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Civic legacies of wartime governance

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Abstract: In conflict zones around the world, both state and non-state actors deliver governance at local levels. This paper explores the long-term impact of individual exposure to 'wartime governance' on social and political behaviour. We operationalize wartime governance as the local policy choices and practices of a ruling actor. Building on detailed ethnographic and historical insights, we use survey data and a natural experiment to show that involvement in wartime governance by armed groups makes Angolan war veterans more likely to participate in local collective action twelve years after the end of the war. This effect is underpinned by a social learning mechanism and a shift in political preferences, but has no bearing on political mobilization at the national level or social relations within the family. Our study documents an important institutional legacy of civil wars and exposes challenges and opportunities for bottom-up approaches to post-conflict state-building and local development.

Key words: conflict, civil war, wartime governance, post-conflict state-building, local development

JEL classification: P37, D74, H56

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Figures and tables at the end of the paper.

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1 Introduction

War strongly affects social and economic development. External war is a central explanation for the emergence of effective state institutions in modern European nations (Tilly 1975). Internal war, by contrast, is associated with debilitating state institutions and 'development in reverse' (Collier 2003).

Most existing models of the impacts of wars presume a unitary government that has the monopoly of force over the entire national territory and of investments in state institutions (Tilly 1975; Besley and Persson 2011). Yet, states affected by internal war — the predominant form of violent conflict today—often lack de facto control over substantial parts of the national territory as non-state rulers compete for power, and governance is regionally fragmented (Kalyvas 2006). Under certain conditions, non-state rulers have (or develop) the institutional capacity to successfully claim legitimacy, exert authority and provide public goods in a given territory (Arjona et al. 2015). To date, the legacies of 'wartime governance' in conflict zones are largely unknown.

This paper studies causal long-term impacts of governance during civil wars on social and political behaviour. Specifically, we investigate how the exposure of soldiers to forms of 'wartime governance' exercised by the armed group they belong to during the war affects their behaviour as civilians in the aftermath of the war.

We define wartime governance as the local policy choices and practices exercised by a ruling actor. We focus in this paper on the supply of goods and services to the governed populace as these are at the heart of how rulers build legitimacy, enhance local productivity and raise tax revenues (Levi 1989; Sánchez de la Sierra 2018; Justino 2018).[1] The supply of public goods and services exposes significant numbers of soldiers to governance since the delivery of many local public goods, such as security and infrastructure, typically requires large-scale, collective and labour-intensive projects.

Our main hypothesis is that exposure of soldiers to the systematic provision of public goods and services by their armed group in wartime will substantially affect their civic behaviour in the postwar period. We focus on two forms of postwar behaviour: attending meetings of key deliberative local institutions that organize local collective action, and the provision of public goods (security), both central to development outcomes in developing societies (Ostrom 1990).

Theoretically, it is a priori unclear whether the involvement of former soldiers in wartime governance increases or decreases their long-term civic engagement. We propose four theoretical mechanisms that may shape such a relationship. To test these, we use unique survey data we collected from 759 civil war veterans in Angola's Huambo province, building on twelve months of ethnographic research of social behaviours among veterans (Spall 2015).

To establish causality, we exploit a natural experiment generated by the 1975–2002 Angolan civil war that resulted in exogenous variation in the likelihood of individual soldiers being exposed to wartime governance. The war was characterized by mass militarization and military competition between two high-capacity actors, the *Movimento Popular de Libertação de Angola (MPLA)* government

[1] Such public investments are just one example of strategies employed by armed groups to legitimize claims and achieve political and economic goals, and some groups may not provide any public goods (Mampilly 2011). Yet, providing public goods and services is one particularly dominant strategy (Berman et al. 2011).

and the *União Nacional para a Independência Total de Angola (UNITA)* rebels. Both sides used their institutional capacity to enforce compulsory military service for all men at (approximately) the age of 20 in territories under their control, which varied substantially during the war (Pearce 2011). This means that conscription exogenously selected individuals into different military entry dates (based on their date of birth) and different armies (due to shifts in territorial control).

Our identification strategy exploits the *interaction* of a man's date of birth and the army he joined as a source of exogenous variation in the (ex ante) likelihood of individual exposure to wartime governance. Given that both groups in Angola had strong state-building missions, we assume that the strategic incentives to engage and invest (more) in wartime governance were higher after (more) gains of new territory. We thus expect that the soldiers who were (ex ante) more likely to serve in periods in which their army would gain (more) new territory, due to their date of birth, would, on average, be more likely to be (more) exposed to wartime governance. At the same time, there is no reason to expect that these specific combinations of date of birth and army recruited simultaneously increased the likelihood of exposure to potentially confounding experiences like exposure to various forms of violence. To test these claims empirically, we collected detailed data on wartime experiences other than governance, including exposure to different forms of violence, and pre-service background characteristics.

Our main result is that individual exposure to wartime governance significantly increases the engagement of ex-combatants in both planning and delivery processes of local public goods production in the long run. We show that this result is robust to a battery of tests and alternative specifications. Additional results reveal that the positive impact on community meeting attendance is driven by a shift in individual political attitudes and preferences, whilst increased individual participation in local security groups is fostered by higher levels of interactions with other members of the armed group. We find equally positive effects of individual exposure to wartime governance on other forms of local social participation and political attitudes, but we do not find evidence for increased mobilization in wider political processes beyond the local level, such as voting in presidential elections or participating in regional protests. We neither find strong effects on social cooperation within the family. We interpret these findings as evidence that exposure to wartime governance may stimulate a lasting interest in and engagement with politics, governance and collective action, but with the effect being limited to the local community level.

This study is among the first to discuss and quantify the long-term legacies of local institutional changes in civil wars. The paper contributes to a growing interdisciplinary literature studying the interrelationships between war, institutions and development. Historical and macroeconomic approaches have focused on mutual reinforcement mechanisms at the *national* level (Tilly 1975; Besley and Persson 2011). A recent body of microeconomic studies has studied the consequences of exposure to *combat* and *violence* (Voors et al. 2012; Jha and Wilkinson 2012; Bauer et al. 2016), but has not been able to address the effects of institutional processes and changes — beyond those related to the exercise of violence — that take place in conflict zones (Blattman and Miguel 2010; Balcells and Justino 2014). An emerging literature in political science on 'rebel governance' has started to produce evidence on the forms of local governance, economies, and institutions that emerge in armed conflict (Arjona et al. 2015), but knowledge about the lasting impacts of these forms of governance is hitherto very limited. All of these literatures suffer also from a dearth of high-quality micro-level data from conflict zones and have struggled to identify and disentangle the mechanisms interrelating war, institutions and development. We contribute to this research by producing an original micro-dataset informed by ethnographic and psychological research, using historical insights to develop a new instrumental variable strategy and theorizing the causal mechanisms that link wartime governance to post-war socio-political behaviour. Our findings suggest that local collective action in post-conflict societies is endogenous to wartime institutions, policies and experiences, which has important policy implications that we discuss in the conclusion.

2 Theoretical framework

Descriptive evidence from conflict zones shows that armed actors across the world provide public goods and services to local populations. This includes armed actors as diverse as the successful Eritrean People's Liberation Front insurgency, the transnational Islamic State, or bandits in stateless areas in Eastern Congo. Armed groups exercise such 'state-like' functions for a variety of reasons, including to win the 'hearts and minds' and political support of local populations (Berman et al. 2011), to support recruitment (Weinstein 2007), and to increase economic activity and the ability to collect taxes (Sánchez de la Sierra 2018). The exercise of rule and governance has also the important function of signaling the institutional and military capacity of a specific armed group over its competitors.

Does this experience have lasting effects? The existing literature in political science and political economy suggests four potential mechanisms that may shape the legacies of wartime governance. We organize them below under four headings: economic interactions between combatants and civilians, social attitudes, social learning and political preferences.

2.1 Economic interactions between combatants and civilians

The long-term social effects of soldiers' exposure to wartime governance may be shaped by the economic interactions that take place between combatants and civilians in wartime. Economic cooperation with civilians is crucial in many contexts, as armed groups often rely on support from civilians to feed and sustain the group. In the case of Angola, economic interactions were critically important as food was often extremely scarce (UNICEF 1998).[2] The idea of the 'economic interactions' mechanism is that the long-run behaviour of individual soldiers depends on how the other group in the repeated interactions (civilians) has behaved towards the individual (direct experience) or towards others in the individual's group (indirect experience) (Axelrod and Hamilton 1981). Reciprocal motives in turn shape long-term strategic actions by soldiers in terms of either mimicking ('tit-for-tat') or punishing others, which is usually costly (Nowak 2006). Wartime public good provision is likely to be a group policy decided by army leaders. It is unlikely that individual soldiers would have been able to 'punish' or 'reward' civilians during their wartime repeated interactions. This may change at the end of the war when soldiers reintegrate into civilian life. In the longer term, two scenarios may shape ex-combatants' behaviour. First, the soldier may perceive that the armed group offered *more* to civilians than they received in return, for instance via public good provision or other forms of material (food or shelter) and non-material support (protection or information). In this case, the soldier's belief in the post-conflict period will be that civilians owe him effort, and he may thus be *less* likely to engage in the production of public goods. Second, the soldier may perceive that the armed group offered *less* to civilians than they received in return. In this case, the soldier's belief in the post-conflict period will be that he owes civilians effort, which may foster a positive impact on individual engagement in public good provision.

2.2 Social attitudes

The long-term legacies of wartime governance may also be affected by daily social interactions that take place between combatants and civilians in wartime. A large literature has documented how civilians and combatants interact on a day to day basis. Although the threat of violence may remain high, social life tends to normalize in conflict zones, particularly as armed groups establish themselves in the area for large periods of time (Lubkemann 2008). Such interactions may foster

[2] More than half of our respondents report that they were starving at critical levels 'often' or 'very often'.

closer integration between ex-combatants and civilians in the aftermath of the conflict. A considerable body of research has emphasized the importance of 'in-group bias' in human interactions, i.e. that humans are often more likely to adopt attitudes that favor other members of their own social reference group (Goette et al. 2006). In-group bias has been identified as both a cause and consequence of war, with a focus on ethnic identification (Choi and Bowles 2007; Bauer et al. 2014). In-groups biases in groups formed of both civilians and combatants have been less explored, but such social interactions and the social attitudes they generate may carry over to the post-war period (Bauer et al. 2017). Repeated, positive daily social interactions with civilians may increase a soldier's motivation to contribute to a public good that will benefit civilians in the post-war period.

2.3 Social learning

A related set of studies provides theory and evidence that systems of social organization may persist across time through social learning processes. Much of this literature is motivated by the influential model of 'democratic capital' by Persson and Tabellini (2009), which posits that a polity may accumulate 'experience with democracy', which in turn may set it on paths that make transitions out of democracy less likely.[3] This is because individuals exposed to certain political systems acquire persistent social behaviours through modeling and constant reinforcement of social interactions (Banerjee 1992). The dominant sociological view of the underlying process emphasizes both normative and non-normative social learning mechanisms. Akers (2011), for instance, distinguishes 'the direct association and interaction with others and their conforming or deviant behaviour' (behavioural/interactional) and 'the different patterns of norms and values to which an individual is exposed through association' (normative). Irrespective of the nature of the learning process, this mechanism suggests that 'local governance may beget local governance', and soldiers that learn from their exposure to wartime governance may be more likely to participate in the organization of public goods today. In contrast to the social interactions mechanism above, this mechanism is not a function of attitudes towards other groups (and its members), but rather emphasizes the importance of within-group learning.

2.4 Political preferences

An alternative and popular interpretation of the persistence of systems of governance, and their broader effects, is that exposure to certain modes of governance changes individuals' deeper political attitudes and beliefs (Alesina and Fuchs-Schündeln 2007; Fuchs-Schündeln and Schündeln 2015). Depetris-Chauvin (2015) provides suggestive evidence that individuals living in regions that were more exposed to indigenous structures that resemble basic state institutions articulate higher trust in local councilors and traditional leaders. Gennaioli and Rainer (2007) show that forms and quality of local governments are associated with their history of state centralization. Hariri (2012) argues that early pre-colonial forms of statehood outside Europe spurred long-run persistence of traditional, authoritarian rule. When extrapolated to contexts of wartime governance, this literature suggests that individual exposure to such a regime may mold political attitudes and preferences in the long run and lead ex-combatants to be more engaged in civic life.

3 Context and data

[3] Giuliano and Nunn (2013) present evidence for such an effect at the village level.

3.1 The Angolan civil war

Angola's recent history offers the ideal setting for our study. From 1975 to 2002, the MPLA and UNITA fought a highly contested civil war, following the withdrawal of the Portuguese colonial administration. Led by upper-class 'assimilados', the MPLA declared Angola's independence in Luanda on 11 November 1975, and formally became 'the government' of the new Angolan nation. On the same day, UNITA proclaimed their own government in Huambo, presenting itself as the 'true party of *all* Angolans', and formally became 'the rebels'. While the war was characterized by brutal and prolonged violence, both sides also engaged systematically with local populations under their control in benign ways, and established local political systems that resembled state functions and institutions (Parsons 2006; Pearce 2011; Roque 2015). Active soldiers were required to help their units establish local monopolies of violence, recruit other young men for (compulsory) military service and regulate social and economic civilian life, most importantly by the delivery of public goods and services. Both parties managed to secure strong international allies and consistent access to natural resources. The MPLA relied on assistance from Cuba, the Eastern bloc and oil revenues, while UNITA was backed by South Africa, the US and the diamond trade. This Cold War 'proxy war' lasted until 1991, when a ceasefire was agreed in the *Bicesse Accords*. After abortive elections in 1992, the MPLA and UNITA returned to war, now without (overt) support by their Cold War allies. A series of violent episodes and see-saw battles ensued, only interrupted by a failed peace agreement in 1994. In February 2002, the MPLA secured a clear and undisputed victory, when UNITA's leader Jonas Savimbi was assassinated in an ambush. Military operations abruptly ground to a halt and a Memorandum of Understanding was signed in April 2002. Angola has since recorded more than a decade of absence of large-scale collective violence. The end of the war marked also the first time since independence that the government had at least notional control of the entire Angolan territory (Pearce 2012).[4] State institutions and their influence remain however weak and governance in many regions strongly depends on collective cooperation and coordination locally (Maier 2013).

3.2 Data

We use primary survey data from a sample of 759 Angolan war veterans from 34 different localities, which we collected in the Study of Angolan Ex-Combatants (POEMA). The quantitative component of the study was supported by an anthropological companion study, which included twelve months of ethnographic fieldwork preceding the survey (Spall 2015). Qualitative findings were used to assess the validity of our hypotheses, determine their relevance in the local context, refine the survey questionnaire design, interpret quantitative results and explore underlying mechanisms. The data collection focused on the Central Highlands and Huambo province ('Huambo' hereafter) for three main reasons.[5] First, this region was the most contested region of the war. It was in Huambo City, Angola's second largest city, that UNITA proclaimed their own government on the same day the MPLA declared the independence of Angola in Luanda, on 11 November 1975. Most parts of the region however changed hands many times. Therefore, many men from the same municipality, village and even family served on different sides, and state and rebel army recruits from this region were essentially identical in background. Second, this region was *not* at the center of the colonial war from 1961–74. Most anti-colonial activity and guerrilla fighting took place near the coast and international borders, and both movements initiated their ambitious activities and mobilization strategies in Huambo only when the civil war started. Thus, the operations we study started in the absence of previous engagement in the region (which might have affected the relations

[4] There were certain periods during the war when government controlled just 20% of its nominal territory (Soares de Oliveira 2013).

[5] Huambo province is roughly of the size of Switzerland (see map in Figure A1).

between combatants and civilians). Third, Huambo province is the most densely populated region in Angola, but ethnically homogeneous. While the Angola literature suggests that ethnicity was not at the root of the conflict (Pearce 2012), this design also allows to rule out potential confounding individual factors related to ethnicity.

We conducted fieldwork between March 2013 and February 2014 in partnership with the local Angolan NGO Development Workshop (DW).[6] We use survey data from two separate interviews that sampled veterans were asked to complete: a household-level interview with their (main) cohabitant partner, and a private individual-level interview. The resulting data captures retrospective information from three different stages of a respondent's life: just before wartime military service; during wartime military service; and twelve years after the end of the war. To ensure as representative a sample as possible, the survey employed three levels of randomization, where the first two involved the primary sampling unit (PSU) and enumeration area (EA) levels. PSUs (*bairro*) were *comunas* (the lowest tier formal administrative unit) in rural areas, and boroughs in urban areas. EAs were either one settlement or multiple very small settlements in rural areas, and equivalent to neighborhoods in urban areas. In the absence of systematic and reliable veteran population data, we used general population data from the ongoing Angolan census to randomly draw PSUs and EAs, with weights proportional to the population. At each survey site, we engaged with local administrations, chiefs and coordinators to produce listings of all former soldiers residing in the EA. Results were double- and cross-checked to develop credibly complete listings of the local veteran population. Conditional on the reliability of the general population as a proxy for the ex-combatant population (as used in the first stages), the sampling strategy is self-weighting and ensures that the geographic spread across Huambo province is representative. Assuming that we did obtain complete lists of ex-soldiers, the EA-level sample is representative of the EA-level veteran population.

The survey documents detailed information on war and military service experiences, pre-service background and post-war social, economic and political behaviours of veterans twelve years after the end of the war. The main outcome variables of interest capture individual engagement in the collective production of local public goods, in terms of attending meetings of local deliberative institutions and providing security.[7] We focused on this public good because informal security institutions play an important and positive role in the Angolan context, and participation in these collective organizations is open, voluntary and not compensated materially. Specific functions include preventive patrolling and the resolution of conflicts between villagers.[8] The good provided is of public nature because it benefits everyone in the village.

The key independent variable is a soldier's recalled involvement in local governance practices with his armed group(s) during the war. We built an index of wartime governance exposure as the simple average of seven items: provision of services (such as providing access to education), building

[6] While NGO activity is generally low in Angola, DW has operated in Angola — and especially Huambo Province — for more than 25 years, and was instrumental for making this survey possible. With support from DW, we recruited, screened, trained, and managed a team of enumerators to do personal interviews based on electronic closed-ended questionnaires. While well-known, DW have not implemented aid assistance or any development programs related to civic participation in Huambo province.

[7] Appendix A provides the exact questions used to measure these two outcomes. The average level of development — especially in rural areas — remains extremely low in post-war Angola, and extensive preliminary and ethnographic research emphasized that security is a top priority among Angolans.

[8] One potential concern may be that these groups resemble criminal networks, and that participation in them may actually be 'bad'. Yet, these groups are neither organized nor perceived in any way like gangs or militias, and participation is universally viewed positively, as confirmed by qualitative fieldwork.

physical infrastructure (such as schools), provision of arms, help with conflict resolution between villagers (e.g. over land), provision of protection and security, requests by villagers for help with conflict resolution between villagers, and requests by villagers to protect the village.[9] Table A1 presents aggregate data on our main measures of exposure to wartime governance and related forms of interactions with civilians. Each entry denotes the fraction of soldiers that were involved in a given activity. The results reveal that a substantial number of soldiers on both sides experienced these activities: on average, around 50 per cent of all ex-combatants (independently of the group they belonged to) reported being exposed to forms of wartime governance. Other summary statistics are provided in Table A2.[10]

A potential concern with the survey is that the pre-service and service information is based on recall. We worked with a team of psychologists to design the survey in a way that minimizes recall biases in responses and optimizes the reliability of the data. Individuals often recall information better when they can relate them temporally to incisive events (Freedman et al. 1988). Being enlisted into the military is a defining life event that should hence increase a respondent's ability to recall outcomes just before this happened reasonably accurately. Similarly, situations and events during military service are plausibly incisive experiences themselves and therefore less prone to memory failure. Two observations from fieldwork strengthen the assumption that the recalled service and pre-service information is reliable. First, 'I don't know' or 'I can't remember' responses were extremely rare and consistently below 2 per cent. Second, the complementary ethnographic research by Spall (2015) gathered vast and detailed information on 'life before the military' and 'life in the military', which we used to carefully triangulate the survey questions. Veterans exhibited a remarkable general openness toward discussing their lives and experiences during the war.

4 Empirical framework

4.1 Econometric specification and identification

The population of this study are all living males who were ever part of an armed group during the Angolan war and reside in Huambo province.

The baseline estimates are based on linear models where the effect of interest β is estimated by OLS regression

$$Participation_i = \beta Experience_i + \gamma^t X_i + \varepsilon_i \quad (1)$$

[9] This list was inspired by leading accounts of local governance by armed groups (Mampilly 2011; Arjona et al. 2015). We motivate and discuss the index and its components in more detail in Appendix A. Our main index assigns equal weights to all items. We also consider different weighting schemes that use weights based on the variance-covariance matrix of the domains and find no difference in the results.

[10] The table shows that there is considerable variability in experience with wartime governance. The mean respondent has an exposure to wartime governance score of 1.16 (SD=.77). The mean score of a respondent above the 75th percentile of the score distribution is 2.35 (SD=.37). Similarly, we observe substantial variation in engagement in public good production today. About 22% of all respondents attend community meetings, while 6% contribute to local security. The low rate of participation in local security provision can be interpreted as support for our assumption that participation is voluntary and unpaid. Summary statistics for the individual components of the wartime governance index and selected related non-violent wartime interactions are reported in the bottom panel of Table A2.

Here, *Participation* is the indicator of individual engagement in collective public good production at the time of the survey; *Experience* denotes experience with wartime governance; X is a flexible vector of control variables; ε is the error term.

The identifying assumption for a causal interpretation of OLS estimates of β is that experience with wartime governance and the error term are not correlated, conditional on a flexible set of control variables. First, all specifications include community fixed effects to purge the results from systematic variation across localities. Second, we add pre-military service, and therefore pre-treatment, family background characteristics and pre-treatment region fixed effects to control for pre-existing differences.[11] Third, we sequentially add potentially confounding contemporary (socioeconomic) variables that have been linked to civic engagement and might simultaneously co-vary with wartime governance experience.[12] Fourth, we carefully explore the effect of controlling for potential wartime confounders, such as experiences of violence, bearing in mind that these may not be determined exogenously themselves.[13] However, even after carefully controlling for these factors, we may measure exposure to wartime governance with systematic error or may not be able to control for all individual factors that are associated with participation in both wartime governance and post-war civic engagement. Either would result in spurious estimates. To mitigate these concerns we rely on IV estimation informed by a natural experiment.

4.2 Natural experiment in exposure to wartime governance

Exogenous sources of variation

Variation 1: army

The discussion in Section 3 emphasized how both the MPLA and UNITA were able to exert strong control over territories and their populations. The literature on war politics in the Angolan Central Highlands argues *against* strong 'selection' into either side based on conventional, individual factors associated with rebel recruitment or mobilization into armed groups. This literature documents that control of local territory during the war shifted frequently and concludes that *'a person's first contact with any political formation was as likely to have been with UNITA as with the MPLA'* (Pearce 2012, 463). Pearce (2009, 4) adds that *'political identity was a matter of necessity rather than of conviction.'*

Information from our survey on recruitment date by army and region presented in Figure A2 is consistent with these findings. For each region, we observe considerable variation over time in how likely (frequent) it was ex-post to join a certain army. There is no region where individuals were consistently more likely to join one army than the other throughout the war.

Table A3 presents estimates from a simple regression of the armed group indicator on a large set of family background characteristics. The results suggest that *no* family background characteristic is a robust predictor of which armed group a soldier was recruited into and reject joint significance, across specifications with and without fixed effects of recruitment date and region (and classical

[11] Pre-treatment variables were collected based on recall questions included in the survey. The individual reference point was the time just before joining an armed group (for the first time), which respondents remembered very well.

[12] Potential confounders include assets, education, wealth and place of birth.

[13] We pay most attention to victimization, i.e. 'receiving violence', which has been linked to post-war social behavior and attitudes (Bauer et al. 2016). Other potential confounders include perpetration of violence (e.g. Humphreys and Weinstein 2006), army characteristics (e.g. Akerlof and Kranton 2000), and length of service in an armed group (e.g. Bauer et al. 2017).

standard errors). These findings, in combination with the historical literature, allow us to conclude that the armed group an individual was recruited into was plausibly determined exogenously.

Variation 2: date of birth

What determined the *date* of military entry? In state-controlled regions, military service was compulsory by law for men in their late teenage years. UNITA also enforced mass enlistment. We therefore expect the age distribution of UNITA soldiers at entry to be consistent with conscription, and thus very similar to that of MPLA soldiers (Stojetz 2018). In particular, for soldiers in either faction, date of entry into the armed group and date of birth should be highly correlated. Figure A3 shows the distribution of age at entry and reveals the expected concentration of mass entries in late teenage years, consistent with compulsory enlistment. The overall mean age at entry is 19.6 years. Figure A4 reveals substantial variation in date of birth,[14] and Figure A5 confirms that there is a very strong linear relationship between date of birth and date of military entry in both armies. These findings imply that the date of birth is a robust mean predictor of when an individual entered an army, and that we should see a similar pattern in mean exposure to wartime governance over date of birth as over date of entry (shifted by 20 years, the rounded overall mean of age at entry).

Identifying variation: army x date of birth

To establish causality, we exploit natural variation in the (ex ante) likelihood of individual exposure to wartime governance, based on the *interaction* of date of birth and the army he joined. Dates of birth will be grouped into four specific bins, as discussed in the next section. As both date of birth and army are plausibly determined exogenously, interactions between the two are also plausibly exogenous. It is worth noting that this holds even if doubts remained whether or not the armed group assignment was determined exogenously.[15] Technically, the strategy follows the same logic as a difference-in-differences estimator: we hypothesize that the expected difference in exposure to wartime governance due to army assignment varies with (grouped) dates of birth.[16] Econometrically, we exclude the interaction of the army and (grouped) birth-cohort indicators in the 'second-stage' of an IV estimation while including the main terms. The instrumental-variables (IV) strategy is based on the same linear models as in Equation 1 (the 'second stage'), where the effect of interest β is estimated by IV/2SLS regression.

4.3 Informativeness of the instrumental variable

We posit that gains in territorial control create demand for public good provision by armed actors, especially for armed groups with particular interests in securing legitimacy and voluntary support. Conflict scholars emphasize that controlling territory and engaging with local populations are

[14] A potential concern is that respondents may misreport their date of birth. To address this issue, we asked for information on both date of birth and current age, provided in separate interviews. When necessary, enumerators provided help to determine the year of birth relying on an extensive list of important events in Angolan history. As an additional quality test, we check whether ages that are multiples of 5 years are more frequent, but the distribution of age answers does not suggest 'age heaping' (Figure A4).

[15] Recent studies put forward similar arguments for using the interaction of two variables as an instrumental variable (e.g. Nunn and Qian 2014). A main difference is that in these strategies one of the two interacted variables is very likely not determined exogenously, while in our case both plausibly are.

[16] The mechanics of the instrumental variation are similar in spirit to studies exploiting wartime lotteries such as the Vietnam draft in the US: the effect of a randomized outcome (a lottery number) depends on the year of birth (Angrist 1990).

central objectives of warfare and counterinsurgency (Toft 2014; Kalyvas 2006), and armed actors that control territory are more likely to provide public goods than those without territorial control (Mampilly 2011; Stewart 2018). If the armed group wants to meet the higher demand for governance in times of more territorial gains, soldiers serving during these periods will in turn be more likely to participate in the supply of public goods and services to civilians.

To explore temporal variation in territorial expansions by the two Angolan actors we use the conflict event dataset by Ziemke (2008), which includes information on major territorial gains, coded by date and actor. Figure 1a reveals three types of variation: (i) across actors, (ii) across time (within actors) and (iii) in the difference between actors over time. The data confirm historical evidence of two distinct periods when UNITA managed to capture large parts of territory (Pearce 2011). The first period includes the first years of the civil war until the early 1980s (time period 'I'), when the MPLA was at the brink of losing the war early (Maier 1997). The second period is a rapid and massive growth of UNITA-held territory, when UNITA surprised the MPLA in a large-scale operation shortly after the elections in 1992 (time period 'III'). This period extends until the end of 1994, when a ceasefire was agreed in the *Lusaka Protocol*. A third strong UNITA campaign, following the end of the formal ceasefire in 1998, was quickly overturned by the MPLA, leading to its final victory in 2002 (time period 'IV'). During period IV and in the mid 1980s (time period 'II'), when the MPLA was supported by large numbers of Cuban troops, UNITA was not able to match the territorial gains by the MPLA. We thus expect the amount of wartime governance provided by the two groups to have been roughly the same during periods I and III, due to UNITA's comparable strength in these periods, and the MPLA's supply to have exceeded UNITA's considerably during periods II and IV.

If our hypothesis is correct, we do not expect much difference in exposure between UNITA and MPLA soldiers who served in periods I and III. In periods II and IV, we expect that an active UNITA soldier would, on average, be *less* exposed to wartime governance than an MPLA soldier. Figure 1b presents local polynomial regressions of the individual wartime governance index on the date of military entry. Due to the limited number of observation per year of entry, the confidence bands are obviously large. Yet, the visual intuition is striking: for entry dates falling roughly into periods II and IV the index is consistently higher for the MPLA as compared to UNITA, while for periods I and III this is clearly not the case.

For identification, we exploit that certain combinations of *date of birth* and armed group assignment should have made exposure to wartime governance *more likely*. We categorize the date-of-birth distribution into four 'pooled birth cohort' indicators ('Bin 1'–'Bin 4'), directly corresponding to the four time periods defined above ('I'–'IV'). The three cut-off points separating Bins 1 to 4 are the three cut-off points separating periods I to IV, shifted by exactly 20 years.

Figure 1c displays polynomial smooths of the wartime governance index over date of birth, which reveal the expected result: the patterns are similar to those for date of entry in Figure 1b. Retrospectively, being born into Bins 2 or 4 involved a clear 'penalty' in the likelihood of exposure to wartime governance for UNITA soldiers. As before, we observe no or even a slightly reversed pattern for Bins 1 or 3. The probability density functions of the wartime governance index for each bin presented in Figure A6 confirm these results.

The patterns in these unconditional relationships suggest that the Angolan war created an informative and exogenous source of variation in exposure to wartime governance based on the interaction between the army the individual joined and his year of birth. To be precise, we expect that soldiers who joined UNITA and were born into 'pooled birth cohorts' 2 and 4 were significantly less likely to be exposed to wartime governance, compared to all other soldiers.

4.4 Exclusion restriction

Our identifying assumption is that the combination of being recruited into UNITA plus being born into Bins 2 or 4 is uncorrelated with confounding factors. There are two potential threats to the excludability of the instrument. First, individuals who were born into Bins 2 or 4 and recruited by UNITA may have differed systematically in background traits that correlate with the proclivity for civic engagement. Second, this sub-group may have simultaneously been more likely to be exposed to other wartime experiences that correlate with civic engagement, notably inter-group violence when fighting over territorial control.

Background confounders

Table A4 compares individual background and military traits of soldiers highly exposed to wartime governance to the traits of those less exposed. The top panel suggests show that the two sub-samples do not differ much in terms of background characteristics that could have determined selection in more involvement with delivering wartime governance. The only statistically significant difference is that highly exposed veterans had slightly better schooling. The middle panel presents summary statistics on the armed group and the pooled birth cohort indicators used in the IV analysis and shows that veterans belonging to the exposed sub-sample are not distributed differently across armed groups and Bins. By contrast, the bottom panel reveals systematic differences in military traits. Exposed soldiers trained slightly longer, were marginally less likely to be an infant (the lowest role in hierarchy), more likely to serve in areas where combat took place and in slightly more battalions.

Table A5 compares means in individual background and military service characteristics between the two sub-samples defined by the value of the binary instrument ('balance table'). Similar to the unconditional comparisons based on actual exposure to wartime governance in Table A4, backgrounds do not differ across the two sub-samples, but now individual self-reported military traits are not significantly different from each other either. Table A6 shows further that no pre-service variable is systematically associated with the value of the IV in multiple regression models.[17]

Violence received: Another important concern is that being recruited into UNITA plus being born into Bins 2 or 4 may simultaneously have increased the likelihood of exposure to other wartime

xperiences that correlate with post-war civic engagement. Specifically, a recent set of studies links the experience of war violence to pro-sociality (Bauer et al. 2016). Securing territory just before, or in parallel to, involvement in wartime governance, the penalized group may have been more likely to fight at the front line more often and experience more battle-related violence than others. This scenario suggests that UNITA and MPLA soldiers from the same birth cohorts should have been at the same risk of exposure to this form violence, as it occurred between the two armed groups, who used similar fighting technology and tactics. However, the logic of the instrument is built upon

[17] To eliminate concerns of the 'correct' specification of background covariates included in the model, we also report results from Bayesian Model Averaging (BMA), which provides a weighted average over the entire model space, i.e. all possible combinations of pre-service covariates. The BMA results confirm that no background characteristic predicts (i) the value of the IV (Figure A7), (ii) UNITA recruitment among those born into Bins 2 or 4 (Figure A8a) and among others (Figure A8b) or (iii) birth into Bins 2 and 4 among UNITA recruits (Figure A9a) and among MPLA recruits (Figure A9b). We repeat the BMA analyses of Figure A8 and Figure A9 with date of entry rather than date of birth, to test whether UNITA recruits that actually joined during periods II and IV were systematically different. The results presented in Figure A10 and Figure A11 show that there were no differences in background across army and actual date of entry either.

the *asymmetric* effect across army assignment within birth cohorts and should therefore isolate the effect of exposure to governance. To address this empirically, we collected detailed data on wartime experiences other than governance, including exposure to different forms of violence. We find that soldiers exposed to more wartime governance received — on average — more violence, when we include and average over all forms of violence received in an index. Yet, how the differential impact of the army assignment varied over birth cohorts is very different for (realized) exposure to any forms of violence than for (realized) exposure to wartime governance. Specifically, the instrumental variation is *not* correlated with any form of violence received, including battle-related violence.

Figure A12 presents residual-residual plots, where variation from the full set of other covariates is partialled out. We follow two strategies to address this issue. First, we exclude 'violence received' from the econometric model, shifting it into the error term. If the exclusion restriction holds, the instrumental variable strategy then recovers a causal estimate. Figure 2 displays running means of exposure to six dominant forms of inter-group and one-sided violence over year of birth. It is apparent that the temporal patterns within and between groups are very different from that of exposure to wartime governance. For instance, the strong 'penalty' in exposure from having joined UNITA out of Bin 2 is not present in any of the variables. Table A7 contrasts mean experiences of the six specific experiences and four index-based measures of battle-field and one-sided violence between the sub-samples defined by the value of the IV. The results corroborate that exposure to no form of battle-related and one-sided violence as well as no general index of exposure to violence is correlated with the IV. These findings document that the full index measure of (any) violence received, which was correlated with the exposure to wartime governance, is not correlated with the instrument. Thus, the instrumental variation allows to isolate the causal effect of exposure to wartime governance in two-stage estimates. Second, as a robustness check, we estimate a model that includes 'violence received' and treats it as endogenous, i.e. we instrument for it.[18]

5 Results

5.1 OLS results

The OLS results suggest that individual exposure to wartime governance is positively associated with participation in both the collective organization and delivery of public goods twelve years after the end of the war. Table 1 shows strongly significant estimates from a parsimonious model, with the full wartime governance index as the treatment, no additional control variables and Huber-White standard errors (columns 1 and 4).

While index measures are widely used in econometric analysis of the impacts of exposure to war and political institutions(e.g. Acemoglu et al. 2001; Bellows and Miguel 2009; Blattman 2009), they are built upon scales that may not reflect constant effects.[19] Inspired by psychological analyses, which often define 'high-intensity' as above the 75th percentile, we divide the sample at the 25th, 50th (median) and 75th percentiles of the distribution of the wartime governance score. Columns 2 and 5 reveal that for both outcomes the significant effect is driven by the top quartile.[20] The magnitude of its impact remains almost the same if the top quartile is compared to the other quartiles combined (columns 3 and 6). To capture the relevant jump in response, ease interpretation and

[18] These results are discussed in Section 5.

[19] For instance, moving from index values 1 to 2 typically has a different effect than moving from 3 to 4.

[20] See Figure A13 for a graphic illustration of the equivalent regressions using octiles instead.

avoid imposing linearity, we collapse the wartime governance index into a coarse binary indicator, defined by the 75th percentile. We interpret exposure above the 75th percentile as 'high exposure to wartime governance' and use this coarsened treatment variable in the main analysis.[21]

In Tables 2 and 3 we provide evidence that the positive relationship is robust in terms of magnitude and statistical significance, when we include *comuna* fixed effects, pre-service background variables, a series of other control variables, with two-way clustered standard errors.[22] The sequential inclusion of other (potentially endogenous) war experiences does not change the estimates noticeably. For both outcome measures, the only variable that appears to slightly affect the magnitude of the coefficient is a measure of how much violence a soldier 'received' (victimization), an issue we address below.

In Appendix B we present evidence that the main result is also robust to classical, Huber-White, Moulton and wild cluster bootstrapped standard errors (Table A8) and non-linear model specifications (Table A9). We also report that the positive association with post-war participation holds for the continuous wartime governance index, and demonstrate its robustness to three alternatively constructed indices (Table A10). Looking at the components of exposure separately, we find markedly moderate intercorrelations (Table A11), lending further support for our preferred method of index construction, and substantial correlations with post-war participation (Table A12), suggesting that the index effect is not driven by a single component alone. Yet, the result might still not have a causal interpretation and could be driven by correlations with unobserved, confounding pre-service, service and post-service variables, or systematic measurement error. To mitigate these concerns we rely on IV estimation, which must be balanced, however, against the inevitable loss of efficiency vis-à-vis OLS.

5.2 IV results

Table 4 presents first-stage and reduced-form results to assess the informativeness of the instrumental variable. As expected, the combination of joining UNITA and being born into Bins 2 or 4 predicts significantly less experience with wartime governance (column 1). Following Angrist and Pischke (2008), we choose our single best instrument for our main specifications. We collapse the Bin 2- and Bin 4-dummy variables into the binary indicator variable Bin 24, which compares being born in pooled cohorts 2 or 4 to all others, and interact Bin 24 with the UNITA dummy variable to form the binary instrumental variable for the main analysis. Columns 2 and 3 show that the binary instrument is highly informative, with and without the inclusion of post-treatment controls. The F-statistics of about 72 and 106 suggest that our instrument is not 'weak' and mitigate concerns of associated bias (Staiger and Stock 1997). The reduced form regressions in columns 4 to 6 demonstrate a robust negative association of the IV with either outcome variable. The coefficients are stable across specifications, and — despite the rich specifications and restrictive assumptions — are statistically significant at conventional levels. Table 5 displays IV and corresponding OLS estimates of the impact of exposure to wartime governance on post-war

[21] While we are confident to capture a treatment effect concentrated around the 75th percentile, our estimates may be susceptible to coarsening bias (Marshall 2016). We address this in the robustness checks and report key results also for the full index measure.

[22] For the main specification we follow Cameron et al. (2011) to estimate the standard error. Observations may not be independent within two sets of locations: where individuals reside, and where they were recruited from. We thus estimate robust standard errors clustered by the primary sampling unit (bairro) and municipality of recruitment. Alternative techniques to estimate the standard error, including wild-bootstrapping order to address 'few cluster' issues, are discussed later in this section. As also suggested by Cameron et al. (2011), we rely on conservative inference and ignore stratification and survey weights (these less conservative results are very similar and available upon request).

community meeting attendance and security provision. The IV estimates confirm the positive and significant effect on public good production 12 years after the end of the war.

6 Mechanisms

6.1 Main results

To explore the explanatory power of the theoretical mechanisms introduced in Section 2, we primarily rely on a set of auxiliary data on additional wartime interactions with civilians we collected for this purpose.[23] Results are reported in Table 6.

Economic interactions between combatants and civilians

To assess the relevance of the economic interactions mechanism, we analyze whether the magnitude of the effect documented in the sections above depends on the level of productive inputs to the group. This supply-side impact is measured by taxes collected from and food and services (voluntarily) delivered by civilians. Armed groups often provide public goods and services in exchange for taxes (Mampilly 2011; Sánchez de la Sierra 2018), while food and manpower/labour are the most fundamental resources to run and sustain an armed group. It thus likely that soldiers genuinely appreciated the voluntary supply of productive inputs, as opposed to having to coerce them from civilians.[24] Yet, we find that the impact of exposure to wartime governance is *not* significantly different among those who collected taxes or were offered food more regularly (Panel A). The interaction coefficients are moderate in magnitude and statistically insignificant, and do not support the economic interactions mechanism.

Social attitudes

To assess the explanatory power of a change in social attitudes towards civilians, we first study the impact of having attended social events together, such as weddings or sports/games — activities with no or little economic and political meaning, which were however quite common during the war. We further analyze a subjective measure of civilian 'compliance', assessing to what extent civilians were not very cooperative, did not follow rules well or even resisted. The interactive effects are weak in general, and that of compliance is slightly negative and marginally significant for local security provision (Panel B). We interpret these weak findings as evidence against the social attitudes mechanism.

Social learning

The third theoretical mechanism is based on social learning and emphasizes the collective and interactive aspect of wartime governance within the group. In the behavioural/interactional version of the mechanism, individuals may simply 'imitate' the behaviour of their peers, while in the

[23] Similar to our treatment measures, these variables were elicited via a five-point frequency scale, ranging from 'never' (=0) to 'extremely often' (=4). We also use additional military and post-service outcomes, as will be explained below. For comparability of effects, all auxiliary variables are standardized to zero mean and unit standard deviation, unless noted otherwise.

[24] Food in particular was often extremely scarce in the Angolan conflict (UNICEF 1998). In our survey, 53 per cent of respondents report that they were 'often' or 'very often' 'that hungry or thirsty that you ate or drank things you would never have imagined to ever eat or drink.' In addition, 39 per cent recall at least one situation where they were 'that hungry or thirsty that you thought you might die within the next hour'.

normative form of the mechanism, group- or unit-specific norms may exist that promote behaviour related to civilians and are reinforced by the interaction of its members. If such an effect exists, we would expect it to be stronger among those who (a) operated in combat areas most, as these interactions are likely to be particularly important and intense when soldiers' lives are on the line and/or (b) still interact a lot with former group comrades in the post-war period.[25]

The results suggest that, as predicted by theory, the impact on local security provision is substantially stronger among those that still have strong ties to former comrades today and also among combat area unit veterans (Panel C). Interestingly, we find negligible and not statistically significant heterogeneous impacts on community meeting attendance.

Political preferences

The final theoretical mechanism is based on a shift in political preferences and emphasizes the 'political system' aspect of local wartime governance. To test the relevance of this mechanism, we analyze whether the magnitude of the effect depends on the extent to which soldiers taught political ideas and gave strategic instructions to local civilians, such as how to act when a different group seizes control of their village. Panel D reveals that both of these activities increase the effect on participation in meetings significantly. In contrast, we find no economically or statistically significant interaction effects with respect to local security provision. Taken together, these results suggest that the positive effects of wartime governance on planning and delivering local public goods mask important differences between the two outcomes when considering the underlying mechanisms. Participation in planning activities seems to be driven largely by social learning processes, whereas participation in the delivery of public goods is shaped by changes in political preferences.

6.2 Additional tests

Panel E of Table 6 reports additional heterogeneity results to test the validity of the social learning and political preference mechanisms and examine factors that may exacerbate or weaken their relevance. First, we hypothesize that social learning processes and political preferences may depend on how armed groups ruled civilian populations (rows 1–3). In particular, we expect that promoting behavioural norms to regulate social behaviour may be related to either mechanism.[26] The results confirm this and show strong and positive interaction effects on local security provision and community meeting attendance. To understand the role of qualitative aspects of the rule by the armed group, we analyzed the impact of relatively more ideological and violent types of rule.[27] The results suggest that neither a more ideological nor a more violent rule are significant sources of heterogeneity.

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[25] The question used to construct a binary combat unit dummy was: 'Did your unit(s) usually operate (more) in combat areas or in non-combat areas?'. Factional ties are also commonly assumed to proxy for strength of previous norms in reintegration programming. In Sierra Leone, a roughly comparable context, Humphreys and Weinstein (2006) show that ties are not correlated with economic reintegration which strengthens the proxy assumption. The exact question to assess tie strength was: 'How often do you usually meet or spend time with people you met in your faction during the war?' (five-point scale).

[26] This measure was based on the following question: 'How often did your unit impose behavioral rules, e.g. about stealing, crime or violence?' (five-point scale).

[27] This measure was based on the following question: 'How often did your unit impose rules that had ideological aspects, such as what food to eat and clothes to wear?' (five-point scale) and 'How often did your unit use violence to impose or enforce rules?' (five-point scale).

The strength of the long-term effect of exposure to wartime governance may also be related to the rank and number of battalions served by ex-soldiers (rows 4–5). Having reached a higher rank or having served in more battalions significantly increases the effect of interest on community meeting attendance, but also significantly reduces the effect on local security provision. An interpretation consistent with our two mechanisms is that higher ranks as well as exposure to more (and likely different) types of battalions may propel a change in political preferences, for instance through more experience and insights into group strategies and policies. Yet at the same time, both may crowd out the social learning effect, e.g. through reduced time with other fellow soldiers in higher ranks and through volatility in battalion membership.

We explore also whether the impact via either mechanism is weaker for rebel veterans, stronger for longer tenures or dissipates over time (rows 6–8). Being a UNITA veteran may depress the long-term impact of wartime governance, if being part of the winning side affects revealing preferences and social behaviours in the post-war period. The negative coefficients reported in row 6 are consistent with a negative impact of being a UNITA veteran, but are not statistically significant. Longer tenures may reinforce both changes in political preferences and mechanisms based on the interactions with other soldiers. We find that more time in the military is indeed associated with a (marginally) stronger effect on community meeting attendance, while the interaction coefficient is small and insignificant for local security provision. The impact is not significantly weaker among those whose army exit dates back longer, which suggests that the effects of wartime governance on both outcomes are persistent.

As a final test for the political preference mechanism we draw on insights from the nascent literature on the effects of exposure to social, political and economic institutions on the formation and shifts of preferences. this literature argues that behavioural parameters are more (or most) likely to change between the ages of 18 and 25 (Giuliano and Spilimbergo 2014). Table A17 presents results from sub-sample regressions for individuals that joined the army a) at age 17 or younger, b) between ages 18 and 24 and c) at age 26 or over.[28] As predicted by the literature, the effect of exposure to wartime governance for community attendance is highest in the 18-24 range (columns 1-3), while for contributions to local security this is not the case (columns 4-6).

7 Political mobilization and social relations

Are the long-run legacies of wartime governance restricted to civic participation? In this section, we explore further implications of wartime governance exposure on other forms of political mobilization and social cooperation, using additional data we collected data on a range of related outcomes. We collapse the outcome variables into four main additive and standardized indices (z-scores): political participation and attitudes, protesting, social group participation, and family cooperation.

Political mobilization

Panel A of Table 7 reveals that exposure to wartime governance is associated with a strong average increase in political mobilization (column 1). Yet, there is important variation in the effects across different aspects of mobilization. The positive overall effect is driven by a strong increase in political

[28] Using 17-24, 17-25 and 18-25 as middle categories gives nearly identical results.

group participation (column 2) and the interest in politics (column 5).[29] We find no effects on electoral participation, proxied by registering and voting in national elections (but should notice that around 97 per cent of respondents report to have registered and voted). Looking at governance preferences, about 58 per cent of respondents express that local governance systems set up by armed groups during the war are better than governance by 'normal' state authorities. While exposure to wartime governance significantly increases the probability of favoring such forms of (local) governance, we see no effect on voting against the ruling MPLA in the national elections. Second, we look at political protests as a form of political mobilization and collective action (Tilly and Tarrow 2015). Before the 2012 elections, several marches against government politics took place in Huambo and Luanda.[30] As reported in Panel B of Table 7, we find a positive association between wartime governance exposure and the composite 'protesting index' (column 1), including both attitudes towards and actual participation in protests. The positive overall effect is driven by two variables: strong attitudes that protesters are justified to use violent tactics in political demonstrations (column 5), and that the police are justified to respond violently to protesters (column 6). We find, however, a weak but negative effect on staying at a (hypothetical) protest that turns violent (column 7).[31] One interpretation of these results is that the exposure to wartime governance shifts a soldier's attitudes toward the political or strategic use of violence, but he does not become more 'prone' to violence in general. In addition, we find that exposure to wartime governance is *not* associated with actual participation in protests, including the marches in Huambo preceding the elections, any other demonstrations in the past year, and hypothetical protests in the future (columns 2–4).

We conclude from these results that individual exposure to wartime governance stimulates an interest in and engagement with politics and political collective action at the local level, but it does not appear to affect taking part in actual action at the regional or national levels.[32]

Social participation and family relations

Panel A of Table 8 reveals that exposure to wartime governance is — on average — also associated with a strong increase in social participation at the local level (column 1). The positive overall effect is driven by a strong increase in participation in various non-religious groups (columns 2–4). These positive effects stand in deep contrast to a strongly negative effect on participation in religious groups and communities (column 5). Religious communities are key networks and central elements of social capital in most developing countries, and a focus of the anthropological study supporting this project (Spall 2015). The ethnographic results describe how Angolan soldiers rely on religious engagement and religiousness as *the* primary mechanism of signaling a certain lifestyle and living up to ideals of masculinity and senior male status. In a framework of pro-social behaviour, these results clearly emphasize the salient role of social reputation, consistent with arguments in the theoretical

[29] General interest in politics was meanthe answer on a five-point scale to the (deliberately unspecific) question: 'How interested are you in politics?'. 'Interest in politics' equals one for replies 'Quite interested' and 'Very interested,' and zero else. Participation in local political groups, was measured by a binary indicator of group membership, which equals one for being a member, and zero if not.

[30] Media reports describe former combatants as the main social group participating in these marches. The government responded to these demonstrations with repression, including crackdowns, incarcerations and violence (e.g. FT 2012; ISS 2012).

[31] The question used was: 'Imagine that you are at a protest and it turns violent, would you stay or leave?'.

[32] This insight complements findings by Depetris-Chauvin (2015) who documents that the positive effect of a local history of indigenous state-like structures on trust in policy actors is confined to the local level. Individuals from regions with a long history of statehood trust local policy makers more, but there is no effect on trust in national policy makers.

literature (e.g. Bénabou and Tirole 2006). Their motivation to participate in religious organizations could hence be largely driven by reputational concerns. Conversely, Spall (2015) suggests that the 'social benefits' of participation in non-religious groups are distinctly lower, and therefore arguably less strategic in terms of social reputation. These insights lead us to conclude that the dynamics of wartime governance may reduce the incentives (or needs) of soldiers' incentives to rely on religious participation as a strategic means to improve social integration. Turning to family-level impacts, Panel B in Table 8 documents weak and slightly *negative* effects of wartime governance exposure on relations within the family (column 1). The negative association appears to be driven by a reduction in caring about the spouse and children (column 4). The results also reveal a similarly negative but insignificant effect on harmony, and no effects on living together or being married (columns 2,3 and 5).[33] This suggests that the positive effects of wartime governance exposure on social participation do not include family relationships. One potential explanation is that being more active in the community may crowd out kin relationships, for instance via time constraints.

Taken together, the results on social participation strengthen our finding that individual exposure to wartime governance can foster social engagement, even beyond contributions to local public goods. Interestingly, these positive effects are not reflected in within-family relations — like the political effects, the social effects are confined to the community-level.

8 Conclusion

In conflict zones around the world, institutions change and both state and non-state actors deliver governance at regional and local levels. This paper provides a first stepping stone towards understanding the micro-foundations of the legacies of local institutional change during violent conflict.

We operationalize 'wartime governance' as the local policy choices and practices by a ruling actor and focus on the provision of public goods and services to the governed populace, as it is at the heart of 'good' and 'state-like' governance. The key result is that soldiers' exposure to wartime governance by armed groups strongly affects their long-run social and political behaviour. Informed by ethnographic and historical insights, we use primary survey data and a natural experiment to show that involvement in wartime governance makes Angolan veterans more likely to participate in the collective production of local public goods more than a decade after the end of the Angolan war. We find that the underlying causal mechanisms differ markedly across outcomes of planning and delivering local public goods: a shift in political preferences increases community meeting attendance, while social learning fosters participation in local security provision. We find similar impacts of individual exposure to wartime governance on other forms of social participation and on political attitudes, but do not find any evidence for effects on mobilization in a wider political sense (in the form of voting in national elections or regional protesting), or on social relations within the family. We interpret these findings as evidence that exposure to wartime governance stimulates lasting interests and participation in *local* politics, governance, and collective action.

While the empirical analysis focuses on the case of Angola, we draw on the 'rebel governance' literature to argue that many aspects of our treatment — wartime governance — are qualitatively similar in many conflict zones across the world. We therefore expect our findings to have two externally valid and important policy implications for state-building and local development in post-

[33] The caring and harmony variables are subjective four-point measures reported by the veteran's partner in a separate interview, and confined to respondents who have a partner.

conflict societies. First, policy designs often emphasize the importance of breaking ties between former fighters, assuming that clustering may fuel the risk of recurring violence. We document a source of pro-social behaviour among veterans and find that remaining factional ties may in fact (also) reinforce the positive impact on contributing to local public goods and services. Second, community-driven development programs and initiatives to build national state capacity 'from the bottom' have struggled to deliver an impact, with results varying substantially across contexts. Our findings can help to understand why certain groups respond differently to interventions related to governance and participation. Conceptually, we show that some of the variation may originate from systematic differences in experiences related to forms of institutional change that took place during the conflict. Specifically, civil wars may spur institution-building processes that foster lasting preferences for *local* and *collective* forms of governance, possibly at the expense of national governance. Hence, settings characterized by strong institutional change during conflict may take longer to build strong and cohesive national states in the post-conflict period.

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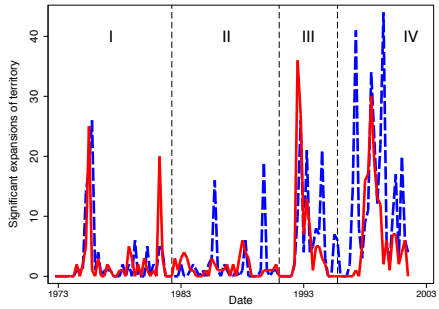
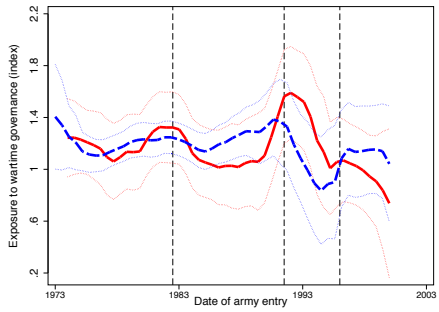
FIGURES

FIGURE 1. First-stage mechanism

(a) Event data: Significant expansions of territory over time



(b) Survey data: Exposure to wartime governance and date of entry



(c) Survey data: Exposure to wartime governance and date of birth

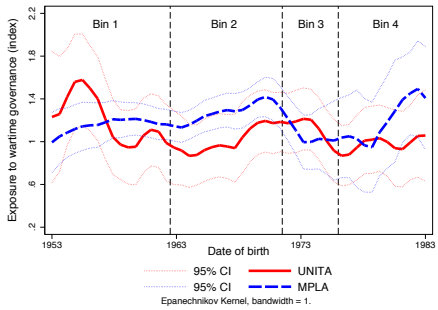
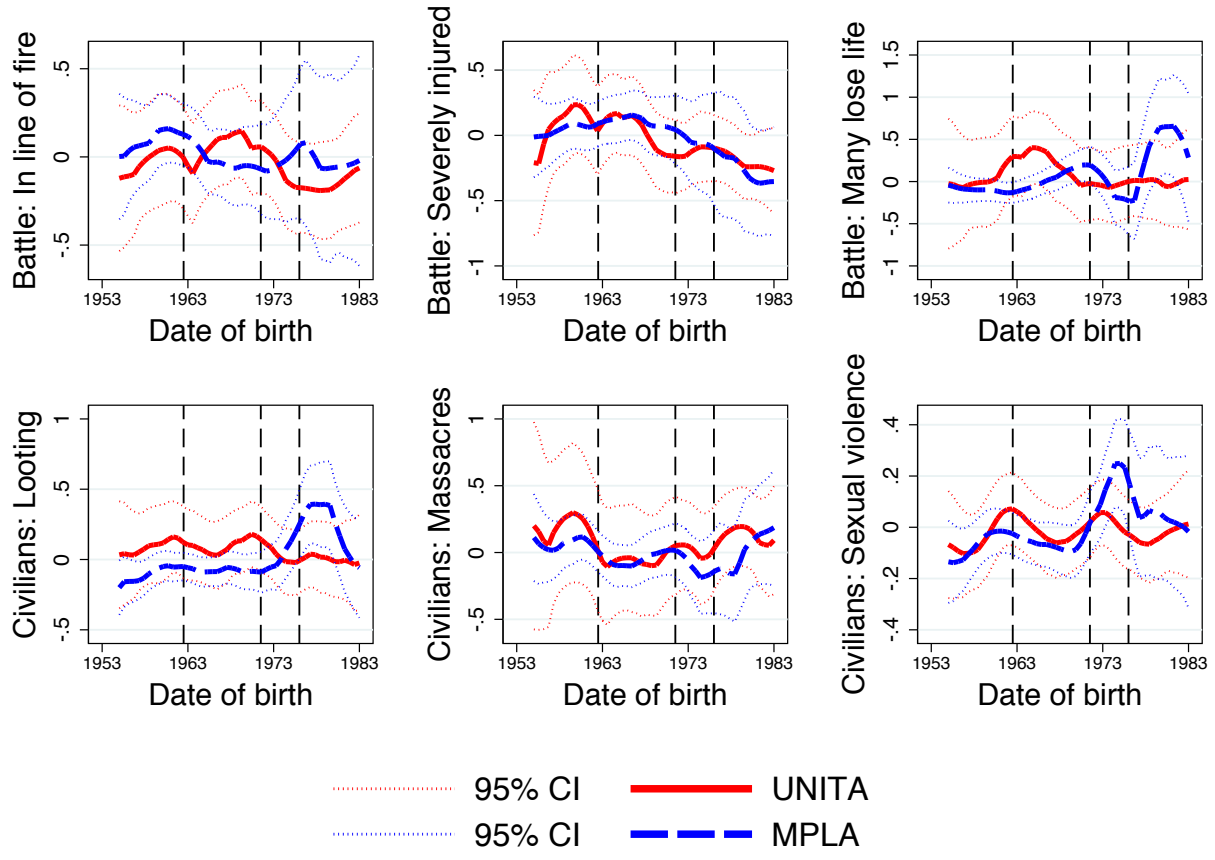


Figure 1a plots conflict event data on major territorial gains by MPLA (blue) and UNITA (red) over time. Figure 1b plots our own survey data on exposure to wartime governance reported by MPLA soldiers (blue) and UNITA soldiers (red) over reported date of armed group entry (local polynomial regressions). Figure 1c plots our own survey data on exposure to wartime governance reported by MPLA soldiers (blue) and UNITA soldiers (red) over reported date of birth (local polynomial regressions). The scale of the x-axis in Figure 1c is shifted by exactly twenty years, the overall rounded mean of age at armed group entry.

FIGURE 2. Exclusion restriction: intergroup violence and violence against civilians



Epanechnikov kernel, bandwidth = 1.5.

The subfigures plot exposure to six different forms of violence (standardized to zero mean and unit standard deviation) reported by MPLA soldiers (blue) and UNITA soldiers (red) over reported date of birth (local polynomial regressions).

TABLES

TABLE 1. Wartime governance and post-war participation in public good production (OLS)

	Community Meetings			Local Security		
	(1)	(2)	(3)	(4)	(5)	(6)
Wartime governance (index)	0.080***			0.071***		
	(0.019)			(0.011)		
—WG index quartile 2		0.011			–0.015	
		(0.041)			(0.024)	
—WG index quartile 3		0.028			–0.023	
		(0.040)			(0.023)	
—WG index quartile 4 (top)		0.183***	0.171***		0.142***	0.153***
		(0.042)	(0.036)		(0.024)	(0.021)
Mean dep.var.	0.224	0.224	0.224	0.064	0.064	0.064
Observations	760	760	760	760	760	760

OLS estimates of Equation 1; no control variables included. *Wartime governance (index)*: full index built from frequency of exposure to seven dimensions of wartime governance. *WG index quartile x*: indicator of quartile x (1 = Yes, 0 = No), defined by the 25th, 50th, and 75th percentiles of the distribution of the wartime governance index. The reference category is quartile 1 (bottom). Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors in parentheses, two-way clustered by *bairro* of residence (= PSU) and municipality of recruitment.

TABLE 2. Community meeting attendance: robustness to control variables

	Community meeting attendance								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
WG high	0.173***	0.173***	0.173***	0.155***	0.173***	0.168***	0.166***		0.135***
	(0.043)	(0.042)	(0.043)	(0.047)	(0.043)	(0.040)	(0.038)		(0.041)
Length of service		0.003							0.000
		(0.003)							(0.002)
Violence witnessed			–0.013						–0.030
			(0.016)						(0.022)
Violence received				0.037				0.061**	0.056**
				(0.028)				(0.025)	(0.026)
Violence perpetrated					–0.004				–0.009
					(0.011)				(0.013)
Radio						0.044			0.042
						(0.032)			(0.036)
Wealth						0.022***			0.020***
						(0.006)			(0.005)
Education						0.087***			0.084***
						(0.029)			(0.031)
Born here						–0.029			–0.017
						(0.022)			(0.020)
Age							0.006		–0.001
							(0.018)		(0.014)
Age^2							–0.000		–0.000
							(0.000)		(0.000)
UNITA (main)							0.013		0.022
							(0.046)		(0.046)
YOB-Bin 2							–0.136***		–0.126***
							(0.030)		(0.034)
YOB-Bin 3							–0.200***		–0.199***
							(0.064)		(0.067)
YOB-Bin 4							–0.214***		–0.228***
							(0.077)		(0.073)
Pre-Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Post-Location FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	760	760	760	760	760	760	760	760	760
R^2	0.09	0.09	0.09	0.09	0.09	0.11	0.11	0.07	0.14

OLS estimates of Equation 1; the dependent variable is the indicator of community meeting attendance; the vector of included control variables varies across columns. *WG high*: indicator of high exposure to wartime governance (1 = Yes, 0 = No). *UNITA (main)*: indicator of main armed group (1 = UNITA, 0 = MPLA). *YOB-Bin x*: indicator of year of birth bin x (1 = Yes, 0 = No). The sample is grouped into four bins (1 – 4), as explained in the text. *YOB-Bin 1* is the oldest group and the reference bin, *YOB-Bin 4* is the youngest group. Note that *age* in this specification captures within *YOB-Bin* variation. *Pre-Controls*: vector of eight pre-service family background characteristics. *Post-Location FE*: full set of *comuna* fixed effects. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors in parentheses, two-way clustered by *bairro* of residence (= PSU) and municipality of recruitment.

TABLE 3. Local security provision: robustness to control variables

	Local security provision								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
WG high	0.153***	0.153***	0.153***	0.141***	0.153***	0.153***	0.150***		0.135***
	(0.033)	(0.033)	(0.033)	(0.035)	(0.033)	(0.033)	(0.034)		(0.037)
Length of service		0.002							0.002
		(0.002)							(0.002)
Violence witnessed			–0.002						–0.019
			(0.012)						(0.013)
Violence received				0.025				0.047***	0.033**
				(0.017)				(0.017)	(0.016)
Violence perpetrated					0.003				0.003
					(0.005)				(0.006)
Radio						–0.012			–0.010
						(0.032)			(0.032)
Wealth						0.003			0.002
						(0.006)			(0.006)
Education						–0.004			–0.007
						(0.019)			(0.017)
Born here						–0.014			–0.011
						(0.027)			(0.024)
Age							–0.002		–0.003
							(0.015)		(0.013)
Age^2							0.000		0.000
							(0.000)		(0.000)
UNITA (main)							–0.008		–0.015
							(0.022)		(0.026)
YOB-Bin 2							–0.006		–0.005
							(0.018)		(0.017)
YOB-Bin 3							–0.037		–0.033
							(0.052)		(0.051)
YOB-Bin 4							–0.038		–0.034
							(0.060)		(0.058)
Pre-Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Post-Location FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	760	760	760	760	760	760	760	760	760
R^2	0.12	0.12	0.12	0.12	0.12	0.12	0.13	0.07	0.14

OLS estimates of Equation 1; the dependent variable is the indicator of local security provision; the vector of included control variables varies across columns. *WG high*: indicator of high exposure to wartime governance (1 = Yes, 0 = No). *UNITA (main)*: indicator of main armed group (1 = UNITA, 0 = MPLA). *YOB-Bin x*: indicator of year of birth bin (1 = Yes, 0 = No). The sample is grouped into four bins (1 – 4), as explained in the text. *YOB-Bin 1* is the oldest group and the reference bin, *YOB-Bin 4* is the youngest group. Note that *age* in this specification captures within *YOB-Bin* variation. *Pre-Controls*: vector of eight pre-service family background characteristics. *Post-Location*: full set of *comuna* fixed effects. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors in parentheses, two-way clustered by *bairro* of residence and municipality of recruitment.

TABLE 4. First-stage and reduced form

	Wartime governance high				Community meetings		Local security	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
UNITA x YOB-Bin 2	–0.237***							
	(0.064)							
UNITA x YOB-Bin 3	–0.027							
	(0.095)							
UNITA x YOB-Bin 4	–0.296***							
	(0.043)							
UNITA x YOB-Bin 24		–0.246***	–0.239***	–0.237***	–0.072**	–0.082***	–0.054**	–0.053**
		(0.029)	(0.020)	(0.023)	(0.034)	(0.029)	(0.024)	(0.025)
Post-Controls	No	No	No	Yes	No	Yes	No	Yes
UNITA+YOB-Bin	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Length of Service	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pre-Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pre-Location FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Post-Location FE	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Observations	760	760	760	760	760	760	760	760
R^2	0.05	0.05	0.07	0.07	0.10	0.12	0.07	0.07
F(UNITA x COB = 0)	13.70	71.92	130.11	97.04				

First-stage and reduced-form effects of the interaction of the armed group and the year-of-birth indicator variables (as specified in the row headers); the vector of included control variables varies across columns. Columns 1–4 show OLS estimates of Equation 2; the dependent variable is the high exposure to wartime governance indicator. Columns 5–8 show OLS estimates of a 'reduced-form' version of Equation 2; the dependent variables are the indicators of participation in community meetings (5–6) and local security provision (7–8). *UNITA (main)*: indicator of main armed group (1 = UNITA, 0 = MPLA). *YOB-Bin x*: indicator of year of birth bin (1 = Yes, 0 = No). The sample is grouped into four bins (1 – 4), as explained in the text. *YOB-Bin 1* is the oldest group and the reference bin, *YOB-Bin 4* is the youngest group. *YOB-Bin 24* collapses *YOB-Bin 2* and *YOB-Bin 4* into a joint bin. *YOB-Bin*: full set of indicators of year of birth bin (1 = Yes, 0 = No). *Post-Controls*: radio ownership (1 = Yes, 0 = No), assets (index), years of schooling, born in this comuna (1 = Yes, 0 = No). *Length of Service*: length of wartime military service (in years). *Pre-Controls*: vector of eight pre-service family background characteristics. *Pre-Location FE*: full set of recruitment region fixed effects. *Post-Location FE*: full set of *comuna* fixed effects. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors in parentheses; in columns 1 and 2 clustered by municipality of recruitment, in columns 3–7 two-way clustered by *bairro* of residence and municipality of recruitment.

TABLE 5. Participation in local public good production (IV)

	Community Meetings				Local Security			
	(1) OLS	(2) OLS	(3) IV	(4) IV	(5) OLS	(6) OLS	(7) IV	(8) IV
WG high	0.161***	0.154***	0.302**	0.344***	0.152***	0.152***	0.225**	0.221**
	(0.041)	(0.039)	(0.134)	(0.122)	(0.034)	(0.035)	(0.093)	(0.102)
Post-Controls	No	Yes	No	Yes	No	Yes	No	Yes
UNITA+YOB-Bin	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Length of Service	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pre-Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pre-Location FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Post-Location FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	760	760	760	760	760	760	760	760
R^2	0.12	0.14	0.10	0.11	0.13	0.13	0.11	0.12
1st stage F-stat(IV)			130.11	97.04			130.11	97.04

OLS and IV estimates of Equation 1; the dependent variables are the indicators of participation in community meetings (1–4) and local security provision (5–8); the vector of included control variables varies across columns. *WG high*: indicator of high exposure to wartime governance (1 = Yes, 0 = No). *UNITA (main)*: indicator of main armed group (1 = UNITA, 0 = MPLA). *YOB-Bin*: full set of indicators of year of birth bin (1 = Yes, 0 = No). *Post-Controls*: radio ownership (1 = Yes, 0 = No), assets (index), years of schooling, born in this comuna (1 = Yes, 0 = No). *Length of Service*: length of wartime military service (in years). *Pre-Controls*: vector of eight pre-service family background characteristics. *Pre-Location FE*: full set of recruitment region fixed effects. *Post-Location FE*: full set of *comuna* fixed effects. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors in parentheses, two-way clustered by *bairro* of residence and municipality of recruitment.

TABLE 6. Mechanisms of impact

	Community meetings	Local security
	(1)	(2)
Panel A: Economic interactions		
WG high x Voluntary supply	0.017	–0.051
	(0.070)	(0.053)
WG high x Collected taxes	–0.014	0.031
	(0.029)	(0.022)
Panel B: Social attitudes		
WG high x Socializing	0.001	0.021
	(0.029)	(0.031)
WG high x Compliance	–0.035*	–0.038
	(0.021)	(0.031)
Panel C: Learning		
WG high x Factional ties	–0.005	0.075***
	(0.042)	(0.019)
WG high x Combat areas	0.023	0.049**
	(0.033)	(0.021)
Panel D: Political preferences		
WG high x Taught political ideas	0.052**	0.007
	(0.021)	(0.039)
WG high x Strategic instructions	0.062***	0.013
	(0.021)	(0.016)
Panel E: Additional tests		
WG high x Social regulation	0.082***	0.083***
	(0.033)	(0.029)
WG high x Ideological rule	–0.006	–0.015
	(0.035)	(0.040)
WG high x Violent rule	0.034	0.024
	(0.038)	(0.026)
WG high x Rank	0.085***	–0.038**
	(0.028)	(0.019)
WG high x No of battallions	0.063***	–0.021***
	(0.023)	(0.007)
WG high x UNITA	–0.013	–0.033
	(0.044)	(0.027)
WG high x Time in military	0.066*	–0.007
	(0.036)	(0.026)
WG high x Time since left military	–0.014	0.024
	(0.036)	(0.018)

Interactive effects of exposure wartime exposure and a set of other variables (as specified in the row headers) on post-war participation in public good production (as specified in the column headers). Each cell shows a coefficient from a separate linear regression; model specification as in column 1 of Table 5 plus the main effect of the interacted variable. All interacted variables are standardized to zero mean and unit standard deviation. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors in parentheses, two-way clustered by *bairro* of residence and municipality of recruitment.

TABLE 7. Political mobilization

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: Politics							
	All	Participation			Attitudes		
	Index z-score	Political group	Election: registered	Election: voted	Interest in politics	Wartime governance	Did NOT vote MPLA
WG high	0.540***	0.165***	–0.000	0.014	0.300***	0.085**	–0.013
	(0.088)	(0.032)	(0.008)	(0.011)	(0.050)	(0.033)	(0.020)
Std. controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mean dep.var.	0.075	0.208	0.979	0.971	0.343	0.579	0.219
Observations	760	760	760	759	760	760	666
Panel B: Protests							
	All	Participation			Attitudes		
	Index z-score	Huambo	Other	Future	Violence protesters	Violence police	Violence stay
WG high	0.255***	–0.006	0.012	0.024	0.155***	0.176***	–0.050*
	(0.091)	(0.012)	(0.021)	(0.040)	(0.035)	(0.037)	(0.028)
Std. controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mean dep.var.	0.015	0.050	0.034	0.175	0.206	0.112	0.152
Observations	760	744	759	747	728	734	693

Estimates of the effect of exposure wartime exposure on a set of post-war variables related to political mobilization (as specified in the column headers). Each cell shows a coefficient from a separate linear regression. In each panel, the z-score in column 1 is constructed by adding up the values of the indicators in columns 2-7, and standardizing the sum. *Std. controls*: Same specification as in column 1 of Table 5. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors in parentheses, two-way clustered by *bairro* of residence and municipality of recruitment.

TABLE 8. Social participation and relations

	(1)	(2)	(3)	(4)	(5)
Panel A: Groups					
	Index z-score	Cultural	Spiritual	Sports	Religious
WG high	0.441***	0.198***	0.080**	0.093***	–0.065***
	(0.125)	(0.032)	(0.037)	(0.036)	(0.019)
Std. controls	Yes	Yes	Yes	Yes	Yes
Mean dep.var.	0.023	0.064	0.020	0.067	0.475
Observations	760	760	760	760	760
Panel B: Family					
	Index z-score	Lives with partner	Married	Caring z-score	Harmony z-score
WG high	–0.179**	0.014	–0.046	–0.273**	–0.148
	(0.070)	(0.014)	(0.030)	(0.118)	(0.092)
Std. controls	Yes	Yes	Yes	Yes	Yes
Mean dep.var.	–0.004	0.954	0.408	–0.006	–0.005
Observations	760	760	760	566	578

Estimates of the effect of exposure wartime exposure on a set of post-war variables related to social participation and relations (as specified in the column headers). Each cell shows a coefficient from a separate linear regression. Panel A: The z-score in column 1 is constructed by adding up the values of the indicators in columns 2-5, and standardizing the sum. Panel B: The z-score in column 1 is constructed by standardizing the values of the indicators in columns 2-3, adding these values to those of the standardized indicators in columns 4-5, and standardizing the sum. *Std. controls*: Same specification as in column 1 of Table 5. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors in parentheses, two-way clustered by *bairro* of residence and municipality of recruitment.

B ADDITIONAL FIGURES

FIGURE A1. Map of Huambo province

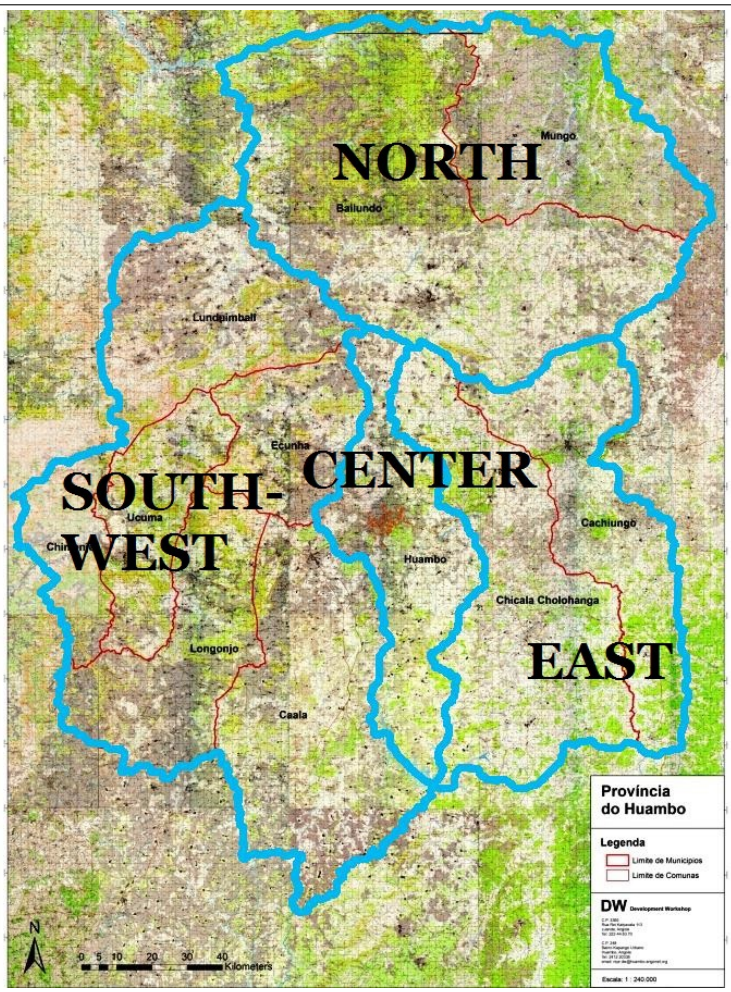
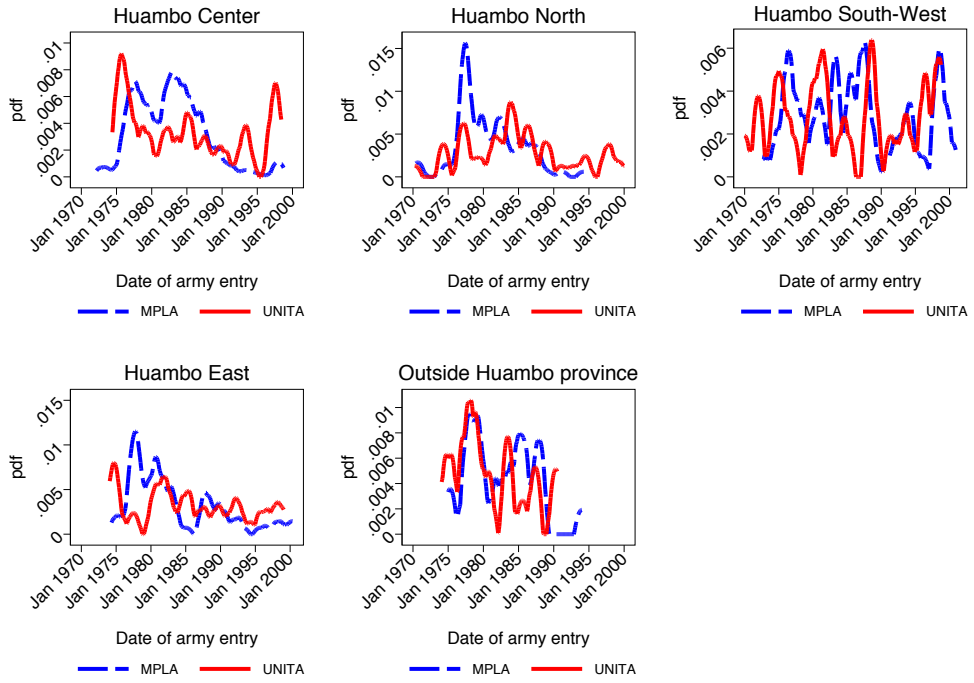


FIGURE A2. Distribution of date of entry by region of recruitment



To produce these graphs, we divided the sample into five sub-samples based on the broad region where a soldier was recruited. The regions are the Center, North, West and East of Huambo province, and a fifth category, into which all soldiers are pooled who were recruited outside Huambo province (about 6.5% of the sample). Each regional sub-sample was further split by the army a soldier joined. The plots show the army-specific distributions of entry dates.

FIGURE A3. Distribution of age at first entry into armed group

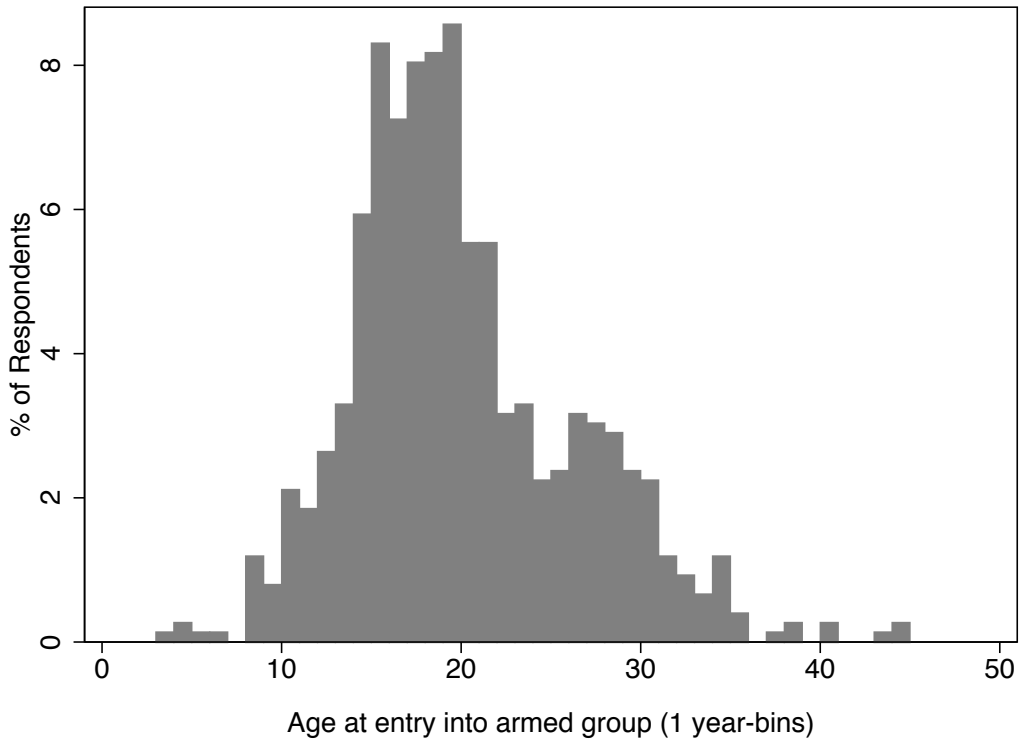


FIGURE A4. Distribution of year of birth

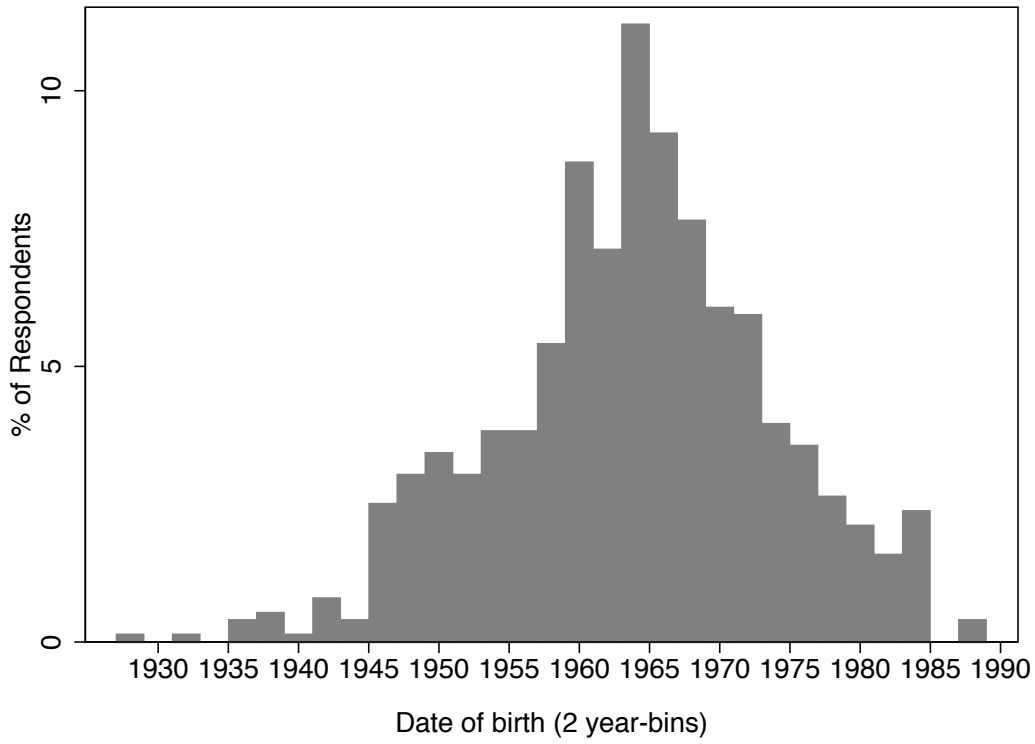
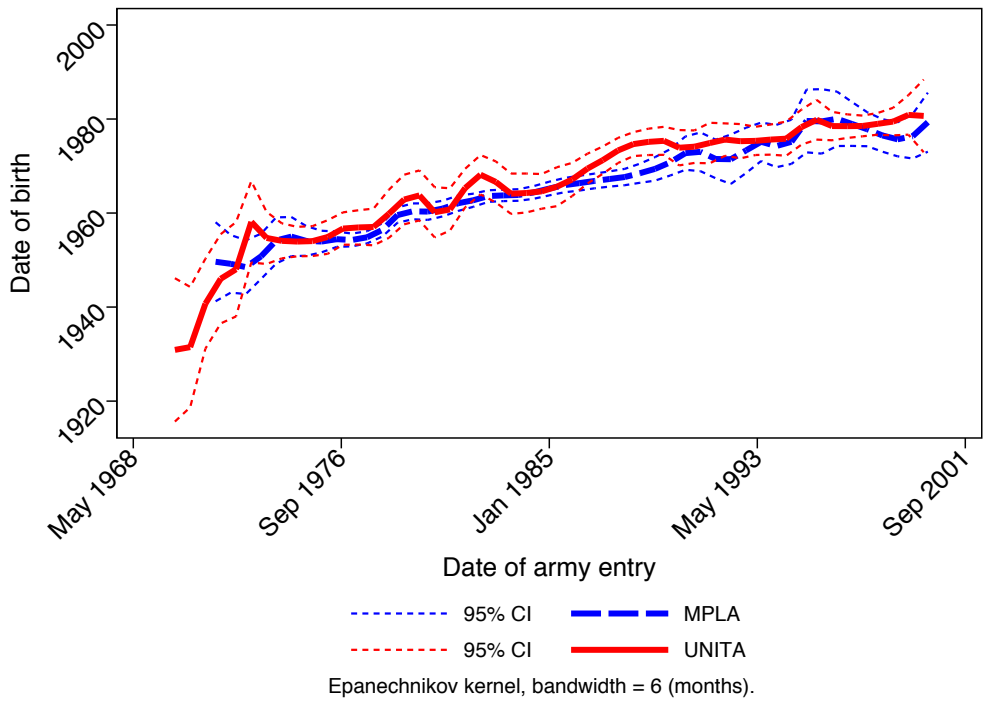


FIGURE A5. Date of military entry vs date of birth



Epanechnikov kernel, bandwidth = 6 (months).

FIGURE A6. Probability density function across YOB-Bins

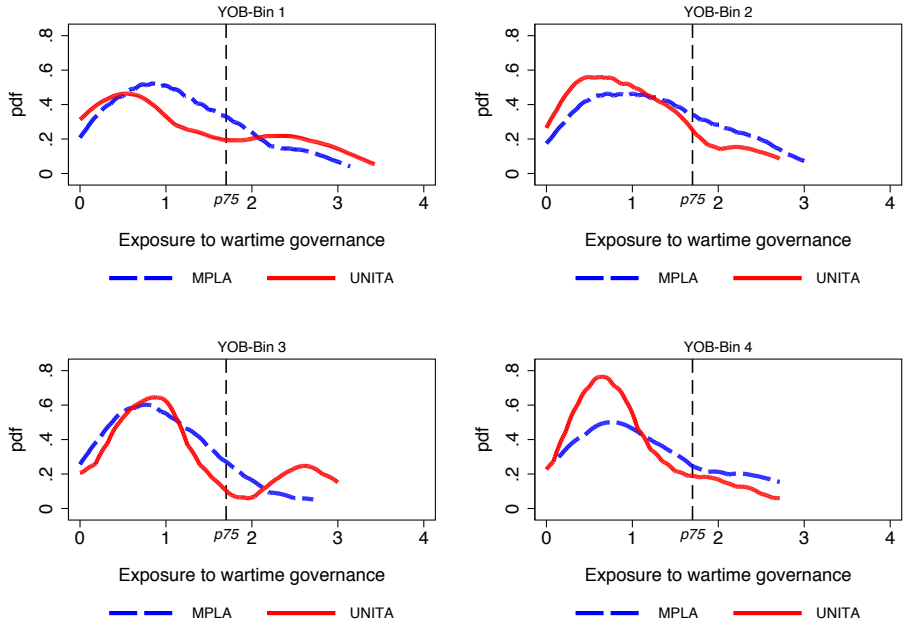


FIGURE A7. Predicting UNITA x YOB-Bin 24 (Bayesian Model Averaging)

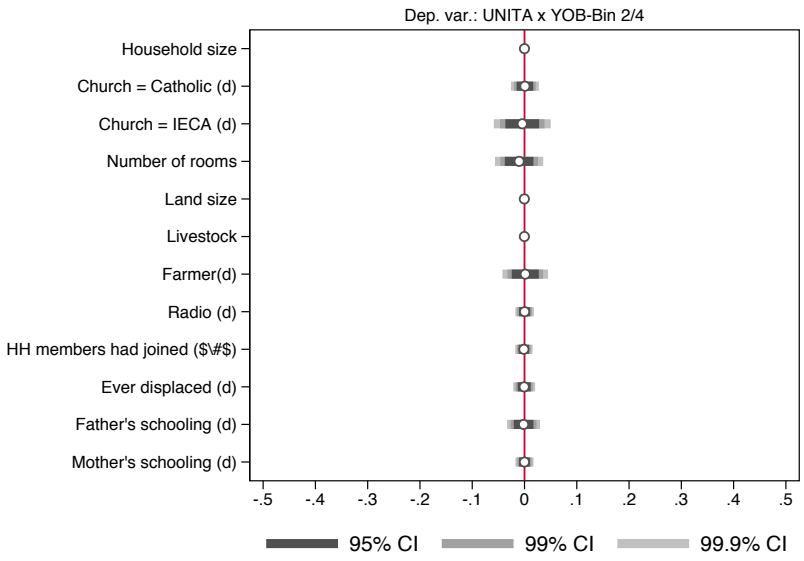
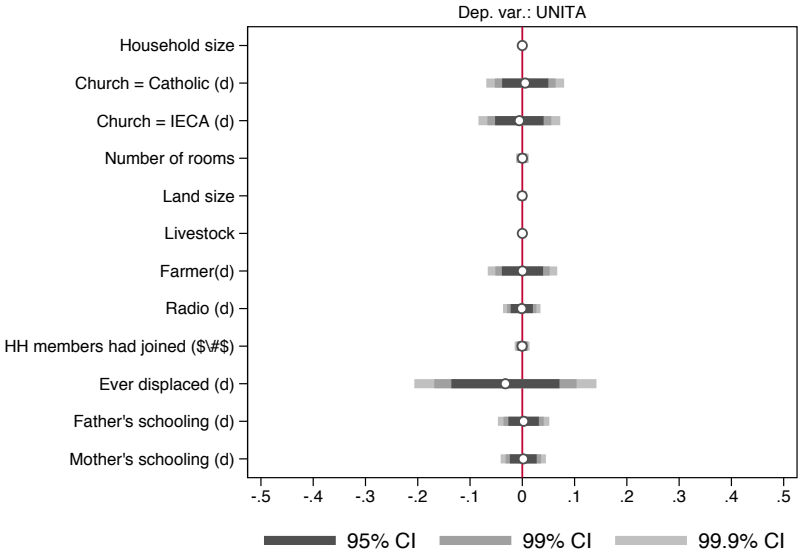


FIGURE A8. Predicting UNITA by date of birth (Bayesian Model Averaging)

(a) Sub-sample: YOB-Bin 24 = 0



(b) Sub-sample: YOB-Bin 24 = 1

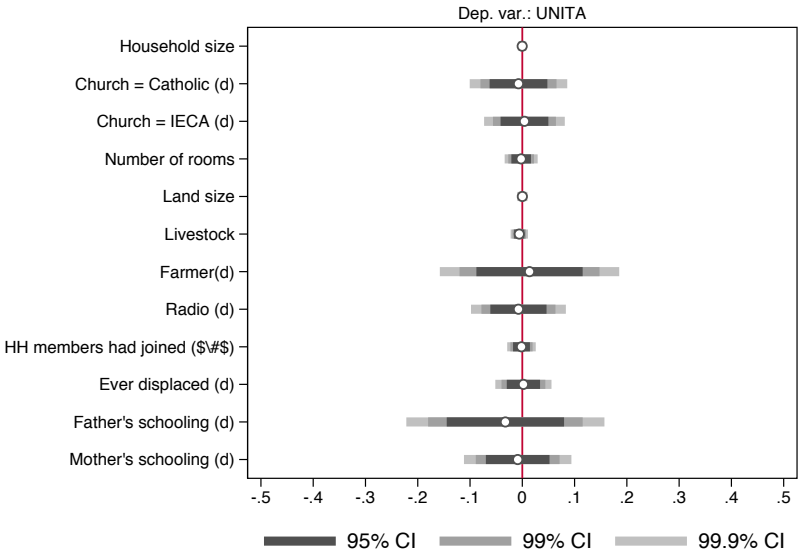
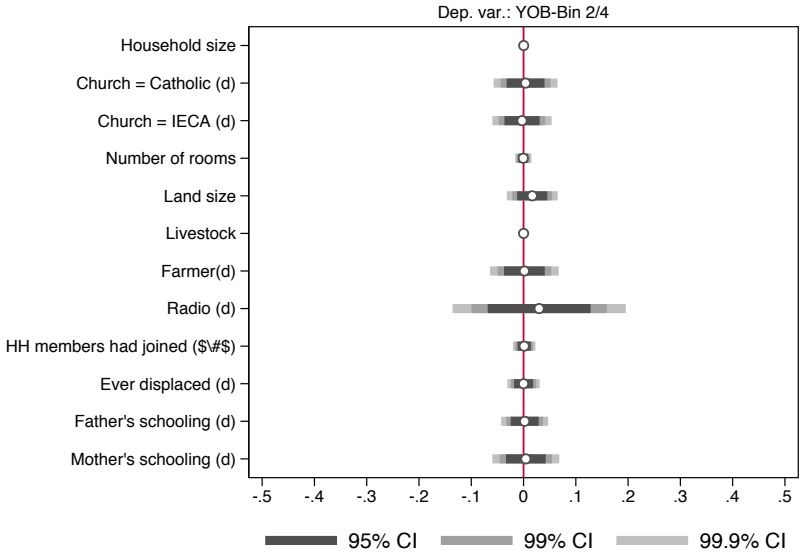


FIGURE A9. Predicting YOB-Bin 24 (Bayesian Model Averaging)

(a) Sub-sample: UNITA = 0



(b) Sub-sample: UNITA = 1

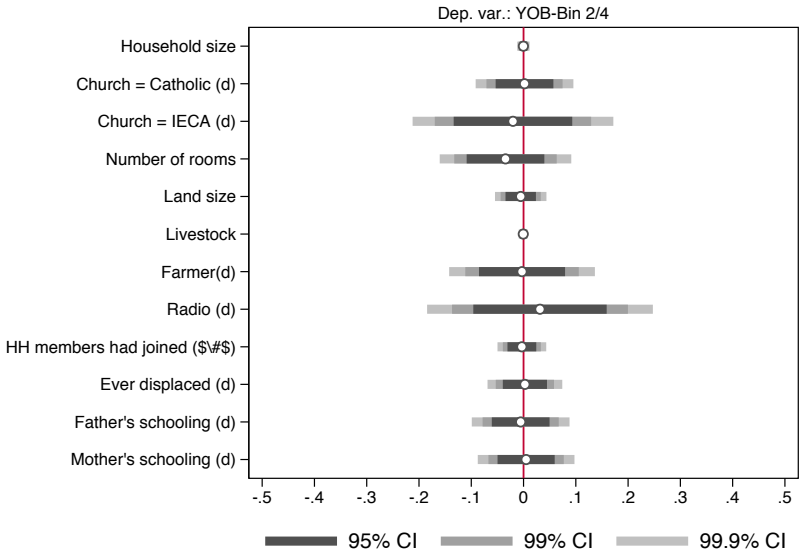
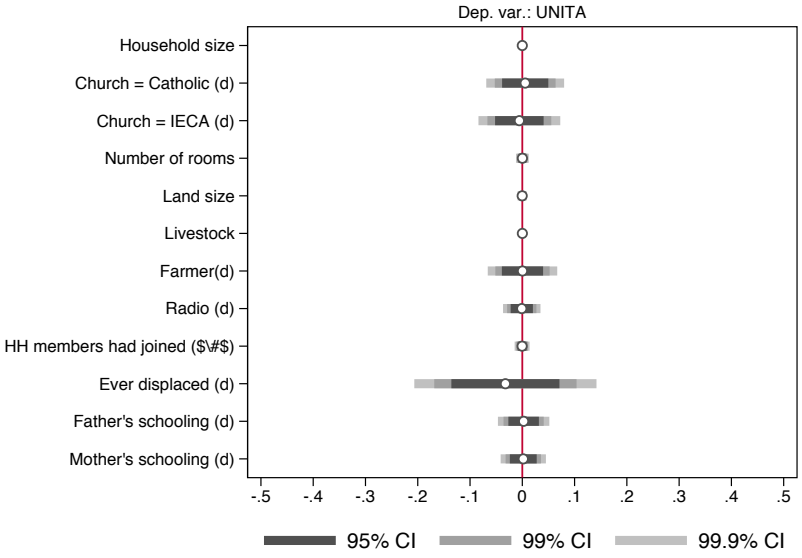


FIGURE A10. Predicting UNITA by date of entry (Bayesian Model Averaging)

(a) Sub-sample: YOE-Bin II/IV = 0



(b) Sub-sample: YOE-Bin II/IV = 1

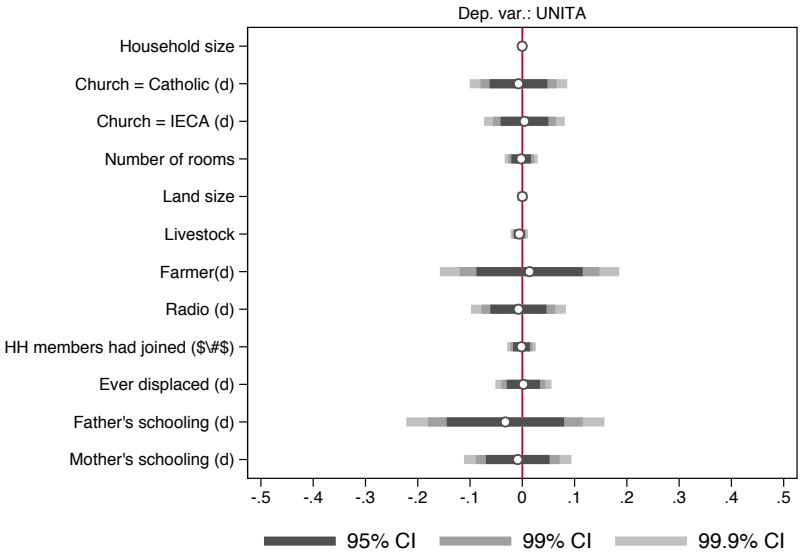
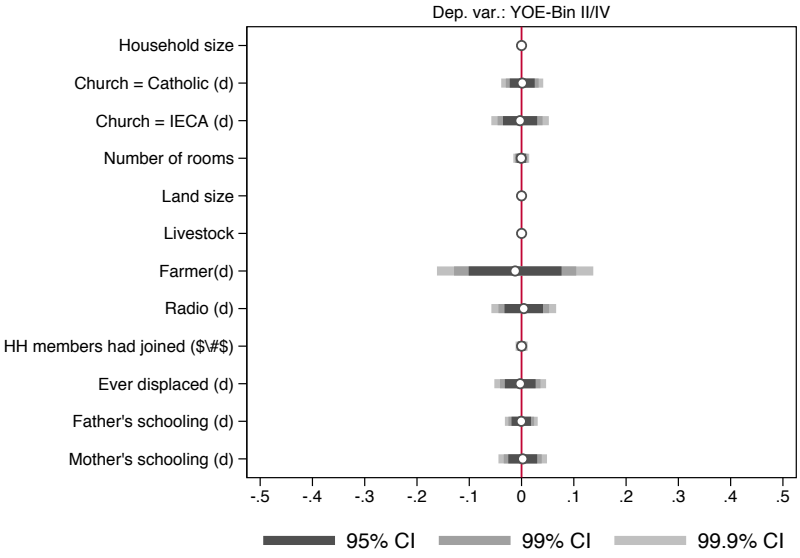


FIGURE A11. Predicting YOE-Bin II or IV (Bayesian Model Averaging)

(a) Sub-sample: UNITA = 0



(b) Sub-sample: UNITA = 1

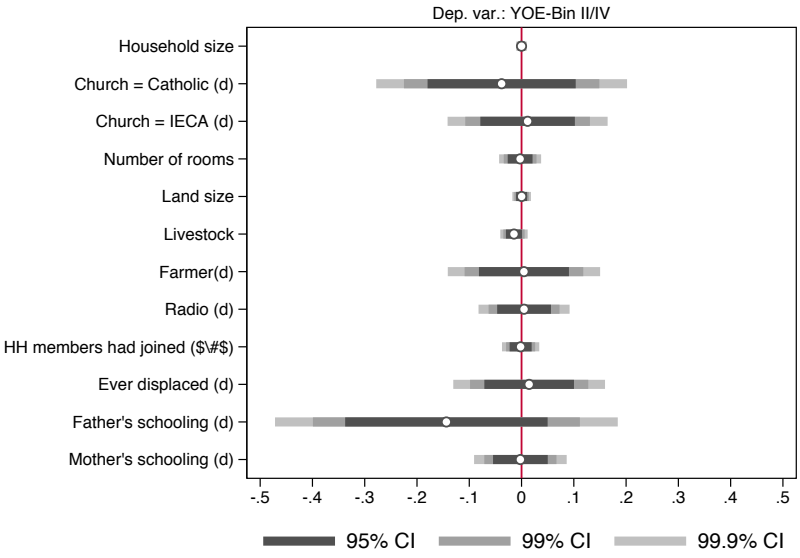
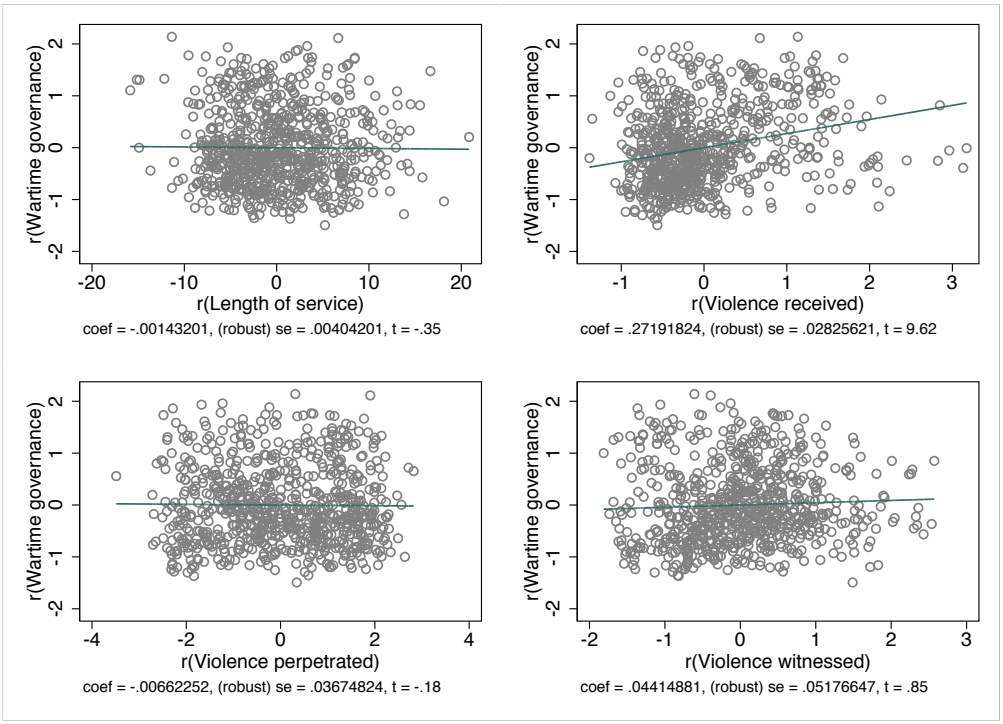
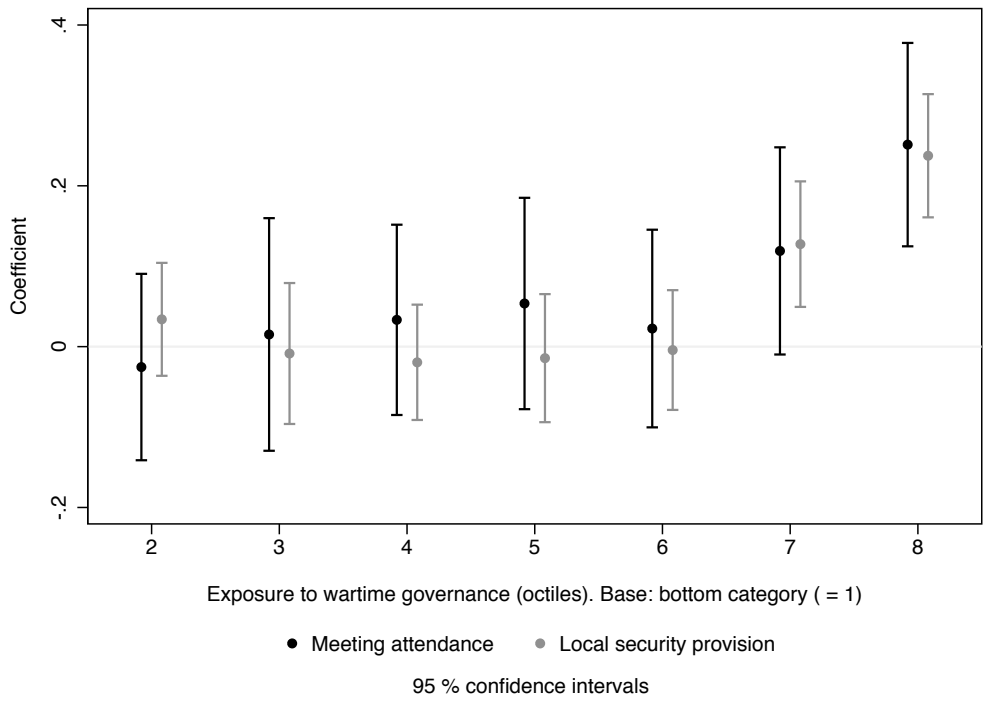


FIGURE A12. Residual-residual plots (other war experiences)



In each plot all standard regressors are partialled out. Top left: wartime military service in years. Top right: Violence received, measured by an average index based on 9 violent acts. Bottom left: Violence perpetrated, measured by an average index based on 3 violent acts. Bottom right: Violence witnessed, measured by an average index based on 5 violent acts. All 17 violent acts measured via a five-point frequency scale, ranging from never $(= 0)$ to extremely often $(= 4)$, based on survey instruments calibrated by a team of psychologists.

FIGURE A13. Effects of octiles of exposure to wartime governance



C ADDITIONAL TABLES

TABLE A1. Wartime interactions with civilians (ever)

	UNITA	MPLA
Exposure to wartime governance (ever)		
Services	0.52	0.60
Infrastructure	0.61	0.61
Arms	0.23	0.16
Conflict resolution	0.49	0.52
Protection	0.81	0.90
Req: conflict resolution	0.36	0.34
Req: protection	0.39	0.31
Other (non-violent) interactions with civilians (ever)		
Collected taxes	0.36	0.31
Attended social events together	0.50	0.51
Taught political ideas	0.70	0.63
Observations	226	534

Entries indicate the share of respondents who ever experienced the specific interaction when they were in the military.

TABLE A2. Key summary statistics

	Mean	SD	MIN	MAX
Main outcome: Participation in public good production				
Community meetings	0.22	0.417	0	1
Local security provision	0.06	0.246	0	1
Main explanatory variable: Exposure to wartime governance				
Exposure to wartime governance	1.16	0.772	0	3
... (in top quartile)	2.35	0.366	2	3
Armed group and pooled birth cohorts				
UNITA (main)	0.30	0.457	0	1
YOB $\leq$ 1962 (Bin 1)	0.43	0.496	0	1
1963 $<$ YOB $\leq$1971 (Bin 2)	0.38	0.485	0	1
1972 $<$ YOB $\leq$1975 (Bin 3)	0.09	0.282	0	1
YOB $>$1975 (Bin 4)	0.10	0.304	0	1
War control variables				
Length of service	11.15	6.806	1	40
Violence witnessed	1.49	0.853	0	4
Violence received	0.84	0.746	0	4
Violence perpetrated	2.13	1.415	0	4
Socio-economic control variables				
Radio	0.74	0.440	0	1
Wealth	0.00	2.501	-2	26
Education	0.85	0.361	0	1
Born in this comuna	0.74	0.439	0	1
Age	49.73	9.847	25	86
Wartime governance components				
Services	1.29	1.349	0	4
Infrastructure	1.52	1.526	0	4
Arms	0.40	0.949	0	4
Conflict resolution	1.07	1.274	0	4
Protection	2.46	1.329	0	4
Civilian requests for conflict resolution	0.70	1.137	0	4
Civilian requests for protection	0.67	1.092	0	4
Other non-violent interactions with civilians				
Taxes on economic activity	0.73	1.231	0	4
Attended social events together	0.92	1.128	0	4
Taught political ideas	1.54	1.372	0	4
Observations	760			

Binary measures: Community meetings, Local security, UNITA (main), Radio, Education, and Born here (1 = Yes, 0 = No). *Index measures*: Wartime governance (7 items), Violence witnessed (5), Violence received (9), Violence perpetrated (3), Wealth (20). *In years*: Length of service, Age. *Frequency measures*: Services, Infrastructure, Arms, Conflict, Resolution, Protection, Civilian requests for conflict resolution, Civilian requests for protection, Collected taxes, Attended social events together, Taught political ideas (4 = Extremely often,..., 0 = Never.)

TABLE A3. Selection into UNITA

	MPLA				
	(1)	(2)	(3)	(4)	(5)
Household size (#)	–0.001	–0.001	–0.002	–0.002	0.001
	(0.849)	(0.801)	(0.686)	(0.775)	(0.841)
Church = Catholic (d)	–0.023	–0.031	–0.034	–0.066	–0.052
	(0.700)	(0.583)	(0.544)	(0.239)	(0.349)
Church = IECA (d)	–0.032	–0.049	–0.053	–0.069	–0.050
	(0.627)	(0.427)	(0.388)	(0.256)	(0.401)
Number of rooms (#)	–0.001	0.015	0.013	0.006	0.019
	(0.945)	(0.292)	(0.346)	(0.634)	(0.150)
Land size (#)	–0.001	–0.004	–0.004	–0.005	–0.005
	(0.880)	(0.592)	(0.594)	(0.483)	(0.512)
Livestock (#)	–0.002	–0.001	–0.002	–0.002	–0.003
	(0.331)	(0.480)	(0.235)	(0.278)	(0.149)
Farmer (d)	0.061	0.082	0.064	0.058	0.082
	(0.381)	(0.215)	(0.325)	(0.372)	(0.199)
Radio (d)	–0.028	–0.027	–0.020	–0.014	–0.043
	(0.411)	(0.404)	(0.528)	(0.653)	(0.174)
HH members had joined (#)	–0.014	–0.015	–0.013	–0.015	–0.014
	(0.329)	(0.269)	(0.312)	(0.243)	(0.235)
Ever displaced (d)	–0.044	–0.031	–0.017	–0.014	–0.024
	(0.219)	(0.357)	(0.607)	(0.666)	(0.450)
Father's schooling (d)	–0.023	–0.011	–0.021	–0.002	0.002
	(0.557)	(0.761)	(0.571)	(0.966)	(0.961)
Mother's schooling (d)	–0.004	–0.023	–0.043	–0.054	–0.023
	(0.922)	(0.536)	(0.240)	(0.136)	(0.210)
Region	No	No	Yes	Yes	Yes
Date (decile)	No	Yes	Yes	Yes	No
Date (year)	No	No	No	No	Yes
Region x Date (decile)	No	No	No	Yes	No
Region x Date (year)	No	No	No	No	Yes
Observations	759	759	759	759	759
R^2	0.01	0.10	0.16	0.22	0.34
Adj R^2	–0.01	0.08	0.13	0.15	0.20
p(background joint)	0.800	0.796	0.647	0.623	0.602

Pre-Location FE: full set of recruitment region fixed effects. Significance levels: * p $<$ 0.1, ** p $<$ 0.05, *** p $<$ 0.01. Classical standard errors.

TABLE A4. Correlations of treatment with military or background traits

	Sample			Difference	
		High exposure			
	Full	Yes	No	Diff	*p*
Background					
Farming household (d)	0.94	0.94	0.93	0.00	0.87
Catholic household (d)	0.65	0.64	0.65	–0.01	0.90
Father any schooling (d)	0.57	0.54	0.57	–0.03	0.49
Mother any schooling (d)	0.39	0.40	0.38	0.01	0.81
Household size (#)	7.48	7.73	7.41	0.33	0.22
HH members recruited (#)	0.90	0.94	0.88	0.05	0.62
HH members killed (#)	0.15	0.17	0.14	0.03	0.30
Subjective health (1-10)	6.15	6.43	6.08	0.35	0.14
Any training (d)	0.06	0.04	0.07	–0.03	0.18
Any schooling (d)	0.64	0.73	0.61	0.12***	0.00
Schooling (yrs)	2.43	2.82	2.32	0.50**	0.02
Armed group and pooled birth cohorts					
UNITA (main)	0.30	0.30	0.30	0.01	0.87
YOB $\leq$ 1962	0.43	0.46	0.43	0.03	0.51
1963 $<$ YOB $\leq$1971	0.38	0.40	0.37	0.02	0.58
1972 $<$ YOB $\leq$1975	0.09	0.07	0.09	–0.02	0.34
YOB $>$1975	0.10	0.08	0.11	–0.03	0.29
Military					
Any training (d)	0.97	0.96	0.97	–0.00	0.82
Training (weeks)	15.38	19.35	14.31	5.04***	0.00
Role: infant (d)	0.43	0.36	0.44	–0.08*	0.07
Rank: private (d)	0.47	0.44	0.48	–0.04	0.40
Combat zone (d)	0.77	0.86	0.75	0.11***	0.00
Battallions (#)	2.14	2.40	2.07	0.33*	0.05

Binary measures of background and military variables are indicated by '(d)'. All other measures of background and military variables are measured as a quantity. Significance levels: * p $<$ 0.1, ** p $<$ 0.05, *** p $<$ 0.01.

TABLE A5. Correlations of the instrument with military or background traits

	Sample			Difference	
		UNITA x YOB-Bin2/4 = 1			
	Full	Yes	No	Diff	*p*
Background					
Farming household (d)	0.94	0.95	0.93	0.02	0.54
Catholic household (d)	0.65	0.68	0.64	0.04	0.39
Father any schooling (d)	0.57	0.52	0.58	–0.06	0.24
Mother any schooling (d)	0.39	0.38	0.39	–0.01	0.86
Household size (#)	7.48	7.28	7.51	–0.23	0.45
HH members recruited (#)	0.90	0.75	0.92	–0.17	0.16
HH members killed (#)	0.15	0.17	0.14	0.03	0.41
Subjective health (1-10)	6.15	5.98	6.18	–0.20	0.45
Any training (d)	0.06	0.09	0.05	0.04*	0.08
Any schooling (d)	0.64	0.59	0.65	–0.05	0.29
Schooling (yrs)	2.43	2.14	2.48	–0.34	0.15
Military					
Any training (d)	0.97	0.97	0.97	–0.00	0.99
Training (weeks)	15.38	14.19	15.60	–1.41	0.20
Role: infant (d)	0.43	0.47	0.42	0.05	0.35
Rank: private (d)	0.47	0.41	0.48	–0.07	0.16
Combat zone (d)	0.77	0.78	0.77	0.01	0.89
Battallions (#)	2.14	2.09	2.15	–0.06	0.76

Binary measures of background and military variables are indicated by '(d)'. All other measures of background and military variables are measured as a quantity. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

TABLE A6. Correlations of the instrument with pre-service variables

	UNITA x YOB-Bin 24		UNITA first army			
	(1)	(2)	(3) Bin 24	(4) Bin 24	(5) Bin 24	(6) Bin 24
Household size	0.000	0.000	–0.003	0.002	–0.005	0.003
	(0.959)	(0.996)	(0.746)	(0.780)	(0.457)	(0.560)
Church = Catholic (d)	–0.040	–0.052	–0.079	0.032	–0.106	0.066
	(0.407)	(0.353)	(0.363)	(0.707)	(0.381)	(0.250)
Church = IECA (d)	–0.074	–0.087	–0.093	0.031	–0.114	0.086
	(0.154)	(0.166)	(0.338)	(0.727)	(0.417)	(0.391)
Number of rooms	–0.020*	–0.021	–0.025	0.016	–0.023	0.017
	(0.082)	(0.218)	(0.251)	(0.411)	(0.376)	(0.233)
Land size	–0.003	–0.003	–0.014	0.019	–0.008	0.014
	(0.683)	(0.564)	(0.217)	(0.166)	(0.136)	(0.220)
Livestock	–0.001	–0.002	–0.003	–0.001	–0.003	–0.004
	(0.444)	(0.148)	(0.295)	(0.666)	(0.105)	(0.169)
Farmer (d)	0.009	–0.014	0.024	0.080	–0.057	0.118
	(0.869)	(0.850)	(0.818)	(0.404)	(0.692)	(0.144)
Radio (d)	0.019	0.030	–0.024	–0.055	–0.017	–0.065
	(0.482)	(0.322)	(0.649)	(0.246)	(0.589)	(0.259)
Members joined (#)	–0.013	–0.012	–0.030	0.009	–0.028	0.010
	(0.233)	(0.143)	(0.146)	(0.657)	(0.121)	(0.404)
Ever displaced (d)	–0.013	–0.004	–0.032	–0.057	–0.011	–0.046
	(0.634)	(0.919)	(0.550)	(0.251)	(0.872)	(0.227)
Father's schooling (d)	–0.030	–0.036	–0.071	0.022	–0.069	0.020
	(0.328)	(0.342)	(0.215)	(0.686)	(0.283)	(0.722)
Mother's schooling (d)	0.017	0.005	0.014	–0.018	–0.000	–0.047
	(0.574)	(0.868)	(0.809)	(0.738)	(1.000)	(0.296)
Pre-Location FE	No	Yes	No	No	Yes	Yes
Observations	760	760	364	396	364	396
R^2	0.02	0.06	0.04	0.02	0.14	0.09

Pre-Location FE: full set of recruitment region fixed effects. Significance levels: * p $<$ 0.1, ** p $<$ 0.05, *** p $<$ 0.01. Standard errors in parentheses; in columns 1, 3 and 4 classical; in columns 2, 5 and 6 robust, clustered at the pre-service location level.

TABLE A7. Correlations of the instrument with experiences of violence

	Sample			Difference	
		UNITA x YOB-Bin 24 = 1			
	Full	Yes	No	Diff	*p*
Specific experiences					
Battle: In line of fire	4.64	4.23	4.72	–0.49	0.67
Battle: Severely injured	0.80	0.67	0.83	–0.16	0.21
Battle: Many lose life	2.02	2.68	1.90	0.78	0.11
Civilians: Looting	1.63	1.88	1.58	0.30	0.43
Civilians: Massacres	0.96	1.03	0.95	0.08	0.74
Civilians: Sexual violence	0.65	0.54	0.67	–0.13	0.70
Index measures					
Fighting experience	1.57	1.60	1.56	0.04	0.68
Battle-field violence received	1.32	1.28	1.33	–0.05	0.57
Violence received (full)	0.84	0.78	0.85	–0.08	0.32
Violence perpetrated (full)	2.15	2.21	2.14	0.07	0.63
Wartime governance (index)	1.16	0.96	1.19	–0.23***	0.00

All measures were based on survey instruments calibrated by a team of psychologists. Specific measures of battle-field and one-sided violence: *In the line of fire*, *Severely injured*, *Many (companions) lose life*, *Looting*, *Massacres*, *Sexual violence (against civilian women)* denote the self-reported, total number of such situations experienced. For measure of violence against civilians, respondents were asked to report exposure to such situations, irrespective of their particular role in these acts, and they were informed that they would not be asked to reveal their role. Index measures: *Fighting experience (6 acts)*, *Battle-field violence received (3 acts) Violence received (full) (9 acts)*, *Violence perpetrated (full) (3 acts)* are based on a set of specific acts and situations, which were all measured via a five-point frequency scale, ranging from never ($= 0$) to extremely often ($= 4$). *UNITA (main)*: indicator of main armed group (1 = UNITA, 0 = MPLA). *YOB-Bin*: full set of indicators of year of birth bin (1 = Yes, 0 = No). *YOB-Bin 2/4* collapses *YOB-Bin 2* and *YOB-Bin 4* into a joint bin. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

TABLE A8. Robustness: Alternative standard errors

	(1) CGM 1-Way	(2) Moulton	(3) WCB	(4) Huber-White	(5) Classical
Panel A: Community meeting attendance					
WG high coefficient	0.173				
p-val	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Panel B: Local security provision					
WG high coefficient	0.153				
p-val	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
UNITA+YOB-Bin	Yes	Yes	Yes	Yes	Yes
Length of Service	Yes	Yes	Yes	Yes	Yes
Post-Location FE	Yes	Yes	Yes	Yes	Yes
Observations	760	760	760	760	760

Estimation of standard errors: one-way clustered by *bairro* of residence (col. 1), Moulton-corrected (col. 2), wild-cluster bootstrapped (col. 3), Huber-White-corrected (col. 4), classical (col. 5). *WG high*: indicator of high exposure to wartime governance (1 = Yes, 0 = No). *UNITA (main)*: indicator of main armed group (1 = UNITA, 0 = MPLA). *YOB-Bin*: full set of indicators of year of birth bin (1 = Yes, 0 = No). *Post-Location FE*: full set of *comuna* fixed effects.

TABLE A9. Non-linear model specifications

	Community Meetings				Local Security			
	(1) OLS	(2) OLS	(3) AME	(4) AME	(5) OLS	(6) OLS	(7) AME	(8) AME
WG high	0.161***	0.159***	0.165***	0.161***	0.152***	0.151***	0.199***	0.196***
	(0.039)	(0.039)	(0.039)	(0.039)	(0.030)	(0.030)	(0.037)	(0.036)
UNITA+YOB-Bin	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Length of Service	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pre-Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pre-Location FE	Yes	No	Yes	No	Yes	No	Yes	No
Post-Location FE	Yes	No	Yes	No	Yes	No	Yes	No
Observations	760	760	760	760	760	760	760	760

Estimation: OLS (cols. 1, 2, 5, 6), logit (cols. 3, 4, 7, 8; average marginal effect). *UNITA (main)*: indicator of main armed group (1 = UNITA, 0 = MPLA). *YOB-Bin*: full set of indicators of year of birth bin (1 = Yes, 0 = No). *Pre-Controls*: vector of eight pre-service family background characteristics. *Pre-Location*: full set of recruitment region fixed effects. *Post-Location*: full set of *comuna* fixed effects. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Huber-White standard errors in parentheses, fixed effects as in standard specifications (logit results to be analyzed with caution).

TABLE A10. Alternatively constructed indices

	Community Meetings				Local Security			
	(1) Ind1	(2) Ind2	(3) Ind3	(4) Ind4	(5) Ind1	(6) Ind2	(7) Ind3	(8) Ind4
WG index	0.063***	0.068***	0.067***	0.061***	0.054***	0.059***	0.058***	0.044***
	(0.015)	(0.019)	(0.017)	(0.013)	(0.010)	(0.009)	(0.011)	(0.012)
UNITA+Cohort	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Length of Service	Yes	Yes	Yes	No	Yes	Yes	Yes	No
Post-Location FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	760	760	760	760	760	760	760	760

Standardized coefficients; all indices standardized to zero mean and unit standard deviation. Ind1: standard index (cols. 1, 5). Ind2: index based on principal component analysis (cols. 2, 6). Ind3: index based on the method described in Anderson (2008) (cols. 3, 7). Ind4: standard index adjusted for length of service (cols. 4, 8). *UNITA (main)*: indicator of main armed group (1 = UNITA, 0 = MPLA). *YOB-Bin*: full set of indicators of year of birth bin (1 = Yes, 0 = No). *Length of Service*: length of wartime military service (in years). *Post-Location FE*: full set of *comuna* fixed effects. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors in parentheses, two-way clustered by *bairro* of residence and municipality of recruitment.

TABLE A11. Wartime governance index components: correlation

	Services	Infra-structure	Arms	Conflict resolution	Pro-tection	Req: conflict resolution	Req: protection
Services	1.000						
Infrastructure	0.503	1.000					
Arms	0.171	0.316	1.000				
Conflict resolution	0.180	0.278	0.383	1.000			
Protection	0.354	0.403	0.201	0.247	1.000		
Req: conflict resolution	0.118	0.164	0.302	0.374	0.183	1.000	
Req: protection	0.102	0.141	0.410	0.414	0.195	0.591	1.000

Req: conflict resolution: civilians requested help with conflict resolution. *Req: protection*: civilians requested protection.

TABLE A12. Wartime governance index components: impact

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: Community meetings attendance							
Services	0.009						
	(0.009)						
Infrastructure		0.026*					
		(0.014)					
Arms			0.047**				
			(0.021)				
Conflict resolution				0.050***			
				(0.013)			
Protection					0.043***		
					(0.008)		
Req: conflict resolution						0.042**	
						(0.019)	
Req: protection							0.041**
							(0.016)
Std. controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	760	760	760	760	760	760	760
R^2	0.10	0.10	0.11	0.11	0.11	0.10	0.10
Panel B: Participation in local security groups							
Services	0.022***						
	(0.008)						
Infrastructure		0.022**					
		(0.010)					
Arms			0.051***				
			(0.015)				
Conflict resolution				0.036***			
				(0.011)			
Protection					0.023***		
					(0.004)		
Req: conflict resolution						0.055***	
						(0.009)	
Req: protection							0.037***
							(0.013)
Std. controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	760	760	760	760	760	760	760
R^2	0.07	0.08	0.11	0.09	0.08	0.11	0.09

Standardized measures, with mean zero and unit standard deviation. *Std. controls*: Same specification as in column 1 of Table 5. *Req: conflict resolution*: civilians requested help with conflict resolution. *Req: protection*: civilians requested protection. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors in parentheses, two-way clustered by *bairro* of residence and municipality of recruitment.

TABLE A13. Results for full index of exposure

	Community Meetings		Local Security	
	(1) OLS	(2) IV	(3) OLS	(4) IV
WG index	0.057***	0.152**	0.054***	0.113*
	(0.015)	(0.075)	(0.010)	(0.060)
Std. controls	Yes	Yes	Yes	Yes
Observations	760	760	760	760
F		12.96		12.96

WG index: full index measure of exposure to wartime governance, standardized to zero mean and unit standard deviation. *Std. controls*: same specification as in column 1 of Table 5. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors in parentheses, two-way clustered by *bairro* of residence and municipality of recruitment.

TABLE A14. IV estimates from alternative specifications of the instrument

	Community meetings			Local security		
	(1)	(2)	(3)	(4)	(5)	(6)
	24	2+4	2+3+4	24	2+4	2+3+4
WG high	0.338***	0.336***	0.343***	0.255**	0.251**	0.248**
	(0.140)	(0.140)	(0.138)	(0.119)	(0.119)	(0.116)
UNITA+YOB-Bin	Yes	Yes	Yes	Yes	Yes	Yes
Length of Service	Yes	Yes	Yes	Yes	Yes	Yes
Post-Controls	Yes	Yes	Yes	Yes	Yes	Yes
Post-Location FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	760	760	760	760	760	760
R^2	0.04	0.05	0.05	0.06	0.06	0.06
F-stat(IV)	48.59	30.81	21.71	48.59	30.81	21.71

WG high: indicator of high exposure to wartime governance (1 = Yes, 0 = No). *UNITA (main)*: indicator of main armed group (1 = UNITA, 0 = MPLA). *YOB-Bin*: full set of indicators of year of birth bin (1 = Yes, 0 = No). *Length of Service*: length of wartime military service (in years). *Post-Controls*: radio ownership (1 = Yes, 0 = No), assets (index), years of schooling, born in this comuna (1 = Yes, 0 = No). *Post-Location FE*: full set of *comuna* fixed effects. Pre-service controls omitted from model on grounds of statistical power (point estimates are not noticeable different when these are included). Significance levels: * p $<$ 0.1, ** p $<$ 0.05, *** p $<$ 0.01. Robust standard errors in parentheses, two-way clustered by *bairro* of residence and municipality of recruitment.

TABLE A15. Violence received: First-stage mechanics

	Violence received			
	(1)	(2)	(3)	(4)
UNITA x YOB-Bin 3	0.335***	0.383**	0.347**	0.388**
	(0.123)	(0.151)	(0.138)	(0.161)
UNITA x YOB-Bin 24			0.022	0.008
			(0.081)	(0.100)
UNITA+YOB-Bin	Yes	Yes	Yes	Yes
Length of Service	Yes	Yes	Yes	Yes
Post-Controls	No	Yes	No	Yes
Pre-Controls	Yes	Yes	Yes	Yes
Pre-Location FE	Yes	Yes	Yes	Yes
Post-Location FE	No	Yes	No	Yes
Observations	760	760	760	760
R^2	0.08	0.11	0.08	0.11
F(UNITA x YOB-Bin 3 = 0)	7.46	6.41	6.29	5.79

UNITA (main): indicator of main armed group (1 = UNITA, 0 = MPLA). *YOB-Bin x*: indicator of year of birth bin (1 = Yes, 0 = No). The sample is grouped into four bins (1 – 4), as explained in the text. *YOB-Bin 1* is the oldest group and the reference bin, YOB-Bin 4 is the youngest group. *YOB-Bin 24* collapses *YOB-Bin 2* and *YOB-Bin 4* into a joint bin. *YOB-Bin*: full set of indicators of year of birth bin (1 = Yes, 0 = No). *Length of Service*: length of wartime military service (in years). *Post-Controls*: radio ownership (1 = Yes, 0 = No), assets (index), years of schooling, born in this comuna (1 = Yes, 0 = No). *Pre-Controls*: vector of eight pre-service family background characteristics. *Pre-Location FE*: full set of recruitment region fixed effects. *Post-Location FE*: full set of *comuna* fixed effects. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors in parentheses, two-way clustered by *bairro* of residence and municipality of recruitment.

TABLE A16. Robustness check: Violence received (OLS and IV)

	Community Meetings				Local Security			
	(1) OLS	(2) OLS	(3) IV	(4) IV	(5) OLS	(6) OLS	(7) IV	(8) IV
Violence received	0.052**	0.030	0.105	–0.014	0.046***	0.024	0.096	0.022
	(0.021)	(0.023)	(0.255)	(0.230)	(0.015)	(0.016)	(0.154)	(0.159)
WG high		0.139***		0.349**		0.140***		0.214*
		(0.043)		(0.169)		(0.037)		(0.122)
UNITA+YOB-Bin	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Length of Service	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Post-Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pre-Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pre-Location FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Post-Location FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	760	760	760	760	760	760	760	760
R^2	0.13	0.15	0.12	0.11	0.09	0.13	0.07	0.12
F- VR			5.85	2.92			5.85	2.92
F-SW VR			5.85	4.92			5.85	4.92
F-AP VR			5.85	5.31			5.85	5.31
F- WG				153.61				153.61
F-SW WG				35.62				35.62
F-AP WG				198.74				198.74

Violence received: index of violence received, standardized to zero mean and unit standard deviation. *WG high*: indicator of high exposure to wartime governance (1 = Yes, 0 = No). *UNITA (main)*: indicator of main armed group (1 = UNITA, 0 = MPLA). *YOB-Bin*: full set of indicators of year of birth bin (1 = Yes, 0 = No). *Post-Controls*: radio ownership (1 = Yes, 0 = No), assets (index), years of schooling, born in this comuna (1 = Yes, 0 = No). *Pre-Controls*: vector of eight pre-service family background characteristics. *Pre-Location FE*: full set of recruitment region fixed effects. *Post-Location FE*: full set of *comuna* fixed effects. *F-VR*: 1st stage F-statistic "Violence received", *F-SW VR*: Sanderson-Windmeijer F-statistic "Violence received", *F-AP VR*: Angrist-Pischke F-statistic "Violence received". *F-WG*: 1st stage F-statistic "WG high", *F-SW WG*: Sanderson-Windmeijer F-statistic "WG high", *F-AP WG*: Angrist-Pischke F-statistic "WG high". *WG high*: indicator of high exposure to wartime governance (1 = Yes, 0 = No). Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors in parentheses, in columns 1 and 3 clustered by municipality of recruitment, in columns 2 and 4 two-way clustered by *bairro* of residence and municipality of recruitment.

TABLE A17. Mechanisms: heterogeneity in age at entry

	Community Meetings			Local Security		
	(1)	(2)	(3)	(4)	(5)	(6)
Age at military entry	$<$18	18-24	$>$24	$<$18	18-24	$>$24
WG high	0.110*	0.227***	0.152**	0.134***	0.158***	0.220***
	(0.063)	(0.055)	(0.059)	(0.031)	(0.050)	(0.065)
Std. controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	319	277	163	319	277	163
R^2	0.18	0.22	0.15	0.14	0.17	0.25

WG high: indicator of high exposure to wartime governance (1 = Yes, 0 = No). *Std. controls*: same specification as in column 1 of Table 5. Significance levels: * p $<$ 0.1, ** p $<$ 0.05, *** p $<$ 0.01. Robust standard errors in parentheses, two-way clustered by *bairro* of residence and municipality of recruitment.

ONLINE APPENDIX

A WARTIME GOVERNANCE INDEX AND OUTCOME VARIABLES

Measures of experience with wartime governance (treatment). In the survey, we asked respondents about the overall frequency with which they experienced each aspect during their time with the armed group, coding seven variables:

Service provision. Question: 'Overall, how frequently did you/your unit provide or help with access to schooling, water, electricity, communication or deliver related services?' (Five-point scale, ranging from 'never' (=0) to 'extremely often' (=4)).

Building infrastructure. Question: 'Overall, how frequently did you/your unit build local facilities, such as schools, health posts, community centers, or buildings for religious purposes?' (Five-point scale, ranging from 'never' (=0) to 'extremely often' (=4)).

Provision of arms. Question: 'Overall, how frequently did you/your unit provide arms to civilians to defend themselves?' (Five-point scale, ranging from 'never' (=0) to 'extremely often' (=4)).

Help with conflict resolution. Question: 'Overall, how frequently did you/your unit help with the resolution of disputes between civilians, including conflicts over land or water?' (Five-point scale, ranging from 'never' (=0) to 'extremely often' (=4)).

Protection and security. Question: 'Overall, how frequently did you/your unit protect civilians from war violence/attacks by armed groups?' (Five-point scale, ranging from 'never' (=0) to 'extremely often' (=4)).

Requests for help with conflict resolution. Question: 'Overall, how frequently did villagers approach/turn to you/your unit for help with the resolution of disputes between civilians, including conflicts over land or water?' (Five-point scale, ranging from 'never' (=0) to 'extremely often' (=4)).

Requests for protection and security. Question: 'Overall, how frequently did villagers approach/turn to you/your unit for protection of civilians from war violence/attacks by armed groups?' (Five-point scale, ranging from 'never' (=0) to 'extremely often' (=4)).

Measures of planning and implementing the delivery of public goods. We follow the literature on civic participation and use binary indicators (e.g. Bellows and Miguel 2009), which are least prone to measurement error. We measure involvement in the planning stage via individual participation in community meetings — the deliberative institutions where planning takes place — via the question: 'Did you attend any community meetings in the past year?' (1 if 'Yes'; 0 otherwise). Participation in the delivery of public goods is captured through a binary variable based on the question: 'Are you a member of a local self-security group or initiative?' (1 if 'Yes'; 0 otherwise).