for the years since demobilization to account for the fact that some respondents are being asked to recall more recent history than others. Additionally, we include as controls a number of variables related to experience with the reintegration program and confidence in government. We again use inverse covariance weighting to combine controls where possible into indices, leaving us with a final set of 18 individual covariates and 22 control indices. Descriptive statistics for all measures can be found in Appendix C.

To provide a more complete picture of our data, Table 3 presents estimates from regressions of our criminality scale on our full set of control variables (see Section 4.5 for our estimation strategy). We group the control variables into five ‘families’ and report the un-

adjusted p-values as well as FDR adjusted q-values for each family of variables as they are added into the regression to account for multiple hypothesis testing (Anderson, 2008).

This analysis reveals a small handful of control variables with significant explanatory power after the multiple hypothesis correction. Of our demographic factors, women are significantly less likely to engage in crime than men following demobilization (Panel A). There is a strong association between conflict exposure and criminality (Panel C), which is notable because of its link to several of our hypotheses. Ex-combatants with more conflict exposure could also be more likely to have skills or abilities that are valuable to the labor market for illicit activities, to suffer from psychological trauma, or to have the most durable conflict networks. Controlling for conflict exposure thus allows us to account for an important source of spurious association. Other conflict factors, like rank, unit hierarchy, and fighting group (guerrilla or paramilitary) interestingly have no significant relationship with criminality when using the corrected p-values.

Of those variables associated with demobilization and reintegration experience (Panels D and E), only insecurity is clearly significant at conventional levels after correcting for multiple hypothesis testing. This could be because insecurity induces former combatants to illegally carry arms for self-protection, to commit crimes in self-defense if facing threats of retaliation, or to join criminal gangs for the social protection that they afford (Boas and Hatloy, 2008; Nussio, 2011). We explore the latter option in Section 6.2. Interestingly, confidence in government, which is a proxy for the perceived probability of detection and punishment for criminal activity loses its significance after adjusting for multiple inference. We also find no significant association between criminality and participation in the reintegration program, the strength of community and family ties, (lack of) political voice and distrust in government.

4.5 Estimation Strategy

We use regressions to estimate the effects of the independent variables on the criminality measures. Specifically, we estimate the following model:

$$Y_{ij} = Z'_{ij}\beta + X'_{ij}\gamma + \mu_j + \epsilon_{ij} \quad (1)$$

where Y_{ij} is one of our crime measures for individual i in municipality j . Z'_{ij} is the vector of independent variables described above, with the main coefficients of interest represented by the vector β . X'_{ij} is the vector of control variables, including all controls in Table 3. Finally, μ_j denotes municipality fixed effects and ϵ_{ij} is individual level random error. We test each hypothesis with a joint F -test for the coefficients on the independent variables that correspond to the hypothesis. For example, we test H1 using an F -test for the joint significance of the employment, objective economic welfare, subjective economic welfare, and education variables. To account for multiple inference, we report the FDR-adjusted q -values, adjusting simultaneously for the eight variables used to test our three hypotheses. This offers a conservative approach for exploring which independent variables may be contributing to a significant joint effect while also permitting us to consider each treatment in isolation.

We fit the model using weighted least squares where the weighting accounts for variation in the probabilities of selection into the sample due to stratification. We use least squares because of its robustness in this setting (Beck, 2015). Our standard errors are consistent for sampling variability given our sampling design. They account for the fact that our sample was stratified by municipality and clustered by neighborhood groupings within each municipality. To address a small amount of item-level missingness that nonetheless would have resulted in dropping a substantial number of observations, we perform ten rounds of predictive-mean-matching imputation (Royston, 2004).

Appendix D reports various robustness checks. We show that our estimates are not biased by correlations between the different families of variables in Z'_{ij} or with the rein-

tegration variables in X'_{ij} by running versions of the baseline specification in which each family of variables is entered separately and the reintegration variables are excluded from the controls. This helps to mitigate concerns about ‘post-treatment’ bias in our estimates (Rosenbaum, 1984). We demonstrate that the results hold when we use a fixed-effects ordinal response “blow-up and cluster” model for our criminality scale model (Baetschmann, Staub and Winkelmann, 2014). Finally, we show the robustness of our results to excluding ex-combatants who committed crimes within one year of demobilization.

5 Main Results

We now turn to our results on the economic, psychological, and social correlates of criminality. Table 4 presents our findings using three measures of criminality: the scale of criminality risk and the binary measure of proven crime described above, as well as a measure of violent crime (described below).

We look first at the results presented in Panels A and B, where Panel A presents the correlates using our vulnerability to crime measure. Panel B displays results using our binary measure of ‘proven’ criminality obtained from combining the survey and administrative data. Our first hypothesis is that ex-combatants who enjoy more economic security and welfare will be less at risk of pursuing criminal activity, consistent with the logic of opportunity costs. Despite the prominence of arguments centered on the individual material incentives to crime, we find no evidence that any of four measures of economic factors—employment status, objective economic well-being, subjective economic welfare, and education—predict being at risk of illicit behavior or proven criminal activity. None of these measures are statistically significant at conventional levels; neither are they jointly significant. The coefficients in Panel B are also close to zero for each of the four measures.

We find more mixed support for a relationship between psychological factors and criminality, consistent with the second hypothesis. The results reveal a strong correlation between

depression and our vulnerability to crime index even when correcting for multiple hypothesis testing in Panel A. Psychological factors become insignificant, however, when using the binary measure of proven criminality. This suggests that depression and trauma might be associated with sympathetic attitudes towards criminality or vulnerability to recruitment but that they do not necessarily tip an individual into criminal behavior.

We do observe clear evidence in favor of social factors. We see in Panel A that the maintenance of social ties to both combatants and former commanders is strongly associated with risk of turning criminal. A one standard deviation change in the index of strong ties to ex-combatant peers is associated with a change of .12 units (or .11 standard deviations) in the vulnerability to crime scale; we observe results of a similar magnitude for the measure of ties to former commanders. The results in Panel A are jointly significant ($p = .001$) and are also individually significant even after accounting for multiple hypothesis testing. We see similar results using our measure of proven criminality in Panel B where a one standard deviation change in the index of strong ties to ex-combatant peers yields a 4 percentage point increase in the probability of criminal activity. The measures of ties to ex-combatant peers and commanders is again jointly significant ($p = .001$), although the measure of ties to ex-combatant peers is not individually significant when employing the FDR correction.

This analysis sheds light on the benefits of including our survey data in the analysis to supplement the administrative data. Table 5 shows how the results for proven criminality would differ if we were to use only the administrative data (Panel A) or only the survey data (Panel B). While both data sources reveal a strong correlation between ties to former commanders and criminality, wealth and depression are strongly correlated with criminal behavior in the survey data but not in the administrative data. Furthermore, the observed correlation between ex-combatant peers and criminality primarily comes from the survey data. This highlights how the correlates of crime can differ when accounting for the ‘hidden’ population of criminals captured in the survey.

So far we have operationalized illicit behavior as any form of criminal activity following

demobilization. There might be greater cause for concern, however, about violent crime. We leverage the nuance made possible by the self-administered survey to create a scale of propensity to engage in violent crime, where we differentiate between those who have not engaged in any crime following demobilization (coded 0), those who have committed crimes but report that those incidents were never or almost never violent (coded 1); and those who have committed crimes and say that those crimes were sometimes, almost always, or always violent (coded 2).¹³ The results, presented in Panel C of Table 4 reinforce the importance of conflict networks to crime that is violent in nature. Of our three main hypotheses, this is the only one that survives as a predictor of violent crime.

6 Interpretation and Further Analysis

The results provide strong evidence that social factors—namely ties to former commanders and combatants—are a key driving force of criminality in general and violent crime in particular. These findings raise important additional questions about *how* wartime social ties pull ex-combatants into crime, which we explore below. We find some evidence that psychological factors are associated with vulnerability to crime, although neither anger nor depression appear to be linked to proven criminality. Moreover, there is a complete lack of support for an opportunity cost logic based on individual material conditions in our data. This is perhaps the most surprising result given the emphasis this explanation has received and we begin our discussion by examining it more closely.

6.1 Null Effects of Individual Material Conditions

We first consider whether the null results on individual material conditions are due to attenuation bias or hidden confounding. A possible source of attenuation bias is classical measurement error. We think this is unlikely to explain our findings. First, the employment,

¹³About eight percent of our ex-combatant population has participated in violent crime.

objective economic welfare, and education measures are based on information that should be relatively easy for respondents to provide. Our measures have also been validated in our country context—indeed, they are drawn from modules commonly used on Colombia’s census. Furthermore, while measuring income and wealth on surveys can produce noisy results, the use of indices helps to remove noise.

Another potential source of attenuation bias is the “classic” selection problem, whereby selection on some variable attenuates its predictive power in the selected sample (Achen, 1986, pp. 73-78; Heckman, 1979). This could taint our results if it were the case that Table 4 reported coefficients on respondents’ economic conditions *prior* to joining an armed group. However, our analysis estimates coefficients on respondents’ economic conditions after demobilizing, *controlling* for economic conditions prior to joining (see Panel B of Table 3). The coefficients in Table 4 make use of variation in economic conditions after partialing out the pre-joining variation. This may mean that there is little variation left to identify the effect for some variables, but it also means that the lack of predictive power for material conditions at the time of demobilization is not attributable to classic sample selection.

A potential concern is that our results are biased due to hidden confounding. For this to be the case, there would have to be an omitted variable that is correlated with both criminality and our economic factors, even after including all of our controls. Appendix E reports the results of a sensitivity analysis based on Imbens (2003) and using the routine developed by Beber, Roessler and Scacco (2014). It shows that our results would change only if the hidden confounder exhibited extremely high correlations—well higher than the correlations exhibited by even the strongest predictors among the control variables. The implication is that the results are robust even to extreme levels of hidden confounding.¹⁴

¹⁴Appendix E also reports sensitivity analysis results for the other predictors in Table 4. The findings indicate that only the “ties to peers result” is sensitive to a degree of confounding that is at all within the realm of what other variables in the data suggest is possible. But even for that variable, the confounding would have to be quite extreme.

Finally, it could be that heterogeneity in our population is obscuring our ability to observe an average effect of economic factors on crime. We therefore look for variation for subgroups in the population that are most likely to be motivated by economic considerations, namely paramilitaries (vis-a-vis guerrillas) and those who could be considered material ‘types’ in that they self-report first joining an armed group for economic reasons.¹⁵ Appendix E shows no role for economic factors for these sub-populations. Taken together, the additional analysis reinforces the lack of evidence for a link between economic opportunity costs and crime in our data and challenges the notion that the dominant explanation for criminal activity among former combatants is profit.

How should we interpret these null results in light of the large literature on the economics of crime? One possibility is that economic factors matter less for the decision to *enter* into crime (our focus) and more for how time is *allocated* between legal and illegal sectors (Lochner, 2004). Consistent with this, Blattman and Annan (2015) find that increasing the opportunity cost of illegal work primarily shifts the amount of time allocated to work in the illegal sector but does not impact the decision to enter or exit. A second possible explanation is that the employment and benefits component of Colombia’s reintegration program succeeded in severing the link between economic insecurity and crime, although we see little evidence in Table 3 that program participation correlates with a reduced likelihood of crime. Alternatively, it could indeed be the case that social factors predominate. To some extent, the literature has struggled to explain the incentives for crime in purely economic terms given that individuals at low levels of criminal organizations face high risks and low economic rewards from their participation (Levitt and Venkatesh, 2000). Our results nonetheless raise additional questions as to why and how these networks operate with respect to criminality, which we turn to next.

¹⁵Paramilitaries tend to be viewed as more mercenary (Arjona and Kalyvas, 2011; Sanin, 2008).

6.2 Unpacking the Social Logic

While the results presented thus far suggest that social factors are important, we conduct additional analysis to develop the social *logic* of ex-combatant criminality. We begin by investigating the plausible ‘first-movers’ into crime in a conflict network: former commanders. Ex-commanders may be especially attracted to crime because of higher economic returns (Levitt and Venkatesh, 2000), greater career investments in criminal skills (Mocan, Billups and Overland, 2005), or greater challenges with reintegration (Humphreys and Weinstein, 2008; Spear, 2002). While our commander sample is small (n=207), we analyze variation in the correlates of criminality separately for ex-combatants and ex-commanders, with results presented in Table 6.¹⁶ The findings in Panel A indeed confirm that ties to former commanders are a strong correlate of proven criminality for lower ranking soldiers.

The results in Panel B indicate that the correlates of criminality differ for ex-commanders, however. Depression appears to be a stronger correlate of commander criminality. Moreover, the data suggests a surprising *positive* relationship between economic welfare (the objective index) and criminality for ex-commanders. It is possible that former commanders who are economically well-off following demobilization turn to crime to maintain a higher quality of life than can be sustained in peace-time, or that wealth facilitates criminality if it helps ex-commanders recruit people into criminal gangs. While the commander results should be interpreted with caution due to the small sample size, they nonetheless indicate that commanders might have their own motivations for entering into crime, pulling in lower-ranking ex-combatants in their networks who join primarily for social reasons.

The proportion of ex-combatants involved in crime likely grows more in strong conflict networks than in weak ones. While we do not have the data to perform a network analysis,

¹⁶We code as a commander anyone who reported this as one of their principal activities while with their fighting unit or who reported that their highest rank was *comandante de bloque o frente* (high-ranking commander) or *mando medio* (mid-ranking commander).

we can examine whether ex-combatants embedded in ‘good’ or ‘bad’ networks are more or less likely to be criminal. We use additional data collected in the survey to construct a measure of the proportion of an ex-combatant’s network of demobilized fighters that are engaged in individual or gang-related crime. Figure 1 shows that ex-combatants embedded in ‘bad’ networks (a greater proportion of their demobilized combatant network is involved in crime) are indeed themselves more likely to be criminal. While this measure of network type could be endogenous to criminality, the results nonetheless underscore that there is a strong social component to criminal behavior and that individuals in ‘good’ networks are significantly less likely to commit crimes than those in bad ones.

Importantly, as criminal behavior diffuses through a conflict network, we should see ties to both peers and commanders playing an important role in entry into both gang and individual crime. This follows from the mechanisms discussed in Section 2. Both ex-combatant peers and commanders could play a role in facilitating criminal behavior if conflict networks serve as a vehicle for criminal learning, norms change, social pressure, status validation, or protection. Moreover, while the latter three mechanisms (social pressure, status validation, or protection) might be more relevant to gang-related crime, criminal learning and norms change could also help to explain individual crime.

To examine this, we take the two questions from the survey that were used to construct our measure of ‘proven’ criminality that capture whether a respondent had participated in a criminal act as an individual or with a gang. We overlap these measures to create two binary indicators: one for whether an individual engaged in individual crime *only* (dropping respondents who engaged in group crime) and one for ex-combatants who engaged in some group crime (dropping those who engaged in individual crime only). We estimate results using these new variables as outcomes and focusing on our measures of conflict networks as our key explanatory variables.¹⁷ The results are presented in Table 7 separately for rank-and-

¹⁷The regressions include all of our controls. Additionally we run specifications with and without the other independent variables.

file combatants and commanders, since our previous analysis suggests that conflict networks might work differently for individuals at different levels of the hierarchy.

Looking first at rank-and-file combatants, we find a clear association between ties to ex-combatant peers and the propensity to commit crimes as an individual (Panel A). Moreover, both peer *and* vertical networks correlate with group crime (Panel B). These results on gang crime are further supported by evidence in Panel C, which uses our recruitment index as the dependent variable and shows that both horizontal and vertical conflict networks are correlated with being targeted for recruitment. Interestingly, the results in Table 7 also reveal a positive association between ties to peers and group crime for commanders. This result lends itself to two interpretations: that ex-commanders with stronger horizontal networks are themselves more likely to be pulled into crime, or—more plausibly—that commanders are more likely to succeed in group crime when they have strong recruitment networks.

The data further allow us to explore four potential mechanisms—norms change, pressure, status validation, and protection—by which conflict networks facilitate criminal entry for lower ranking ex-combatants. To examine the possibility that conflict networks facilitate the spread of social norms that legitimate criminality, we regress the index of sympathy towards criminal behavior (used to construct our criminality scale) on our conflict network variables plus controls. Recall that the index combines several measures about situations in which ex-combatants think it would be acceptable to engage in illegal activity, consistent with norms change (see Table 1). As can be seen in Panel A of Table 8, the coefficients on ties to commanders is large and positive, although not significant at conventional levels. To examine susceptibility to pressure, we re-estimate our regression using one variable in the sympathy index—if it would be acceptable to engage in crime if ordered by a superior—as the dependent variable. There is a clear positive association between strong ties to commanders and willingness to obey an order. While we cannot be certain of the extent to which such obedience is voluntary or involuntary, we interpret this as evidence that ex-combatants in strong networks might feel pressured into crime by commanders.

Table 9 presents evidence that the association between networks and crime is conditional on whether an ex-combatant is status-seeking or in need of protection. To investigate the status-seeking mechanism, we use a question from the survey that inquires into whether respondents felt that they had lost social status, respect, or power by demobilizing. When we interact this indicator with our measures of horizontal and vertical ties, we find ambiguous evidence that the effect of strong ties on proven criminality or individual crime is conditioned by feelings of status reversal. The interaction effects are positive and the coefficients are large, even if not statistically significant. We do, however, see clearer evidence that the interaction is positive and significant with respect to group crime, indicating that individuals with strong conflict networks are more likely to join criminal gangs when they are status-seeking or suffering from status reversal compared to when they are not. Finally, to test whether ex-combatants join criminal gangs for protection, we interact our network variables with a dichotomized version of the insecurity index used as a control variable. The results at the bottom of Table 9, however, provide no evidence that ex-combatants who are in greater need of protection and who have strong conflict networks are more likely to enter into group crime.

All in all, the additional analysis presented is consistent with a story in which former commanders enter into crime first, pulling rank-and-file soldiers in their networks into gang-related crime. As criminal behavior pervades a network, ties to ex-combatant peers and commanders serve as powerful drivers of group crime while ties to peers primarily drive individual crime. Norms change, status validation, and social pressure all help to explain why conflict networks play such an important role in criminal entry for ex-combatants.

The social logic of crime developed here has implications for considering economic and psychological explanations for crime. The results presented above suggest that commanders who possess robust organizational endowments—wealth to fund criminal endeavors and strong recruitment networks to staff their gangs—are more likely to engage in gang-related crime. The notion that wealth facilitates criminality suggests how a social logic of criminality

might actually be at odds with an opportunity cost logic of crime if commanders actually need initial endowments of wealth to successfully launch a criminal enterprise. With respect to psychological explanations for crime, the evidence that ex-combatants who have strong networks and are more status-seeking are more likely to enter into gang-related crime suggests that psychological factors other than anger and depression might explain ex-combatant criminality. This result could help to explain one of the channels by which cognitive behavioral therapy might work (Blattman, Jamison and Sheridan, 2015)—by altering self image such that individuals no longer need to seek social validation through conflict networks. Overall, the analysis underscores the importance of considering the social logic alongside economic and psychological accounts of ex-combatant criminality.

7 Conclusion

This paper presents evidence for a social logic of ex-combatant crime vis-a-vis individualistic explanations focused on economic or psychological factors. We find that ties to former combatant peers and commanders predominate in explaining crime in general and violent crime in particular. All in all, we use high quality data to provide some of the first quantitative evidence of the relative importance of a social logic for ex-combatant criminality.

These findings contribute to important literatures on ex-combatant criminality (Collier, 1994; Spear, 2002; Muggah, 2009; Kaplan and Nussio, 2016); on the rise of crime in weak and post-conflict states (Bateson, 2013; Lessing, 2015; Blattman and Annan, 2015; Blattman, Jamison and Sheridan, 2015); and on post-conflict reintegration (Humphreys and Weinstein, 2007; Gilligan, Mvukiyehe and Samii, 2013). Entering into crime is one of the most extreme forms of reintegration failure, yet to date much of the literature has focused more on explaining why ex-combatants find jobs, participate politically, or reconcile with their communities than on explaining why they enter into crime. Existing studies have also primarily highlighted individualistic factors; to the extent that they have considered conflict networks the

concern has predominantly been war recurrence and not criminality. Our results suggest the need for an even more detailed analysis of the conditions under which demobilized networks are re-purposed for crime.

An important question pertains to the extent to which the results presented here generalize to other contexts. There may be contexts in which economic or psychological factors would play a greater role in explaining criminality. For example, in the aftermath of brief wars in which conflict bonds were never forged or where reintegration programs shatter wartime organizations, individualistic explanations may become elevated. Furthermore, while we find that conflict networks have a strong association with criminality, in other conflicts or for other demobilizing groups, conflict networks may instead become neutralized or re-purposed for legal ends. For example, in Peru, the *Rondas Campesinas* became civil society associations (Starn, 1995) whereas the Free Aceh Movement in Indonesia resurrected itself as a victorious political party (Clark and Palmer, 2008). It might matter whether the transition to peace maintains the balance of power between armed factions, the peace agreement offers the ex-combatants opportunities for political participation, or the market for illegality is sizeable. Researching these varied trajectories of conflict networks and the conditions under which they are used for good or for ill offers a promising avenue for future research.

Our findings nonetheless highlight the need for evaluating reintegration interventions that can diminish the perverse pull of conflict networks, with respect not only to command-and-control relationships but also to horizontal linkages among peers. They also highlight norms change, status validation, and social pressure as the mechanisms that policies should seek to obstruct. There are, however, important challenges with a recommendation of uniformly dismantling conflict networks. We still have little empirical evidence for how to dismantle effectively existing networks, especially in post-conflict contexts. Such interventions could also have important adverse effects such as re-militarization if breaking up conflict networks alters the balance of power and information asymmetries among demobilized fighting groups

(Daly, 2016). Finally, in evaluating policy options one needs to consider not only the marginal effects of risk factors that we estimate here but also the prevalence of those risk factors in a society. In other words, while there might be a strong association between conflict networks and criminality, if such networks are not widespread then interventions that target other risk factors might yield better overall outcomes. In (citation redacted), we target analysis precisely to this kind of joint consideration and confirm that potential interventions that address networks indeed offer a promising avenue for crime reduction. All in all, our results bring to the fore the need for further empirical investigation into ex-combatant criminality in general and its social logic in particular.

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Figures and Tables

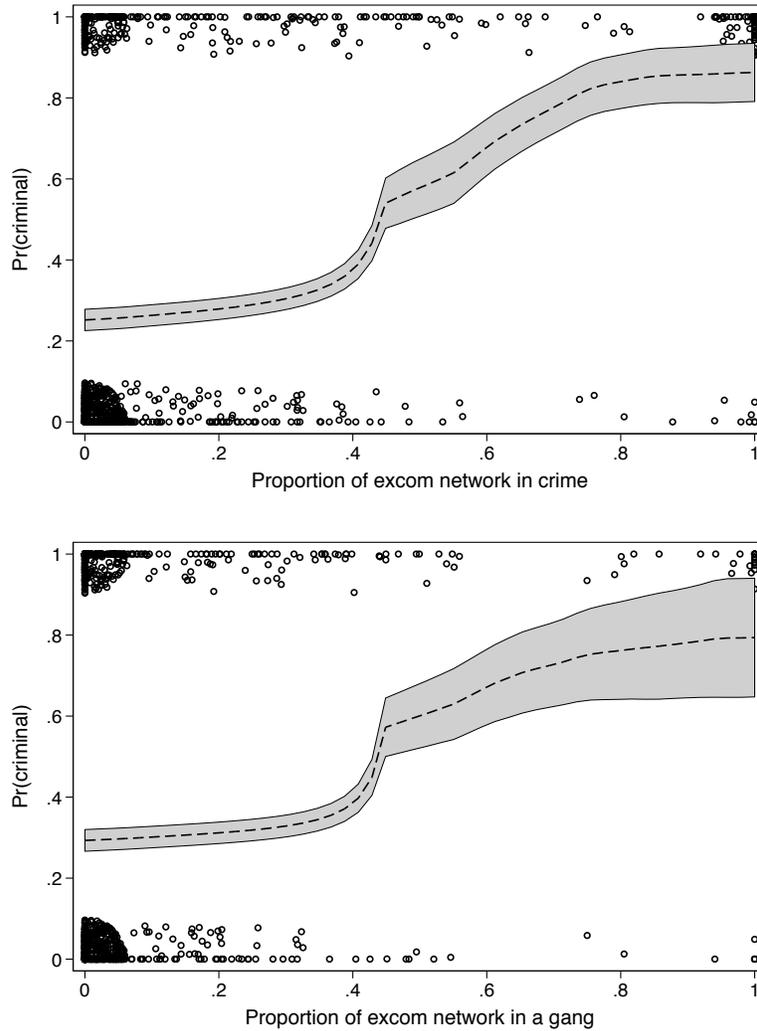


Figure 1: Network quality. *The top figure shows the association between the proportion of an ex-combatant's demobilized network in crime. The bottom panel shows the proportion of an ex-combatant's demobilized network that is involved in a gang. Figures are based on a single imputation.*

Table 1: Summary Statistics for Dependent Variables

	Mean	SD	Min	Max	Count
Panel A: ‘Proven’ criminality					
Convicted of crime (administrative data)	0.11	0.31	0	1	1158
Reported criminal activity (survey data)	0.20	0.40	0	1	1158
As an individual	0.09	0.29	0	1	1158
With a gang	0.05	0.21	0	1	1158
Reported committing specific type(s) of crime	0.19	0.39	0	1	1158
Gang affiliation	0.04	0.19	0	1	1158
Proven criminality (survey + admin)	0.24	0.43	0	1	1158
Panel B: Vulnerability to criminal behavior					
Criminality scale	1.27	1.14	0	3	1158
Sympathy scale (index)	0.01	0.99	-0.69	5.77	1158
Sympathetic to hypothetical story 1	0.26	0.44	0	1	1158
to hypothetical story 2	0.09	0.28	0	1	1158
Sympathy if unemployed	0.15	0.35	0	1	1158
if in need of money	0.11	0.31	0	1	1158
if commanded by superior	0.05	0.21	0	1	1158
if feel threatened	0.24	0.43	0	1	1158
if recruited	0.04	0.20	0	1	1158
if want adventure	0.06	0.23	0	1	1158
if rejected by family/community	0.09	0.29	0	1	1158
if government renegs	0.16	0.37	0	1	1158
Recruitment scale (index)	-0.10	0.97	-0.91	1.98	1158
Recruited to join a gang	0.44	0.50	0	1	1158
Recruited to participate in crime for a gang	0.26	0.44	0	1	1158

Summary statistics based on imputed data and survey weights.

Table 2: Comparing criminality in the administrative and survey data (sample)

		Criminal activity (survey)			Total:	
		<i>No</i>	<i>Yes</i>	<i>Missing</i>		
Convicted of a crime (admin data)	<i>No</i>	<i>n</i>	718	190	71	979
		%	62.0	16.4	6.1	84.5
	<i>Yes</i>	<i>n</i>	47	120	12	179
		%	4.1	10.4	1.0	15.5
Total:		<i>n</i>	765	310	83	1158
		%	66.1	26.8	7.2	100.0

Unimputed and unweighted.

Table 3: Correlates of criminality: All controls

	(1)	(2)	(3)	(4)	(5)	P-value	Q-value					
Panel A: General controls								<i>For column 1</i>				
Female	-0.46***	(0.08)	-0.42***	(0.09)	-0.32***	(0.10)	-0.32***	(0.10)	-0.29***	(0.09)	0.000	0.001
Race	-0.20*	(0.11)	-0.21*	(0.11)	-0.22**	(0.10)	-0.22**	(0.10)	-0.27***	(0.10)	0.077	0.148
Age	-0.01	(0.01)	-0.01	(0.01)	-0.02*	(0.01)	-0.02*	(0.01)	-0.02*	(0.01)	0.237	0.220
Age joined armed group	-0.01	(0.01)	-0.01	(0.01)	0.01	(0.01)	0.01	(0.01)	0.01	(0.01)	0.185	0.220
Education level prior to joining	0.08**	(0.03)	0.06	(0.04)	0.06*	(0.03)	0.07*	(0.03)	0.07**	(0.03)	0.021	0.068
Risk preferences	0.01	(0.01)	0.01	(0.01)	0.01	(0.01)	0.01	(0.01)	0.02	(0.01)	0.409	0.305
Time discounting	0.01	(0.01)	0.01	(0.01)	0.02*	(0.01)	0.02*	(0.01)	0.01	(0.01)	0.184	0.220
Panel B: Motivations for initially joining								<i>For column 2</i>				
Family motivations (index)		0.03	(0.04)	0.04	(0.04)	0.04	(0.04)	0.03	(0.04)	0.445	0.610	
Grievances (index)		0.03	(0.04)	0.02	(0.04)	0.02	(0.04)	0.02	(0.04)	0.488	0.610	
Ideological motivations (index)		0.06	(0.04)	0.04	(0.04)	0.04	(0.04)	0.03	(0.04)	0.163	0.445	
Economic welfare ob. (index)		0.13***	(0.05)	0.14***	(0.05)	0.13***	(0.05)	0.12***	(0.04)	0.008	0.064	
Economic welfare sub. (index)		0.03	(0.05)	0.02	(0.05)	0.02	(0.05)	0.00	(0.04)	0.504	0.610	
Network factors (index)		-0.02	(0.03)	-0.02	(0.03)	-0.02	(0.03)	-0.01	(0.03)	0.628	0.610	
Status/power motivations (index)		0.06	(0.05)	0.01	(0.05)	0.02	(0.05)	0.02	(0.05)	0.201	0.445	
Security motivations (index)		-0.02	(0.04)	-0.07*	(0.04)	-0.07*	(0.04)	-0.08**	(0.04)	0.601	0.610	
Coerced (index)		0.01	(0.05)	-0.02	(0.05)	0.00	(0.05)	-0.01	(0.05)	0.814	0.610	
Panel C: Conflict experience								<i>For column 3</i>				
Conflict exposure (index)				0.27***	(0.05)	0.27***	(0.05)	0.24***	(0.05)	0.000	0.001	
Mid-level commander (index)				0.08*	(0.04)	0.08*	(0.04)	0.09**	(0.04)	0.055	0.206	
High-level Commander (index)				0.06	(0.04)	0.06	(0.04)	0.06	(0.05)	0.176	0.307	
Combatant				-0.08	(0.12)	-0.07	(0.12)	-0.06	(0.12)	0.478	0.620	
Unit cohesion (index)				-0.04	(0.04)	-0.04	(0.04)	-0.01	(0.04)	0.325	0.409	
Unit discipline (index)				0.08*	(0.04)	0.07	(0.05)	0.06	(0.05)	0.092	0.238	
Unit hierarchy (index)				0.08**	(0.04)	0.08**	(0.04)	0.09**	(0.04)	0.036	0.206	
Total time in groups				0.01	(0.01)	0.01	(0.01)	0.01	(0.01)	0.259	0.409	
Paramilitary (vs. guerilla)				0.12	(0.12)	0.11	(0.20)	0.09	(0.19)	0.326	0.409	
Group freq. indoctrinated				0.02	(0.04)	0.02	(0.04)	0.02	(0.04)	0.684	0.697	
Income while in group				0.00	(0.00)	0.00	(0.00)	0.00	(0.00)	0.538	0.643	
Panel D: Demobilization experience								<i>For column 4</i>				
Year of demob.						0.00	(0.02)	0.00	(0.02)	0.903	1.000	
Individual Demob						-0.03	(0.19)	-0.16	(0.18)	0.870	1.000	
Demob coerced						-0.03	(0.11)	-0.06	(0.12)	0.769	1.000	
Glad demobilized						0.12*	(0.06)	0.00	(0.06)	0.058	0.220	
Minor of age						-0.19	(0.17)	-0.22	(0.17)	0.280	0.636	
Disabled						-0.08	(0.10)	-0.11	(0.10)	0.448	0.812	
Panel E: Reintegration controls								<i>For column 5</i>				
Particip. in reint prog. (index)								0.04	(0.04)	0.334	0.857	
Registered with the state (index)								-0.02	(0.04)	0.615	1.000	
Political voice (index)								-0.03	(0.04)	0.480	1.000	

Continued on next page

Table 3: Correlates of criminality: All controls

	(1)	(2)	(3)	(4)	(5)	P-value	Q-value			
Shame about group (index)					-0.04	(0.04)	0.276	0.668		
Confident govt. will not renege (index)					-0.04	(0.05)	0.462	1.000		
Confident in govt. capacity (index)					-0.11**	(0.06)	0.048	0.216		
Insecurity (Index)					0.18***	(0.04)	0.000	0.001		
Family support (index)					0.03	(0.04)	0.497	1.000		
Community support (index)					0.08*	(0.05)	0.080	0.303		
Constant	1.77***	(0.20)	1.81***	(0.21)	1.58***	(0.28)	7.54	(48.73)	6.63	(46.45)
N	1158		1158		1158		1158		1158	

* p < .10, ** p < .05, *** p < .01

(Unadjusted two-sided p-values.)

Weighted least squares with municipality FE and indiv. controls (demographic controls not shown).

Standard errors account for municipality clustering.

Q-values are adjusted separately within each panel.

Table 4: Correlates of criminality

	Panel A				Panel B				Panel C				Pred.
	Vulnerability to crime (scale 0-3)				'Proven' criminality (0/1)				Violent crime (0-2)				
	<i>b</i>	<i>se</i>	<i>p-value</i>	<i>q-value</i>	<i>b</i>	<i>se</i>	<i>p-value</i>	<i>q-value</i>	<i>b</i>	<i>se</i>	<i>p-value</i>	<i>q-value</i>	
Economic factors (H1)													
Employment	0.06	(0.09)	0.514	0.743	0.00	(0.03)	0.930	0.870	-0.06	(0.06)	0.315	0.337	-
Ec. welfare obj. (index)	0.03	(0.04)	0.456	0.743	0.02	(0.02)	0.144	0.276	0.04	(0.03)	0.126	0.234	-
Ec. welfare subj. (index)	0.02	(0.04)	0.639	0.743	0.01	(0.02)	0.724	0.870	0.02	(0.03)	0.504	0.447	-
Education	0.01	(0.05)	0.842	0.743	0.00	(0.02)	0.899	0.870	-0.02	(0.03)	0.540	0.447	-
<i>Joint sig test:</i>	$F(4, 567)=0.32, p=.866$				$F(4, 567)=0.55, p=0.699$				$F(4, 567)=1.09, p=0.361$				
Psychological factors (H2)													
Anger	-0.22	(0.17)	0.213	0.363	-0.02	(0.06)	0.706	0.870	0.02	(0.12)	0.849	0.738	+
Depression/PTSD (index)	0.16***	(0.04)	0.000	0.001	0.03*	(0.02)	0.082	0.197	0.04	(0.03)	0.118	0.234	+
<i>Joint sig test:</i>	$F(2, 567)=6.79, p=0.001$				$F(2, 567)=1.51, p=0.221$				$F(2, 567)=1.29, p=0.277$				
Conflict networks (H3)													
Strong ties to excom peers (index)	0.12**	(0.05)	0.029	0.062	0.05**	(0.02)	0.037	0.149	0.15***	(0.04)	0.000	0.001	+
Strong ties to ex-commanders (index)	0.11**	(0.04)	0.011	0.041	0.05***	(0.02)	0.004	0.034	0.08***	(0.03)	0.009	0.033	+
<i>Joint sig test:</i>	$F(2, 567)=7.99, p=0.000$				$F(2, 567)=7.72, p=0.001$				$F(2, 567)=11.97, p=0.000$				
N	1158				1158				1158				

* $p < .10$, ** $p < .05$, *** $p < .01$.

Weighted least squares with municipality FE and indiv. controls (demographic controls not shown).

Standard errors account for municipality clustering.

Table reports both two-sided p-values and FDR adjusted q-values.

Table 5: Correlates of ‘proven’ criminality: Admin vs. survey data

	Panel A Admin data				Panel B Survey data			
	<i>b</i>	<i>se</i>	<i>p-value</i>	<i>q-value</i>	<i>b</i>	<i>se</i>	<i>p-value</i>	<i>q-value</i>
Economic factors (H1)								
Employment	0.02	(0.03)	0.563	1.000	-0.01	(0.03)	0.836	0.719
Ec. welfare obj. (index)	0.00	(0.01)	0.952	1.000	0.04***	(0.01)	0.003	0.017
Ec. welfare subj. (index)	0.01	(0.01)	0.609	1.000	0.01	(0.01)	0.589	0.647
Education	-0.01	(0.01)	0.437	1.000	0.01	(0.02)	0.743	0.719
<i>Joint sig test:</i>	$F(4, 567)=0.28, p=0.890$				$F(4, 567)=2.31, p=0.057$			
Psychological factors (H2)								
Anger	-0.04	(0.05)	0.484	1.000	-0.05	(0.05)	0.348	0.386
Depression/PTSD (index)	-0.01	(0.01)	0.328	1.000	0.04**	(0.02)	0.01	0.021
<i>Joint sig test:</i>	$F(2, 567)=1.00, p=0.370$				$F(2, 567)=3.52, p=0.030$			
Conflict networks (H3)								
Strong ties to excom peers (index)	0.01	(0.01)	0.38	1.000	0.05**	(0.02)	0.015	0.024
Strong ties to ex-commanders (index)	0.04***	(0.02)	0.007	0.060	0.04***	(0.01)	0.004	0.017
<i>Joint sig test:</i>	$F(2, 567)=4.64, p=0.010$				$F(2, 567)=7.74, p=0.001$			
N	1158				1158			
N (criminal)	179				310			

* $p < .10$, ** $p < .05$, *** $p < .01$.

Weighted least squares with municipality FE and indiv. controls (demographic controls not shown).

Standard errors account for municipality clustering.

Note: There is an overlap of 120 observations in Panels A and B

Table 6: Correlates of ‘proven’ criminality: Rank-and-file vs. commander

	Panel A Combatant				Panel B Commander				Pred.
	<i>b</i>	<i>se</i>	<i>p-value</i>	<i>q-value</i>	<i>b</i>	<i>se</i>	<i>p-value</i>	<i>q-value</i>	
Economic factors (H1)									
Employment	-0.01	(0.04)	0.828	1.000	0.01	(0.11)	0.947	1.000	-
Ec. welfare obj. (index)	0.01	(0.02)	0.569	0.902	0.12**	(0.05)	0.015	0.137	-
Ec. welfare subj. (index)	0.01	(0.02)	0.452	0.902	-0.01	(0.05)	0.774	1.000	-
Education	0.00	(0.02)	0.850	1.000	0.04	(0.07)	0.577	0.939	-
<i>Joint sig test:</i>	$F(4,448) = 0.25, p = 0.911$				$F(4,158) = 1.81, p = 0.130$				
Psychological factors (H2)									
Anger	-0.04	(0.06)	0.498	0.902	0.10	(0.18)	0.581	0.939	+
Depression/PTSD (index)	0.03	(0.02)	0.110	0.283	0.09**	(0.04)	0.030	0.137	+
<i>Joint sig test:</i>	$F(2,448) = 1.32, p = 0.267$				$F(2,158) = 2.93, p = 0.056$				
Conflict networks (H3)									
Strong ties to excom peers (index)	0.05**	(0.03)	0.047	0.197	0.04	(0.05)	0.404	0.939	+
Strong ties to ex-commanders (index)	0.06***	(0.02)	0.002	0.017	0.09*	(0.05)	0.065	0.150	+
<i>Joint sig test:</i>	$F(2,448) = 8.32, p = 0.000$				$F(2,158) = 2.09, p = 0.127$				
N	951				207				

* $p < .10$, ** $p < .05$, *** $p < .01$.

Weighted least squares with municipality FE and indiv. controls.

Standard errors account for municipality clustering.

Table reports both two-sided p-values and FDR adjusted q-values.

Table 7: Correlates of different types of crime

	Panel A: Individual crime		Panel B: Group crime		Panel C: Targeted for recruitment	
	(1)	(2)	(3)	(4)	(5)	(6)
Rank-and-file combatants						
Strong ties to excom peers (index)	0.04** (0.02)	0.03** (0.02)	0.03*** (0.01)	0.03** (0.01)	0.11*** (0.04)	0.09** (0.04)
Strong ties to ex-commander (index)	0.02 (0.01)	0.02 (0.01)	0.04*** (0.02)	0.04*** (0.02)	0.14** (0.06)	0.14** (0.06)
N	901	901	862	862	951	951
Commanders						
Strong ties to excom peers (index)	0.04 (0.06)	0.07 (0.06)	0.09** (0.04)	0.09* (0.05)	0.11 (0.11)	0.05 (0.11)
Strong ties to ex-commander (index)	0.08* (0.05)	0.07 (0.05)	-0.03 (0.04)	-0.03 (0.04)	0.05 (0.10)	0.05 (0.09)
N	178	178	168	168	207	207
Other ind. vars included as controls	No	Yes	No	Yes	No	Yes

* p < .10, ** p < .05, *** p < .01.

Weighted least squares with municipality FE and indiv. controls.

Standard errors account for municipality clustering.

Table 8: Conflict network mechanisms: Norms and pressure

	Panel A:				Panel B:			
	Sympathetic towards crime (index)				Pressure to commit crime (0/1)			
	(1)	(2)	(3)	(4)				
Strong ties to excom peers (index)	0.06 (0.05)	0.05 (0.06)	0.00 (0.01)	0.00 (0.01)				
Strong ties to ex-commanders (index)	0.11 (0.07)	0.11* (0.07)	0.04** (0.02)	0.04** (0.02)				
N	951	951	951	951				
Other ind. vars included as controls	No	Yes	No	Yes				

* p < .10, ** p < .05, *** p < .01.

Weighted least squares with municipality FE and indiv. controls.

Standard errors account for municipality clustering.

Results are for rank-and-file combatants only

Table 9: Conflict network mechanisms: Status-seeking and protection

	Panel A: Individual crime only				Panel B: Group crime			
	(1)	(2)	(3)	(4)	(3)	(4)	(3)	(4)
Status-seeking								
Horizontal ties								
Strong ties to excom peers (index)	0.03*	(0.02)	0.03*	(0.02)	0.03**	(0.01)	0.03*	(0.01)
Lost status by demobilizing	0.06	(0.05)	0.05	(0.05)	0.03	(0.04)	0.02	(0.04)
Peers * lost status	0.05	(0.06)	0.05	(0.06)	0.09**	(0.04)	0.08**	(0.04)
Vertical ties								
Strong ties to ex-commanders (index)	0.01	(0.01)	0.01	(0.01)	0.03*	(0.02)	0.02	(0.02)
Lost status by demobilizing	0.07	(0.05)	0.05	(0.05)	0.02	(0.03)	0.01	(0.03)
Commanders * lost status	0.06	(0.05)	0.05	(0.05)	0.10**	(0.04)	0.10**	(0.04)
Protection								
Horizontal ties								
Strong ties to excom peers (index)	0.03	(0.02)	0.03	(0.02)	0.04**	(0.02)	0.03*	(0.02)
Insecure	0.07***	(0.03)	0.06**	(0.03)	0.01	(0.01)	0.00	(0.02)
Peers * insecure	0.02	(0.03)	0.02	(0.03)	0.01	(0.03)	0.01	(0.03)
Vertical ties								
Strong ties to ex-commanders (index)	0.02	(0.02)	0.01	(0.02)	0.05*	(0.03)	0.04	(0.02)
Insecure	0.06***	(0.02)	0.05**	(0.03)	0.01	(0.01)	0.00	(0.01)
Commanders * insecure	0.01	(0.03)	0.01	(0.03)	0.01	(0.03)	0.01	(0.03)
N	901		901		862		862	
Ind. vars included as controls	No		Yes		No		Yes	

* p < .10, ** p < .05, *** p < .01.

Weighted least squares with municipality FE and indiv. controls.

Standard errors account for municipality clustering.

Results are for foot-soldiers only