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**Working Paper**

## Sub-Saharan growth surprises: Geography, institutions and history in an all African data panel

Working Paper, No. 2006-21

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**Supplemental Appendix to “Sub-Saharan Growth Surprises: Being Heterogeneous,  
Inland and Close to the Equator Doesn’t Slow Growth Within Africa”**

by Matthias Cinyabuguma and Louis Putterman

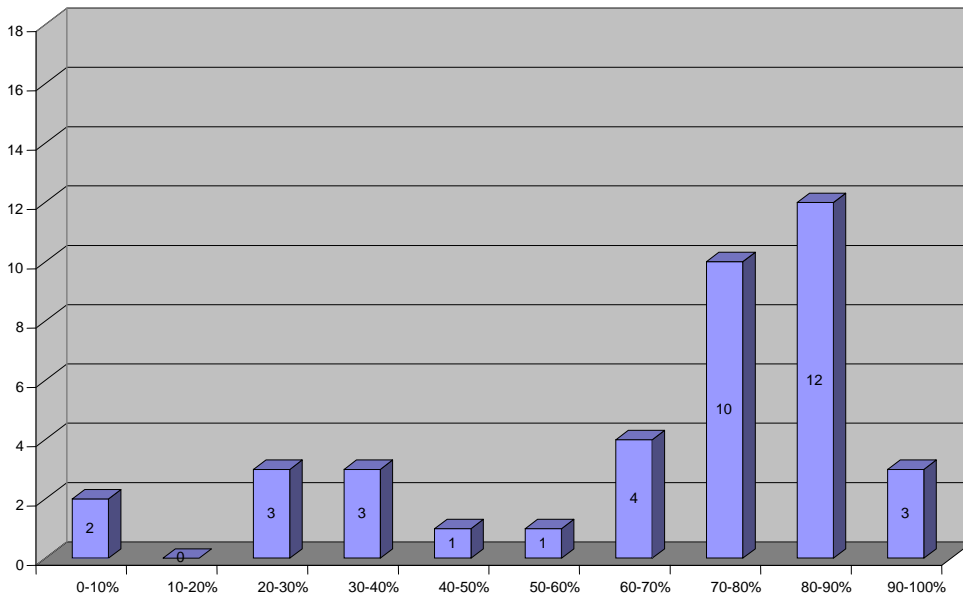
*Journal of African Economies* 2010

**I. Comparison of distributions of key variables for African sample countries and non-African countries for which the same indicators are available**

The material in this section is discussed in the next to last paragraph of section 2 of our paper.

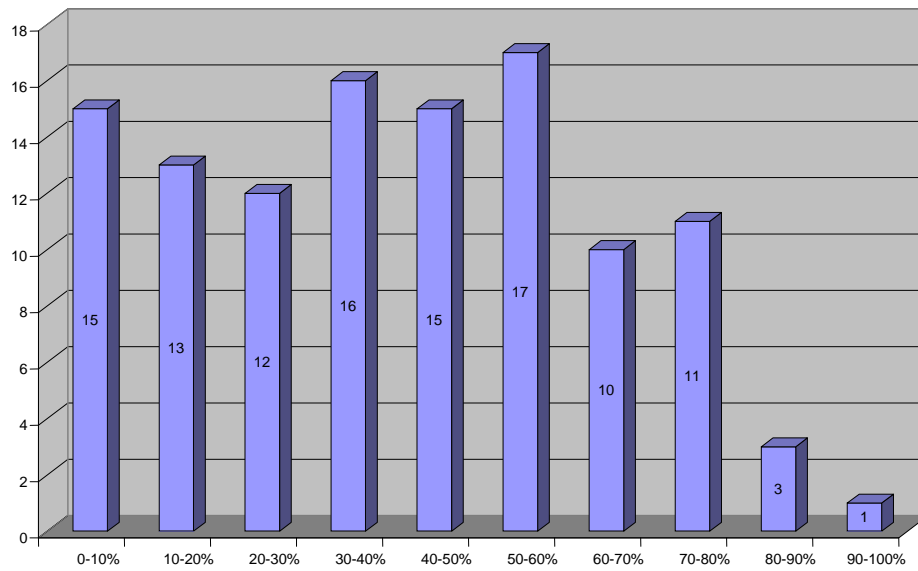
As described in our paper, we treat the lowest observed value as 0% and the highest observed value (for the combined African and non-African observations) as 100%, and divide the range of values for each variable into equal 10% bands.

Ethnic Heterogeneity, Africa



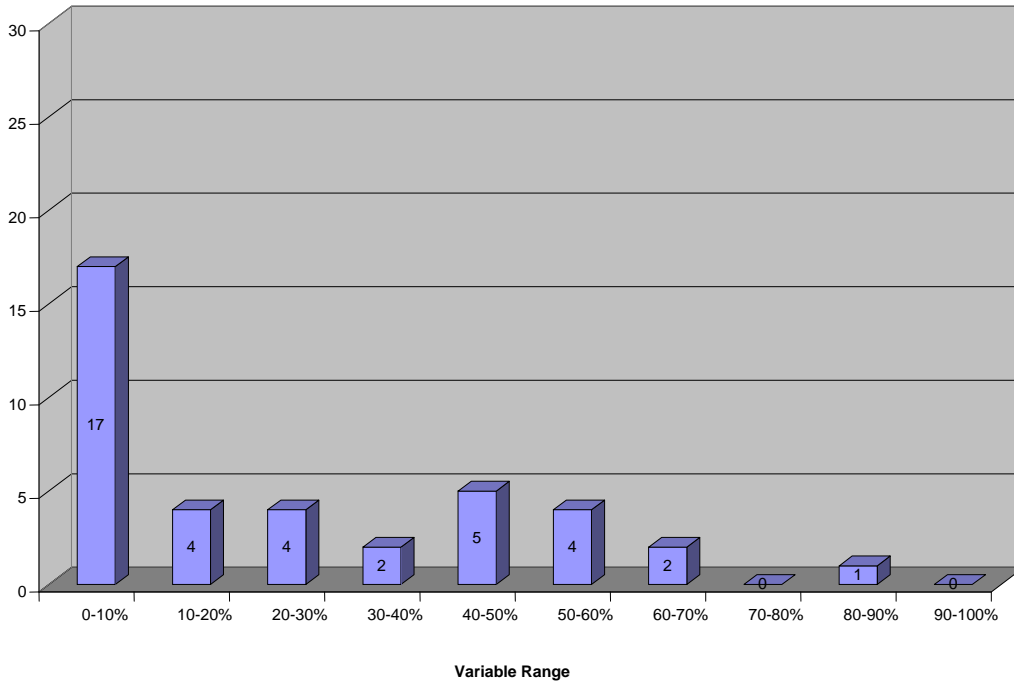
Variable Range

Ethnic Heterogeneity, Rest of World

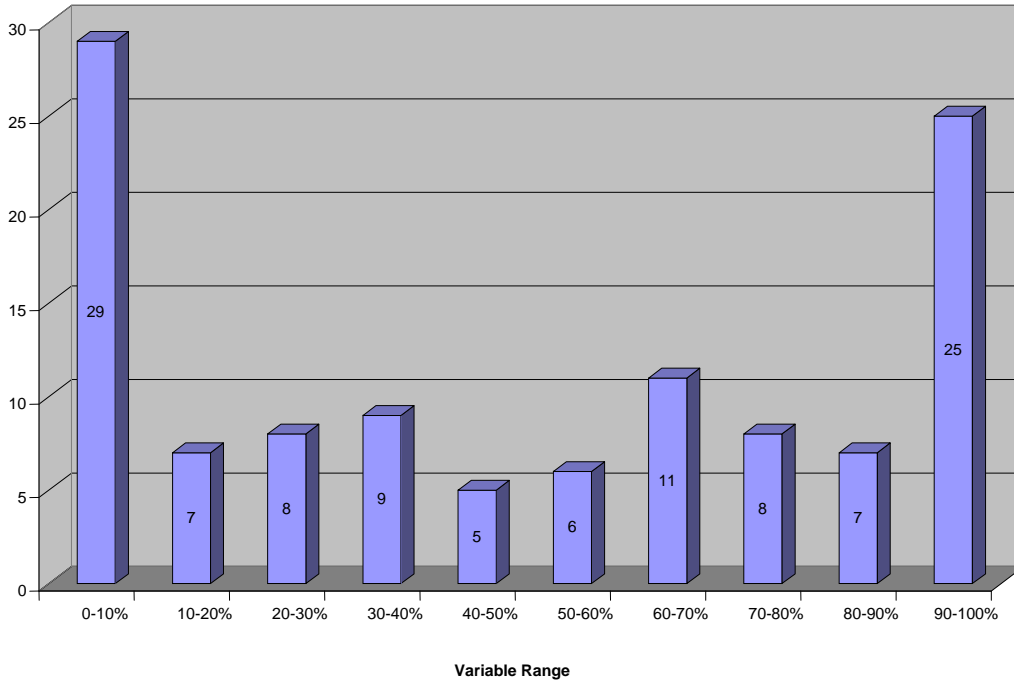


Variable Range

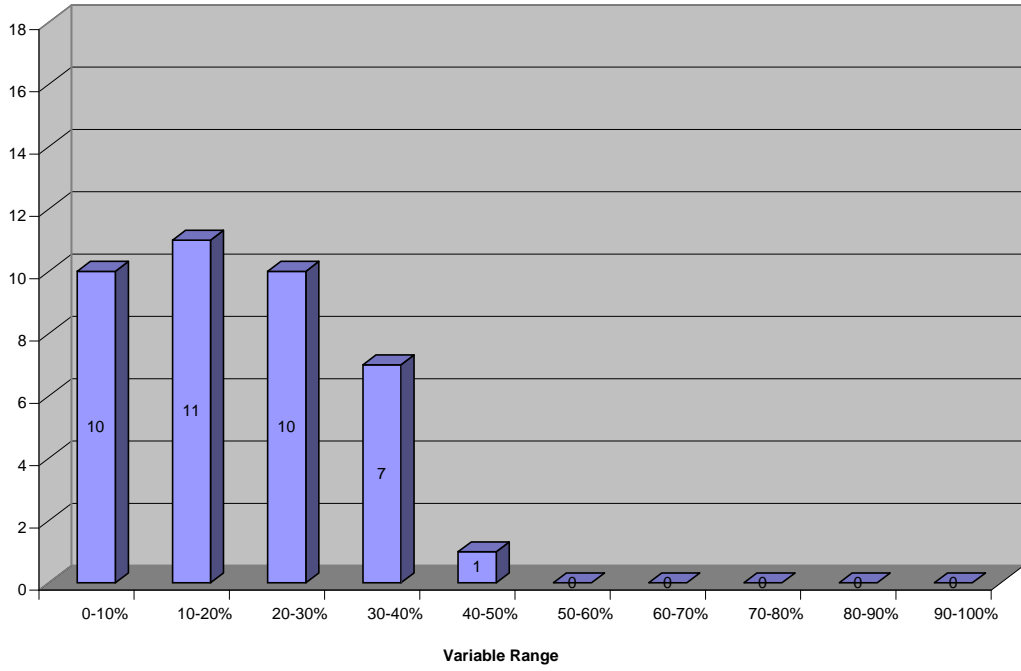
Coastal Population Share, Africa



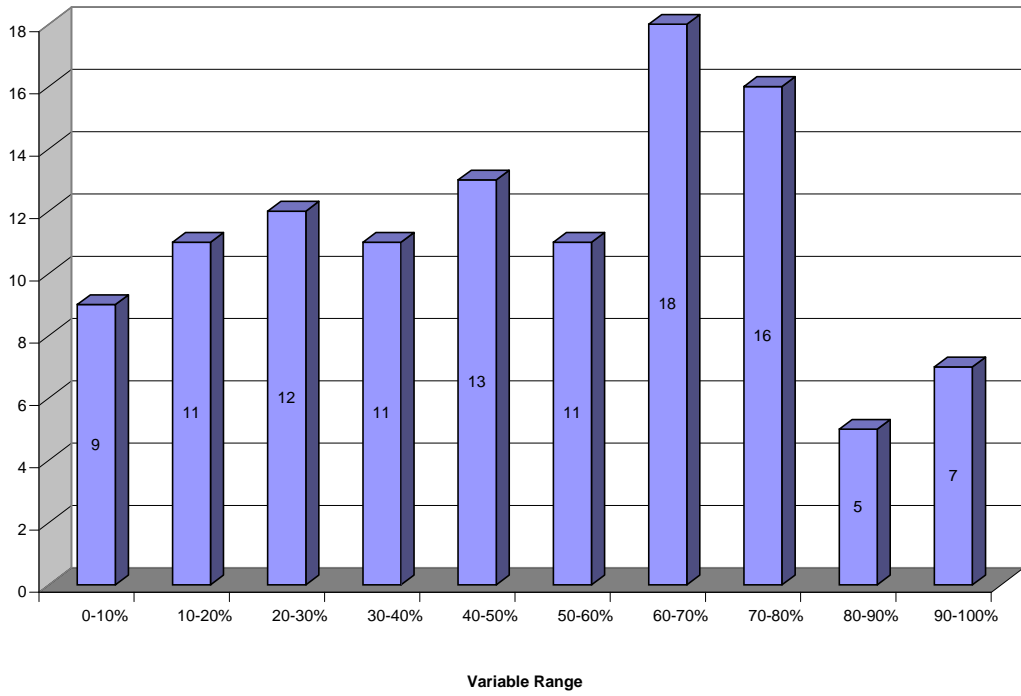
Coastal Population Share, Rest of World



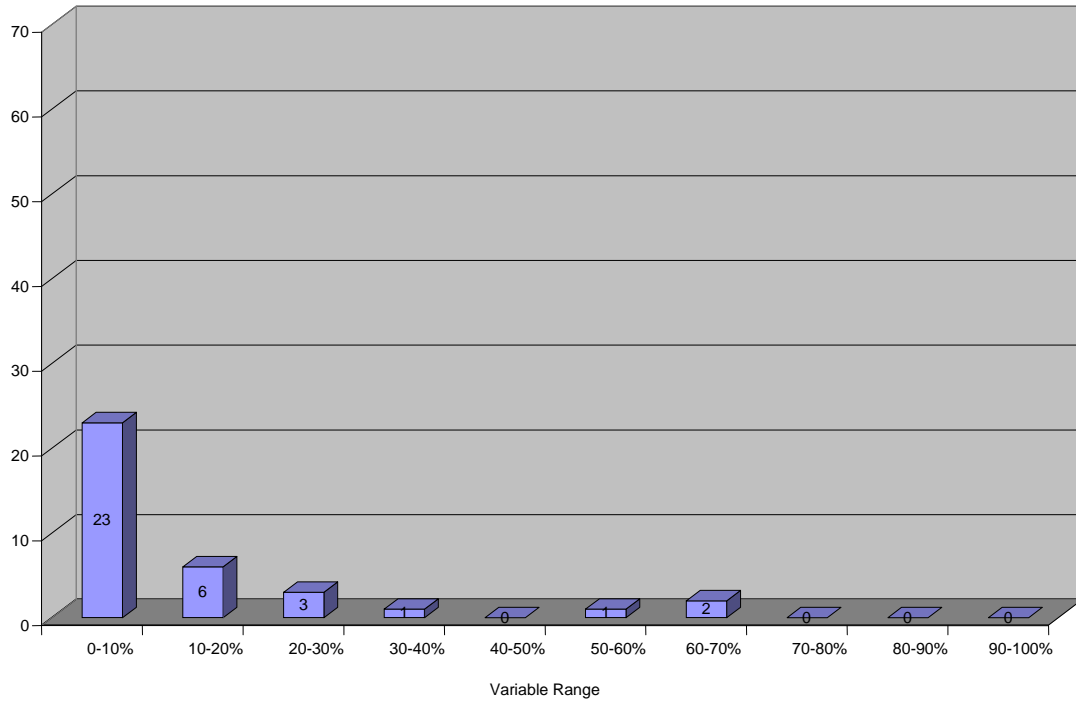
Absolute Latitude, Africa



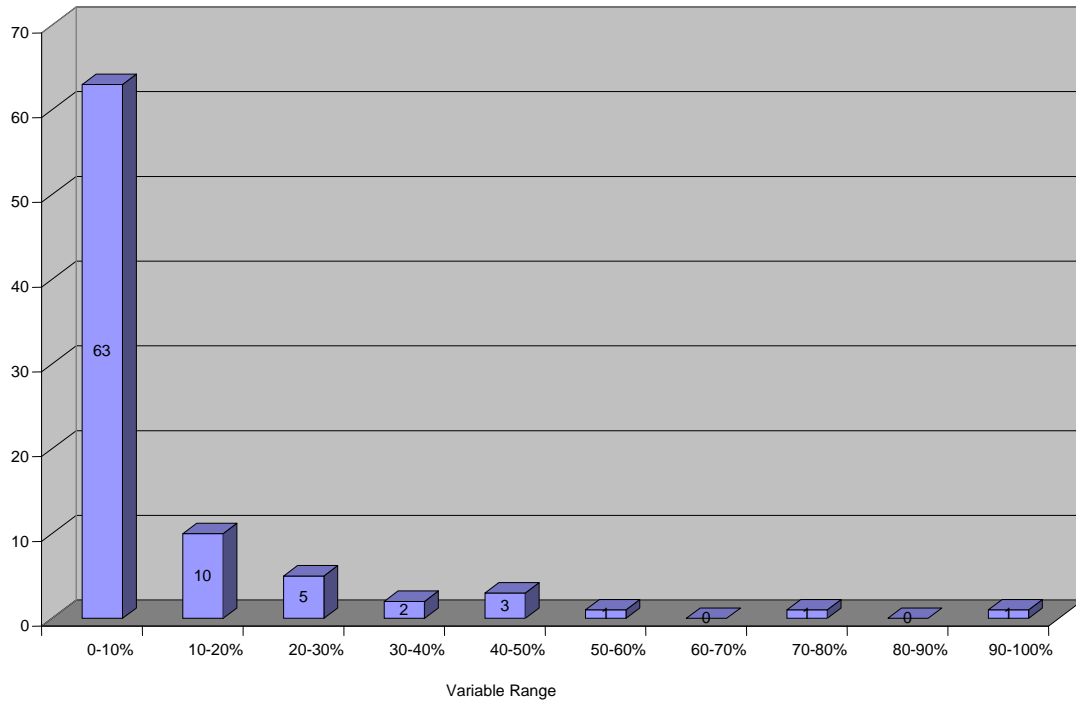
Absolute Latitude, Rest of World



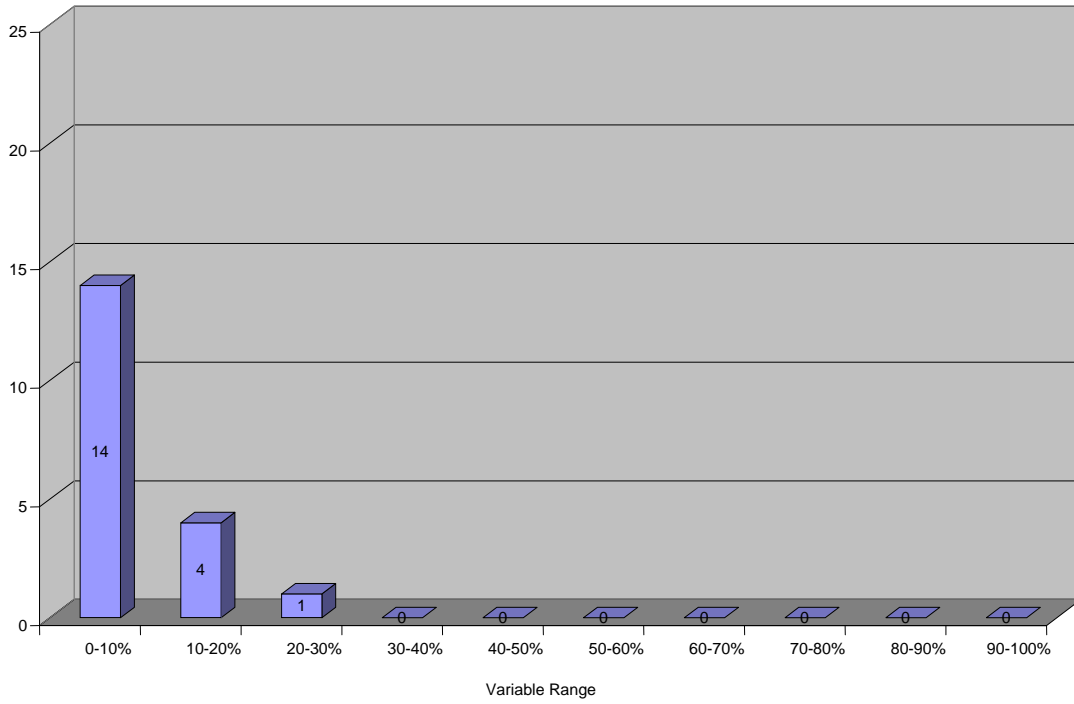
Civil War, Africa



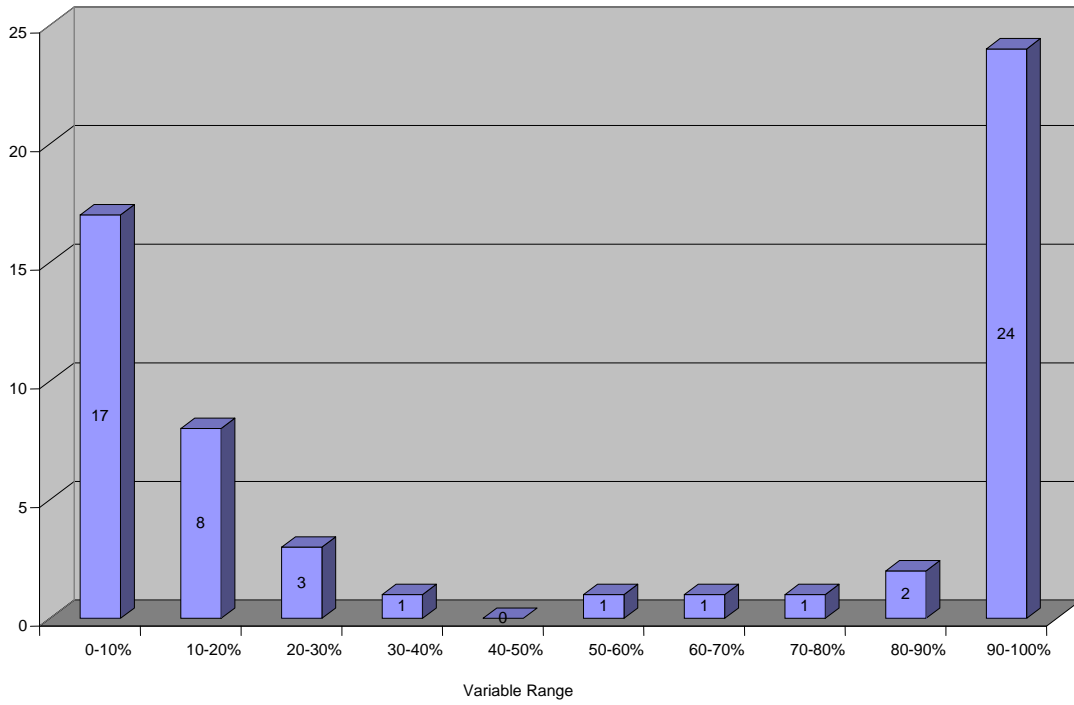
Civil War, Rest of World



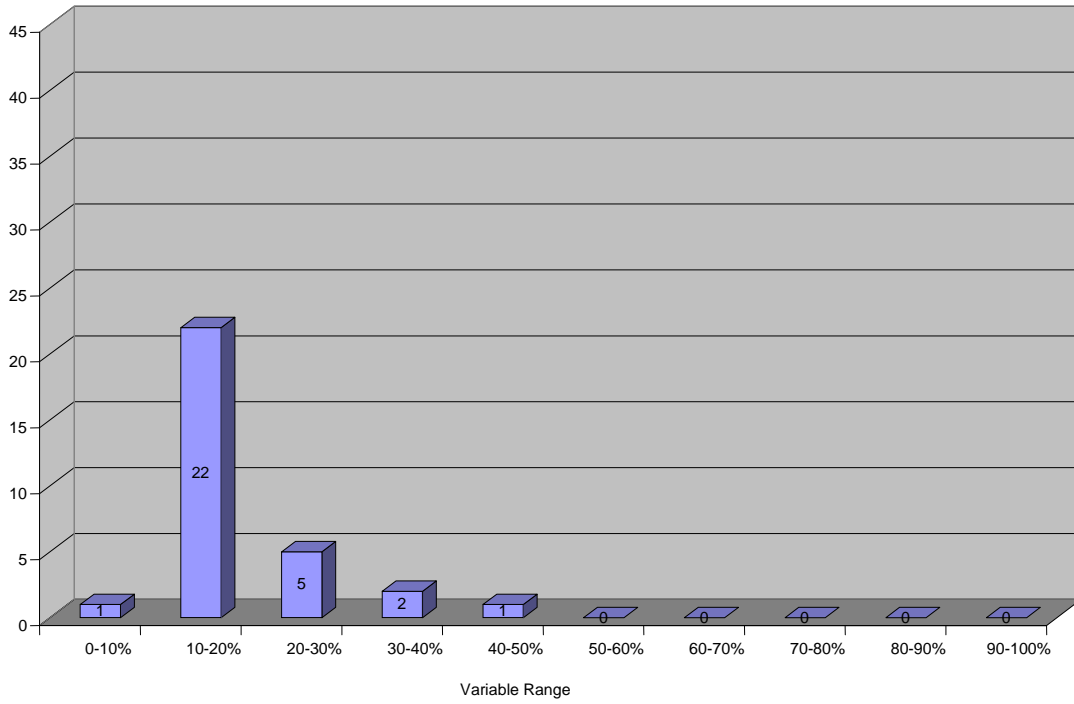
Openness, Africa



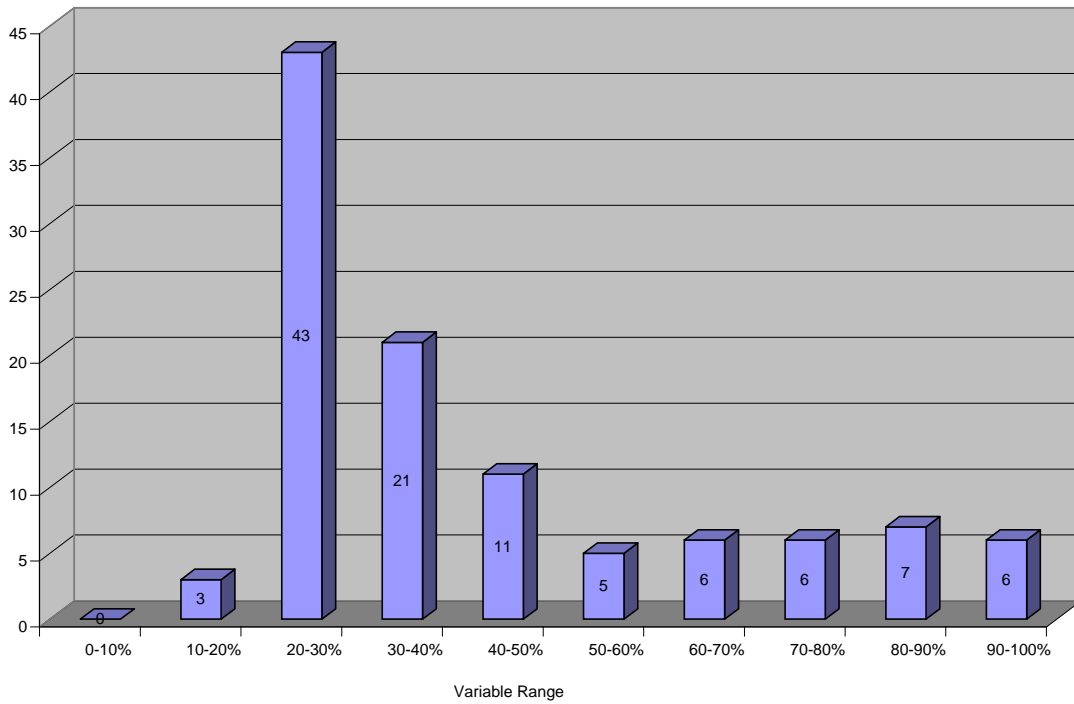
Openness, Rest of World



Absence of Corruption, Africa

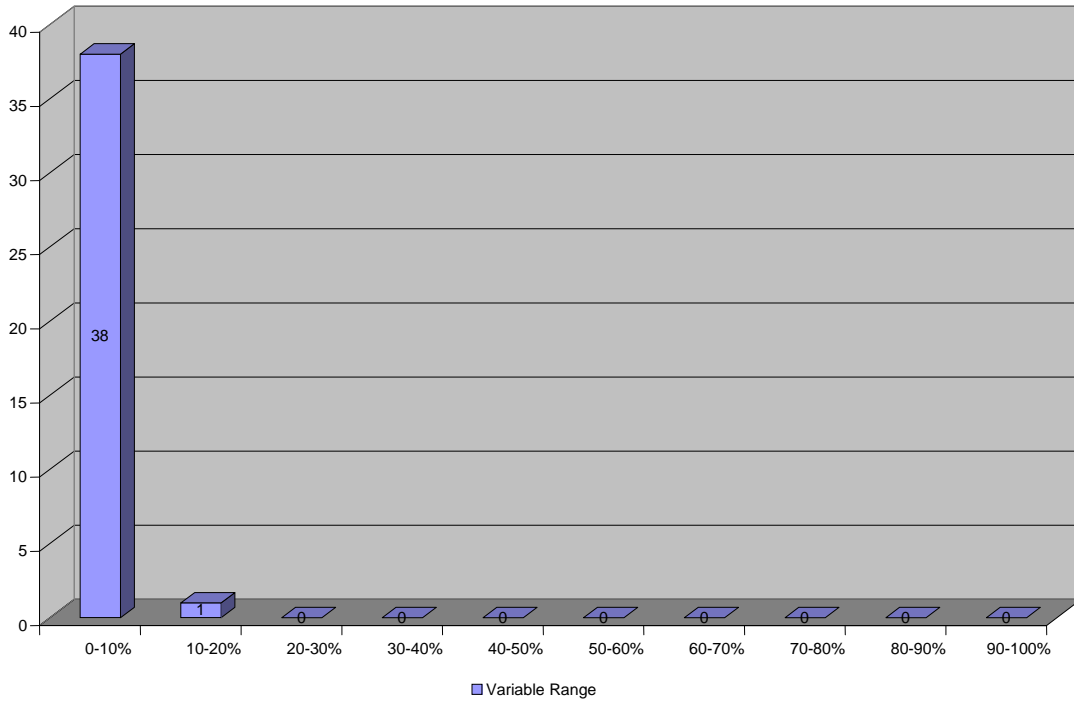


Absence of Corruption, Rest of World

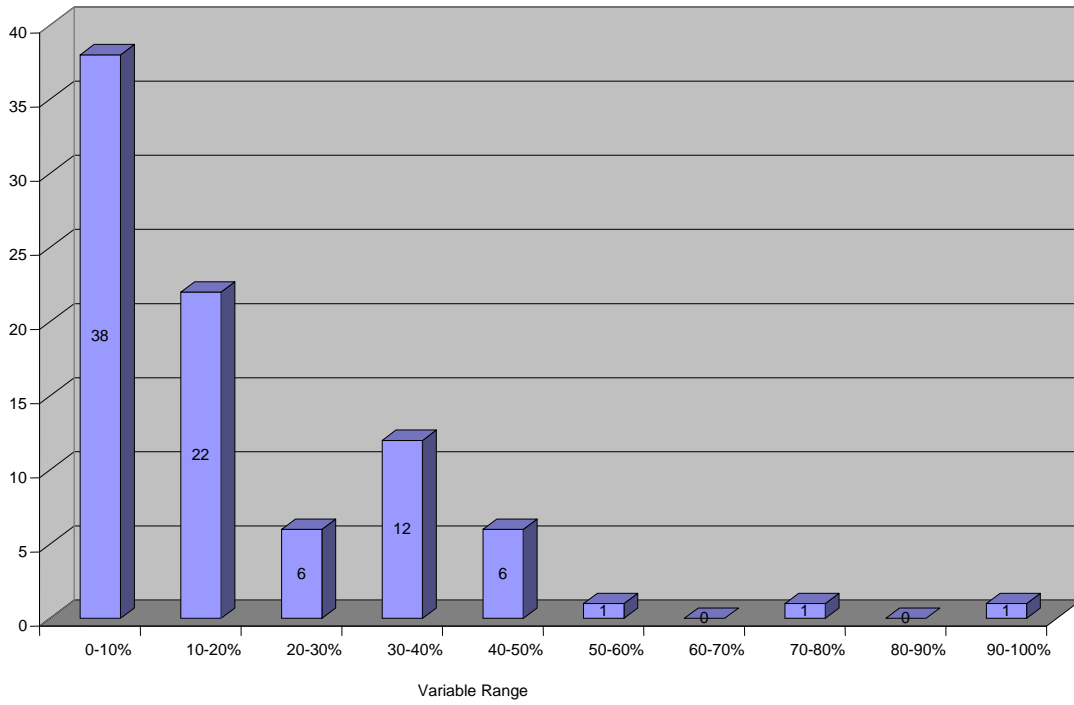




Real GDP per capita, Africa



Real GDP per capita, Rest of World



## II. 2SLS regression systems with multiple endogenous variables.

At the end of section 3.2, 2SLS Regression Results, in footnote 46, we report a series of tests of 2SLS equations that include either two or three endogenous institutional variables in their 2<sup>nd</sup> stage regression. There are five endogenous institutional variables: Civil Wars (CW), Years Open (YO), Political Rights (PR), Political Openness (PO) and Absence of Corruption (AC). This means that there are ten possible pairs of endogenous variables: CW-YO, CW-PR, CW-PO, CW-AC, YO-PR, YO-PO, YO-AC, PR-PO, PR-AC and PO-AC. The estimates of the regression systems for these ten pairs follow. Each system is estimated in two versions: first, with the intersection of the set of instruments used for the two variables in the regressions of Table 3 of the paper, dubbed “small set of instruments;” second, with the union of the set of instruments used for the two variables in Table 3, dubbed “large set of instruments.” These regression systems are followed by one regression system with three endogenous variables: YO, PO and AC, reported because of absence of a clear dominance relationship among these three based on the two variable equations. This is also reported for a small and a large set of instruments. See the paper for discussion.

### A. CW and YO

#### 1. Small set of instruments

```
. ivreg2 grgdppc ( civilwars yrsopen= religfrac percentmuslim statehist01v3  
predtrdshr lat lat2 eurlngshr ) logigdppc loginv_gdp coastpopshr malariaec  
> ol naturalcap time1 time2 time3 time4 time5 time6 time7, first
```

First-stage regressions  
-----

First-stage regression of civilwars:

OLS estimation  
-----

Estimates efficient for homoskedasticity only  
Statistics consistent for homoskedasticity only

	Number of obs =	191
	F( 19, 171) =	2.73
	Prob > F =	0.0003
Total (centered) SS =	25.28795812	Centered R2 = 0.2330
Total (uncentered) SS =	30	Uncentered R2 = 0.3535
Residual SS =	19.39470833	Root MSE = .3368

civilwars	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
logigppc	-.1002342	.0755362	-1.33	0.186	-.2493377	.0488693
loginv_gdp	-.2051814	.0639895	-3.21	0.002	-.3314925	-.0788704
coastpopshr	-.363176	.1647685	-2.20	0.029	-.6884181	-.0379339
malariaecol	-.0068092	.0043506	-1.57	0.119	-.0153969	.0017786
naturalcap	.0000224	.0000119	1.88	0.062	-1.10e-06	.0000458
time1	-.1800147	.0996372	-1.81	0.073	-.376692	.0166625
time2	-.0385623	.0976725	-0.39	0.693	-.2313614	.1542368
time3	-.0414749	.0973439	-0.43	0.671	-.2336252	.1506754
time4	-.0956544	.0975469	-0.98	0.328	-.2882055	.0968967
time5	-.1173938	.0978954	-1.20	0.232	-.310633	.0758453
time6	-.078197	.0975964	-0.80	0.424	-.2708458	.1144519
time7	.0892016	.0973757	0.92	0.361	-.1030116	.2814148
religfrac	.0061817	.0031549	1.96	0.052	-.0000459	.0124092
percentmus~m	.0021424	.0020493	1.05	0.297	-.0019028	.0061876
statehist0~3	.3800733	.3226047	1.18	0.240	-.256727	1.016874
predtrdshr	.2162038	.0889634	2.43	0.016	.0405958	.3918118
lat	-.0095122	.0233446	-0.41	0.684	-.0555929	.0365685
lat2	-.000253	.0010994	-0.23	0.818	-.0024232	.0019172
eurlngshr	5.417173	2.157549	2.51	0.013	1.158314	9.676032
_cons	.530353	.601966	0.88	0.380	-.6578882	1.718594

Included instruments: logigppc loginv\_gdp coastpopshr malariaecol naturalcap  
time1 time2 time3 time4 time5 time6 time7 religfrac  
percentmuslim statehist01v3 predtrdshr lat lat2 eurlngshr

Partial R-squared of excluded instruments: 0.1003

Test of excluded instruments:

F( 7, 171) = 2.72

Prob > F = 0.0105

First-stage regression of yrsopen:

OLS estimation

Estimates efficient for homoskedasticity only  
Statistics consistent for homoskedasticity only

Number of obs = 191

F( 19, 171) = 8.92

Prob > F = 0.0000

Total (centered) SS = 1.855459874

Centered R2 = 0.4977

Total (uncentered) SS = 2.73782809

Uncentered R2 = 0.6596

Residual SS = .9320699917      Root MSE = .07383

-----	-----	-----	-----	-----	-----	-----
yrsopen	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	-----
-----+-----	-----	-----	-----	-----	-----	-----
logigdppc	.0074459	.0165591	0.45	0.654	-.0252407	.0401326
loginv_gdp	-.0015097	.0140279	-0.11	0.914	-.0291997	.0261804
coastpopshr	-.0247499	.0361208	-0.69	0.494	-.0960499	.04655
malariaecol	.0043439	.0009537	4.55	0.000	.0024613	.0062265
naturalcap	3.01e-06	2.61e-06	1.15	0.250	-2.14e-06	8.15e-06
time1	-.0019663	.0218426	-0.09	0.928	-.0450822	.0411495
time2	-.0005512	.0214119	-0.03	0.979	-.0428168	.0417145
time3	-.0010195	.0213398	-0.05	0.962	-.0431429	.0411039
time4	-.0008181	.0213843	-0.04	0.970	-.0430293	.0413932
time5	-.0010962	.0214608	-0.05	0.959	-.0434583	.0412659
time6	-.0008143	.0213952	-0.04	0.970	-.043047	.0414184
time7	-.0005385	.0213468	-0.03	0.980	-.0426757	.0415987
religfrac	.002467	.0006916	3.57	0.000	.0011018	.0038322
percentmus~m	-.0000426	.0004492	-0.09	0.925	-.0009294	.0008442
statehist0~3	.4442199	.0707218	6.28	0.000	.3046197	.5838201
predtrdshr	.1272186	.0195027	6.52	0.000	.0887216	.1657156
lat	-.0314474	.0051176	-6.14	0.000	-.0415493	-.0213456
lat2	.0017137	.000241	7.11	0.000	.0012379	.0021894
eurlngshr	.3150857	.4729805	0.67	0.506	-.6185466	1.248718
_cons	-.5555938	.1319637	-4.21	0.000	-.8160815	-.2951061

Included instruments: logigdppc loginv\_gdp coastpopshr malariaecol naturalcap  
time1 time2 time3 time4 time5 time6 time7 religfrac  
percentmuslim statehist01v3 predtrdshr lat lat2 eurlngshr

-----  
Partial R-squared of excluded instruments: 0.4545  
Test of excluded instruments:  
F( 7, 171) = 20.35  
Prob > F = 0.0000

Summary results for first-stage regressions

-----	-----	-----	-----	-----
Variable	Shea Partial R2	Partial R2	F( 7, 171)	P-value
civilwars	0.1003	0.1003	2.72	0.0105
yrsopen	0.4543	0.4545	20.35	0.0000

Underidentification tests  
Ho: matrix of reduced form coefficients has rank=K1-1 (underidentified)  
Ha: matrix has rank=K1 (identified)

Anderson canon. corr. N\*CCEV LM statistic Chi-sq(6)=19.12 P-val=0.0040  
 Cragg-Donald N\*CDEV Wald statistic Chi-sq(6)=21.24 P-val=0.0017

Weak identification test

Ho: equation is weakly identified

Cragg-Donald Wald F-statistic 2.72

See main output for Cragg-Donald weak id test critical values

Weak-instrument-robust inference

Tests of joint significance of endogenous regressors B1 in main equation

Ho: B1=0 and overidentifying restrictions are valid

Anderson-Rubin Wald test F(7,171)= 5.26 P-val=0.0000

Anderson-Rubin Wald test Chi-sq(7)=41.13 P-val=0.0000

Stock-Wright LM S statistic Chi-sq(7)=33.84 P-val=0.0000

Number of observations N = 191  
 Number of regressors K = 15  
 Number of instruments L = 20  
 Number of excluded instruments L1 = 7

IV (2SLS) estimation

-----

Estimates efficient for homoskedasticity only

Statistics consistent for homoskedasticity only

Number of obs = 191  
 F( 14, 176) = 6.23  
 Prob > F = 0.0000  
 Total (centered) SS = 1805.83949 Centered R2 = 0.2611  
 Total (uncentered) SS = 1894.730014 Uncentered R2 = 0.2957  
 Residual SS = 1334.387752 Root MSE = 2.643

grgdppc	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
civilwars	-2.05201	1.798176	-1.14	0.254	-5.57637	1.47235
yrsoopen	15.52402	3.000923	5.17	0.000	9.642315	21.40572
logigdppc	-1.284791	.582938	-2.20	0.028	-2.427329	-.1422539
loginv_gdp	1.848968	.5808042	3.18	0.001	.7106131	2.987324
coastpopshr	-2.021003	1.048792	-1.93	0.054	-4.076598	.0345922
malariaecol	-.0499393	.023978	-2.08	0.037	-.0969354	-.0029432
naturalcap	-.0001215	.0000768	-1.58	0.114	-.0002721	.0000291
time1	.1303027	.8461944	0.15	0.878	-1.528208	1.788813
time2	1.318085	.7684694	1.72	0.086	-.1880875	2.824257
time3	1.100833	.7672376	1.43	0.151	-.4029255	2.604591

```

time4 | .3648206 .7853713 0.46 0.642 -1.174479 1.90412
time5 | -.225319 .7965492 -0.28 0.777 -1.786527 1.335889
time6 | -.2977901 .778597 -0.38 0.702 -1.823812 1.228232
time7 | -1.68468 .7805594 -2.16 0.031 -3.214549 -.154812
_cons | 4.938432 4.34962 1.14 0.256 -3.586665 13.46353

```

```

-----
Underidentification test (Anderson canon. corr. LM statistic):    19.117
                                                                Chi-sq(6) P-val = 0.0040
-----

```

```

Weak identification test (Cragg-Donald Wald F statistic):        2.717
Stock-Yogo weak ID test critical values: 5% maximal IV relative bias 16.88
                                         10% maximal IV relative bias 9.92
                                         20% maximal IV relative bias 6.16
                                         30% maximal IV relative bias 4.76
                                         10% maximal IV size 23.72
                                         15% maximal IV size 13.34
                                         20% maximal IV size 9.77
                                         25% maximal IV size 7.91

```

Source: Stock-Yogo (2005). Reproduced by permission.

```

-----
Sargan statistic (overidentification test of all instruments):    6.212
                                                                Chi-sq(5) P-val = 0.2861
-----

```

```

Instrumented:    civilwars yrsopen
Included instruments: logigdppc loginv_gdp coastpopshr malariaecol naturalcap
                    time1 time2 time3 time4 time5 time6 time7
Excluded instruments: religfrac percentmuslim statehist01v3 predtrdshr lat lat2
                    eurlngshr

```

## 2. Large set of instruments

```

. ivreg2 grgdppc ( civilwars yrsopen= religfrac    percentmuslim statehist01v3
                predtrdshr lat lat2 eurlngshr predtrdshr lat lat2 ) logigdppc loginv_gdp
> coastpopshr malariaecol naturalcap  time1 time2 time3 time4 time5 time6 time7,
                    first

```

```

Warning - duplicate variables detected
Duplicates:    predtrdshr lat lat2

```

First-stage regressions

-----

First-stage regression of civilwars:

OLS estimation

-----

Estimates efficient for homoskedasticity only  
 Statistics consistent for homoskedasticity only

	Number of obs =	191	
	F( 19, 171) =	2.73	
	Prob > F =	0.0003	
Total (centered) SS =	25.28795812	Centered R2 =	0.2330
Total (uncentered) SS =	30	Uncentered R2 =	0.3535
Residual SS =	19.39470833	Root MSE =	.3368

	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
civilwars						
logigdppc	-.1002342	.0755362	-1.33	0.186	-.2493377	.0488693
loginv_gdp	-.2051814	.0639895	-3.21	0.002	-.3314925	-.0788704
coastpopshr	-.363176	.1647685	-2.20	0.029	-.6884181	-.0379339
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time1	-.1800147	.0996372	-1.81	0.073	-.376692	.0166625
time2	-.0385623	.0976725	-0.39	0.693	-.2313614	.1542368
time3	-.0414749	.0973439	-0.43	0.671	-.2336252	.1506754
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time6	-.078197	.0975964	-0.80	0.424	-.2708458	.1144519
time7	.0892016	.0973757	0.92	0.361	-.1030116	.2814148
religfrac	.0061817	.0031549	1.96	0.052	-.0000459	.0124092
percentmus~m	.0021424	.0020493	1.05	0.297	-.0019028	.0061876
statehist0~3	.3800733	.3226047	1.18	0.240	-.256727	1.016874
predtrdshr	.2162038	.0889634	2.43	0.016	.0405958	.3918118
lat	-.0095122	.0233446	-0.41	0.684	-.0555929	.0365685
lat2	-.000253	.0010994	-0.23	0.818	-.0024232	.0019172
eurlngshr	5.417173	2.157549	2.51	0.013	1.158314	9.676032
_cons	.530353	.601966	0.88	0.380	-.6578882	1.718594

Included instruments: logigdppc loginv\_gdp coastpopshr malariaecol naturalcap  
 time1 time2 time3 time4 time5 time6 time7 religfrac  
 percentmuslim statehist01v3 predtrdshr lat lat2 eurlngshr

Partial R-squared of excluded instruments: 0.1003  
 Test of excluded instruments:  
 F( 7, 171) = 2.72  
 Prob > F = 0.0105

First-stage regression of yrsopen:

OLS estimation

Estimates efficient for homoskedasticity only  
 Statistics consistent for homoskedasticity only

Number of obs = 191  
 F( 19, 171) = 8.92  
 Prob > F = 0.0000  
 Total (centered) SS = 1.855459874      Centered R2 = 0.4977  
 Total (uncentered) SS = 2.73782809      Uncentered R2 = 0.6596  
 Residual SS = .9320699917      Root MSE = .07383

varsopen	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
logigdppc	.0074459	.0165591	0.45	0.654	-.0252407	.0401326
loginv_gdp	-.0015097	.0140279	-0.11	0.914	-.0291997	.0261804
coastpopshr	-.0247499	.0361208	-0.69	0.494	-.0960499	.04655
malariaecol	.0043439	.0009537	4.55	0.000	.0024613	.0062265
naturalcap	3.01e-06	2.61e-06	1.15	0.250	-2.14e-06	8.15e-06
time1	-.0019663	.0218426	-0.09	0.928	-.0450822	.0411495
time2	-.0005512	.0214119	-0.03	0.979	-.0428168	.0417145
time3	-.0010195	.0213398	-0.05	0.962	-.0431429	.0411039
time4	-.0008181	.0213843	-0.04	0.970	-.0430293	.0413932
time5	-.0010962	.0214608	-0.05	0.959	-.0434583	.0412659
time6	-.0008143	.0213952	-0.04	0.970	-.043047	.0414184
time7	-.0005385	.0213468	-0.03	0.980	-.0426757	.0415987
religfrac	.002467	.0006916	3.57	0.000	.0011018	.0038322
percentmus~m	-.0000426	.0004492	-0.09	0.925	-.0009294	.0008442
statehist0~3	.4442199	.0707218	6.28	0.000	.3046197	.5838201
predtrdshr	.1272186	.0195027	6.52	0.000	.0887216	.1657156
lat	-.0314474	.0051176	-6.14	0.000	-.0415493	-.0213456
lat2	.0017137	.000241	7.11	0.000	.0012379	.0021894
eurlngshr	.3150857	.4729805	0.67	0.506	-.6185466	1.248718
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Included instruments: logigdppc loginv\_gdp coastpopshr malariaecol naturalcap  
 time1 time2 time3 time4 time5 time6 time7 religfrac  
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Partial R-squared of excluded instruments: 0.4545  
 Test of excluded instruments:  
 F( 7, 171) = 20.35  
 Prob > F = 0.0000



Summary results for first-stage regressions

Variable	Shea Partial R2	Partial R2	F( 7, 171)	P-value
civilwars	0.1003	0.1003	2.72	0.0105
yrsopen	0.4543	0.4545	20.35	0.0000

Underidentification tests

Ho: matrix of reduced form coefficients has rank=K1-1 (underidentified)

Ha: matrix has rank=K1 (identified)

Anderson canon. corr. N\*CCEV LM statistic Chi-sq(6)=19.12 P-val=0.0040

Cragg-Donald N\*CDEV Wald statistic Chi-sq(6)=21.24 P-val=0.0017

Weak identification test

Ho: equation is weakly identified

Cragg-Donald Wald F-statistic 2.72

See main output for Cragg-Donald weak id test critical values

Weak-instrument-robust inference

Tests of joint significance of endogenous regressors B1 in main equation

Ho: B1=0 and overidentifying restrictions are valid

Anderson-Rubin Wald test F(7,171)= 5.26 P-val=0.0000

Anderson-Rubin Wald test Chi-sq(7)=41.13 P-val=0.0000

Stock-Wright LM S statistic Chi-sq(7)=33.84 P-val=0.0000

Number of observations	N =	191
Number of regressors	K =	15
Number of instruments	L =	20
Number of excluded instruments	L1 =	7

IV (2SLS) estimation

Estimates efficient for homoskedasticity only  
 Statistics consistent for homoskedasticity only

	Number of obs =	191
	F( 14, 176) =	6.23
	Prob > F =	0.0000
Total (centered) SS =	1805.83949	Centered R2 = 0.2611
Total (uncentered) SS =	1894.730014	Uncentered R2 = 0.2957
Residual SS =	1334.387752	Root MSE = 2.643

-----  
 grgdppc | Coef. Std. Err. z P>|z| [95% Conf. Interval]

civilwars		-2.05201	1.798176	-1.14	0.254	-5.57637	1.47235
ysrsopen		15.52402	3.000923	5.17	0.000	9.642315	21.40572
logigdppc		-1.284791	.582938	-2.20	0.028	-2.427329	-.1422539
loginv_gdp		1.848968	.5808042	3.18	0.001	.7106131	2.987324
coastpopshr		-2.021003	1.048792	-1.93	0.054	-4.076598	.0345922
malariaecol		-.0499393	.023978	-2.08	0.037	-.0969354	-.0029432
naturalcap		-.0001215	.0000768	-1.58	0.114	-.0002721	.0000291
time1		.1303027	.8461944	0.15	0.878	-1.528208	1.788813
time2		1.318085	.7684694	1.72	0.086	-.1880875	2.824257
time3		1.100833	.7672376	1.43	0.151	-.4029255	2.604591
time4		.3648206	.7853713	0.46	0.642	-1.174479	1.90412
time5		-.225319	.7965492	-0.28	0.777	-1.786527	1.335889
time6		-.2977901	.778597	-0.38	0.702	-1.823812	1.228232
time7		-1.68468	.7805594	-2.16	0.031	-3.214549	-.154812
_cons		4.938432	4.34962	1.14	0.256	-3.586665	13.46353

Underidentification test (Anderson canon. corr. LM statistic): 19.117  
Chi-sq(6) P-val = 0.0040

Weak identification test (Cragg-Donald Wald F statistic): 2.717  
Stock-Yogo weak ID test critical values: 5% maximal IV relative bias 16.88  
10% maximal IV relative bias 9.92  
20% maximal IV relative bias 6.16  
30% maximal IV relative bias 4.76  
10% maximal IV size 23.72  
15% maximal IV size 13.34  
20% maximal IV size 9.77  
25% maximal IV size 7.91

Source: Stock-Yogo (2005). Reproduced by permission.

Sargan statistic (overidentification test of all instruments): 6.212  
Chi-sq(5) P-val = 0.2861

Instrumented: civilwars yrsopen  
Included instruments: logigdppc loginv\_gdp coastpopshr malariaecol naturalcap  
time1 time2 time3 time4 time5 time6 time7  
Excluded instruments: religfrac percentmuslim statehist01v3 predtrdshr lat lat2  
eurlngshr  
Duplicates: predtrdshr lat lat2

## B. CW and PR

### 3. Large set of instruments

```
. ivreg2 grgdppc ( civilwars politrights= religfrac ethheter percentmuslim
statehist01v3 predtrdshr lat lat2 eurlngshr predtrdshr lat lat2 ) logigd
> ppc loginv_gdp coastpopshr malariaecol naturalcap time1 time2 time3 time4 time5
time6 time7, first
Warning - duplicate variables detected
Duplicates:    predtrdshr lat lat2
Warning - collinearities detected
Vars dropped:  time1 time2
```

First-stage regressions

First-stage regression of civilwars:

OLS estimation

Estimates efficient for homoskedasticity only  
Statistics consistent for homoskedasticity only

	Number of obs =	138
	F( 18, 119) =	1.82
	Prob > F =	0.0306
Total (centered) SS =	17.80434783	Centered R2 = 0.2156
Total (uncentered) SS =	21	Uncentered R2 = 0.3349
Residual SS =	13.96631308	Root MSE = .3426

civilwars	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
logigdppc	-.0579768	.1002938	-0.58	0.564	-.2565686	.140615
loginv_gdp	-.1537287	.0822433	-1.87	0.064	-.3165786	.0091212
coastpopshr	-.3820872	.1878158	-2.03	0.044	-.7539813	-.0101931
malariaecol	.0001057	.0052547	0.02	0.984	-.0102991	.0105106
naturalcap	.0000189	.0000142	1.32	0.188	-9.34e-06	.0000471
time3	-.008179	.1011949	-0.08	0.936	-.208555	.192197
time4	-.0728172	.101371	-0.72	0.474	-.2735419	.1279075
time5	-.0895801	.1020211	-0.88	0.382	-.2915922	.112432
time6	-.0438303	.1015634	-0.43	0.667	-.244936	.1572755
time7	.0880712	.1012189	0.87	0.386	-.1123523	.2884947
religfrac	.003647	.0041926	0.87	0.386	-.0046548	.0119488
ethheter	-.2125926	.1821043	-1.17	0.245	-.5731774	.1479921
percentmus~m	.0014297	.0030079	0.48	0.635	-.0045262	.0073856
statehist0~3	.145178	.4649984	0.31	0.755	-.7755653	1.065921
predtrdshr	.1251825	.1072023	1.17	0.245	-.0870886	.3374537
lat	-.0116957	.0277225	-0.42	0.674	-.0665891	.0431976

lat2	-.0001765	.0013068	-0.14	0.893	-.0027641	.0024111
eurlngshr	5.811777	2.601105	2.23	0.027	.6613285	10.96222
_cons	.6036625	.7426745	0.81	0.418	-.8669072	2.074232

-----  
Included instruments: logigdppc loginv\_gdp coastpopshr malariaecol naturalcap  
time3 time4 time5 time6 time7 religfrac ethheter  
percentmuslim statehist01v3 predtrdshr lat lat2 eurlngshr  
-----

Partial R-squared of excluded instruments: 0.0794

Test of excluded instruments:

F( 8, 119) = 1.28

Prob > F = 0.2592

First-stage regression of politrights:

OLS estimation

Estimates efficient for homoskedasticity only

Statistics consistent for homoskedasticity only

Number of obs = 138

F( 18, 119) = 6.39

Prob > F = 0.0000

Total (centered) SS = 248.3876588

Centered R2 = 0.4915

Total (uncentered) SS = 1281.774893

Uncentered R2 = 0.9015

Residual SS = 126.3117773

Root MSE = 1.03

politrights	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
logigdppc	.3576425	.3016166	1.19	0.238	-.2395885	.9548734
loginv_gdp	-.4232961	.2473327	-1.71	0.090	-.9130394	.0664473
coastpopshr	.3588997	.5648242	0.64	0.526	-.7595085	1.477308
malariaecol	.0406633	.0158027	2.57	0.011	.0093725	.0719542
naturalcap	-.0001275	.0000428	-2.98	0.004	-.0002123	-.0000427
time3	-1.082201	.3043264	-3.56	0.001	-1.684798	-.4796044
time4	-1.034751	.304856	-3.39	0.001	-1.638396	-.4311056
time5	-1.087499	.3068112	-3.54	0.001	-1.695016	-.4799822
time6	-1.179669	.3054347	-3.86	0.000	-1.78446	-.5748776
time7	-.2448417	.3043985	-0.80	0.423	-.8475812	.3578979
religfrac	-.0165829	.0126086	-1.32	0.191	-.0415491	.0083834
ethheter	1.655683	.5476477	3.02	0.003	.5712859	2.74008
percentmus~m	-.013963	.0090457	-1.54	0.125	-.0318743	.0039484
statehist0~3	-.5527978	1.398404	-0.40	0.693	-3.321776	2.216181
predtrdshr	.2273409	.3223925	0.71	0.482	-.4110284	.8657103

lat		-.1685808	.0833708	-2.02	0.045	-.3336632	-.0034983
lat2		.015311	.00393	3.90	0.000	.0075292	.0230928
eurlngshr		-17.88496	7.822381	-2.29	0.024	-33.37406	-2.395866
_cons		1.52182	2.233467	0.68	0.497	-2.900668	5.944308

-----  
Included instruments: logigdppc loginv\_gdp coastpopshr malariaecol naturalcap  
time3 time4 time5 time6 time7 religfrac ethheter  
percentmuslim statehist01v3 predtrdshr lat lat2 eurlngshr  
-----

Partial R-squared of excluded instruments: 0.3450  
Test of excluded instruments:  
F( 8, 119) = 7.83  
Prob > F = 0.0000

Summary results for first-stage regressions  
-----

Variable	Shea Partial R2	Partial R2	F( 8, 119)	P-value
civilwars	0.0390	0.0794	1.28	0.2592
politrighs	0.1696	0.3450	7.83	0.0000

Underidentification tests

Ho: matrix of reduced form coefficients has rank=K1-1 (underidentified)

Ha: matrix has rank=K1 (identified)

Anderson canon. corr. N\*CCEV LM statistic Chi-sq(7)=5.01 P-val=0.6590

Cragg-Donald N\*CDEV Wald statistic Chi-sq(7)=5.20 P-val=0.6360

Weak identification test

Ho: equation is weakly identified

Cragg-Donald Wald F-statistic 0.56

See main output for Cragg-Donald weak id test critical values

Weak-instrument-robust inference

Tests of joint significance of endogenous regressors B1 in main equation

Ho: B1=0 and overidentifying restrictions are valid

Anderson-Rubin Wald test F(8,119)= 5.39 P-val=0.0000

Anderson-Rubin Wald test Chi-sq(8)=50.02 P-val=0.0000

Stock-Wright LM S statistic Chi-sq(8)=36.71 P-val=0.0000

Number of observations	N =	138
Number of regressors	K =	13
Number of instruments	L =	19
Number of excluded instruments	L1 =	8

IV (2SLS) estimation

---

-----  
 Estimates efficient for homoskedasticity only  
 Statistics consistent for homoskedasticity only

Number of obs = 138  
 F( 12, 125) = 2.10  
 Prob > F = 0.0210  
 Total (centered) SS = 1438.2282  
 Total (uncentered) SS = 1488.510012  
 Residual SS = 2713.659938  
 Centered R2 = -0.8868  
 Uncentered R2 = -0.8231  
 Root MSE = 4.434

grgdppc	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
civilwars	10.28845	5.783701	1.78	0.075	-1.047395	21.6243
politrighs	2.122288	.7780647	2.73	0.006	.5973097	3.647267
logigdppc	-1.735092	1.163284	-1.49	0.136	-4.015088	.5449032
loginv_gdp	4.74077	1.379393	3.44	0.001	2.03721	7.44433
coastpopshr	.8429013	2.414565	0.35	0.727	-3.889559	5.575362
malariaecol	-.0400803	.046449	-0.86	0.388	-.1311187	.0509581
naturalcap	-.0000546	.0001546	-0.35	0.724	-.0003576	.0002484
time3	3.280917	1.572398	2.09	0.037	.1990733	6.362761
time4	3.370182	1.771859	1.90	0.057	-.1025982	6.842962
time5	3.045638	1.856195	1.64	0.101	-.592437	6.683712
time6	2.64687	1.741958	1.52	0.129	-.7673051	6.061045
time7	-2.420668	1.364351	-1.77	0.076	-5.094748	.2534112
_cons	-9.534944	8.254802	-1.16	0.248	-25.71406	6.644171

-----  
 Underidentification test (Anderson canon. corr. LM statistic): 5.008  
 Chi-sq(7) P-val = 0.6590

-----  
 Weak identification test (Cragg-Donald Wald F statistic): 0.560  
 Stock-Yogo weak ID test critical values: 5% maximal IV relative bias 17.70  
 10% maximal IV relative bias 10.22  
 20% maximal IV relative bias 6.20  
 30% maximal IV relative bias 4.73  
 10% maximal IV size 25.64  
 15% maximal IV size 14.31  
 20% maximal IV size 10.41  
 25% maximal IV size 8.39

Source: Stock-Yogo (2005). Reproduced by permission.

-----  
 Sargan statistic (overidentification test of all instruments): 6.534  
 Chi-sq(6) P-val = 0.3661  
 -----

Instrumented: civilwars politrights  
 Included instruments: logigdppc loginv\_gdp coastpopshr malariaecol naturalcap  
 time3 time4 time5 time6 time7  
 Excluded instruments: religfrac ethheter percentmuslim statehist01v3 predtrdshr  
 lat lat2 eurlngshr  
 Duplicates: predtrdshr lat lat2  
 Dropped collinear: time1 time2

4. Small set of instruments

```
. ivreg2 grgdppc ( civilwars politrights= religfrac ethheter percentmuslim
statehist01v3 predtrdshr lat lat2 eurlngshr ) logigdppc loginv_gdp coas
> tpopshr malariaecol naturalcap time1 time2 time3 time4 time5 time6 time7, first
Warning - collinearities detected
Vars dropped: time1 time2
```

First-stage regressions

First-stage regression of civilwars:

OLS estimation

Estimates efficient for homoskedasticity only  
 Statistics consistent for homoskedasticity only

	Number of obs =	138
	F( 18, 119) =	1.82
	Prob > F =	0.0306
Total (centered) SS =	17.80434783	Centered R2 = 0.2156
Total (uncentered) SS =	21	Uncentered R2 = 0.3349
Residual SS =	13.96631308	Root MSE = .3426

civilwars	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
logigdppc	-.0579768	.1002938	-0.58	0.564	-.2565686 .140615
loginv_gdp	-.1537287	.0822433	-1.87	0.064	-.3165786 .0091212
coastpopshr	-.3820872	.1878158	-2.03	0.044	-.7539813 -.0101931
malariaecol	.0001057	.0052547	0.02	0.984	-.0102991 .0105106
naturalcap	.0000189	.0000142	1.32	0.188	-9.34e-06 .0000471
time3	-.008179	.1011949	-0.08	0.936	-.208555 .192197
time4	-.0728172	.101371	-0.72	0.474	-.2735419 .1279075

time5		-.0895801	.1020211	-0.88	0.382	-.2915922	.112432
time6		-.0438303	.1015634	-0.43	0.667	-.244936	.1572755
time7		.0880712	.1012189	0.87	0.386	-.1123523	.2884947
religfrac		.003647	.0041926	0.87	0.386	-.0046548	.0119488
ethheter		-.2125926	.1821043	-1.17	0.245	-.5731774	.1479921
percentmus~m		.0014297	.0030079	0.48	0.635	-.0045262	.0073856
statehist0~3		.145178	.4649984	0.31	0.755	-.7755653	1.065921
predtrdshr		.1251825	.1072023	1.17	0.245	-.0870886	.3374537
lat		-.0116957	.0277225	-0.42	0.674	-.0665891	.0431976
lat2		-.0001765	.0013068	-0.14	0.893	-.0027641	.0024111
eurlngshr		5.811777	2.601105	2.23	0.027	.6613285	10.96222
_cons		.6036625	.7426745	0.81	0.418	-.8669072	2.074232

-----  
Included instruments: logigdppc loginv\_gdp coastpopshr malariaecol naturalcap  
time3 time4 time5 time6 time7 religfrac ethheter  
percentmuslim statehist01v3 predtrdshr lat lat2 eurlngshr  
-----

Partial R-squared of excluded instruments: 0.0794

Test of excluded instruments:

F( 8, 119) = 1.28

Prob > F = 0.2592

First-stage regression of politrights:

OLS estimation

-----  
Estimates efficient for homoskedasticity only  
Statistics consistent for homoskedasticity only

		Number of obs =		138
		F( 18, 119) =		6.39
		Prob > F =		0.0000
Total (centered) SS	=	248.3876588	Centered R2	= 0.4915
Total (uncentered) SS	=	1281.774893	Uncentered R2	= 0.9015
Residual SS	=	126.3117773	Root MSE	= 1.03

-----

politrights		Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
logigdppc		.3576425	.3016166	1.19	0.238	-.2395885 .9548734
loginv_gdp		-.4232961	.2473327	-1.71	0.090	-.9130394 .0664473
coastpopshr		.3588997	.5648242	0.64	0.526	-.7595085 1.477308
malariaecol		.0406633	.0158027	2.57	0.011	.0093725 .0719542
naturalcap		-.0001275	.0000428	-2.98	0.004	-.0002123 -.0000427
time3		-1.082201	.3043264	-3.56	0.001	-1.684798 -.4796044

-----



time4		-1.034751	.304856	-3.39	0.001	-1.638396	-.4311056
time5		-1.087499	.3068112	-3.54	0.001	-1.695016	-.4799822
time6		-1.179669	.3054347	-3.86	0.000	-1.78446	-.5748776
time7		-.2448417	.3043985	-0.80	0.423	-.8475812	.3578979
religfrac		-.0165829	.0126086	-1.32	0.191	-.0415491	.0083834
ethheter		1.655683	.5476477	3.02	0.003	.5712859	2.74008
percentmus~m		-.013963	.0090457	-1.54	0.125	-.0318743	.0039484
statehist0~3		-.5527978	1.398404	-0.40	0.693	-3.321776	2.216181
predtrdshr		.2273409	.3223925	0.71	0.482	-.4110284	.8657103
lat		-.1685808	.0833708	-2.02	0.045	-.3336632	-.0034983
lat2		.015311	.00393	3.90	0.000	.0075292	.0230928
eurlngshr		-17.88496	7.822381	-2.29	0.024	-33.37406	-2.395866
_cons		1.52182	2.233467	0.68	0.497	-2.900668	5.944308

-----  
Included instruments: logigppc loginv\_gdp coastpopshr malariaeol naturalcap  
time3 time4 time5 time6 time7 religfrac ethheter  
percentmuslim statehist01v3 predtrdshr lat lat2 eurlngshr  
-----

Partial R-squared of excluded instruments: 0.3450

Test of excluded instruments:

F( 8, 119) = 7.83

Prob > F = 0.0000

Summary results for first-stage regressions  
-----

Variable	Shea Partial R2	Partial R2	F( 8, 119)	P-value
civilwars	0.0390	0.0794	1.28	0.2592
politrighs	0.1696	0.3450	7.83	0.0000

Underidentification tests

Ho: matrix of reduced form coefficients has rank=K1-1 (underidentified)

Ha: matrix has rank=K1 (identified)

Anderson canon. corr. N\*CCEV LM statistic Chi-sq(7)=5.01 P-val=0.6590

Cragg-Donald N\*CDEV Wald statistic Chi-sq(7)=5.20 P-val=0.6360

Weak identification test

Ho: equation is weakly identified

Cragg-Donald Wald F-statistic 0.56

See main output for Cragg-Donald weak id test critical values

Weak-instrument-robust inference

Tests of joint significance of endogenous regressors B1 in main equation

Ho: B1=0 and overidentifying restrictions are valid

Anderson-Rubin Wald test F(8,119)= 5.39 P-val=0.0000

Anderson-Rubin Wald test Chi-sq(8)=50.02 P-val=0.0000  
 Stock-Wright LM S statistic Chi-sq(8)=36.71 P-val=0.0000

Number of observations N = 138  
 Number of regressors K = 13  
 Number of instruments L = 19  
 Number of excluded instruments L1 = 8

IV (2SLS) estimation

Estimates efficient for homoskedasticity only  
 Statistics consistent for homoskedasticity only

Number of obs = 138  
 F( 12, 125) = 2.10  
 Prob > F = 0.0210  
 Total (centered) SS = 1438.2282 Centered R2 = -0.8868  
 Total (uncentered) SS = 1488.510012 Uncentered R2 = -0.8231  
 Residual SS = 2713.659938 Root MSE = 4.434

grgdppc	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
civilwars	10.28845	5.783701	1.78	0.075	-1.047395	21.6243
politrights	2.122288	.7780647	2.73	0.006	.5973097	3.647267
logigdppc	-1.735092	1.163284	-1.49	0.136	-4.015088	.5449032
loginv_gdp	4.74077	1.379393	3.44	0.001	2.03721	7.44433
coastpopshr	.8429013	2.414565	0.35	0.727	-3.889559	5.575362
malariaecol	-.0400803	.046449	-0.86	0.388	-.1311187	.0509581
naturalcap	-.0000546	.0001546	-0.35	0.724	-.0003576	.0002484
time3	3.280917	1.572398	2.09	0.037	.1990733	6.362761
time4	3.370182	1.771859	1.90	0.057	-.1025982	6.842962
time5	3.045638	1.856195	1.64	0.101	-.592437	6.683712
time6	2.64687	1.741958	1.52	0.129	-.7673051	6.061045
time7	-2.420668	1.364351	-1.77	0.076	-5.094748	.2534112
_cons	-9.534944	8.254802	-1.16	0.248	-25.71406	6.644171

Underidentification test (Anderson canon. corr. LM statistic): 5.008  
 Chi-sq(7) P-val = 0.6590

Weak identification test (Cragg-Donald Wald F statistic): 0.560  
 Stock-Yogo weak ID test critical values: 5% maximal IV relative bias 17.70  
 10% maximal IV relative bias 10.22  
 20% maximal IV relative bias 6.20  
 30% maximal IV relative bias 4.73

10% maximal IV size 25.64  
 15% maximal IV size 14.31  
 20% maximal IV size 10.41  
 25% maximal IV size 8.39

Source: Stock-Yogo (2005). Reproduced by permission.

-----  
 Sargan statistic (overidentification test of all instruments): 6.534  
 Chi-sq(6) P-val = 0.3661  
 -----

Instrumented: civilwars politrights  
 Included instruments: logigdppc loginv\_gdp coastpopshr malariaecol naturalcap  
 time3 time4 time5 time6 time7  
 Excluded instruments: religfrac ethheter percentmuslim statehist01v3 predtrdshr  
 lat lat2 eurlngshr  
 Dropped collinear: time1 time2

### C. CW and PO

#### 5. Large set of instruments

```
. ivreg2 grgdppc ( civilwars politopen= religfrac ethheter othercol eurlngshr
percentmuslim statehist01v3 predtrdshr lat lat2 ) logigdppc loginv_g
> dp coastpopshr malariaecol naturalcap time1 time2 time3 time4 time5 time6 time7,
first
```

---

First-stage regressions

---

First-stage regression of civilwars:

---

OLS estimation

---

Estimates efficient for homoskedasticity only  
 Statistics consistent for homoskedasticity only

	Number of obs = 185
	F( 21, 163) = 2.59
	Prob > F = 0.0004
Total (centered) SS = 23.76216216	Centered R2 = 0.2505
Total (uncentered) SS = 28	Uncentered R2 = 0.3639
Residual SS = 17.80959141	Root MSE = .3305

---



---

civilwars	Coef.	Std. Err.	T	P> t	[95% Conf. Interval]
-----------	-------	-----------	---	------	----------------------

---

logigdppc		-.0160376	.0893806	-0.18	0.858	-.1925306	.1604554
loginv_gdp		-.1686267	.0704797	-2.39	0.018	-.3077975	-.0294558
coastpopshr		-.3729858	.167544	-2.23	0.027	-.7038223	-.0421494
malariaecol		-.0020767	.0050638	-0.41	0.682	-.0120759	.0079224
naturalcap		.0000147	.000014	1.05	0.296	-.000013	.0000424
time1		-.155366	.1015499	-1.53	0.128	-.3558891	.045157
time2		-.0501805	.0986157	-0.51	0.612	-.2449094	.1445484
time3		-.0455015	.0955853	-0.48	0.635	-.2342465	.1432435
time4		-.1076582	.0959168	-1.12	0.263	-.2970579	.0817415
time5		-.1501975	.0972788	-1.54	0.125	-.3422865	.0418916
time6		-.0860196	.0959373	-0.90	0.371	-.2754598	.1034206
time7		.0834405	.0956405	0.87	0.384	-.1054136	.2722946
religfrac		.0063523	.0035627	1.78	0.076	-.0006826	.0133873
ethheter		-.1799052	.1720383	-1.05	0.297	-.5196162	.1598059
othercol		.120321	.1436918	0.84	0.404	-.1634165	.4040585
eurlngshr		5.648919	2.55235	2.21	0.028	.6089868	10.68885
percentmus~m		.0031782	.0023253	1.37	0.174	-.0014133	.0077698
statehist0~3		.0938848	.352859	0.27	0.791	-.6028793	.790649
predtrdshr		.1245668	.106544	1.17	0.244	-.0858175	.3349512
lat		-.0145467	.0234174	-0.62	0.535	-.0607872	.0316939
lat2		-8.01e-06	.0011507	-0.01	0.994	-.0022803	.0022643
_cons		.2344973	.6296632	0.37	0.710	-1.008851	1.477846

Included instruments: logigdppc loginv\_gdp coastpopshr malariaecol naturalcap  
time1 time2 time3 time4 time5 time6 time7 religfrac  
ethheter othercol eurlngshr percentmuslim statehist01v3  
predtrdshr lat lat2

Partial R-squared of excluded instruments: 0.1093

Test of excluded instruments:

F( 9, 163) = 2.22

Prob > F = 0.0230

First-stage regression of politopen:

OLS estimation

Estimates efficient for homoskedasticity only  
Statistics consistent for homoskedasticity only

Number of obs = 185

F( 21, 163) = 6.49

Prob > F = 0.0000

Total (centered) SS	= 1247.689352	Centered R2	= 0.4555
Total (uncentered) SS	= 1730.886286	Uncentered R2	= 0.6075
Residual SS	= 679.385368	Root MSE	= 2.042

	politopen	Coef.	Std. Err.	T	P> t	[95% Conf. Interval]	
logigdppc		.6633175	.5520446	1.20	0.231	-.4267633	1.753398
loginv_gdp		-1.117264	.4353062	-2.57	0.011	-1.976831	-.2576979
coastpopshr		-1.940803	1.034808	-1.88	0.063	-3.984161	.1025555
malariaecol		.0798734	.031276	2.55	0.012	.0181151	.1416317
naturalcap		-.0001355	.0000865	-1.57	0.119	-.0003064	.0000354
time1		-.7592192	.6272069	-1.21	0.228	-1.997717	.4792789
time2		-1.555316	.6090838	-2.55	0.012	-2.758027	-.3526037
time3		-1.684082	.5903671	-2.85	0.005	-2.849835	-.5183283
time4		-1.608699	.5924148	-2.72	0.007	-2.778496	-.4389027
time5		-1.780044	.6008266	-2.96	0.004	-2.966451	-.5936373
time6		-2.170847	.5925413	-3.66	0.000	-3.340894	-1.000801
time7		-.530369	.5907082	-0.90	0.371	-1.696796	.6360579
religfrac		-.02412	.0220043	-1.10	0.275	-.0675703	.0193302
ethheter		3.888666	1.062567	3.66	0.000	1.790496	5.986837
othercol		.8046375	.8874895	0.91	0.366	-.9478213	2.557096
eurlngshr		-16.95882	15.76418	-1.08	0.284	-48.08716	14.16951
percentmus~m		-.0274586	.0143616	-1.91	0.058	-.0558174	.0009002
statehist0~3		-1.870979	2.179377	-0.86	0.392	-6.17443	2.432473
predtrdshr		1.890863	.6580517	2.87	0.005	.5914583	3.190268
lat		-.5141644	.1446338	-3.55	0.000	-.799762	-.2285669
lat2		.039973	.0071074	5.62	0.000	.0259386	.0540073
_cons		-4.575243	3.889013	-1.18	0.241	-12.25458	3.104098

Included instruments: logigdppc loginv\_gdp coastpopshr malariaecol naturalcap  
time1 time2 time3 time4 time5 time6 time7 religfrac  
ethheter othercol eurlngshr percentmuslim statehist01v3  
predtrdshr lat lat2

Partial R-squared of excluded instruments: 0.3639

Test of excluded instruments:

F( 9, 163) = 10.36

Prob > F = 0.0000

Summary results for first-stage regressions

Variable	Shea Partial R2	Partial R2	F( 9, 163)	P-value
civilwars	0.0872	0.1093	2.22	0.0230
politopen	0.2904	0.3639	10.36	0.0000

Underidentification tests

Ho: matrix of reduced form coefficients has rank=K1-1 (underidentified)

Ha: matrix has rank=K1 (identified)

Anderson canon. Corr. N\*CCEV LM statistic Chi-sq(8)=14.85 P-val=0.0622

Cragg-Donald N\*CDEV Wald statistic Chi-sq(8)=16.14 P-val=0.0404

Weak identification test

Ho: equation is weakly identified

Cragg-Donald Wald F-statistic 1.58

See main output for Cragg-Donald weak id test critical values

Weak-instrument-robust inference

Tests of joint significance of endogenous regressors B1 in main equation

Ho: B1=0 and overidentifying restrictions are valid

Anderson-Rubin Wald test F(9,163)= 4.31 P-val=0.0000

Anderson-Rubin Wald test Chi-sq(9)=44.06 P-val=0.0000

Stock-Wright LM S statistic Chi-sq(9)=35.59 P-val=0.0000

Number of observations	N =	185
Number of regressors	K =	15
Number of instruments	L =	22
Number of excluded instruments	L1 =	9

---

IV (2SLS) estimation

---

Estimates efficient for homoskedasticity only

Statistics consistent for homoskedasticity only

	Number of obs =	185
	F( 14, 170) =	5.46
	Prob > F =	0.0000
Total (centered) SS =	1777.183475	Centered R2 = 0.2193
Total (uncentered) SS =	1866.300015	Uncentered R2 = 0.2566
Residual SS =	1387.470681	Root MSE = 2.739

---

grgdppc	Coef.	Std. Err.	Z	P> z	[95% Conf. Interval]
civilwars	1.405877	2.074152	0.68	0.498	-2.659385 5.47114
politopen	.6719018	.1555159	4.32	0.000	.3670963 .9767073
logigdpcc	-1.503822	.6149786	-2.45	0.014	-2.709158 -.2984863

---

loginv_gdp		2.908505	.6269991	4.64	0.000	1.679609	4.1374
coastpopshr		-.5046085	1.163234	-0.43	0.664	-2.784505	1.775288
malariaecol		-.0146999	.0256502	-0.57	0.567	-.0649734	.0355736
naturalcap		-.0001105	.0000826	-1.34	0.181	-.0002724	.0000513
time1		1.27427	.9383077	1.36	0.174	-.5647796	3.113319
time2		2.733449	.8684353	3.15	0.002	1.031347	4.435551
time3		2.373549	.8511476	2.79	0.005	.7053302	4.041768
time4		1.826764	.8976304	2.04	0.042	.0674409	3.586087
time5		1.407788	.9499019	1.48	0.138	-.4539854	3.269561
time6		1.433341	.9099624	1.58	0.115	-.3501521	3.216835
time7		-1.630701	.8079306	-2.02	0.044	-3.214216	-.0471865
<hr/>							
_cons		.9808835	4.323777	0.23	0.821	-7.493565	9.455332
<hr/>							
Underidentification test (Anderson canon. Corr. LM statistic):							14.846
Chi-sq(8) P-val =							0.0622
<hr/>							
Weak identification test (Cragg-Donald Wald F statistic):							1.580
Stock-Yogo weak ID test critical values: 5% maximal IV relative bias							18.30
10% maximal IV relative bias							10.43
20% maximal IV relative bias							6.22
30% maximal IV relative bias							4.69
10% maximal IV size							27.51
15% maximal IV size							15.24
20% maximal IV size							11.03
25% maximal IV size							8.85
<hr/>							
Source: Stock-Yogo (2005). Reproduced by permission.							
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Sargan statistic (overidentification test of all instruments):							12.877
Chi-sq(7) P-val =							0.0752
<hr/>							
Instrumented: civilwars politopen							
Included instruments: logigdppc loginv_gdp coastpopshr malariaecol naturalcap							
time1 time2 time3 time4 time5 time6 time7							
Excluded instruments: religfrac ethheter othercol eurlngshr percentmuslim							
statehist01v3 predtrdshr lat lat2							
<hr/>							

## 6. Small set of instruments

```

ivreg2 grgdppc ( civilwars politopen= religfrac ethheter othercol eurlngshr
percentmuslim statehist01v3 ) logigdppc loginv_gdp coastpopshr ma
> lariaecol naturalcap time1 time2 time3 time4 time5 time6 time7, first

```

First-stage regressions

First-stage regression of civilwars:

OLS estimation

Estimates efficient for homoskedasticity only  
 Statistics consistent for homoskedasticity only

Number of obs = 185  
 F( 18, 166) = 2.71  
 Prob > F = 0.0004  
 Total (centered) SS = 23.76216216      Centered R2 = 0.2271  
 Total (uncentered) SS = 28              Uncentered R2 = 0.3441  
 Residual SS = 18.36500102              Root MSE = .3326

civilwars	Coef.	Std. Err.	T	P> t	[95% Conf. Interval]	
logigdppc	.0404678	.0854156	0.47	0.636	-.1281731	.2091088
loginv_gdp	-.193621	.0633863	-3.05	0.003	-.3187683	-.0684737
coastpopshr	-.3913549	.1370082	-2.86	0.005	-.6618582	-.1208517
malariaecol	.0018033	.0039803	0.45	0.651	-.0060554	.0096619
naturalcap	-5.51 <sup>e</sup> -06	.0000105	-0.52	0.601	-.0000263	.0000152
time1	-.1521295	.1021228	-1.49	0.138	-.3537565	.0494975
time2	-.0474269	.0990721	-0.48	0.633	-.2430306	.1481768
time3	-.0483468	.0961737	-0.50	0.616	-.2382282	.1415345
time4	-.1106267	.0964269	-1.15	0.253	-.3010079	.0797545
time5	-.15877	.0977676	-1.62	0.106	-.3517982	.0342583
time6	-.0925489	.096491	-0.96	0.339	-.2830566	.0979588
time7	.0792708	.096218	0.82	0.411	-.110698	.2692396
religfrac	.0029939	.0029719	1.01	0.315	-.0028737	.0088615
ethheter	.0256908	.143765	0.18	0.858	-.2581527	.3095344
othercol	.3278731	.0980851	3.34	0.001	.1342181	.5215281
eurlngshr	2.192116	2.044406	1.07	0.285	-1.844273	6.228505
percentmus~m	.0013785	.0021255	0.65	0.518	-.0028181	.0055751
statehist0~3	-.2059016	.322589	-0.64	0.524	-.8428077	.4310045
_cons	.3266903	.5995682	0.54	0.587	-.8570718	1.510452

Included instruments: logigdppc loginv\_gdp coastpopshr malariaecol naturalcap  
 time1 time2 time3 time4 time5 time6 time7 religfrac  
 ethheter othercol eurlngshr percentmuslim statehist01v3

Partial R-squared of excluded instruments: 0.0815

Test of excluded instruments:

F( 6, 166) = 2.46

Prob > F = 0.0266

First-stage regression of politopen:



OLS estimation

Estimates efficient for homoskedasticity only  
 Statistics consistent for homoskedasticity only

Number of obs = 185  
 F( 18, 166) = 2.26  
 Prob > F = 0.0038  
 Total (centered) SS = 1247.689352  
 Total (uncentered) SS = 1730.886286  
 Residual SS = 1002.327611  
 Centered R2 = 0.1967  
 Uncentered R2 = 0.4209  
 Root MSE = 2.457

politopen	Coef.	Std. Err.	T	P> t	[95% Conf. Interval]	
logigdppc	.3716754	.631025	0.59	0.557	-.8741936	1.617544
loginv_gdp	.3849404	.4682793	0.82	0.412	-.5396105	1.309491
coastpopshr	1.647784	1.012176	1.63	0.105	-.3506138	3.646181
malariaecol	-.0184183	.0294056	-0.63	0.532	-.0764755	.0396389
naturalcap	2.57 <sup>e</sup> -06	.0000777	0.03	0.974	-.0001508	.0001559
time1	-.8577492	.7544531	-1.14	0.257	-2.34731	.6318112
time2	-1.396213	.7319149	-1.91	0.058	-2.841275	.048849
time3	-1.63313	.710503	-2.30	0.023	-3.035917	-.230343
time4	-1.722319	.7123732	-2.42	0.017	-3.128799	-.3158397
time5	-1.774382	.7222781	-2.46	0.015	-3.200418	-.3483471
time6	-2.101673	.7128466	-2.95	0.004	-3.509087	-.6942589
time7	-.5004371	.71083	-0.70	0.482	-1.90387	.9029956
religfrac	-.0489225	.0219556	-2.23	0.027	-.0922708	-.0055743
ethheter	.2817043	1.062093	0.27	0.791	-1.815247	2.378656
othercol	-1.724003	.7246234	-2.38	0.018	-3.154669	-.293337
eurlngshr	13.78708	15.10346	0.91	0.363	-16.03255	43.60672
percentmus~m	-.0310908	.0157029	-1.98	0.049	-.0620939	-.0000877
statehist0~3	1.406994	2.383191	0.59	0.556	-3.298278	6.112267
_cons	2.581589	4.429431	0.58	0.561	-6.163693	11.32687

Included instruments: logigdppc loginv\_gdp coastpopshr malariaecol naturalcap  
 time1 time2 time3 time4 time5 time6 time7 religfrac  
 ethheter othercol eurlngshr percentmuslim statehist01v3

Partial R-squared of excluded instruments: 0.0616

Test of excluded instruments:

F( 6, 166) = 1.82

Prob > F = 0.0990

Summary results for first-stage regressions

Variable	Shea Partial R2	Partial R2	F( 6, 166)	P-value
civilwars	0.0449	0.0815	2.46	0.0266
politopen	0.0339	0.0616	1.82	0.0990

Underidentification tests

Ho: matrix of reduced form coefficients has rank=K1-1 (underidentified)

Ha: matrix has rank=K1 (identified)

Anderson canon. Corr. N\*CCEV LM statistic Chi-sq(5)=4.21 P-val=0.5201

Cragg-Donald N\*CDEV Wald statistic Chi-sq(5)=4.30 P-val=0.5065

Weak identification test

Ho: equation is weakly identified

Cragg-Donald Wald F-statistic 0.64

See main output for Cragg-Donald weak id test critical values

Weak-instrument-robust inference

Tests of joint significance of endogenous regressors B1 in main equation

Ho: B1=0 and overidentifying restrictions are valid

Anderson-Rubin Wald test F(6,166)= 1.81 P-val=0.1008

Anderson-Rubin Wald test Chi-sq(6)=12.08 P-val=0.0603

Stock-Wright LM S statistic Chi-sq(6)=11.34 P-val=0.0785

Number of observations	N =	185
Number of regressors	K =	15
Number of instruments	L =	19
Number of excluded instruments	L1 =	6

IV (2SLS) estimation

Estimates efficient for homoskedasticity only

Statistics consistent for homoskedasticity only

	Number of obs =	185
	F( 14, 170) =	4.64
	Prob > F =	0.0000
Total (centered) SS =	1777.183475	Centered R2 = 0.2375
Total (uncentered) SS =	1866.300015	Uncentered R2 = 0.2739
Residual SS =	1355.167199	Root MSE = 2.707

grgdppc	Coef.	Std. Err.	Z	P> z	[95% Conf. Interval]
civilwars	-1.101126	2.85594	-0.39	0.700	-6.698666 4.496415
politopen	.7305451	.4496082	1.62	0.104	-.1506709 1.611761
logigdppc	-1.747917	.7739043	-2.26	0.024	-3.264741 -.2310922
loginv_gdp	2.43054	.673332	3.61	0.000	1.110834 3.750247
coastpopshr	-1.282956	1.208259	-1.06	0.288	-3.6511 1.085188

malariaecol		-0.0183983	.0288356	-0.64	0.523	-.0749151	.0381184
naturalcap		-.0001352	.0000839	-1.61	0.107	-.0002995	.0000292
time1		.9208837	1.15288	0.80	0.424	-1.33872	3.180487
time2		2.64091	1.105476	2.39	0.017	.474216	4.807604
time3		2.36915	1.15483	2.05	0.040	.1057239	4.632575
time4		1.680957	1.297103	1.30	0.195	-.8613179	4.223232
time5		1.153202	1.412063	0.82	0.414	-1.61439	3.920795
time6		1.359056	1.401564	0.97	0.332	-1.38796	4.106072
time7		-1.379425	.8089892	-1.71	0.088	-2.965014	.2061649
_cons		4.585524	4.531148	1.01	0.312	-4.295363	13.46641
Underidentification test (Anderson canon. Corr. LM statistic):							4.206
Chi-sq(5) P-val =							0.5201
Weak identification test (Cragg-Donald Wald F statistic):							0.644
Stock-Yogo weak ID test critical values: 5% maximal IV relative bias							15.72
10% maximal IV relative bias							9.48
20% maximal IV relative bias							6.08
30% maximal IV relative bias							4.78
10% maximal IV size							21.68
15% maximal IV size							12.33
20% maximal IV size							9.10
25% maximal IV size							7.42
Source: Stock-Yogo (2005). Reproduced by permission.							
Sargan statistic (overidentification test of all instruments):							4.357
Chi-sq(4) P-val =							0.3598
Instrumented:							civilwars politopen
Included instruments:							logigdppc loginv_gdp coastpopshr malariaecol naturalcap time1 time2 time3 time4 time5 time6 time7
Excluded instruments:							religfrac ethheter othercol eurlngshr percentmuslim statehist01v3

D. CW and AC

## 7. Large set of instruments

```
. ivreg2 grgdppc ( civilwars corruption= religfrac ethheter percentmuslim
statehist01v3 predtrdshr lat lat2 ) logigdppc loginv_gdp coastpopshr
> malariaecol naturalcap time1 time2 time3 time4 time5 time6 time7, first
```

First-stage regressions

-----

First-stage regression of civilwars:

OLS estimation

-----

Estimates efficient for homoskedasticity only  
 Statistics consistent for homoskedasticity only

	Number of obs =	136
	F( 19, 116) =	2.46
	Prob > F =	0.0017
Total (centered) SS =	16.34558824	Centered R2 = 0.2876
Total (uncentered) SS =	19	Uncentered R2 = 0.3871
Residual SS =	11.64442475	Root MSE = .3168

civilwars	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
logigdppc	.1366395	.1021776	1.34	0.184	-.0657361	.3390151
loginv_gdp	-.238512	.0795417	-3.00	0.003	-.3960544	-.0809697
coastpopshr	-.9548479	.2604961	-3.67	0.000	-1.470793	-.4389025
malariaecol	.0066194	.0080846	0.82	0.415	-.0093931	.0226319
naturalcap	-.0000156	.0000153	-1.02	0.312	-.0000459	.0000148
time1	-.1760081	.1106261	-1.59	0.114	-.395117	.0431009
time2	-.0877611	.1091299	-0.80	0.423	-.3039066	.1283844
time3	-.0644353	.1088914	-0.59	0.555	-.2801085	.151238
time4	-.0581528	.1091494	-0.53	0.595	-.2743369	.1580312
time5	-.1093053	.1109212	-0.99	0.326	-.3289988	.1103881
time6	-.1033567	.1100218	-0.94	0.349	-.3212687	.1145554
time7	.0973759	.1089924	0.89	0.373	-.1184972	.313249
religfrac	.0078158	.0040068	1.95	0.054	-.0001202	.0157519
ethheter	-.7105625	.3513978	-2.02	0.045	-1.40655	-.0145749
percentmus~m	.0056841	.0030283	1.88	0.063	-.0003138	.011682
statehist0~3	-.4779179	.3442765	-1.39	0.168	-1.159801	.2039651
predtrdshr	.1297596	.1060558	1.22	0.224	-.0802972	.3398164
lat	-.0059762	.027063	-0.22	0.826	-.0595779	.0476255
lat2	-.0004985	.0015492	-0.32	0.748	-.0035669	.0025699
_cons	-.1569884	.7498878	-0.21	0.835	-1.642236	1.328259

Included instruments: logigdppc loginv\_gdp coastpopshr malariaecol naturalcap  
 time1 time2 time3 time4 time5 time6 time7 religfrac  
 ethheter percentmuslim statehist01v3 predtrdshr lat lat2

Partial R-squared of excluded instruments: 0.1023

Test of excluded instruments:

F( 7, 116) = 1.89

Prob > F = 0.0774

First-stage regression of corruption:

OLS estimation

-----

Estimates efficient for homoskedasticity only  
 Statistics consistent for homoskedasticity only

	Number of obs =	136
	F( 19, 116) =	54.09
	Prob > F =	0.0000
Total (centered) SS =	117.6376488	Centered R2 = 0.8986
Total (uncentered) SS =	1197.359974	Uncentered R2 = 0.9900
Residual SS =	11.9314778	Root MSE = .3207

	corruption	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
logigdppc		-.4602219	.1034294	-4.45	0.000	-.6650768 -.255367
loginv_gdp		.0872102	.0805161	1.08	0.281	-.0722622 .2466826
coastpopshr		1.151049	.2636874	4.37	0.000	.628783 1.673315
malariaecol		.0934746	.0081836	11.42	0.000	.077266 .1096832
naturalcap		-7.84e-06	.0000155	-0.51	0.614	-.0000385 .0000229
time1		-.0052785	.1119814	-0.05	0.962	-.2270718 .2165147
time2		.000301	.1104668	0.00	0.998	-.2184924 .2190945
time3		.0318568	.1102254	0.29	0.773	-.1864586 .2501722
time4		.0439666	.1104865	0.40	0.691	-.1748658 .2627991
time5		.0865374	.1122801	0.77	0.442	-.1358474 .3089223
time6		.0583711	.1113696	0.52	0.601	-.1622105 .2789528
time7		.0307003	.1103276	0.28	0.781	-.1878174 .249218
religfrac		-.0151803	.0040559	-3.74	0.000	-.0232136 -.0071471
ethheter		2.536749	.3557027	7.13	0.000	1.832235 3.241263
percentmus~m		-.0319	.0030654	-10.41	0.000	-.0379714 -.0258286
statehist0~3		3.020032	.3484942	8.67	0.000	2.329795 3.710268
predtrdshr		.5633116	.107355	5.25	0.000	.3506815 .7759417
lat		-.3426688	.0273946	-12.51	0.000	-.3969272 -.2884104
lat2		.0234838	.0015682	14.98	0.000	.0203778 .0265898
_cons		2.02481	.7590745	2.67	0.009	.5213669 3.528252

Included instruments: logigdppc loginv\_gdp coastpopshr malariaecol naturalcap  
 time1 time2 time3 time4 time5 time6 time7 religfrac  
 ethheter percentmuslim statehist01v3 predtrdshr lat lat2

Partial R-squared of excluded instruments: 0.8896

Test of excluded instruments:

F( 7, 116) = 133.49

Prob > F = 0.0000

Summary results for first-stage regressions

---

Variable	Shea Partial R2	Partial R2	F( 7, 116)	P-value
civilwars	0.0878	0.1023	1.89	0.0774
corruption	0.7633	0.8896	133.49	0.0000

Underidentification tests

Ho: matrix of reduced form coefficients has rank=K1-1 (underidentified)

Ha: matrix has rank=K1 (identified)

Anderson canon. corr. N\*CCEV LM statistic Chi-sq(6)=11.87 P-val=0.0650

Cragg-Donald N\*CDEV Wald statistic Chi-sq(6)=13.00 P-val=0.0430

Weak identification test

Ho: equation is weakly identified

Cragg-Donald Wald F-statistic 1.58

See main output for Cragg-Donald weak id test critical values

Weak-instrument-robust inference

Tests of joint significance of endogenous regressors B1 in main equation

Ho: B1=0 and overidentifying restrictions are valid

Anderson-Rubin Wald test F(7,116)= 6.11 P-val=0.0000

Anderson-Rubin Wald test Chi-sq(7)=50.14 P-val=0.0000

Stock-Wright LM S statistic Chi-sq(7)=36.64 P-val=0.0000

Number of observations	N =	136
Number of regressors	K =	15
Number of instruments	L =	20
Number of excluded instruments	L1 =	7

IV (2SLS) estimation

---

Estimates efficient for homoskedasticity only

Statistics consistent for homoskedasticity only

	Number of obs =	136
	F( 14, 121) =	6.37
	Prob > F =	0.0000
Total (centered) SS =	1364.689426	Centered R2 = 0.3628
Total (uncentered) SS =	1433.020015	Uncentered R2 = 0.3931
Residual SS =	869.647192	Root MSE = 2.529

---

grgdppc	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
civilwars	3.310107	2.428665	1.36	0.173	-1.449989	8.070202
corruption	1.57133	.2854259	5.51	0.000	1.011905	2.130754
logigdppc	-1.949636	.7335289	-2.66	0.008	-3.387326	-.511946
loginv_gdp	3.678111	.8429304	4.36	0.000	2.025998	5.330225
coastpopshr	1.495921	2.056539	0.73	0.467	-2.534822	5.526663
malariaecol	-.0698724	.0384559	-1.82	0.069	-.1452446	.0054998
naturalcap	-6.14e-06	.0001102	-0.06	0.956	-.0002221	.0002098
time1	1.481055	.9816007	1.51	0.131	-.4428468	3.404957
time2	1.361625	.8967016	1.52	0.129	-.3958778	3.119128
time3	1.982007	.8814701	2.25	0.025	.2543577	3.709657
time4	.9477068	.8798638	1.08	0.281	-.7767945	2.672208
time5	1.29412	.9183394	1.41	0.159	-.5057917	3.094032
time6	.5711863	.9103785	0.63	0.530	-1.213123	2.355495
time7	-1.597526	.9018809	-1.77	0.077	-3.36518	.1701283
_cons	-1.092493	4.124449	-0.26	0.791	-9.176265	6.99128

Underidentification test (Anderson canon. corr. LM statistic): 11.866  
Chi-sq(6) P-val = 0.0650

Weak identification test (Cragg-Donald Wald F statistic): 1.584  
Stock-Yogo weak ID test critical values: 5% maximal IV relative bias 16.88  
10% maximal IV relative bias 9.92  
20% maximal IV relative bias 6.16  
30% maximal IV relative bias 4.76  
10% maximal IV size 23.72  
15% maximal IV size 13.34  
20% maximal IV size 9.77  
25% maximal IV size 7.91

Source: Stock-Yogo (2005). Reproduced by permission.

Sargan statistic (overidentification test of all instruments): 7.480  
Chi-sq(5) P-val = 0.1873

Instrumented: civilwars corruption  
Included instruments: logigdppc loginv\_gdp coastpopshr malariaecol naturalcap  
time1 time2 time3 time4 time5 time6 time7  
Excluded instruments: religfrac ethheter percentmuslim statehist01v3 predtrdshr  
lat lat2

## 8. Small set of instruments

```
. ivreg2 grgdppc ( civilwars corruption= religfrac ethheter percentmuslim
statehist01v3 ) logigdppc loginv_gdp coastpopshr malariaecol natural
> cap time1 time2 time3 time4 time5 time6 time7, first
```

First-stage regressions

First-stage regression of civilwars:

OLS estimation

Estimates efficient for homoskedasticity only  
 Statistics consistent for homoskedasticity only

Number of obs = 136  
 F( 16, 119) = 2.59  
 Prob > F = 0.0017  
 Total (centered) SS = 16.34558824      Centered R2 = 0.2585  
 Total (uncentered) SS = 19      Uncentered R2 = 0.3621  
 Residual SS = 12.12043522      Root MSE = .3191

civilwars	Coef.	Std. Err.	T	P> t	[95% Conf. Interval]	
logigdppc	.107273	.0997302	1.08	0.284	-.0902028	.3047487
loginv_gdp	-.2255187	.076242	-2.96	0.004	-.3764855	-.0745518
coastpopshr	-.6948602	.1888171	-3.68	0.000	-1.068737	-.3209834
malariaecol	.0137814	.0057822	2.38	0.019	.0023321	.0252307
naturalcap	-.0000177	.0000142	-1.25	0.214	-.0000457	.0000103
time1	-.1741887	.1111989	-1.57	0.120	-.3943736	.0459963
time2	-.0866716	.1098713	-0.79	0.432	-.3042277	.1308845
time3	-.0624869	.1096703	-0.57	0.570	-.2796452	.1546713
time4	-.0558081	.1098996	-0.51	0.613	-.2734204	.1618041
time5	-.1029174	.1116159	-0.92	0.358	-.3239279	.1180932
time6	-.0986816	.1107503	-0.89	0.375	-.3179782	.120615
time7	.0997246	.1097705	0.91	0.365	-.1176319	.3170812
religfrac	.0056705	.0034242	1.66	0.100	-.0011099	.0124508
ethheter	-.2370915	.2000627	-1.19	0.238	-.6332355	.1590526
percentmus~m	.0024648	.0026504	0.93	0.354	-.0027833	.0077129
statehist0~3	-.6008677	.33174	-1.81	0.073	-1.257746	.0560106
_cons	-.0053118	.7065649	-0.01	0.994	-1.404381	1.393757

Included instruments: logigdppc loginv\_gdp coastpopshr malariaecol naturalcap  
 time1 time2 time3 time4 time5 time6 time7 religfrac  
 ethheter percentmuslim statehist01v3

Partial R-squared of excluded instruments: 0.0656

Test of excluded instruments:

F( 4, 119) = 2.09

Prob > F = 0.0863

First-stage regression of corruption:



OLS estimation

Estimates efficient for homoskedasticity only  
 Statistics consistent for homoskedasticity only

Number of obs = 136  
 F( 16, 119) = 10.28  
 Prob > F = 0.0000  
 Total (centered) SS = 117.6376488  
 Total (uncentered) SS = 1197.359974  
 Residual SS = 49.38619656  
 Centered R2 = 0.5802  
 Uncentered R2 = 0.9588  
 Root MSE = .6442

corruption	Coef.	Std. Err.	T	P> t	[95% Conf. Interval]	
logigdppc	.0045613	.2013123	0.02	0.982	-.3940572	.4031798
loginv_gdp	.1381832	.1538998	0.90	0.371	-.1665538	.4429202
coastpopshr	-.2756444	.3811405	-0.72	0.471	-1.030341	.4790518
malariaecol	.0251638	.0116717	2.16	0.033	.0020526	.048275
naturalcap	-.0001143	.0000286	-4.00	0.000	-.0001709	-.0000577
time1	.0417951	.2244627	0.19	0.853	-.4026635	.4862537
time2	.0214143	.2217828	0.10	0.923	-.4177379	.4605664
time3	-.0007902	.2213772	-0.00	0.997	-.4391392	.4375587
time4	-.0086457	.22184	-0.04	0.969	-.4479112	.4306197
time5	.0153536	.2253044	0.07	0.946	-.4307716	.4614788
time6	.0172114	.2235571	0.08	0.939	-.4254539	.4598767
time7	.0069916	.2215793	0.03	0.975	-.4317576	.4457408
religfrac	-.0453852	.006912	-6.57	0.000	-.0590717	-.0316987
ethheter	-1.570644	.4038404	-3.89	0.000	-2.370289	-.7710002
percentmus~m	-.0281523	.00535	-5.26	0.000	-.0387459	-.0175587
statehist0~3	4.08689	.6696402	6.10	0.000	2.760936	5.412844
_cons	6.222741	1.42625	4.36	0.000	3.398623	9.046859

Included instruments: logigdppc loginv\_gdp coastpopshr malariaecol naturalcap  
 time1 time2 time3 time4 time5 time6 time7 religfrac  
 ethheter percentmuslim statehist01v3

Partial R-squared of excluded instruments: 0.5429

Test of excluded instruments:

F( 4, 119) = 35.34

Prob > F = 0.0000

Summary results for first-stage regressions

Variable	Shea Partial R2	Partial R2	F( 4, 119)	P-value
civilwars	0.0493	0.0656	2.09	0.0863
corruption	0.4081	0.5429	35.34	0.0000

Underidentification tests

Ho: matrix of reduced form coefficients has rank=K1-1 (underidentified)  
 Ha: matrix has rank=K1 (identified)

Anderson canon. Corr. N\*CCEV LM statistic Chi-sq(3)=6.70 P-val=0.0821  
 Cragg-Donald N\*CDEV Wald statistic Chi-sq(3)=7.05 P-val=0.0704

Weak identification test

Ho: equation is weakly identified

Cragg-Donald Wald F-statistic 1.54

See main output for Cragg-Donald weak id test critical values

Weak-instrument-robust inference

Tests of joint significance of endogenous regressors B1 in main equation

Ho: B1=0 and overidentifying restrictions are valid

Anderson-Rubin Wald test F(4,119)= 2.74 P-val=0.0317  
 Anderson-Rubin Wald test Chi-sq(4)=12.54 P-val=0.0138  
 Stock-Wright LM S statistic Chi-sq(4)=11.48 P-val=0.0217

Number of observations N = 136  
 Number of regressors K = 15  
 Number of instruments L = 17  
 Number of excluded instruments L1 = 4

IV (2SLS) estimation

---

Estimates efficient for homoskedasticity only  
 Statistics consistent for homoskedasticity only

	Number of obs = 136
	F( 14, 121) = 5.22
	Prob > F = 0.0000
Total (centered) SS = 1364.689426	Centered R2 = 0.3731
Total (uncentered) SS = 1433.020015	Uncentered R2 = 0.4030
Residual SS = 855.5136714	Root MSE = 2.508

---

grgdppc	Coef.	Std. Err.	Z	P> z	[95% Conf. Interval]	
-----+-----						
civilwars	-1.743882	3.213668	-0.54	0.587	-8.042556	4.554791
corruption	1.027635	.387191	2.65	0.008	.2687541	1.786515
logigdppc	-1.303114	.7734977	-1.68	0.092	-2.819141	.2129139
loginv_gdp	2.529501	.974756	2.60	0.009	.6190145	4.439988
coastpopshr	-1.719632	2.463475	-0.70	0.485	-6.547954	3.108689
malariaecol	-.0272859	.0425436	-0.64	0.521	-.1106699	.056098
naturalcap	-.0001356	.0001223	-1.11	0.268	-.0003754	.0001041
time1	.6068651	1.042856	0.58	0.561	-1.437096	2.650826

time2		.9268814	.9085535	1.02	0.308	-.8538508	2.707614
time3		1.660279	.8844944	1.88	0.061	-.0732977	3.393857
time4		.6555402	.8809831	0.74	0.457	-1.071155	2.382235
time5		.7556278	.938372	0.81	0.421	-1.083548	2.594803
time6		.0606126	.9282089	0.07	0.948	-1.758643	1.879869
time7		-1.099907	.9187574	-1.20	0.231	-2.900638	.7008246
_cons		.808469	4.167971	0.19	0.846	-7.360603	8.977542
Underidentification test (Anderson canon. Corr. LM statistic):							6.701
Chi-sq(3) P-val =							0.0821
Weak identification test (Cragg-Donald Wald F statistic):							1.542
Stock-Yogo weak ID test critical values: 5% maximal IV relative bias							11.04
10% maximal IV relative bias							7.56
20% maximal IV relative bias							5.57
30% maximal IV relative bias							4.73
10% maximal IV size							16.87
15% maximal IV size							9.93
20% maximal IV size							7.54
25% maximal IV size							6.28
Source: Stock-Yogo (2005). Reproduced by permission.							
Sargan statistic (overidentification test of all instruments):							0.014
Chi-sq(2) P-val =							0.9928
Instrumented:							civilwars corruption
Included instruments:							logigdppc loginv_gdp coastpopshr malariaecol naturalcap
							time1 time2 time3 time4 time5 time6 time7
Excluded instruments:							religfrac ethheter percentmuslim statehist01v3

## E. YO and PR

### 9. Large set of instruments

```
. ivreg2 grgdppc ( yrsopen politrights= religfrac othercol eurlngshr ethheter
percentmuslim statehist01v3 predtrdshr lat lat2 ) logigdppc loginv_gdp
> p coastpopshr malariaecol naturalcap time1 time2 time3 time4 time5 time6 time7,
first
Warning - collinearities detected
Vars dropped: time1 time2

First-stage regressions
-----

First-stage regression of yrsopen:

OLS estimation
-----
```

Estimates efficient for homoskedasticity only  
 Statistics consistent for homoskedasticity only

	Number of obs =	138
	F( 19, 118) =	15.49
	Prob > F =	0.0000
Total (centered) SS =	1.371214481	Centered R2 = 0.7138
Total (uncentered) SS =	2.077134068	Uncentered R2 = 0.8111
Residual SS =	.3924135513	Root MSE = .05767

	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
logigdppc	-.0130043	.0204987	-0.63	0.527	-.0535973	.0275887
loginv_gdp	-.0472347	.0140868	-3.35	0.001	-.0751304	-.019339
coastpopshr	-.0436427	.031752	-1.37	0.172	-.1065202	.0192349
malariaecol	.0039623	.0010219	3.88	0.000	.0019387	.0059859
naturalcap	-5.77e-06	2.90e-06	-1.99	0.049	-.0000115	-3.19e-08
time3	-.0024285	.017039	-0.14	0.887	-.0361704	.0313135
time4	.0040458	.0170793	0.24	0.813	-.0297759	.0378675
time5	-.0013908	.0172456	-0.08	0.936	-.0355417	.0327601
time6	-.0005569	.0171371	-0.03	0.974	-.034493	.0333792
time7	.0000587	.0170537	0.00	0.997	-.0337122	.0338297
religfrac	-.0007382	.0007169	-1.03	0.305	-.0021578	.0006814
othercol	.0744394	.0288321	2.58	0.011	.0173439	.1315349
eurlngshr	-.8529288	.4972013	-1.72	0.089	-1.837523	.1316651
ethheter	.3194942	.0341346	9.36	0.000	.2518984	.3870899
percentmus~m	-.002269	.0005068	-4.48	0.000	-.0032727	-.0012653
statehist0~3	.57731	.0863402	6.69	0.000	.406333	.748287
predtrdshr	.1161252	.022077	5.26	0.000	.0724067	.1598437
lat	-.0291317	.0046726	-6.23	0.000	-.0383848	-.0198786
lat2	.0019062	.0002255	8.45	0.000	.0014596	.0023528
_cons	-.2538883	.130031	-1.95	0.053	-.5113851	.0036085

Included instruments: logigdppc loginv\_gdp coastpopshr malariaecol naturalcap  
 time3 time4 time5 time6 time7 religfrac othercol eurlngshr  
 ethheter percentmuslim statehist01v3 predtrdshr lat lat2

Partial R-squared of excluded instruments: 0.6648  
 Test of excluded instruments:  
 F( 9, 118) = 26.00  
 Prob > F = 0.0000

First-stage regression of politrights:

OLS estimation

Estimates efficient for homoskedasticity only  
 Statistics consistent for homoskedasticity only

Number of obs = 138  
 F( 19, 118) = 6.33  
 Prob > F = 0.0000  
 Total (centered) SS = 248.3876588  
 Total (uncentered) SS = 1281.774893  
 Residual SS = 123.0421077  
 Centered R2 = 0.5046  
 Uncentered R2 = 0.9040  
 Root MSE = 1.021

politrights	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
logigdppc	.7222043	.3629786	1.99	0.049	.0034078	1.441001
loginv_gdp	-.504941	.2494409	-2.02	0.045	-.9989018	-.0109802
coastpopshr	.2665847	.5622451	0.47	0.636	-.8468136	1.379983
malariaecol	.0567082	.0180948	3.13	0.002	.0208756	.0925407
naturalcap	-.0001786	.0000513	-3.48	0.001	-.0002803	-.000077
time3	-1.094921	.3017173	-3.63	0.000	-1.692403	-.4974387
time4	-1.05754	.3024306	-3.50	0.001	-1.656435	-.4586446
time5	-1.136954	.3053743	-3.72	0.000	-1.741678	-.5322293
time6	-1.216744	.3034534	-4.01	0.000	-1.817664	-.6158237
time7	-.2675755	.3019763	-0.89	0.377	-.8655707	.3304198
religfrac	-.0205292	.0126941	-1.62	0.108	-.0456669	.0046085
othercol	.9040614	.5105424	1.77	0.079	-.1069517	1.915074
eurlngshr	-25.27194	8.804143	-2.87	0.005	-42.70654	-7.83734
ethheter	2.126562	.6044347	3.52	0.001	.9296169	3.323507
percentmus~m	-.0132374	.0089749	-1.47	0.143	-.0310102	.0045355
statehist0~3	-1.695411	1.52886	-1.11	0.270	-4.72297	1.332148
predtrdshr	-.1714561	.3909266	-0.44	0.662	-.9455972	.602685
lat	-.1760545	.0827403	-2.13	0.035	-.3399027	-.0122062
lat2	.0168685	.0039933	4.22	0.000	.0089608	.0247763
_cons	.4002939	2.302511	0.17	0.862	-4.159306	4.959893

Included instruments: logigdppc loginv\_gdp coastpopshr malariaecol naturalcap  
 time3 time4 time5 time6 time7 religfrac othercol eurlngshr  
 ethheter percentmuslim statehist01v3 predtrdshr lat lat2

Partial R-squared of excluded instruments: 0.3619  
 Test of excluded instruments:  
 F( 9, 118) = 7.44  
 Prob > F = 0.0000

Summary results for first-stage regressions

Variable	Shea Partial R2	Partial R2	F( 9, 118)	P-value
yrsopen	0.5106	0.6648	26.00	0.0000
politrighs	0.2780	0.3619	7.44	0.0000

Underidentification tests

Ho: matrix of reduced form coefficients has rank=K1-1 (underidentified)

Ha: matrix has rank=K1 (identified)

Anderson canon. corr. N\*CCEV LM statistic Chi-sq(8)=38.24 P-val=0.0000

Cragg-Donald N\*CDEV Wald statistic Chi-sq(8)=52.89 P-val=0.0000

Weak identification test

Ho: equation is weakly identified

Cragg-Donald Wald F-statistic 5.02

See main output for Cragg-Donald weak id test critical values

Weak-instrument-robust inference

Tests of joint significance of endogenous regressors B1 in main equation

Ho: B1=0 and overidentifying restrictions are valid

Anderson-Rubin Wald test F(9,118)= 5.16 P-val=0.0000

Anderson-Rubin Wald test Chi-sq(9)=54.28 P-val=0.0000

Stock-Wright LM S statistic Chi-sq(9)=38.96 P-val=0.0000

Number of observations	N =	138
Number of regressors	K =	13
Number of instruments	L =	20
Number of excluded instruments	L1 =	9

IV (2SLS) estimation

Estimates efficient for homoskedasticity only

Statistics consistent for homoskedasticity only

	Number of obs =	138
	F( 12, 125) =	6.81
	Prob > F =	0.0000
Total (centered) SS =	1438.2282	Centered R2 = 0.3768
Total (uncentered) SS =	1488.510012	Uncentered R2 = 0.3978
Residual SS =	896.3534408	Root MSE = 2.549

-----  
 +-----  
 grgdppc | Coef. Std. Err. z P>|z| [95% Conf. Interval]  
 -----+-----

```

    yrsopen | 15.41567  3.593778  4.29  0.000  8.371996  22.45935
  politrights | .0045545  .3794798  0.01  0.990  -.7392121  .7483212
  logigdppc | -1.310695  .6556215  -2.00  0.046  -2.595689  -.0257002
  loginv_gdp |  2.684819  .5434844  4.94  0.000  1.619609  3.750028
  coastpopshr | -2.16624  1.049339  -2.06  0.039  -4.222908  -.1095729
  malariaecol | -.0532313  .0270154  -1.97  0.049  -1.061804  -.0002822
  naturalcap | -.0001261  .0000849  -1.49  0.137  -.0002924  .0000403
    time3 | .9242458  .8543917  1.08  0.279  -.7503311  2.598823
    time4 | .3825027  .8560043  0.45  0.655  -1.295235  2.06024
    time5 | -.1845126  .8619918  -0.21  0.831  -1.873986  1.50496
    time6 | -.3110659  .8778047  -0.35  0.723  -2.031532  1.4094
    time7 | -2.042276  .7585452  -2.69  0.007  -3.528998  -.555555
    _cons |  2.564802  3.928109  0.65  0.514  -5.13415  10.26375

```

```

-----
Underidentification test (Anderson canon. corr. LM statistic):      38.235
                                                                Chi-sq(8) P-val =  0.0000
-----

```

```

Weak identification test (Cragg-Donald Wald F statistic):          5.025
Stock-Yogo weak ID test critical values: 5% maximal IV relative bias 18.30
                                         10% maximal IV relative bias 10.43
                                         20% maximal IV relative bias  6.22
                                         30% maximal IV relative bias  4.69
                                         10% maximal IV size      27.51
                                         15% maximal IV size      15.24
                                         20% maximal IV size      11.03
                                         25% maximal IV size       8.85

```

Source: Stock-Yogo (2005). Reproduced by permission.

```

-----
Sargan statistic (overidentification test of all instruments):     16.524
                                                                Chi-sq(7) P-val =  0.0207
-----

```

```

Instrumented:      yrsopen politrights
Included instruments: logigdppc loginv_gdp coastpopshr malariaecol naturalcap
                    time3 time4 time5 time6 time7
Excluded instruments: religfrac othercol eurlngshr ethheter percentmuslim
                    statehist01v3 predtrdshr lat lat2
Dropped collinear: time1 time2
-----

```

## 10. Small set of instruments

```

. ivreg2 grgdppc ( yrsopen politrights= religfrac othercol percentmuslim
statehist01v3 predtrdshr lat lat2 ) logigdppc loginv_gdp coastpopshr mala
> riaecol naturalcap time1 time2 time3 time4 time5 time6 time7, first
Warning - collinearities detected

```

Vars dropped: time1 time2

First-stage regressions

First-stage regression of yrsopen:

OLS estimation

Estimates efficient for homoskedasticity only  
Statistics consistent for homoskedasticity only

	Number of obs =	138
	F( 17, 120) =	7.02
	Prob > F =	0.0000
Total (centered) SS =	1.371214481	Centered R2 = 0.4987
Total (uncentered) SS =	2.077134068	Uncentered R2 = 0.6691
Residual SS =	.6873616678	Root MSE = .07568

	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
yrsopen						
logigdppc	.003521	.0236978	0.15	0.882	-.043399	.0504409
loginv_gdp	-.0144221	.0178027	-0.81	0.419	-.0496702	.020826
coastpopshr	-.0288302	.0413594	-0.70	0.487	-.1107189	.0530584
malariaecol	.0035137	.0013073	2.69	0.008	.0009254	.0061021
naturalcap	3.52e-06	3.08e-06	1.14	0.255	-2.58e-06	9.62e-06
time3	-.0011954	.0223583	-0.05	0.957	-.0454632	.0430725
time4	.0005505	.0223943	0.02	0.980	-.0437887	.0448897
time5	-.0013354	.0225733	-0.06	0.953	-.0460289	.0433582
time6	-.000869	.0224565	-0.04	0.969	-.0453314	.0435934
time7	-.0004241	.0223682	-0.02	0.985	-.0447115	.0438634
religfrac	.0024917	.0008115	3.07	0.003	.0008849	.0040984
othercol	-.0334164	.0311004	-1.07	0.285	-.0949929	.0281601
percentmus~m	-.0000546	.0005892	-0.09	0.926	-.0012211	.0011119
statehist0~3	.4237045	.0938292	4.52	0.000	.2379292	.6094797
predtrdshr	.1414358	.0256964	5.50	0.000	.0905586	.1923129
lat	-.0285767	.0059718	-4.79	0.000	-.0404004	-.016753
lat2	.0015773	.0002915	5.41	0.000	.0010001	.0021545
_cons	-.5253688	.1637605	-3.21	0.002	-.8496031	-.2011345

Included instruments: logigdppc loginv\_gdp coastpopshr malariaecol naturalcap  
time3 time4 time5 time6 time7 religfrac othercol  
percentmuslim statehist01v3 predtrdshr lat lat2



Partial R-squared of excluded instruments: 0.4128

Test of excluded instruments:

F( 7, 120) = 12.05

Prob > F = 0.0000

First-stage regression of politrights:

OLS estimation

-----

Estimates efficient for homoskedasticity only

Statistics consistent for homoskedasticity only

Number of obs = 138

F( 17, 120) = 5.48

Prob > F = 0.0000

Total (centered) SS = 248.3876588

Centered R2 = 0.4370

Total (uncentered) SS = 1281.774893

Uncentered R2 = 0.8909

Residual SS = 139.8488067

Root MSE = 1.08

-----  
politrights | Coef. Std. Err. t P>|t| [95% Conf. Interval]

-----+-----  
logigdppc | .4336474 .3380217 1.28 0.202 -.2356121 1.102907  
loginv\_gdp | -.2404238 .2539348 -0.95 0.346 -.7431971 .2623495  
coastpopshr | .5031949 .5899437 0.85 0.395 -.6648526 1.671242  
malariaecol | .0448114 .018647 2.40 0.018 .0078915 .0817312  
naturalcap | -.0000646 .0000439 -1.47 0.144 -.0001516 .0000224  
time3 | -1.075257 .3189153 -3.37 0.001 -1.706687 -.443827  
time4 | -1.053099 .3194294 -3.30 0.001 -1.685547 -.4206508  
time5 | -1.085234 .321982 -3.37 0.001 -1.722735 -.4477316  
time6 | -1.179907 .3203168 -3.68 0.000 -1.814112 -.5457018  
time7 | -.2465829 .3190564 -0.77 0.441 -.8782923 .3851265  
religfrac | .0042403 .0115754 0.37 0.715 -.0186781 .0271588  
othercol | -.2434333 .4436107 -0.55 0.584 -1.121752 .6348851  
percentmus~m | .0000569 .0084037 0.01 0.995 -.0165819 .0166957  
statehist0~3 | -.7783023 1.338365 -0.58 0.562 -3.428173 1.871568  
predtrdshr | .3874449 .36653 1.06 0.293 -.3382591 1.113149  
lat | -.2160473 .0851804 -2.54 0.012 -.3846986 -.047396  
lat2 | .0155476 .0041581 3.74 0.000 .0073149 .0237803  
\_cons | -.3534216 2.335854 -0.15 0.880 -4.978251 4.271407  
-----

Included instruments: logigdppc loginv\_gdp coastpopshr malariaecol naturalcap  
time3 time4 time5 time6 time7 religfrac othercol  
percentmuslim statehist01v3 predtrdshr lat lat2  
-----

Partial R-squared of excluded instruments: 0.2748

Test of excluded instruments:

F( 7, 120) = 6.49

Prob > F = 0.0000

Summary results for first-stage regressions

Variable	Shea Partial R2	Partial R2	F( 7, 120)	P-value
yrsopen	0.3648	0.4128	12.05	0.0000
politrighths	0.2428	0.2748	6.49	0.0000

Underidentification tests

Ho: matrix of reduced form coefficients has rank=K1-1 (underidentified)

Ha: matrix has rank=K1 (identified)

Anderson canon. corr. N\*CCEV LM statistic Chi-sq(6)=33.49 P-val=0.0000

Cragg-Donald N\*CDEV Wald statistic Chi-sq(6)=44.22 P-val=0.0000

Weak identification test

Ho: equation is weakly identified

Cragg-Donald Wald F-statistic 5.49

See main output for Cragg-Donald weak id test critical values

Weak-instrument-robust inference

Tests of joint significance of endogenous regressors B1 in main equation

Ho: B1=0 and overidentifying restrictions are valid

Anderson-Rubin Wald test F(7,120)= 5.04 P-val=0.0000

Anderson-Rubin Wald test Chi-sq(7)=40.57 P-val=0.0000

Stock-Wright LM S statistic Chi-sq(7)=31.35 P-val=0.0001

Number of observations N = 138

Number of regressors K = 13

Number of instruments L = 18

Number of excluded instruments L1 = 7

IV (2SLS) estimation

Estimates efficient for homoskedasticity only

Statistics consistent for homoskedasticity only

Number of obs = 138

F( 12, 125) = 6.70

Prob > F = 0.0000

Total (centered) SS	=	1438.2282	Centered R2	=	0.3567
Total (uncentered) SS	=	1488.510012	Uncentered R2	=	0.3784
Residual SS	=	925.2361509	Root MSE	=	2.589

```

-----+-----
          |  Coef.  Std. Err.   z  P>|z|  [95% Conf. Interval]
-----+-----
  yrsopen | 17.52016  4.319736   4.06  0.000   9.053629  25.98668
  politrights | .4099671  .4125315   0.99  0.320  -0.3985799  1.218514
  logigdppc | -1.786143  .6869663  -2.60  0.009  -3.132572  -0.4397137
  loginv_gdp | 2.611532  .5543674   4.71  0.000   1.524992  3.698072
  coastpopshr | -2.605898  1.079615  -2.41  0.016  -4.721904  -0.4898921
  malariaecol | -0.0591843  .0276963  -2.14  0.033  -0.1134681  -0.0049005
  naturalcap | -0.0001149  .0000864  -1.33  0.183  -0.0002842  .0000543
  time3 | 1.356676  .8820357   1.54  0.124  -0.3720821  3.085434
  time4 | .8434038  .884318   0.95  0.340  -0.8898277  2.576635
  time5 | .2811378  .890633   0.32  0.752  -1.464471  2.026746
  time6 | .1888413  .908954   0.21  0.835  -1.592676  1.970358
  time7 | -1.927191  .7716305  -2.50  0.013  -3.439559  -0.4148229
  _cons | 4.464184  4.101897   1.09  0.276  -3.575388  12.50375
-----+-----

```

Underidentification test (Anderson canon. corr. LM statistic): 33.487  
Chi-sq(6) P-val = 0.0000

Weak identification test (Cragg-Donald Wald F statistic): 5.493  
Stock-Yogo weak ID test critical values: 5% maximal IV relative bias 16.88  
10% maximal IV relative bias 9.92  
20% maximal IV relative bias 6.16  
30% maximal IV relative bias 4.76  
10% maximal IV size 23.72  
15% maximal IV size 13.34  
20% maximal IV size 9.77  
25% maximal IV size 7.91

Source: Stock-Yogo (2005). Reproduced by permission.

Sargan statistic (overidentification test of all instruments): 6.213  
Chi-sq(5) P-val = 0.2861

Instrumented: yrsopen politrights  
Included instruments: logigdppc loginv\_gdp coastpopshr malariaecol naturalcap  
time3 time4 time5 time6 time7  
Excluded instruments: religfrac othercol percentmuslim statehist01v3 predtrdshr  
lat lat2  
Dropped collinear: time1 time2

11. Large set of instruments

```

ivreg2 grgdppc ( yrsopen politopen= eurlngshr religfrac ethheter statehist01v3
                othercol percentmuslim predtrdshr lat lat2 ) logigdppc loginv_gd
> p coastpopshr malariaecol naturalcap time1 time2 time3 time4 time5 time6 time7,
                first
    
```

First-stage regressions

First-stage regression of yrsopen:

OLS estimation

Estimates efficient for homoskedasticity only  
 Statistics consistent for homoskedasticity only

	Number of obs =	185
	F( 21, 163) =	16.96
	Prob > F =	0.0000
Total (centered) SS =	1.722150674	Centered R2 = 0.6861
Total (uncentered) SS =	2.530124083	Uncentered R2 = 0.7863
Residual SS =	.5406217141	Root MSE = .05759

	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
logigdppc	.0008746	.0155727	0.06	0.955	-.0298755	.0316248
loginv_gdp	-.0339883	.0122796	-2.77	0.006	-.0582358	-.0097407
coastpopshr	-.04026	.029191	-1.38	0.170	-.0979013	.0173812
malariaecol	.0041434	.0008823	4.70	0.000	.0024013	.0058855
naturalcap	-5.50e-06	2.44e-06	-2.25	0.026	-.0000103	-6.80e-07
time1	-.0125995	.0176929	-0.71	0.477	-.0475364	.0223373
time2	-.0043779	.0171817	-0.25	0.799	-.0383053	.0295495
time3	-.0005793	.0166537	-0.03	0.972	-.0334641	.0323055
time4	.0032412	.0167115	0.19	0.846	-.0297576	.0362401
time5	-.0000548	.0169488	-0.00	0.997	-.0335222	.0334127
time6	-.0009691	.016715	-0.06	0.954	-.033975	.0320368
time7	-.0002703	.0166633	-0.02	0.987	-.0331742	.0326335
eurlngshr	-.9355657	.4446927	-2.10	0.037	-1.813667	-.0574646
religfrac	-.0005302	.0006207	-0.85	0.394	-.0017559	.0006955
ethheter	.3055167	.029974	10.19	0.000	.2463293	.3647041
statehist0~3	.5402326	.0614782	8.79	0.000	.4188363	.661629
othercol	.0846724	.0250352	3.38	0.001	.0352372	.1341076

percentmus~m	-.0020568	.0004051	-5.08	0.000	-.0028568	-.0012568
predtrdshr	.0997977	.018563	5.38	0.000	.0631427	.1364527
lat	-.0288751	.00408	-7.08	0.000	-.0369315	-.0208187
lat2	.0018593	.0002005	9.27	0.000	.0014634	.0022552
_cons	-.3389026	.1097054	-3.09	0.002	-.5555296	-.1222755

-----  
Included instruments: logigdppc loginv\_gdp coastpopshr malariaecol naturalcap  
time1 time2 time3 time4 time5 time6 time7 eurlngshr  
religfrac ethheter statehist01v3 othercol percentmuslim  
predtrdshr lat lat2  
-----

Partial R-squared of excluded instruments: 0.6522  
Test of excluded instruments:  
F( 9, 163) = 33.96  
Prob > F = 0.0000

First-stage regression of politopen:

OLS estimation  
-----

Estimates efficient for homoskedasticity only  
Statistics consistent for homoskedasticity only

	Number of obs =	185
	F( 21, 163) =	6.49
	Prob > F =	0.0000
Total (centered) SS =	1247.689352	Centered R2 = 0.4555
Total (uncentered) SS =	1730.886286	Uncentered R2 = 0.6075
Residual SS =	679.385368	Root MSE = 2.042

-----

politopen	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
logigdppc	.6633175	.5520446	1.20	0.231	-.4267633 1.753398
loginv_gdp	-1.117264	.4353062	-2.57	0.011	-1.976831 -.2576979
coastpopshr	-1.940803	1.034808	-1.88	0.063	-3.984161 .1025555
malariaecol	.0798734	.031276	2.55	0.012	.0181151 .1416317
naturalcap	-.0001355	.0000865	-1.57	0.119	-.0003064 .0000354
time1	-.7592192	.6272069	-1.21	0.228	-1.997717 .4792789
time2	-1.555316	.6090838	-2.55	0.012	-2.758027 -.3526037
time3	-1.684082	.5903671	-2.85	0.005	-2.849835 -.5183283
time4	-1.608699	.5924148	-2.72	0.007	-2.778496 -.4389027
time5	-1.780044	.6008266	-2.96	0.004	-2.966451 -.5936373
time6	-2.170847	.5925413	-3.66	0.000	-3.340894 -1.000801
time7	-.530369	.5907082	-0.90	0.371	-1.696796 .6360579

eurlngshr		-16.95882	15.76418	-1.08	0.284	-48.08716	14.16951
religfrac		-.02412	.0220043	-1.10	0.275	-.0675703	.0193302
ethheter		3.888666	1.062567	3.66	0.000	1.790496	5.986837
statehist0~3		-1.870979	2.179377	-0.86	0.392	-6.17443	2.432473
othercol		.8046375	.8874895	0.91	0.366	-.9478213	2.557096
percentmus~m		-.0274586	.0143616	-1.91	0.058	-.0558174	.0009002
predtrdshr		1.890863	.6580517	2.87	0.005	.5914583	3.190268
lat		-.5141644	.1446338	-3.55	0.000	-.799762	-.2285669
lat2		.039973	.0071074	5.62	0.000	.0259386	.0540073
_cons		-4.575243	3.889013	-1.18	0.241	-12.25458	3.104098

-----  
Included instruments: logigdppc loginv\_gdp coastpopshr malariaecol naturalcap  
time1 time2 time3 time4 time5 time6 time7 eurlngshr  
religfrac ethheter statehist01v3 othercol percentmuslim  
predtrdshr lat lat2  
-----

Partial R-squared of excluded instruments: 0.3639  
Test of excluded instruments:  
F( 9, 163) = 10.36  
Prob > F = 0.0000

Summary results for first-stage regressions  
-----

Variable		Shea Partial R2		Partial R2		F( 9, 163)	P-value
yrsoopen		0.4921		0.6522		33.96	0.0000
politopen		0.2746		0.3639		10.36	0.0000

Underidentification tests

Ho: matrix of reduced form coefficients has rank=K1-1 (underidentified)

Ha: matrix has rank=K1 (identified)

Anderson canon. corr. N\*CCEV LM statistic Chi-sq(8)=50.79 P-val=0.0000

Cragg-Donald N\*CDEV Wald statistic Chi-sq(8)=70.01 P-val=0.0000

Weak identification test

Ho: equation is weakly identified

Cragg-Donald Wald F-statistic 6.85

See main output for Cragg-Donald weak id test critical values

Weak-instrument-robust inference

Tests of joint significance of endogenous regressors B1 in main equation

Ho: B1=0 and overidentifying restrictions are valid

Anderson-Rubin Wald test F(9,163)= 4.31 P-val=0.0000

Anderson-Rubin Wald test Chi-sq(9)=44.06 P-val=0.0000

Stock-Wright LM S statistic Chi-sq(9)=35.59 P-val=0.0000

Number of observations N = 185  
 Number of regressors K = 15  
 Number of instruments L = 22  
 Number of excluded instruments L1 = 9

IV (2SLS) estimation

Estimates efficient for homoskedasticity only  
 Statistics consistent for homoskedasticity only

Number of obs = 185  
 F( 14, 170) = 6.68  
 Prob > F = 0.0000  
 Total (centered) SS = 1777.183475 Centered R2 = 0.3309  
 Total (uncentered) SS = 1866.300015 Uncentered R2 = 0.3628  
 Residual SS = 1189.134825 Root MSE = 2.535

grgdppc	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
yrsoopen	7.461702	3.289526	2.27	0.023	1.01435	13.90905
politopen	.379295	.1679946	2.26	0.024	.0500317	.7085583
logigdppc	-1.454894	.5691957	-2.56	0.011	-2.570497	-.3392909
loginv_gdp	2.48334	.4823508	5.15	0.000	1.53795	3.42873
coastpopshr	-1.084925	.9460383	-1.15	0.251	-2.939126	.7692761
malariaecol	-.0323262	.0238785	-1.35	0.176	-.0791272	.0144749
naturalcap	-.0001126	.0000743	-1.52	0.129	-.0002582	.0000329
time1	.8790448	.7871602	1.12	0.264	-.6637609	2.421851
time2	2.185798	.7917063	2.76	0.006	.6340822	3.737514
time3	1.826746	.7855356	2.33	0.020	.2871242	3.366367
time4	1.203767	.7899212	1.52	0.128	-.3444499	2.751984
time5	.6831995	.8049879	0.85	0.396	-.8945477	2.260947
time6	.6935575	.8202924	0.85	0.398	-.9141862	2.301301
time7	-1.659018	.7386395	-2.25	0.025	-3.106724	-.2113107
_cons	2.847165	3.468142	0.82	0.412	-3.950269	9.644599

Underidentification test (Anderson canon. corr. LM statistic): 50.790  
 Chi-sq(8) P-val = 0.0000

Weak identification test (Cragg-Donald Wald F statistic): 6.854  
 Stock-Yogo weak ID test critical values: 5% maximal IV relative bias 18.30  
 10% maximal IV relative bias 10.43  
 20% maximal IV relative bias 6.22

30% maximal IV relative bias 4.69  
 10% maximal IV size 27.51  
 15% maximal IV size 15.24  
 20% maximal IV size 11.03  
 25% maximal IV size 8.85

Source: Stock-Yogo (2005). Reproduced by permission.

-----  
 Sargan statistic (overidentification test of all instruments): 10.416  
 Chi-sq(7) P-val = 0.1662  
 -----

Instrumented: yrsopen politopen  
 Included instruments: logigdppc loginv\_gdp coastpopshr malariaecol naturalcap  
 time1 time2 time3 time4 time5 time6 time7  
 Excluded instruments: eurlngshr religfrac ethheter statehist01v3 othercol  
 percentmuslim predtrdshr lat lat2.

## 12. Small set of instruments

```
. ivreg2 grgdppc ( yrsopen politopen= religfrac othercol percentmuslim predtrdshr
  lat lat2 ) logigdppc loginv_gdp coastpopshr malariaecol natural
  > cap time1 time2 time3 time4 time5 time6 time7, first
```

First-stage regressions

-----  
 First-stage regression of yrsopen:

OLS estimation

-----  
 Estimates efficient for homoskedasticity only  
 Statistics consistent for homoskedasticity only

	Number of obs =	193
	F( 18, 174) =	4.98
	Prob > F =	0.0000
Total (centered) SS =	1.7556418	Centered R2 = 0.3399
Total (uncentered) SS =	2.530124083	Uncentered R2 = 0.5420
Residual SS =	1.158816272	Root MSE = .08161

-----  
 yrsopen | Coef. Std. Err. t P>|t| [95% Conf. Interval]  
 -----+-----  
 logigdppc | .0148037 .018904 0.78 0.435 -.022507 .0521143  
 loginv\_gdp | -.0047283 .0164638 -0.29 0.774 -.0372228 .0277663  
 coastpopshr | -.0621941 .0401825 -1.55 0.123 -.141502 .0171139



malariaecol		.0042666	.0011672	3.66	0.000	.001963	.0065703
naturalcap		2.65e-06	2.86e-06	0.92	0.356	-3.00e-06	8.30e-06
time1		-.0103452	.024432	-0.42	0.673	-.0585665	.0378761
time2		-.00061	.0237505	-0.03	0.980	-.0474862	.0462662
time3		-.0013917	.023122	-0.06	0.952	-.0470274	.0442441
time4		-.0013233	.023205	-0.06	0.955	-.0471228	.0444761
time5		.0000357	.0235031	0.00	0.999	-.0463521	.0464235
time6		-.0018561	.0232078	-0.08	0.936	-.047661	.0439489
time7		-.001218	.0231382	-0.05	0.958	-.0468856	.0444496
religfrac		.0027054	.0007596	3.56	0.000	.0012062	.0042047
othercol		.0098865	.0264573	0.37	0.709	-.0423322	.0621051
percentmus~m		.0009112	.0004772	1.91	0.058	-.0000306	.0018529
predtrdshr		.1161952	.0223753	5.19	0.000	.0720334	.1603571
lat		-.0315471	.0056346	-5.60	0.000	-.0426681	-.0204262
lat2		.0018128	.000275	6.59	0.000	.0012701	.0023555
_cons		-.5285107	.1511332	-3.50	0.001	-.826801	-.2302203

-----  
Included instruments: logigdppc loginv\_gdp coastpopshr malariaecol naturalcap  
time1 time2 time3 time4 time5 time6 time7 religfrac  
othercol percentmuslim predtrdshr lat lat2  
-----

Partial R-squared of excluded instruments: 0.2907

Test of excluded instruments:

F( 6, 174) = 11.89

Prob > F = 0.0000

First-stage regression of politopen:

OLS estimation  
-----

Estimates efficient for homoskedasticity only

Statistics consistent for homoskedasticity only

Number of obs = 193

F( 18, 174) = 6.72

Prob > F = 0.0000

Total (centered) SS = 1267.718241

Centered R2 = 0.4102

Total (uncentered) SS = 1730.886286

Uncentered R2 = 0.5680

Residual SS = 747.6630394

Root MSE = 2.073

-----  
+-----  
politopen | Coef. Std. Err. t P>|t| [95% Conf. Interval]  
-----+-----  
logigdppc | .332333 .4801746 0.69 0.490 -.6153836 1.28005  
loginv\_gdp | -.6862099 .4181933 -1.64 0.103 -1.511594 .1391746  
-----

coastpopshr		-1.705399	1.020665	-1.67	0.097	-3.719876	.3090777
malariaecol		.0567227	.0296472	1.91	0.057	-.0017917	.1152372
naturalcap		6.51e-06	.0000727	0.09	0.929	-.000137	.00015
time1		-.7702636	.620591	-1.24	0.216	-1.995119	.4545914
time2		-1.518609	.6032801	-2.52	0.013	-2.709298	-.3279204
time3		-1.594258	.587316	-2.71	0.007	-2.753439	-.4350774
time4		-1.548249	.5894224	-2.63	0.009	-2.711587	-.3849113
time5		-1.64735	.5969943	-2.76	0.006	-2.825633	-.4690679
time6		-2.05313	.5894937	-3.48	0.001	-3.216608	-.8896508
time7		-.5030402	.5877256	-0.86	0.393	-1.663029	.6569487
religfrac		.0122259	.0192944	0.63	0.527	-.0258554	.0503072
othercol		-1.267448	.6720351	-1.89	0.061	-2.593838	.0589418
percentmus~m		-.0096849	.0121202	-0.80	0.425	-.0336064	.0142366
predtrdshr		2.6282	.568347	4.62	0.000	1.506458	3.749941
lat		-.4856357	.1431228	-3.39	0.001	-.7681159	-.2031555
lat2		.0340422	.0069845	4.87	0.000	.020257	.0478274
_cons		-5.802674	3.838889	-1.51	0.132	-13.37946	1.774108

-----  
Included instruments: logigppc loginv\_gdp coastpopshr malariaecol naturalcap  
time1 time2 time3 time4 time5 time6 time7 religfrac  
othercol percentmuslim predtrdshr lat lat2  
-----

Partial R-squared of excluded instruments: 0.3254

Test of excluded instruments:

F( 6, 174) = 13.99

Prob > F = 0.0000

Summary results for first-stage regressions  
-----

Variable	Shea Partial R2	Partial R2	F( 6, 174)	P-value
yrsoopen	0.1090	0.2907	11.89	0.0000
politopen	0.1219	0.3254	13.99	0.0000

Underidentification tests

Ho: matrix of reduced form coefficients has rank=K1-1 (underidentified)

Ha: matrix has rank=K1 (identified)

Anderson canon. corr. N\*CCEV LM statistic Chi-sq(5)=17.91 P-val=0.0031

Cragg-Donald N\*CDEV Wald statistic Chi-sq(5)=19.74 P-val=0.0014

Weak identification test

Ho: equation is weakly identified

Cragg-Donald Wald F-statistic 2.97

See main output for Cragg-Donald weak id test critical values

Weak-instrument-robust inference

Tests of joint significance of endogenous regressors B1 in main equation

Ho: B1=0 and overidentifying restrictions are valid

Anderson-Rubin Wald test F(6,174)= 4.76 P-val=0.0002  
 Anderson-Rubin Wald test Chi-sq(6)=31.66 P-val=0.0000  
 Stock-Wright LM S statistic Chi-sq(6)=27.20 P-val=0.0001

Number of observations N = 193  
 Number of regressors K = 15  
 Number of instruments L = 19  
 Number of excluded instruments L1 = 6

IV (2SLS) estimation

Estimates efficient for homoskedasticity only  
 Statistics consistent for homoskedasticity only

Number of obs = 193  
 F( 14, 178) = 6.37  
 Prob > F = 0.0000  
 Total (centered) SS = 1894.540121 Centered R2 = 0.3005  
 Total (uncentered) SS = 1993.930018 Uncentered R2 = 0.3354  
 Residual SS = 1325.221299 Root MSE = 2.62

grgdppc	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
yrsoopen	10.25506	7.13743	1.44	0.151	-3.73405	24.24416
politopen	.3023398	.2590239	1.17	0.243	-.2053378	.8100174
logigdppc	-1.005908	.5517008	-1.82	0.068	-2.087222	.0754053
loginv_gdp	2.385557	.5172292	4.61	0.000	1.371806	3.399307
coastpopshr	-1.221288	.9964493	-1.23	0.220	-3.174293	.731717
malariaecol	-.0218704	.0260431	-0.84	0.401	-.0729139	.0291732
naturalcap	-.0001315	.0000766	-1.72	0.086	-.0002817	.0000187
time1	.9309501	.7990981	1.17	0.244	-.6352534	2.497154
time2	2.072159	.8501316	2.44	0.015	.4059317	3.738386
time3	1.631975	.8512162	1.92	0.055	-.0363784	3.300328
time4	1.048829	.8521389	1.23	0.218	-.6213329	2.71899
time5	.1280334	.8760505	0.15	0.884	-1.588994	1.845061
time6	.3121528	.9181569	0.34	0.734	-1.487402	2.111707
time7	-1.809573	.7544877	-2.40	0.016	-3.288342	-.3308045
_cons	.3210199	3.329428	0.10	0.923	-6.204539	6.846579

Underidentification test (Anderson canon. corr. LM statistic): 17.906

Chi-sq(5) P-val = 0.0031

-----  
Weak identification test (Cragg-Donald Wald F statistic): 2.966  
Stock-Yogo weak ID test critical values: 5% maximal IV relative bias 15.72  
10% maximal IV relative bias 9.48  
20% maximal IV relative bias 6.08  
30% maximal IV relative bias 4.78  
10% maximal IV size 21.68  
15% maximal IV size 12.33  
20% maximal IV size 9.10  
25% maximal IV size 7.42

Source: Stock-Yogo (2005). Reproduced by permission.

-----  
Sargan statistic (overidentification test of all instruments): 6.287  
Chi-sq(4) P-val = 0.1787

-----  
Instrumented: yrsopen politopen  
Included instruments: logigdppc loginv\_gdp coastpopshr malariaecol naturalcap  
time1 time2 time3 time4 time5 time6 time7  
Excluded instruments: religfrac othercol percentmuslim predtrdshr lat lat2  
-----

G. YO and AC

### 13. Large set of instruments

```
. ivreg2 grgdppc ( yrsopen corruption= eurlngshr religfrac ethheter statehist01v3  
othercol percentmuslim predtrdshr lat lat2 ) logigdppc loginv_  
> gdp coastpopshr malariaecol naturalcap time1 time2 time3 time4 time5 time6 time7,  
first  
Warning - collinearities detected  
Vars dropped: othercol
```

First-stage regressions

-----  
First-stage regression of yrsopen:

OLS estimation

-----  
Estimates efficient for homoskedasticity only  
Statistics consistent for homoskedasticity only

Number of obs = 136  
F( 20, 115) = 23.85

Total (centered) SS	= 1.503292286	Prob > F	= 0.0000
Total (uncentered) SS	= 2.516040082	Centered R2	= 0.8057
Residual SS	= .2920311897	Uncentered R2	= 0.8839
		Root MSE	= .05039

	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
logigdppc	-.0784965	.0171834	-4.57	0.000	-.1125334	-.0444595
loginv_gdp	-.0005639	.012813	-0.04	0.965	-.0259439	.0248162
coastpopshr	.1174061	.0417647	2.81	0.006	.0346782	.2001339
malariaecol	.0106953	.001339	7.99	0.000	.008043	.0133476
naturalcap	3.53e-06	2.82e-06	1.25	0.214	-2.06e-06	9.12e-06
time1	-.0054431	.0175961	-0.31	0.758	-.0402975	.0294113
time2	-.0022347	.0173575	-0.13	0.898	-.0366165	.0321472
time3	.0055598	.0173227	0.32	0.749	-.028753	.0398727
time4	.0084382	.0173664	0.49	0.628	-.0259613	.0428377
time5	.0129601	.0176804	0.73	0.465	-.0220614	.0479815
time6	.0079807	.0175188	0.46	0.650	-.0267208	.0426821
time7	.0044262	.0173405	0.26	0.799	-.0299219	.0387744
eurlngshr	-.3093021	.4048793	-0.76	0.446	-1.11129	.4926859
religfrac	.0009032	.0007226	1.25	0.214	-.0005282	.0023346
ethheter	.4927665	.0569186	8.66	0.000	.3800217	.6055112
statehist0~3	.4134929	.0619134	6.68	0.000	.2908544	.5361315
percentmus~m	-.0028498	.0005122	-5.56	0.000	-.0038643	-.0018353
predtrdshr	.1233408	.0198248	6.22	0.000	.0840717	.1626099
lat	-.0480053	.0044354	-10.82	0.000	-.056791	-.0392196
lat2	.00305	.000247	12.35	0.000	.0025606	.0035393
_cons	-.2665799	.1201751	-2.22	0.029	-.5046235	-.0285362

Included instruments: logigdppc loginv\_gdp coastpopshr malariaecol naturalcap  
time1 time2 time3 time4 time5 time6 time7 eurlngshr  
religfrac ethheter statehist01v3 percentmuslim predtrdshr  
lat lat2

Partial R-squared of excluded instruments: 0.7929

Test of excluded instruments:

F( 8, 115) = 55.05

Prob > F = 0.0000

First-stage regression of corruption:

OLS estimation

Estimates efficient for homoskedasticity only

Statistics consistent for homoskedasticity only

	Number of obs =	136
	F( 20, 115) =	639.78
	Prob > F =	0.0000
Total (centered) SS =	117.6376488	Centered R2 = 0.9911
Total (uncentered) SS =	1197.359974	Uncentered R2 = 0.9991
Residual SS =	1.047853493	Root MSE = .09546

corruption	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
logigdppc	-.0947845	.0325495	-2.91	0.004	-.1592587	-.0303103
loginv_gdp	-.045679	.0242709	-1.88	0.062	-.0937549	.002397
coastpopshr	.8066586	.0791125	10.20	0.000	.6499519	.9633653
malariaecol	.1179262	.0025364	46.49	0.000	.1129021	.1229503
naturalcap	-.0001012	5.35e-06	-18.94	0.000	-.0001118	-.0000906
time1	-.0169453	.0333312	-0.51	0.612	-.082968	.0490775
time2	-.0064934	.0328793	-0.20	0.844	-.071621	.0586342
time3	.0093758	.0328133	0.29	0.776	-.0556211	.0743727
time4	.0137868	.0328962	0.42	0.676	-.0513742	.0789478
time5	.010403	.033491	0.31	0.757	-.0559361	.0767422
time6	.0038796	.0331849	0.12	0.907	-.0618534	.0696125
time7	.0029836	.0328471	0.09	0.928	-.0620802	.0680474
eurlngshr	-26.50615	.7669397	-34.56	0.000	-28.02531	-24.98699
religfrac	-.0374843	.0013689	-27.38	0.000	-.0401957	-.0347728
ethheter	3.241918	.1078176	30.07	0.000	3.028352	3.455484
statehist0~3	1.128399	.117279	9.62	0.000	.896092	1.360706
percentmus~m	-.0432974	.0009701	-44.63	0.000	-.045219	-.0413757
predtrdshr	-.1185631	.037553	-3.16	0.002	-.1929482	-.0441779
lat	-.2726102	.0084018	-32.45	0.000	-.2892525	-.2559679
lat2	.0223173	.000468	47.69	0.000	.0213903	.0232442
_cons	2.988447	.2276407	13.13	0.000	2.537534	3.439359

Included instruments: logigdppc loginv\_gdp coastpopshr malariaecol naturalcap  
time1 time2 time3 time4 time5 time6 time7 eurlngshr  
religfrac ethheter statehist01v3 percentmuslim predtrdshr  
lat lat2

Partial R-squared of excluded instruments: 0.9903  
Test of excluded instruments:  
F( 8, 115) = 1467.84  
Prob > F = 0.0000

Summary results for first-stage regressions

Variable	Shea Partial R2	Partial R2	F( 8, 115)	P-value
yrsopen	0.5512	0.7929	55.05	0.0000
corruption	0.6884	0.9903	1467.84	0.0000

Underidentification tests

Ho: matrix of reduced form coefficients has rank=K1-1 (underidentified)

Ha: matrix has rank=K1 (identified)

Anderson canon. corr. N\*CCEV LM statistic Chi-sq(7)=74.92 P-val=0.0000

Cragg-Donald N\*CDEV Wald statistic Chi-sq(7)=166.81 P-val=0.0000

Weak identification test

Ho: equation is weakly identified

Cragg-Donald Wald F-statistic 17.63

See main output for Cragg-Donald weak id test critical values

Weak-instrument-robust inference

Tests of joint significance of endogenous regressors B1 in main equation

Ho: B1=0 and overidentifying restrictions are valid

Anderson-Rubin Wald test F(8,115)= 5.77 P-val=0.0000

Anderson-Rubin Wald test Chi-sq(8)=54.57 P-val=0.0000

Stock-Wright LM S statistic Chi-sq(8)=38.94 P-val=0.0000

Number of observations	N =	136
Number of regressors	K =	15
Number of instruments	L =	21
Number of excluded instruments	L1 =	8

IV (2SLS) estimation

Estimates efficient for homoskedasticity only

Statistics consistent for homoskedasticity only

	Number of obs =	136
	F( 14, 121) =	6.84
	Prob > F =	0.0000
Total (centered) SS =	1364.689426	Centered R2 = 0.4003
Total (uncentered) SS =	1433.020015	Uncentered R2 = 0.4289
Residual SS =	818.4049263	Root MSE = 2.453

grgdppc	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
---------	-------	-----------	---	------	----------------------

```

    yrsopen | 14.78759 4.331726 3.41 0.001 6.297564 23.27762
  corruption | -.1370694 .4428522 -0.31 0.757 -1.005044 .7309049
  logigdppc | -1.347168 .6637598 -2.03 0.042 -2.648113 -.0462224
  loginv_gdp | 2.849174 .5843104 4.88 0.000 1.703947 3.994402
  coastpopshr | .263235 1.265676 0.21 0.835 -2.217444 2.743914
  malariaecol | -.0923253 .0336085 -2.75 0.006 -.1581969 -.0264538
  naturalcap | .0000239 .0000936 0.26 0.798 -.0001596 .0002074
    time1 | .898901 .8542515 1.05 0.293 -.7754012 2.573203
    time2 | 1.071362 .8444558 1.27 0.205 -.5837412 2.726465
    time3 | 1.759982 .8425019 2.09 0.037 .1087082 3.411255
    time4 | .7421233 .8436942 0.88 0.379 -.9114869 2.395734
    time5 | .9027896 .8556249 1.06 0.291 -.7742044 2.579784
    time6 | .2086127 .8504001 0.25 0.806 -1.458141 1.875366
    time7 | -1.285795 .843478 -1.52 0.127 -2.938982 .3673913
    _cons | 1.778406 3.9316 0.45 0.651 -5.927388 9.484201

```

```

-----
Underidentification test (Anderson canon. corr. LM statistic):      74.919
                                                                Chi-sq(7) P-val = 0.0000
-----

```

```

Weak identification test (Cragg-Donald Wald F statistic):          17.632
Stock-Yogo weak ID test critical values: 5% maximal IV relative bias 17.70
                                         10% maximal IV relative bias 10.22
                                         20% maximal IV relative bias 6.20
                                         30% maximal IV relative bias 4.73
                                         10% maximal IV size 25.64
                                         15% maximal IV size 14.31
                                         20% maximal IV size 10.41
                                         25% maximal IV size 8.39

```

Source: Stock-Yogo (2005). Reproduced by permission.

```

-----
Sargan statistic (overidentification test of all instruments):      9.300
                                                                Chi-sq(6) P-val = 0.1574
-----

```

```

Instrumented:      yrsopen corruption
Included instruments: logigdppc loginv_gdp coastpopshr malariaecol naturalcap
                    time1 time2 time3 time4 time5 time6 time7
Excluded instruments: eurlngshr religfrac ethheter statehist01v3 percentmuslim
                    predtrdshr lat lat2
Dropped collinear:  othercol

```

#### 14. Small set of instruments

```

. ivreg2 grgdppc ( yrsopen corruption= religfrac statehist01v3 percentmuslim
  predtrdshr lat lat2 ) logigdppc loginv_gdp coastpopshr malariae
> col naturalcap time1 time2 time3 time4 time5 time6 time7, first

```



First-stage regressions

First-stage regression of yrsopen:

OLS estimation

Estimates efficient for homoskedasticity only  
 Statistics consistent for homoskedasticity only

	Number of obs =	136
	F( 18, 117) =	13.67
	Prob > F =	0.0000
Total (centered) SS =	1.503292286	Centered R2 = 0.6778
Total (uncentered) SS =	2.516040082	Uncentered R2 = 0.8075
Residual SS =	.4843742477	Root MSE = .06434

	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
yrsopen						
logigdpcc	-.0411903	.0198265	-2.08	0.040	-.0804556	-.001925
loginv_gdp	-.0068386	.0161122	-0.42	0.672	-.0387479	.0250707
coastpopshr	-.1244471	.0385655	-3.23	0.002	-.2008241	-.0480701
malariaecol	.0053634	.0014639	3.66	0.000	.0024641	.0082627
naturalcap	-3.08e-06	2.90e-06	-1.06	0.290	-8.81e-06	2.66e-06
time1	-.0047542	.0224658	-0.21	0.833	-.0492466	.0397381
time2	-.0021143	.0221621	-0.10	0.924	-.0460052	.0417766
time3	.0029927	.0221098	0.14	0.893	-.0407945	.0467799
time4	.004834	.0221584	0.22	0.828	-.0390496	.0487176
time5	.0060379	.0224965	0.27	0.789	-.0385153	.050591
time6	.0033507	.0223298	0.15	0.881	-.0408723	.0475737
time7	.0019793	.0221304	0.09	0.929	-.0418488	.0458075
religfrac	.0014925	.0008123	1.84	0.069	-.0001161	.0031012
statehist0~3	.4603395	.0698205	6.59	0.000	.3220637	.5986153
percentmus~m	-.0006446	.0005339	-1.21	0.230	-.001702	.0004128
predtrdshr	.1825647	.020171	9.05	0.000	.1426172	.2225122
lat	-.0314451	.0048637	-6.47	0.000	-.0410774	-.0218129
lat2	.0017239	.0002451	7.03	0.000	.0012386	.0022092
_cons	-.2575216	.152258	-1.69	0.093	-.5590606	.0440174

Included instruments: logigdpcc loginv\_gdp coastpopshr malariaecol naturalcap  
 time1 time2 time3 time4 time5 time6 time7 religfrac  
 statehist01v3 percentmuslim predtrdshr lat lat2

Partial R-squared of excluded instruments: 0.6566

Test of excluded instruments:  
 F( 6, 117) = 37.28  
 Prob > F = 0.0000

First-stage regression of corruption:

OLS estimation

Estimates efficient for homoskedasticity only  
 Statistics consistent for homoskedasticity only

Number of obs = 136  
 F( 18, 117) = 38.05  
 Prob > F = 0.0000  
 Centered R2 = 0.8541  
 Uncentered R2 = 0.9857  
 Root MSE = .383

Total (centered) SS = 117.6376488  
 Total (uncentered) SS = 1197.359974  
 Residual SS = 17.16286859

corruption	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
logigdppc	-.2425838	.1180184	-2.06	0.042	-.476313	-.0088545
loginv_gdp	.0462411	.0959088	0.48	0.631	-.1437013	.2361835
coastpopshr	-.1361884	.2295639	-0.59	0.554	-.5908278	.318451
malariaecol	.0670539	.0087142	7.69	0.000	.0497958	.0843119
naturalcap	-.0000481	.0000172	-2.79	0.006	-.0000823	-.000014
time1	-.0023849	.1337294	-0.02	0.986	-.2672289	.2624592
time2	.0005163	.1319215	0.00	0.997	-.2607473	.26178
time3	.0170434	.1316099	0.13	0.897	-.2436031	.2776899
time4	.0232535	.1318995	0.18	0.860	-.2379665	.2844735
time5	.0456458	.133912	0.34	0.734	-.21956	.3108516
time6	.0308024	.1329196	0.23	0.817	-.2324379	.2940426
time7	.0161965	.1317329	0.12	0.902	-.2446936	.2770866
religfrac	-.0134574	.0048351	-2.78	0.006	-.023033	-.0038819
statehist0~3	3.149728	.4156112	7.58	0.000	2.326632	3.972824
percentmus~m	-.0210512	.0031782	-6.62	0.000	-.0273454	-.014757
predtrdshr	.8317154	.120069	6.93	0.000	.5939251	1.069506
lat	-.2516895	.0289513	-8.69	0.000	-.3090262	-.1943529
lat2	.0164699	.0014587	11.29	0.000	.0135811	.0193588
_cons	2.131104	.9063262	2.35	0.020	.3361724	3.926036

Included instruments: logigdppc loginv\_gdp coastpopshr malariaecol naturalcap  
 time1 time2 time3 time4 time5 time6 time7 religfrac  
 statehist01v3 percentmuslim predtrdshr lat lat2

Partial R-squared of excluded instruments: 0.8412

Test of excluded instruments:

F( 6, 117) = 103.26

Prob > F = 0.0000

Summary results for first-stage regressions

Variable	Shea Partial R2	Partial R2	F( 6, 117)	P-value
yrsopen	0.3471	0.6566	37.28	0.0000
corruption	0.4447	0.8412	103.26	0.0000

Underidentification tests

Ho: matrix of reduced form coefficients has rank=K1-1 (underidentified)

Ha: matrix has rank=K1 (identified)

Anderson canon. corr. N\*CCEV LM statistic Chi-sq(5)=47.16 P-val=0.0000

Cragg-Donald N\*CDEV Wald statistic Chi-sq(5)=72.20 P-val=0.0000

Weak identification test

Ho: equation is weakly identified

Cragg-Donald Wald F-statistic 10.35

See main output for Cragg-Donald weak id test critical values

Weak-instrument-robust inference

Tests of joint significance of endogenous regressors B1 in main equation

Ho: B1=0 and overidentifying restrictions are valid

Anderson-Rubin Wald test F(6,117)= 6.66 P-val=0.0000

Anderson-Rubin Wald test Chi-sq(6)=46.48 P-val=0.0000

Stock-Wright LM S statistic Chi-sq(6)=34.64 P-val=0.0000

Number of observations N = 136

Number of regressors K = 15

Number of instruments L = 19

Number of excluded instruments L1 = 6

IV (2SLS) estimation

Estimates efficient for homoskedasticity only

Statistics consistent for homoskedasticity only

Number of obs = 136

F( 14, 121) = 6.96

Prob > F = 0.0000

Total (centered) SS = 1364.689426

Centered R2 = 0.4117

Total (uncentered) SS = 1433.020015

Uncentered R2 = 0.4397

Residual SS = 802.8999622                          Root MSE = 2.43

	grgdppc	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
yrsoopen		12.45409	5.406959	2.30	0.021	1.856649	23.05154
corruption		.2812626	.5457766	0.52	0.606	-.7884399	1.350965
logigdppc		-1.439365	.6595172	-2.18	0.029	-2.731995	-.1467345
loginv_gdp		2.805211	.5795369	4.84	0.000	1.66934	3.941083
coastpopshr		.0309955	1.270034	0.02	0.981	-2.458225	2.520216
malariaecol		-.0816128	.0351868	-2.32	0.020	-.1505776	-.0126481
naturalcap		4.10e-06	.0000962	0.04	0.966	-.0001845	.0001927
time1		.8804053	.8461744	1.04	0.298	-.7780661	2.538877
time2		1.062964	.8364301	1.27	0.204	-.5764089	2.702337
time3		1.767377	.8344918	2.12	0.034	.131803	3.402951
time4		.7548599	.8356865	0.90	0.366	-.8830555	2.392775
time5		.9129633	.8475288	1.08	0.281	-.7481626	2.574089
time6		.2124464	.8423292	0.25	0.801	-1.438489	1.863381
time7		-1.282869	.835456	-1.54	0.125	-2.920332	.3545951
_cons		1.515032	3.910977	0.39	0.698	-6.150342	9.180407

Underidentification test (Anderson canon. corr. LM statistic): 47.161  
Chi-sq(5) P-val = 0.0000

Weak identification test (Cragg-Donald Wald F statistic): 10.352  
Stock-Yogo weak ID test critical values:

5% maximal IV relative bias	15.72
10% maximal IV relative bias	9.48
20% maximal IV relative bias	6.08
30% maximal IV relative bias	4.78
10% maximal IV size	21.68
15% maximal IV size	12.33
20% maximal IV size	9.10
25% maximal IV size	7.42

Source: Stock-Yogo (2005). Reproduced by permission.

Sargan statistic (overidentification test of all instruments): 4.768  
Chi-sq(4) P-val = 0.3119

Instrumented: yrsoopen corruption  
Included instruments: logigdppc loginv\_gdp coastpopshr malariaecol naturalcap  
time1 time2 time3 time4 time5 time6 time7  
Excluded instruments: religfrac statehist01v3 percentmuslim predtrdshr lat lat2

15. Large set of instruments

```
. ivreg2 grgdppc ( politrighs politopen= eurlngshr religfrac ethheter statehist01v3
                  othercol percentmuslim predtrdshr lat lat2 ) logigdppc loginv
> _gdp coastpopshr malariaecol naturalcap time1 time2 time3 time4 time5 time6
                                     time7, first
Warning - collinearities detected
Vars dropped: time1 time2
```

First-stage regressions

First-stage regression of politrighs:

OLS estimation

Estimates efficient for homoskedasticity only  
 Statistics consistent for homoskedasticity only

	Number of obs =	137
	F( 19, 117) =	6.28
	Prob > F =	0.0000
Total (centered) SS =	246.8476206	Centered R2 = 0.5049
Total (uncentered) SS =	1279.524893	Uncentered R2 = 0.9045
Residual SS =	122.2224023	Root MSE = 1.022

politrighs	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
logigdppc	.7724508	.3677116	2.10	0.038	.0442172	1.500684
loginv_gdp	-.5988193	.2712305	-2.21	0.029	-1.135977	-.0616615
coastpopshr	.1510579	.5776731	0.26	0.794	-.9929933	1.295109
malariaecol	.0573507	.0181258	3.16	0.002	.0214535	.093248
naturalcap	-.0001789	.0000514	-3.48	0.001	-.0002807	-.0000772
time3	-1.101879	.3020951	-3.65	0.000	-1.700163	-.5035956
time4	-1.055525	.3027155	-3.49	0.001	-1.655037	-.4560126
time5	-1.103876	.3079258	-3.58	0.000	-1.713707	-.494045
time6	-1.224951	.3038719	-4.03	0.000	-1.826753	-.6231482
time7	-.2719482	.3022925	-0.90	0.370	-.8706226	.3267262
eurlngshr	-25.66121	8.823137	-2.91	0.004	-43.13497	-8.187449
religfrac	-.0181518	.012986	-1.40	0.165	-.0438699	.0075664
ethheter	2.108205	.6053417	3.48	0.001	.9093572	3.307052

statehist0~3		-1.855514	1.540893	-1.20	0.231	-4.907173	1.196145
othercol		.9289767	.5117824	1.82	0.072	-.0845815	1.942535
percentmus~m		-.0117152	.009146	-1.28	0.203	-.0298284	.006398
predtrdshr		-.1364236	.3932773	-0.35	0.729	-.9152887	.6424414
lat		-.1746	.0828321	-2.11	0.037	-.3386447	-.0105553
lat2		.0169354	.0039976	4.24	0.000	.0090183	.0248525
_cons		.0873747	2.331531	0.04	0.970	-4.530101	4.70485

-----  
Included instruments: logigdppc loginv\_gdp coastpopshr malariaecol naturalcap  
time3 time4 time5 time6 time7 eurlngshr religfrac ethheter  
statehist01v3 othercol percentmuslim predtrdshr lat lat2  
-----

Partial R-squared of excluded instruments: 0.3656

Test of excluded instruments:

F( 9, 117) = 7.49

Prob > F = 0.0000

First-stage regression of politopen:

OLS estimation

-----  
Estimates efficient for homoskedasticity only  
Statistics consistent for homoskedasticity only

					Number of obs =	137
					F( 19, 117) =	6.88
					Prob > F =	0.0000
Total (centered) SS	=	1021.092575			Centered R2 =	0.5276
Total (uncentered) SS	=	1407.784898			Uncentered R2 =	0.6573
Residual SS	=	482.4097572			Root MSE =	2.031

politopen		Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
logigdppc		.4462717	.7305333	0.61	0.542	-1.000511 1.893055
loginv_gdp		-1.764063	.538854	-3.27	0.001	-2.831235 -.6968908
coastpopshr		-2.311289	1.147664	-2.01	0.046	-4.584178 -.038401
malariaecol		.1049322	.0360106	2.91	0.004	.0336151 .1762493
naturalcap		-.0001425	.0001021	-1.40	0.165	-.0003446 .0000597
time3		-1.730509	.6001727	-2.88	0.005	-2.91912 -.5418985
time4		-1.535728	.6014053	-2.55	0.012	-2.72678 -.3446764
time5		-1.729247	.6117567	-2.83	0.006	-2.940799 -.5176948
time6		-2.162101	.6037027	-3.58	0.000	-3.357703 -.9664993
time7		-.4411822	.600565	-0.73	0.464	-1.63057 .7482052
eurlngshr		-15.8644	17.52894	-0.91	0.367	-50.57954 18.85075

religfrac		-.0366132	.0257994	-1.42	0.159	-.0877075	.0144811
ethheter		3.812159	1.202633	3.17	0.002	1.430407	6.193911
statehist0~3		.0701151	3.061295	0.02	0.982	-5.99262	6.13285
othercol		.5137875	1.016759	0.51	0.614	-1.49985	2.527425
percentmus~m		-.0407328	.0181704	-2.24	0.027	-.0767183	-.0047473
predtrdshr		2.255232	.7813246	2.89	0.005	.7078594	3.802604
lat		-.4204922	.1645627	-2.56	0.012	-.7464001	-.0945843
lat2		.0376693	.0079421	4.74	0.000	.0219404	.0533982
_cons		-2.48718	4.632057	-0.54	0.592	-11.66073	6.686366

-----  
Included instruments: logigdppc loginv\_gdp coastpopshr malariaeol naturalcap  
time3 time4 time5 time6 time7 eurlngshr religfrac ethheter  
statehist01v3 othercol percentmuslim predtrdshr lat lat2  
-----

Partial R-squared of excluded instruments: 0.4372

Test of excluded instruments:

F( 9, 117) = 10.10

Prob > F = 0.0000

Summary results for first-stage regressions  
-----

Variable		Shea Partial R2		Partial R2		F( 9, 117)	P-value
politrighs		0.1973		0.3656		7.49	0.0000
politopen		0.2359		0.4372		10.10	0.0000

Underidentification tests

Ho: matrix of reduced form coefficients has rank=K1-1 (underidentified)

Ha: matrix has rank=K1 (identified)

Anderson canon. corr. N\*CCEV LM statistic Chi-sq(8)=27.01 P-val=0.0007

Cragg-Donald N\*CDEV Wald statistic Chi-sq(8)=33.65 P-val=0.0000

Weak identification test

Ho: equation is weakly identified

Cragg-Donald Wald F-statistic 3.19

See main output for Cragg-Donald weak id test critical values

Weak-instrument-robust inference

Tests of joint significance of endogenous regressors B1 in main equation

Ho: B1=0 and overidentifying restrictions are valid

Anderson-Rubin Wald test F(9,117)= 5.20 P-val=0.0000

Anderson-Rubin Wald test Chi-sq(9)=54.75 P-val=0.0000

Stock-Wright LM S statistic Chi-sq(9)=39.12 P-val=0.0000

Number of observations      N =    137  
 Number of regressors        K =    13  
 Number of instruments        L =    20  
 Number of excluded instruments   L1 =    9

IV (2SLS) estimation  
 -----

Estimates efficient for homoskedasticity only  
 Statistics consistent for homoskedasticity only

Number of obs =    137  
 F( 12, 124) =    5.38  
 Prob > F        = 0.0000  
 Total (centered) SS    = 1420.428772      Centered R2    = 0.3145  
 Total (uncentered) SS = 1475.550013      Uncentered R2 = 0.3401  
 Residual SS            = 973.7268941      Root MSE      = 2.666

	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
grgdppc						
politrighs	-1.040657	.7537393	-1.38	0.167	-2.517959	.4366447
politopen	.9486596	.3267948	2.90	0.004	.3081537	1.589166
logigdppc	-1.236988	.6886344	-1.80	0.072	-2.586686	.112711
loginv_gdp	3.232691	.6036495	5.36	0.000	2.049559	4.415822
coastpopshr	-.7666939	1.152025	-0.67	0.506	-3.024621	1.491233
malariaecol	-.0228888	.0284727	-0.80	0.421	-.0786943	.0329168
naturalcap	-.0001943	.0000907	-2.14	0.032	-.0003721	-.0000166
time3	1.393278	.8773234	1.59	0.112	-.3262447	3.1128
time4	.792591	.8814176	0.90	0.369	-.9349558	2.520138
time5	.2778443	.8848885	0.31	0.754	-1.456505	2.012194
time6	.4699233	.8836356	0.53	0.595	-1.261971	2.201817
time7	-1.897176	.7921342	-2.40	0.017	-3.44973	-.3446212
_cons	2.130421	4.188875	0.51	0.611	-6.079624	10.34047

Underidentification test (Anderson canon. corr. LM statistic):    27.012  
 Chi-sq(8) P-val = 0.0007

Weak identification test (Cragg-Donald Wald F statistic):    3.193  
 Stock-Yogo weak ID test critical values: 5% maximal IV relative bias    18.30  
 10% maximal IV relative bias    10.43  
 20% maximal IV relative bias    6.22  
 30% maximal IV relative bias    4.69  
 10% maximal IV size    27.51  
 15% maximal IV size    15.24  
 20% maximal IV size    11.03



25% maximal IV size 8.85

Source: Stock-Yogo (2005). Reproduced by permission.

Sargan statistic (overidentification test of all instruments): 24.349  
Chi-sq(7) P-val = 0.0010

Instrumented: politrights politopen  
Included instruments: logigdppc loginv\_gdp coastpopshr malariaecol naturalcap  
time3 time4 time5 time6 time7  
Excluded instruments: eurlngshr religfrac ethheter statehist01v3 othercol  
percentmuslim predtrdshr lat lat2  
Dropped collinear: time1 time2

16. Small set of instruments

```
ivreg2 grgdppc ( politrights politopen= religfrac ethheter othercol percentmuslim
predtrdshr lat lat2 ) logigdppc loginv_gdp coastpopshr mala
> riaecol naturalcap time1 time2 time3 time4 time5 time6 time7, first
Warning - collinearities detected
Vars dropped: time1 time2
```

First-stage regressions

First-stage regression of politrights:

OLS estimation

Estimates efficient for homoskedasticity only  
Statistics consistent for homoskedasticity only

Number of obs = 143  
F( 17, 125) = 6.39  
Prob > F = 0.0000  
Total (centered) SS = 247.5823283  
Total (uncentered) SS = 1319.054892  
Residual SS = 132.5015282  
Centered R2 = 0.4648  
Uncentered R2 = 0.8995  
Root MSE = 1.03

```
-----+-----
politrights | Coef. Std. Err. t P>|t| [95% Conf. Interval]
-----+-----
logigdppc | .2678843 .2753043 0.97 0.332 -.2769771 .8127457
```

loginv_gdp		-.4455415	.2635476	-1.69	0.093	-.967135	.076052
coastpopshr		.3062868	.5657448	0.54	0.589	-.8133923	1.425966
malariaecol		.0436775	.0169791	2.57	0.011	.0100738	.0772812
naturalcap		-.0000954	.0000431	-2.21	0.029	-.0001807	-1.00e-05
time3		-1.069699	.2977401	-3.59	0.000	-1.658964	-.4804346
time4		-.9932706	.2985298	-3.33	0.001	-1.584098	-.4024431
time5		-.9970986	.3027762	-3.29	0.001	-1.59633	-.3978669
time6		-1.149413	.2992406	-3.84	0.000	-1.741647	-.5571786
time7		-.2429524	.2980719	-0.82	0.417	-.8328737	.3469689
religfrac		-.007857	.0120147	-0.65	0.514	-.0316357	.0159217
ethheter		1.519075	.5508966	2.76	0.007	.4287817	2.609367
othercol		.1923638	.4283704	0.45	0.654	-.6554343	1.040162
percentmus~m		-.0087978	.0075272	-1.17	0.245	-.023695	.0060995
predtrdshr		.4196148	.3268791	1.28	0.202	-.2273195	1.066549
lat		-.2264551	.0809353	-2.80	0.006	-.3866362	-.066274
lat2		.0174619	.003997	4.37	0.000	.0095513	.0253725
_cons		.9814502	2.157242	0.45	0.650	-3.288	5.2509

-----  
Included instruments: logigdppc loginv\_gdp coastpopshr malariaecol naturalcap  
time3 time4 time5 time6 time7 religfrac ethheter othercol  
percentmuslim predtrdshr lat lat2  
-----

Partial R-squared of excluded instruments: 0.3290

Test of excluded instruments:

F( 7, 125) = 8.76

Prob > F = 0.0000

First-stage regression of politopen:

OLS estimation  
-----

Estimates efficient for homoskedasticity only

Statistics consistent for homoskedasticity only

Number of obs = 143

F( 17, 125) = 8.02

Prob > F = 0.0000

Total (centered) SS = 1037.317427

Centered R2 = 0.5218

Total (uncentered) SS = 1407.784898

Uncentered R2 = 0.6477

Residual SS = 496.0109433

Root MSE = 1.992

-----  
politopen | Coef. Std. Err. t P>|t| [95% Conf. Interval]  
-----+-----

logigdppc | .1776845 .5326577 0.33 0.739 -.8765112 1.23188

loginv_gdp		-1.582017	.5099109	-3.10	0.002	-2.591194	-.5728396
coastpopshr		-2.289683	1.094601	-2.09	0.038	-4.456033	-.123332
malariaecol		.0959396	.0328511	2.92	0.004	.0309232	.1609559
naturalcap		-.0000865	.0000834	-1.04	0.302	-.0002517	.0000786
time3		-1.627418	.5760663	-2.83	0.006	-2.767525	-.4873115
time4		-1.43584	.5775942	-2.49	0.014	-2.578971	-.2927095
time5		-1.606131	.5858102	-2.74	0.007	-2.765522	-.4467397
time6		-2.064081	.5789695	-3.57	0.001	-3.209933	-.9182282
time7		-.4482386	.5767083	-0.78	0.438	-1.589616	.6931388
religfrac		-.0264417	.0232461	-1.14	0.258	-.0724486	.0195652
ethheter		3.203126	1.065873	3.01	0.003	1.093632	5.31262
othercol		.085792	.8288093	0.10	0.918	-1.554524	1.726108
percentmus~m		-.0341272	.0145636	-2.34	0.021	-.0629503	-.0053041
predtrdshr		2.582696	.6324443	4.08	0.000	1.33101	3.834382
lat		-.4533121	.1565934	-2.89	0.004	-.7632298	-.1433943
lat2		.0380829	.0077334	4.92	0.000	.0227774	.0533883
_cons		-2.443733	4.173824	-0.59	0.559	-10.70425	5.816782

-----  
Included instruments: logigppc loginv\_gdp coastpopshr malariaecol naturalcap  
time3 time4 time5 time6 time7 religfrac ethheter othercol  
percentmuslim predtrdshr lat lat2  
-----

Partial R-squared of excluded instruments: 0.4486

Test of excluded instruments:

F( 7, 125) = 14.53

Prob > F = 0.0000

Summary results for first-stage regressions  
-----

Variable	Shea Partial R2	Partial R2	F( 7, 125)	P-value
politrighs	0.1164	0.3290	8.76	0.0000
politopen	0.1587	0.4486	14.53	0.0000

Underidentification tests

Ho: matrix of reduced form coefficients has rank=K1-1 (underidentified)

Ha: matrix has rank=K1 (identified)

Anderson canon. corr. N\*CCEV LM statistic Chi-sq(6)=16.63 P-val=0.0107

Cragg-Donald N\*CDEV Wald statistic Chi-sq(6)=18.82 P-val=0.0045

Weak identification test

Ho: equation is weakly identified

Cragg-Donald Wald F-statistic 2.35

See main output for Cragg-Donald weak id test critical values

Weak-instrument-robust inference

Tests of joint significance of endogenous regressors B1 in main equation

Ho: B1=0 and overidentifying restrictions are valid

Anderson-Rubin Wald test F(7,125)= 3.82 P-val=0.0008  
 Anderson-Rubin Wald test Chi-sq(7)=30.62 P-val=0.0001  
 Stock-Wright LM S statistic Chi-sq(7)=25.22 P-val=0.0007

Number of observations N = 143  
 Number of regressors K = 13  
 Number of instruments L = 18  
 Number of excluded instruments L1 = 7

IV (2SLS) estimation

Estimates efficient for homoskedasticity only  
 Statistics consistent for homoskedasticity only

Number of obs = 143  
 F( 12, 130) = 5.74  
 Prob > F = 0.0000  
 Total (centered) SS = 1505.317357 Centered R2 = 0.3473  
 Total (uncentered) SS = 1558.980014 Uncentered R2 = 0.3698  
 Residual SS = 982.4765749 Root MSE = 2.621

grgdppc	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
politrights	.5254639	.9613885	0.55	0.585	-1.358823	2.409751
politopen	.3013686	.3857397	0.78	0.435	-.4546673	1.057405
logigdppc	-1.164049	.6350199	-1.83	0.067	-2.408665	.0805675
loginv_gdp	3.010539	.5777869	5.21	0.000	1.878098	4.142981
coastpopshr	-1.587469	1.180553	-1.34	0.179	-3.901309	.7263718
malariaecol	-.0239942	.0275882	-0.87	0.384	-.0780661	.0300778
naturalcap	-.0001675	.0000903	-1.86	0.064	-.0003445	9.42e-06
time3	1.930603	.9016916	2.14	0.032	.1633202	3.697886
time4	1.36756	.8978377	1.52	0.128	-.3921691	3.12729
time5	.3819789	.8866818	0.43	0.667	-1.355885	2.119843
time6	.7174601	.8853225	0.81	0.418	-1.01774	2.45266
time7	-1.879435	.7642177	-2.46	0.014	-3.377274	-.3815955
_cons	-1.081618	3.787897	-0.29	0.775	-8.505761	6.342524

Underidentification test (Anderson canon. corr. LM statistic): 16.629  
 Chi-sq(6) P-val = 0.0107

Weak identification test (Cragg-Donald Wald F statistic): 2.350  
 Stock-Yogo weak ID test critical values: 5% maximal IV relative bias 16.88  
 10% maximal IV relative bias 9.92  
 20% maximal IV relative bias 6.16  
 30% maximal IV relative bias 4.76  
 10% maximal IV size 23.72  
 15% maximal IV size 13.34  
 20% maximal IV size 9.77  
 25% maximal IV size 7.91

Source: Stock-Yogo (2005). Reproduced by permission.

-----  
 Sargan statistic (overidentification test of all instruments): 12.952  
 Chi-sq(5) P-val = 0.0238  
 -----

Instrumented: politrights politopen  
 Included instruments: logigdppc loginv\_gdp coastpopshr malariaecol naturalcap  
 time3 time4 time5 time6 time7  
 Excluded instruments: religfrac ethheter othercol percentmuslim predtrdshr lat  
 lat2  
 Dropped collinear: time1 time2 -----

## I. PR and AC

### 17. Large set of instruments

```
. ivreg2 grgdppc ( politrights corruption= religfrac ethheter statehist01v3 othercol
percentmuslim predtrdshr lat lat2 ) logigdppc loginv_gdp co
> astpopshr malariaecol naturalcap time1 time2 time3 time4 time5 time6 time7, first
Warning - collinearities detected
Vars dropped: time1 time2 othercol
```

First-stage regressions  
 -----

First-stage regression of politrights:

OLS estimation  
 -----

Estimates efficient for homoskedasticity only  
 Statistics consistent for homoskedasticity only

Number of obs = 96  
 F( 17, 78) = 6.02  
 Prob > F = 0.0000

Total (centered) SS = 195.0474803      Centered R2 = 0.5673  
 Total (uncentered) SS = 1060.650223      Uncentered R2 = 0.9204  
 Residual SS = 84.39405843      Root MSE = 1.04

```

-----
politrights |   Coef.  Std. Err.   t  P>|t|  [95% Conf. Interval]
-----+-----
logigdppc | -.3203047  .408504  -0.78  0.435  -1.133574  .4929642
loginv_gdp | -.0027521  .3222098  -0.01  0.993  -.6442225  .6387184
coastpopshr | 2.755013  1.06506  2.59  0.012  .634641  4.875385
malariaecol | .0525745  .0349727  1.50  0.137  -.0170507  .1221997
naturalcap | .0000566  .0000614  0.92  0.359  -.0000657  .0001789
time3 | -1.111438  .3681953  -3.02  0.003  -1.844458  -.3784174
time4 | -1.106852  .368881  -3.00  0.004  -1.841237  -.3724659
time5 | -.9681563  .3788118  -2.56  0.013  -1.722313  -.214
time6 | -1.128819  .3742454  -3.02  0.003  -1.873885  -.3837539
time7 | -.0878558  .3690694  -0.24  0.812  -.8226165  .6469048
religfrac | .0101816  .0175013  0.58  0.562  -.0246608  .0450241
ethheter | 4.245238  1.471571  2.88  0.005  1.315565  7.174911
statehist0~3 | -1.683357  1.72539  -0.98  0.332  -5.118344  1.75163
percentmus~m | -.0068848  .0124588  -0.55  0.582  -.0316884  .0179187
predtrdshr | .7789609  .4201166  1.85  0.067  -.057427  1.615349
lat | -.3987786  .1136516  -3.51  0.001  -.6250415  -.1725157
lat2 | .0288049  .0067242  4.28  0.000  .0154181  .0421917
_cons | -.922096  3.015312  -0.31  0.761  -6.92512  5.080928
-----

```

Included instruments: logigdppc loginv\_gdp coastpopshr malariaecol naturalcap  
 time3 time4 time5 time6 time7 religfrac ethheter  
 statehist01v3 percentmuslim predtrdshr lat lat2

Partial R-squared of excluded instruments: 0.4098  
 Test of excluded instruments:  
 F( 7, 78) = 7.74  
 Prob > F = 0.0000

First-stage regression of corruption:

OLS estimation

Estimates efficient for homoskedasticity only  
 Statistics consistent for homoskedasticity only

Number of obs = 96  
 F( 17, 78) = 45.10  
 Prob > F = 0.0000

Total (centered) SS = 86.5200012                      Centered R2 = 0.9077  
 Total (uncentered) SS = 866.2799816                  Uncentered R2 = 0.9908  
 Residual SS = 7.989931465                              Root MSE = .3201

	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
corruption						
logigdppc	-.6126335	.1256932	-4.87	0.000	-.8628695	-.3623975
loginv_gdp	.096953	.0991412	0.98	0.331	-.1004221	.294328
coastpopshr	1.171241	.3277101	3.57	0.001	.5188206	1.823662
malariaecol	.0950456	.0107608	8.83	0.000	.0736225	.1164686
naturalcap	-8.39e-07	.0000189	-0.04	0.965	-.0000385	.0000368
time3	.0159792	.1132906	0.14	0.888	-.209565	.2415234
time4	.0429364	.1135016	0.38	0.706	-.1830279	.2689006
time5	.101859	.1165572	0.87	0.385	-.1301886	.3339065
time6	.0679068	.1151522	0.59	0.557	-.1613435	.2971571
time7	.0301913	.1135595	0.27	0.791	-.1958884	.2562709
religfrac	-.0183231	.005385	-3.40	0.001	-.0290439	-.0076024
ethheter	2.772709	.45279	6.12	0.000	1.871273	3.674144
statehist0~3	3.354664	.5308879	6.32	0.000	2.297747	4.41158
percentmus~m	-.0360093	.0038335	-9.39	0.000	-.0436411	-.0283774
predtrdshr	.6557587	.1292663	5.07	0.000	.3984092	.9131082
lat	-.3531627	.0349696	-10.10	0.000	-.4227819	-.2835436
lat2	.0242598	.002069	11.73	0.000	.0201408	.0283788
_cons	2.764727	.927786	2.98	0.004	.9176474	4.611807

Included instruments: logigdppc loginv\_gdp coastpopshr malariaecol naturalcap  
 time3 time4 time5 time6 time7 religfrac ethheter  
 statehist01v3 percentmuslim predtrdshr lat lat2

Partial R-squared of excluded instruments: 0.8911  
 Test of excluded instruments:  
 F( 7, 78) = 91.15  
 Prob > F = 0.0000

Summary results for first-stage regressions

Variable	Shea Partial R2	Partial R2	F( 7, 78)	P-value
politights	0.2036	0.4098	7.74	0.0000
corruption	0.4426	0.8911	91.15	0.0000

Underidentification tests  
 Ho: matrix of reduced form coefficients has rank=K1-1 (underidentified)

Ha: matrix has rank=K1 (identified)  
 Anderson canon. corr. N\*CCEV LM statistic Chi-sq(6)=19.52 P-val=0.0034  
 Cragg-Donald N\*CDEV Wald statistic Chi-sq(6)=24.51 P-val=0.0004

Weak identification test  
 Ho: equation is weakly identified  
 Cragg-Donald Wald F-statistic 2.84  
 See main output for Cragg-Donald weak id test critical values

Weak-instrument-robust inference  
 Tests of joint significance of endogenous regressors B1 in main equation  
 Ho: B1=0 and overidentifying restrictions are valid  
 Anderson-Rubin Wald test F(7,78)= 6.35 P-val=0.0000  
 Anderson-Rubin Wald test Chi-sq(7)=54.74 P-val=0.0000  
 Stock-Wright LM S statistic Chi-sq(7)=34.86 P-val=0.0000

Number of observations N = 96  
 Number of regressors K = 13  
 Number of instruments L = 18  
 Number of excluded instruments L1 = 7

IV (2SLS) estimation

Estimates efficient for homoskedasticity only  
 Statistics consistent for homoskedasticity only

Number of obs = 96  
 F( 12, 83) = 6.19  
 Prob > F = 0.0000  
 Total (centered) SS = 1173.919598 Centered R2 = 0.4157  
 Total (uncentered) SS = 1230.040016 Uncentered R2 = 0.4423  
 Residual SS = 685.9438665 Root MSE = 2.673

grgdppc	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
politrights	-.1787065	.5795646	-0.31	0.758	-1.314632	.9572192
corruption	1.944718	.5488036	3.54	0.000	.869083	3.020354
logigdppc	-2.199415	.8117366	-2.71	0.007	-3.790389	-.6084402
loginv_gdp	3.319755	.7553888	4.39	0.000	1.83922	4.80029
coastpopshr	-.9926567	1.745244	-0.57	0.570	-4.413273	2.42796
malariaecol	-.041937	.0432441	-0.97	0.332	-.1266938	.0428198
naturalcap	-.0001408	.0001104	-1.28	0.202	-.0003572	.0000756
time3	1.231283	1.145679	1.07	0.283	-1.014207	3.476773
time4	.377816	1.149454	0.33	0.742	-1.875073	2.630705



```

time5 | .6177718  1.122666  0.55  0.582  -1.582612  2.818156
time6 | -.1389272  1.162334  -0.12  0.905  -2.41706  2.139205
time7 | -1.482035  .9492101  -1.56  0.118  -3.342452  .3783826
_cons |  2.648911  4.87708   0.54  0.587  -6.90999  12.20781

```

```

-----
Underidentification test (Anderson canon. corr. LM statistic):      19.524
                                                                Chi-sq(6) P-val =  0.0034
-----

```

```

Weak identification test (Cragg-Donald Wald F statistic):          2.845
Stock-Yogo weak ID test critical values: 5% maximal IV relative bias 16.88
                                           10% maximal IV relative bias  9.92
                                           20% maximal IV relative bias  6.16
                                           30% maximal IV relative bias  4.76
                                           10% maximal IV size          23.72
                                           15% maximal IV size          13.34
                                           20% maximal IV size          9.77
                                           25% maximal IV size          7.91

```

Source: Stock-Yogo (2005). Reproduced by permission.

```

-----
Sargan statistic (overidentification test of all instruments):      9.302
                                                                Chi-sq(5) P-val =  0.0976
-----

```

```

Instrumented:      politrights corruption
Included instruments: logigdppc loginv_gdp coastpopshr malariaecol naturalcap
                    time3 time4 time5 time6 time7
Excluded instruments: religfrac ethheter statehist01v3 percentmuslim predtrdshr
                    lat lat2
Dropped collinear: time1 time2 othercol
-----

```

### 18. Small set of instruments

```

. ivreg2 grgdppc ( politrights corruption= religfrac ethheter statehist01v3
percentmuslim predtrdshr lat lat2 ) logigdppc loginv_gdp coastpopshr
> r malariaecol naturalcap time1 time2 time3 time4 time5 time6 time7, first
Warning - collinearities detected
Vars dropped:      time1 time2

```

First-stage regressions

First-stage regression of politrights:

OLS estimation

Estimates efficient for homoskedasticity only

Statistics consistent for homoskedasticity only

		Number of obs =	96
		F( 17, 78) =	6.02
		Prob > F =	0.0000
Total (centered) SS =	195.0474803	Centered R2 =	0.5673
Total (uncentered) SS =	1060.650223	Uncentered R2 =	0.9204
Residual SS =	84.39405843	Root MSE =	1.04

	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
politrights						
logigdppc	-.3203047	.408504	-0.78	0.435	-1.133574	.4929642
loginv_gdp	-.0027521	.3222098	-0.01	0.993	-.6442225	.6387184
coastpopshr	2.755013	1.06506	2.59	0.012	.634641	4.875385
malariaecol	.0525745	.0349727	1.50	0.137	-.0170507	.1221997
naturalcap	.0000566	.0000614	0.92	0.359	-.0000657	.0001789
time3	-1.111438	.3681953	-3.02	0.003	-1.844458	-.3784174
time4	-1.106852	.368881	-3.00	0.004	-1.841237	-.3724659
time5	-.9681563	.3788118	-2.56	0.013	-1.722313	-.214
time6	-1.128819	.3742454	-3.02	0.003	-1.873885	-.3837539
time7	-.0878558	.3690694	-0.24	0.812	-.8226165	.6469048
religfrac	.0101816	.0175013	0.58	0.562	-.0246608	.0450241
ethheter	4.245238	1.471571	2.88	0.005	1.315565	7.174911
statehist0~3	-1.683357	1.72539	-0.98	0.332	-5.118344	1.75163
percentmus~m	-.0068848	.0124588	-0.55	0.582	-.0316884	.0179187
predtrdshr	.7789609	.4201166	1.85	0.067	-.057427	1.615349
lat	-.3987786	.1136516	-3.51	0.001	-.6250415	-.1725157
lat2	.0288049	.0067242	4.28	0.000	.0154181	.0421917
_cons	-.922096	3.015312	-0.31	0.761	-6.92512	5.080928

Included instruments: logigdppc loginv\_gdp coastpopshr malariaecol naturalcap  
time3 time4 time5 time6 time7 religfrac ethheter  
statehist01v3 percentmuslim predtrdshr lat lat2

Partial R-squared of excluded instruments: 0.4098

Test of excluded instruments:

F( 7, 78) = 7.74

Prob > F = 0.0000

First-stage regression of corruption:

OLS estimation

Estimates efficient for homoskedasticity only

Statistics consistent for homoskedasticity only

		Number of obs =	96
		F( 17, 78) =	45.10
		Prob > F =	0.0000
Total (centered) SS =	86.5200012	Centered R2 =	0.9077
Total (uncentered) SS =	866.2799816	Uncentered R2 =	0.9908
Residual SS =	7.989931465	Root MSE =	.3201

corruption	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
logigdppc	-.6126335	.1256932	-4.87	0.000	-.8628695	-.3623975
loginv_gdp	.096953	.0991412	0.98	0.331	-.1004221	.294328
coastpopshr	1.171241	.3277101	3.57	0.001	.5188206	1.823662
malariaecol	.0950456	.0107608	8.83	0.000	.0736225	.1164686
naturalcap	-8.39e-07	.0000189	-0.04	0.965	-.0000385	.0000368
time3	.0159792	.1132906	0.14	0.888	-.209565	.2415234
time4	.0429364	.1135016	0.38	0.706	-.1830279	.2689006
time5	.101859	.1165572	0.87	0.385	-.1301886	.3339065
time6	.0679068	.1151522	0.59	0.557	-.1613435	.2971571
time7	.0301913	.1135595	0.27	0.791	-.1958884	.2562709
religfrac	-.0183231	.005385	-3.40	0.001	-.0290439	-.0076024
ethheter	2.772709	.45279	6.12	0.000	1.871273	3.674144
statehist0~3	3.354664	.5308879	6.32	0.000	2.297747	4.41158
percentmus~m	-.0360093	.0038335	-9.39	0.000	-.0436411	-.0283774
predtrdshr	.6557587	.1292663	5.07	0.000	.3984092	.9131082
lat	-.3531627	.0349696	-10.10	0.000	-.4227819	-.2835436
lat2	.0242598	.002069	11.73	0.000	.0201408	.0283788
_cons	2.764727	.927786	2.98	0.004	.9176474	4.611807

Included instruments: logigdppc loginv\_gdp coastpopshr malariaecol naturalcap  
time3 time4 time5 time6 time7 religfrac ethheter  
statehist01v3 percentmuslim predtrdshr lat lat2

Partial R-squared of excluded instruments: 0.8911

Test of excluded instruments:

F( 7, 78) = 91.15

Prob > F = 0.0000

Summary results for first-stage regressions

Variable	Shea Partial R2	Partial R2	F( 7, 78)	P-value
politrighs	0.2036	0.4098	7.74	0.0000
corruption	0.4426	0.8911	91.15	0.0000

Underidentification tests

Ho: matrix of reduced form coefficients has rank=K1-1 (underidentified)  
 Ha: matrix has rank=K1 (identified)

Anderson canon. corr. N\*CCEV LM statistic    Chi-sq(6)=19.52    P-val=0.0034  
 Cragg-Donald N\*CDEV Wald statistic        Chi-sq(6)=24.51    P-val=0.0004

Weak identification test

Ho: equation is weakly identified

Cragg-Donald Wald F-statistic            2.84

See main output for Cragg-Donald weak id test critical values

Weak-instrument-robust inference

Tests of joint significance of endogenous regressors B1 in main equation

Ho: B1=0 and overidentifying restrictions are valid

Anderson-Rubin Wald test    F(7,78)= 6.35    P-val=0.0000  
 Anderson-Rubin Wald test    Chi-sq(7)=54.74    P-val=0.0000  
 Stock-Wright LM S statistic    Chi-sq(7)=34.86    P-val=0.0000

Number of observations        N =    96  
 Number of regressors         K =    13  
 Number of instruments        L =    18  
 Number of excluded instruments    L1 =    7

IV (2SLS) estimation

-----

Estimates efficient for homoskedasticity only  
 Statistics consistent for homoskedasticity only

	Number of obs =    96
	F( 12, 83) =    6.19
	Prob > F    = 0.0000
Total (centered) SS    = 1173.919598	Centered R2    = 0.4157
Total (uncentered) SS = 1230.040016	Uncentered R2 = 0.4423
Residual SS         = 685.9438665	Root MSE      = 2.673

	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
grgdppc						
politrights	-.1787065	.5795646	-0.31	0.758	-1.314632	.9572192
corruption	1.944718	.5488036	3.54	0.000	.869083	3.020354
logigdppc	-2.199415	.8117366	-2.71	0.007	-3.790389	-.6084402
loginv_gdp	3.319755	.7553888	4.39	0.000	1.83922	4.80029
coastpopshr	-.9926567	1.745244	-0.57	0.570	-4.413273	2.42796
malariaecol	-.041937	.0432441	-0.97	0.332	-.1266938	.0428198

```

naturalcap | -.0001408 .0001104 -1.28 0.202 -.0003572 .0000756
time3 | 1.231283 1.145679 1.07 0.283 -1.014207 3.476773
time4 | .377816 1.149454 0.33 0.742 -1.875073 2.630705
time5 | .6177718 1.122666 0.55 0.582 -1.582612 2.818156
time6 | -.1389272 1.162334 -0.12 0.905 -2.41706 2.139205
time7 | -1.482035 .9492101 -1.56 0.118 -3.342452 .3783826
_cons | 2.648911 4.87708 0.54 0.587 -6.90999 12.20781

```

```

-----
Underidentification test (Anderson canon. corr. LM statistic):      19.524
                                                                Chi-sq(6) P-val = 0.0034
-----

```

```

Weak identification test (Cragg-Donald Wald F statistic):          2.845
Stock-Yogo weak ID test critical values: 5% maximal IV relative bias 16.88
                                         10% maximal IV relative bias 9.92
                                         20% maximal IV relative bias 6.16
                                         30% maximal IV relative bias 4.76
                                         10% maximal IV size 23.72
                                         15% maximal IV size 13.34
                                         20% maximal IV size 9.77
                                         25% maximal IV size 7.91

```

Source: Stock-Yogo (2005). Reproduced by permission.

```

-----
Sargan statistic (overidentification test of all instruments):      9.302
                                                                Chi-sq(5) P-val = 0.0976
-----

```

```

Instrumented:      politights corruption
Included instruments: logigdppc loginv_gdp coastpopshr malariaecol naturalcap
                    time3 time4 time5 time6 time7
Excluded instruments: religfrac ethheter statehist01v3 percentmuslim predtrdshr
                    lat lat2
Dropped collinear: time1 time2 -----

```

J. PO and AC

### 19. Large set of instruments

```

.ivreg2 grgdppc ( politopen corruption= eurlngshr religfrac ethheter statehist01v3
                 othercol percentmuslim predtrdshr lat lat2 ) logigdppc login
> v_gdp coastpopshr malariaecol naturalcap time1 time2 time3 time4 time5 time6
                    time7, first
Warning - collinearities detected
Vars dropped:      othercol

First-stage regressions
-----

```

First-stage regression of politopen:

OLS estimation

-----

Estimates efficient for homoskedasticity only  
 Statistics consistent for homoskedasticity only

	Number of obs =	131
	F( 20, 110) =	6.66
	Prob > F =	0.0000
Total (centered) SS =	1073.937104	Centered R2 = 0.5475
Total (uncentered) SS =	1646.200007	Uncentered R2 = 0.7048
Residual SS =	485.9085733	Root MSE = 2.102

politopen	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
logigdppc	-.9397418	.7389414	-1.27	0.206	-2.40415	.5246665
loginv_gdp	.0155084	.5878371	0.03	0.979	-1.149447	1.180464
coastpopshr	-.1923421	1.818763	-0.11	0.916	-3.796704	3.41202
malariaecol	.0950214	.0565994	1.68	0.096	-.0171453	.207188
naturalcap	.0000351	.0001186	0.30	0.768	-.0001999	.00027
time1	-.1736013	.7726354	-0.22	0.823	-1.704783	1.357581
time2	-1.426982	.7377957	-1.93	0.056	-2.88912	.0351557
time3	-1.503557	.7225964	-2.08	0.040	-2.935573	-.0715404
time4	-1.641266	.7246366	-2.26	0.025	-3.077325	-.2052059
time5	-1.481211	.7442411	-1.99	0.049	-2.956122	-.0062996
time6	-2.060433	.7317712	-2.82	0.006	-3.510632	-.610234
time7	-.0899598	.7234619	-0.12	0.901	-1.523691	1.343772
eurlngshr	-.6465136	17.94771	-0.04	0.971	-36.21466	34.92163
religfrac	-.0080835	.0304097	-0.27	0.791	-.0683485	.0521815
ethheter	3.615718	2.424843	1.49	0.139	-1.189752	8.421189
statehist0~3	-3.457683	2.585429	-1.34	0.184	-8.581396	1.666031
percentmus~m	-.018756	.02198	-0.85	0.395	-.0623151	.0248031
predtrdshr	3.094	.8594054	3.60	0.000	1.39086	4.79714
lat	-.690352	.1878711	-3.67	0.000	-1.062668	-.3180357
lat2	.0490912	.010561	4.65	0.000	.0281617	.0700207
_cons	-1.775702	5.054177	-0.35	0.726	-11.79189	8.240491

Included instruments: logigdppc loginv\_gdp coastpopshr malariaecol naturalcap  
 time1 time2 time3 time4 time5 time6 time7 eurlngshr  
 religfrac ethheter statehist01v3 percentmuslim predtrdshr  
 lat lat2

Partial R-squared of excluded instruments: 0.4663

Test of excluded instruments:

F( 8, 110) = 12.01

Prob > F = 0.0000

First-stage regression of corruption:

OLS estimation

-----

Estimates efficient for homoskedasticity only

Statistics consistent for homoskedasticity only

Number of obs = 131

F( 20, 110) = 606.02

Prob > F = 0.0000

Total (centered) SS = 105.7171009

Centered R2 = 0.9910

Total (uncentered) SS = 1140.049974

Uncentered R2 = 0.9992

Residual SS = .9508142236

Root MSE = .09297

-----+-----

	corruption	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
logigdppc		-.1070332	.0326874	-3.27	0.001	-.171812 -.0422544
loginv_gdp		-.0699414	.0260032	-2.69	0.008	-.1214737 -.0184091
coastpopshr		.7744886	.0804538	9.63	0.000	.615048 .9339292
malariaecol		.1188102	.0025037	47.45	0.000	.1138484 .1237719
naturalcap		-.0001005	5.24e-06	-19.17	0.000	-.0001109 -.0000901
time1		.0032804	.0341779	0.10	0.924	-.0644522 .0710129
time2		-.0034958	.0326367	-0.11	0.915	-.0681742 .0611825
time3		.0107101	.0319644	0.34	0.738	-.0526358 .0740561
time4		.016675	.0320546	0.52	0.604	-.0468498 .0801998
time5		.0184131	.0329218	0.56	0.577	-.0468303 .0836564
time6		.002032	.0323702	0.06	0.950	-.0621183 .0661822
time7		.0024058	.0320027	0.08	0.940	-.0610159 .0658276
eurlngshr		-26.20713	.7939252	-33.01	0.000	-27.7805 -24.63376
religfrac		-.0375925	.0013452	-27.95	0.000	-.0402583 -.0349266
ethheter		3.262502	.1072641	30.42	0.000	3.04993 3.475074
statehist0~3		1.129596	.1143676	9.88	0.000	.9029458 1.356245
percentmus~m		-.0436761	.0009723	-44.92	0.000	-.045603 -.0417493
predtrdshr		-.0940467	.0380162	-2.47	0.015	-.1693859 -.0187075
lat		-.2751538	.0083106	-33.11	0.000	-.2916234 -.2586842
lat2		.0225199	.0004672	48.20	0.000	.0215941 .0234457
_cons		3.056586	.2235738	13.67	0.000	2.613515 3.499657

-----+-----

Included instruments: logigdppc loginv\_gdp coastpopshr malariaecol naturalcap

time1 time2 time3 time4 time5 time6 time7 eurlngshr  
 religfrac ethheter statehist01v3 percentmuslim predtrdshr  
 lat lat2

-----  
 Partial R-squared of excluded instruments: 0.9900  
 Test of excluded instruments:  
 F( 8, 110) = 1356.65  
 Prob > F = 0.0000

Summary results for first-stage regressions  
 -----

Variable	Shea Partial R2	Partial R2	F( 8, 110)	P-value
politopen	0.2753	0.4663	12.01	0.0000
corruption	0.5845	0.9900	1356.65	0.0000

Underidentification tests

Ho: matrix of reduced form coefficients has rank=K1-1 (underidentified)

Ha: matrix has rank=K1 (identified)

Anderson canon. corr. N\*CCEV LM statistic Chi-sq(7)=36.06 P-val=0.0000

Cragg-Donald N\*CDEV Wald statistic Chi-sq(7)=49.76 P-val=0.0000

Weak identification test

Ho: equation is weakly identified

Cragg-Donald Wald F-statistic 5.22

See main output for Cragg-Donald weak id test critical values

Weak-instrument-robust inference

Tests of joint significance of endogenous regressors B1 in main equation

Ho: B1=0 and overidentifying restrictions are valid

Anderson-Rubin Wald test F(8,110)= 5.39 P-val=0.0000

Anderson-Rubin Wald test Chi-sq(8)=51.31 P-val=0.0000

Stock-Wright LM S statistic Chi-sq(8)=36.87 P-val=0.0000

Number of observations	N =	131
Number of regressors	K =	15
Number of instruments	L =	21
Number of excluded instruments	L1 =	8

IV (2SLS) estimation  
 -----

Estimates efficient for homoskedasticity only  
 Statistics consistent for homoskedasticity only



Number of obs = 131  
 F( 14, 116) = 6.11  
 Prob > F = 0.0000  
 Centered R2 = 0.4128  
 Uncentered R2 = 0.4416  
 Root MSE = 2.447

Total (centered) SS = 1335.946886  
 Total (uncentered) SS = 1404.840016  
 Residual SS = 784.4584837

grgdppc	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
politopen	.3544831	.1793313	1.98	0.048	.0030003	.7059659
corruption	.5782036	.3814558	1.52	0.130	-.1694359	1.325843
logigdppc	-1.455269	.6764377	-2.15	0.031	-2.781062	-.1294751
loginv_gdp	2.863323	.6393062	4.48	0.000	1.610306	4.11634
coastpopshr	-1.002324	1.327479	-0.76	0.450	-3.604135	1.599487
malariaecol	-.0252054	.0324259	-0.78	0.437	-.0887591	.0383482
naturalcap	-.0001037	.0000885	-1.17	0.241	-.0002772	.0000698
time1	1.089985	.8987753	1.21	0.225	-.6715827	2.851552
time2	1.708933	.8951792	1.91	0.056	-.0455863	3.463452
time3	2.324163	.886125	2.62	0.009	.5873897	4.060936
time4	1.370016	.8985327	1.52	0.127	-.3910755	3.131108
time5	1.442949	.9095357	1.59	0.113	-.3397087	3.225606
time6	.9867794	.9267992	1.06	0.287	-.8297136	2.803272
time7	-1.227829	.8418171	-1.46	0.145	-2.87776	.4221018
_cons	.3690086	3.935495	0.09	0.925	-7.344419	8.082436

Underidentification test (Anderson canon. corr. LM statistic): 36.061  
 Chi-sq(7) P-val = 0.0000

Weak identification test (Cragg-Donald Wald F statistic): 5.223  
 Stock-Yogo weak ID test critical values: 5% maximal IV relative bias 17.70  
 10% maximal IV relative bias 10.22  
 20% maximal IV relative bias 6.20  
 30% maximal IV relative bias 4.73  
 10% maximal IV size 25.64  
 15% maximal IV size 14.31  
 20% maximal IV size 10.41  
 25% maximal IV size 8.39

Source: Stock-Yogo (2005). Reproduced by permission.

Sargan statistic (overidentification test of all instruments): 18.097  
 Chi-sq(6) P-val = 0.0060

Instrumented: politopen corruption  
 Included instruments: logigdppc loginv\_gdp coastpopshr malariaecol naturalcap  
 time1 time2 time3 time4 time5 time6 time7

Excluded instruments: eurlngshr religfrac ethheter statehist01v3 percentmuslim  
 predtrdshr lat lat2  
 Dropped collinear: othercol

20. Small set of instruments

```
. ivreg2 grgdppc ( politopen corruption= religfrac ethheter percentmuslim
  predtrdshr lat lat2 ) logigdppc loginv_gdp coastpopshr malariaecol na
  > turalcap time1 time2 time3 time4 time5 time6 time7, first
```

First-stage regressions

First-stage regression of politopen:

OLS estimation

Estimates efficient for homoskedasticity only  
 Statistics consistent for homoskedasticity only

	Number of obs =	139
	F( 18, 120) =	8.01
	Prob > F =	0.0000
Total (centered) SS =	1106.873098	Centered R2 = 0.5459
Total (uncentered) SS =	1646.200007	Uncentered R2 = 0.6947
Residual SS =	502.6410417	Root MSE = 2.047

politopen	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
logigdppc	-.8834773	.6727995	-1.31	0.192	-2.215574	.4486189
loginv_gdp	-.0615865	.5447088	-0.11	0.910	-1.140072	1.016899
coastpopshr	-.6369572	1.621848	-0.39	0.695	-3.848104	2.57419
malariaecol	.0536353	.0441986	1.21	0.227	-.0338748	.1411454
naturalcap	.000019	.000101	0.19	0.851	-.0001811	.000219
time1	-.218071	.7247426	-0.30	0.764	-1.653011	1.216869
time2	-1.367723	.695009	-1.97	0.051	-2.743793	.0083464
time3	-1.403332	.6844013	-2.05	0.042	-2.758399	-.0482652
time4	-1.525116	.6870844	-2.22	0.028	-2.885495	-.1647366
time5	-1.394273	.7039578	-1.98	0.050	-2.788061	-.0004859
time6	-1.945087	.6939109	-2.80	0.006	-3.318982	-.5711918
time7	-.0891957	.6859611	-0.13	0.897	-1.447351	1.26896
religfrac	-.0054551	.0266334	-0.20	0.838	-.0581874	.0472772
ethheter	2.932909	2.136214	1.37	0.172	-1.296647	7.162465
percentmus~m	-.0163317	.0196381	-0.83	0.407	-.0552137	.0225503

predtrdshr		3.425524	.6501255	5.27	0.000	2.138321	4.712728
lat		-.6206755	.1692794	-3.67	0.000	-.955837	-.285514
lat2		.0441651	.0095577	4.62	0.000	.0252414	.0630887
_cons		-2.602899	4.828361	-0.54	0.591	-12.16272	6.95692

-----  
Included instruments: logigdppc loginv\_gdp coastpopshr malariaecol naturalcap  
time1 time2 time3 time4 time5 time6 time7 religfrac  
ethheter percentmuslim predtrdshr lat lat2  
-----

Partial R-squared of excluded instruments: 0.4659

Test of excluded instruments:

F( 6, 120) = 17.44

Prob > F = 0.0000

First-stage regression of corruption:

OLS estimation

-----

Estimates efficient for homoskedasticity only

Statistics consistent for homoskedasticity only

		Number of obs =	139
		F( 18, 120) =	26.05
		Prob > F =	0.0000
Total (centered) SS	=	110.6628789	Centered R2 = 0.7962
Total (uncentered) SS	=	1172.049974	Uncentered R2 = 0.9808
Residual SS	=	22.55088533	Root MSE = .4335

corruption		Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
logigdppc		-.549389	.1425078	-3.86	0.000	-.8315445 -.2672336
loginv_gdp		.0648306	.1153765	0.56	0.575	-.1636067 .293268
coastpopshr		.4835947	.3435287	1.41	0.162	-.1965682 1.163758
malariaecol		.0966309	.0093618	10.32	0.000	.0780952 .1151667
naturalcap		-.0000125	.0000214	-0.58	0.562	-.0000548 .0000299
time1		.0967083	.15351	0.63	0.530	-.2072308 .4006474
time2		.0665745	.147212	0.45	0.652	-.224895 .3580441
time3		.0449101	.1449652	0.31	0.757	-.2421109 .331931
time4		.0646559	.1455335	0.44	0.658	-.2234903 .3528021
time5		.1236914	.1491075	0.83	0.408	-.171531 .4189138
time6		.0725393	.1469794	0.49	0.623	-.2184697 .3635483
time7		.0379803	.1452955	0.26	0.794	-.2496948 .3256553
religfrac		-.0163804	.0056413	-2.90	0.004	-.0275498 -.005211
ethheter		1.735927	.4524782	3.84	0.000	.8400514 2.631802

percentmus~m	-.0264705	.0041596	-6.36	0.000	-.0347062	-.0182347
predtrdshr	.6783517	.1377051	4.93	0.000	.4057052	.9509983
lat	-.3229593	.0358556	-9.01	0.000	-.3939509	-.2519677
lat2	.0228469	.0020245	11.29	0.000	.0188386	.0268551
_cons	3.328743	1.02271	3.25	0.001	1.303848	5.353638

-----

Included instruments: logigdppc loginv\_gdp coastpopshr malariaecol naturalcap  
time1 time2 time3 time4 time5 time6 time7 religfrac  
ethheter percentmuslim predtrdshr lat lat2

-----

Partial R-squared of excluded instruments: 0.7777  
Test of excluded instruments:  
F( 6, 120) = 69.97  
Prob > F = 0.0000

Summary results for first-stage regressions

-----

Variable	Shea Partial R2	Partial R2	F( 6, 120)	P-value
politopen	0.1191	0.4659	17.44	0.0000
corruption	0.1988	0.7777	69.97	0.0000

Underidentification tests

Ho: matrix of reduced form coefficients has rank=K1-1 (underidentified)

Ha: matrix has rank=K1 (identified)

Anderson canon. corr. N\*CCEV LM statistic Chi-sq(5)=15.78 P-val=0.0075

Cragg-Donald N\*CDEV Wald statistic Chi-sq(5)=17.80 P-val=0.0032

Weak identification test

Ho: equation is weakly identified

Cragg-Donald Wald F-statistic 2.56

See main output for Cragg-Donald weak id test critical values

Weak-instrument-robust inference

Tests of joint significance of endogenous regressors B1 in main equation

Ho: B1=0 and overidentifying restrictions are valid

Anderson-Rubin Wald test F(6,120)= 6.20 P-val=0.0000

Anderson-Rubin Wald test Chi-sq(6)=43.08 P-val=0.0000

Stock-Wright LM S statistic Chi-sq(6)=32.89 P-val=0.0000

Number of observations	N =	139
Number of regressors	K =	15
Number of instruments	L =	19
Number of excluded instruments	L1 =	6

IV (2SLS) estimation

Estimates efficient for homoskedasticity only  
 Statistics consistent for homoskedasticity only

	Number of obs =	139
	F( 14, 124) =	6.00
	Prob > F =	0.0000
Total (centered) SS =	1453.00232	Centered R2 = 0.3688
Total (uncentered) SS =	1532.470018	Uncentered R2 = 0.4016
Residual SS =	917.0850826	Root MSE = 2.569

grgdppc	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
politopen	-.0309622	.2850845	-0.11	0.914	-.5897175	.527793
corruption	1.473391	.6720489	2.19	0.028	.1561997	2.790583
logigdppc	-1.17854	.6750842	-1.75	0.081	-2.501681	.1446007
loginv_gdp	2.981771	.6593791	4.52	0.000	1.689411	4.27413
coastpopshr	-.6962748	1.402661	-0.50	0.620	-3.445441	2.052891
malariaecol	-.0220045	.0344975	-0.64	0.524	-.0896185	.0456094
naturalcap	-.0001136	.0000926	-1.23	0.220	-.000295	.0000678
time1	1.028495	.916161	1.12	0.262	-.7671472	2.824138
time2	1.162747	.9614304	1.21	0.227	-.7216224	3.047116
time3	1.629767	.9539047	1.71	0.088	-.2398519	3.499386
time4	.6821361	.9770902	0.70	0.485	-1.232926	2.597198
time5	.2210763	.9805488	0.23	0.822	-1.700764	2.142917
time6	-.065858	1.03035	-0.06	0.949	-2.085306	1.95359
time7	-1.407783	.8605093	-1.64	0.102	-3.09435	.2787846
_cons	-2.908792	3.899579	-0.75	0.456	-10.55183	4.734242

Underidentification test (Anderson canon. corr. LM statistic): 15.780  
 Chi-sq(5) P-val = 0.0075

Weak identification test (Cragg-Donald Wald F statistic): 2.561  
 Stock-Yogo weak ID test critical values: 5% maximal IV relative bias 15.72  
 10% maximal IV relative bias 9.48  
 20% maximal IV relative bias 6.08  
 30% maximal IV relative bias 4.78  
 10% maximal IV size 21.68  
 15% maximal IV size 12.33  
 20% maximal IV size 9.10  
 25% maximal IV size 7.42

Source: Stock-Yogo (2005). Reproduced by permission.

-----  
 Sargan statistic (overidentification test of all instruments): 11.730  
 Chi-sq(4) P-val = 0.0195  
 -----

Instrumented: politopen corruption  
 Included instruments: logigdppc loginv\_gdp coastpopshr malariaecol naturalcap  
 time1 time2 time3 time4 time5 time6 time7  
 Excluded instruments: religfrac ethheter percentmuslim predtrdshr lat lat2  
 -----

K. PO, YO and AC

Large set of instruments:

```
. ivreg2 grgdppc ( politopen yrsopen corruption= eurlngshr religfrac ethheter
statehist01v3 othercol percentmuslim predtrdshr lat lat2 ) logigdpc
> pc loginv_gdp coastpopshr malariaecol naturalcap time1 time2 time3 time4 time5
time6 time7, first
Warning - collinearities detected
Vars dropped: othercol
```

First-stage regressions  
 -----

First-stage regression of politopen:

OLS estimation  
 -----

Estimates efficient for homoskedasticity only  
 Statistics consistent for homoskedasticity only

	Number of obs =	131
	F( 20, 110) =	6.66
	Prob > F =	0.0000
Total (centered) SS =	1073.937104	Centered R2 = 0.5475
Total (uncentered) SS =	1646.200007	Uncentered R2 = 0.7048
Residual SS =	485.9085733	Root MSE = 2.102

politopen	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
logigdppc	-.9397418	.7389414	-1.27	0.206	-2.40415 .5246665
loginv_gdp	.0155084	.5878371	0.03	0.979	-1.149447 1.180464
coastpopshr	-.1923421	1.818763	-0.11	0.916	-3.796704 3.41202
malariaecol	.0950214	.0565994	1.68	0.096	-.0171453 .207188
naturalcap	.0000351	.0001186	0.30	0.768	-.0001999 .00027

time1		-1.1736013	.7726354	-0.22	0.823	-1.704783	1.357581
time2		-1.426982	.7377957	-1.93	0.056	-2.88912	.0351557
time3		-1.503557	.7225964	-2.08	0.040	-2.935573	-.0715404
time4		-1.641266	.7246366	-2.26	0.025	-3.077325	-.2052059
time5		-1.481211	.7442411	-1.99	0.049	-2.956122	-.0062996
time6		-2.060433	.7317712	-2.82	0.006	-3.510632	-.610234
time7		-.0899598	.7234619	-0.12	0.901	-1.523691	1.343772
eurlngshr		-.6465136	17.94771	-0.04	0.971	-36.21466	34.92163
religfrac		-.0080835	.0304097	-0.27	0.791	-.0683485	.0521815
ethheter		3.615718	2.424843	1.49	0.139	-1.189752	8.421189
statehist0~3		-3.457683	2.585429	-1.34	0.184	-8.581396	1.666031
percentmus~m		-.018756	.02198	-0.85	0.395	-.0623151	.0248031
predtrdshr		3.094	.8594054	3.60	0.000	1.39086	4.79714
lat		-.690352	.1878711	-3.67	0.000	-1.062668	-.3180357
lat2		.0490912	.010561	4.65	0.000	.0281617	.0700207
_cons		-1.775702	5.054177	-0.35	0.726	-11.79189	8.240491

-----  
Included instruments: logigdpcc loginv\_gdp coastpopshr malariaecol naturalcap  
time1 time2 time3 time4 time5 time6 time7 eurlngshr  
religfrac ethheter statehist01v3 percentmuslim predtrdshr  
lat lat2  
-----

Partial R-squared of excluded instruments: 0.4663

Test of excluded instruments:

F( 8, 110) = 12.01

Prob > F = 0.0000

First-stage regression of yrsopen:

OLS estimation  
-----

Estimates efficient for homoskedasticity only

Statistics consistent for homoskedasticity only

Number of obs = 131

F( 20, 110) = 21.84

Prob > F = 0.0000

Total (centered) SS = 1.389631009

Centered R2 = 0.7989

Total (uncentered) SS = 2.340020076

Uncentered R2 = 0.8806

Residual SS = .2795020767

Root MSE = .05041

-----  
+-----  
-----

yrsopen		Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
logigdpcc		-.0802152	.0177225	-4.53	0.000	-.115337 - .0450933

loginv_gdp		-.0051676	.0140985	-0.37	0.715	-.0331075	.0227722
coastpopshr		.1136935	.0436206	2.61	0.010	.0272478	.2001393
malariaecol		.0111711	.0013575	8.23	0.000	.0084809	.0138613
naturalcap		3.75e-06	2.84e-06	1.32	0.190	-1.88e-06	9.39e-06
time1		-.0066898	.0185306	-0.36	0.719	-.0434131	.0300335
time2		-.0023989	.017695	-0.14	0.892	-.0374663	.0326685
time3		.005775	.0173305	0.33	0.740	-.0285699	.04012
time4		.0089232	.0173794	0.51	0.609	-.0255187	.0433652
time5		.0138593	.0178496	0.78	0.439	-.0215144	.0492331
time6		.007568	.0175505	0.43	0.667	-.0272131	.042349
time7		.0042822	.0173513	0.25	0.806	-.0301039	.0386684
eurlngshr		-.3631417	.4304515	-0.84	0.401	-1.216196	.4899123
religfrac		.0007732	.0007293	1.06	0.291	-.0006722	.0022186
ethheter		.5063916	.0581566	8.71	0.000	.3911389	.6216443
statehist0~3		.4145025	.062008	6.68	0.000	.2916172	.5373878
percentmus~m		-.0030698	.0005272	-5.82	0.000	-.0041145	-.0020251
predtrdshr		.1230209	.0206117	5.97	0.000	.0821734	.1638684
lat		-.0488742	.0045058	-10.85	0.000	-.0578037	-.0399447
lat2		.0031199	.0002533	12.32	0.000	.002618	.0036219
_cons		-.2454211	.1212176	-2.02	0.045	-.4856459	-.0051963

-----  
Included instruments: logigdpcc loginv\_gdp coastpopshr malariaecol naturalcap  
time1 time2 time3 time4 time5 time6 time7 eurlngshr  
religfrac ethheter statehist01v3 percentmuslim predtrdshr  
lat lat2  
-----

Partial R-squared of excluded instruments: 0.7791

Test of excluded instruments:

F( 8, 110) = 48.50

Prob > F = 0.0000

First-stage regression of corruption:

OLS estimation

-----

Estimates efficient for homoskedasticity only

Statistics consistent for homoskedasticity only

Number of obs = 131

F( 20, 110) = 606.02

Prob > F = 0.0000

Total (centered) SS = 105.7171009

Centered R2 = 0.9910

Total (uncentered) SS = 1140.049974

Uncentered R2 = 0.9992

Residual SS = .9508142236

Root MSE = .09297



	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
corruption						
logigdppc	-.1070332	.0326874	-3.27	0.001	-.171812	-.0422544
loginv_gdp	-.0699414	.0260032	-2.69	0.008	-.1214737	-.0184091
coastpopshr	.7744886	.0804538	9.63	0.000	.615048	.9339292
malariaecol	.1188102	.0025037	47.45	0.000	.1138484	.1237719
naturalcap	-.0001005	5.24e-06	-19.17	0.000	-.0001109	-.0000901
time1	.0032804	.0341779	0.10	0.924	-.0644522	.0710129
time2	-.0034958	.0326367	-0.11	0.915	-.0681742	.0611825
time3	.0107101	.0319644	0.34	0.738	-.0526358	.0740561
time4	.016675	.0320546	0.52	0.604	-.0468498	.0801998
time5	.0184131	.0329218	0.56	0.577	-.0468303	.0836564
time6	.002032	.0323702	0.06	0.950	-.0621183	.0661822
time7	.0024058	.0320027	0.08	0.940	-.0610159	.0658276
eurlngshr	-26.20713	.7939252	-33.01	0.000	-27.7805	-24.63376
religfrac	-.0375925	.0013452	-27.95	0.000	-.0402583	-.0349266
ethheter	3.262502	.1072641	30.42	0.000	3.04993	3.475074
statehist0~3	1.129596	.1143676	9.88	0.000	.9029458	1.356245
percentmus~m	-.0436761	.0009723	-44.92	0.000	-.045603	-.0417493
predtrdshr	-.0940467	.0380162	-2.47	0.015	-.1693859	-.0187075
lat	-.2751538	.0083106	-33.11	0.000	-.2916234	-.2586842
lat2	.0225199	.0004672	48.20	0.000	.0215941	.0234457
_cons	3.056586	.2235738	13.67	0.000	2.613515	3.499657

Included instruments: logigdppc loginv\_gdp coastpopshr malariaecol naturalcap  
time1 time2 time3 time4 time5 time6 time7 eurlngshr  
religfrac ethheter statehist01v3 percentmuslim predtrdshr  
lat lat2

Partial R-squared of excluded instruments: 0.9900  
Test of excluded instruments:  
F( 8, 110) = 1356.65  
Prob > F = 0.0000

#### Summary results for first-stage regressions

Variable	Shea Partial R2	Partial R2	F( 8, 110)	P-value
politopen	0.2806	0.4663	12.01	0.0000
yrsoopen	0.5633	0.7791	48.50	0.0000
corruption	0.5899	0.9900	1356.65	0.0000

Underidentification tests

Ho: matrix of reduced form coefficients has rank=K1-1 (underidentified)  
 Ha: matrix has rank=K1 (identified)  
 Anderson canon. corr. N\*CCEV LM statistic Chi-sq(6)=36.05 P-val=0.0000  
 Cragg-Donald N\*CDEV Wald statistic Chi-sq(6)=49.74 P-val=0.0000

Weak identification test  
 Ho: equation is weakly identified  
 Cragg-Donald Wald F-statistic 5.22  
 See main output for Cragg-Donald weak id test critical values

Weak-instrument-robust inference  
 Tests of joint significance of endogenous regressors B1 in main equation  
 Ho: B1=0 and overidentifying restrictions are valid  
 Anderson-Rubin Wald test F(8,110)= 5.39 P-val=0.0000  
 Anderson-Rubin Wald test Chi-sq(8)=51.31 P-val=0.0000  
 Stock-Wright LM S statistic Chi-sq(8)=36.87 P-val=0.0000

Number of observations N = 131  
 Number of regressors K = 16  
 Number of instruments L = 21  
 Number of excluded instruments L1 = 8

IV (2SLS) estimation

Estimates efficient for homoskedasticity only  
 Statistics consistent for homoskedasticity only

Number of obs = 131  
 F( 15, 115) = 5.98  
 Prob > F = 0.0000  
 Total (centered) SS = 1335.946886 Centered R2 = 0.3873  
 Total (uncentered) SS = 1404.840016 Uncentered R2 = 0.4174  
 Residual SS = 818.507516 Root MSE = 2.5

grgdppc	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
politopen	.2630709	.1855371	1.42	0.156	-.1005751	.6267169
yrsoopen	14.08703	4.541345	3.10	0.002	5.186163	22.98791
corruption	-.4711015	.5159966	-0.91	0.361	-1.482436	.5402333
logigdppc	-1.409457	.6911198	-2.04	0.041	-2.764027	-.0548868
loginv_gdp	2.852947	.6530417	4.37	0.000	1.573008	4.132885
coastpopshr	.1202561	1.403444	0.09	0.932	-2.630444	2.870956
malariaecol	-.0779146	.0372265	-2.09	0.036	-.1508772	-.0049519
naturalcap	.0000113	.0000977	0.12	0.908	-.0001803	.0002028

time1	1.148328	.9182662	1.25	0.211	-.651441	2.948096
time2	1.536776	.9160829	1.68	0.093	-.2587136	3.332265
time3	2.177524	.9063853	2.40	0.016	.4010412	3.954006
time4	1.206611	.9193362	1.31	0.189	-.5952546	3.008477
time5	1.257004	.9309969	1.35	0.177	-.5677162	3.081724
time6	.7834091	.9489666	0.83	0.409	-1.076531	2.64335
time7	-1.244148	.8599084	-1.45	0.148	-2.929538	.4412412
_cons	2.19157	4.062707	0.54	0.590	-5.77119	10.15433

-----  
Underidentification test (Anderson canon. corr. LM statistic): 36.051  
Chi-sq(6) P-val = 0.0000  
-----

Weak identification test (Cragg-Donald Wald F statistic): 5.221  
Stock-Yogo weak ID test critical values: 5% maximal IV relative bias 15.18  
10% maximal IV relative bias 9.01  
20% maximal IV relative bias 5.69  
30% maximal IV relative bias 4.46

Source: Stock-Yogo (2005). Reproduced by permission.

-----  
Sargan statistic (overidentification test of all instruments): 7.722  
Chi-sq(5) P-val = 0.1722  
-----

Instrumented: politopen yrsopen corruption  
Included instruments: logigdppc loginv\_gdp coastpopshr malariaecol naturalcap  
time1 time2 time3 time4 time5 time6 time7  
Excluded instruments: eurlngshr religfrac ethheter statehist01v3 percentmuslim  
predtrdshr lat lat2  
Dropped collinear: othercol

[Small set of instruments](#)

```
. ivreg2 grgdppc ( politopen yrsopen corruption= religfrac statehist01v3
percentmuslim predtrdshr lat lat2 ) logigdppc loginv_gdp coastpopshr
> malariaecol naturalcap time1 time2 time3 time4 time5 time6 time7, first
```

First-stage regressions

-----  
First-stage regression of politopen:

OLS estimation

-----  
Estimates efficient for homoskedasticity only  
Statistics consistent for homoskedasticity only

		Number of obs =	131
		F( 18, 112) =	7.25
		Prob > F =	0.0000
Total (centered) SS	=	1073.937104	
Total (uncentered) SS	=	1646.200007	Centered R2 = 0.5382
Residual SS	=	495.9442399	Uncentered R2 = 0.6987
			Root MSE = 2.104

politopen	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
logigdppc	-.6116336	.6643943	-0.92	0.359	-1.928046	.7047785
loginv_gdp	-.066357	.5782942	-0.11	0.909	-1.212173	1.079459
coastpopshr	-2.031946	1.323171	-1.54	0.127	-4.65364	.5897483
malariaecol	.0563457	.0484456	1.16	0.247	-.0396432	.1523345
naturalcap	-.0000192	.0000975	-0.20	0.844	-.0002123	.0001739
time1	-.2103826	.7713565	-0.27	0.786	-1.738727	1.317961
time2	-1.440871	.7375307	-1.95	0.053	-2.902193	.0204519
time3	-1.525603	.7231728	-2.11	0.037	-2.958478	-.0927293
time4	-1.671224	.7249793	-2.31	0.023	-3.107678	-.2347705
time5	-1.513434	.7434662	-2.04	0.044	-2.986517	-.0403515
time6	-2.104567	.7311393	-2.88	0.005	-3.553226	-.655908
time7	-.1128803	.7239379	-0.16	0.876	-1.54727	1.32151
religfrac	-.0035228	.0273823	-0.13	0.898	-.0577772	.0507316
statehist0~3	-3.23038	2.323324	-1.39	0.167	-7.833749	1.372988
percentmus~m	-.002053	.017889	-0.11	0.909	-.0374978	.0333917
predtrdshr	3.493313	.7120864	4.91	0.000	2.082405	4.904221
lat	-.5614602	.1616296	-3.47	0.001	-.8817086	-.2412118
lat2	.0390277	.0081487	4.79	0.000	.0228821	.0551734
_cons	-1.868415	5.035088	-0.37	0.711	-11.8448	8.107967

Included instruments: logigdppc loginv\_gdp coastpopshr malariaecol naturalcap  
time1 time2 time3 time4 time5 time6 time7 religfrac  
statehist01v3 percentmuslim predtrdshr lat lat2

Partial R-squared of excluded instruments: 0.4552  
Test of excluded instruments:  
F( 6, 112) = 15.60  
Prob > F = 0.0000

First-stage regression of yrsopen:

OLS estimation

Estimates efficient for homoskedasticity only  
Statistics consistent for homoskedasticity only

		Number of obs =	131
		F( 18, 112) =	12.05
		Prob > F =	0.0000
Total (centered) SS =	1.389631009	Centered R2 =	0.6595
Total (uncentered) SS =	2.340020076	Uncentered R2 =	0.7978
Residual SS =	.4732012765	Root MSE =	.065

	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
yrsoopen						
logigdppc	-.0384339	.0205226	-1.87	0.064	-.0790968	.002229
loginv_gdp	-.0150654	.017863	-0.84	0.401	-.0504587	.0203279
coastpopshr	-.1371166	.0408717	-3.35	0.001	-.2180986	-.0561346
malariaecol	.0055946	.0014964	3.74	0.000	.0026296	.0085596
naturalcap	-2.90e-06	3.01e-06	-0.96	0.338	-8.86e-06	3.07e-06
time1	-.0109766	.0238266	-0.46	0.646	-.0581859	.0362327
time2	-.003709	.0227817	-0.16	0.871	-.048848	.0414301
time3	.002946	.0223382	0.13	0.895	-.0413143	.0472063
time4	.0050698	.022394	0.23	0.821	-.0393011	.0494407
time5	.0100821	.0229651	0.44	0.661	-.0354203	.0555844
time6	.0020154	.0225843	0.09	0.929	-.0427325	.0467633
time7	.0013912	.0223619	0.06	0.951	-.042916	.0456983
religfrac	.0016025	.0008458	1.89	0.061	-.0000734	.0032784
statehist0~3	.4632262	.0717656	6.45	0.000	.3210319	.6054205
percentmus~m	-.0006577	.0005526	-1.19	0.236	-.0017526	.0004371
predtrdshr	.1844966	.0219958	8.39	0.000	.1409148	.2280784
lat	-.0316835	.0049926	-6.35	0.000	-.0415757	-.0217913
lat2	.0017385	.0002517	6.91	0.000	.0012397	.0022372
_cons	-.2658938	.1555298	-1.71	0.090	-.5740561	.0422686

Included instruments: logigdppc loginv\_gdp coastpopshr malariaecol naturalcap  
time1 time2 time3 time4 time5 time6 time7 religfrac  
statehist01v3 percentmuslim predtrdshr lat lat2

Partial R-squared of excluded instruments: 0.6260

Test of excluded instruments:

F( 6, 112) = 31.25

Prob > F = 0.0000

First-stage regression of corruption:

OLS estimation

Estimates efficient for homoskedasticity only

Statistics consistent for homoskedasticity only

		Number of obs =	131
		F( 18, 112) =	35.28
		Prob > F =	0.0000
Total (centered) SS =	105.7171009	Centered R2 =	0.8501
Total (uncentered) SS =	1140.049974	Uncentered R2 =	0.9861
Residual SS =	15.85012585	Root MSE =	.3762

corruption	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
logigdppc	-.2030658	.1187752	-1.71	0.090	-.4384036	.0322721
loginv_gdp	.0035525	.1033829	0.03	0.973	-.2012875	.2083925
coastpopshr	-.2432368	.2365462	-1.03	0.306	-.7119228	.2254492
malariaecol	.0688824	.0086607	7.95	0.000	.0517223	.0860425
naturalcap	-.0000598	.0000174	-3.43	0.001	-.0000943	-.0000253
time1	.0513603	.1378971	0.37	0.710	-.2218651	.3245857
time2	.0436643	.13185	0.33	0.741	-.2175795	.3049081
time3	.0151309	.1292832	0.12	0.907	-.2410271	.271289
time4	.0218202	.1296061	0.17	0.867	-.2349778	.2786181
time5	.0584997	.1329111	0.44	0.661	-.2048466	.3218459
time6	.0212867	.1307074	0.16	0.871	-.2376932	.2802666
time7	.0117134	.1294199	0.09	0.928	-.2447157	.2681424
religfrac	-.0155624	.0048952	-3.18	0.002	-.0252616	-.0058632
statehist0~3	2.922279	.4153457	7.04	0.000	2.099325	3.745233
percentmus~m	-.0217641	.0031981	-6.81	0.000	-.0281007	-.0154276
predtrdshr	.7880283	.1273012	6.19	0.000	.5357972	1.040259
lat	-.2397777	.0288949	-8.30	0.000	-.2970292	-.1825262
lat2	.0160659	.0014568	11.03	0.000	.0131795	.0189523
_cons	2.269077	.9001337	2.52	0.013	.485578	4.052577

Included instruments: logigdppc loginv\_gdp coastpopshr malariaecol naturalcap  
time1 time2 time3 time4 time5 time6 time7 religfrac  
statehist01v3 percentmuslim predtrdshr lat lat2

Partial R-squared of excluded instruments: 0.8327  
Test of excluded instruments:  
F( 6, 112) = 92.94  
Prob > F = 0.0000

Summary results for first-stage regressions

Variable	Shea Partial R2	Partial R2	F( 6, 112)	P-value
politopen	0.2459	0.4552	15.60	0.0000
ysopen	0.3819	0.6260	31.25	0.0000
corruption	0.3775	0.8327	92.94	0.0000

Underidentification tests

Ho: matrix of reduced form coefficients has rank=K1-1 (underidentified)

Ha: matrix has rank=K1 (identified)

Anderson canon. corr. N\*CCEV LM statistic Chi-sq(4)=29.56 P-val=0.0000

Cragg-Donald N\*CDEV Wald statistic Chi-sq(4)=38.18 P-val=0.0000

Weak identification test

Ho: equation is weakly identified

Cragg-Donald Wald F-statistic 5.44

See main output for Cragg-Donald weak id test critical values

Weak-instrument-robust inference

Tests of joint significance of endogenous regressors B1 in main equation

Ho: B1=0 and overidentifying restrictions are valid

Anderson-Rubin Wald test F(6,112)= 5.96 P-val=0.0000

Anderson-Rubin Wald test Chi-sq(6)=41.85 P-val=0.0000

Stock-Wright LM S statistic Chi-sq(6)=31.72 P-val=0.0000

Number of observations	N =	131
Number of regressors	K =	16
Number of instruments	L =	19
Number of excluded instruments	L1 =	6

IV (2SLS) estimation

-----

Estimates efficient for homoskedasticity only

Statistics consistent for homoskedasticity only

	Number of obs =	131
	F( 15, 115) =	6.06
	Prob > F =	0.0000
Total (centered) SS =	1335.946886	Centered R2 = 0.4082
Total (uncentered) SS =	1404.840016	Uncentered R2 = 0.4372
Residual SS =	790.6285278	Root MSE = 2.457

	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
grgdppc					
politopen	.1325397	.1947947	0.68	0.496	-.2492509 .5143303
ysopen	12.55733	5.420601	2.32	0.021	1.93315 23.18152

corruption		.088207	.6339068	0.14	0.889	-1.154227	1.330641
logigdppc		-1.526518	.6820235	-2.24	0.025	-2.86326	-.1897765
loginv_gdp		2.857107	.6422649	4.45	0.000	1.598291	4.115923
coastpopshr		.1116582	1.391851	0.08	0.936	-2.61632	2.839636
malariaecol		-.0783573	.0377523	-2.08	0.038	-.1523505	-.0043641
naturalcap		4.98e-06	.0000988	0.05	0.960	-.0001887	.0001986
time1		1.09021	.9034333	1.21	0.228	-.6804864	2.860907
time2		1.329406	.9068062	1.47	0.143	-.4479018	3.106713
time3		1.980774	.8967868	2.21	0.027	.2231039	3.738443
time4		.9916168	.9105864	1.09	0.276	-.7930998	2.776333
time5		1.052602	.9211965	1.14	0.253	-.75291	2.858114
time6		.5141568	.9432602	0.55	0.586	-1.334599	2.362913
time7		-1.256097	.84516	-1.49	0.137	-2.91258	.4003863
_cons		1.983292	4.016486	0.49	0.621	-5.888876	9.855459

-----  
Underidentification test (Anderson canon. corr. LM statistic): 29.564  
Chi-sq(4) P-val = 0.0000  
-----

Weak identification test (Cragg-Donald Wald F statistic): 5.440  
Stock-Yogo weak ID test critical values: 5% maximal IV relative bias 12.20  
10% maximal IV relative bias 7.77  
20% maximal IV relative bias 5.35  
30% maximal IV relative bias 4.40

Source: Stock-Yogo (2005). Reproduced by permission.

-----  
Sargan statistic (overidentification test of all instruments): 4.310  
Chi-sq(3) P-val = 0.2299  
-----

Instrumented: politopen yrsopen corruption  
Included instruments: logigdppc loginv\_gdp coastpopshr malariaecol naturalcap  
time1 time2 time3 time4 time5 time6 time7  
Excluded instruments: religfrac statehist01v3 percentmuslim predtrdshr lat lat2