

# Supplementary Materials for: Remittances, Terrorism, and Democracy (Not for publication)

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## Contents

<b>A Countries in the data</b>	<b>1</b>
<b>B Robustness checks</b>	<b>4</b>
B.1 Alternative measures of remittances . . . . .	4
B.2 Alternative measures of democracy . . . . .	6
B.3 Alternative modeling choices . . . . .	6

## A Countries in the data

**Table A.1:** Countries included in the data

Country	Number of years
United States of America	36
Canada	18
Haiti	29
Dominican Republic	43
Jamaica	37
Mexico	34
Guatemala	36
Honduras	39
El Salvador	37
Nicaragua	24
Costa Rica	34
Panama	34
Colombia	43
Venezuela	28
Suriname	36
Ecuador	28
Peru	23
Brazil	38
Bolivia	37
Paraguay	38
Chile	18
Argentina	35
United Kingdom	26
Ireland	23
Netherlands	43
Belgium	38
France	38
Switzerland	36
Spain	38
Portugal	38
Germany	23
Austria	43
Italy	43
Macedonia	17

Kosovo	5
Greece	37
Cyprus	37
Russia	19
Estonia	17
Latvia	17
Armenia	18
Georgia	16
Azerbaijan	18
Sweden	43
Mali	38
Senegal	39
Niger	39
Ivory Coast	21
Guinea	26
Sierra Leone	33
Ghana	34
Togo	39
Nigeria	36
Gabon	34
Central African Republic	16
Chad	8
Congo	35
Democratic Republic of the Congo	8
Uganda	14
Kenya	43
Tanzania	18
Burundi	9
Rwanda	37
Ethiopia	31
Angola	6
Mozambique	32
Zimbabwe	22
South Africa	43
Lesotho	38
Swaziland	26
Madagascar	32
Morocco	38
Algeria	43

Tunisia	37
Sudan	36
Iran	22
Turkey	39
Iraq	3
Egypt	36
Lebanon	8
Jordan	37
Israel	43
Saudi Arabia	8
Yemen	22
Tajikistan	11
Uzbekistan	7
Kazakhstan	18
China	31
South Korea	37
Japan	30
India	38
Pakistan	37
Bangladesh	34
Myanmar	26
Sri Lanka	38
Nepal	20
Thailand	38
Cambodia	19
Laos	28
Malaysia	31
Philippines	36
Indonesia	30
Australia	43
Papua New Guinea	34
New Zealand	41
Solomon Islands	13

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## B Robustness checks

We now consider a series of robustness checks designed to assess how robust the main findings are to measurements and model specifications. Unless noted otherwise, all models use the same controls as Model 1 from the main text. Across every model we find support for our main hypothesis that remittances have a pacifying effect on domestic terrorism within democracies. In most models, we find support for our second hypothesis that remittances lead to an increase in domestic terrorism with autocracies at conventional levels. However, in only two models do we find that the direction of the autocratic relationship is opposite of our expectations. In both of these models, the relationship is insignificant and model fit measures suggest that the main model (Model 1) is preferred.

### B.1 Alternative measures of remittances

The first set of robustness checks considers alternative ways to measure or transform remittances. In the main text we used an untransformed measure of remittances per capita. In Table B.1, we consider a logged transformation, a square root transform, a cubic detrending, and a measure of remittances as a percentage of GDP. The first three of these (Models 9-11) are directly comparable to Model 1 from the main text as they use identical samples. Using AIC to assess the fit of these models, we find that Model 1 is preferred to these alternatives. A few observations are lost when considering remittances as a percentage of GDP, so this comparison is less direct; however if we re-fit Model 1 using the smaller sample we still find that the AIC prefers Model 1. Additionally, we note that in every model the combined coefficients  $\hat{\beta}_{\text{remittances}} + \hat{\beta}_{\text{remittances} \times \text{Dem.}}$  are negative and statistically significant. Likewise, when we find a significant relationship of remittances within autocracies, it is positive. In Models 9 and 12, we find a negative relationship for remittances within autocracies, but the relationship statistically insignificant and the models have worse fit than the main model.

**Table B.1:** Negative binomials with Different measures and transformations of remittances

	<i>Dependent variable:</i>			
	Domestic terrorist attacks			
	(9)	(10)	(11)	(12)
Log(Remittances per capita)	-0.06 (0.09)			
Log(Remittances per capita) $\times$ Dem.	-0.25** (0.12)			
Log(Remittances per capita) $\times$ Ano.	0.09 (0.09)			
Sqrt(Remittances per capita)		0.54 (0.36)		
Sqrt(Remittances per capita) $\times$ Dem.		-1.38** (0.42)		
Sqrt(Remittances per capita) $\times$ Ano.		-0.27 (0.29)		
Remittances per capita, detrended			0.19** (0.08)	
Remittances per capita, detrended $\times$ Dem.			-0.43** (0.14)	
Remittances per capita, detrended $\times$ Ano.			-0.18 (0.11)	
Remittances/GDP				-0.03 (0.11)
Remittances/GDP $\times$ Dem.				-0.24* (0.13)
Remittances/GDP $\times$ Ano.				0.01 (0.11)
Democracy	-0.81* (0.45)	0.31 (0.42)	-0.50 (0.35)	-0.52 (0.36)
Anocracy	1.08** (0.37)	0.97** (0.34)	0.90** (0.26)	0.87** (0.28)
Military personnel	3.46** (0.65)	3.27** (0.66)	3.20** (0.64)	3.67** (0.66)
Population	1.47** (0.49)	1.41** (0.48)	1.36** (0.52)	1.55** (0.50)
GDP Growth	-0.04** (0.01)	-0.04** (0.01)	-0.04** (0.01)	-0.04** (0.01)
GDP per capita	-0.20 (0.40)	-0.28 (0.40)	-0.34 (0.38)	-0.27 (0.41)
Free Press	0.30 (0.22)	0.39* (0.21)	0.50** (0.21)	0.35 (0.21)
$\hat{\beta}_{\text{Remittances}} + \hat{\beta}_{\text{Remittances} \times \text{Dem.}}$	-0.31** (0.10)	-0.84** (0.35)	-0.24* (0.14)	-0.27** (0.10)
Country Fixed Effects	Yes	Yes	Yes	Yes
Observations	3,127	3,127	3,127	3,109
Log Likelihood	-6,046.55	-6,045.90	-6,052.01	-6,001.10
$\theta$	0.39	0.39	0.39	0.39

\* $p < 0.1$ , \*\* $p < 0.05$ . Coefficients from negative binomial models. Standard errors in parentheses clustered on country.

## B.2 Alternative measures of democracy

In this appendix we consider alternatives to the democracy, autocracy dummies we presented in the main text. Specifically, we consider a specification that uses each observation’s polity score and polity score squared and one based on V-DEM where we define democracy using the top two categories from their levels measure: “Electoral democracy” and “liberal democracy.” We use “Electoral autocracy” to denote an anocracy and “Closed autocracy” to denote an autocracy. These results are presented in Table B.2. The main results hold here, although the coefficient for remittances to autocracies is positive, but not significant. The results based on squared polity scores are less easy to interpret, but they are positive and significant at the autocratic end of the spectrum and negative and significant at the democracy end.

## B.3 Alternative modeling choices

In this set of robustness checks we consider several alternative modeling choices. The first one we consider is a zero-inflated negative binomial. To specify the binomial component we follow advice from Drakos and Gofas (2006) and focus on the regime and media aspects by using democracy, anocracy, free press, and the lagged number of attacks. The count specification uses the variables from Model 1 including country fixed effects and is reported in Table B.3. Here we see that the within autocracy effect is positive and significant. A linear hypothesis test reveals that the within-democracy effect is negative and significant at  $p < 0.10$  within the count equation.

In Models 16-18, we try alternatives to main modeling choice of a negative binomial regression with country dummies. In Model 16, we pool across countries, while in Model 17 we use country random effects; both of these models retain the negative binomial framework. The main results hold, although the within-autocracy effect is not significant in the pooled model. In Model 18, we use a correlated random effects model (see ?) and the Poisson distribution to make sure that the results are robust to the distributional assumption (Wooldridge 2002). The Poisson distribution will produce consistent estimates even when the constant

**Table B.2:** Negative binomials with different measures of democracy

	<i>Dependent variable:</i>	
	Domestic terrorist attacks	
	(13)	(14)
Remittances per capita	-0.26 (0.17)	0.08 (0.08)
Remittances per capita $\times$ polity	-0.02** (0.01)	
Remittances per capita $\times$ polity sq.	0.003* (0.002)	
Remittances per capita $\times$ V-DEM anoc.		-0.42** (0.13)
Remittances per capita $\times$ V-DEM demo.		-0.31** (0.13)
Polity	0.01 (0.02)	
Polity sq.	-0.02** (0.004)	
V-DEM anoc.		-0.11 (0.28)
V-DEM demo.		-0.50 (0.33)
Military personnel	3.36** (0.62)	3.12** (0.60)
Population	1.40** (0.47)	1.92** (0.50)
GDP Growth	-0.04** (0.01)	-0.03** (0.01)
GDP per capita	-0.22 (0.38)	-0.29 (0.38)
Free Press	0.42** (0.21)	0.39* (0.21)
Country Fixed Effects	Yes	Yes
Observations	3,127	3,171
Log Likelihood	-6,071.96	-6,121.32
$\theta$	0.38	0.37

\* $p < 0.1$ , \*\* $p < 0.05$ . Coefficients from negative binomial models. Standard errors in parentheses clustered on country.



**Table B.3:** Alternative dependent variable and specifications

	<i>Dependent variable:</i>						ESG data	
	Domestic Attacks (Main coding)						<i>QMLE</i>	<i>Negative binomial</i>
	<i>Zero-inflated</i> <i>neg. bin.</i> (15)	<i>Pooled</i> <i>neg. bin.</i> (16)	<i>Random effects</i> <i>neg. bin.</i> (17)	<i>CRE</i> <i>Poisson</i> (18)	<i>QMLE</i> <i>Poisson</i> (19)	<i>Negative binomial</i> (6)		
Remittances per capita	0.21** (0.08)	0.05 (0.16)	0.23** (0.08)	0.14** (0.05)	0.13 (0.27)	0.11** (0.04)		
Remittances per capita × dem.	-0.38** (0.11)	-0.44* (0.23)	-0.51** (0.10)	-0.50** (0.05)	-0.49 (0.34)	-0.31** (0.08)		
Remittances per capita × ano.	-0.08 (0.11)	-0.15 (0.16)	-0.15 (0.10)	0.05 (0.05)	0.05 (0.30)	-0.21** (0.06)		
Democracy	-0.10 (0.23)	1.25 (0.88)	-0.09 (0.21)	-0.16** (0.05)	-0.17 (0.54)	0.43 (0.29)		
Anocracy	0.49** (0.19)	1.67** (0.76)	1.01** (0.17)	0.62** (0.04)	0.61* (0.35)	0.59** (0.18)		
Military personnel	2.18** (0.39)	2.66** (0.49)	2.79** (0.36)	1.08** (0.05)	1.09 (0.88)	1.43** (0.63)		
Population	1.58** (0.32)	1.01** (0.12)	1.33** (0.14)	2.51** (0.05)	2.51** (0.74)	0.28 (0.44)		
GDP Growth	-0.03** (0.01)	-0.10** (0.02)	-0.04** (0.01)	-0.03** (0.001)	-0.03* (0.02)	-0.02** (0.01)		
GDP per capita	-0.43** (0.20)	-0.18 (0.16)	-0.26** (0.12)	-0.71** (0.03)	-0.71 (0.77)	-0.20 (0.47)		
Free Press	0.57** (0.15)	-0.39 (0.34)	0.50** (0.15)	0.23** (0.02)	0.23 (0.29)	0.10 (0.17)		
Constant		-15.06** (1.79)	-21.97** (2.31)	-23.91** (3.24)				
$\hat{\beta}_{\text{Remittances}} + \hat{\beta}_{\text{Remittances} \times \text{Dem.}}$	-0.17** (0.07)	-0.38** (0.17)	-0.28** (0.07)	-0.36** (0.01)	-0.36* (0.20)	-0.20** (0.08)		
Country fixed effect	Yes	No	No	Mundlak	Yes	Yes		
Observations	3,127	4,032	4,032	4,032	3,127	1,287		
Log Likelihood	-5,772.86	-7,221.62	-6,327.96	-29,176.72		-4,417.35		
$\theta$	0.72	0.12	0.37			1.20		

\*  $p < 0.1$ , \*\*  $p < 0.05$ . Regression coefficients. Ordinary (Models 15, 17-18) or clustered standard errors in parentheses.

variance assumption is wrong (but the standard errors will be incorrect), as such we are only interested in the sign and relative magnitude of the estimates. They are roughly inline with the negative binomial estimates which gives us confidence in the results. Additionally, in Model 19 we adopt a quasi-MLE Poisson specification with country dummies. The Poisson estimates are consistent under very general assumptions (Wooldridge 2002, 648). This specification is to ensure that the main results are not driven by negative binomial distributional assumption. The estimates here should be very similar to the CRE (large differences would suggest numeric or specification concerns), but the standard errors may be more appropriate if the Poisson variance assumptions are misspecified. Again, the main results are present; the within-autocracy result is not significant at conventional levels, and within-democracy effect is negative and significant at  $p < 0.10$ .

Finally, Model 20 uses the domestic terrorist attack data from Enders, Sandler and Gaibullov (2011, referred to as ESG hereafter). As mentioned before, these data were aggregated before the inclusion of the `INT_LOG` indicator within the GTD. Using `INT_LOG` correlates highly with the ESG approach, while allowing for the inclusion of more recent data. However, it is important to make sure that the use of one or the other does not drive the main results. We see in Model 20 that we get the same results from the ESG data.

## References

- Drakos, Konstantinos and Andreas Gofas. 2006. “The Devil You Know but Are Afraid to Face: Underreporting Bias and its Distorting Effects on the Study of Terrorism.” *Journal of Conflict Resolution* 5(5):714–735.
- Enders, Walter, Todd Sandler and Khusrav Gaibullov. 2011. “Domestic versus transnational terrorism: Data, decomposition, and dynamics.” *Journal of Peace Research* 48(3):319–337.
- Wooldridge, Jeffrey M. 2002. *Econometric Analysis of Cross Section and Panel Data*. Cambridge, MA: MIT Press.