

Johansen Cointegration Test

Vector Error Correction Model (VECM)

To perform Johansen cointegration test, Vector Error Correct model (VECM) should be estimated and compute the test index.

```
. vecrank inf thco neer vms2 rp14, lags(1/1) max
```

Johansen tests for cointegration
Trend: constant
Sample: 1997m2 - 2004m5
Number of obs = 88
Lags = 1

maximum rank	parms	LL	eigenvalue	trace statistic	5% critical value
0	5	-1267.4154	.	113.0442	68.52
1	14	-1235.827	0.51223	49.8674	47.21
2	21	-1223.6922	0.24103	25.5978*	29.68
3	26	-1216.0279	0.15986	10.2691	15.41
4	29	-1210.9262	0.10948	0.0658	3.76
5	30	-1210.8933	0.00075		

maximum rank	parms	LL	eigenvalue	max statistic	5% critical value
0	5	-1267.4154	.	63.1768	33.46
1	14	-1235.827	0.51223	24.2696	27.07
2	21	-1223.6922	0.24103	15.3287	20.97
3	26	-1216.0279	0.15986	10.2033	14.07
4	29	-1210.9262	0.10948	0.0658	3.76
5	30	-1210.8933	0.00075		

```
. vec inf thco neer vms2 rp14, lags(1/1)
```

Vector error-correction model
Sample: 1997m2 - 2004m5

No. of obs = 88
AIC = 28.40516
HQIC = 28.56394
SBIC = 28.79928

Equation	Parms	RMSE	R-sq	chi2	P>chi2
D_inf	2	.00472	0.3514	46.59861	0.0000
D_thco	2	1.31178	0.1516	15.36817	0.0005
D_neer	2	3.00162	0.0241	2.125663	0.3455
D_vms2	2	42705.2	0.2821	33.79565	0.0000
D_rp14	2	1.68757	0.0276	2.442627	0.2948

	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
D_inf						
_ce1						
L1.	-.0644931	.0094668	-6.81	0.000	-.0830477	-.0459386
_cons	-.0097342	.0014847	-6.56	0.000	-.0126442	-.0068242
D_thco						
_ce1						
L1.	10.18172	2.630959	3.87	0.000	5.025134	15.3383
_cons	1.589864	.4126283	3.85	0.000	.7811275	2.398601
D_neer						
_ce1						
L1.	5.731973	6.020191	0.95	0.341	-6.067385	17.53133
_cons	.492486	.9441806	0.52	0.602	-1.358074	2.343046
D_vms2						
_ce1						
L1.	-168742.7	85651.54	-1.97	0.049	-336616.6	-868.7359
_cons	.0001369	13433.22	0.00	1.000	-26328.62	26328.62
D_rp14						

_ce1						
L1.	-4.924644	3.384674	-1.45	0.146	-11.55848	1.709196
_cons	-.8293151	.5308376	-1.56	0.118	-1.869738	.2111075

Cointegrating equations

Equation	Parms	chi2	P>chi2
_ce1	4	133.5158	0.0000

Identification: beta is exactly identified

Johansen normalization restriction imposed

beta	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
_ce1						
inf	1	.	.	.	.	.
thco	-.0083155	.0011756	-7.07	0.000	-.0106197	-.0060114
neer	.0050075	.0013058	3.83	0.000	.0024482	.0075667
vms2	1.44e-07	3.44e-08	4.17	0.000	7.61e-08	2.11e-07
rp14	-.0059911	.0015366	-3.90	0.000	-.0090027	-.0029795
_cons	-.27832	.	.	.	.	.