

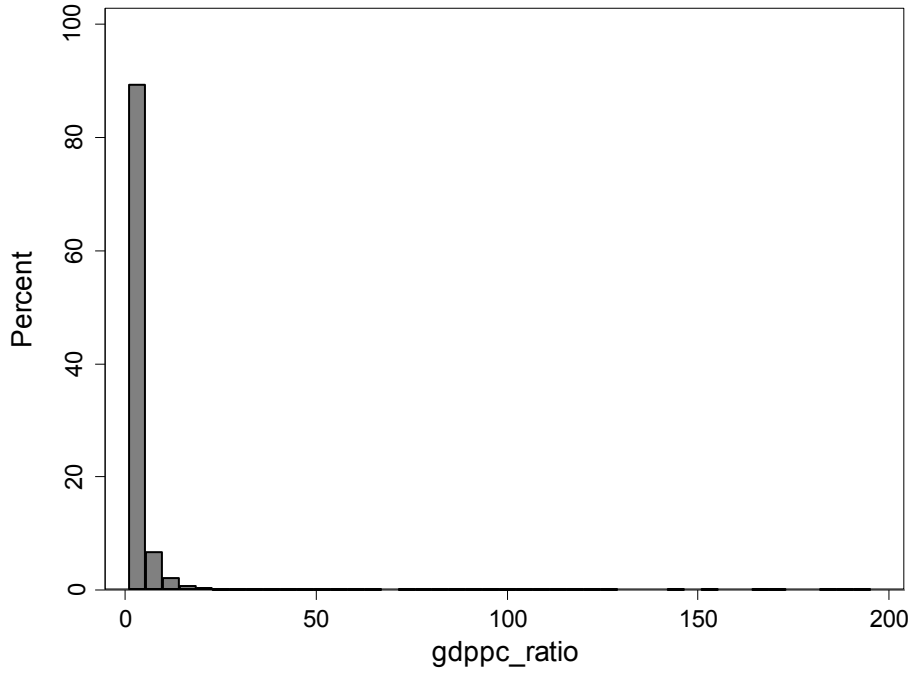
SUPPLEMENTAL Appendix

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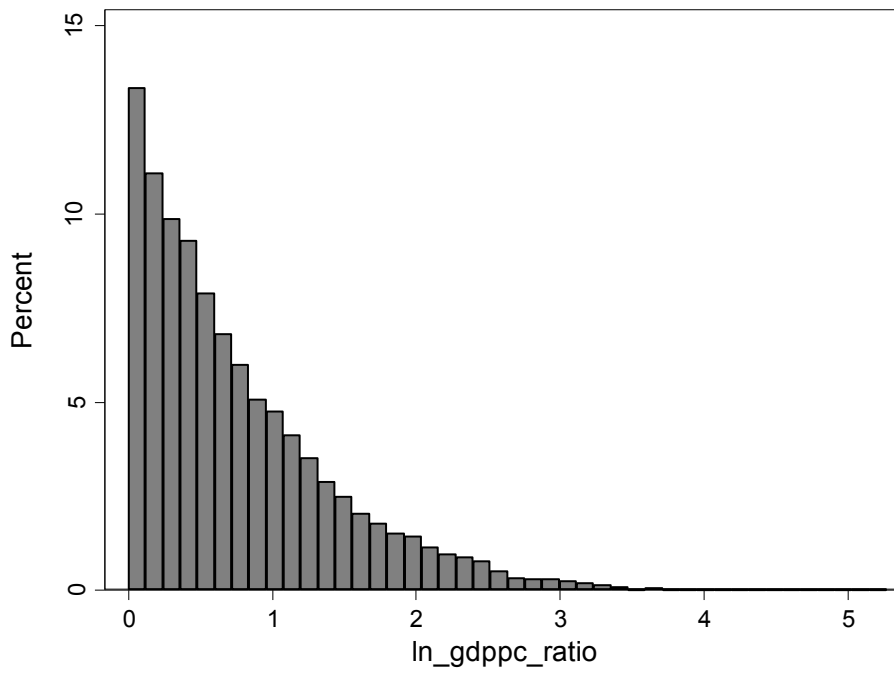
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II. Histograms of GDP per capita Ratio Variables

Histogram of Unlogged GDP per capita Ratio



Histogram of Logged GDP per capita Ratio



II. ANALYSIS WITH UNLOGGED RESULTS

First, we establish ran a simple regression with the unlogged version of cross-border inequality in the undirected model. Note that the distribution of the unlogged variable is highly right-skewed, which suggests it is not a good choice relative to the logged variable, which is much less skewed. Model comparison statistics also bear this point out. Nonetheless, we show the results using the unlogged variable for interested readers.

```

Logistic regression                                Number of obs   =       29817
                                                    LR chi2(1)      =        27.18
                                                    Prob > chi2     =        0.0000
Log likelihood = -2912.2099                       Pseudo R2       =        0.0046
  
```

```

-----+-----
      barrier |          Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-----+-----
gdppc_ratio |    .0218628    .0034595     6.32   0.000    .0150824    .0286433
      _cons |   -3.96743    .0438284   -90.52   0.000   -4.053332   -3.881528
-----+-----
  
```

Second, we reran our models in Table 3 using with the unlogged version of cross-border inequality.

* Model I

```

Random-effects logistic regression      Number of obs      =      26209
Group variable: dyad                  Number of groups   =      612

Random effects u_i ~ Gaussian          Obs per group: min =      1
                                       avg =      42.8
                                       max =      90

Integration method: mvaghermite        Integration points =      12

Log likelihood = -764.0121              Wald chi2(7)       =      60.86
                                       Prob > chi2        =      0.0000
    
```

barrier	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
gdppc_ratio	-.0004662	.007423	-0.06	0.950	-.0150151	.0140826
dem_autoc	1.264002	.230242	5.49	0.000	.8127357	1.715268
upp_cw	-.6742027	.216991	-3.11	0.002	-1.099497	-.2489081
ln_distance	-.4347721	.3713745	-1.17	0.242	-1.162653	.2931085
atopally	.2108212	.1945061	1.08	0.278	-.1704038	.5920462
ln_cap_ratio	-.8081554	.2015697	-4.01	0.000	-1.203225	-.413086
terr_dispute_M	.4946409	.2816537	1.76	0.079	-.0573901	1.046672
_cons	-11.43732	2.644431	-4.33	0.000	-16.62031	-6.25433
/lnsig2u	3.277711	.118338			3.045773	3.509649
sigma_u	5.149273	.3046773			4.585442	5.782434
rho	.8896198	.0116204			.8647044	.9104223

Likelihood-ratio test of rho=0: chibar2(01) = 3023.29 Prob >= chibar2 = 0.000

* Model II

```

Conditional fixed-effects logistic regression      Number of obs      =      1517
Group variable: dyad                            Number of groups   =       32

                                                Obs per group: min =       16
                                                avg               =      47.4
                                                max               =       87

Log likelihood = -516.25381                      LR chi2(6)         =      68.63
                                                Prob > chi2       =      0.0000
    
```

barrier	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
gdppc_ratio	-.0018167	.0073627	-0.25	0.805	-.0162474	.0126139
dem_autoc	1.241909	.24152	5.14	0.000	.7685383	1.715279
upp_cw	-.7758295	.2223335	-3.49	0.000	-1.211595	-.3400639
atopally	.2570785	.2027853	1.27	0.205	-.1403734	.6545304
ln_cap_ratio	-1.062955	.2165997	-4.91	0.000	-1.487482	-.6384271
terr_dispute_M	.1483143	.29048	0.51	0.610	-.4210161	.7176448

. * Model III

Logistic regression

Number of obs = 26209
Wald chi2(7) = 675.39
Prob > chi2 = 0.0000
Pseudo R2 = 0.1438

Log pseudolikelihood = -2275.6577

```
-----+-----
```

barrier	Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]	
gdppc_ratio	.0224812	.0043361	5.18	0.000	.0139827	.0309797
dem_autoc	1.15583	.0955456	12.10	0.000	.9685641	1.343096
upp_cw	-.0175033	.1014525	-0.17	0.863	-.2163467	.18134
ln_distance	-.6033415	.0397994	-15.16	0.000	-.681347	-.5253361
atopally	-.55378	.0983183	-5.63	0.000	-.7464802	-.3610797
ln_cap_ratio	-.1000576	.0297053	-3.37	0.001	-.1582789	-.0418362
terr_dispute_M	2.028217	.091259	22.22	0.000	1.849352	2.207081
_cons	-.7961456	.2400645	-3.32	0.001	-1.266663	-.3256278

```
-----+-----
```



```
. * Model IV
. xtlogit barrier_m gdppc_ratio dem_autoc upp_cw ln_distance atopally_m ln_cap_ratio terr_stratval
terr_econval terr_ethval by1_yrs1 by1_yrs2 by1_yrs3, i(dyad)
```

```
Random-effects logistic regression      Number of obs      =      19315
Group variable: dyad                  Number of groups   =         593

Random effects u_i ~ Gaussian          Obs per group: min =         2
                                         avg =        32.6
                                         max =         55

Integration method: mvaghermite        Integration points =         12

Wald chi2(12) =      179.46
Prob > chi2    =      0.0000

Log likelihood = -300.52985
```

barrier_m	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
gdppc_ratio	.2653237	.0973968	2.72	0.006	.0744294	.4562179
dem_autoc	1.241882	.4125463	3.01	0.003	.4333059	2.050458
upp_cw	.628606	.3535694	1.78	0.075	-.0643773	1.321589
ln_distance	-1.446463	.6107719	-2.37	0.018	-2.643554	-.2493719
atopally_m	-.6982077	.4230349	-1.65	0.099	-1.527341	.1309255
ln_cap_ratio	.6487605	.2427089	2.67	0.008	.1730598	1.124461
terr_stratval	-.5315739	.5981469	-0.89	0.374	-1.70392	.6407725
terr_econval	.2328005	.5762334	0.40	0.686	-.8965961	1.362197
terr_ethval	2.250429	.8350765	2.69	0.007	.6137091	3.887149
by1_yrs1	8.040362	.7186086	11.19	0.000	6.631915	9.448809
by1_yrs2	-2.693684	.2329967	-11.56	0.000	-3.15035	-2.237019
by1_yrs3	.1995461	.0182041	10.96	0.000	.1638668	.2352254
_cons	-10.11185	3.991084	-2.53	0.011	-17.93423	-2.289471
/lnsig2u	4.290268	.1235578			4.048099	4.532437
sigma_u	8.543187	.5277888			7.568915	9.642868
rho	.9568688	.0050993			.9456923	.9658283

```
Likelihood-ratio test of rho=0: chibar2(01) = 930.34 Prob >= chibar2 = 0.000
```

* Model V

```

Conditional fixed-effects logistic regression   Number of obs   =       775
Group variable: dyad                         Number of groups =        18

Obs per group: min =        10
                  avg =       43.1
                  max =        51

LR chi2(11) =       283.12
Prob > chi2  =        0.0000

Log likelihood = -151.82875

```

barrier_m	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
gdppc_ratio	.7037519	.252596	2.79	0.005	.2086728 1.198831
dem_autoc	1.074107	.4607051	2.33	0.020	.1711421 1.977073
upp_cw	.4187888	.3683631	1.14	0.256	-.3031896 1.140767
atopally_m	-.5816825	.4785003	-1.22	0.224	-1.519526 .3561609
ln_cap_ratio	1.574636	.497781	3.16	0.002	.5990028 2.550268
terr_stratval	.2634512	.645488	0.41	0.683	-1.001682 1.528584
terr_econval	.2784036	.5812036	0.48	0.632	-.8607344 1.417542
terr_ethval	.7280442	.8845061	0.82	0.410	-1.005556 2.461644
by1_yrs1	7.666885	.7871987	9.74	0.000	6.124004 9.209766
by1_yrs2	-2.786267	.2953122	-9.43	0.000	-3.365069 -2.207466
by1_yrs3	.2106081	.0232911	9.04	0.000	.1649583 .2562578

* Model VI

Logistic regression	Number of obs	=	19315
	Wald chi2(12)	=	1560.38
	Prob > chi2	=	0.0000
Log pseudolikelihood = -765.69816	Pseudo R2	=	0.6465

	Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]	
barrier_m						
gdppc_ratio	.079524	.0138033	5.76	0.000	.05247	.1065779
dem_autoc	1.005816	.1602414	6.28	0.000	.691749	1.319884
upp_cw	.6912127	.1813975	3.81	0.000	.3356801	1.046745
ln_distance	-.4105676	.0856988	-4.79	0.000	-.5785342	-.2426011
atopally_m	-.6895804	.199444	-3.46	0.001	-1.080483	-.2986774
ln_cap_ratio	.2285067	.0382028	5.98	0.000	.1536305	.3033829
terr_stratval	1.482326	.3351326	4.42	0.000	.8254782	2.139174
terr_econval	.3470909	.372715	0.93	0.352	-.3834171	1.077599
terr_ethval	.4172884	.39137	1.07	0.286	-.3497828	1.18436
by1_yrs1	7.105425	.3571258	19.90	0.000	6.405471	7.805378
by1_yrs2	-2.157555	.1799827	-11.99	0.000	-2.510315	-1.804795
by1_yrs3	.1761324	.0213431	8.25	0.000	.1343007	.2179641
_cons	-3.090914	.5442486	-5.68	0.000	-4.157622	-2.024207

Note: 0 failures and 1 success completely determined.

* Model VII

```

Random-effects logistic regression      Number of obs      =      17896
Group variable: dyad                   Number of groups   =         562

Random effects u_i ~ Gaussian          Obs per group: min =         2
                                       avg =        31.8
                                       max =         54

Integration method: mvaghermite        Integration points =         12

Log likelihood = -199.48288             Wald chi2(12)      =      255.29
                                       Prob > chi2        =      0.0000

```

barrier_m	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
gdppc_ratio	.3076946	.1134792	2.71	0.007	.0852794	.5301098
dem_autoc	1.629047	.5612754	2.90	0.004	.5289677	2.729127
upp_cw	.8554769	.4681912	1.83	0.068	-.062161	1.773115
total_lnreflows	-.6269017	.3187259	-1.97	0.049	-1.251593	-.0022104
mzmid_t_1	.7271785	.4951606	1.47	0.142	-.2433183	1.697675
ln_distance	-1.582484	.7340851	-2.16	0.031	-3.021264	-.1437034
atopally_m	-.3576651	.5477704	-0.65	0.514	-1.431275	.7159451
ln_cap_ratio	.9723517	.2941919	3.31	0.001	.3957461	1.548957
terr_dispute_M	-.1735396	.6732589	-0.26	0.797	-1.493103	1.146024
by1_yrs1	13.03274	1.153852	11.29	0.000	10.77123	15.29425
by1_yrs2	-4.349277	.3594695	-12.10	0.000	-5.053824	-3.64473
by1_yrs3	.3161813	.0273489	11.56	0.000	.2625784	.3697843
_cons	-11.69674	4.762307	-2.46	0.014	-21.03069	-2.362785
/lnsig2u	4.601049	.1218936			4.362142	4.839957
sigma_u	9.979417	.6082136			8.855787	11.24561
rho	.9680219	.0037733			.9597396	.9746453

Likelihood-ratio test of rho=0: chibar2(01) = 910.62 Prob >= chibar2 = 0.000

* Model VIII

```

Conditional fixed-effects logistic regression   Number of obs   =       521
Group variable: dyad                         Number of groups =       14

Obs per group: min =           8
                  avg =        37.2
                  max =         51

LR chi2(11) = 309.76
Prob > chi2 = 0.0000

Log likelihood = -75.034648

```

barrier_m	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
gdppc_ratio	1.040873	.4350283	2.39	0.017	.1882329	1.893513
dem_autoc	1.36238	.6396776	2.13	0.033	.1086351	2.616125
upp_cw	.7585969	.5186928	1.46	0.144	-.2580222	1.775216
total_lnreflows	-.4337751	.3496583	-1.24	0.215	-1.119093	.2515426
mzmid_t_1	.8921162	.5222569	1.71	0.088	-.1314884	1.915721
atopally_m	-.2692149	.6716515	-0.40	0.689	-1.585628	1.047198
ln_cap_ratio	3.116263	.7836844	3.98	0.000	1.580269	4.652256
terr_dispute_M	.2323226	.8415479	0.28	0.782	-1.417081	1.881726
by1_yrs1	13.14853	1.593527	8.25	0.000	10.02527	16.27178
by1_yrs2	-4.579842	.562066	-8.15	0.000	-5.681471	-3.478213
by1_yrs3	.3391752	.0428151	7.92	0.000	.2552591	.4230914

* Model IX

Logistic regression

Number of obs = 17896
Wald chi2(12) = 1554.04
Prob > chi2 = 0.0000
Pseudo R2 = 0.6534

Log pseudolikelihood = -654.79427

```
-----
```

barrier_m	Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]	
gdppc_ratio	.0798114	.01296	6.16	0.000	.0544102	.1052127
dem_autoc	1.192691	.1763304	6.76	0.000	.8470894	1.538292
upp_cw	.5129536	.2070783	2.48	0.013	.1070876	.9188196
total_lnreflows	-.2189042	.1606192	-1.36	0.173	-.5337121	.0959037
mzmid_t_1	1.2008	.3005391	4.00	0.000	.6117542	1.789846
ln_distance	-.2980393	.096069	-3.10	0.002	-.4863312	-.1097475
atopally_m	-.8535556	.2189906	-3.90	0.000	-1.282769	-.4243419
ln_cap_ratio	.2687458	.0405173	6.63	0.000	.1893332	.3481583
terr_dispute_M	.4743607	.2734497	1.73	0.083	-.0615908	1.010312
by1_yrs1	7.401308	.3500292	21.14	0.000	6.715263	8.087352
by1_yrs2	-2.233989	.1716847	-13.01	0.000	-2.570485	-1.897493
by1_yrs3	.1810157	.0197869	9.15	0.000	.142234	.2197974
_cons	-3.854835	.6206041	-6.21	0.000	-5.071197	-2.638473

```
-----
```

Note: 0 failures and 1 success completely determined.

Third, we reran our models in Table 4 using with the unlogged version of cross-border inequality.

* Model I of Table 4

```

Random-effects logistic regression      Number of obs      =      52420
Group variable: dyadid2                Number of groups   =      1224

Random effects u_i ~ Gaussian          Obs per group: min =          1
                                          avg =          42.8
                                          max =          90

Integration method: mvaghermite        Integration points =          12

Log likelihood = -823.4045              Wald chi2(9)       =      158.20
                                          Prob > chi2        =      0.0000
    
```

builder_a	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
gdppc_ratioD	1.344282	.1952262	6.89	0.000	.9616457	1.726919
auto1_dem2	-.4035654	.283293	-1.42	0.154	-.9588094	.1516787
dem1_auto2	1.146955	.2446259	4.69	0.000	.6674967	1.626413
autodyad	-.242475	.3190595	-0.76	0.447	-.86782	.3828701
ln_distance	-.78535	.2551648	-3.08	0.002	-1.285464	-.2852361
_atopally	.4580956	.191578	2.39	0.017	.0826095	.8335816
ln_cap_ratio	-.2826755	.1143457	-2.47	0.013	-.506789	-.058562
cw_b	-1.412944	.2500534	-5.65	0.000	-1.90304	-.9228483
terr_dispute_M	.4723552	.2718404	1.74	0.082	-.0604423	1.005153
_cons	-18.20455	1.788242	-10.18	0.000	-21.70944	-14.69966
/lnsig2u	4.432022	.0787317			4.27771	4.586333
sigma_u	9.170674	.3610115			8.489712	9.906256
rho	.9623547	.0028523			.9563476	.9675631

Likelihood-ratio test of rho=0: chibar2(01) = 3879.36 Prob >= chibar2 = 0.000

* Model II of Table 4

```

Conditional fixed-effects logistic regression   Number of obs   =   1691
Group variable: dyadid2                       Number of groups =    35

Obs per group: min =    16
                  avg =   48.3
                  max =    87

LR chi2(8) = 123.06
Prob > chi2 = 0.0000

Log likelihood = -544.29687

```

builder_a	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
gdppc_ratioD	1.360114	.2474582	5.50	0.000	.8751051	1.845123
auto1_dem2	-.6652806	.3093348	-2.15	0.032	-1.271566	-.0589955
dem1_auto2	1.090053	.2694201	4.05	0.000	.5619991	1.618107
autodyad	-.408961	.3500066	-1.17	0.243	-1.094961	.2770394
atopally	.4825108	.2035408	2.37	0.018	.0835782	.8814435
ln_cap_ratio	-.642725	.2040019	-3.15	0.002	-1.042561	-.2428886
cw_b	-1.417121	.2548368	-5.56	0.000	-1.916592	-.9176505
terr_dispute_M	.1579685	.3064189	0.52	0.606	-.4426015	.7585385

* Model III of Table 4

Logistic regression	Number of obs	=	52420
	Wald chi2(9)	=	959.24
	Prob > chi2	=	0.0000
Log pseudolikelihood = -2763.0849	Pseudo R2	=	0.1372

builder_a	Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]	
gdppc_ratioD	.8067274	.0580947	13.89	0.000	.692864	.9205909
autol_dem2	.5889977	.1422407	4.14	0.000	.310211	.8677843
dem1_auto2	1.322709	.1332639	9.93	0.000	1.061517	1.583902
autodyad	.3812991	.1295064	2.94	0.003	.1274711	.6351271
ln_distance	-.5773711	.0361102	-15.99	0.000	-.6481459	-.5065963
atopally	-.3125109	.0916379	-3.41	0.001	-.4921178	-.132904
ln_cap_ratio	-.0047881	.0267991	-0.18	0.858	-.0573132	.0477371
cw_b	-.5585312	.1371263	-4.07	0.000	-.8272938	-.2897686
terr_dispute_M	1.805234	.0893718	20.20	0.000	1.630069	1.9804
_cons	-2.255274	.2222435	-10.15	0.000	-2.690863	-1.819684

* Model IV of Table 4

```

Conditional fixed-effects logistic regression   Number of obs   =   2276
Group variable: dyad                         Number of groups =    33

Obs per group: min =    19
                  avg =   69.0
                  max =   173

LR chi2(8) = 32.37
Prob > chi2 = 0.0001

Log likelihood = -122.86708

```

b_create	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
gdppc_ratioD	1.563779	.3972062	3.94	0.000	.785269	2.342289
autol_dem2	-.8724046	.9000818	-0.97	0.332	-2.636532	.8917233
dem1_auto2	.7335762	.8045945	0.91	0.362	-.8434	2.310552
autodyad	-.5749168	.9420402	-0.61	0.542	-2.421282	1.271448
atopally	.8399625	.5492969	1.53	0.126	-.2366397	1.916565
ln_cap_ratio	-1.143888	.6492786	-1.76	0.078	-2.416451	.1286746
cw_b	-.1495243	.5106205	-0.29	0.770	-1.150322	.8512734
terr_dispute_M	1.643128	.7920085	2.07	0.038	.0908202	3.195436

* Model V of Table 4

```

Random-effects logistic regression      Number of obs      =      51522
Group variable: dyad                   Number of groups   =      612

Random effects u_i ~ Gaussian          Obs per group: min =      2
                                          avg =      84.2
                                          max =      180

Integration method: mvaghermite        Integration points =      12

Log likelihood = -258.73961            Wald chi2(9)      =      54.35
                                          Prob > chi2       =      0.0000

```

b_create	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
gdppc_ratioD	.6577037	.2141564	3.07	0.002	.2379648	1.077443
auto1_dem2	1.34425	.6971311	1.93	0.054	-.0221024	2.710601
dem1_auto2	1.856203	.6654604	2.79	0.005	.5519242	3.160481
autodyad	1.236554	.6644032	1.86	0.063	-.0656525	2.53876
ln_distance	-.4163551	.1972423	-2.11	0.035	-.802943	-.0297672
atopally	.1542763	.3553243	0.43	0.664	-.5421464	.8506991
ln_cap_ratio	-.0101082	.133672	-0.08	0.940	-.2721005	.251884
cw_b	.2809091	.4147099	0.68	0.498	-.5319074	1.093726
terr_dispute_M	1.822683	.3507328	5.20	0.000	1.135259	2.510107
_cons	-6.95336	1.479799	-4.70	0.000	-9.853713	-4.053007
/lnsig2u	-9.548613	20.14551			-49.03308	29.93586
sigma_u	.0084439	.0850537			2.25e-11	3165843
rho	.0000217	.0004366			1.54e-22	1

Likelihood-ratio test of rho=0: chibar2(01) = 6.3e-05 Prob >= chibar2 = 0.497

* Model VI of Table 4

Corrected logit estimates

Number of obs = 51522

```

-----
      |           |           |           |           |           |           |
      | b_create  |           | Robust   |           |           |           |
      |           | Coef.    | Std. Err.| z         | P>|z|    | [95% Conf. Interval]
-----+-----+-----+-----+-----+-----+-----
gdppc_ratioD | .6817244 | .1619172 | 4.21      | 0.000    | .3643724  .9990764
  auto1_dem2 | 1.249317 | .731841  | 1.71      | 0.088    | -.1850655  2.683699
  dem1_auto2 | 1.729512 | .6788845 | 2.55      | 0.011    | .3989228  3.060101
  autodyad   | 1.11178  | .6787944 | 1.64      | 0.101    | -.2186323  2.442193
  ln_distance | -.4168726 | .1497901 | -2.78     | 0.005    | -.7104558  -.1232895
  atopally   | .1567266 | .3856705 | 0.41      | 0.684    | -.5991738  .912627
  ln_cap_ratio | .0028772 | .0949564 | 0.03      | 0.976    | -.1832339  .1889884
  cw_b       | .3219734 | .4398945 | 0.73      | 0.464    | -.5402041  1.184151
terr_dispute_M | 1.831833 | .3574563 | 5.12      | 0.000    | 1.131232  2.532435
  _cons     | -6.700286 | 1.113817 | -6.02     | 0.000    | -8.883327  -4.517245
-----

```

III. ENDOGENEITY CONCERN I: LAGS ON ECONOMIC DISPARITY

1-year Lag
(4295 missing values generated)

Iteration 0: log pseudolikelihood = -2286.8503
Iteration 1: log pseudolikelihood = -2242.8983
Iteration 2: log pseudolikelihood = -2225.8906
Iteration 3: log pseudolikelihood = -2225.4787
Iteration 4: log pseudolikelihood = -2225.4783

Logit estimates Number of obs = 22307
Wald chi2(1) = 10.83
Prob > chi2 = 0.0010
Log pseudolikelihood = -2225.4783 Pseudo R2 = 0.0268

(standard errors adjusted for clustering on dyad)

barrier_m	Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]	
L_ln_gdppc~o	.7663279	.2328969	3.29	0.001	.3098583	1.222797
_cons	-4.436485	.3379113	-13.13	0.000	-5.098779	-3.77419

5-year Lag
(6364 missing values generated)

Iteration 0: log pseudolikelihood = -2169.0315
Iteration 1: log pseudolikelihood = -2129.5378
Iteration 2: log pseudolikelihood = -2116.9872
Iteration 3: log pseudolikelihood = -2116.7314
Iteration 4: log pseudolikelihood = -2116.7312

Logit estimates Number of obs = 20238
Wald chi2(1) = 10.55
Prob > chi2 = 0.0012
Log pseudolikelihood = -2116.7312 Pseudo R2 = 0.0241

(standard errors adjusted for clustering on dyad)

barrier_m	Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]	
L_ln_gdppc~o	.7337477	.2258863	3.25	0.001	.2910187	1.176477
_cons	-4.344263	.323695	-13.42	0.000	-4.978694	-3.709833

10-year Lag
(9526 missing values generated)

Iteration 0: log pseudolikelihood = -1926.6246
 Iteration 1: log pseudolikelihood = -1894.4034
 Iteration 2: log pseudolikelihood = -1886.5813
 Iteration 3: log pseudolikelihood = -1886.4583
 Iteration 4: log pseudolikelihood = -1886.4583

Logit estimates Number of obs = 17076
Wald chi2(1) = 9.74
Prob > chi2 = 0.0018
 Log pseudolikelihood = -1886.4583 Pseudo R2 = 0.0208

(standard errors adjusted for clustering on dyad)

barrier_m	Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]	
L_ln_gdppc~o	.7003008	.2243368	3.12	0.002	.2606088	1.139993
_cons	-4.237384	.3214216	-13.18	0.000	-4.867359	-3.60741

15-year Lag
(12249 missing values generated)

Iteration 0: log pseudolikelihood = -1660.2539
 Iteration 1: log pseudolikelihood = -1634.4897
 Iteration 2: log pseudolikelihood = -1629.6895
 Iteration 3: log pseudolikelihood = -1629.6317
 Iteration 4: log pseudolikelihood = -1629.6317

Logit estimates Number of obs = 14353
Wald chi2(1) = 8.39
Prob > chi2 = 0.0038
 Log pseudolikelihood = -1629.6317 Pseudo R2 = 0.0184

(standard errors adjusted for clustering on dyad)

barrier_m	Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]	
L_ln_gdppc~o	.6842967	.2363036	2.90	0.004	.2211501	1.147443
_cons	-4.178721	.3369143	-12.40	0.000	-4.839061	-3.518381

IV. Endogeneity Concern II: Do Barriers Predict Economic Growth?

We estimate a simple model of economic growth, where the GDP growth rate (as a percentage) for every country that is the poorer of the two countries among at least one of its neighbors. (While the GDP growth rate for the wealthier country makes less sense here, we also try this and it works similarly.) We only include measures of whether the country has a physical barrier at their border, and country and year fixed effects. This specification presumably makes it easier to find a border barrier effect, as it includes none of the other variables included in typical growth models. None of the specifications show any relationship between a barrier and economic growth rates. We show two specifications here.

First, we show the results of a model where the dependent variable is the three-year growth rate in GDP in the poorer of the two neighbors. To assess the effect of barriers, we include a four-year lag of whether there is a barrier at the poorer countries barrier. We include a four-year lag to ensure that there is a barrier at the country's border the year before the growth rate is assessed from. The barrier measure is not even close to statistical significance. A one, two, four, or five year growth rate performs similarly (the barrier measure is always lagged one year before the year the growth rate is measured from).

```
Fixed-effects (within) regression          Number of obs   =    1464
Group variable: low_gdp_in~r             Number of groups =     94

R-sq:  within = 0.4141                    Obs per group:  min =     1
        between = 0.2786                   avg =    15.6
        overall = 0.3611                   max =     66

corr(u_i, Xb) = -0.0565                    F(66, 93)       =     .
                                           Prob > F        =     .
```

(Std. Err. adjusted for 94 clusters in low_gdp_indicator)

```
-----+-----
low_gdp~3_100 |          Coef.   Robust
                |          Std. Err.   t    P>|t|    [95% Conf. Interval]
-----+-----
barrier_t_4    | -2.098709    2.719369   -0.77  0.442   -7.498838    3.30142
   _cons       | -1.709504   10.2896   -0.17  0.868   -22.14261   18.7236
-----+-----
sigma_u        |   8.120163
sigma_e        |  12.798339
rho            |   .28701408   (fraction of variance due to u_i)
-----+-----
```

The dependent variable in the specification below is the one-year growth rate in GDP in the poorer of the two neighbors. We measure borders differently here to account for the possibility that borders have a slower, long-term effect on growth. Thus, the variable “barrier years” counts the number of years a barrier has been at the border. The coefficient is not only far from any conventional level of statistical significance, but is actually positive.

```
Fixed-effects (within) regression          Number of obs   =   1648
Group variable: low_gdp_in~r             Number of groups =   103

R-sq:  within = 0.3030                    Obs per group:  min =    1
        between = 0.1038                   avg   =   16.0
        overall = 0.2802                   max   =   69

corr(u_i, Xb) = -0.0737                    F(71,102)       =    .
                                                Prob > F         =    .
```

(Std. Err. adjusted for 103 clusters in low_gdp_indicator)

	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
low_gd~h_100						
barrier_yrs	.1362807	.5049617	0.27	0.788	-.8653085	1.13787
_cons	-2.236417	5.88595	-0.38	0.705	-13.91117	9.438337
sigma_u	4.4770155					
sigma_e	10.070238					
rho	.16503181	(fraction of variance due to u_i)				

V. Endogeneity Concerns III: Simultaneous Equation Model

As described in the text, we estimate a simultaneous equations model in which an instrumental variable version of the absolute difference in GDP per capita is created and then used to estimate the effect of absolute difference in GDP per capita on GDP (second set of results on page 40). Looking at the second model on page 40, one can see that the instrumental version of GDP per capita has a positive, large, and statistically significant effect on the presence of a barrier.

NOTE: Both equations contain the same set of control variables except the GDP per capita difference model contains the lag of GDP per capita.

```
. cdsimeq (abs_gdp_diff_10000 lag_diff dem_dyad decentral_dyad atopally_m terrdisp_m
civ_war total_lnreflows cap_diff)(barrier_m dem_dyad decentral_dyad atopally_m terrdisp_m
civ_war total_lnreflows cap_diff)
```

NOW THE FIRST STAGE REGRESSIONS

Source	SS	df	MS	Number of obs =	16084
Model	3216.87208	8	402.10901	F(8, 16075) =	.
Residual	42.3566325	16075	.002634938	Prob > F =	0.0000
-----+-----				R-squared =	0.9870
-----+-----				Adj R-squared =	0.9870
Total	3259.22871	16083	.202650545	Root MSE =	.05133

abs_gdp_d~10000	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
lag_diff	.9903757	.0009086	1090.02	0.000	.9885948 .9921567
dem_dyad	.0012046	.0010715	1.12	0.261	-.0008957 .0033049
decentral_dyad	.0012846	.0032687	0.39	0.694	-.0051223 .0076916
atopally_m	-.0058239	.0008542	-6.82	0.000	-.0074983 -.0041495
terrdisp_m	.0012521	.0012076	1.04	0.300	-.0011149 .003619
civ_war	-.0035254	.0009274	-3.80	0.000	-.0053433 -.0017075
total_lnreflows	-.0001273	.0006521	-0.20	0.845	-.0014055 .0011509
cap_diff	.0604714	.010182	5.94	0.000	.0405135 .0804293
_cons	.0103429	.0007923	13.05	0.000	.00879 .0118958

Iteration 0: log likelihood = -1854.2538

...

Iteration 5: log likelihood = -1631.2274

Probit regression	Number of obs =	16084
	LR chi2(8) =	446.05
	Prob > chi2 =	0.0000
Log likelihood = -1631.2274	Pseudo R2 =	0.1203

barrier_m	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
lag_diff	.2476018	.0398678	6.21	0.000	.1694624 .3257413
dem_dyad	-.6211329	.1021376	-6.08	0.000	-.821319 -.4209469
decentral_~d	.1976895	.1436934	1.38	0.169	-.0839444 .4793235
atopally_m	-.1906142	.0481016	-3.96	0.000	-.2848915 -.0963369
terrdisp_m	.6206223	.0505189	12.28	0.000	.5216071 .7196375
civ_war	-.1780496	.0551974	-3.23	0.001	-.2862345 -.0698647
total_lnr~ws	.0456237	.0315758	1.44	0.148	-.0162637 .1075111
cap_diff	3.923945	.413397	9.49	0.000	3.113702 4.734189
_cons	-2.143371	.0433342	-49.46	0.000	-2.228304 -2.058437

NOW THE SECOND STAGE REGRESSIONS WITH INSTRUMENTS

Source	SS	df	MS	Number of obs =	16084
Model	3216.87208	8	402.10901	F(8, 16075) =	.
Residual	42.3566325	16075	.002634938	Prob > F =	0.0000
				R-squared =	0.9870
				Adj R-squared =	0.9870
Total	3259.22871	16083	.202650545	Root MSE =	.05133

abs_gdp_diff_10000	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
dichotomous_instrument	.0154109	.0025948	5.94	0.000	.0103247 .020497
lag_diff	.98656	.0011264	875.83	0.000	.984352 .9887679
dem_dyad	.0107768	.0020049	5.38	0.000	.0068469 .0147067
decentral_dyad	-.0017619	.0034029	-0.52	0.605	-.0084321 .0049082
atopally_m	-.0028864	.0009857	-2.93	0.003	-.0048184 -.0009544
terrdisp_m	-.0083123	.0020666	-4.02	0.000	-.012363 -.0042615
civ_war	-.0007815	.00105	-0.74	0.457	-.0028397 .0012767
total_lnreflows	-.0008304	.0006554	-1.27	0.205	-.002115 .0004542
cap_diff	0	(omitted)			
_cons	.0433741	.0054152	8.01	0.000	.0327598 .0539884

Variable(s) have been dropped during the OLS estimation.
 This is probably due to collinearity. Estimation cannot continue

Iteration 0: log likelihood = -1854.2538
 Iteration 1: log likelihood = -1652.0118
 Iteration 2: log likelihood = -1631.9437
 Iteration 3: log likelihood = -1631.2333
 Iteration 4: log likelihood = -1631.2274
 Iteration 5: log likelihood = -1631.2274

Probit regression
 Number of obs = 16084
 LR chi2(8) = 446.05
 Prob > chi2 = 0.0000
 Pseudo R2 = 0.1203
 Log likelihood = -1631.2274

barrier_m	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
continuous~t	.250008	.0402552	6.21	0.000	.1711092 .3289068
dem_dyad	-.6214341	.1021346	-6.08	0.000	-.8216143 -.4212539
decentral~d	.1973684	.143696	1.37	0.170	-.0842706 .4790073
atopally_m	-.1891582	.0480772	-3.93	0.000	-.2833877 -.0949286
terrdisp_m	.6203093	.0505237	12.28	0.000	.5212846 .7193339
civ_war	-.1771682	.0552129	-3.21	0.001	-.2853834 -.0689529
total_lnr~ws	.0456555	.0315759	1.45	0.148	-.016232 .1075431
cap_diff	3.908827	.4133313	9.46	0.000	3.098713 4.718942
_cons	-2.145956	.0435009	-49.33	0.000	-2.231217 -2.060696

NOW THE SECOND STAGE REGRESSIONS WITH CORRECTED STANDARD ERRORS

abs_gdp_diff_10000	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
dichotomous_instrument	.0305534	.0088432	3.45	0.001	.0132197	.0478871
lag_diff	.9828107	.0025507	385.30	0.000	.9778109	.9878104
dem_dyad	.0201823	.0068989	2.93	0.003	.0066597	.0337049
decentral_dyad	-.0047555	.0056573	-0.84	0.401	-.0158445	.0063335
terrdisp_m	-.01771	.0058992	-3.00	0.003	-.0292732	-.0061469
civ_war	.0019146	.0023957	0.80	0.424	-.0027812	.0066105
total_lnreflows	-.0015212	.0012489	-1.22	0.223	-.0039693	.0009268
cap_diff	-.0594184	.0374024	-1.59	0.112	-.1327312	.0138944
_cons	.0758301	.0196687	3.86	0.000	.0372773	.114383

barrier_m	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
continuous_instrument	.250008	.0402502	6.21	0.000	.171119	.328897
dem_dyad	-.6214341	.1021319	-6.08	0.000	-.821609	-.4212592
decentral_dyad	.1973684	.1436782	1.37	0.170	-.0842357	.4789724
atopally_m	-.1891582	.0480736	-3.93	0.000	-.2833806	-.0949357
terrdisp_m	.6203093	.0505168	12.28	0.000	.5212981	.7193204
civ_war	-.1771682	.0552091	-3.21	0.001	-.2853761	-.0689603
total_lnreflows	.0456555	.0315726	1.45	0.148	-.0162257	.1075368
cap_diff	3.908827	.4132713	9.46	0.000	3.09883	4.718824
_cons	-2.145956	.0434974	-49.34	0.000	-2.23121	-2.060703