

Pastoral conflicts and (dis)trust: evidence from Nigeria using an instrumental variable approach

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Online Appendix

[#] This paper was written while the author was employed by the WZB Berlin Social Science Center. He is currently an Independent Researcher in Germany.

A. Robustness checks using pastoral conflicts within the 10 km radius that caused at least 1 fatality

Table A1. Replicating the results in table 2 using only conflicts that caused at least one fatality

Pastoral conflict ^Φ	(1)	(2)	(3)	(4)
Drought index	-16.466*** (1.948)		-31.796*** (1.907)	-35.952*** (2.339)
Distance		-0.027*** (0.002)	-0.043*** (0.002)	-0.044*** (0.002)
Constant	2.147*** (.22)	5.862*** (0.227)	4.333*** (0.227)	3.359*** (0.546)
Control variables	No	No	No	Yes
Observations	1353	1353	1353	1298
R-squared	0.05	0.098	0.252	0.268
AIC statistic	8176.297	8107.078	7855.815	7532.197
BIC statistic	8186.717	8117.498	7871.445	7573.545

Notes: Standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.10. Φ is the dependent variable. All models are estimated using ordinary least squares (OLS) regression.

Table A2. Replicating the results in table 3 using only pastoral conflicts that caused at least one fatality (Fulani)

Distrust Fulani ^Φ	Full sample		Religious subsamples	
	(1)	(2)	(3) Muslims	(4) Christians
Pastoral conflict (1 fatal)	0.083*** (0.01)	0.052*** (0.011)	0.039*** (0.011)	0.076 (0.052)
Victimization		0.111 (0.079)	0.06 (0.127)	0.153 (0.099)
Household income		-0.029 (0.032)	-0.032 (0.043)	-0.007 (0.046)
Muslim (Ref: Christian)		-0.711*** (0.068)		
Female (Ref: Male)		0.004 (0.059)	-0.202** (0.083)	0.233** (0.094)
Age		-0.008*** (0.002)	-0.007** (0.003)	-0.009** (0.003)
Intercept 1	-0.318*** (0.061)	-1.203*** (0.133)	-0.685*** (0.152)	-0.836* (0.457)
Intercept 2	0.386*** (0.048)	-0.398*** (0.123)	0.192 (0.149)	-0.17 (0.335)
Intercept 3	0.508*** (0.047)	-0.257** (0.121)	0.344** (0.149)	-0.048 (0.313)
Intercept 4	0.813*** (0.044)	0.1 (0.118)	0.778*** (0.151)	0.232 (0.265)
Observations	1278	1278	719	559
Log likelihood	-5557.02	-5484.729	-2808.611	-2492.24
Error terms correlation	-0.485***	-0.333***	-0.189***	-0.533**
AIC statistic	11134.04	10999.46	5645.222	5012.48
BIC statistic	11185.57	11076.75	5709.312	5073.047

Notes: Standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.10. “Ref” denotes the reference category; Φ is the dependent variable which measures distrust in members of the Fulani ethnic group on a scale with five ordinal categories ranging from “trust completely” to “do not trust at all.” All models are estimated using IV-Ordered Probit regression. Only the second stage regression results have been reported.

Table A3. Replicating the results in table 4 using only pastoral conflicts that caused at least one fatality (Muslims)

Distrust Muslims^Φ	Full sample		Religious subsamples	
	(1)	(2)	(3) Muslims	(4) Christians
Pastoral conflict (1 fatal)	0.096*** (0.01)	0.05*** (0.012)	0.042*** (0.012)	0.094** (0.04)
Victimization		0.042 (0.08)	-0.08 (0.148)	0.119 (0.082)
Household income		0.056* (0.034)	0.076 (0.049)	0.053 (0.041)
Muslim (Ref: Christian)		-1.159*** (0.076)		
Female (Ref: Male)		0.12* (0.062)	-0.146 (0.095)	0.3*** (0.097)
Age		0.001 (0.002)	0.008** (0.003)	-0.005* (0.003)
Intercept 1	0.314*** (0.05)	-0.379*** (0.128)	0.894*** (0.17)	-0.189 (0.311)
Intercept 2	0.996*** (0.043)	0.539*** (0.12)	1.823*** (0.177)	0.582*** (0.167)
Intercept 3	1.104*** (0.043)	0.684*** (0.12)	1.981*** (0.18)	0.697*** (0.15)
Intercept 4	1.533*** (0.05)	1.247*** (0.12)	2.592*** (0.207)	1.149*** (0.123)
Observations	1289	1289	726	563
Log likelihood	-5344.317	-5193.686	-2433.547	-2561.538
Error terms correlation	-0.56***	-0.321***	-0.088	-0.67***
AIC statistic	10708.63	10417.37	4895.093	5151.076
BIC statistic	10760.25	10494.8	4959.319	5211.742

Notes: Standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.10. “Ref” denotes the reference category; Φ is the dependent variable which measures distrust in Muslims on a scale with five ordinal categories ranging from “trust completely” to “do not trust at all.” All models are estimated using IV-Ordered Probit regression. Only the second stage regression results have been reported.

B. Robustness checks using 2SLS as an alternative estimation method

Table A4. Replicating the results in table 3 using 2SLS (Fulani)

Distrust Fulani ^Φ	Full sample		Religious subsamples	
	(1)	(2)	(3) Muslims	(4) Christians
Pastoral conflict	0.097*** (0.015)	0.048*** (0.014)	0.035*** (0.012)	0.062 (0.055)
Victimization		0.078 (0.115)	0.039 (0.17)	0.128 (0.173)
Household income		-0.018 (0.047)	-0.015 (0.057)	0.00 (0.081)
Muslim (Ref: Christian)		-1.136*** (0.088)		
Female (Ref: Male)		-0.02 (0.086)	-0.309*** (0.11)	0.343** (0.137)
Age		-0.011*** (0.003)	-0.009** (0.004)	-0.014*** (0.005)
Constant	1.51*** (0.079)	2.741*** (0.164)	1.777*** (0.196)	2.589*** (0.322)
Observations	1278	1278	719	559
R-squared	0.00	0.102	0.008	0.00
F-statistic (first-stage)	244.601***	247.043***	577.346***	11.5414***

Notes: Standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.10. Φ is the dependent variable, which measures distrust in members of the Fulani ethnic group on a scale with five ordinal categories ranging from “trust completely” to “do not trust at all.” All models are estimated using two-stage least squares (2SLS) regression.

Table A5. Replicating the results in table 4 using 2SLS (Muslims)

Distrust Muslims ^Φ	Full sample		Religious subsamples	
	(1)	(2)	(3) Muslims	(4) Christians
Pastoral conflict	0.081*** (0.013)	0.026** (0.01)	0.014** (0.007)	0.077 (0.054)
Victimization		0.063 (0.087)	0.006 (0.099)	0.094 (0.165)
Household income		0.059 (0.036)	0.065* (0.034)	0.102 (0.078)
Muslim (Ref: Christian)		-1.315*** (0.067)		
Female (Ref: Male)		0.164** (0.066)	-0.112* (0.065)	0.525*** (0.132)
Age		0.00 (0.002)	0.006*** (0.002)	-0.01** (0.005)
Constant	0.695*** (0.066)	1.514*** (0.125)	0.191* (0.114)	1.388*** (0.317)
Observations	1289	1289	726	563
R-squared	0.00	0.225	0.024	0.00
F-statistic (first-stage)	247.452***	250.538***	591.227***	11.1403***

Notes: Standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.10. Φ is the dependent variable, which measures distrust in Muslims on a scale with five ordinal categories ranging from “trust completely” to “do not trust at all.” All models are estimated using 2SLS regression.

C. Plotting the average marginal effect of religious affiliation on distrust

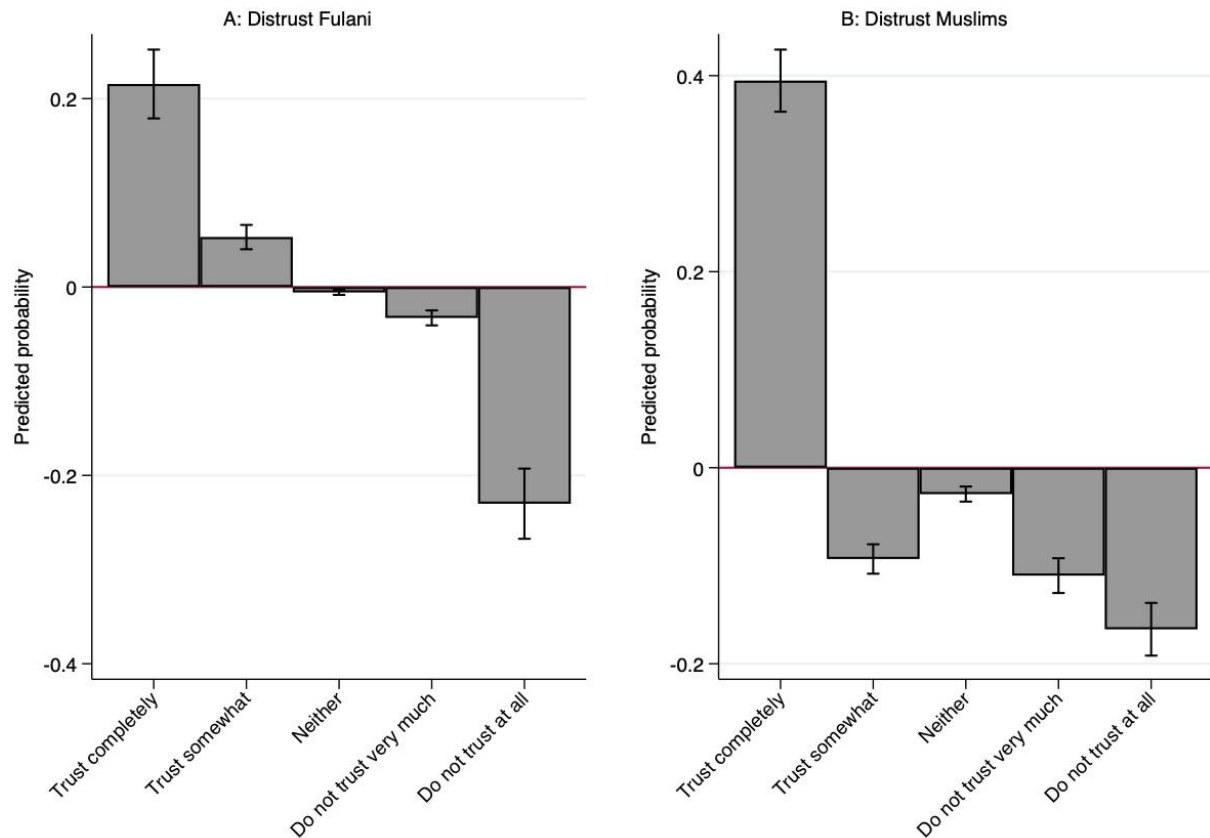


Figure A1. Average marginal effects of religious affiliation on distrust in the Fulani and Muslims.

Notes: Panel A, based on Model 2 in table 3, illustrates the average marginal effect of Muslim affiliation (reference: Christian affiliation) on each category of the dependent variable, which measures the degree to which respondents trust members of the Fulani ethnic group on a scale with five ordinal categories ranging from “trust completely” to “do not trust at all.” Panel B, based on Model 2 in table 4, illustrates the same relationship, but for distrust in Muslims rather than the Fulani. The vertical axis shows the predicted probabilities, while the horizontal axis shows the levels of distrust. Confidence intervals are set at 95%.

A glance at figure A1 indicates that the effect of religious affiliation on distrust in both the Fulani and Muslims is strongest at the extreme response categories of the dependent variable. Panel A, which is based on Model 2 in table 3, shows that, compared to Christians, Muslim individuals are 22 percentage points more likely to choose the “trust completely” response category and 23 percentage points less likely to choose the “do not trust at all” response when asked how much they trust members of the Fulani ethnic group. Panel B, which is based on Model 3 in table 4, shows that, compared to Christians, Muslim individuals are 39 percentage points more likely to choose the “trust completely” response category and 16 percentage points less likely to choose the “do not trust at all” response category when asked about the extent to which they trust Muslims. Notably, a comparison of both results indicates that Muslims exhibit more trust in their fellow Muslims than in the Fulani.

D. Additional data descriptions

Table A6. Distribution of respondents based on ethnic group

Ethnic group	Frequency	Percent
Birom	5	0.39
Ebira	1	0.08
Edo	2	0.15
Fulani	53	4.08
Gwari	25	1.93
Hausa	594	45.76
Ibibio	2	0.15
Idoma	12	0.92
Igala	13	1.00
Igbo	17	1.31
Ikwere	2	0.15
Isoko	1	0.08
Itsekiri	1	0.08
Jukun	1	0.08
Kagoma	26	2.00
Bajju	21	1.62
Kanuri	2	0.15
Kataf	20	1.54
Nupe	2	0.15
Tiv	6	0.46
Urhobo	2	0.15
Yoruba	20	1.54
Others	470	36.21
Total	1,298	100.00

Notes: The data is based on the Transnational Perspectives on Migration and Integration (TRANSMIT) survey conducted in the state of Kaduna in 2021.

Table A7. Distribution of pastoral conflicts across Nigeria’s states (1997–2023)

State	Frequency	Percent	Cumulative
Abia	13	0.51	0.51
Adamawa	95	3.75	4.26
Akwa Ibom	5	0.20	4.46
Anambra	23	0.91	5.37
Bauchi	11	0.43	5.80
Bayelsa	4	0.16	5.96
Benue	406	16.03	21.99
Borno	29	1.14	23.13
Cross River	6	0.24	23.37
Delta	102	4.03	27.40
Ebonyi	14	0.55	27.95
Edo	31	1.22	29.17
Ekiti	14	0.55	29.73
Enugu	70	2.76	32.49
Federal Capital Territory (Abuja)	31	1.22	33.71
Gombe	6	0.24	33.95
Imo	14	0.55	34.50
Jigawa	37	1.46	35.97
Kaduna	289	11.41	47.37
Kano	5	0.20	47.57
Katsina	65	2.57	50.14
Kebbi	11	0.43	50.57
Kogi	49	1.93	52.51
Kwara	27	1.07	53.57
Lagos	8	0.32	53.89
Nassarawa	138	5.45	59.34
Niger	59	2.33	61.67
Ogun	49	1.93	63.60
Ondo	48	1.89	65.50
Osun	12	0.47	65.97
Oyo	62	2.45	68.42
Plateau	410	16.19	84.60
Rivers	12	0.47	85.08
Sokoto	18	0.71	85.79
Taraba	158	6.24	92.03
Yobe	7	0.28	92.30
Zamfara	195	7.70	100.00
Total	2,533	100.00	

Notes: The table shows the distribution of pastoral conflict incidents in which at least one of the parties is defined as “Fulani” or “pastoralist.” Based on data from the Armed Conflict location and Events Data Project (ACLED) (Raleigh *et al.*, 2010).

Reference

Raleigh C, Linke A, Hegre H and Karlsen J (2010) Introducing ACLED – Armed Conflict Location and Event Data. *Journal of Peace Research* **47**, 651–660.
<https://doi.org/10.1177/0022343310378914>.