

NOTES ON USING LESAGE MODELS

LESAGE WEB SITE: www.spatial-econometrics.com

PRELIMINARIES:

- Open class directory: “sys502/matlab”
- File → Set Path → Add with Subfolders → “sys502/matlab/Lesage_7” → Close

PROCEDURE FOR SEM MODEL (My SAR Model)

```
» u = ones(26,1);
» X=[u,x];
» names = strvcat('Blood Group','const','Pale')
» info.lflag = 0; %Full computation of log determinant
» res = sem(y,X,W,info);
» prt(res,names);
```

OUTPUT OF SEM MODEL

Spatial error Model Estimates

Dependent Variable = Blood Group
R-squared = 0.7391
Rbar-squared = 0.7283
sigma² = 2.1127
log-likelihood = -49.8660
Nobs, Nvars = 26, 2
iterations = 18
min and max rho = -0.9900, 0.9900
total time in secs = 0.3750

Variable	Coefficient	Asymptot t-stat	z-probability
Const	28.837616	20.133410	0.000000
Pale	1.522077	1.722639	0.084954
lambda	0.794987	8.080420	0.000000

PROCEDURE FOR SAR MODEL (My SP_LAG Model)

```
» u = ones(26,1);
» X=[u,x];
» vnames = strvcat('Blood Group','const','Pale')
» info.lflag = 0; %Full computation of log determinant

» res = sar(y,X,W,info);

» prt(res,vnames);
```

OUTPUT OF SAR MODEL

Spatial autoregressive Model Estimates

```
Dependent Variable = Blood Group
R-squared          = 0.7336
Rbar-squared      = 0.7225
sigma^2           = 1.6105
Nobs, Nvars       = 26, 2
log-likelihood    = -45.654
# of iterations   = 18
min and max rho   = -1.000, 1.0000
total time in secs = 0.093
```

Variable	Coefficient	Asymptot t-stat	z-probability
Const	7.030062	2.204916	0.027460
Pale	2.003214	3.461328	0.000538
rho	0.729977	6.549890	0.000000

PROCEDURE FOR SAC MODEL (Combined Model)

```
» u = ones(26,1);
» X=[u,x];
» vnames = strvcat('Blood Group','const','Pale')
» info.lflag = 0; %Full computation of log determinant
» res = sac(y,X,W,W,info); %Use W for rho and lambda
» prt(res,vnames);
```

OUTPUT OF SAC MODEL

General Spatial Model Estimates

Dependent Variable = Blood Group
R-squared = 0.8471
Rbar-squared = 0.8408
sigma² = 1.238
log-likelihood = -44.4074
Nobs, Nvars = 26, 2

Variable	Coefficient	Asymptot t-stat	z-probability
const	3.804233	1.452591	0.146337
Pale	1.787101	3.704048	0.000212
rho	0.842238	9.033662	0.000000
lambda	-0.486363	-1.671626	0.094598

NESTED TESTS: (Not in LeSage)

$$2*(L_{\text{sac}} - L_{\text{sem}}) = 2*(-44.407 + 49.866) = 10.92$$

$$\rightarrow 1 - \text{chi2cdf}(10.92,1) = .0009 \text{ (very significant)}$$

$$2*(L_{\text{sac}} - L_{\text{sar}}) = 2*(-44.407 + 45.654) = 2.49$$

$$\rightarrow 1 - \text{chi2cdf}(2.49,1) = .1145 \text{ (not significant)}$$