

ONLINE APPENDIX

Community organization and armed group behaviour

Evidence from Colombia

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A Model proofs

Proof of Proposition 1. Since pay-offs are realized every period, pre-existing institutional capacity and rural residents' preferences are fixed, and ξ_t is independent and identically distributed, then, conditional on s , armed group presence, dominance, and participation are independent across time. Therefore, for every t and r :

$$\bar{P}_t^D = \bar{P}_r^D$$

$$\bar{P}_t^L = \bar{P}_r^L$$

$$\bar{P}_t^P = \bar{P}_r^P$$

Moreover, from 8 and 9

$$\bar{P}_t^L = \Pr(\bar{u}_i \leq u(s)) = \bar{P}_t^P$$

and from 7 and 9

$$\bar{P}_t^D = \Pr(\bar{u}_i \leq u(s) - v(s)) \geq \Pr(\bar{u}_i \leq u(s)) = \bar{P}_t^P$$

$$\Leftrightarrow -v(s) \geq 0$$

$$\Leftrightarrow s \leq \bar{s}$$

Proof of Proposition 2. Part 1 follows from $R(\Pr(\bar{u}_i \leq u(s) - v(s)))$ being monotonically increasing in s . For part 2, since $R' > 0$ and $u(s) - v(s)$ is increasing on s , then $R(\Pr(\bar{u}_i \leq u(s) - v(s)))$ is also increasing on s . Thus, for every $\hat{d}_o > \hat{d}$, there is a $\hat{s}_o > \hat{s}$ such that $R(\Pr(\bar{u}_i \leq u(\hat{s}_o) - v(\hat{s}_o))) = \hat{d}_o$; and for $\hat{d}_o < \hat{d}$, there is a $\hat{s}_o < \hat{s}$ such that $R(\Pr(\bar{u}_i \leq u(\hat{s}_o) - v(\hat{s}_o))) = \hat{d}_o$.

Proof of Proposition 3. Note that for $\hat{s} \geq \bar{s}$:

1. If $s < \bar{s} \leq \hat{s}$ then $D_t^*|_{\xi_t \geq 0} = 0$ and $E[p_{it}^*|A_t^* = 1, s] - E[p_{it}^*|A_t^* = 0, s] = 0$

2. If $\bar{s} \leq s \leq \hat{s}$ then $D_t^*|_{\xi_t \geq 0} = 0$ and $E[p_{it}^*|A_t^* = 1, s] - E[p_{it}^*|A_t^* = 0, s] = 0$

3. If $\bar{s} \leq \hat{s} < s$ then $D_t^*|_{\xi_t \geq 0} = 1$ and $E[p_{it}^*|A_t^* = 1, s] - E[p_{it}^*|A_t^* = 0, s] < 0$

and for $\hat{s} < \bar{s}$:

1. If $s \leq \hat{s} < \bar{s}$ then $D_t^*|_{\xi_t \geq 0} = 0$ and $E[p_{it}^*|A_t^* = 1, s] - E[p_{it}^*|A_t^* = 0, s] = 0$

2. If $\hat{s} < s \leq \bar{s}$ then $D_t^*|_{\xi_t \geq 0} = 1$ and $E[p_{it}^*|A_t^* = 1, s] - E[p_{it}^*|A_t^* = 0, s] \geq 0$

3. If $\hat{s} < \bar{s} < s$ then $D_t^*|_{\xi_t \geq 0} = 1$ and $E[p_{it}^*|A_t^* = 1, s] - E[p_{it}^*|A_t^* = 0, s] < 0$

Proof of proposition 4. Since R and d are monotonically increasing in \bar{P} , and \bar{P} is monotonically increasing in s , if there exists a $\bar{s}^r \in \mathcal{S}$ such that $R(\Pr(\bar{u}_i \leq u(\bar{s}^r) - v(s) + r(\bar{s}^r))) = d(\Pr(\bar{u}_i \leq u(\bar{s}^r) - v(\bar{s}^r) + r(\bar{s}^r)))$, then $R(\bar{P}) - d(\bar{P})$ satisfy the single crossing property. For $s \leq \bar{s}^r$, $D_t^*|_{\xi_t \geq 0} = 1$ and $E[p_{it}^*|A_t^* = 1, s] = \Pr(\bar{u}_i \leq u(s) - v(s) + r(s)) > \Pr(\bar{u}_i \leq u(s)) = E[p_{it}^*|A_t^* = 0, s]$. For $s > \bar{s}^r$, $D_t^*|_{\xi_t \geq 0} = 0$ and $E[p_{it}^*|A_t^* = 1, s] = \Pr(\bar{u}_i \leq u(s)) = \Pr(\bar{u}_i \leq u(s)) = E[p_{it}^*|A_t^* = 0, s]$.

B Matching records of parliamentary transfers with ELCA communities

We digitized official information on parliamentary transfers available in the Annals of the National Congress. This information contains the name and municipality of the recipient, the amount of the transfer, and the purpose of the funds. If the recipient is a JAC, the name of the community (*vereda*) is specified. First, we match ELCA communities with communities in the public records by name and municipality. Since communities are not official jurisdictions, their names might have changed over time. To reduce mismeasurement due to variations in the names of communities, we follow a two-step procedure. First, we use a fuzzy merge algorithm to match names in the ELCA data with names in the Congress records. With this procedure, we were able to find 91 ELCA communities in the Congress Annals. Second, use the GPS co-ordinates of the communities to identify alternative names of these communities based on a map of *veredas* available in the National Department of Statistics (DANE). We then apply the fuzzy merge algorithm to match these alternative names with the Congress records. In this step, we were able to match 27 additional communities.

C Sample selection and bounds on treatment effects

We follow Lee (2009) to estimate bounds on the effect of the exposure to armed groups on participation in local organizations. We present the analysis only for communities in the highest tercile of parliamentary transfers, since we aim to check if sample selection is inducing the negative and statistically significant effect that we find in these communities. We compute the change in participation and individual exposure to armed groups between rounds for each individual in the sample. As a baseline for the analysis, we estimate the first-differences equations:

$$\Delta P_{i,c,m,r} = \beta^+ \Delta A_{c,m,r} + \epsilon^+_{i,c,m,r} \quad \text{if} \quad \Delta A_{c,m,r} \geq 0$$

$$\Delta P_{i,c,m,r} = \beta^- \Delta A_{c,m,r} + \epsilon^-_{i,c,m,r} \quad \text{if} \quad \Delta A_{c,m,r} \leq 0$$

The change in exposure to armed groups can take three possible values: $\Delta A_{c,m,r} = -1$ if armed groups left the community between rounds, $\Delta A_{c,m,r} = 0$ if the presence of armed groups did not change, and $\Delta A_{c,m,r} = 1$ if armed groups arrived between rounds. We estimate independently the effect of a positive and a negative $\Delta A_{c,m,r}$, taking as the control group individuals who did not experienced changes in their exposure to armed groups, $\Delta A_{c,m,r} = 0$. We then follow Lee (2009) to compute bounds on β^+ and β^- .

Table C1: First-differences estimates and Lee bounds in strong communities

Panel A: 2013–10, 2016–13				
	Coefficient (S.E.)	Lower bound (S.E.)	Upper bound (S.E.)	n
β^-	-0.091 (0.058)	-0.106 (0.053)	-0.077 (0.053)	3,201
β^+	-0.033 (0.012)	-0.0332 (0.116)	-0.0323 (0.116)	3,073
Panel B: 2013–10				
β^-	-0.123 (0.036)	-0.138 (0.059)	-0.112 (0.056)	1,696
β^+	-0.101 (0.028)	-0.112 (0.118)	-0.091 (0.116)	1,634
Panel C: 2013–16				
β^-	-0.001 (0.067)	-0.074 (0.104)	0.058 (0.100)	1,505
β^+	-	-	-	

Note: sample includes only communities with high pre-existing institutional capacity; β^+ is not identified for 2013–16 because there is no arrival of armed groups in communities during this period; S.E. = standard error.

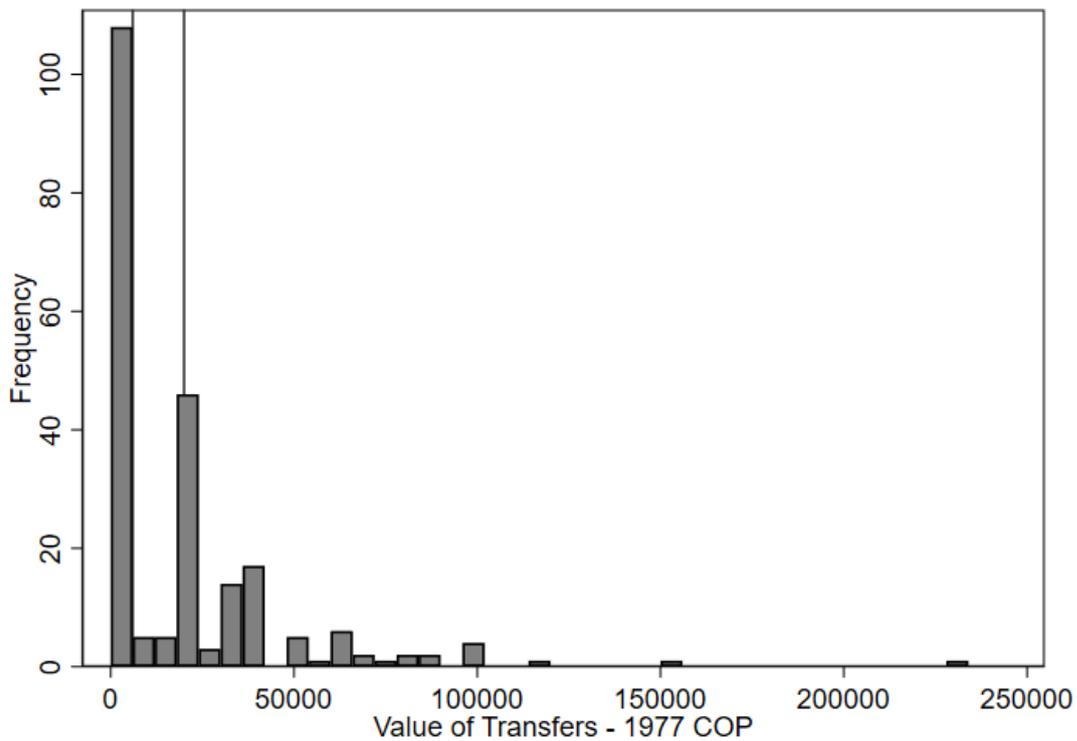
Source: authors' calculation based on ELCA data.

Table C1 presents the results for the whole period and for each follow-up round individually. Overall, we find negative upper bounds for the effects of armed group presence on participation in local organizations. Note that since there is a sharp reduction in the presence of armed groups

after 2013, for the last period we do not have observations with $\Delta A_{c,m,r} = 1$ and we cannot identify β^+ .

D Additional figures and tables

Figure D1: Distribution of parliamentary transfers in 1977 across ELCA communities



Source: authors' calculations based on ELCA data and public records on parliamentary transfers.

Table D1: Sample size by survey round

	Round		
	2010	2013	2016
All household heads and spouses	7,562	7,664	6,590
Migrants		1,258	894
Migrants with community information		515	486
Migrants with community and 1977 parliamentary transfers information		348	412

Note: migrants are defined as those individuals who report a change in the community of residence between waves.

Source: authors' calculations based on ELCA data and public records on parliamentary transfers.

Table D2: Baseline community characteristics in 2010, by pre-existing institutional capacity

	Pre-existing institutional capacity		
	Low	Intermediate	High
	(1)	(2)	(3)
Value of parliamentary transfers (1977 COP)	0.00	18,404.07	54,769.70
	(0.00)	(3,641.55)	(34,546.21)
Time to urban centre (hours)	0.61	0.92	0.74
	(0.44)	(0.83)	(0.61)
Number of households in community	85.61	92.76	87.68
	(78.24)	(94.36)	(92.43)
Public institutions	2.06	2.39	2.50
	(1.72)	(1.63)	(2.07)
Public institutions: childcare	0.24	0.13	0.43
	(0.51)	(0.38)	(0.65)
Public institutions: schools	1.55	1.98	1.70
	(1.12)	(1.20)	(1.28)
Public institutions: health facilities	0.06	0.09	0.10
Average annual rainfall between waves	7.50	7.57	7.55
	(0.34)	(0.40)	(0.28)
Droughts	0.53	0.40	0.46
Log daily agricultural wage	9.59	9.87	9.67
	(0.42)	(0.14)	(0.35)
Years of armed group presence 2001–07	0.59	1.16	0.81
	(1.33)	(2.05)	(1.55)
Community residents help each other	0.95	0.88	0.96
Infrastructure investments between waves: education	0.36	0.38	0.37
Infrastructure investments between waves: transport and communication	0.65	0.76	0.47
Infrastructure investments between waves: other	0.12	0.18	0.12
Community violent shock: any	0.09	0.28	0.05
Community violent shock: kidnapping	0.00	0.06	0.00
Community violent shock: land eviction	0.01	0.02	0.00
Community violent shock: homicides	0.08	0.24	0.05
Observations	108	56	60

Note: low, intermediate, and high pre-existing institutional capacity correspond to terciles of the distribution of parliamentary transfers in 1977; 'public institutions' refers to the total number of public institutions of different categories available in the community; childcare and schools can take values between 0 and 2 and 0 and 4 respectively, corresponding to the number of public institutions that provide different types of educational and childcare services; health facilities is a dummy variable for the presence of health facilities in the community.

Source: authors' calculations based on ELCA data and public records on parliamentary transfers.

Table D3: Participation in community organizations

	Survey wave			All
	2010	2013	2016	
% of participations				
Overall participation				
Participation	0.26	0.34	0.29	0.30
Meeting attendance	0.24	0.33	0.27	0.28
Hold leadership position	0.11	0.14	0.14	0.13
Political organization				
Participation	0.18	0.21	0.18	0.19
Meeting attendance	0.16	0.20	0.17	0.18
Hold leadership position	0.07	0.09	0.09	0.09
Other organizations				
Participation	0.12	0.22	0.17	0.17
Meeting attendance	0.11	0.20	0.15	0.16
Hold leadership position	0.05	0.07	0.07	0.07
Observations	5,809	5,879	5,154	16,842

Note: sample includes household heads and spouses for whom the full set of household and community variables is available; political organizations include community boards (JACs), political parties, and unions; other organizations include producers' associations, religious groups, charities, and environmental, cultural, sport, or security organizations.

Source: authors' calculations based on ELCA data.

Table D4: Participation in local organizations across armed group presence

Mean (std dev.)	Armed group presence			(4)
	Whole sample (1)	Yes (2)	No (3)	
Overall participation				
Participation	0.30	0.39	0.30	***
Meeting attendance	0.28	0.38	0.28	***
Hold leader position	0.13	0.17	0.13	***
Observations	16,842	640	16,202	

Note: columns 1 to 3 present the share of individuals who participate, attend meetings, and hold leadership positions in each sample; political organizations include community boards (JACs), political parties, and unions; other organizations include producers' associations, religious groups, charities, and environmental, cultural, sport, or security organizations; armed group presence in the community is defined as a dummy variable for the presence of armed groups in the year of the survey or within two years before the survey; column 4 presents the test for mean differences across the sample with and without armed group presence; *** p<0.01, ** p<0.05, * p<0.1.

Source: authors' calculations based on ELCA data.

Table D5: Descriptive statistics of main individual and household variables across pre-existing institutional capacity

	Pre-existing institutional capacity		
	Low (1)	Intermediate (2)	High (3)
Panel A: Household head and spouse variables			
Meeting attendance any organization	0.29	0.27	0.25
Hold leadership position any organization	0.14	0.13	0.11
Meeting attendance political organization	0.19	0.17	0.14
Hold leadership position political organization	0.09	0.08	0.06
Meeting attendance other organization	0.15	0.15	0.15
Hold leadership position other organization	0.06	0.06	0.06
Age	47.07 (13.50)	46.24 (13.39)	46.43 (13.65)
= 1 if male	0.48	0.48	0.48
Years of education	4.53 (3.54)	4.63 (3.50)	4.64 (3.61)
Panel B: Household variables			
Children under five	0.47 (0.76)	0.48 (0.75)	0.48 (0.76)
Number of household members	4.62 (2.09)	4.59 (2.03)	4.56 (2.01)
Wealth index	0.12 (2.71)	-0.12 (1.86)	-0.12 (2.24)
Household violent shock	0.01	0.01	0.01
Observations	10,131	4,900	6,150

Note: pre-existing institutional capacity defined as terciles of 1977 parliamentary transfers to community; see text for more details.

Source: authors' calculations based on ELCA data.

Table D6: Descriptive statistics across migration status

Mean (std dev.)	Migration status			
	Whole Sample	Migrant	Non-migrant	
	(1)	(2)	(3)	(4)
Participation any organization	0.30	0.26	0.30	***
Meeting attendance any organization	0.28	0.24	0.29	***
Hold leadership position any organization	0.13	0.10	0.13	***
Armed group presence between waves	0.02	0.04	0.02	***
Children under five	0.51	0.57	0.50	***
	(0.77)	(0.77)	(0.77)	
Number of household members	4.65	4.53	4.67	**
	(1.98)	(1.96)	(1.98)	
Wealth index	0.01	-0.01	0.01	
	(2.81)	(2.85)	(2.80)	
Age	45.78	42.85	46.24	***
	(12.77)	(12.45)	(12.76)	
= 1 if male	0.48	0.49	0.48	
Years of education	4.49	4.64	4.47	*
	(3.49)	(3.53)	(3.48)	
Time to urban centre (hours)	0.77	0.74	0.78	**
	(0.67)	(0.60)	(0.68)	
Number of households in community	116.60	97.52	119.58	***
	(138.80)	(132.62)	(139.52)	
Public institutions: childcare	0.35	0.23	0.37	***
	(0.61)	(0.50)	(0.63)	
Public institutions: schools	2.06	1.97	2.07	***
	(1.14)	(1.15)	(1.14)	
Public institutions: health facilities	0.08	0.08	0.08	
Daily agricultural wage (COP)	18,130.53	19,011.26	17,993.07	***
	(5,654.38)	(4,752.04)	(5,770.61)	
Infrastructure investments between waves: education	0.38	0.32	0.39	***
Infrastructure investments between waves: transport and communication	0.74	0.74	0.74	
Infrastructure investments between waves: other	0.15	0.16	0.15	
Average annual rainfall between waves	7.31	7.44	7.29	***
	(0.36)	(0.38)	(0.36)	
Observations	11,844	530	11,314	

Note: migration is defined by whether the individual reports a change in community of residence between each wave; column 4 presents the test for mean differences across the samples of migrants or non-migrants; *** p<0.01, ** p<0.05, * p<0.1; childcare and schools take values between 0 and 2 and 0 and 4 respectively, corresponding to the number of public institutions that provide different types of educational and childcare services; health is a dummy variable for the presence of health facilities in the community.

Source: authors' calculations based on ELCA data.

Table D7: Migration rounds and presence of armed groups

	Pre-existing institutional capacity					
	Low (1)	Intermediate (2)	High (3)	Low (4)	Intermediate (5)	High (6)
Armed group presence between waves	-0.017 (0.036)	-0.094 (0.133)	-0.034 (0.102)	-0.015 (0.036)	-0.096 (0.133)	-0.032 (0.106)
	[-0.091— 0.056]	[-0.374— 0.186]	[-0.243— 0.174]	[-0.088— 0.058]	[-0.376— 0.183]	[-0.249— 0.185]
Participation any ($t - 1$)				0.014 (0.017)	-0.015 (0.028)	0.035 (0.021)
				[-0.020— 0.048]	[-0.075— 0.045]	[-0.009— 0.078]
Observations	4,598	1,940	2,802	4,504	1,916	2,762
R-squared	0.670	0.637	0.670	0.669	0.639	0.664
FE	Individual	Individual	Individual	Individual	Individual	Individual

Note: standard errors with municipality-year and individual cluster in parenthesis, 95 per cent confidence interval in square brackets; all estimations include municipality-year dummies and control variables are lagged: age, age squared, sex, years of education, number of household members, number of children under five, wealth index, time to reach municipal urban centre, total number of households in the community, total rainfall between rounds, presence of public institutions in the community, and investments in public between rounds; pre-existing institutional capacity defined as terciles of 1977 parliamentary transfers to community; for the baseline survey, presence between rounds corresponds to the presence of armed groups between 2008 and 2010; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Source: authors' calculations based on ELCA data.

Table D8: Descriptive statistics of main individual and household characteristics across armed group presence

Mean (std dev.)	Armed group presence			
	Whole sample (1)	Yes (2)	No (3)	
Panel A: Household head and spouse characteristics				
Age	47.42 (12.84)	45.94 (12.53)	47.48 (12.85)	***
= 1 if male	0.48	0.49	0.48	
Years of education	4.52 (3.48)	4.61 (3.50)	4.51 (3.48)	
Observations	16,842	640	16,202	
Panel B: Household characteristics				
Children under five	0.42 (0.71)	0.53 (0.79)	0.42 (0.71)	***
Number of household members	4.43 (2.00)	4.84 (2.17)	4.41 (1.99)	***
Wealth index	-0.01 (2.34)	-0.11 (2.78)	-0.00 (2.32)	
Household violent shock	0.01	0.02	0.01	
Observations	9,700	363	9,337	

Note: armed group presence in the community is defined as a dummy variable for the presence of armed groups in the year of the survey or within two years before the survey; column 4 presents the test for mean differences across the sample with and without armed group presence; *** p<0.01, ** p<0.05, * p<0.1.

Source: authors' calculations based on ELCA data.

Table D9: Descriptive statistics of main community variables across armed group presence

Mean (std dev.)	Armed group presence		
	Whole sample (1)	Yes (2)	No (3) (4)
Time to urban centre (hours)	0.68 (0.55)	1.25 (0.86)	0.66 (0.52) ***
Number of households in community	89.77 (85.21)	68.52 (41.81)	90.72 (86.54)
Public institutions: childcare	0.29 (0.57)	0.19 (0.40)	0.29 (0.57)
Public institutions: health facilities	0.08	0.15	0.07
Public institutions: schools	2.04 (1.11)	2.07 (1.47)	2.03 (1.10)
Infrastructure investments between waves: education	0.37	0.48	0.36
Infrastructure investments between waves: transport and communication	0.69	0.56	0.70
Infrastructure investments between waves: other	0.15	0.07	0.15
Log daily agricultural wage	9.87 (0.38)	9.81 (0.23)	9.87 (0.39)
Average annual rainfall between waves	7.40 (0.37)	7.64 (0.30)	7.38 (0.37) ***
Community violent shock: any	0.19	0.48	0.18 ***
Community violent shock: kidnapping	0.06	0.11	0.06
Community violent shock: land eviction	0.04	0.07	0.04
Community violent shock: homicides	0.16	0.37	0.15 ***
Observations	631	27	604

Note: armed group presence in the community is defined as a dummy variable for the presence of armed groups within two years before the survey; column 4 presents the test for mean differences across the sample with and without armed group presence; *** p<0.01, ** p<0.05, * p<0.1; childcare and schools can take values between 0 and 2 and 0 and 4 respectively, corresponding to the number of public institutions that provide different types of educational and childcare services; health facilities is a dummy variable for the presence of health facilities in the community.

Source: authors' calculations based on ECLA data.

Table D10: Armed group presence between waves and community variables

	No FE	mpio-wave FE	mpio-wave & comm. FE
	(1)	(2)	(3)
Time to urban centre (hours) ($t - 1$)	0.032*	0.025	0.005
	(0.017)	(0.016)	(0.031)
Number of households in community ($t - 1$)	0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)
Public institutions: childcare ($t - 1$)	-0.016	-0.032	-0.026
	(0.013)	(0.024)	(0.023)
Public institutions: health facilities ($t - 1$)	0.001	-0.009	-0.007
	(0.022)	(0.022)	(0.070)
Public institutions: schools ($t - 1$)	-0.012*	-0.006	-0.025
	(0.007)	(0.008)	(0.017)
Average annual rainfall between waves ($t - 1$)	-0.011	-0.037	-0.067
	(0.022)	(0.077)	(0.169)
Average annual rainfall between waves	0.041	0.066	0.299
	(0.026)	(0.084)	(0.210)
Infrastructure investments between waves: education ($t - 1$)	0.004	-0.004	-0.025
	(0.008)	(0.007)	(0.020)
Infrastructure investments between waves: transport and communication ($t - 1$)	0.034	0.023	0.028
	(0.024)	(0.024)	(0.032)
Infrastructure investments between waves: other ($t - 1$)	-0.020 **	-0.016	-0.030
	(0.010)	(0.011)	(0.026)
Log Daily agricultural wage ($t - 1$)	-0.034	0.031	0.156
	(0.032)	(0.049)	(0.138)
Pre-existing institutional capacity: intermediate	-0.009	-0.030	
	(0.021)	(0.022)	
Pre-existing institutional capacity: high	-0.007	0.003	
	(0.017)	(0.016)	
Years of armed group presence 2001–07	0.011	0.015*	
	(0.006)	(0.009)	
Constant	0.117	-0.499	-3.135
	(0.426)	(0.712)	(2.791)
Observations	382	382	382
R-squared	0.053	0.168	0.593
FE	No	Mpio-year	Mpio-year & Comm.
Mean dep. var.	0.0236	0.0236	0.0236

Note: ordinary least squares (OLS) estimation with presence of armed groups between waves as dependent variable; standard errors with community clusters in parenthesis; sample includes a balanced panel of 191 communities in 2013 and 2016 for which we have information on lagged community characteristics; armed group presence between waves takes the value of 1 if armed groups were present at least one year between waves, including the survey year; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Source: authors' calculations based on ECLA data.

Table D11: First stage: instrumental variables estimates

	Pre-existing institutional capacity					
	Low (1)	Intermediate (2)	High (3)	Low (1)	Intermediate (2)	High (3)
$FARC_m \times Post_r \times distance_{cm}$	-0.369*** (0.064)	-0.098* (0.059)	-0.285*** (0.084)	-0.367*** (0.072)	-0.095 (0.073)	-0.305*** (0.103)
Observations	7,976	3,828	5,038	7,976	3,828	5,038
FE	Community	Community	Community	Individual	Individual	Individual
Controls	Yes	Yes	Yes	Yes	Yes	Yes

Note: standard errors with municipality-year cluster in parenthesis; all estimations include municipality-year dummies and control variables: age, age squared, sex, years of education, number of household members, number of children under five, wealth index, time to municipal urban centre, total number of households in the community, total rainfall between waves, the presence of public institutions in the community, and investments in public infrastructure between waves; pre-existing institutional capacity defined as terciles of 1977 parliamentary transfers to community; for the baseline survey, presence between waves corresponds to the presence of armed groups between 2008 and 2010; *** p<0.01, ** p<0.05, * p<0.1.

Source: authors' calculations based on ECLA data.