

```
161 . clear matrix
162 . capture log close
163 . program drop _all
164 . version 16
165 . set maxvar 10000

166 . set matacache 5000
167 . set matafavor space, perm
    (set matafavor preference recorded)
168 . timer clear

169 .
170 . ** The stata code handels big matrices. I ran on a server with stata MP 2 cores
171 . ** and 1024 GB memory. It took aproximatly 20 hours.
```



```
172 .
173 . *****
174 . *** log
175 . *****
176 . **log using Application_PPML_EE_2025_batch, replace
177 .
178 . *****
179 . *** globals **
180 . *****
181 . global cut=31 /* 31, 40, 83 , paper cut==31*/

182 . global bootpath="D:\pfafferm\tmp" //temporary fille do save bootstrap results

183 . **global bootpath="\tmp"
184 . global boot=1999 /**1999**/

185 .
186 . *****
187 . *** database
188 . *****
189 . use WTO_gravity_final, clear
```



```
190 .
191 . ren s y

192 . gen double s=y //notation change below
    (128,495 missing values generated)

193 .
194 . keep if year > 1993
    (191,646 observations deleted)

195 . **keep if year==2*int(year/2)
196 . ren year year1

197 . egen year=group(year1)

198 .
199 . drop ybord*

200 . forvalues i = 1995(1)2016 {
    2. gen ybord`i' = (ex~=im & year1==`i')
    3. }
```



```

201 .
202 . drop ex im

203 . keep ex* im* year y* s* *eu *pta ybord* ldist

204 .
205 . *****
206 . *** Select countries
207 . *****
208 . egen ex=group(exiso)

209 . egen im=group(imiso)

210 .
211 . egen c=count(y), by(ex im)

212 . tab exiso if c==0

```

Exporter IsoCode	Freq.	Percent	Cum.
BLR	23	8.33	8.33
BWA	69	25.00	33.33
CAF	23	8.33	41.67
FJI	23	8.33	50.00
IRQ	23	8.33	58.33
JAM	23	8.33	66.67
MMR	23	8.33	75.00
SUR	23	8.33	83.33
TJK	46	16.67	100.00
Total	276	100.00	


```
213 .
214 . drop if exiso=="HKG"
      (2,360 observations deleted)

215 . drop if imiso=="HKG"
      (2,340 observations deleted)

216 . drop if exiso=="AFG" | imiso=="AFG"
      (5,359 observations deleted)

217 . drop if exiso=="ARM" | imiso=="ARM"
      (5,313 observations deleted)

218 . drop if exiso=="BOL" | imiso=="BOL"
      (5,267 observations deleted)

219 . drop if exiso=="BWA" | imiso=="BWA"
      (5,221 observations deleted)

220 . drop if exiso=="BLR" | imiso=="BLR"
      (5,175 observations deleted)
```



```
221 . drop if exiso=="COG" | imiso=="COG"  
      (5,129 observations deleted)
```

```
222 . drop if exiso=="ERI" | imiso=="ERI"  
      (5,083 observations deleted)
```

```
223 . drop if exiso=="IRQ" | imiso=="IRQ"  
      (5,037 observations deleted)
```

```
224 . drop if exiso=="MMR" | imiso=="MMR"  
      (4,991 observations deleted)
```

```
225 . drop if exiso=="TJK" | imiso=="TJK"  
      (4,945 observations deleted)
```

```
226 . drop if exiso=="TON" | imiso=="TON"  
      (4,899 observations deleted)
```

```
227 .
```

```
228 . drop if exiso=="AZE" | imiso=="AZE"  
      (4,853 observations deleted)
```



```
229 . drop if exiso=="BDI" | imiso=="BDI"  
    (4,807 observations deleted)  
  
230 . drop if exiso=="CZE" | imiso=="CZE"  
    (4,761 observations deleted)  
  
231 . drop if exiso=="ZAF" | imiso=="ZAF"  
    (4,715 observations deleted)  
  
232 . drop if exiso=="PAK" | imiso=="PAK"  
    (4,669 observations deleted)  
  
233 . **drop if exiso=="YEM" | imiso=="YEM"  
234 .  
235 . drop c  
  
236 . egen c=count(y), by(ex im)  
  
237 . tab exiso if c==1  
    no observations
```



```
238 .
239 . egen yi=sum(y), by(ex)

240 . gen tyi=yi if ex==im & year==1
      (234,522 missing values generated)

241 . egen tryi=rank(tyi)
      (234,522 missing values generated)

242 .
243 . egen ryi=mean(tryi), by (ex)

244 . egen ryj=mean(tryi), by (im)

245 .
246 . drop tyi tryi

247 .
248 . **keep if ex<`nn'+1 & im < `nn'+1
249 . keep if ryi > $cut & ryj> $cut
      (121,923 observations deleted)
```



```

250 . *****
251 .
252 . *****
253 . *** Check for zero trade within bilats
254 . *****
255 . gen v0=y==0 | y==.

256 . replace v0=1-v0
      (112,700 real changes made)

257 . egen cy=sum(v0), by(ex im)

258 . tab cy

```

cy	Freq.	Percent	Cum.
2	23	0.02	0.02
3	23	0.02	0.04
4	115	0.10	0.14
5	46	0.04	0.18
6	138	0.12	0.31
7	46	0.04	0.35
8	69	0.06	0.41
9	115	0.10	0.51
10	69	0.06	0.57
11	161	0.14	0.71
12	253	0.22	0.94
13	184	0.16	1.10
14	345	0.31	1.41
15	299	0.27	1.67
16	713	0.63	2.31
17	529	0.47	2.78
18	1,058	0.94	3.71

19	1,196	1.06	4.78
20	1,380	1.22	6.00
21	3,243	2.88	8.88
22	6,187	5.49	14.37
23	96,508	85.63	100.00
<hr/>			
Total	112,700	100.00	

259 . list exiso imiso y if cy<4

	exiso	imiso	y
8741.	BHR	ISR	.
8742.	BHR	ISR	0
8743.	BHR	ISR	0
8744.	BHR	ISR	0
8745.	BHR	ISR	0
8746.	BHR	ISR	0
8747.	BHR	ISR	0
8748.	BHR	ISR	3.50e-10
8749.	BHR	ISR	0
8750.	BHR	ISR	0
8751.	BHR	ISR	0
8752.	BHR	ISR	0
8753.	BHR	ISR	0
8754.	BHR	ISR	.
8755.	BHR	ISR	.
8756.	BHR	ISR	.
8757.	BHR	ISR	6.39e-11

8758.	BHR	ISR	.
8759.	BHR	ISR	9.48e-10
8760.	BHR	ISR	.
8761.	BHR	ISR	.
8762.	BHR	ISR	.
8763.	BHR	ISR	.
101201.	TTO	SYR	.
101202.	TTO	SYR	0
101203.	TTO	SYR	0
101204.	TTO	SYR	6.31e-10
101205.	TTO	SYR	0
101206.	TTO	SYR	0
101207.	TTO	SYR	0
101208.	TTO	SYR	0
101209.	TTO	SYR	0
101210.	TTO	SYR	0
101211.	TTO	SYR	0
101212.	TTO	SYR	0
101213.	TTO	SYR	0
101214.	TTO	SYR	.
101215.	TTO	SYR	9.81e-10
101216.	TTO	SYR	.
101217.	TTO	SYR	.
101218.	TTO	SYR	.
101219.	TTO	SYR	.
101220.	TTO	SYR	.
101221.	TTO	SYR	.
101222.	TTO	SYR	.

101223.	TTO	SYR	.
---------	-----	-----	---

```

260 .
261 . *****
262 . *** normalizing trade flows
263 . *****
264 . egen sy=sum(y), by(year)

265 . replace y=y/sy
    (110,192 real changes made)

266 . replace s=s/sy
    (110,192 real changes made)

267 . drop sy

268 .
269 . *****
270 . *** new exporter and importer codes

```



```

271 . *****
272 . drop ex im

273 . egen ex=group(exiso)

274 . egen im=group(imiso)

275 .
276 . *****
277 . *** Globals and Scalars
278 . *****
279 . **global a=`a' /100 /*0...100, 100 fully observed*/
280 .
281 . qui sum ex

282 . di r(max)
    70

283 . local nn=r(max)

284 . global nn=`nn'

```



```
285 . global b= `nn' /* number of countries */
```

```
286 .
```

```
287 . qui sum year, d
```

```
288 . di r(max)
```

```
23
```

```
289 . global T=r(max)
```

```
290 . global tfirst=1
```

```
291 . global tlast=r(max)
```

```
292 .
```

```
293 . qui sum ex, d
```

```
294 . di r(max)
```

```
70
```

```
295 . global b=r(max)
```



```

296 . global bfirst=1
297 . global blast=$b
298 . global blastex=$b-1
299 . global NT=($b^2)*$tlast
300 .
301 . *****
302 . *** List explanatory variables
303 . *****
304 . gen ptac=0
305 . global dummies0="ibn.im#i.year ibn.ex#i.year ibn.im#ibn.ex "
306 . global dummies1="ibn.im#i(1/$tlast).year ibn.ex#i(1/$tlast).year i(1/$blast).im#i(1/$blastex).ex "
307 . global dummies="fe* ibn.im#i(1/$tlast).year ibn.ex#i(1/$tlast).year "
308 . global re="ybord* eu pta "

```



```

309 .
310 . *****
311 . *** Sorting ***
312 . *****
313 . sort year ex im

314 .
315 . *****
316 . *** Descriptives ***
317 . *****
318 . sum $re if (s==0 | s==.) & ex==im

```

Variable	Obs	Mean	Std. dev.	Min	Max
ybord1995	138	0	0	0	0
ybord1996	138	0	0	0	0
ybord1997	138	0	0	0	0
ybord1998	138	0	0	0	0
ybord1999	138	0	0	0	0
ybord2000	138	0	0	0	0
ybord2001	138	0	0	0	0
ybord2002	138	0	0	0	0
ybord2003	138	0	0	0	0
ybord2004	138	0	0	0	0
ybord2005	138	0	0	0	0
ybord2006	138	0	0	0	0
ybord2007	138	0	0	0	0
ybord2008	138	0	0	0	0
ybord2009	138	0	0	0	0
ybord2010	138	0	0	0	0

ybord2011	138	0	0	0	0
ybord2012	138	0	0	0	0
ybord2013	138	0	0	0	0
ybord2014	138	0	0	0	0
<hr/>					
ybord2015	138	0	0	0	0
ybord2016	138	0	0	0	0
eu	138	0	0	0	0
pta	138	0	0	0	0

```
319 . sum $re if (s==0 | s==.) & ex~=im
```

Variable	Obs	Mean	Std. dev.	Min	Max
ybord1995	2,370	.1223629	.3277736	0	1
ybord1996	2,370	.092827	.2902511	0	1
ybord1997	2,370	.0767932	.2663193	0	1
ybord1998	2,370	.0632911	.2435373	0	1
ybord1999	2,370	.0666667	.2494965	0	1
<hr/>					
ybord2000	2,370	.0451477	.2076718	0	1
ybord2001	2,370	.035443	.1849358	0	1
ybord2002	2,370	.0316456	.1750916	0	1
ybord2003	2,370	.0261603	.1596456	0	1
ybord2004	2,370	.021519	.1451372	0	1
<hr/>					
ybord2005	2,370	.0177215	.1319652	0	1
ybord2006	2,370	.0198312	.1394495	0	1
ybord2007	2,370	.0172996	.1304127	0	1
ybord2008	2,370	.0160338	.1256317	0	1
ybord2009	2,370	.014346	.1189376	0	1
<hr/>					
ybord2010	2,370	.0101266	.1001412	0	1

ybord2011	2,370	.0139241	.1172005	0	1
ybord2012	2,370	.0198312	.1394495	0	1
ybord2013	2,370	.0118143	.1080726	0	1
ybord2014	2,370	.0278481	.1645722	0	1
<hr/>					
ybord2015	2,370	.0219409	.1465216	0	1
ybord2016	2,370	.0582278	.2342232	0	1
eu	2,370	.0008439	.0290435	0	1
pta	2,370	.178903	.3833519	0	1

```

320 .
321 . *****
322 . *** Domestic trade flows observed and true zeros ***
323 . *****
324 . gen mis = y==.

325 . replace y=0 if mis==1
    (1,152 real changes made)

326 . replace s=0 if mis==1
    (1,152 real changes made)

```



```

327 .
328 . gen V=1

329 . replace V=0 if mis==1
    (1,152 real changes made)

330 . **gen V=1 if ex==im
331 . **replace V=1 if s==0 & ex~=im
332 .
333 . *****
334 . *** make bilat key ***
335 . *****
336 . egen bi=group(ex im)

337 .
338 . *****
339 . *** make pair fixed effects dummies ***
340 . *****
341 . sca cfi=0

342 . qui forvalues i = 1(1)$blastex {

```



```

343 . global cfi=cfi

344 . *****/
345 .
346 . *****/
347 . *** Dummy PPML true model ***
348 . *****/
349 . egen a1=group(ex year)

350 . egen a2=group(im year)

351 . egen a3=group(ex im)

352 .
353 . gen neg=( y < 0 ) // check negative trade flows

354 . qui sum neg

355 . sca mneg=r(mean)

356 . di as red "negative flows: " r(mean)
      negative flows: 0

```



```

357 .
358 . if mneg > 0 {
359 . sum y mneg
360 . di as red mneg "neagative trade flws"
361 . exit
362 . }

363 .
364 .
365 . ***** ppmlhdfe vce(robust) ***
366 . *****
367 .
368 . di as red "ppmlhdfe"
    ppmlhdfe

369 . ppmlhdfe y $re if V==1 , absorb(a1 a2 a3) d cluster(bi)
    warning: dependent variable takes very low values after standardizing (6.1710e-12)
Iteration 1:  deviance = 7.5851e+00  eps = .      iters = 10  tol = 1.0e-04  min(eta) = -5.55  P
Iteration 2:  deviance = 1.9973e+00  eps = 2.80e+00  iters = 10  tol = 1.0e-04  min(eta) = -6.58
Iteration 3:  deviance = 7.9393e-01  eps = 1.52e+00  iters = 9   tol = 1.0e-04  min(eta) = -8.21
Iteration 4:  deviance = 4.5276e-01  eps = 7.54e-01  iters = 9   tol = 1.0e-04  min(eta) = -10.20
Iteration 5:  deviance = 3.6037e-01  eps = 2.56e-01  iters = 9   tol = 1.0e-04  min(eta) = -12.32
Iteration 6:  deviance = 3.3728e-01  eps = 6.85e-02  iters = 8   tol = 1.0e-04  min(eta) = -13.86
Iteration 7:  deviance = 3.3197e-01  eps = 1.60e-02  iters = 8   tol = 1.0e-04  min(eta) = -14.96
Iteration 8:  deviance = 3.3085e-01  eps = 3.38e-03  iters = 6   tol = 1.0e-04  min(eta) = -15.83
Iteration 9:  deviance = 3.3063e-01  eps = 6.59e-04  iters = 4   tol = 1.0e-04  min(eta) = -16.47
Iteration 10: deviance = 3.3059e-01  eps = 1.19e-04  iters = 2   tol = 1.0e-04  min(eta) = -17.19
Iteration 11: deviance = 3.3058e-01  eps = 1.96e-05  iters = 2   tol = 1.0e-04  min(eta) = -18.02
Iteration 12: deviance = 3.3058e-01  eps = 2.86e-06  iters = 4   tol = 1.0e-05  min(eta) = -18.62  S
Iteration 13: deviance = 3.3058e-01  eps = 3.45e-07  iters = 6   tol = 1.0e-06  min(eta) = -18.89  S
Iteration 14: deviance = 3.3058e-01  eps = 3.80e-08  iters = 5   tol = 1.0e-07  min(eta) = -18.94  S
Iteration 15: deviance = 3.3058e-01  eps = 3.81e-09  iters = 5   tol = 1.0e-08  min(eta) = -19.26  S
Iteration 16: deviance = 3.3058e-01  eps = 1.83e-10  iters = 6   tol = 1.0e-09  min(eta) = -19.45  S 0

```


(legend: **p**: exact partial-out **s**: exact solver **h**: step-halving **o**: epsilon below tolerance)
 Converged in 16 iterations and 103 HDFE sub-iterations (tol = 1.0e-08)

HDFE <u>PPML</u> regression	No. of obs	=	111,548
Absorbing 3 HDFE groups	Residual df	=	4,899
Statistics robust to heteroskedasticity	Wald chi2(24)	=	2079.61
Deviance = .3305834663	Prob > chi2	=	0.0000
Log pseudolikelihood = -105.6358895	Pseudo R2	=	0.4884

Number of clusters (**bi**) = **4,900**
 (Std. err. adjusted for **4,900** clusters in **bi**)

y	Coefficient	Robust std. err.	z	P> z	[95% conf. interval]	
ybord1995	.0303964	.0095606	3.18	0.001	.0116579	.049135
ybord1996	.0330606	.0122651	2.70	0.007	.0090215	.0570997
ybord1997	.1404091	.0142805	9.83	0.000	.1124198	.1683984
ybord1998	.2196725	.0161348	13.61	0.000	.1880488	.2512962
ybord1999	.2122794	.0187019	11.35	0.000	.1756244	.2489345
ybord2000	.3692811	.0207008	17.84	0.000	.3287082	.409854
ybord2001	.3835252	.0211477	18.14	0.000	.3420764	.4249739
ybord2002	.3837754	.022989	16.69	0.000	.3387177	.4288331
ybord2003	.3555519	.0246639	14.42	0.000	.3072116	.4038921
ybord2004	.4058099	.025548	15.88	0.000	.3557368	.455883
ybord2005	.4337426	.0271939	15.95	0.000	.3804436	.4870417
ybord2006	.5035398	.0282794	17.81	0.000	.4481131	.5589665
ybord2007	.462227	.0330491	13.99	0.000	.397452	.5270019
ybord2008	.4958216	.0335584	14.77	0.000	.4300485	.5615948
ybord2009	.4141469	.0353656	11.71	0.000	.3448315	.4834623
ybord2010	.4923917	.0353795	13.92	0.000	.4230492	.5617343
ybord2011	.5431857	.0366408	14.82	0.000	.4713711	.6150003

ybord2012	.535675	.0369364	14.50	0.000	.463281	.608069
ybord2013	.5482318	.0381255	14.38	0.000	.4735073	.6229563
ybord2014	.5579085	.0386843	14.42	0.000	.4820887	.6337283
ybord2015	.5773203	.0402725	14.34	0.000	.4983878	.6562529
ybord2016	.4615208	.0440863	10.47	0.000	.3751132	.5479283
eu	.3471637	.0417334	8.32	0.000	.2653678	.4289596
pta	.1105965	.0283529	3.90	0.000	.0550258	.1661672
_cons	-4.251029	.0061592	-690.19	0.000	-4.2631	-4.238957

Absorbed degrees of freedom:

Absorbed FE	Categories	- Redundant	= Num. Coefs
a1	1610	1	1609
a2	1610	23	1587
a3	4900	4900	0 *

* = FE nested within cluster; treated as redundant for DoF computation

370 . global K=e(rank) /* number of paramters*/


```
371 .
372 . *****
373 . *** Vpoi ***
374 . *****
375 . mat Vpoi=e(V)

376 . mat Vpoi=Vpoi[1..$K,1..$K]

377 . mat bpoi=e(b)'

378 . mat bpoi=bpoi[1..$K,1]

379 . mat ds=e(b)'

380 . mat Spoi=vecdiag(Vpoi)'

381 . mat Spoi=diag(Spoi)

382 . mat Spoi=cholesky( Spoi)

383 . mat Spoi=vecdiag( Spoi)'
```


384 . mat li Spoi

Spoi[24,1]

	r1
ybord1995	.00956065
ybord1996	.01226508
ybord1997	.01428053
ybord1998	.01613482
ybord1999	.01870189
ybord2000	.02070083
ybord2001	.0211477
ybord2002	.02298905
ybord2003	.02466386
ybord2004	.02554797
ybord2005	.02719389
ybord2006	.02827945
ybord2007	.03304907
ybord2008	.03355837
ybord2009	.03536564
ybord2010	.03537951
ybord2011	.03664079
ybord2012	.03693639
ybord2013	.03812546
ybord2014	.03868429
ybord2015	.04027246
ybord2016	.04408629
eu	.04173336
pta	.0283529


```

385 .
386 . *****
387 . *** Prediction ***
388 . *****
389 . predict double ypoi
    (option mu assumed; predicted mean of depvar)

```

```

390 . sum y ypoi

```

Variable	Obs	Mean	Std. dev.	Min	Max
y	112,700	.0002041	.0042757	0	.3789791
ypoi	111,548	.0002062	.0043045	4.63e-12	.3769974

```

391 . sum y ypoi if ypoi==.

```

Variable	Obs	Mean	Std. dev.	Min	Max
y	1,152	0	0	0	0
ypoi	0				


```

392 . replace ypoi=0 if ypoi==.
    (1,152 real changes made)

393 . *****
394 .
395 . *****
396 . *** Estimate rho ***
397 . *****
398 . preserve

399 . keep ypoi y bi year V

400 .
401 . tset bi year

    Panel variable: bi (strongly balanced)
    Time variable: year, 1 to 23
    Delta: 1 unit

402 . gen double epoi=(y- ypoi)/ypoi
    (1,152 missing values generated)

```



```
403 . gen double lepoi=1.epoi
      (5,902 missing values generated)
```

```
404 . gen double depoi=epoi-1.epoi
      (6,297 missing values generated)
```

405 .

```
406 . xtdpdqml epoi if V==1 , fe    mlparams
      note: 145 groups are dropped due to gaps or insufficient number of observations
```

Quasi-maximum likelihood estimation

Iteration 0: $f(p) = -166614.88$

Iteration 1: $f(p) = -166483.82$

Iteration 2: $f(p) = -166483.69$

Iteration 3: $f(p) = -166483.69$

```

Group variable: bi                Number of obs    =    103848
Time variable: year              Number of groups  =     4754

```

```
Fixed effects              Obs per group:   min =          4
                           avg =    21.84434
                           max =          22
```

D.epoi	Coefficient	Std. err.	z	P> z	[95% conf. interval]	
_model						
epoi						
LD.	.2671724	.0027166	98.35	0.000	.261848	.2724967
_initobs						
_cons	-.0928088	.0360026	-2.58	0.010	-.1633727	-.0222449
/_sigma2e	1.162942	.0052389			1.152673	1.17321

/_omega

6.252364

.1177535

6.021571

6.483156

407 . mat r=e(b)

408 . sca r=r[1,1]

409 . global r=r

410 . restore

411 . di as red \$r

.26717237

412 . *****

413 .

414 . *****

415 . *** Mata Matrices I ***

416 . *****

417 . di as red "matrices for mata and mata procdures"

matrices for mata and mata procdures


```
418 . mata: bpoi=st_matrix("bpoi")
419 . mata: Vpoi=st_matrix("Vpoi")
420 . mata: Spoi=st_matrix("Spoi")
421 . mata: y=.
422 . mata: yp=.
423 . *****
424 .
425 . *****
426 . *** sort
427 . *****
428 . sort bi year
429 . xtset bi year
```

```
Panel variable: bi (strongly balanced)
Time variable: year, 1 to 23
Delta: 1 unit
```



```
430 .
431 . *****
432 . *** Mata Matrices II ***
433 . *****
434 . qui mata

435 .
436 . *****
437 .
438 . *****
439 . *** Load Mata procedure Vppml1 ***
440 . *****
441 . qui compress

442 . qui do mata_procedures_EE_2025.do

443 .
444 . *****
445 . *** VR with autocorrelation ***
446 . *****
447 . qui mata
```



```

448 .
449 . *****
450 . *** Save space ***
451 . *****
452 . drop fe*_*

453 . qui compress

454 .
455 . *****
456 . *** Vpoipt, Vpoiijk, Vpoiptp ***
457 . *****
458 . {
459 . timer clear
460 . mata mata des

```

# bytes	type	name and extent
5,920	transmorphic matrix	Vppm11()
324	structdef scalar	Vppm1s()
7,174,932,800	real matrix	D[112700,7958]
192	real colvector	Spoi[24]
176	real colvector	V[112700]
4,608	real matrix	Vpoi[24,24]
4,232	real matrix	Vrho[23,23]
360	real matrix	Z[112700,24]
704	real matrix	__00000U[22,4]
192	real colvector	bpoi[24]
176	real colvector	ex[112700]
8	real scalar	i
176	real colvector	im[112700]
8	real scalar	j
8	real scalar	n

8	real scalar	nobs
901,600	real colvector	vm[112700]
901,600	real colvector	vzero[112700]
8	struct scalar	xtdpdqml_qml
176	real colvector	y[112700]
176	real colvector	yp[112700]

461 . mata

_____ mata (type **end** to exit) _____

```

:
: v= Vppmls()

: Vppml1(y,yp, Z, D, vm, vzero, Vrho, v)
begin Vppml
done yp
done residuals
done residuals in OM and S
done Zs, Ds, Ws
done C, B
done QsZs
begin Voipt and Vpoijk
done GIZZ
begin working variance
done Cholesky VR
start loop PT
end loop PT
done Vpoipt
done Vpoijk
start Vpoiptp
start loop PTP
end loop PTP
done ee correction
done Vpoiptp

```


done Vppm1
0x1d7a55f0

```
:  
: Vpoipt= v.Vhc1  
  
: Vpoiptp=v.Vhc2  
  
: Vpoiijk=v.Vhc3  
  
:  
: Spoipt=diagonal(Vpoipt):^.5  
  
: Spoiptp=diagonal(Vpoiptp):^.5  
  
: Spoijk=diagonal(Vpoiijk):^.5  
  
:  
: st_matrix("Spoipt",Spoipt)  
  
: st_matrix("Spoiptp",Spoiptp)  
  
: st_matrix("Spoijk",Spoijk)  
  
:  
: timer()
```

timer report

2.	13660 /	1 =	13659.66
3.	5933 /	1 =	5932.972
4.	1407 /	1 =	1407.13
5.	1016 /	1 =	1015.679
6.	134 /	1 =	133.763
7.	.041 /	1 =	.041
22.	567 /	1 =	567.415

: end

462 . }

463 .

464 . mata

mata (type end to exit)

: (Spoi, Spoipt, Spoijk, Spoiptp)

1

2

3

4

1	.0095606468	.0233302032	.0289285023	.0833619455
2	.0122650769	.0329793763	.0399560784	.086854538
3	.014280531	.0394134146	.0474834727	.0863732625
4	.0161348212	.0432931229	.0522573148	.0797462726
5	.0187018891	.0513854884	.0623803891	.0893299968
6	.020700832	.0522537154	.0637926813	.0840470597
7	.0211477035	.0509779554	.0620963453	.0724378621
8	.0229890467	.0609805303	.0727812837	.0716556765
9	.0246638626	.0732372633	.0861324938	.0705197888
10	.025547968	.0763301983	.0901174934	.0675440112
11	.0271938889	.088991847	.104452241	.0689470124
12	.0282794463	.0940660028	.1105055673	.0699710144

13	.0330490689	.1122917941	.1310503945	.0781529705
14	.0335583677	.1132323352	.1320531488	.0718000516
15	.0353656412	.1266657739	.1473604465	.0781456122
16	.035379512	.1252032171	.145593804	.07707324
17	.0366407925	.1315331014	.1529403975	.0805263692
18	.0369363868	.1287455855	.1495485231	.080498147
19	.0381254552	.1336302669	.1550544749	.0854038906
20	.0386842938	.132810338	.1548397207	.0843062618
21	.0402724632	.1280023577	.1498072423	.0855147558
22	.0440862915	.1391734919	.1632237499	.1009171699
23	.0417333566	.1302675325	.1527678838	.0391516306
24	.0283528991	.0683935846	.0789924382	.0190163357

: end

```

465 . *****
466 .
467 . *****
468 . *** bootstrap percentile ***

```



```

469 . *****
470 . /*
    >
    > check number ob bootstraps
    > tsset, clear
    > bssize initial, tau(0.05) pdb(5)
    > ***1000
    > bootstrap _b, saving(one, replace) nodots reps(1000) cluster(bi) idcluster(idbi) : ppmlhdfc y $re if V==1 , ab
    > bssize refine using one
    > ***999
    > bootstrap _b, saving(two, replace) nodots reps(999) cluster(bi) idcluster(idbi) : ppmlhdfc y $re if V==1 , abs
    > bssize display using one, append(two)
    > bssize analyze using one, append(two) pdb(5)
    > bssize display using one, append(two) level(95)
    > bssize cleanup
    > */
471 .
472 . *** 1999 bootstraps ***
473 . timer on 8

474 . tsset, clear

```



```

475 .
476 . bootstrap _b, nodots reps($boot) cluster(bi) idcluster(idbi) ///
>       saving($bootpath, replace): ///
>       ppmlhdfe y $re if V==1 , absorb(a1 a2 a3)

```

```

HDFE PPML regression                      No. of obs      =    111,548
Absorbing 3 HDFE groups                   Residual df      =    103,497
                                           Wald chi2(24)    =     311.02
Deviance                                =    .3305834663      Prob > chi2      =     0.0000
Log pseudolikelihood = -105.6358895      Pseudo R2       =     0.4884
                                           (Replications based on 4,900 clusters in bi)

```

y	Observed coefficient	Bootstrap std. err.	z	P> z	Normal-based [95% conf. interval]	
ybord1995	.0303964	.0241213	1.26	0.208	-.0168805	.0776733
ybord1996	.0330606	.0320186	1.03	0.302	-.0296947	.095816
ybord1997	.1404091	.0377301	3.72	0.000	.0664595	.2143586
ybord1998	.2196725	.0448375	4.90	0.000	.1317926	.3075524
ybord1999	.2122794	.0479671	4.43	0.000	.1182656	.3062933
ybord2000	.3692811	.0529446	6.97	0.000	.2655117	.4730505
ybord2001	.3835252	.0560025	6.85	0.000	.2737623	.4932881
ybord2002	.3837754	.065379	5.87	0.000	.255635	.5119158
ybord2003	.3555519	.0728719	4.88	0.000	.2127255	.4983782
ybord2004	.4058099	.0746435	5.44	0.000	.2595114	.5521084
ybord2005	.4337426	.0828692	5.23	0.000	.2713219	.5961634
ybord2006	.5035398	.0863093	5.83	0.000	.3343767	.6727029
ybord2007	.462227	.0958756	4.82	0.000	.2743143	.6501396
ybord2008	.4958216	.0962023	5.15	0.000	.3072687	.6843746
ybord2009	.4141469	.1055642	3.92	0.000	.2072448	.621049
ybord2010	.4923917	.1059945	4.65	0.000	.2846464	.7001371
ybord2011	.5431857	.1105577	4.91	0.000	.3264966	.7598748
ybord2012	.535675	.1117578	4.79	0.000	.3166337	.7547163

ybord2013	.5482318	.1158123	4.73	0.000	.3212438	.7752198
ybord2014	.5579085	.114774	4.86	0.000	.3329556	.7828614
ybord2015	.5773203	.1145828	5.04	0.000	.3527422	.8018985
ybord2016	.4615208	.1249664	3.69	0.000	.2165912	.7064504
eu	.3471637	.0965188	3.60	0.000	.1579903	.5363371
pta	.1105965	.0426933	2.59	0.010	.0269192	.1942737
_cons	-4.251029	.7062696	-6.02	0.000	-5.635291	-2.866766

Absorbed degrees of freedom:

Absorbed FE	Categories	- Redundant	= Num. Coefs	
a1	1610	0	1610	
a2	1610	23	1587	
a3	4900	70	4830	?

? = number of redundant parameters may be higher

477 .

478 . preserve


```

479 . mat bpoibsmmed=J($K,1,0)

480 . use $bootpath, clear
    (bootstrap: ppmlhdfe)

481 . local k=1

482 . local vars "_b_ybord1995 _b_ybord1996 _b_ybord1997 _b_ybord1998 _b_ybord1999 _b_ybord2000 _b_ybord2001 _b_ybord2002 _
> 05 _b_ybord2006 _b_ybord2007 _b_ybord2008 _b_ybord2009 _b_ybord2010 _b_ybord2011 _b_ybord2012 _b_ybord2013 _b_ybord20
> b_pta "

483 . foreach x of local vars {
    2. centile `x', c(2.5 50 0.975)
    3. sort `x'
    4. di "quantiles: " `x'[50] " " `x'[1000] " " `x'[1950] " "
    5. qui sum `x',d
    6. di "median " r(p50)
    7. di as red `k'
    8. mat bpoibsmmed[`k',1]=r(p50)
    9. local k=`k'+1
    10. }

```

Variable	Obs	Percentile	Centile	Binom. interp. [95% conf. interval]	
_b_ybord1995	1,999	2.5	-.0188135	-.0216865	-.0154162
		50	.0307575	.0291834	.0323661
		.975	-.0292433	-.0365914	-.0238165
quantiles: -.01881353 .03075751 .07788008					
median .03075751					
1					

Variable	Obs	Percentile	Centile	Binom. interp. [95% conf. interval]	
_b_ybord1996	1,999	2.5	-.034228	-.0419243	-.0302651
		50	.0291608	.0275863	.0307527
		.975	-.0498373	-.0546839	-.0448011
quantiles: -.03422799 .02916083 .09424201					
median .02916083					
2					

Variable	Obs	Percentile	Centile	Binom. interp. [95% conf. interval]	
_b_ybord1997	1,999	2.5	.0703241	.0632499	.0754255
		50	.139483	.1377993	.1420941
		.975	.052704	.0482444	.056307
quantiles: .07032413 .13948303 .22110659					
median .13948303					
3					

Variable	Obs	Percentile	Centile	Binom. interp. [95% conf. interval]	
_b_ybord1998	1,999	2.5	.1367765	.1316616	.1403315
		50	.2191901	.2165877	.2212784
		.975	.1197409	.1123004	.1292109
quantiles: .13677646 .21919014 .31585547					
median .21919014					
4					

Variable	Obs	Percentile	Centile	Binom. interp. [95% conf. interval]	
_b_ybord1999	1,999	2.5	.1282272	.124488	.1342661
		50	.2121772	.2090851	.2149014
		.975	.1077661	.0976572	.116763
quantiles: .12822716 .21217725 .3130559					
median .21217725					
5					

Variable	Obs	Percentile	Centile	Binom. interp. [95% conf. interval]	
_b_ybord2000	1,999	2.5	.2854459	.2793815	.2888699
		50	.3713116	.368446	.3745267
		.975	.2701127	.2625965	.2757942
quantiles: .2854459 .3713116 .49088803					
median .3713116					
6					

Variable	Obs	Percentile	Centile	Binom. interp. [95% conf. interval]	
_b_ybord2001	1,999	2.5	.2973298	.2924028	.3010323
		50	.3941196	.3899756	.396952
		.975	.2839408	.2764757	.2890203
quantiles: .29732984 .39411962 .52024287					
median .39411962					
7					

Variable	Obs	Percentile	Centile	Binom. interp. [95% conf. interval]	
_b_ybord2002	1,999	2.5	.2738224	.2671843	.2827636
		50	.3926904	.3890802	.3954436
		.975	.2556301	.2436647	.2632849
quantiles: .2738224 .39269045 .5323416					
median .39269045					
8					

Variable	Obs	Percentile	Centile	Binom. interp. [95% conf. interval]	
_b_ybord2003	1,999	2.5	.2452286	.2402859	.2514497
		50	.3703705	.366393	.3741166
		.975	.2261337	.2195224	.2343885
quantiles: .24522859 .37037051 .52974945					
median .37037051					
9					

Variable	Obs	Percentile	Centile	Binom. interp. [95% conf. interval]	
_b_ybord2004	1,999	2.5	.2931805	.2876793	.2995402
		50	.4179504	.4141606	.4224773
		.975	.2730929	.266982	.2820473
quantiles: .29318053 .41795042 .58756977					
median .41795042					
10					

Variable	Obs	Percentile	Centile	Binom. interp. [95% conf. interval]	
_b_ybord2005	1,999	2.5	.3122969	.3060879	.3208221
		50	.4513322	.446611	.4556072
		.975	.2895116	.284245	.3023429
quantiles: .31229687 .45133218 .63911748					
median .45133218					
11					

Variable	Obs	Percentile	Centile	Binom. interp. [95% conf. interval]	
_b_ybord2006	1,999	2.5	.3767633	.3692161	.3848977
		50	.5252142	.5217322	.5304224
		.975	.356359	.3512536	.3645635
quantiles: .37676328 .5252142 .72087663					
median .5252142					
12					

Variable	Obs	Percentile	Centile	Binom. interp. [95% conf. interval]	
_b_ybord2007	1,999	2.5	.3325484	.3244074	.3435683
		50	.4944316	.4878999	.4993564
		.975	.3069292	.2923347	.3128963
quantiles: .33254841 .49443161 .70556271					
median .49443161					
13					

Variable	Obs	Percentile	Centile	Binom. interp. [95% conf. interval]	
_b_ybord2008	1,999	2.5	.3722398	.3574399	.3795204
		50	.5334579	.5275748	.538849
		.975	.3370712	.3229302	.3477447

quantiles: .37223983 .53345793 .7507351

median .53345793

14

Variable	Obs	Percentile	Centile	Binom. interp. [95% conf. interval]	
_b_ybord2009	1,999	2.5	.2790369	.2687867	.2894771
		50	.4575352	.4512174	.4630203
		.975	.2437241	.2248815	.2540896

quantiles: .27903688 .45753524 .69247937

median .45753524

15

Variable	Obs	Percentile	Centile	Binom. interp. [95% conf. interval]	
_b_ybord2010	1,999	2.5	.3538345	.3426154	.3632922
		50	.5346071	.5294008	.5403634
		.975	.3215104	.3119015	.3332967

quantiles: .35383445 .53460711 .77097958

median .53460711

16

Variable	Obs	Percentile	Centile	Binom. interp. [95% conf. interval]	
_b_ybord2011	1,999	2.5	.407732	.3993172	.4196185
		50	.5912356	.58519	.5969402
		.975	.3761427	.3677639	.3885537
quantiles: .40773195 .59123558 .83514941					
median .59123558					
17					

Variable	Obs	Percentile	Centile	Binom. interp. [95% conf. interval]	
_b_ybord2012	1,999	2.5	.4024248	.3925015	.4093168
		50	.5852485	.5781941	.5918667
		.975	.381744	.3677799	.3884479
quantiles: .40242481 .58524847 .8370887					
median .58524847					
18					

Variable	Obs	Percentile	Centile	Binom. interp. [95% conf. interval]	
_b_ybord2013	1,999	2.5	.41392	.406707	.4217431
		50	.6018962	.5938528	.6082332
		.975	.3881408	.3764174	.3967177
quantiles: .41391996 .60189617 .85937744					
median .60189617					
19					

Variable	Obs	Percentile	Centile	Binom. interp. [95% conf. interval]	
_b_ybord2014	1,999	2.5	.426899	.4217885	.4318221
		50	.6135785	.6068539	.6201184
		.975	.407611	.3955387	.4154569
quantiles: .42689899 .6135785 .87008303					
median .6135785					
20					

Variable	Obs	Percentile	Centile	Binom. interp. [95% conf. interval]	
_b_ybord2015	1,999	2.5	.4419036	.4300465	.4523513
		50	.6299658	.6249383	.6380752
		.975	.4131966	.3960445	.4223991
quantiles: .44190362 .62996578 .88366121					
median .62996578					
21					

Variable	Obs	Percentile	Centile	Binom. interp. [95% conf. interval]	
_b_ybord2016	1,999	2.5	.3067347	.2911938	.3138525
		50	.5145171	.5065784	.5227155
		.975	.2676038	.2600548	.2815865
quantiles: .30673465 .51451713 .78739583					
median .51451713					
22					

Variable	Obs	Percentile	Centile	Binom. interp. [95% conf. interval]	
_b_eu	1,999	2.5	.0805132	.0732565	.0904877
		50	.3048635	.2997657	.3114944
		.975	.0483513	.0359536	.0677135
quantiles: .08051321 .30486351 .43439147					
median .30486351					
23					

Variable	Obs	Percentile	Centile	Binom. interp. [95% conf. interval]	
_b_pta	1,999	2.5	-.012275	-.0172793	-.0074705
		50	.0702032	.0676999	.0724896
		.975	-.0275731	-.0337086	-.0221255
quantiles: -.01227503 .07020321 .15020435					
median .07020321					
24					

484 . restore


```
485 .
486 . *****
487 . *** Bootstrap results
488 . *****
489 . mat bci=e(ci_percentile)

490 . mat bci=bci[., 1..$K]

491 . mat bci=bci'

492 .
493 . mat bcibc=e(ci_bc)

494 . mat bcibc=bcibc[., 1..$K]

495 . mat bcibc=bcibc'

496 .
497 . mat Vpoibs=e(V)

498 . mat Spoibs=vecdiag(Vpoibs)'
```



```

499 . mat Spoibs=diag(Spoibs)
500 . mat Spoibs=cholesky( Spoibs)
501 . mat Spoibs=vecdiag(Spoibs)'
502 . mat Spoibs=Spoibs[1..$K,1]
503 . mat li Spoibs

```

```
Spoibs[24,1]
```

	r1
ybord1995	.02412131
ybord1996	.03201863
ybord1997	.03773006
ybord1998	.04483752
ybord1999	.04796713
ybord2000	.05294455
ybord2001	.05600251
ybord2002	.06537897
ybord2003	.07287195
ybord2004	.07464347
ybord2005	.08286925
ybord2006	.0863093
ybord2007	.09587557
ybord2008	.09620227
ybord2009	.10556423
ybord2010	.10599448
ybord2011	.11055768
ybord2012	.11175781
ybord2013	.11581235
ybord2014	.114774
ybord2015	.11458279


```
ybord2016 .12496639
      eu .09651883
      pta .04269326
```

```
504 . timer off 8
```

```
505 . *****
506 .
507 .
508 . *****
509 . *** Weidner, Zylkin, 2021, PPML bias ***
510 . *****
511 . timer on 9
```

```
512 . matrix beta = bpoi'
```

```
513 . ppml_fe_bias y $re if V==1, i(ex) j(im) t(year) lambda(ypoi) beta(beta) exact
performance warning: -by- prefix may be slower than -by()-
Adjusted SEs
```

1

1	.0149710755
2	.0194811663
3	.0227379595
4	.025055665
5	.0296570842
6	.0320324702
7	.0313887404
8	.0349368444
9	.0374413606
10	.0376108429
11	.040893053
12	.042917655

13	.0502755836
14	.0507761017
15	.0541261578
16	.0538766539
17	.0569182475
18	.0566878692
19	.0590248776
20	.0597070873
21	.0607958769
22	.0678130575
23	.0716662501
24	.037901045

bias corrections (to be subtracted from original coefficients)

1

1	.002382846
2	-.0002466141
3	-.0038688117
4	-.0082686092
5	-.0079016859
6	-.0078661223
7	-.0074697528
8	-.0073195531
9	.001287287
10	.0005359194
11	.0010429293
12	.0017917854
13	.0153957626
14	.0113628228
15	.0062486774
16	.0055048617
17	.0041244329

18	- .0002063009
19	- .0006788548
20	- .0008737486
21	- .0057492457
22	- .0114067253
23	- .0265292838
24	- .020640524

	original	bias	adjusted SEs	bias-corrected
ybord1995	0.0303964 (0.0095606)	0.0023828	0.0149711	0.0280136 (0.0149711)*
ybord1996	0.0330606 (0.0122651)	-0.0002466	0.0194812	0.0333072 (0.0194812)*
ybord1997	0.1404091 (0.0142805)	-0.0038688	0.0227380	0.1442779 (0.0227380)***
ybord1998	0.2196725 (0.0161348)	-0.0082686	0.0250557	0.2279411 (0.0250557)***
ybord1999	0.2122794 (0.0187019)	-0.0079017	0.0296571	0.2201811 (0.0296571)***
ybord2000	0.3692811 (0.0207008)	-0.0078661	0.0320325	0.3771472 (0.0320325)***
ybord2001	0.3835252 (0.0211477)	-0.0074698	0.0313887	0.3909949 (0.0313887)***
ybord2002	0.3837754 (0.0229890)	-0.0073196	0.0349368	0.3910949 (0.0349368)***
ybord2003	0.3555519 (0.0246639)	0.0012873	0.0374414	0.3542646 (0.0374414)***
ybord2004	0.4058099 (0.0255480)	0.0005359	0.0376108	0.4052740 (0.0376108)***
ybord2005	0.4337426	0.0010429	0.0408931	0.4326997

	(0.0271939)			(0.0408931)***
ybord2006	0.5035398	0.0017918	0.0429177	0.5017480
	(0.0282794)			(0.0429177)***
ybord2007	0.4622270	0.0153958	0.0502756	0.4468312
	(0.0330491)			(0.0502756)***
ybord2008	0.4958216	0.0113628	0.0507761	0.4844588
	(0.0335584)			(0.0507761)***
ybord2009	0.4141469	0.0062487	0.0541262	0.4078982
	(0.0353656)			(0.0541262)***
ybord2010	0.4923917	0.0055049	0.0538767	0.4868869
	(0.0353795)			(0.0538767)***
ybord2011	0.5431857	0.0041244	0.0569182	0.5390613
	(0.0366408)			(0.0569182)***
ybord2012	0.5356750	-0.0002063	0.0566879	0.5358813
	(0.0369364)			(0.0566879)***
ybord2013	0.5482318	-0.0006789	0.0590249	0.5489106
	(0.0381255)			(0.0590249)***
ybord2014	0.5579085	-0.0008737	0.0597071	0.5587822
	(0.0386843)			(0.0597071)***
ybord2015	0.5773203	-0.0057492	0.0607959	0.5830696
	(0.0402725)			(0.0607959)***
ybord2016	0.4615208	-0.0114067	0.0678131	0.4729275
	(0.0440863)			(0.0678131)***
eu	0.3471637	-0.0265293	0.0716663	0.3736930
	(0.0417334)			(0.0716663)***
pta	0.1105965	-0.0206405	0.0379010	0.1312370
	(0.0283529)			(0.0379010)***

Standard errors clustered by pair, using a local de-biasing adjustment to account for estimation noise in the ex-year and im-year fixed effects.

* p<0.10; ** p<0.05; *** p<0.01

514 . ereturn list

macros:

```

        e(cmd) : "ppml_fe_bias"
        e(cmdline) : "ppml_fe_bias y ybord* eu pta if V==1, i(ex) j(im) t(year) lambda(ypoi) beta(beta) exact"
        e(properties) : "b V"
        e(depvar) : "y"

```

matrices:

```

        e(b) : 1 x 24
        e(V) : 24 x 24

```

515 . mat bpoibias=e(b)'

516 . mat Vpoibias=e(V)

517 . mat Spoibias=vecdiag(Vpoibias)'

518 . mat Spoibias=diag(Spoibias)'

519 . mat Spoibias=cholesky(Spoibias)


```
520 . mat Spoibias=vecdiag(Spoibias)'
```

```
521 . mat li Spoibias
```

```
Spoibias[24,1]
```

```
    r1
```

```
ybord1995 .01497108
ybord1996 .01948117
ybord1997 .02273796
ybord1998 .02505566
ybord1999 .02965708
ybord2000 .03203247
ybord2001 .03138874
ybord2002 .03493684
ybord2003 .03744136
ybord2004 .03761084
ybord2005 .04089305
ybord2006 .04291765
ybord2007 .05027558
ybord2008 .0507761
ybord2009 .05412616
ybord2010 .05387665
ybord2011 .05691825
ybord2012 .05668787
ybord2013 .05902488
ybord2014 .05970709
ybord2015 .06079588
ybord2016 .06781306
    eu .07166625
    pta .03790105
```


522 . timer off 9

523 . *****

524 .

525 . *****

526 . *** Collect all estimation results ***

527 . *****

528 . mat bpoibsbias =2*bpoi-bpoibsmmed

529 . mat out1 =(bpoi, bpoibias, bpoibsbias, bpoibsmmed)

530 . matrix colnames out1 = bpoi bpoibias bpoibsbias bpoibsmmed

531 . estout matrix(out1, fmt(%5.3f))

	out1			
	bpoi	bpoibias	bpoibsbias	bpoibsmmed
ybord1995	0.030	0.028	0.030	0.031
ybord1996	0.033	0.033	0.037	0.029
ybord1997	0.140	0.144	0.141	0.139
ybord1998	0.220	0.228	0.220	0.219
ybord1999	0.212	0.220	0.212	0.212
ybord2000	0.369	0.377	0.367	0.371
ybord2001	0.384	0.391	0.373	0.394
ybord2002	0.384	0.391	0.375	0.393
ybord2003	0.356	0.354	0.341	0.370
ybord2004	0.406	0.405	0.394	0.418
ybord2005	0.434	0.433	0.416	0.451
ybord2006	0.504	0.502	0.482	0.525
ybord2007	0.462	0.447	0.430	0.494
ybord2008	0.496	0.484	0.458	0.533

ybord2009	0.414	0.408	0.371	0.458
ybord2010	0.492	0.487	0.450	0.535
ybord2011	0.543	0.539	0.495	0.591
ybord2012	0.536	0.536	0.486	0.585
ybord2013	0.548	0.549	0.495	0.602
ybord2014	0.558	0.559	0.502	0.614
ybord2015	0.577	0.583	0.525	0.630
ybord2016	0.462	0.473	0.409	0.515
eu	0.347	0.374	0.389	0.305
pta	0.111	0.131	0.151	0.070

532 .

533 . mat out =(bpoi, bpoibias, bpoibsmmed, Spoi)

534 . mat out=(out,Spoipt,Spoiptp,Spoijsk)

535 . mat out=(out,Spoibias, Spoibs)

536 .

537 . matrix colnames out = bpoi bpoibias bpoibsmmed Spoi Spoipb Spoiptp Spoijsk Spoibias Spoibs


```
538 . estout matrix(out, fmt(%5.3f))
```

	out bpoi	bpoibias	bpoibsmmed	Spoi	Spoipb	Spoiptp	Spoijsk	Spoibias
ybord1995	0.030	0.028	0.031	0.010	0.023	0.083	0.029	0.015
ybord1996	0.033	0.033	0.029	0.012	0.033	0.087	0.040	0.019
ybord1997	0.140	0.144	0.139	0.014	0.039	0.086	0.047	0.023
ybord1998	0.220	0.228	0.219	0.016	0.043	0.080	0.052	0.025
ybord1999	0.212	0.220	0.212	0.019	0.051	0.089	0.062	0.030
ybord2000	0.369	0.377	0.371	0.021	0.052	0.084	0.064	0.032
ybord2001	0.384	0.391	0.394	0.021	0.051	0.072	0.062	0.031
ybord2002	0.384	0.391	0.393	0.023	0.061	0.072	0.073	0.035
ybord2003	0.356	0.354	0.370	0.025	0.073	0.071	0.086	0.037
ybord2004	0.406	0.405	0.418	0.026	0.076	0.068	0.090	0.038
ybord2005	0.434	0.433	0.451	0.027	0.089	0.069	0.104	0.041
ybord2006	0.504	0.502	0.525	0.028	0.094	0.070	0.111	0.043
ybord2007	0.462	0.447	0.494	0.033	0.112	0.078	0.131	0.050
ybord2008	0.496	0.484	0.533	0.034	0.113	0.072	0.132	0.051
ybord2009	0.414	0.408	0.458	0.035	0.127	0.078	0.147	0.054
ybord2010	0.492	0.487	0.535	0.035	0.125	0.077	0.146	0.054
ybord2011	0.543	0.539	0.591	0.037	0.132	0.081	0.153	0.057
ybord2012	0.536	0.536	0.585	0.037	0.129	0.080	0.150	0.057
ybord2013	0.548	0.549	0.602	0.038	0.134	0.085	0.155	0.059
ybord2014	0.558	0.559	0.614	0.039	0.133	0.084	0.155	0.060
ybord2015	0.577	0.583	0.630	0.040	0.128	0.086	0.150	0.061
ybord2016	0.462	0.473	0.515	0.044	0.139	0.101	0.163	0.068
eu	0.347	0.374	0.305	0.042	0.130	0.039	0.153	0.072
pta	0.111	0.131	0.070	0.028	0.068	0.019	0.079	0.038


```

539 .
540 . mat out =(bpoi, bpoibias, bpoibsbias, Spoi)

541 . mat out=(out,Spoipt,Spoiptp,Spoi)

542 . mat out=(out,Spoibias, Spoibs)

543 .
544 . matrix colnames out = bpoi bpoibias bpoibsbias Spoi Spoipb Spoiptp Spoi)k Spoibias Spoibs

545 . estout matrix(out, fmt(%5.3f))

```

	out bpoi	bpoibias	bpoibsbias	Spoi	Spoipb	Spoiptp	Spoi)k	Spoibias
ybord1995	0.030	0.028	0.030	0.010	0.023	0.083	0.029	0.015
ybord1996	0.033	0.033	0.037	0.012	0.033	0.087	0.040	0.019
ybord1997	0.140	0.144	0.141	0.014	0.039	0.086	0.047	0.023
ybord1998	0.220	0.228	0.220	0.016	0.043	0.080	0.052	0.025
ybord1999	0.212	0.220	0.212	0.019	0.051	0.089	0.062	0.030
ybord2000	0.369	0.377	0.367	0.021	0.052	0.084	0.064	0.032
ybord2001	0.384	0.391	0.373	0.021	0.051	0.072	0.062	0.031
ybord2002	0.384	0.391	0.375	0.023	0.061	0.072	0.073	0.035
ybord2003	0.356	0.354	0.341	0.025	0.073	0.071	0.086	0.037
ybord2004	0.406	0.405	0.394	0.026	0.076	0.068	0.090	0.038
ybord2005	0.434	0.433	0.416	0.027	0.089	0.069	0.104	0.041
ybord2006	0.504	0.502	0.482	0.028	0.094	0.070	0.111	0.043
ybord2007	0.462	0.447	0.430	0.033	0.112	0.078	0.131	0.050
ybord2008	0.496	0.484	0.458	0.034	0.113	0.072	0.132	0.051
ybord2009	0.414	0.408	0.371	0.035	0.127	0.078	0.147	0.054
ybord2010	0.492	0.487	0.450	0.035	0.125	0.077	0.146	0.054
ybord2011	0.543	0.539	0.495	0.037	0.132	0.081	0.153	0.057

ybord2012	0.536	0.536	0.486	0.037	0.129	0.080	0.150	0.057
ybord2013	0.548	0.549	0.495	0.038	0.134	0.085	0.155	0.059
ybord2014	0.558	0.559	0.502	0.039	0.133	0.084	0.155	0.060
ybord2015	0.577	0.583	0.525	0.040	0.128	0.086	0.150	0.061
ybord2016	0.462	0.473	0.409	0.044	0.139	0.101	0.163	0.068
eu	0.347	0.374	0.389	0.042	0.130	0.039	0.153	0.072
pta	0.111	0.131	0.151	0.028	0.068	0.019	0.079	0.038

```

546 .
547 . *****
548 . *** Confidence Intervals
549 . *****
550 . clear

551 . svmat out, names(col)
    number of observations will be reset to 24
    Press any key to continue, or Break to abort
    Number of observations (_N) was 0, now 24.

552 .

```



```
553 . svmat bci, names(col)

554 . ren ll lo_pci

555 . ren ul up_pci

556 .
557 . svmat bcibc, names(col)

558 . ren ll lo_pcibc

559 . ren ul up_pcibc

560 .
561 . local list "poi poipb poiptp poijs poibias "

562 . foreach x of local list {
      2. display "`x'"
      3. gen lo_`x'=bpoi-1.96*S`x'
      4. gen up_`x'=bpoi+1.96*S`x'
      5. }
poi
poipb
poiptp
poijs
poibias
```


563 .

564 . preserve

565 . keep bpoi lo_poi up_poi lo_poipb up_poipb lo_poiptp up_poiptp ///
 > lo_poijk up_poijk lo_poibias up_poibias lo_pci* up_pci*

566 . format bpoi lo_poi up_poi lo_poipb up_poipb lo_poiptp lo_poijk up_poijk up_poiptp lo_poibias up_poibias lo_pci* up_pci*

567 . order bpoi lo_poi up_poi lo_poipb up_poipb lo_poiptp up_poiptp lo_poijk up_poijk lo_poibias up_poibias lo_pci up_pci*

568 . list *, clean

	bpoi	lo_poi	up_poi	lo_poipb	up_poipb	lo_poi~p	up_poi~p	lo_poijk	up_poijk	lo_poi~s	up_poi~s
> bc											
1.	0.03	0.01	0.05	-0.02	0.08	-0.13	0.19	-0.03	0.09	0.00	0.06
> 08											
2.	0.03	0.01	0.06	-0.03	0.10	-0.14	0.20	-0.05	0.11	-0.01	0.07
> 10											
3.	0.14	0.11	0.17	0.06	0.22	-0.03	0.31	0.05	0.23	0.10	0.18
> 22											
4.	0.22	0.19	0.25	0.13	0.30	0.06	0.38	0.12	0.32	0.17	0.27
> 32											
5.	0.21	0.18	0.25	0.11	0.31	0.04	0.39	0.09	0.33	0.15	0.27
> 31											
6.	0.37	0.33	0.41	0.27	0.47	0.20	0.53	0.24	0.49	0.31	0.43
> 48											
7.	0.38	0.34	0.42	0.28	0.48	0.24	0.53	0.26	0.51	0.32	0.45
> 49											
8.	0.38	0.34	0.43	0.26	0.50	0.24	0.52	0.24	0.53	0.32	0.45
> 51											
9.	0.36	0.31	0.40	0.21	0.50	0.22	0.49	0.19	0.52	0.28	0.43
> 49											
10.	0.41	0.36	0.46	0.26	0.56	0.27	0.54	0.23	0.58	0.33	0.48

> 55

11.	0.43	0.38	0.49	0.26	0.61	0.30	0.57	0.23	0.64	0.35	0.51
-----	------	------	------	------	------	------	------	------	------	------	------

> 59

12.	0.50	0.45	0.56	0.32	0.69	0.37	0.64	0.29	0.72	0.42	0.59
-----	------	------	------	------	------	------	------	------	------	------	------

> 66

13.	0.46	0.40	0.53	0.24	0.68	0.31	0.62	0.21	0.72	0.36	0.56
-----	------	------	------	------	------	------	------	------	------	------	------

> 63

14.	0.50	0.43	0.56	0.27	0.72	0.36	0.64	0.24	0.75	0.40	0.60
-----	------	------	------	------	------	------	------	------	------	------	------

> 65

15.	0.41	0.34	0.48	0.17	0.66	0.26	0.57	0.13	0.70	0.31	0.52
-----	------	------	------	------	------	------	------	------	------	------	------

> 58

16.	0.49	0.42	0.56	0.25	0.74	0.34	0.64	0.21	0.78	0.39	0.60
-----	------	------	------	------	------	------	------	------	------	------	------

> 66

17.	0.54	0.47	0.62	0.29	0.80	0.39	0.70	0.24	0.84	0.43	0.65
-----	------	------	------	------	------	------	------	------	------	------	------

> 71

18.	0.54	0.46	0.61	0.28	0.79	0.38	0.69	0.24	0.83	0.42	0.65
-----	------	------	------	------	------	------	------	------	------	------	------

> 71

19.	0.55	0.47	0.62	0.29	0.81	0.38	0.72	0.24	0.85	0.43	0.66
-----	------	------	------	------	------	------	------	------	------	------	------

> 73

20.	0.56	0.48	0.63	0.30	0.82	0.39	0.72	0.25	0.86	0.44	0.67
-----	------	------	------	------	------	------	------	------	------	------	------

> 74

21.	0.58	0.50	0.66	0.33	0.83	0.41	0.74	0.28	0.87	0.46	0.70
-----	------	------	------	------	------	------	------	------	------	------	------

> 76

22.	0.46	0.38	0.55	0.19	0.73	0.26	0.66	0.14	0.78	0.33	0.59
-----	------	------	------	------	------	------	------	------	------	------	------

> 66

23.	0.35	0.27	0.43	0.09	0.60	0.27	0.42	0.05	0.65	0.21	0.49
-----	------	------	------	------	------	------	------	------	------	------	------

> 49

24.	0.11	0.06	0.17	-0.02	0.24	0.07	0.15	-0.04	0.27	0.04	0.18
-----	------	------	------	-------	------	------	------	-------	------	------	------

> 21

569 . restore

570 .

571 . timer list

2:	13659.66 /	1 =	13659.6600
3:	5932.97 /	1 =	5932.9720
4:	1407.13 /	1 =	1407.1300
5:	1015.68 /	1 =	1015.6790
6:	133.76 /	1 =	133.7630
7:	0.04 /	1 =	0.0410
8:	74153.67 /	1 =	74153.6690
9:	324.29 /	1 =	324.2850
22:	567.41 /	1 =	567.4150

572 .

end of do-file

573 .