

```

1  ***STEP 1: PREPARING DATA
2  **encoding
3  xtset country_id yr
4  gen ln_lc_encons = log(lc_encons_gja)
5  gen ln_nlc_encons = log(nlc_encons_gja)
6  gen ln_tc_encons = log(tc_encons_gja)
7  gen ln_cpi = log(cpi)
8  **Filling missing data
9  misstable sum
10 bysort country_id: ipolate ln_lc_encons yr, gen(ln_lc_encons_filled) epolate
11 replace ln_lc_encons=ln_lc_encons_filled if missing(ln_lc_encons)
12 drop ln_lc_encons_filled
13 //before filling missing data
14                                     Obs<.
15                                     +-----+
16                                     | Unique
17      Variable |      Obs=.      Obs>.      Obs<. | values      Min      Max
18      +-----+-----+-----+-----+
19      ln_lc_encons |      56              875 | >500    -6.04183    3.480838
20      +-----+-----+-----+-----+
21 //after filling missing data
22                                     Obs<.
23                                     +-----+
24                                     | Unique
25      Variable |      Obs=.      Obs>.      Obs<. | values      Min      Max
26      +-----+-----+-----+-----+
27      ln_lc_encons |      38              893 | >500    -6.04183    3.480838
28      +-----+-----+-----+-----+
29
30
31 ***STEP 2: GMM to Low-carbon enegy
32 **2.1. Low-carbon energy with composite institutional quality
33 *2.1.1. Upper bound vs. Lower bound
34 *2.1.1.1. upper bound: pooled ols
35 reg L(0/1).ln_lc_encons fdi composite_iq ln_cpi gdppc_growth c.fdi#c.composite_iq i.yr
36 est sto lc_comiq_ols
37 //result: .9726317
38 *2.1.1.2 lower bound: fixed effect
39 xtreg L(0/1).ln_lc_encons fdi composite_iq ln_cpi gdppc_growth c.fdi#c.composite_iq i.yr, fe robust
40 est sto lc_comiq_fe
41 //result: .8508833
42 **2.1.2 Difference GMM vs. System GMM
43 *2.1.2.1 twostep difference gmm
44 xtabond2 L(0/1).ln_lc_encons fdi composite_iq ln_cpi gdppc_growth c.fdi#c.composite_iq i.yr, gmm(L4.
ln_lc_encons L8.fdi L7.composite_iq L7.ln_cpi L5.gdppc_growth L7.c.fdi#c.composite_iq, lag(8 8)) iv(i
.yr)noleveleq nodiffsargan twostep robust orthogonal small
45 est sto lc_comiq_diffgmm
46 //result: .5853741 => system GMM is the way to go
47 *2.1.2.2. twostep system gmm
48 xtabond2 L(0/1).ln_lc_encons fdi composite_iq ln_cpi gdppc_growth c.fdi#c.composite_iq i.yr, gmm(L4.
ln_lc_encons, lag (4 4)) iv(L.fdi L.composite_iq ln_cpi gdppc_growth L.c.fdi#c.composite_iq i.yr,
equation(level)) nodiffsargan twostep robust orthogonal
49 est sto lc_comiq_sysgmm
50
51 Dynamic panel-data estimation, two-step system GMM
52 -----
53 Group variable: country_id      Number of obs      =      846
54 Time variable : yr              Number of groups    =      47
55 Number of instruments = 45      Obs per group: min =      18
56 Wald chi2(23) = 6602.31          avg =      18.00
57 Prob > chi2 = 0.000              max =      18
58 -----
59 |                               Corrected

```

	ln_lc_encons	Coefficient	std. err.	z	P> z	[95% conf. interval]	
60							
61							
62	ln_lc_encons						
63	L1.	.8839644	.0345399	25.59	0.000	.8162673	.9516614
64							
65	fdi	.0083503	.003092	2.70	0.007	.0022901	.0144105
66	composite_iq	.1476712	.0451234	3.27	0.001	.0592309	.2361115
67	ln_cpi	.1117118	.1051893	1.06	0.288	-.0944555	.3178791
68	gdppc_growth	.006206	.0061705	1.01	0.315	-.0058879	.0183
69							
70	c.fdi#c.composite_iq	-.0077179	.003897	-1.98	0.048	-.0153558	-.00008
71							
72	yr						
73	2005	.0902277	.0511079	1.77	0.077	-.009942	.1903974
74	2006	.0683981	.0487093	1.40	0.160	-.0270703	.1638666
75	2007	.072442	.0455231	1.59	0.112	-.0167818	.1616657
76	2008	.0618093	.0450026	1.37	0.170	-.0263942	.1500128
77	2009	.0542022	.0603548	0.90	0.369	-.0640909	.1724954
78	2010	.0668144	.0349404	1.91	0.056	-.0016675	.1352963
79	2011	.0677502	.0352462	1.92	0.055	-.001331	.1368315
80	2012	.0089888	.0414079	0.22	0.828	-.0721691	.0901467
81	2013	.1029615	.0410312	2.51	0.012	.0225419	.1833811
82	2014	.0544556	.0364272	1.49	0.135	-.0169403	.1258516
83	2015	.0809456	.0366348	2.21	0.027	.0091426	.1527485
84	2016	.051377	.0422337	1.22	0.224	-.0313996	.1341536
85	2017	.0704375	.0314977	2.24	0.025	.0087032	.1321719
86	2018	.0419495	.030485	1.38	0.169	-.0178	.1016989
87	2019	.086978	.045036	1.93	0.053	-.0012911	.175247
88	2020	.050254	.0668586	0.75	0.452	-.0807864	.1812944
89	2022	-.0078779	.0331169	-0.24	0.812	-.0727858	.0570301
90							
91	_cons	-.6580234	.5214145	-1.26	0.207	-1.679977	.3639301
92							

Instruments for orthogonal deviations equation

GMM-type (missing=0, separate instruments for each period unless collapsed)

L4.L4.ln_lc_encons

Instruments for levels equation

Standard

L.fdi L.composite_iq ln_cpi gdppc_growth cL.fdi#c.composite_iq 2004b.yr

2005.yr 2006.yr 2007.yr 2008.yr 2009.yr 2010.yr 2011.yr 2012.yr 2013.yr

2014.yr 2015.yr 2016.yr 2017.yr 2018.yr 2019.yr 2020.yr 2021.yr 2022.yr

_cons

GMM-type (missing=0, separate instruments for each period unless collapsed)

DL3.L4.ln_lc_encons

Arellano-Bond test for AR(1) in first differences: z = -3.09 Pr > z = 0.002

Arellano-Bond test for AR(2) in first differences: z = -0.31 Pr > z = 0.758

Sargan test of overid. restrictions: chi2(21) = 30.97 Prob > chi2 = 0.074
(Not robust, but not weakened by many instruments.)

Hansen test of overid. restrictions: chi2(21) = 13.48 Prob > chi2 = 0.891
(Robust, but weakened by many instruments.)

****2.2. Low-carbon energy with voi_iq**

xtabond2 L(0/1).ln_lc_encons fdi voi_iq ln_cpi gdppc_growth c.fdi#c.voi_iq i.yr, gmm(L4.ln_lc_encons,
lag (4 4)) iv(L.fdi L.voi_iq L.ln_cpi gdppc_growth L.c.fdi#c.voi_iq i.yr, equation(level))

nodiffsargan twostep robust

est sto lc_voiq_sysgmm

Dynamic panel-data estimation, two-step system GMM

Group variable: country_id Number of obs = 846

```

121 Time variable : yr                      Number of groups =      47
122 Number of instruments = 45              Obs per group: min =      18
123 Wald chi2(23) = 8592.03                 avg =      18.00
124 Prob > chi2 = 0.000                     max =      18

```

		Corrected					
ln_lc_encons		Coefficient	std. err.	z	P> z	[95% conf. interval]	
ln_lc_encons							
	L1.	.8775979	.0387897	22.62	0.000	.8015715	.9536243
	fdi	.0074785	.0041572	1.80	0.072	-.0006696	.0156265
	voi_iq	.1849208	.0638473	2.90	0.004	.0597824	.3100593
	ln_cpi	.1007137	.1069719	0.94	0.346	-.1089475	.3103748
	gdppc_growth	.0086988	.0037635	2.31	0.021	.0013224	.0160751
	c.fdi#c.voi_iq	-.0076686	.0036421	-2.11	0.035	-.014807	-.0005302
	yr						
	2005	.0061287	.0267209	0.23	0.819	-.0462433	.0585008
	2006	-.0038239	.0212732	-0.18	0.857	-.0455187	.0378709
	2008	-.004895	.0298984	-0.16	0.870	-.0634948	.0537049
	2009	-.01074	.0423239	-0.25	0.800	-.0936934	.0722134
	2010	-.0108822	.0363233	-0.30	0.764	-.0820747	.0603102
	2011	-.0047674	.0287933	-0.17	0.868	-.0612012	.0516663
	2012	-.065878	.0417408	-1.58	0.115	-.1476884	.0159324
	2013	.0231024	.0393192	0.59	0.557	-.0539618	.1001667
	2014	-.0206446	.041058	-0.50	0.615	-.1011169	.0598277
	2015	.0055585	.0370792	0.15	0.881	-.0671155	.0782325
	2016	-.0231167	.0493788	-0.47	0.640	-.1198972	.0736639
	2017	-.0046393	.0430157	-0.11	0.914	-.0889486	.0796699
	2018	-.0356303	.0494389	-0.72	0.471	-.1325289	.0612682
	2019	.0147028	.0583604	0.25	0.801	-.0996815	.1290871
	2020	-.0002411	.060283	-0.00	0.997	-.1183937	.1179115
	2021	-.0786297	.0453343	-1.73	0.083	-.1674833	.0102239
	2022	-.0886328	.0526353	-1.68	0.092	-.1917962	.0145305
	_cons	-.5711879	.5191755	-1.10	0.271	-1.588753	.4463774

```

160 Instruments for first differences equation
161   GMM-type (missing=0, separate instruments for each period unless collapsed)
162   L4.L4.ln_lc_encons
163 Instruments for levels equation
164   Standard
165   L.fdi L.voi_iq L.ln_cpi gdppc_growth cL.fdi#c.voi_iq 2004b.yr 2005.yr
166   2006.yr 2007.yr 2008.yr 2009.yr 2010.yr 2011.yr 2012.yr 2013.yr 2014.yr
167   2015.yr 2016.yr 2017.yr 2018.yr 2019.yr 2020.yr 2021.yr 2022.yr
168   _cons
169   GMM-type (missing=0, separate instruments for each period unless collapsed)
170   DL3.L4.ln_lc_encons

```

```

171 -----
172 Arellano-Bond test for AR(1) in first differences: z = -3.09 Pr > z = 0.002
173 Arellano-Bond test for AR(2) in first differences: z = -0.30 Pr > z = 0.768
174 -----
175 Sargan test of overid. restrictions: chi2(21) = 40.18 Prob > chi2 = 0.007
176 (Not robust, but not weakened by many instruments.)
177 Hansen test of overid. restrictions: chi2(21) = 13.84 Prob > chi2 = 0.876
178 (Robust, but weakened by many instruments.)

```

```

180 **2.3. Low-carbon energy with pol_iq
181 xtabond2 L(0/1).ln_lc_encons fdi pol_iq ln_cpi gdppc_growth c.fdi#c.pol_iq i.yr, gmm(L4.ln_lc_encons,
lag (4 4)) iv(L.fdi L.pol_iq L.ln_cpi gdppc_growth L.c.fdi#c.pol_iq i.yr, equation(level))
nodiffsargan twostep robust orthogonal

```

```

182 est sto lc_poliq_sysgmm
183
184 Dynamic panel-data estimation, two-step system GMM
185 -----
186 Group variable: country_id      Number of obs      =      846
187 Time variable : yr              Number of groups    =       47
188 Number of instruments = 45      Obs per group: min =       18
189 Wald chi2(23) = 29034.48        avg =      18.00
190 Prob > chi2 = 0.000             max =       18
191 -----
192
193 ln_lc_encons | Coefficient   Corrected   z   P>|z|   [95% conf. interval]
194 -----+-----
195 ln_lc_encons |
196     L1.       | .9157395     .034559    26.50  0.000    .848005    .9834739
197
198     fdi       | .0087966     .0082992    1.06   0.289    -.0074694  .0250627
199     pol_iq    | .1033017     .0329963    3.13   0.002    .0386302  .1679732
200     ln_cpi    | .0605353     .0649769    0.93   0.352    -.066817  .1878876
201     gdppc_growth | .0041641     .0046445    0.90   0.370    -.004939  .0132671
202
203 c.fdi#c.pol_iq | -.0109562    .0101201   -1.08   0.279    -.0307913  .0088788
204
205     yr        |
206     2006      | -.0290313    .0207009   -1.40   0.161    -.0696044  .0115418
207     2007      | -.0458411    .0294101   -1.56   0.119    -.1034839  .0118017
208     2008      | -.0437945    .0325271   -1.35   0.178    -.1075464  .0199575
209     2009      | -.0438015    .0404971   -1.08   0.279    -.1231743  .0355713
210     2010      | -.0191031    .0287285   -0.66   0.506    -.07541    .0372038
211     2011      | -.0328287    .0257796   -1.27   0.203    -.0833559  .0176984
212     2012      | -.0859521    .0320165   -2.68   0.007    -.1487034  -.0232009
213     2013      | .0015337     .0310316    0.05   0.961    -.0592871  .0623544
214     2014      | -.0405033    .0317945   -1.27   0.203    -.1028193  .0218127
215     2015      | -.0134034    .0365021   -0.37   0.713    -.0849462  .0581394
216     2016      | -.0603861     .047535    -1.27   0.204    -.153553  .0327809
217     2017      | -.0378023    .0377175   -1.00   0.316    -.1117272  .0361225
218     2018      | -.0626945    .0447302   -1.40   0.161    -.1503641  .024975
219     2019      | -.0003617    .0457783   -0.01   0.994    -.0900854  .089362
220     2020      | -.0438782     .047087   -0.93   0.351    -.1361671  .0484107
221     2021      | -.0995016    .0433987   -2.29   0.022    -.1845615  -.0144418
222     2022      | -.0888896    .0451874   -1.97   0.049    -.1774554  -.0003239
223
224     _cons     | -.2453832    .2956716   -0.83   0.407    -.8248889  .3341226
225 -----
226 Instruments for orthogonal deviations equation
227     GMM-type (missing=0, separate instruments for each period unless collapsed)
228     L4.L4.ln_lc_encons
229 Instruments for levels equation
230     Standard
231     L.fdi L.pol_iq L.ln_cpi gdppc_growth cL.fdi#c.pol_iq 2004b.yr 2005.yr
232     2006.yr 2007.yr 2008.yr 2009.yr 2010.yr 2011.yr 2012.yr 2013.yr 2014.yr
233     2015.yr 2016.yr 2017.yr 2018.yr 2019.yr 2020.yr 2021.yr 2022.yr
234     _cons
235     GMM-type (missing=0, separate instruments for each period unless collapsed)
236     DL3.L4.ln_lc_encons
237 -----
238 Arellano-Bond test for AR(1) in first differences: z = -2.89 Pr > z = 0.004
239 Arellano-Bond test for AR(2) in first differences: z = -0.23 Pr > z = 0.815
240 -----
241 Sargan test of overid. restrictions: chi2(21) = 47.30 Prob > chi2 = 0.001
242 (Not robust, but not weakened by many instruments.)
243 Hansen test of overid. restrictions: chi2(21) = 15.67 Prob > chi2 = 0.788
244 (Robust, but weakened by many instruments.)

```

```

245
246
247 **2.4. Low-carbon energy with gov_iq
248 xtabond2 L(0/1).ln_lc_encons fdi gov_iq ln_cpi gdppc_growth c.fdi#c.gov_iq i.yr, gmm(L4.ln_lc_encons,
    lag (4 4)) iv(L.fdi gov_iq L.ln_cpi gdppc_growth L.c.fdi#c.gov_iq i.yr, equation(level))
    nodiffsargan twostep robust
249 est sto lc_goviq_sysgmm
250
251 Dynamic panel-data estimation, two-step system GMM
252 -----
253 Group variable: country_id          Number of obs      =      846
254 Time variable : yr                  Number of groups    =       47
255 Number of instruments = 45           Obs per group: min =       18
256 Wald chi2(23) = 6508.98              avg =      18.00
257 Prob > chi2 = 0.000                  max =       18
258 -----
259
260 ln_lc_encons | Coefficient   Corrected      z    P>|z|    [95% conf. interval]
261 -----+-----
262 ln_lc_encons |
263     L1.       | .8780153   .0477633   18.38   0.000   .7844009   .9716297
264
265     fdi       | .0072132   .0042003    1.72   0.086   -.0010191   .0154456
266     gov_iq    | .1315724   .0612781    2.15   0.032   .0114696   .2516752
267     ln_cpi    | .0466793   .0950281    0.49   0.623   -.1395723   .2329309
268     gdppc_growth | .0039967   .007496    0.53   0.594   -.0106952   .0186886
269
270 c.fdi#c.gov_iq | -.0054906   .0041867   -1.31   0.190   -.0136964   .0027152
271
272     yr        |
273     2005      | .0234898   .025831    0.91   0.363   -.0271381   .0741177
274     2006      | .0019867   .0207279    0.10   0.924   -.0386391   .0426126
275     2008      | -.0055518   .0344348   -0.16   0.872   -.0730427   .0619392
276     2009      | -.0207464   .0665171   -0.31   0.755   -.1511174   .1096247
277     2010      | .0158834   .0343881    0.46   0.644   -.051516   .0832828
278     2011      | .0102251   .0264069    0.39   0.699   -.0415315   .0619818
279     2012      | -.0458401   .0424798   -1.08   0.281   -.129099   .0374189
280     2013      | .0487118   .0488563    1.00   0.319   -.0470448   .1444685
281     2014      | .0004264   .047573    0.01   0.993   -.092815   .0936678
282     2015      | .0198145   .0413401    0.48   0.632   -.0612106   .1008395
283     2016      | -.0080848   .0470857   -0.17   0.864   -.1003711   .0842015
284     2017      | .0257893   .0416493    0.62   0.536   -.0558418   .1074204
285     2018      | -.001492   .0546822   -0.03   0.978   -.1086673   .1056832
286     2019      | .0351015   .052863    0.66   0.507   -.068508   .1387111
287     2020      | -.0068972   .0839219   -0.08   0.934   -.1713812   .1575867
288     2021      | -.0300846   .0472812   -0.64   0.525   -.1227539   .0625848
289     2022      | -.04433    .0617331   -0.72   0.473   -.1653246   .0766645
290
291     _cons     | -.2938159   .433738   -0.68   0.498   -1.143927   .556295
292 -----
293 Instruments for first differences equation
294     GMM-type (missing=0, separate instruments for each period unless collapsed)
295     L4.L4.ln_lc_encons
296 Instruments for levels equation
297     Standard
298     L.fdi gov_iq L.ln_cpi gdppc_growth cL.fdi#c.gov_iq 2004b.yr 2005.yr
299     2006.yr 2007.yr 2008.yr 2009.yr 2010.yr 2011.yr 2012.yr 2013.yr 2014.yr
300     2015.yr 2016.yr 2017.yr 2018.yr 2019.yr 2020.yr 2021.yr 2022.yr
301     _cons
302     GMM-type (missing=0, separate instruments for each period unless collapsed)
303     DL3.L4.ln_lc_encons
304 -----
305 Arellano-Bond test for AR(1) in first differences: z = -3.04 Pr > z = 0.002

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306 Arellano-Bond test for AR(2) in first differences: z = -0.38 Pr > z = 0.707
307 -----
308 Sargan test of overid. restrictions: chi2(21) = 31.07 Prob > chi2 = 0.072
309 (Not robust, but not weakened by many instruments.)
310 Hansen test of overid. restrictions: chi2(21) = 13.75 Prob > chi2 = 0.880
311 (Robust, but weakened by many instruments.)
312
313
314 **2.5. Low-carbon energy with rul_iq
315 xtabond2 L(0/1).ln_lc_encons fdi rul_iq ln_cpi gdppc_growth c.fdi#c.rul_iq i.yr, gmm(L4.ln_lc_encons,
lag (4 4)) iv(L.fdi rul_iq L.ln_cpi gdppc_growth L.c.fdi#c.rul_iq i.yr, equation(level))
nodiffsargan twostep robust orthogonal
316 est sto lc_ruliq_sysgmm
317 Dynamic panel-data estimation, two-step system GMM
318 -----
319 Group variable: country_id Number of obs = 846
320 Time variable : yr Number of groups = 47
321 Number of instruments = 45 Obs per group: min = 18
322 Wald chi2(23) = 4639.88 avg = 18.00
323 Prob > chi2 = 0.000 max = 18
324 -----
325
326 ln_lc_encons | Coefficient Corrected std. err. z P>|z| [95% conf. interval]
327 -----+-----
328 ln_lc_encons |
329 L1. | .8796564 .0378878 23.22 0.000 .8053976 .9539152
330
331 fdi | .0085351 .0029478 2.90 0.004 .0027575 .0143126
332 rul_iq | .1338393 .0453984 2.95 0.003 .0448602 .2228185
333 ln_cpi | .0784 .0921622 0.85 0.395 -.1022346 .2590346
334 gdppc_growth | .0049506 .0068619 0.72 0.471 -.0084985 .0183997
335
336 c.fdi#c.rul_iq | -.0068723 .0033416 -2.06 0.040 -.0134216 -.0003229
337
338 yr |
339 2005 | .074562 .0488481 1.53 0.127 -.0211785 .1703026
340 2006 | .0535711 .046363 1.16 0.248 -.0372988 .144441
341 2007 | .059932 .0430771 1.39 0.164 -.0244975 .1443616
342 2008 | .0479665 .044425 1.08 0.280 -.0391048 .1350378
343 2009 | .0305536 .0640468 0.48 0.633 -.0949758 .156083
344 2010 | .0557318 .0357465 1.56 0.119 -.01433 .1257935
345 2011 | .0547875 .0351299 1.56 0.119 -.0140658 .1236408
346 2012 | -.0049304 .0421692 -0.12 0.907 -.0875804 .0777196
347 2013 | .0941905 .0429793 2.19 0.028 .0099527 .1784284
348 2014 | .0322429 .0393747 0.82 0.413 -.0449301 .109416
349 2015 | .067857 .0393964 1.72 0.085 -.0093585 .1450724
350 2016 | .0342213 .044312 0.77 0.440 -.0526285 .1210711
351 2017 | .0631707 .0340901 1.85 0.064 -.0036447 .1299861
352 2018 | .0357205 .0333927 1.07 0.285 -.029728 .101169
353 2019 | .0778196 .0493948 1.58 0.115 -.0189925 .1746317
354 2020 | .0348944 .0729723 0.48 0.633 -.1081286 .1779174
355 2022 | -.0133196 .0362898 -0.37 0.714 -.0844463 .0578072
356
357 _cons | -.4889577 .4553066 -1.07 0.283 -1.381342 .4034268
358 -----
359 Instruments for orthogonal deviations equation
360 GMM-type (missing=0, separate instruments for each period unless collapsed)
361 L4.L4.ln_lc_encons
362 Instruments for levels equation
363 Standard
364 L.fdi rul_iq L.ln_cpi gdppc_growth cL.fdi#c.rul_iq 2004b.yr 2005.yr
365 2006.yr 2007.yr 2008.yr 2009.yr 2010.yr 2011.yr 2012.yr 2013.yr 2014.yr
366 2015.yr 2016.yr 2017.yr 2018.yr 2019.yr 2020.yr 2021.yr 2022.yr

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367      _cons
368      GMM-type (missing=0, separate instruments for each period unless collapsed)
369      DL3.L4.ln_lc_encons
370  -----
371  Arellano-Bond test for AR(1) in first differences: z = -3.10 Pr > z = 0.002
372  Arellano-Bond test for AR(2) in first differences: z = -0.41 Pr > z = 0.684
373  -----
374  Sargan test of overid. restrictions: chi2(21) = 28.52 Prob > chi2 = 0.126
375  (Not robust, but not weakened by many instruments.)
376  Hansen test of overid. restrictions: chi2(21) = 14.02 Prob > chi2 = 0.869
377  (Robust, but weakened by many instruments.)
378
379  **2.6. Low-carbon energy with con_iq
380  xtabond2 L(0/1).ln_lc_encons fdi con_iq ln_cpi gdppc_growth c.fdi#c.con_iq i.yr, gmm(L4.ln_lc_encons,
      lag (4 4)) iv(L.fdi L.con_iq L.ln_cpi gdppc_growth L.c.fdi#c.con_iq i.yr, equation(level))
      nodiffsargan twostep robust orthogonal
381  est sto lc_coniq_sysgmm
382  Dynamic panel-data estimation, two-step system GMM
383  -----
384  Group variable: country_id      Number of obs      =      846
385  Time variable : yr              Number of groups   =      47
386  Number of instruments = 45      Obs per group: min =      18
387  Wald chi2(23) = 7247.65          avg =      18.00
388  Prob > chi2 = 0.000              max =      18
389  -----
390
391      ln_lc_encons |      Coefficient      Corrected      z      P>|z|      [95% conf. interval]
392      -----+-----
393      ln_lc_encons |
394      L1.           |      .8911877      .0380847      23.40      0.000      .816543      .9658323
395
396      fdi           |      .0056523      .0019086      2.96      0.003      .0019115      .0093931
397      con_iq        |      .0907105      .0335179      2.71      0.007      .0250167      .1564044
398      ln_cpi        |      .0567591      .0838513      0.68      0.498      -.1075865      .2211047
399      gdppc_growth  |      .0050013      .0061187      0.82      0.414      -.0069912      .0169937
400
401      c.fdi#c.con_iq |      -.0048699      .0026752      -1.82      0.069      -.0101132      .0003734
402
403      yr            |
404      2005           |      .0720614      .0467255      1.54      0.123      -.0195189      .1636417
405      2006           |      .0503309      .0449009      1.12      0.262      -.0376733      .1383351
406      2007           |      .0558855      .0423099      1.32      0.187      -.0270404      .1388115
407      2008           |      .0447122      .0432442      1.03      0.301      -.0400449      .1294693
408      2009           |      .0328801      .0614908      0.53      0.593      -.0876398      .1533999
409      2010           |      .0598533      .0332546      1.80      0.072      -.0053246      .1250312
410      2011           |      .0576695      .0351352      1.64      0.101      -.0111942      .1265332
411      2012           |      .0034952      .0424092      0.08      0.934      -.0796254      .0866158
412      2013           |      .0969712      .0428455      2.26      0.024      .0129957      .1809468
413      2014           |      .0499295      .0395739      1.26      0.207      -.027634      .1274931
414      2015           |      .0772438      .0414492      1.86      0.062      -.0039952      .1584828
415      2016           |      .0423102      .0483331      0.88      0.381      -.0524209      .1370412
416      2017           |      .0639383      .0358021      1.79      0.074      -.0062324      .1341091
417      2018           |      .0362125      .0267884      1.35      0.176      -.0162917      .0887167
418      2019           |      .0881295      .0474624      1.86      0.063      -.0048951      .1811541
419      2020           |      .0384975      .065243      0.59      0.555      -.0893763      .1663714
420      2022           |      -.0086725      .0311032      -0.28      0.780      -.0696335      .0522886
421
422      _cons          |      -.3466012      .4129425      -0.84      0.401      -1.155954      .4627512
423  -----
424  Instruments for orthogonal deviations equation
425      GMM-type (missing=0, separate instruments for each period unless collapsed)
426      L4.L4.ln_lc_encons
427  Instruments for levels equation

```

```

428 Standard
429 L.fdi L.con_iq L.ln_cpi gdppc_growth cL.fdi#c.con_iq 2004b.yr 2005.yr
430 2006.yr 2007.yr 2008.yr 2009.yr 2010.yr 2011.yr 2012.yr 2013.yr 2014.yr
431 2015.yr 2016.yr 2017.yr 2018.yr 2019.yr 2020.yr 2021.yr 2022.yr
432 _cons
433 GMM-type (missing=0, separate instruments for each period unless collapsed)
434 DL3.L4.ln_lc_encons
435 -----
436 Arellano-Bond test for AR(1) in first differences: z = -3.03 Pr > z = 0.002
437 Arellano-Bond test for AR(2) in first differences: z = -0.36 Pr > z = 0.720
438 -----
439 Sargan test of overid. restrictions: chi2(21) = 28.95 Prob > chi2 = 0.115
440 (Not robust, but not weakened by many instruments.)
441 Hansen test of overid. restrictions: chi2(21) = 13.27 Prob > chi2 = 0.899
442 (Robust, but weakened by many instruments.)
443
444 -----
445
446 ***STEP 2: GMM to Non-low-carbon enegy
447 **2.1. Non-low-carbon energy with composite institutional quality
448 *2.1.1. Upper bound vs. Lower bound
449 *2.1.1.1. upper bound: pooled ols
450 reg L(0/1).ln_nlc_encons fdi composite_iq ln_cpi gdppc_growth c.fdi#c.composite_iq i.yr
451 est sto nlc_comiq_ols
452 //result: .9916427
453 *2.1.1.2 lower bound: fixed effect
454 xtreg L(0/1).ln_nlc_encons fdi composite_iq ln_cpi gdppc_growth c.fdi#c.composite_iq i.yr, fe robust
455 est sto nlc_comiq_fe
456 //result: .823528
457 **2.1.2 Difference GMM vs. System GMM
458 *2.1.2.1 twostep difference gmm
459 xtabond2 L(0/1).ln_nlc_encons fdi composite_iq ln_cpi gdppc_growth c.fdi#c.composite_iq i.yr, gmm(L4.
460 ln_nlc_encons L8.fdi L7.composite_iq L7.ln_cpi L5.gdppc_growth L7.c.fdi#c.composite_iq, lag(8 8)) iv(
461 i.yr)noleveleq nodiffsargan twostep robust orthogonal small
462 est sto nlc_comiq_diffgmm
463 //result: .5803862 => system GMM is the way to go
464 *2.1.2.2. twostep system gmm
465 xtabond2 L(0/1).ln_nlc_encons fdi composite_iq ln_cpi gdppc_growth c.fdi#c.composite_iq i.yr, gmm(L4.
466 ln_nlc_encons, lag(4 4)) iv(L.fdi L.composite_iq L.ln_cpi L.gdppc_growth L.c.fdi#c.composite_iq i.yr
467 , equation(level)) nodiffsargan twostep robust
468 est sto nlc_comiq_sysgmm
469
470 Dynamic panel-data estimation, two-step system GMM
471 -----
472
473 Group variable: country_id Number of obs = 882
474 Time variable : yr Number of groups = 49
475 Number of instruments = 33 Obs per group: min = 18
476 Wald chi2(23) = 977669.58 avg = 18.00
477 Prob > chi2 = 0.000 max = 18
478 -----
479
480 ln_nlc_encons | Corrected
481 | Coefficient std. err. z P>|z| [95% conf. interval]
482 -----+-----
483 ln_nlc_encons
484 L1. | .9237882 .0409062 22.58 0.000 .8436136 1.003963
485
486 fdi | -.00114 .0020415 -0.56 0.577 -.0051413 .0028612
487 composite_iq | .0548047 .0439204 1.25 0.212 -.0312776 .140887
488 ln_cpi | .0098303 .0384855 0.26 0.798 -.0655999 .0852605
489 gdppc_growth | .0045837 .0059457 0.77 0.441 -.0070697 .0162371
490
491 c.fdi#c.composite_iq | .0014391 .0020152 0.71 0.475 -.0025106 .0053887

```


485							
486	yr						
487	2005	-.0014996	.0226276	-0.07	0.947	-.0458489	.0428496
488	2006	-.0101228	.0207567	-0.49	0.626	-.0508052	.0305596
489	2007	-.0055815	.0203005	-0.27	0.783	-.0453699	.0342068
490	2008	-.0194184	.0342813	-0.57	0.571	-.0866085	.0477717
491	2009	-.075335	.0630511	-1.19	0.232	-.1989129	.0482428
492	2010	.0485154	.0250743	1.93	0.053	-.0006294	.0976602
493	2011	-.0162859	.0240948	-0.68	0.499	-.0635109	.0309392
494	2012	-.0244877	.0316067	-0.77	0.438	-.0864358	.0374603
495	2013	.0101137	.034202	0.30	0.767	-.0569209	.0771483
496	2014	-.0179054	.0257538	-0.70	0.487	-.0683819	.0325711
497	2015	-.0220392	.0244838	-0.90	0.368	-.0700265	.0259481
498	2016	-.0197104	.0220764	-0.89	0.372	-.0629792	.0235585
499	2017	-.0012766	.0208083	-0.06	0.951	-.0420602	.0395069
500	2018	-.0035091	.0210213	-0.17	0.867	-.04471	.0376918
501	2019	-.0305335	.0265494	-1.15	0.250	-.0825695	.0215024
502	2020	-.0173989	.0616055	-0.28	0.778	-.1381436	.1033457
503	2022	-.0390754	.022055	-1.77	0.076	-.0823025	.0041516
504							
505	_cons	.181565	.1888478	0.96	0.336	-.1885699	.5516998

Instruments for first differences equation

GMM-type (missing=0, separate instruments for each period unless collapsed)

L7.L7.ln_nlc_encons

Instruments for levels equation

Standard

L.fdi L.composite_iq L.ln_cpi L.gdppc_growth cL.fdi#c.composite_iq

2004b.yr 2005.yr 2006.yr 2007.yr 2008.yr 2009.yr 2010.yr 2011.yr 2012.yr

2013.yr 2014.yr 2015.yr 2016.yr 2017.yr 2018.yr 2019.yr 2020.yr 2021.yr

2022.yr

_cons

GMM-type (missing=0, separate instruments for each period unless collapsed)

DL6.L7.ln_nlc_encons

Arellano-Bond test for AR(1) in first differences: z = -3.09 Pr > z = 0.002

Arellano-Bond test for AR(2) in first differences: z = -0.32 Pr > z = 0.746

Sargan test of overid. restrictions: chi2(9) = 21.61 Prob > chi2 = 0.010
(Not robust, but not weakened by many instruments.)

Hansen test of overid. restrictions: chi2(9) = 10.19 Prob > chi2 = 0.335
(Robust, but weakened by many instruments.)

**2.2. Non-low-carbon energy with voi_iq

xtabond2 L(0/1).ln_nlc_encons fdi voi_iq ln_cpi gdppc_growth c.fdi#c.voi_iq i.yr, gmm(L7.
ln_nlc_encons, lag (7 7)) iv(L.fdi L.voi_iq L.ln_cpi L.gdppc_growth L.c.fdi#c.voi_iq i.yr, equation(
level)) nodiffsargan twostep robust

est sto nlc_voi_iq_sysgmm

Dynamic panel-data estimation, two-step system GMM

Group variable: country_id	Number of obs	=	882
Time variable : yr	Number of groups	=	49
Number of instruments = 33	Obs per group: min	=	18
Wald chi2(23) = 843537.70	avg	=	18.00
Prob > chi2 = 0.000	max	=	18

		Corrected				
ln_nlc_encons	Coefficient	std. err.	z	P> z	[95% conf. interval]	
-----+-----						
ln_nlc_encons						
L1.	.9206787	.0322157	28.58	0.000	.8575371	.9838203

546							
547	fdi	.0046794	.0026618	1.76	0.079	-.0005375	.0098964
548	voi_iq	.0478488	.0308749	1.55	0.121	-.012665	.1083625
549	ln_cpi	-.0050381	.0365504	-0.14	0.890	-.0766756	.0665993
550	gdppc_growth	.0031476	.0053087	0.59	0.553	-.0072572	.0135524
551							
552	c.fdi#c.voi_iq	-.0027691	.0018519	-1.50	0.135	-.0063989	.0008606
553							
554	yr						
555	2005	-.0041592	.0229728	-0.18	0.856	-.049185	.0408667
556	2006	-.0149147	.0218234	-0.68	0.494	-.0576878	.0278585
557	2007	-.0102383	.0206892	-0.49	0.621	-.0507883	.0303118
558	2008	-.0246024	.0327214	-0.75	0.452	-.0887351	.0395303
559	2009	-.084587	.0560949	-1.51	0.132	-.194531	.0253569
560	2010	.0473577	.0239615	1.98	0.048	.0003941	.0943214
561	2011	-.0206482	.0228504	-0.90	0.366	-.0654341	.0241378
562	2012	-.0270088	.0301675	-0.90	0.371	-.0861361	.0321184
563	2013	.0089161	.033039	0.27	0.787	-.0558392	.0736713
564	2014	-.0170097	.0242693	-0.70	0.483	-.0645766	.0305572
565	2015	-.0255497	.0229601	-1.11	0.266	-.0705508	.0194513
566	2016	-.0221976	.0218474	-1.02	0.310	-.0650177	.0206226
567	2017	-.0025267	.01922	-0.13	0.895	-.0401972	.0351438
568	2018	-.0009284	.0200103	-0.05	0.963	-.0401478	.038291
569	2019	-.0365222	.0252667	-1.45	0.148	-.0860439	.0129995
570	2020	-.0345152	.0545556	-0.63	0.527	-.1414421	.0724118
571	2022	-.0400092	.0202934	-1.97	0.049	-.0797835	-.0002348
572							
573	_cons	.2678679	.1901732	1.41	0.159	-.1048648	.6406006

```

574 -----
575 Instruments for first differences equation
576   GMM-type (missing=0, separate instruments for each period unless collapsed)
577   L7.L7.ln_nlc_encons
578 Instruments for levels equation
579   Standard
580   L.fdi L.voi_iq L.ln_cpi L.gdppc_growth cL.fdi#c.voi_iq 2004b.yr 2005.yr
581   2006.yr 2007.yr 2008.yr 2009.yr 2010.yr 2011.yr 2012.yr 2013.yr 2014.yr
582   2015.yr 2016.yr 2017.yr 2018.yr 2019.yr 2020.yr 2021.yr 2022.yr
583   _cons
584   GMM-type (missing=0, separate instruments for each period unless collapsed)
585   DL6.L7.ln_nlc_encons
586 -----

```

```

587 Arellano-Bond test for AR(1) in first differences: z = -3.09 Pr > z = 0.002
588 Arellano-Bond test for AR(2) in first differences: z = -0.67 Pr > z = 0.505
589 -----

```

```

590 Sargan test of overid. restrictions: chi2(9) = 19.69 Prob > chi2 = 0.020
591 (Not robust, but not weakened by many instruments.)
592 Hansen test of overid. restrictions: chi2(9) = 8.09 Prob > chi2 = 0.525
593 (Robust, but weakened by many instruments.)
594
595

```

```

596 **2.3. Non-low-carbon energy with pol_iq
597 xtabond2 L(0/1).ln_nlc_encons fdi pol_iq ln_cpi gdppc_growth c.fdi#c.pol_iq i.yr, gmm(L7.
598 ln_nlc_encons, lag (7 7)) iv(L.fdi L.pol_iq L.ln_cpi gdppc_growth L.c.fdi#c.pol_iq i.yr, equation(
599 level)) nodiffsargan twostep robust orthogonal
600 est sto nlc_poliq_sysgmm
601

```

```

602 Dynamic panel-data estimation, two-step system GMM
603 -----

```

```

602 Group variable: country_id          Number of obs      =      882
603 Time variable : yr                  Number of groups    =       49
604 Number of instruments = 33          Obs per group: min  =       18
605 Wald chi2(23) = 820826.42          avg                =     18.00
606 Prob > chi2    =      0.000          max                =       18

```

```

607 -----
608
609 ln_nlc_encons | Coefficient | Corrected | z | P>|z| | [95% conf. interval]
610 -----+-----
611 ln_nlc_encons
612     L1. | .9133011 | .0298355 | 30.61 | 0.000 | .8548246 | .9717775
613
614     fdi | -.0014109 | .0029378 | -0.48 | 0.631 | -.0071689 | .0043471
615     pol_iq | .0503488 | .0276445 | 1.82 | 0.069 | -.0038334 | .104531
616     ln_cpi | -.0060025 | .0361404 | -0.17 | 0.868 | -.0768364 | .0648313
617     gdppc_growth | .0035477 | .0026721 | 1.33 | 0.184 | -.0016895 | .0087849
618
619 c.fdi#c.pol_iq | .0018935 | .0032397 | 0.58 | 0.559 | -.0044562 | .0082432
620
621     yr
622     2005 | .0360564 | .0255359 | 1.41 | 0.158 | -.0139931 | .0861058
623     2006 | .0260333 | .0234052 | 1.11 | 0.266 | -.0198401 | .0719066
624     2007 | .0349587 | .026818 | 1.30 | 0.192 | -.0176036 | .087521
625     2008 | .0150064 | .0289782 | 0.52 | 0.605 | -.0417899 | .0718027
626     2009 | -.0473271 | .0328446 | -1.44 | 0.150 | -.1117013 | .0170472
627     2010 | .0850255 | .0231768 | 3.67 | 0.000 | .0395998 | .1304512
628     2011 | .0208106 | .0259815 | 0.80 | 0.423 | -.0301123 | .0717335
629     2012 | .0081135 | .0252976 | 0.32 | 0.748 | -.0414689 | .0576959
630     2013 | .0439012 | .0275145 | 1.60 | 0.111 | -.0100262 | .0978286
631     2014 | .0171319 | .0190296 | 0.90 | 0.368 | -.0201654 | .0544293
632     2015 | .014072 | .0181882 | 0.77 | 0.439 | -.0215762 | .0497202
633     2016 | .0202763 | .0217327 | 0.93 | 0.351 | -.0223191 | .0628717
634     2017 | .0356117 | .0180942 | 1.97 | 0.049 | .0001477 | .0710757
635     2018 | .0326969 | .0158203 | 2.07 | 0.039 | .0016896 | .0637041
636     2019 | .0030535 | .0188772 | 0.16 | 0.871 | -.0339452 | .0400522
637     2020 | .011083 | .0292103 | 0.38 | 0.704 | -.0461683 | .0683342
638     2021 | .0396883 | .0157056 | 2.53 | 0.012 | .0089059 | .0704707
639
640     _cons | .2871345 | .2099432 | 1.37 | 0.171 | -.1243465 | .6986156
641 -----
642 Instruments for orthogonal deviations equation
643     GMM-type (missing=0, separate instruments for each period unless collapsed)
644     L7.L7.ln_nlc_encons
645 Instruments for levels equation
646     Standard
647     L.fdi L.pol_iq L.ln_cpi gdppc_growth cL.fdi#c.pol_iq 2004b.yr 2005.yr
648     2006.yr 2007.yr 2008.yr 2009.yr 2010.yr 2011.yr 2012.yr 2013.yr 2014.yr
649     2015.yr 2016.yr 2017.yr 2018.yr 2019.yr 2020.yr 2021.yr 2022.yr
650     _cons
651     GMM-type (missing=0, separate instruments for each period unless collapsed)
652     DL6.L7.ln_nlc_encons
653 -----
654 Arellano-Bond test for AR(1) in first differences: z = -3.14 Pr > z = 0.002
655 Arellano-Bond test for AR(2) in first differences: z = -0.37 Pr > z = 0.708
656 -----
657 Sargan test of overid. restrictions: chi2(9) = 24.99 Prob > chi2 = 0.003
658 (Not robust, but not weakened by many instruments.)
659 Hansen test of overid. restrictions: chi2(9) = 8.92 Prob > chi2 = 0.444
660 (Robust, but weakened by many instruments.)
661
662 **2.4. Non-low-carbon energy with gov_iq
663 xtabond2 L(0/1).ln_nlc_encons fdi gov_iq ln_cpi gdppc_growth c.fdi#c.gov_iq i.yr, gmm(L7.
664 ln_nlc_encons, lag (7 7)) iv(L.fdi L.gov_iq L.ln_cpi gdppc_growth L.c.fdi#c.gov_iq i.yr, equation(
665 level)) nodiffsargan twostep robust
666 est sto nlc_goviq_sysgmm
667 -----
668 Dynamic panel-data estimation, two-step system GMM
669 -----

```

```

668 Group variable: country_id      Number of obs      =      882
669 Time variable : yr              Number of groups    =      49
670 Number of instruments = 33      Obs per group: min =      18
671 Wald chi2(23) = 508513.15      avg =      18.00
672 Prob > chi2    =      0.000      max =      18

```

673	-----						
674							
675	ln_nlc_encons	Coefficient	Corrected std. err.	z	P> z	[95% conf. interval]	
676	-----						
677	ln_nlc_encons						
678	L1.	.8778754	.076404	11.49	0.000	.7281263	1.027624
679							
680	fdi	.00061	.0038196	0.16	0.873	-.0068762	.0080962
681	gov_iq	.101591	.0776575	1.31	0.191	-.0506148	.2537968
682	ln_cpi	.0134202	.0407381	0.33	0.742	-.0664249	.0932654
683	gdppc_growth	.0055183	.0035095	1.57	0.116	-.0013602	.0123968
684							
685	c.fdi#c.gov_iq	.0002141	.0023591	0.09	0.928	-.0044097	.0048379
686							
687	yr						
688	2005	.0030128	.0198336	0.15	0.879	-.0358603	.041886
689	2006	-.0085115	.0206828	-0.41	0.681	-.049049	.032026
690	2007	-.005025	.0181742	-0.28	0.782	-.0406458	.0305958
691	2008	-.0152725	.0230792	-0.66	0.508	-.0605069	.029962
692	2009	-.0715407	.0388663	-1.84	0.066	-.1477173	.004636
693	2010	.0452786	.0189781	2.39	0.017	.0080822	.0824749
694	2011	-.0135589	.018089	-0.75	0.454	-.0490127	.0218948
695	2012	-.0223135	.0216754	-1.03	0.303	-.0647964	.0201694
696	2013	.010373	.025608	0.41	0.685	-.0398177	.0605637
697	2014	-.0150071	.0159294	-0.94	0.346	-.0462282	.0162141
698	2015	-.0212326	.0166108	-1.28	0.201	-.0537892	.0113239
699	2016	-.0180256	.0131357	-1.37	0.170	-.0437711	.00772
700	2017	-.0017639	.0132799	-0.13	0.894	-.0277921	.0242642
701	2018	.0026421	.013917	0.19	0.849	-.0246347	.0299189
702	2019	-.0305573	.0163248	-1.87	0.061	-.0625533	.0014387
703	2020	-.0106338	.0351957	-0.30	0.763	-.0796161	.0583484
704	2022	-.0342772	.015819	-2.17	0.030	-.0652818	-.0032725
705							
706	cons	.2692769	.2692056	1.00	0.317	-.2583565	.7969102

```

708 Instruments for first differences equation
709 GMM-type (missing=0, separate instruments for each period unless collapsed)
710 L7.L7.ln_nlc_encons
711 Instruments for levels equation
712 Standard
713 L.fdi L.gov_iq L.ln_cpi gdppc_growth cL.fdi#c.gov_iq 2004b.yr 2005.yr
714 2006.yr 2007.yr 2008.yr 2009.yr 2010.yr 2011.yr 2012.yr 2013.yr 2014.yr
715 2015.yr 2016.yr 2017.yr 2018.yr 2019.yr 2020.yr 2021.yr 2022.yr
716 _cons
717 GMM-type (missing=0, separate instruments for each period unless collapsed)
718 DL6.L7.ln_nlc_encons

```

```

720 Arellano-Bond test for AR(1) in first differences: z = -2.84 Pr > z = 0.004
721 Arellano-Bond test for AR(2) in first differences: z = -0.44 Pr > z = 0.656
722 -----

```

```

723 Sargan test of overid. restrictions: chi2(9) = 20.32 Prob > chi2 = 0.016
724 (Not robust, but not weakened by many instruments.)

```

```

725 Hansen test of overid. restrictions: chi2(9) = 10.07 Prob > chi2 = 0.345
726 (Robust, but weakened by many instruments.)

```

```

729 **2.4. Low-carbon energy with reg_iq

```

```

730 xtabond2 L(0/1).ln_nlc_encons fdi reg_iq ln_cpi gdppc_growth c.fdi#c.reg_iq i.yr, gmm(L7.

```

```

ln_nlc_encons, lag (7 7)) iv(L.fdi reg_iq L.ln_cpi gdppc_growth L.c.fdi#c.reg_iq i.yr, equation(level
)) nodiffsargan twostep robust
731 est sto nlc_regiq_sysgmm
732
733 Dynamic panel-data estimation, two-step system GMM
734 -----
735 Group variable: country_id          Number of obs      =      882
736 Time variable : yr                 Number of groups   =       49
737 Number of instruments = 33          Obs per group: min =       18
738 Wald chi2(23) = 2.15e+06             avg =      18.00
739 Prob > chi2 = 0.000                  max =       18
740 -----
741
742 ln_nlc_encons | Coefficient      Corrected      z      P>|z|      [95% conf. interval]
743 -----+-----
744 ln_nlc_encons |
745 L1.            | .9400643 .0401009 23.44 0.000 .8614679 1.018661
746
747 fdi            | .0011752 .0016706 0.70 0.482 -.0020991 .0044494
748 reg_iq         | .0416778 .0444056 0.94 0.348 -.0453555 .1287111
749 ln_cpi         | .0051212 .0432837 0.12 0.906 -.0797134 .0899558
750 gdppc_growth   | .0048228 .003006 1.60 0.109 -.0010689 .0107144
751
752 c.fdi#c.reg_iq | -.0002315 .0013847 -0.17 0.867 -.0029455 .0024825
753
754 yr            |
755 2005           | .0061964 .0113059 0.55 0.584 -.0159627 .0283555
756 2006           | -.0025826 .0120525 -0.21 0.830 -.0262051 .0210399
757 2008           | -.0144309 .0159564 -0.90 0.366 -.0457048 .016843
758 2009           | -.0657016 .0314886 -2.09 0.037 -.1274182 -.003985
759 2010           | .0580807 .0138395 4.20 0.000 .0309557 .0852056
760 2011           | -.0087755 .0186202 -0.47 0.637 -.0452703 .0277194
761 2012           | -.0147289 .0173198 -0.85 0.395 -.0486751 .0192173
762 2013           | .0168244 .0228528 0.74 0.462 -.0279663 .0616151
763 2014           | -.0089508 .0165781 -0.54 0.589 -.0414433 .0235417
764 2015           | -.0128308 .0178741 -0.72 0.473 -.0478633 .0222017
765 2016           | -.0132609 .0149743 -0.89 0.376 -.0426099 .0160882
766 2017           | .0057896 .0185882 0.31 0.755 -.0306426 .0422217
767 2018           | .0041956 .0215129 0.20 0.845 -.037969 .0463602
768 2019           | -.0264567 .0201807 -1.31 0.190 -.0660102 .0130968
769 2020           | -.0121703 .0343145 -0.35 0.723 -.0794255 .0550849
770 2021           | .0056941 .018051 0.32 0.752 -.0296852 .0410735
771 2022           | -.0303694 .0260581 -1.17 0.244 -.0814424 .0207036
772
773 _cons          | .1412073 .1373307 1.03 0.304 -.1279559 .4103704
774 -----
775 Instruments for first differences equation
776 GMM-type (missing=0, separate instruments for each period unless collapsed)
777 L7.L7.ln_nlc_encons
778 Instruments for levels equation
779 Standard
780 L.fdi reg_iq L.ln_cpi gdppc_growth cL.fdi#c.reg_iq 2004b.yr 2005.yr
781 2006.yr 2007.yr 2008.yr 2009.yr 2010.yr 2011.yr 2012.yr 2013.yr 2014.yr
782 2015.yr 2016.yr 2017.yr 2018.yr 2019.yr 2020.yr 2021.yr 2022.yr
783 _cons
784 GMM-type (missing=0, separate instruments for each period unless collapsed)
785 DL6.L7.ln_nlc_encons
786 -----
787 Arellano-Bond test for AR(1) in first differences: z = -3.06 Pr > z = 0.002
788 Arellano-Bond test for AR(2) in first differences: z = -0.44 Pr > z = 0.661
789 -----
790 Sargan test of overid. restrictions: chi2(9) = 21.44 Prob > chi2 = 0.011
791 (Not robust, but not weakened by many instruments.)

```

```

792 Hansen test of overid. restrictions: chi2(9) = 10.02 Prob > chi2 = 0.349
793 (Robust, but weakened by many instruments.)
794
795
796 **2.5. Non-low-carbon energy with rul_iq
797 xtabond2 L(0/1).ln_nlc_encons fdi rul_iq ln_cpi gdppc_growth c.fdi#c.rul_iq i.yr, gmm(L7.
ln_nlc_encons, lag (7 7)) iv(L.fdi rul_iq L.ln_cpi gdppc_growth L.c.fdi#c.rul_iq i.yr, equation(level
)) nodiffsargan twostep robust orthogonal
798 est sto nlc_ruliq_sysgmm
799
800 Dynamic panel-data estimation, two-step system GMM
801 -----
802 Group variable: country_id Number of obs = 882
803 Time variable : yr Number of groups = 49
804 Number of instruments = 33 Obs per group: min = 18
805 Wald chi2(23) = 804534.60 avg = 18.00
806 Prob > chi2 = 0.000 max = 18
807 -----
808
809 ln_nlc_encons | Coefficient Corrected std. err. z P>|z| [95% conf. interval]
810 -----+-----
811 ln_nlc_encons
812 L1. | .9156474 .049178 18.62 0.000 .8192604 1.012034
813
814 fdi | -.0008071 .001963 -0.41 0.681 -.0046545 .0030403
815 rul_iq | .0565984 .046699 1.21 0.226 -.03493 .1481267
816 ln_cpi | .0057029 .0390271 0.15 0.884 -.0707889 .0821946
817 gdppc_growth | .0056597 .0034723 1.63 0.103 -.0011459 .0124653
818
819 c.fdi#c.rul_iq | .0010268 .0016198 0.63 0.526 -.0021479 .0042014
820
821 yr
822 2005 | .0413019 .027345 1.51 0.131 -.0122933 .0948972
823 2006 | .0290608 .0267847 1.08 0.278 -.0234363 .0815579
824 2007 | .0343876 .028252 1.22 0.224 -.0209854 .0897605
825 2008 | .0262386 .0307674 0.85 0.394 -.0340645 .0865417
826 2009 | -.026979 .0384773 -0.70 0.483 -.1023931 .048435
827 2010 | .0890378 .0241363 3.69 0.000 .0417316 .136344
828 2011 | .02511 .0241066 1.04 0.298 -.0221381 .0723582
829 2012 | .0200096 .027411 0.73 0.465 -.0337149 .0737341
830 2013 | .0561241 .0307415 1.83 0.068 -.0041282 .1163764
831 2014 | .0206903 .019352 1.07 0.285 -.0172389 .0586195
832 2015 | .0174176 .0188077 0.93 0.354 -.019445 .0542801
833 2016 | .0229348 .0217824 1.05 0.292 -.019758 .0656275
834 2017 | .0399091 .0194965 2.05 0.041 .0016967 .0781215
835 2018 | .0384984 .0176402 2.18 0.029 .0039242 .0730725
836 2019 | .0138617 .0201314 0.69 0.491 -.0255951 .0533185
837 2020 | .0313699 .0362349 0.87 0.387 -.0396492 .1023889
838 2021 | .0376674 .0176909 2.13 0.033 .0029939 .0723408
839
840 _cons | .1791803 .2171638 0.83 0.409 -.2464528 .6048135
841 -----
842 Instruments for orthogonal deviations equation
843 GMM-type (missing=0, separate instruments for each period unless collapsed)
844 L7.L7.ln_nlc_encons
845 Instruments for levels equation
846 Standard
847 L.fdi rul_iq L.ln_cpi gdppc_growth cL.fdi#c.rul_iq 2004b.yr 2005.yr
848 2006.yr 2007.yr 2008.yr 2009.yr 2010.yr 2011.yr 2012.yr 2013.yr 2014.yr
849 2015.yr 2016.yr 2017.yr 2018.yr 2019.yr 2020.yr 2021.yr 2022.yr
850 _cons
851 GMM-type (missing=0, separate instruments for each period unless collapsed)
852 DL6.L7.ln_nlc_encons

```



```

853 -----
854 Arellano-Bond test for AR(1) in first differences: z = -3.09 Pr > z = 0.002
855 Arellano-Bond test for AR(2) in first differences: z = -0.42 Pr > z = 0.672
856 -----
857 Sargan test of overid. restrictions: chi2(9) = 21.19 Prob > chi2 = 0.012
858 (Not robust, but not weakened by many instruments.)
859 Hansen test of overid. restrictions: chi2(9) = 10.95 Prob > chi2 = 0.279
860 (Robust, but weakened by many instruments.)
861
862
863 **2.6. Non-low-carbon energy with con_iq
864 xtabond2 L(0/1).ln_nlc_encons fdi con_iq ln_cpi gdppc_growth c.fdi#c.con_iq i.yr, gmm(L7.
ln_nlc_encons, lag (7 7)) iv(L.fdi L.con_iq L.ln_cpi gdppc_growth L.c.fdi#c.con_iq i.yr, equation(
level)) nodiffsargan twostep robust orthogonal
865 est sto nlc_coniq_sysgmm
866
867
868 Dynamic panel-data estimation, two-step system GMM
869 -----
870 Group variable: country_id Number of obs = 882
871 Time variable : yr Number of groups = 49
872 Number of instruments = 33 Obs per group: min = 18
873 Wald chi2(23) = 839781.85 avg = 18.00
874 Prob > chi2 = 0.000 max = 18
875 -----
876
877 ln_nlc_encons | Coefficient | Corrected | z | P>|z| | [95% conf. interval]
878 -----+-----
879 ln_nlc_encons |
880 L1. | .9222666 | .0425909 | 21.65 | 0.000 | .83879 | 1.005743
881
882 fdi | -.0002142 | .0015656 | -0.14 | 0.891 | -.0032828 | .0028544
883 con_iq | .0421401 | .0330861 | 1.27 | 0.203 | -.0227074 | .1069876
884 ln_cpi | -.0035363 | .0362091 | -0.10 | 0.922 | -.0745047 | .0674322
885 gdppc_growth | .0051477 | .0033233 | 1.55 | 0.121 | -.0013658 | .0116612
886
887 c.fdi#c.con_iq | .0006817 | .0011245 | 0.61 | 0.544 | -.0015222 | .0028857
888
889 yr |
890 2005 | .0065589 | .0329483 | 0.20 | 0.842 | -.0580186 | .0711365
891 2006 | -.0039365 | .0386173 | -0.10 | 0.919 | -.079625 | .071752
892 2007 | .0023959 | .0354442 | 0.07 | 0.946 | -.0670734 | .0718653
893 2008 | -.0068482 | .0273297 | -0.25 | 0.802 | -.0604133 | .046717
894 2009 | -.0613258 | .0182361 | -3.36 | 0.001 | -.0970678 | -.0255838
895 2010 | .0600294 | .0283841 | 2.11 | 0.034 | .0043975 | .1156612
896 2011 | -.0037073 | .0274439 | -0.14 | 0.893 | -.0574963 | .0500817
897 2012 | -.0091726 | .0247541 | -0.37 | 0.711 | -.0576897 | .0393445
898 2013 | .0262487 | .0298288 | 0.88 | 0.379 | -.0322146 | .084712
899 2014 | -.0018288 | .026714 | -0.07 | 0.945 | -.0541873 | .0505297
900 2015 | -.0070741 | .0236276 | -0.30 | 0.765 | -.0533832 | .0392351
901 2016 | -.0045186 | .0273358 | -0.17 | 0.869 | -.0580957 | .0490584
902 2017 | .0152008 | .0266045 | 0.57 | 0.568 | -.036943 | .0673446
903 2018 | .0114307 | .0255408 | 0.45 | 0.654 | -.0386283 | .0614897
904 2019 | -.0142299 | .0248412 | -0.57 | 0.567 | -.0629177 | .034458
905 2021 | .0125503 | .0346411 | 0.36 | 0.717 | -.055345 | .0804456
906 2022 | -.0261296 | .0335852 | -0.78 | 0.437 | -.0919555 | .0396962
907
908 _cons | .2431334 | .2002593 | 1.21 | 0.225 | -.1493676 | .6356345
909 -----
910 Instruments for orthogonal deviations equation
911 GMM-type (missing=0, separate instruments for each period unless collapsed)
912 L7.L7.ln_nlc_encons
913 Instruments for levels equation

```

```

914 Standard
915 L.fdi L.con_iq L.ln_cpi gdppc_growth cL.fdi#c.con_iq 2004b.yr 2005.yr
916 2006.yr 2007.yr 2008.yr 2009.yr 2010.yr 2011.yr 2012.yr 2013.yr 2014.yr
917 2015.yr 2016.yr 2017.yr 2018.yr 2019.yr 2020.yr 2021.yr 2022.yr
918 _cons
919 GMM-type (missing=0, separate instruments for each period unless collapsed)
920 DL6.L7.ln_nlc_encons
921 -----
922 Arellano-Bond test for AR(1) in first differences: z = -3.10 Pr > z = 0.002
923 Arellano-Bond test for AR(2) in first differences: z = -0.36 Pr > z = 0.722
924 -----
925 Sargan test of overid. restrictions: chi2(9) = 20.62 Prob > chi2 = 0.014
926 (Not robust, but not weakened by many instruments.)
927 Hansen test of overid. restrictions: chi2(9) = 10.29 Prob > chi2 = 0.328
928 (Robust, but weakened by many instruments.)
929
930
931 -----
932
933 ***STEP 3: GMM to Total energy
934 **2.1. Total energy with composite institutional quality
935 *2.1.1. Upper bound vs. Lower bound
936 *2.1.1.1. upper bound: pooled ols
937 reg L(0/1).ln_tc_encons fdi composite_iq ln_cpi gdppc_growth c.fdi#c.composite_iq i.yr
938 est sto tc_comiq_ols
939 //result: .9915247
940 *2.1.1.2 lower bound: fixed effect
941 xtreg L(0/1).ln_tc_encons fdi composite_iq ln_cpi gdppc_growth c.fdi#c.composite_iq i.yr, fe robust
942 est sto tc_comiq_fe
943 //result: .8308939
944 **2.1.2 Difference GMM vs. System GMM
945 *2.1.2.1 twostep difference gmm
946 xtabond2 L(0/1).ln_tc_encons fdi composite_iq ln_cpi gdppc_growth c.fdi#c.composite_iq i.yr, gmm(L4.
947 ln_tc_encons L8.fdi L7.composite_iq L7.ln_cpi L5.gdppc_growth L7.c.fdi#c.composite_iq, lag(8 8)) iv(i
948 .yr)noleveleq nodiffsargan twostep robust orthogonal small
949 est sto nlc_comiq_diffgmm
950 //result: .5348232 => system GMM is the way to go
951 *2.1.2.2. twostep system gmm
952 xtabond2 L(0/1).ln_tc_encons fdi composite_iq ln_cpi gdppc_growth c.fdi#c.composite_iq i.yr, gmm(L4.
953 ln_tc_encons, lag(4 4)) iv(L.fdi L.composite_iq L.ln_cpi L.gdppc_growth L.c.fdi#c.composite_iq i.yr,
954 equation(level)) nodiffsargan twostep robust
955 est sto tc_comiq_sysgmm
956
957 Dynamic panel-data estimation, two-step system GMM
958 -----
959 Group variable: country_id Number of obs = 882
960 Time variable : yr Number of groups = 49
961 Number of instruments = 45 Obs per group: min = 18
962 Wald chi2(23) = 979013.80 avg = 18.00
963 Prob > chi2 = 0.000 max = 18
964 -----
965
966 ln_tc_encons | Corrected
967 | Coefficient std. err. z P>|z| [95% conf. interval]
968 -----+-----
969 ln_tc_encons |
970 L1. | .9840498 .042402 23.21 0.000 .9009434 1.067156
971 |
972 fdi | -.0005315 .0017735 -0.30 0.764 -.0040075 .0029445
973 composite_iq | .0005846 .0369091 0.02 0.987 -.071756 .0729252
974 ln_cpi | -.0254898 .0344424 -0.74 0.459 -.0929957 .0420161
975 gdppc_growth | .0080365 .0036383 2.21 0.027 .0009055 .0151675
976 |

```

```

970 c.fdi#c.composite_iq | .0005754 .001543 0.37 0.709 -.0024488 .0035996
971
972 yr |
973 2005 | .0005112 .0210298 0.02 0.981 -.0407064 .0417288
974 2006 | -.0194034 .0208761 -0.93 0.353 -.0603197 .021513
975 2007 | -.0118492 .0207748 -0.57 0.568 -.0525671 .0288687
976 2008 | -.0129808 .0240387 -0.54 0.589 -.0600958 .0341343
977 2009 | -.0457786 .0419129 -1.09 0.275 -.1279265 .0363693
978 2010 | .048043 .0165436 2.90 0.004 .015618 .0804679
979 2011 | -.0010018 .0195281 -0.05 0.959 -.0392763 .0372727
980 2012 | -.0129744 .0223935 -0.58 0.562 -.0568648 .0309159
981 2013 | .01952 .0251066 0.78 0.437 -.029688 .0687281
982 2014 | -.0044969 .0184301 -0.24 0.807 -.0406192 .0316254
983 2015 | -.015879 .0177072 -0.90 0.370 -.0505845 .0188265
984 2016 | -.0089854 .0174683 -0.51 0.607 -.0432225 .0252518
985 2017 | .002552 .0181576 0.14 0.888 -.0330363 .0381402
986 2018 | .0099174 .0170966 0.58 0.562 -.0235914 .0434262
987 2019 | -.0132748 .020319 -0.65 0.514 -.0530994 .0265497
988 2020 | .0207655 .0415528 0.50 0.617 -.0606765 .1022075
989 2022 | -.0343715 .0191702 -1.79 0.073 -.0719444 .0032015
990
991 _cons | .164415 .1283751 1.28 0.200 -.0871956 .4160256
992 -----
993 Instruments for first differences equation
994 GMM-type (missing=0, separate instruments for each period unless collapsed)
995 L4.L4.ln_tc_encons
996 Instruments for levels equation
997 Standard
998 L.fdi L.composite_iq L.ln_cpi L.gdppc_growth cL.fdi#c.composite_iq
999 2004b.yr 2005.yr 2006.yr 2007.yr 2008.yr 2009.yr 2010.yr 2011.yr 2012.yr
1000 2013.yr 2014.yr 2015.yr 2016.yr 2017.yr 2018.yr 2019.yr 2020.yr 2021.yr
1001 2022.yr
1002 _cons
1003 GMM-type (missing=0, separate instruments for each period unless collapsed)
1004 DL3.L4.ln_tc_encons
1005 -----
1006 Arellano-Bond test for AR(1) in first differences: z = -3.27 Pr > z = 0.001
1007 Arellano-Bond test for AR(2) in first differences: z = -0.54 Pr > z = 0.589
1008 -----
1009 Sargan test of overid. restrictions: chi2(21) = 84.03 Prob > chi2 = 0.000
1010 (Not robust, but not weakened by many instruments.)
1011 Hansen test of overid. restrictions: chi2(21) = 24.86 Prob > chi2 = 0.253
1012 (Robust, but weakened by many instruments.)
1013
1014
1015 **2.2. total energy with voi_iq
1016 xtabond2 L(0/1).ln_tc_encons fdi voi_iq ln_cpi gdppc_growth c.fdi#c.voi_iq i.yr, gmm(L4.ln_tc_encons,
lag (4 4)) iv(L.fdi L.voi_iq L.ln_cpi L.gdppc_growth L.c.fdi#c.voi_iq i.yr, equation(level))
nodiffsargan twostep robust
1017 est sto tc_voi_iq_sysgmm
1018
1019 Dynamic panel-data estimation, two-step system GMM
1020 -----
1021 Group variable: country_id Number of obs = 882
1022 Time variable : yr Number of groups = 49
1023 Number of instruments = 45 Obs per group: min = 18
1024 Wald chi2(23) = 9.69e+06 avg = 18.00
1025 Prob > chi2 = 0.000 max = 18
1026 -----
1027 | Corrected
1028 ln_tc_encons | Coefficient std. err. z P>|z| [95% conf. interval]
1029 -----+-----
1030 ln_tc_encons |

```

```

1031      L1.      .9991437 .0191748 52.11 0.000 .9615618 1.036726
1032
1033      fdi      .0003904 .0010303 0.38 0.705 -.0016289 .0024098
1034      voi_iq   -.0138426 .0130955 -1.06 0.290 -.0395093 .0118241
1035      ln_cpi   -.0490747 .0191261 -2.57 0.010 -.0865611 -.0115883
1036      gdppc_growth .0051267 .0034303 1.49 0.135 -.0015966 .0118499
1037
1038      c.fdi#c.voi_iq .00035 .0012857 0.27 0.785 -.0021699 .0028699
1039
1040      yr
1041      2005     -.0139831 .018148 -0.77 0.441 -.0495525 .0215864
1042      2006     -.0325641 .0178228 -1.83 0.068 -.0674961 .002368
1043      2007     -.0205339 .0185742 -1.11 0.269 -.0569388 .0158709
1044      2008     -.0289914 .0221908 -1.31 0.191 -.0724846 .0145017
1045      2009     -.0780169 .0377166 -2.07 0.039 -.15194 -.0040938
1046      2010     .0332875 .0160827 2.07 0.038 .001766 .0648091
1047      2011     -.0146059 .0190976 -0.76 0.444 -.0520365 .0228248
1048      2012     -.0285606 .0163854 -1.74 0.081 -.0606755 .0035542
1049      2013     .0040181 .0224705 0.18 0.858 -.0400233 .0480594
1050      2014     -.0183516 .0175449 -1.05 0.296 -.0527389 .0160357
1051      2015     -.0256947 .0169771 -1.51 0.130 -.0589692 .0075797
1052      2016     -.023685 .017378 -1.36 0.173 -.0577452 .0103752
1053      2017     -.0070537 .0147514 -0.48 0.633 -.0359659 .0218585
1054      2018     .0004331 .0167748 0.03 0.979 -.032445 .0333112
1055      2019     -.0231903 .0181516 -1.28 0.201 -.0587668 .0123862
1056      2020     -.0060299 .0375754 -0.16 0.873 -.0796764 .0676165
1057      2022     -.0316224 .0170509 -1.85 0.064 -.0650416 .0017968
1058
1059      _cons    .2444194 .1025254 2.38 0.017 .0434734 .4453654
1060
1061      -----
1062      Instruments for first differences equation
1063      GMM-type (missing=0, separate instruments for each period unless collapsed)
1064      L4.L4.ln_tc_encons
1065      Instruments for levels equation
1066      Standard
1067      L.fdi L.voi_iq L.ln_cpi L.gdppc_growth cL.fdi#c.voi_iq 2004b.yr 2005.yr
1068      2006.yr 2007.yr 2008.yr 2009.yr 2010.yr 2011.yr 2012.yr 2013.yr 2014.yr
1069      2015.yr 2016.yr 2017.yr 2018.yr 2019.yr 2020.yr 2021.yr 2022.yr
1070      _cons
1071      GMM-type (missing=0, separate instruments for each period unless collapsed)
1072      DL3.L4.ln_tc_encons
1073
1074      -----
1075      Arellano-Bond test for AR(1) in first differences: z = -3.23 Pr > z = 0.001
1076      Arellano-Bond test for AR(2) in first differences: z = -0.36 Pr > z = 0.719
1077
1078      -----
1079      Sargan test of overid. restrictions: chi2(21) = 82.24 Prob > chi2 = 0.000
1080      (Not robust, but not weakened by many instruments.)
1081      Hansen test of overid. restrictions: chi2(21) = 24.53 Prob > chi2 = 0.268
1082      (Robust, but weakened by many instruments.)
1083
1084      **2.3. Total energy with pol_iq
1085      xtabond2 L(0/1).ln_tc_encons fdi pol_iq ln_cpi gdppc_growth c.fdi#c.pol_iq i.yr, gmm(L4.ln_tc_encons,
1086      lag (4 4)) iv(L.fdi L.pol_iq L.ln_cpi gdppc_growth L.c.fdi#c.pol_iq i.yr, equation(level))
1087      nodiffsargan twostep robust orthogonal
1088      est sto tc_poliq_sysgmm
1089
1090      Dynamic panel-data estimation, two-step system GMM
1091
1092      -----
1093      Group variable: country_id      Number of obs      =      882
1094      Time variable : yr              Number of groups    =      49
1095      Number of instruments = 45      Obs per group: min =      18
1096      Wald chi2(23) = 1.84e+06      avg =      18.00

```

1092	Prob > chi2 =		0.000		max =		18
1093	-----						
1094			Corrected				
1095	ln_tc_encons	Coefficient	std. err.	z	P> z	[95% conf. interval]	
1096	-----						
1097	ln_tc_encons						
1098	L1.	.9763125	.0316236	30.87	0.000	.9143313	1.038294
1099							
1100	fdi	-.0010282	.001716	-0.60	0.549	-.0043915	.0023351
1101	pol_iq	.0108923	.0237647	0.46	0.647	-.0356856	.0574703
1102	ln_cpi	-.0120714	.0236115	-0.51	0.609	-.0583491	.0342063
1103	gdppc_growth	.0072937	.0020578	3.54	0.000	.0032605	.0113269
1104							
1105	c.fdi#c.pol_iq	.000787	.0015102	0.52	0.602	-.0021729	.003747
1106							
1107	yr						
1108	2005	-.0112812	.0223825	-0.50	0.614	-.0551501	.0325877
1109	2006	-.029225	.0246786	-1.18	0.236	-.0775941	.0191441
1110	2007	-.0209696	.0218994	-0.96	0.338	-.0638916	.0219524
1111	2008	-.0263762	.018797	-1.40	0.161	-.0632177	.0104653
1112	2009	-.0665744	.0167925	-3.96	0.000	-.0994872	-.0336617
1113	2010	.038468	.023701	1.62	0.105	-.0079852	.0849211
1114	2011	-.0126618	.0180858	-0.70	0.484	-.0481093	.0227858
1115	2012	-.0259278	.0193846	-1.34	0.181	-.0639209	.0120653
1116	2013	.0045527	.0188005	0.24	0.809	-.0322955	.041401
1117	2014	-.0207529	.0204142	-1.02	0.309	-.0607639	.0192581
1118	2015	-.0288593	.0163557	-1.76	0.078	-.0609159	.0031973
1119	2016	-.0206864	.0213303	-0.97	0.332	-.062493	.0211202
1120	2017	-.0103655	.0246225	-0.42	0.674	-.0586246	.0378936
1121	2018	-.0050423	.0192262	-0.26	0.793	-.042725	.0326405
1122	2019	-.027854	.0184738	-1.51	0.132	-.064062	.0083539
1123	2021	-.0098048	.0253348	-0.39	0.699	-.05946	.0398505
1124	2022	-.0580367	.020611	-2.82	0.005	-.0984335	-.0176398
1125							
1126	_cons	.1424607	.0906135	1.57	0.116	-.0351385	.32006

Instruments for orthogonal deviations equation

GMM-type (missing=0, separate instruments for each period unless collapsed)

L4.L4.ln_tc_encons

Instruments for levels equation

Standard

L.fdi L.pol_iq L.ln_cpi gdppc_growth cL.fdi#c.pol_iq 2004b.yr 2005.yr

2006.yr 2007.yr 2008.yr 2009.yr 2010.yr 2011.yr 2012.yr 2013.yr 2014.yr

2015.yr 2016.yr 2017.yr 2018.yr 2019.yr 2020.yr 2021.yr 2022.yr

_cons

GMM-type (missing=0, separate instruments for each period unless collapsed)

DL3.L4.ln_tc_encons

Arellano-Bond test for AR(1) in first differences: z = -3.21 Pr > z = 0.001

Arellano-Bond test for AR(2) in first differences: z = -0.51 Pr > z = 0.609

Sargan test of overid. restrictions: chi2(21) = 83.73 Prob > chi2 = 0.000

(Not robust, but not weakened by many instruments.)

Hansen test of overid. restrictions: chi2(21) = 24.46 Prob > chi2 = 0.271

(Robust, but weakened by many instruments.)

****2.4. Total energy with gov_iq**

xtabond2 L(0/1).ln_tc_encons fdi gov_iq ln_cpi gdppc_growth c.fdi#c.gov_iq i.yr, gmm(L4.ln_tc_encons, lag(4 4)) iv(L.fdi gov_iq L.ln_cpi gdppc_growth L.c.fdi#c.gov_iq i.yr, equation(level)) nodiffsargan twostep robust orthogonal small

est sto tc_goviq_sysgmm

```

1153 Dynamic panel-data estimation, two-step system GMM
1154 -----
1155 Group variable: country_id      Number of obs      =      882
1156 Time variable : yr             Number of groups   =       49
1157 Number of instruments = 45      Obs per group: min =       18
1158 F(23, 48)      = 33231.50      avg =      18.00
1159 Prob > F       = 0.000         max =       18
1160 -----
1161      ln_tc_encons |               Corrected
1162      ln_tc_encons | Coefficient   std. err.      t    P>|t|    [95% conf. interval]
1163 -----+-----
1164      ln_tc_encons |
1165      L1.          |      .9674315   .0479299    20.18   0.000    .871062    1.063801
1166                  |
1167      fdi          |     -.0005712   .0009724    -0.59   0.560   -.0025263   .001384
1168      gov_iq       |     .0178997   .0416702     0.43   0.669   -.0658838   .1016833
1169      ln_cpi       |     -.0180839   .0385827    -0.47   0.641   -.0956596   .0594919
1170      gdppc_growth |     .0074134   .001939     3.82   0.000    .0035149   .011312
1171                  |
1172      c.fdi#c.gov_iq |     .0005031   .0009562     0.53   0.601   -.0014194   .0024256
1173                  |
1174      yr          |
1175      2005         |     -.014575   .0222357    -0.66   0.515   -.0592829   .0301328
1176      2006         |     -.0316722   .026987     -1.17   0.246   -.0859332   .0225888
1177      2007         |     -.0217956   .0248421     -0.88   0.385   -.0717439   .0281527
1178      2008         |     -.027101   .0209201     -1.30   0.201   -.0691638   .0149617
1179      2009         |     -.0694117   .0205335     -3.38   0.001   -.1106972   -.0281262
1180      2010         |     .0335415   .0217062     1.55   0.129   -.0101016   .0771847
1181      2011         |     -.0161194   .0195405     -0.82   0.413   -.0554082   .0231693
1182      2012         |     -.0288858   .0174691     -1.65   0.105   -.0640098   .0062382
1183      2013         |     .0056611   .0196784     0.29   0.775   -.0339048   .0452271
1184      2014         |     -.0213175   .0193275     -1.10   0.276   -.0601781   .017543
1185      2015         |     -.0325159   .0175439     -1.85   0.070   -.0677903   .0027585
1186      2016         |     -.0269192   .0182681     -1.47   0.147   -.0636498   .0098113
1187      2017         |     -.0160116   .0206263     -0.78   0.441   -.0574836   .0254603
1188      2018         |     -.0062107   .0173639     -0.36   0.722   -.041123    .0287017
1189      2019         |     -.029306   .0185349     -1.58   0.120   -.0665729   .0079608
1190      2021         |     -.0145746   .0228606     -0.64   0.527   -.060539    .0313899
1191      2022         |     -.0530429   .0237468     -2.23   0.030   -.100789    -.0052968
1192                  |
1193      _cons        |     .1911962   .1598168     1.20   0.237   -.1301371   .5125295
1194 -----
1195 Instruments for orthogonal deviations equation
1196   GMM-type (missing=0, separate instruments for each period unless collapsed)
1197   L4.L4.ln_tc_encons
1198 Instruments for levels equation
1199   Standard
1200   L.fdi gov_iq L.ln_cpi gdppc_growth cL.fdi#c.gov_iq 2004b.yr 2005.yr
1201   2006.yr 2007.yr 2008.yr 2009.yr 2010.yr 2011.yr 2012.yr 2013.yr 2014.yr
1202   2015.yr 2016.yr 2017.yr 2018.yr 2019.yr 2020.yr 2021.yr 2022.yr
1203   _cons
1204   GMM-type (missing=0, separate instruments for each period unless collapsed)
1205   DL3.L4.ln_tc_encons
1206 -----
1207 Arellano-Bond test for AR(1) in first differences: z = -3.15 Pr > z = 0.002
1208 Arellano-Bond test for AR(2) in first differences: z = -0.53 Pr > z = 0.595
1209 -----
1210 Sargan test of overid. restrictions: chi2(21) = 84.29 Prob > chi2 = 0.000
1211 (Not robust, but not weakened by many instruments.)
1212 Hansen test of overid. restrictions: chi2(21) = 24.84 Prob > chi2 = 0.254
1213 (Robust, but weakened by many instruments.)
1214
1215 **2.4. Total energy with reg_iq

```



```

1216 xtabond2 L(0/1).ln_tc_encons fdi reg_iq ln_cpi gdppc_growth c.fdi#c.reg_iq i.yr, gmm(L4.ln_tc_encons,
      lag (4 4)) iv(L.fdi reg_iq L.ln_cpi gdppc_growth L.c.fdi#c.reg_iq i.yr, equation(level))
1217 est sto tc_regiq_sysgmm
1218
1219 Dynamic panel-data estimation, two-step system GMM
1220 -----
1221 Group variable: country_id          Number of obs      =      882
1222 Time variable : yr                 Number of groups   =       49
1223 Number of instruments = 45          Obs per group: min =       18
1224 Wald chi2(23) = 3.96e+06             avg =      18.00
1225 Prob > chi2 = 0.000                  max =       18
1226 -----
1227
1228 ln_tc_encons | Coefficient   Corrected   z   P>|z|   [95% conf. interval]
1229 -----+-----
1230 ln_tc_encons |
1231   L1.         | .9954492     .036047     27.62  0.000   .9247983     1.0661
1232
1233   fdi         | -.0000228    .002224     -0.01  0.992   -.0043817    .0043362
1234   reg_iq      | -.0080837    .0385806     -0.21  0.834   -.0837003    .0675328
1235   ln_cpi      | -.0342501    .0418279     -0.82  0.413   -.1162313    .047731
1236   gdppc_growth | .0076762    .0018653      4.12  0.000   .0040201    .0113322
1237
1238 c.fdi#c.reg_iq | .0003875    .0023215      0.17  0.867   -.0041625    .0049375
1239
1240   yr         |
1241   2005       | .0065996    .014034      0.47  0.638   -.0209065    .0341056
1242   2006       | -.0062301    .0148042     -0.42  0.674   -.0352458    .0227856
1243   2008       | -.0003184    .0148303     -0.02  0.983   -.0293852    .0287484
1244   2009       | -.0347749    .0302211     -1.15  0.250   -.0940073    .0244574
1245   2010       | .061639     .0168711      3.65  0.000   .0285722    .0947058
1246   2011       | .0098736    .0133841      0.74  0.461   -.0163588    .0361059
1247   2012       | -.0011022    .0270952     -0.04  0.968   -.0542078    .0520033
1248   2013       | .0306153    .020587      1.49  0.137   -.0097344    .070965
1249   2014       | .0082584    .021364      0.39  0.699   -.0336143    .0501311
1250   2015       | -.0020302    .0192292     -0.11  0.916   -.0397188    .0356584
1251   2016       | -.0000818    .0191385     -0.00  0.997   -.0375925    .037429
1252   2017       | .0157047    .0295617      0.53  0.595   -.0422352    .0736447
1253   2018       | .0241173    .0252832      0.95  0.340   -.0254367    .0736714
1254   2019       | -.0003447    .0308415     -0.01  0.991   -.0607929    .0601036
1255   2020       | .030327     .0315995      0.96  0.337   -.0316069    .092261
1256   2021       | .014979     .0265384      0.56  0.572   -.0370352    .0669933
1257   2022       | -.0170308    .034754     -0.49  0.624   -.0851475    .0510858
1258
1259   _cons      | .156779     .1293255      1.21  0.225   -.0966943    .4102523
1260 -----
1261 Instruments for first differences equation
1262   GMM-type (missing=0, separate instruments for each period unless collapsed)
1263   L4.L4.ln_tc_encons
1264 Instruments for levels equation
1265   Standard
1266   L.fdi reg_iq L.ln_cpi gdppc_growth cL.fdi#c.reg_iq 2004b.yr 2005.yr
1267   2006.yr 2007.yr 2008.yr 2009.yr 2010.yr 2011.yr 2012.yr 2013.yr 2014.yr
1268   2015.yr 2016.yr 2017.yr 2018.yr 2019.yr 2020.yr 2021.yr 2022.yr
1269   _cons
1270   GMM-type (missing=0, separate instruments for each period unless collapsed)
1271   DL3.L4.ln_tc_encons
1272 -----
1273 Arellano-Bond test for AR(1) in first differences: z = -3.14 Pr > z = 0.002
1274 Arellano-Bond test for AR(2) in first differences: z = -0.47 Pr > z = 0.638
1275 -----
1276 Sargan test of overid. restrictions: chi2(21) = 81.12 Prob > chi2 = 0.000

```

```

1277 (Not robust, but not weakened by many instruments.)
1278 Hansen test of overid. restrictions: chi2(21) = 24.70 Prob > chi2 = 0.260
1279 (Robust, but weakened by many instruments.)
1280
1281 **2.5. Total energy with rul_iq
1282 xtabond2 L(0/1).ln_tc_encons fdi rul_iq ln_cpi gdppc_growth c.fdi#c.rul_iq i.yr, gmm(L4.ln_tc_encons,
    lag (4 4)) iv(L.fdi rul_iq L.ln_cpi gdppc_growth L.c.fdi#c.rul_iq i.yr, equation(level))
    nodiffsargan twostep robust orthogonal
1283 est sto tc_ruliq_sysgmm
1284
1285 Dynamic panel-data estimation, two-step system GMM
1286 -----
1287 Group variable: country_id Number of obs = 882
1288 Time variable : yr Number of groups = 49
1289 Number of instruments = 45 Obs per group: min = 18
1290 Wald chi2(23) = 1.45e+06 avg = 18.00
1291 Prob > chi2 = 0.000 max = 18
1292 -----
1293
1294 ln_tc_encons | Coefficient Corrected std. err. z P>|z| [95% conf. interval]
1295 -----+-----
1296 ln_tc_encons
1297 L1. | .9899324 .0468492 21.13 0.000 .8981097 1.081755
1298
1299 fdi | -.0006404 .0010459 -0.61 0.540 -.0026904 .0014095
1300 rul_iq | -.0041761 .0350414 -0.12 0.905 -.0728561 .0645038
1301 ln_cpi | -.0279182 .0326375 -0.86 0.392 -.0918865 .0360501
1302 gdppc_growth | .007443 .0020114 3.70 0.000 .0035008 .0113852
1303
1304 c.fdi#c.rul_iq | .0006336 .0009351 0.68 0.498 -.0011991 .0024663
1305
1306 yr
1307 2005 | -.0164976 .0216873 -0.76 0.447 -.0590039 .0260087
1308 2006 | -.0336767 .0258022 -1.31 0.192 -.0842481 .0168947
1309 2007 | -.0279832 .0230007 -1.22 0.224 -.0730637 .0170973
1310 2008 | -.0292628 .0198763 -1.47 0.141 -.0682197 .009694
1311 2009 | -.066917 .0172543 -3.88 0.000 -.1007349 -.0330992
1312 2010 | .0344229 .0228272 1.51 0.132 -.0103176 .0791634
1313 2011 | -.0193951 .0189071 -1.03 0.305 -.0564524 .0176622
1314 2012 | -.0263148 .0172963 -1.52 0.128 -.0602148 .0075853
1315 2013 | .0039254 .0189706 0.21 0.836 -.0332564 .0411071
1316 2014 | -.0206775 .0195381 -1.06 0.290 -.0589714 .0176165
1317 2015 | -.0320989 .0180732 -1.78 0.076 -.0675217 .003324
1318 2016 | -.0241737 .0187208 -1.29 0.197 -.0608658 .0125184
1319 2017 | -.0121515 .0213531 -0.57 0.569 -.0540028 .0296998
1320 2018 | -.0049437 .0179303 -0.28 0.783 -.0400863 .030199
1321 2019 | -.0284248 .0176119 -1.61 0.107 -.0629435 .0060938
1322 2021 | -.0132198 .0240369 -0.55 0.582 -.0603312 .0338917
1323 2022 | -.0487722 .0244361 -2.00 0.046 -.0966661 -.0008783
1324
1325 _cons | .176012 .1368778 1.29 0.198 -.0922635 .4442876
1326 -----
1327 Instruments for orthogonal deviations equation
1328 GMM-type (missing=0, separate instruments for each period unless collapsed)
1329 L4.L4.ln_tc_encons
1330 Instruments for levels equation
1331 Standard
1332 L.fdi rul_iq L.ln_cpi gdppc_growth cL.fdi#c.rul_iq 2004b.yr 2005.yr
1333 2006.yr 2007.yr 2008.yr 2009.yr 2010.yr 2011.yr 2012.yr 2013.yr 2014.yr
1334 2015.yr 2016.yr 2017.yr 2018.yr 2019.yr 2020.yr 2021.yr 2022.yr
1335 _cons
1336 GMM-type (missing=0, separate instruments for each period unless collapsed)
1337 DL3.L4.ln_tc_encons

```

```

1338 -----
1339 Arellano-Bond test for AR(1) in first differences: z = -3.30 Pr > z = 0.001
1340 Arellano-Bond test for AR(2) in first differences: z = -0.52 Pr > z = 0.604
1341 -----
1342 Sargan test of overid. restrictions: chi2(21) = 84.69 Prob > chi2 = 0.000
1343 (Not robust, but not weakened by many instruments.)
1344 Hansen test of overid. restrictions: chi2(21) = 21.77 Prob > chi2 = 0.413
1345 (Robust, but weakened by many instruments.)
1346
1347
1348 **2.6. Total energy with con_iq
1349 xtabond2 L(0/1).ln_tc_encons fdi con_iq ln_cpi gdppc_growth c.fdi#c.con_iq i.yr, gmm(L4.ln_tc_encons,
lag (4 4)) iv(L.fdi con_iq ln_cpi L.gdppc_growth L.c.fdi#c.con_iq i.yr, equation(level))
nodiffsargan twostep robust
1350 est sto tc_coniq_sysgmm
1351
1352 Dynamic panel-data estimation, two-step system GMM
1353 -----
1354 Group variable: country_id Number of obs = 882
1355 Time variable : yr Number of groups = 49
1356 Number of instruments = 45 Obs per group: min = 18
1357 Wald chi2(23) = 2.52e+06 avg = 18.00
1358 Prob > chi2 = 0.000 max = 18
1359 -----
1360
1361 ln_tc_encons | Coefficient std. err. z P>|z| [95% conf. interval]
1362 -----+-----
1363 ln_tc_encons |
1364 L1. | .9978171 .0322212 30.97 0.000 .9346647 1.06097
1365
1366 fdi | -.0008305 .0011443 -0.73 0.468 -.0030733 .0014123
1367 con_iq | -.0097208 .0228544 -0.43 0.671 -.0545146 .0350731
1368 ln_cpi | -.039033 .0359941 -1.08 0.278 -.1095803 .0315142
1369 gdppc_growth | .0068942 .0030505 2.26 0.024 .0009153 .012873
1370
1371 c.fdi#c.con_iq | .0007768 .0011226 0.69 0.489 -.0014235 .002977
1372
1373 yr |
1374 2005 | .0119207 .0140952 0.85 0.398 -.0157055 .0395468
1375 2006 | -.0088086 .0138123 -0.64 0.524 -.0358802 .0182629
1376 2008 | -.0022143 .013196 -0.17 0.867 -.0280781 .0236495
1377 2009 | -.0441262 .0238735 -1.85 0.065 -.0909173 .002665
1378 2010 | .058911 .014241 4.14 0.000 .0309992 .0868228
1379 2011 | .0085561 .0125729 0.68 0.496 -.0160862 .0331985
1380 2012 | -.0029226 .0182627 -0.16 0.873 -.0387169 .0328717
1381 2013 | .030956 .0162875 1.90 0.057 -.0009669 .0628789
1382 2014 | .0057196 .0154589 0.37 0.711 -.0245794 .0360185
1383 2015 | -.0048161 .015629 -0.31 0.758 -.0354485 .0258162
1384 2016 | .0010945 .0156152 0.07 0.944 -.0295108 .0316997
1385 2017 | .0150663 .0245762 0.61 0.540 -.0331021 .0632348
1386 2018 | .0212016 .0226212 0.94 0.349 -.0231351 .0655383
1387 2019 | -.0002436 .0191249 -0.01 0.990 -.0377277 .0372405
1388 2020 | .0272037 .0213481 1.27 0.203 -.0146378 .0690453
1389 2021 | .016396 .030515 0.54 0.591 -.0434123 .0762042
1390 2022 | -.0173243 .0276693 -0.63 0.531 -.0715551 .0369065
1391
1392 _cons | .1750629 .1412394 1.24 0.215 -.1017612 .4518869
1393 -----
1394 Instruments for first differences equation
1395 GMM-type (missing=0, separate instruments for each period unless collapsed)
1396 L4.L4.ln_tc_encons
1397 Instruments for levels equation
1398 Standard

```

```

1399      L.fdi con_iq ln_cpi L.gdppc_growth cL.fdi#c.con_iq 2004b.yr 2005.yr
1400      2006.yr 2007.yr 2008.yr 2009.yr 2010.yr 2011.yr 2012.yr 2013.yr 2014.yr
1401      2015.yr 2016.yr 2017.yr 2018.yr 2019.yr 2020.yr 2021.yr 2022.yr
1402      _cons
1403      GMM-type (missing=0, separate instruments for each period unless collapsed)
1404      DL3.L4.ln_tc_encons
1405      -----
1406      Arellano-Bond test for AR(1) in first differences: z = -3.25 Pr > z = 0.001
1407      Arellano-Bond test for AR(2) in first differences: z = -0.50 Pr > z = 0.615
1408      -----
1409      Sargan test of overid. restrictions: chi2(21) = 83.70 Prob > chi2 = 0.000
1410      (Not robust, but not weakened by many instruments.)
1411      Hansen test of overid. restrictions: chi2(21) = 23.10 Prob > chi2 = 0.339
1412      (Robust, but weakened by many instruments.)
1413

```