

## Demand Estimation Using Chinese Household Expenditures<sup>1</sup>

Shown on the following pages are demand estimates based on surveys of Chinese household expenditures. The data cover the period 1991 through 1995 and are broken into rural and urban households. The data break household expenditures into 8 categories, food, clothing, home furnishings, housing, transportation and communications, entertainment, health and medical, and other. For urban households there is a breakdown of food expenditures separating them into grain, meat, fish, vegetables, cigarettes and liquor (which are added together because there is only one price index covering these two categories), and other food products.

The estimates shown below cover only urban consumers and only for the years 1993-1995. Only these years are used because there is some suggestion that the survey, regime, or both changed in 1993. Only urban consumers are examined because both total and food specific estimates are given.

The system of demand curves was estimated in double log form. That is, each equation looks like:

$$\ln q_i = \beta_{i0} + \beta_{i1} \ln p_1 + \dots + \beta_{ii} \ln p_i + \dots + \beta_{in} \ln p_n + \beta_{i,n+1} \ln M$$

where there are  $n$  goods,  $q_i$  is consumption in units of the  $i^{\text{th}}$  good,  $p$  is price, and  $M$  is total expenditures. Using this estimating form, the  $\beta$ 's are elasticities. Each equation includes all prices and total expenditures. In other words, the right-hand side variables are the same in each regression equation.

The estimates were obtained by imposing restrictions on the estimation process as discussed in Lecture 8. The restrictions include the homogeneity condition that the elasticities in each demand curve sum to zero,

$$\sum_{j=1, \dots, i, \dots, n} \varepsilon_{ij} + \varepsilon_{iM} = 0$$

the cross Slutsky conditions,

$$\frac{\varepsilon_{ij}}{S_j} + \varepsilon_{iM} = \frac{\varepsilon_{ji}}{S_i} + \varepsilon_{jM}$$

and the budget constraint restrictions:

$$\sum_{i=1}^n \varepsilon_{ij} S_i = -S_j$$

$$\sum_{i=1}^n \varepsilon_{iM} S_i = 1$$

The last condition is superfluous because the cross Slutsky conditions include income elasticities and budget shares.<sup>2</sup> The regression estimates are tested to see if the Slutsky own-price conditions are satisfied.

Unrestricted estimates explain more of the variation in the dependent variables. Hence, restricting the estimates so that they conform to the theory gives up predictive power in order to

<sup>1</sup> These data are taken from the Ph.D. dissertation of Haiyue Nie, Applied Econ, CU, circa 1998. The estimation technique reported here is slightly different, but the results are consistent.

<sup>2</sup> As shown in the regression output, the computer program ignores this restriction when calculating the estimates because it is redundant.

gain theoretical consistency. Unrestricted estimates that are inconsistent with the Law of Demand are of no use because we have no theoretical basis from which to make forecasts.

The estimates were derived using SAS. The programming statements are listed before the SAS estimation output at the end of this document. The estimates for overall expenditures are given first. The programming statements show the SAS naming conventions for the inclusion of the cross equation restrictions. The budget share information is included in the restrictions and in the tests of the Slutsky conditions. (The reciprocal of the budget shares shows up in the cross Slutsky restrictions.)

The estimation procedure used is iterative seemingly unrelated regressions. This allows the correlations in the error terms across equations to be estimated and then used to adjust the elasticity estimates.

In the estimates shown in two tables below, all of the price elasticities are statistically significant as are the expenditure elasticities. All goods are normal at this level of aggregation. All demand curves are consistent with the Slutsky own-price restriction. There are no paradoxical cross price elasticities. That is, the reciprocals of all of the gross cross price elasticities are of the same sign except for some that are trivially small and insignificant. Health care is the most elastically demand good, while clothing has the lowest income elasticity. Food has a price elasticity and an income elasticity approximately equal to unity, and it is not significantly affected by price changes among other goods. Even so, the demand for health care, housing and home furnishings is significantly affected when the price of food changes.

When we estimate food by disaggregated categories, the proper method is to include all other non-food items as an index. This is created in the programming statements by constructing a weighted price index and then dividing total expenditures minus food by this non-food price index. As we will see in future lectures, if non-food goods have a unitary own-price elasticity when estimated in conjunction with food items, then it would be acceptable to estimate the food equations by examining only food expenditures. Notice that the non-food demand curve does, in fact, have a price elasticity that is fairly close to one.

All the individual food categories are normal, that is, they have negative price and positive income elasticities. They obey the Law of Demand. There are two cases where the cross price elasticities are of opposite sign: fish & meat, and meat & grain. Fish is a complement to meat while meat is a substitute for fish. Also meat is a complement to grain, while grain is a substitute for meat. The other cross price elasticities have symmetrical signs. In the two cases where the signs are opposite, the elasticities are not statistically significantly different from zero.

The most interesting effect is the inelastic price coefficient on fish and the strongly elastic income coefficient. These effects are resolved in the theory by the low income share for fish and in practice by the fact that fish is a holiday item for the Chinese.

---

Questions:

What is the possible bias in these estimates that results from using total expenditures instead of total income as a variable in the equations?

What other mathematical forms could be used in the estimation process? Is this the best? The worst? Completely bogus?

---

### Food Demand Estimates for Urban Chinese Household Expenditures, 1993-1995

		DEMAND PARAMETERS								
		Grain	Meat	Fish	Vegetables	Cigarettes & Liquor	Other Foods	All Other Goods	Total Expenditures	Shares
D E M A N D  C U R V E S	Grain	<b>-1.57</b>	0.09	-0.02	<b>-0.28</b>	-0.49	<b>1.08</b>	<b>0.88</b>	<b>0.30</b>	0.073
	Meat	-0.03	<b>-1.12</b>	0.01	0.01	<b>0.51</b>	<b>0.08</b>	<b>-0.80</b>	<b>1.34</b>	0.139
	Fish	-0.21	<b>-0.11</b>	<b>-0.88</b>	<b>-0.05</b>	0.08	<b>-0.17</b>	<b>-1.18</b>	<b>2.53</b>	0.031
	Vegetables	<b>-0.41</b>	0.10	0.02	<b>-0.97</b>	0.14	<b>0.22</b>	<b>0.06</b>	<b>0.84</b>	0.055
	Cigarettes & Liquor	<b>-0.70</b>	<b>1.52</b>	0.11	<b>0.17</b>	<b>-0.83</b>	<b>-1.11</b>	<b>0.46</b>	<b>0.38</b>	0.051
	Other Food	<b>0.45</b>	<b>0.10</b>	0.01	0.06	<b>-0.40</b>	<b>-1.32</b>	<b>0.00</b>	<b>1.10</b>	0.156
	All Other Goods	0.08	<b>-0.17</b>	-0.02	0.00	0.02	0.02	<b>-0.89</b>	<b>0.96</b>	0.496
Sum of expenditure elasticities weighed by budget shares:										0.999

Notes: All coefficients except shares are in elasticity form. Bold figures are greater than .15. There are no sign reversals on reciprocal price elasticities except for insignificant coefficients. Data come from Haiyue Nie, Clemson University Dissertation, 1998.

### Demand Estimates for Urban Chinese Household Expenditures, 1993-1995

		DEMAND PARAMETERS									
		Food	Clothing	Home Furnishings	Housing	Transportation & Communications	Entertainment	Health Care	Other	Total Expenditures	Shares
D E M A N D  C U R V E S	Food	<b>-0.98</b>	-0.11	0.00	0.00	0.04	0.00	0.01	0.00	<b>1.04</b>	0.504
	Clothing	-0.05	<b>-0.75</b>	<b>0.28</b>	<b>0.36</b>	-0.12	0.10	-0.10	-0.06	<b>0.34</b>	0.141
	Home Furnishings	<b>-0.15</b>	<b>0.48</b>	<b>-1.58</b>	<b>-0.34</b>	0.14	<b>-0.30</b>	<b>0.24</b>	<b>0.20</b>	<b>1.32</b>	0.064
	Housing	<b>-0.15</b>	<b>0.47</b>	<b>-0.26</b>	<b>-0.93</b>	-0.02	<b>-0.22</b>	-0.07	-0.12	<b>1.30</b>	0.084
	Transportation & Communications	0.12	<b>-0.61</b>	<b>0.18</b>	-0.09	<b>-1.35</b>	0.04	0.10	<b>-0.20</b>	<b>1.82</b>	0.043
	Entertainment	0.00	0.05	<b>-0.20</b>	<b>-0.18</b>	0.05	<b>-0.96</b>	<b>0.19</b>	-0.02	<b>1.06</b>	0.089
	Health Care	<b>0.34</b>	<b>-0.49</b>	<b>0.56</b>	-0.13	<b>0.19</b>	<b>0.61</b>	<b>-1.98</b>	<b>0.30</b>	<b>0.61</b>	0.030
	Other	0.09	<b>-0.26</b>	<b>0.30</b>	<b>-0.20</b>	<b>-0.16</b>	-0.02	<b>0.19</b>	<b>-0.89</b>	<b>0.94</b>	0.045
Sum of expenditure elasticities weighed by budget shares:											1.000

Notes: All coefficients except shares are in elasticity form. Bold figures are greater than .15. There are no sign reversals on reciprocal price elasticities. Data come from Haiyue Nie, Clemson University Dissertation, 1998.

## Programs and Estimation Output

ALL EXPENDITURES:

```

proc access dbms=xls;
create work.f.access;
path='C:\chinese.xls';
  getnames=yes;
  list all;
create work.f.view;
select all;
list view;
run;
data chinax; set;

data logs; set chinax;
array p foodp--othrp;
do over p; p=log(p); end;
array q food--othr;
do over q; q=log(q); end;
lx=log(totexp);
array s foodexp--othrexp;
do over s; s=s/totexp; end;

proc syslin itsur; where urban=1 and year>1992;
b:model food =foodp clothp furnp housp trcmp entrtp medicp othrp lx;
c:model cloth =foodp clothp furnp housp trcmp entrtp medicp othrp lx;
d:model furn =foodp clothp furnp housp trcmp entrtp medicp othrp lx;
e:model hous =foodp clothp furnp housp trcmp entrtp medicp othrp lx;
f:model trcm =foodp clothp furnp housp trcmp entrtp medicp othrp lx;
g:model entrtp =foodp clothp furnp housp trcmp entrtp medicp othrp lx;
h:model medic =foodp clothp furnp housp trcmp entrtp medicp othrp lx;
i:model othr =foodp clothp furnp housp trcmp entrtp medicp othrp lx;

b:srestrict b.foodp+b.clothp+b.furnp+b.housp+b.trcmp+b.entrtp+b.medicp+b.othrp+b.lx=0;
c:srestrict c.foodp+c.clothp+c.furnp+c.housp+c.trcmp+c.entrtp+c.medicp+c.othrp+c.lx=0;
d:srestrict d.foodp+d.clothp+d.furnp+d.housp+d.trcmp+d.entrtp+d.medicp+d.othrp+d.lx=0;
e:srestrict e.foodp+e.clothp+e.furnp+e.housp+e.trcmp+e.entrtp+e.medicp+e.othrp+e.lx=0;
f:srestrict f.foodp+f.clothp+f.furnp+f.housp+f.trcmp+f.entrtp+f.medicp+f.othrp+f.lx=0;
g:srestrict g.foodp+g.clothp+g.furnp+g.housp+g.trcmp+g.entrtp+g.medicp+g.othrp+g.lx=0;
h:srestrict h.foodp+h.clothp+h.furnp+h.housp+h.trcmp+h.entrtp+h.medicp+h.othrp+h.lx=0;
i:srestrict i.foodp+i.clothp+i.furnp+i.housp+i.trcmp+i.entrtp+i.medicp+i.othrp+i.lx=0;

bc:srestrict b.lx+7.09*b.clothp=c.lx+1.98*c.foodp;
bd:srestrict b.lx+15.63*b.furnp=d.lx+1.98*d.foodp;
be:srestrict b.lx+11.90*b.housp=e.lx+1.98*e.foodp;
bf:srestrict b.lx+23.26*b.trcmp=f.lx+1.98*f.foodp;
bg:srestrict b.lx+11.24*b.entrtp=g.lx+1.98*g.foodp;
bh:srestrict b.lx+33.33*b.medicp=h.lx+1.98*h.foodp;
bi:srestrict b.lx+22.22*b.othrp=i.lx+1.98*i.foodp;

cd:srestrict c.lx+15.63*c.furnp=d.lx+7.09*d.clothp;
ce:srestrict c.lx+11.90*c.housp=e.lx+7.09*e.clothp;
cf:srestrict c.lx+23.26*c.trcmp=f.lx+7.09*f.clothp;
cg:srestrict c.lx+11.24*c.entrtp=g.lx+7.09*g.clothp;
ch:srestrict c.lx+33.33*c.medicp=h.lx+7.09*h.clothp;
ci:srestrict c.lx+22.22*c.othrp=i.lx+7.09*i.clothp;

de:srestrict d.lx+11.90*d.housp=e.lx+15.63*e.furnp;
df:srestrict d.lx+23.26*d.trcmp=f.lx+15.63*f.furnp;
dg:srestrict d.lx+11.24*d.entrtp=g.lx+15.63*g.furnp;
dh:srestrict d.lx+33.33*d.medicp=h.lx+15.63*h.furnp;
di:srestrict d.lx+22.22*d.othrp=i.lx+15.63*i.furnp;

ef:srestrict e.lx+23.26*e.trcmp=f.lx+11.90*f.housp;
eg:srestrict e.lx+11.24*e.entrtp=g.lx+11.90*g.housp;
eh:srestrict e.lx+33.33*e.medicp=h.lx+11.90*h.housp;
ei:srestrict e.lx+22.22*e.othrp=i.lx+11.90*i.housp;

fg:srestrict f.lx+11.24*f.entrtp=g.lx+23.26 *g.trcmp;

```

```

fh:srestrict f.lx+33.33*f.medicp=h.lx+23.26 *h.trcmp;
fi:srestrict f.lx+22.22*f.othrp=i.lx+23.26 *i.trcmp;

gh:srestrict g.lx+33.33*g.medicp=h.lx+11.24*h.entrt;
gi:srestrict g.lx+22.22*g.othrp=i.lx+11.24*i.entrt;

hi:srestrict h.lx+22.22*h.othrp=i.lx+33.33 *i.medicp;

bx:srestrict .504*b.foodp+.141*c.foodp+.064*d.foodp+.084*e.foodp+.043*f.foodp
+.089*g.foodp+.03*h.foodp+.045*i.foodp=-.504;
cx:srestrict .504*b.clothp+.141*c.clothp+.064*d.clothp+.084*e.clothp+.043*f.clothp
+.089*g.clothp+.03*h.clothp+.045*i.clothp=-.141;
dx:srestrict .504*b.furnp+.141*c.furnp+.064*d.furnp+.084*e.furnp+.043*f.furnp
+.089*g.furnp+.03*h.furnp+.045*i.furnp=-.064;
ex:srestrict .504*b.housp+.141*c.housp+.064*d.housp+.084*e.housp+.043*f.housp
+.089*g.housp+.03*h.housp+.045*i.housp=-.084;
fx:srestrict .504*b.trcmp+.141*c.trcmp+.064*d.trcmp+.084*e.trcmp+.043*f.trcmp
+.089*g.trcmp+.03*h.trcmp+.045*i.trcmp=-.043;
gx:srestrict .504*b.entrt+.141*c.entrt+.064*d.entrt+.084*e.entrt+.043*f.entrt
+.089*g.entrt+.03*h.entrt+.045*i.entrt=-.089;
hx:srestrict .504*b.medicp+.141*c.medicp+.064*d.medicp+.084*e.medicp+.043*f.medicp
+.089*g.medicp+.03*h.medicp+.045*i.medicp=-.03;
ix:srestrict .504*b.othrp+.141*c.othrp+.064*d.othrp+.084*e.othrp+.043*f.othrp
+.089*g.othrp+.03*h.othrp+.045*i.othrp=-.045;

x:srestrict .504*b.lx+.141*c.lx+.064*d.lx+.084*e.lx+.043*f.lx
+.089*g.lx+.03*h.lx+.045*i.lx=1;

bs:stest .504*b.lx+b.foodp ;
cs:stest .141*c.lx+c.clothp ;
ds:stest .064*d.lx+d.furnp ;
es:stest .084*e.lx+e.housp ;
fs:stest .043*f.lx+f.trcmp ;
gs:stest .089*g.lx+g.entrt ;
hs:stest .03*h.lx+h.medicp ;
is:stest .045*i.lx+i.othrp ;

run;

```





08:15 Monday, October 5, 1998

SYSLIN Procedure  
Ordinary Least Squares Estimation

Model: B  
Dependent variable: FOOD FOOD

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	9	4.71789	0.52421	137.220	0.0001
Error	80	0.30562	0.00382		
C Total	89	5.02350			
Root MSE		0.06181	R-Square	0.9392	
Dep Mean		2.05268	Adj R-SQ	0.9323	
C.V.		3.01108			

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob >  T	Variable Label
INTERCEP	1	1.265620	0.596064	2.123	0.0368	Interc
FOODP	1	-0.544463	0.089461	-6.086	0.0001	FOODP
CLOTHP	1	-0.452967	0.115048	-3.937	0.0002	CLOTHP
FURNP	1	-0.295753	0.195657	-1.512	0.1346	FURNP
HOUSP	1	0.117736	0.038327	3.072	0.0029	HOUSP
TRCMP	1	0.027555	0.077110	0.357	0.7218	TRCMP
ENTRTP	1	0.062623	0.072518	0.864	0.3904	ENTRTP
MEDICP	1	-0.344493	0.097393	-3.537	0.0007	MEDICP
OTHRP	1	-0.040975	0.062698	-0.654	0.5153	OTHRP
LX	1	1.025490	0.031557	32.497	0.0001	

The SAS System 232  
08:15 Monday, October 5, 1998

SYSLIN Procedure  
Ordinary Least Squares Estimation

Model: C  
Dependent variable: CLOTH CLOTH

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	9	1.62850	0.18094	7.651	0.0001
Error	80	1.89199	0.02365		
C Total	89	3.52048			
Root MSE		0.15379	R-Square	0.4626	
Dep Mean		1.00173	Adj R-SQ	0.4021	
C.V.		15.35200			

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob >  T	Variable Label
INTERCEP	1	-3.703314	1.483074	-2.497	0.0146	Interc
FOODP	1	-0.635990	0.222590	-2.857	0.0054	FOODP
CLOTHP	1	-0.046761	0.286251	-0.163	0.8707	CLOTHP
FURNP	1	0.435033	0.486818	0.894	0.3742	FURNP
HOUSP	1	0.249421	0.095363	2.615	0.0106	HOUSP
TRCMP	1	-0.238827	0.191858	-1.245	0.2168	TRCMP
ENTRTP	1	0.119436	0.180433	0.662	0.5099	ENTRTP



MEDICP	1	0.515678	0.242324	2.128	0.0364	MEDICP
OTHRP	1	0.265595	0.155999	1.703	0.0925	OTHRP
LX	1	0.186923	0.078516	2.381	0.0197	

The SAS System 233  
08:15 Monday, October 5, 1998

SYSLIN Procedure  
Ordinary Least Squares Estimation

Model: D  
Dependent variable: FURN FURN

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	9	9.95436	1.10604	34.263	0.0001
Error	80	2.58245	0.03228		
C Total	89	12.53681			

  

Root MSE	0.17967	R-Square	0.7940
Dep Mean	0.57515	Adj R-SQ	0.7708
C.V.	31.23854		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob >  T	Variable Label
INTERCEP	1	-1.110200	1.732686	-0.641	0.5235	Intercept
FOODP	1	-0.518606	0.260053	-1.994	0.0495	FOODP
CLOTHP	1	0.713277	0.334429	2.133	0.0360	CLOTHP
FURNP	1	-2.002315	0.568753	-3.521	0.0007	FURNP
HOUSP	1	-0.475320	0.111413	-4.266	0.0001	HOUSP
TRCMP	1	-0.067551	0.224149	-0.301	0.7639	TRCMP
ENTRTP	1	-0.300309	0.210801	-1.425	0.1582	ENTRTP
MEDICP	1	0.501313	0.283109	1.771	0.0804	MEDICP
OTHRP	1	0.189630	0.182254	1.040	0.3013	OTHRP
LX	1	1.442386	0.091731	15.724	0.0001	LX

The SAS System 234  
08:15 Monday, October 5, 1998

SYSLIN Procedure  
Ordinary Least Squares Estimation

Model: E  
Dependent variable: HOUS HOUS

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	9	8.76623	0.97403	22.658	0.0001
Error	80	3.43901	0.04299		
C Total	89	12.20524			

  

Root MSE	0.20733	R-Square	0.7182
Dep Mean	-0.19457	Adj R-SQ	0.6865
C.V.	-106.56232		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob >  T	Variable Label
INTERCEP	1	-0.712491	1.999496	-0.356	0.7225	Intercept
FOODP	1	0.189652	0.300098	0.632	0.5292	FOODP

CLOTHP	1	0.339647	0.385927	0.880	0.3815	CLOTHP
FURNP	1	-0.949802	0.656333	-1.447	0.1518	FURNP
HOUSP	1	-0.771683	0.128570	-6.002	0.0001	HOUSP
TRCMP	1	0.160890	0.258665	0.622	0.5357	TRCMP
ENTRTP	1	-0.479998	0.243262	-1.973	0.0519	ENTRTP
MEDICP	1	0.110207	0.326704	0.337	0.7368	MEDICP
OTHRP	1	-0.463378	0.210319	-2.203	0.0305	OTHRP
LX	1	1.259818	0.105856	11.901	0.0001	

The SAS System 235  
08:15 Monday, October 5, 1998

SYSLIN Procedure  
Ordinary Least Squares Estimation

Model: F  
Dependent variable: TRCM TRCM

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	9	23.99033	2.66559	76.048	0.0001
Error	80	2.80413	0.03505		
C Total	89	26.79446			
Root MSE		0.18722	R-Square	0.8953	
Dep Mean		-0.39658	Adj R-SQ	0.8836	
C.V.		-47.20835			

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob >  T	Variable Label
INTERCEP	1	-8.673433	1.805522	-4.804	0.0001	Interc
FOODP	1	0.039815	0.270985	0.147	0.8836	FOODP
CLOTHP	1	0.343881	0.348488	0.987	0.3267	CLOTHP
FURNP	1	0.054834	0.592661	0.093	0.9265	FURNP
HOUSP	1	-0.206546	0.116097	-1.779	0.0790	HOUSP
TRCMP	1	-1.174965	0.233571	-5.030	0.0001	TRCMP
ENTRTP	1	-0.239482	0.219662	-1.090	0.2789	ENTRTP
MEDICP	1	0.638588	0.295010	2.165	0.0334	MEDICP
OTHRP	1	-0.418530	0.189916	-2.204	0.0304	OTHRP
LX	1	1.694763	0.095587	17.730	0.0001	

The SAS System 236  
08:15 Monday, October 5, 1998

SYSLIN Procedure  
Ordinary Least Squares Estimation

Model: G  
Dependent variable: ENTRT ENTRT

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	9	7.69419	0.85491	86.924	0.0001
Error	80	0.78681	0.00984		
C Total	89	8.48101			
Root MSE		0.09917	R-Square	0.9072	
Dep Mean		0.60161	Adj R-SQ	0.8968	
C.V.		16.48442			

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob >  T	Variable Label
INTERCEP	1	-6.763672	0.956399	-7.072	0.0001	Interc
FOODP	1	-0.731278	0.143543	-5.094	0.0001	FOODP
CLOTHP	1	0.233667	0.184597	1.266	0.2093	CLOTHP
FURNP	1	0.933754	0.313937	2.974	0.0039	FURNP
HOUSP	1	-0.256480	0.061497	-4.171	0.0001	HOUSP
TRCMP	1	0.197944	0.123725	1.600	0.1136	TRCMP
ENRTRP	1	-1.004208	0.116357	-8.630	0.0001	ENRTRP
MEDICP	1	0.447520	0.156269	2.864	0.0053	MEDICP
OTHRP	1	-0.063170	0.100600	-0.628	0.5318	OTHRP
LX	1	1.118169	0.050633	22.084	0.0001	

The SAS System 237  
08:15 Monday, October 5, 1998

SYSLIN Procedure  
Ordinary Least Squares Estimation

Model: H  
Dependent variable: MEDIC MEDIC

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	9	6.06031	0.67337	8.932	0.0001
Error	80	6.03087	0.07539		
C Total	89	12.09118			
Root MSE		0.27456	R-Square	0.5012	
Dep Mean		-0.63018	Adj R-SQ	0.4451	
C.V.		-43.56957			

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob >  T	Variable Label
INTERCEP	1	-11.705396	2.647852	-4.421	0.0001	Interc
FOODP	1	-0.294904	0.397408	-0.742	0.4602	FOODP
CLOTHP	1	0.273444	0.511068	0.535	0.5941	CLOTHP
FURNP	1	2.131961	0.869155	2.453	0.0163	FURNP
HOUSP	1	-0.416758	0.170260	-2.448	0.0166	HOUSP
TRCMP	1	0.365367	0.342539	1.067	0.2893	TRCMP
ENRTRP	1	0.276767	0.322142	0.859	0.3928	ENRTRP
MEDICP	1	-1.046331	0.432641	-2.418	0.0179	MEDICP
OTHRP	1	0.261384	0.278517	0.938	0.3508	OTHRP
LX	1	0.481445	0.140181	3.434	0.0009	

The SAS System 238  
08:15 Monday, October 5, 1998

SYSLIN Procedure  
Ordinary Least Squares Estimation

Model: I  
Dependent variable: OTHR OTHR

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	9	6.24157	0.69351	39.438	0.0001
Error	80	1.40679	0.01758		
C Total	89	7.64836			
Root MSE		0.13261	R-Square	0.8161	



D	-0.068153175	0.3307785085	-0.171319815	0.4022506861
E	-0.044622311	0.0578783707	-0.261780524	-0.469527578
F	1	-0.242589638	0.3273978627	0.0103063118
G	-0.242589638	1	0.0620397055	0.2554493066
H	0.3273978627	0.0620397055	1	0.3360744946
I	0.0103063118	0.2554493066	0.3360744946	1

The SAS System 240  
08:15 Monday, October 5, 1998

SYSLIN Procedure  
Iterative Seemingly Unrelated Regression Estimation

Cross Model Inverse Correlation

Inv Corr	B	C	D	E
B	19.355018406	10.076985546	5.0777651756	7.7359979221
C	10.076985546	6.7032744228	2.4191211541	4.3426780894
D	5.0777651756	2.4191211541	2.914778249	1.7034909297
E	7.7359979221	4.3426780894	1.7034909297	4.575301783
F	3.8844407781	1.7929594647	0.8892901406	1.4619242101
G	5.2461548917	2.6822985624	1.0298070362	1.8759563567
H	5.3776921727	2.1349238982	2.0664965037	2.0849854204
I	5.0534101816	2.8120665909	0.451114894	2.8624993306

Inv Corr	F	G	H	I
B	3.8844407781	5.2461548917	5.3776921727	5.0534101816
C	1.7929594647	2.6822985624	2.1349238982	2.8120665909
D	0.8892901406	1.0298070362	2.0664965037	0.451114894
E	1.4619242101	1.8759563567	2.0849854204	2.8624993306
F	2.0539705518	1.4206897228	0.6795947169	1.0976093801
G	1.4206897228	2.708051055	1.2359926839	1.1575124087
H	0.6795947169	1.2359926839	3.3030587917	0.6977715123
I	1.0976093801	1.1575124087	0.6977715123	3.320879482

Cross Model Inverse Covariance

Inv Sigma	B	C	D	E
B	3263.2120747	692.82086981	342.45087247	448.7607558
C	692.82086981	187.93857957	66.530670233	102.72940649
D	342.45087247	66.530670233	78.633052988	39.528679403
E	448.7607558	102.72940649	39.528679403	91.319828481
F	240.68010966	45.302355353	22.040889996	31.166165321
G	571.28887929	119.11333742	44.858471317	70.28848902
H	221.05370713	35.786800931	33.978992063	29.488433461
I	415.23898421	94.227525184	14.827730655	80.92929897

Inv Sigma	F	G	H	I
B	240.68010966	571.28887929	221.05370713	415.23898421
C	45.302355353	119.11333742	35.786800931	94.227525184
D	22.040889996	44.858471317	33.978992063	14.827730655
E	31.166165321	70.28848902	29.488433461	80.92929897
F	46.769841087	56.855683587	10.266250171	33.145254971
G	56.855683587	190.47345509	32.81562758	61.433063786
H	10.266250171	32.81562758	33.10307366	13.979027413
I	33.145254971	61.433063786	13.979027413	132.99292631

System Weighted MSE: 0.93567 with 684 degrees of freedom.  
System Weighted R-Square: 0.9885

The SAS System 241  
08:15 Monday, October 5, 1998

SYSLIN Procedure  
Iterative Seemingly Unrelated Regression Estimation

Model: B  
Dependent variable: FOOD FOOD

The SAS System 242  
08:15 Monday, October 5, 1998

SYSLIN Procedure  
Iterative Seemingly Unrelated Regression Estimation

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob >  T	Variable Label
INTERCEP	1	-0.827366	0.093851	-8.816	0.0001	Interc
FOODP	1	-0.979219	0.004181	-234.199	0.0001	FOODP
CLOTHP	1	-0.112668	0.019154	-5.882	0.0001	CLOTHP
FURNP	1	-0.001947	0.010993	-0.177	0.8599	FURNP
HOUSP	1	-0.003999	0.009633	-0.415	0.6791	HOUSP
TRCMP	1	0.043522	0.006627	6.568	0.0001	TRCMP
ENTRTP	1	0.001585	0.008891	0.178	0.8589	ENTRTP
MEDICP	1	0.006962	0.007595	0.917	0.3621	MEDICP
OTHRP	1	0.003868	0.005398	0.717	0.4758	OTHRP
LX	1	1.041895	0.031944	32.616	0.0001	

Model: C  
Dependent variable: CLOTH CLOTH

The SAS System 243  
08:15 Monday, October 5, 1998

SYSLIN Procedure  
Iterative Seemingly Unrelated Regression Estimation

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob >  T	Variable Label
INTERCEP	1	-0.085617	0.221758	-0.386	0.7005	Interc
FOODP	1	-0.049717	0.048524	-1.025	0.3086	FOODP
CLOTHP	1	-0.751947	0.205864	-3.653	0.0005	CLOTHP
FURNP	1	0.278906	0.127045	2.195	0.0310	FURNP
HOUSP	1	0.359882	0.076503	4.704	0.0001	HOUSP
TRCMP	1	-0.123856	0.071800	-1.725	0.0884	TRCMP
ENTRTP	1	0.097833	0.087658	1.116	0.2677	ENTRTP
MEDICP	1	-0.095330	0.081687	-1.167	0.2467	MEDICP
OTHRP	1	-0.057292	0.055688	-1.029	0.3067	OTHRP
LX	1	0.341520	0.073857	4.624	0.0001	

Model: D  
Dependent variable: FURN FURN

The SAS System 244  
08:15 Monday, October 5, 1998

SYSLIN Procedure  
Iterative Seemingly Unrelated Regression Estimation

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob >  T	Variable Label
INTERCEP	1	-3.415296	0.265713	-12.853	0.0001	Interc
FOODP	1	-0.154311	0.078680	-1.961	0.0533	FOODP
CLOTHP	1	0.477267	0.276646	1.725	0.0884	CLOTHP
FURNP	1	-1.578105	0.292859	-5.389	0.0001	FURNP

HOUSP	1	-0.342962	0.096582	-3.551	0.0006	HOUSP
TRCMP	1	0.144671	0.129018	1.121	0.2655	TRCMP
ENTRTP	1	-0.299138	0.145244	-2.060	0.0427	ENTRTP
MEDICP	1	0.239152	0.170400	1.403	0.1643	MEDICP
OTHRP	1	0.196422	0.101572	1.934	0.0567	OTHRP
LX	1	1.317005	0.087510	15.050	0.0001	

Model: E

Dependent variable: HOUS HOUS

The SAS System

245

08:15 Monday, October 5, 1998

SYSLIN Procedure  
Iterative Seemingly Unrelated Regression Estimation

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob >  T	Variable Label
INTERCEP	1	-3.640247	0.264762	-13.749	0.0001	Interc
FOODP	1	-0.154198	0.029590	-5.211	0.0001	FOODP
CLOTHP	1	0.468900	0.130004	3.607	0.0005	CLOTHP
FURNP	1	-0.260004	0.074313	-3.499	0.0008	FURNP
HOUSP	1	-0.925837	0.120232	-7.700	0.0001	HOUSP
TRCMP	1	-0.022877	0.054000	-0.424	0.6730	TRCMP
ENTRTP	1	-0.215105	0.062452	-3.444	0.0009	ENTRTP
MEDICP	1	-0.068363	0.055140	-1.240	0.2187	MEDICP
OTHRP	1	-0.122132	0.040209	-3.037	0.0032	OTHRP
LX	1	1.299617	0.089407	14.536	0.0001	

Model: F

Dependent variable: TRCM TRCM

The SAS System

246

08:15 Monday, October 5, 1998

SYSLIN Procedure  
Iterative Seemingly Unrelated Regression Estimation

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob >  T	Variable Label
INTERCEP	1	-5.500788	0.279717	-19.666	0.0001	Interc
FOODP	1	0.118230	0.061279	1.929	0.0572	FOODP
CLOTHP	1	-0.614879	0.236881	-2.596	0.0112	CLOTHP
FURNP	1	0.183104	0.194833	0.940	0.3501	FURNP
HOUSP	1	-0.088456	0.105975	-0.835	0.4064	HOUSP
TRCMP	1	-1.345058	0.166084	-8.099	0.0001	TRCMP
ENTRTP	1	0.035072	0.147136	0.238	0.8122	ENTRTP
MEDICP	1	0.095107	0.140146	0.679	0.4993	MEDICP
OTHRP	1	-0.203251	0.091183	-2.229	0.0286	OTHRP
LX	1	1.820131	0.091243	19.948	0.0001	

Model: G

Dependent variable: ENTRT ENTRT

The SAS System

247

08:15 Monday, October 5, 1998

SYSLIN Procedure  
Iterative Seemingly Unrelated Regression Estimation

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob >  T	Variable Label
----------	----	--------------------	----------------	--------------------------	-----------	----------------

INTERCEP	1	-2.558077	0.156925	-16.301	0.0001	Interc
FOODP	1	-0.000087433	0.037205	-0.002	0.9981	FOODP
CLOTHP	1	0.053777	0.137862	0.390	0.6975	CLOTHP
FURNP	1	-0.198669	0.104960	-1.893	0.0620	FURNP
HOUSP	1	-0.183029	0.057867	-3.163	0.0022	HOUSP
TRCMP	1	0.049633	0.070145	0.708	0.4813	TRCMP
ENTRTP	1	-0.957029	0.104104	-9.193	0.0001	ENTRTP
MEDICP	1	0.191023	0.076839	2.486	0.0150	MEDICP
OTHRP	1	-0.015503	0.049492	-0.313	0.7549	OTHRP
LX	1	1.059885	0.052268	20.278	0.0001	

Model: H

Dependent variable: MEDIC MEDIC

The SAS System 248  
08:15 Monday, October 5, 1998

SYSLIN Procedure  
Iterative Seemingly Unrelated Regression Estimation

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob >  T	Variable Label
INTERCEP	1	-2.409045	0.422908	-5.696	0.0001	Interc
FOODP	1	0.337235	0.109120	3.090	0.0027	FOODP
CLOTHP	1	-0.485478	0.384272	-1.263	0.2101	CLOTHP
FURNP	1	0.555453	0.366860	1.514	0.1339	FURNP
HOUSP	1	-0.133205	0.154828	-0.860	0.3922	HOUSP
TRCMP	1	0.188471	0.200339	0.941	0.3497	TRCMP
ENTRTP	1	0.606803	0.229442	2.645	0.0098	ENTRTP
MEDICP	1	-1.979625	0.345450	-5.731	0.0001	MEDICP
OTHRP	1	0.304134	0.158302	1.921	0.0583	OTHRP
LX	1	0.606213	0.140210	4.324	0.0001	

Model: I

Dependent variable: OTHR OTHR

The SAS System 249  
08:15 Monday, October 5, 1998

SYSLIN Procedure  
Iterative Seemingly Unrelated Regression Estimation

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob >  T	Variable Label
INTERCEP	1	-2.887110	0.203320	-14.200	0.0001	Intercep
FOODP	1	0.092703	0.044231	2.096	0.0393	FOODP
CLOTHP	1	-0.264568	0.172109	-1.537	0.1282	CLOTHP
FURNP	1	0.303085	0.144036	2.104	0.0385	FURNP
HOUSP	1	-0.198189	0.073469	-2.698	0.0085	HOUSP
TRCMP	1	-0.156508	0.085657	-1.827	0.0714	TRCMP
ENTRTP	1	-0.020362	0.097189	-0.210	0.8346	ENTRTP
MEDICP	1	0.192613	0.104366	1.846	0.0687	MEDICP
OTHRP	1	-0.893055	0.095126	-9.388	0.0001	OTHRP
LX	1	0.944283	0.068013	13.884	0.0001	

The SAS System 250  
08:15 Monday, October 5, 1998

SYSLIN Procedure  
Iterative Seemingly Unrelated Regression Estimation

Cross Model Restrictions:

Parameter Estimates

Parameter	Standard	T for H0:	Variable
-----------	----------	-----------	----------



Variable	DF	Estimate	Error	Parameter=0	Prob >  T	Label
RESTRICT	-1	9451.883635	3615.002341	2.615	0.0081	B
RESTRICT	-1	-1535.357221	3021.662426	-0.508	0.6144	C
RESTRICT	-1	912.444559	2712.703924	0.336	0.7389	D
RESTRICT	-1	-292.692349	2805.324007	-0.104	0.9177	E
RESTRICT	-1	1046.935320	2239.927758	0.467	0.6431	F
RESTRICT	-1	-5584.549383	3878.732755	-1.440	0.1511	G
RESTRICT	-1	3886.777346	1784.002345	2.179	0.0284	H
RESTRICT	-1	-8513.552484	3649.770803	-2.333	0.0187	I
RESTRICT	-1	-2111.673750	1670.936100	-1.264	0.2083	BC
RESTRICT	-1	-139.144933	1358.009848	-0.102	0.9192	BD
RESTRICT	-1	-932.409579	1588.732789	-0.587	0.5606	BE
RESTRICT	-1	117.511507	1182.208556	0.099	0.9216	BF
RESTRICT	-1	-3661.711792	2062.296245	-1.776	0.0756	BG
RESTRICT	-1	1672.623473	883.851470	1.892	0.0579	BH
RESTRICT	-1	-4711.856505	1877.376192	-2.510	0.0112	BI
RESTRICT	-1	228.618003	435.088023	0.525	0.6024	CD
RESTRICT	-1	90.407407	440.624301	0.205	0.8389	CE
RESTRICT	-1	212.630139	371.303674	0.573	0.5701	CF
RESTRICT	-1	-651.444170	663.148834	-0.982	0.3290	CG
RESTRICT	-1	593.717556	298.092933	1.992	0.0457	CH
RESTRICT	-1	-1128.955676	553.093945	-2.041	0.0405	CI
RESTRICT	-1	-95.787006	315.579996	-0.304	0.7636	DE
RESTRICT	-1	26.961253	187.118350	0.144	0.8865	DF
RESTRICT	-1	-440.265346	385.949592	-1.141	0.2565	DG
RESTRICT	-1	220.712995	114.278628	1.931	0.0529	DH
RESTRICT	-1	-586.200088	319.382642	-1.835	0.0661	DI
RESTRICT	-1	99.956939	241.814388	0.413	0.6820	EF
RESTRICT	-1	-444.846345	470.191425	-0.946	0.3473	EG
RESTRICT	-1	334.642612	175.592078	1.906	0.0562	EH
RESTRICT	-1	-701.985797	300.429487	-2.337	0.0185	EI
RESTRICT	-1	-333.450587	233.776707	-1.426	0.1550	FG
RESTRICT	-1	135.761412	112.782342	1.204	0.2310	FH
RESTRICT	-1	-412.691724	189.645187	-2.176	0.0286	FI
RESTRICT	-1	513.563806	207.200208	2.479	0.0123	GH
RESTRICT	-1	-505.374990	402.257865	-1.256	0.2110	GI
RESTRICT	-1	-429.928988	154.791788	-2.777	0.0048	HI
RESTRICT	-1	-18712	7118.130059	-2.629	0.0077	BX
RESTRICT	-1	10992	21432	0.513	0.6111	CX
RESTRICT	-1	-14414	42355	-0.340	0.7359	DX
RESTRICT	-1	3916.227617	33367	0.117	0.9074	EX
RESTRICT	-1	-24243	52058	-0.466	0.6443	FX
RESTRICT	-1	62835	43551	1.443	0.1502	GX
RESTRICT	-1	-129285	59393	-2.177	0.0286	HX
RESTRICT	-1	188944	81002	2.333	0.0187	IX
RESTRICT	-0	0	.	.	.	X

Test: BS

Numerator: 678.6858 DF: 1 F Value: 725.3454  
Denominator: 0.935673 DF: 684 Prob>F: 0.0001

The SAS System

251

08:15 Monday, October 5, 1998

SYSLIN Procedure  
Iterative Seemingly Unrelated Regression Estimation

Test: CS

Numerator: 11.76732 DF: 1 F Value: 12.5763  
Denominator: 0.935673 DF: 684 Prob>F: 0.0004

Test: DS

Numerator: 26.35899 DF: 1 F Value: 28.1712  
Denominator: 0.935673 DF: 684 Prob>F: 0.0001

Test: ES

Numerator: 46.62553 DF: 1 F Value: 49.8310  
Denominator: 0.935673 DF: 684 Prob>F: 0.0001

Test: FS

Numerator: 57.56269 DF: 1 F Value: 61.5201  
Denominator: 0.935673 DF: 684 Prob>F: 0.0001

Test: GS

Numerator: 69.37013 DF: 1 F Value: 74.1393  
Denominator: 0.935673 DF: 684 Prob>F: 0.0001

Test: HS

Numerator: 32.12362 DF: 1 F Value: 34.3321  
Denominator: 0.935673 DF: 684 Prob>F: 0.0001

Test: IS

Numerator: 81.47956 DF: 1 F Value: 87.0813  
Denominator: 0.935673 DF: 684 Prob>F: 0.0001

NOTE: Restrictions in effect for model tested.

ESTIMATES OF FOOD EXPENDITURES BY FOOD CATEGORY:

```
data logs; set s.chinax; if year>1992; if urban=1;
```



```
zxp=sum(clothexp -- othrexp)/sum(cloth -- othr);
```



$zx = \log((\text{totexp} - \text{foodexp}) / \text{zxp});$





$zxp = \log(zxp);$



```

array p foodp--othrfp;
do over p; p=log(p); end;
array q food--othrf;
do over q; q=log(q); end;
lx=log(totexp);
fx=log(foodexp);
array s foodexp--othrfexp;
do over s; s=s/totexp; end;
proc means; var foodexp--othrfexp;

proc syslin itsur;
b:model grain =grainp meatp fishp vegip sinp othrfp zxp lx;
c:model meat =grainp meatp fishp vegip sinp othrfp zxp lx;
d:model fish =grainp meatp fishp vegip sinp othrfp zxp lx;
e:model vegi =grainp meatp fishp vegip sinp othrfp zxp lx;
f:model sin =grainp meatp fishp vegip sinp othrfp zxp lx;
g:model othrf =grainp meatp fishp vegip sinp othrfp zxp lx;
h:model zx =grainp meatp fishp vegip sinp othrfp zxp lx;

b:srestrict b.grainp+b.meatp+b.fishp+b.vegip+b.sinp+b.othrfp+b.zxp+b.lx=0;
c:srestrict c.grainp+c.meatp+c.fishp+c.vegip+c.sinp+c.othrfp+c.zxp+c.lx=0;
d:srestrict d.grainp+d.meatp+d.fishp+d.vegip+d.sinp+d.othrfp+d.zxp+d.lx=0;
e:srestrict e.grainp+e.meatp+e.fishp+e.vegip+e.sinp+e.othrfp+e.zxp+e.lx=0;
f:srestrict f.grainp+f.meatp+f.fishp+f.vegip+f.sinp+f.othrfp+f.zxp+f.lx=0;
g:srestrict g.grainp+g.meatp+g.fishp+g.vegip+g.sinp+g.othrfp+g.zxp+g.lx=0;
h:srestrict h.grainp+h.meatp+h.fishp+h.vegip+h.sinp+h.othrfp+h.zxp+h.lx=0;

bc:srestrict b.lx+7.2*b.meatp=c.lx+13.73*c.grainp;
bd:srestrict b.lx+32.65*b.fishp=d.lx+13.73*d.grainp;
be:srestrict b.lx+18.19*b.vegip=e.lx+13.73*e.grainp;
bf:srestrict b.lx+19.65*b.sinp=f.lx+13.73*f.grainp;
bg:srestrict b.lx+6.42*b.othrfp=g.lx+13.73*g.grainp;
bh:srestrict b.lx+2.02*b.zxp=h.lx+13.73*h.grainp;

cd:srestrict c.lx+32.65*c.fishp=d.lx+7.2*d.meatp;
ce:srestrict c.lx+18.19*c.vegip=e.lx+7.2*e.meatp;
cf:srestrict c.lx+19.65*c.sinp=f.lx+7.2*f.meatp;
cg:srestrict c.lx+6.42*c.othrfp=g.lx+7.2*g.meatp;
ch:srestrict c.lx+2.02*c.zxp=h.lx+7.2*h.meatp;

de:srestrict d.lx+18.19*d.vegip=e.lx+32.65*e.fishp;
df:srestrict d.lx+19.65*d.sinp=f.lx+32.65*f.fishp;
dg:srestrict d.lx+6.42*d.othrfp=g.lx+32.65*g.fishp;
dh:srestrict d.lx+2.02*d.zxp=h.lx+32.65*h.fishp;

ef:srestrict e.lx+19.65*e.sinp=f.lx+18.19*f.vegip;
eg:srestrict e.lx+6.42*e.othrfp=g.lx+18.19*g.vegip;
eh:srestrict e.lx+2.02*e.zxp=h.lx+18.19*h.vegip;

fg:srestrict f.lx+6.42*f.othrfp=g.lx+19.65 *g.sinp;
fh:srestrict f.lx+2.02*f.zxp=h.lx+19.65 *h.sinp;

gh:srestrict g.lx+2.02*g.zxp=h.lx+6.42*h.othrfp;

bx:srestrict .073*b.grainp+.139*c.grainp+.031*d.grainp+.055*e.grainp+.051*f.grainp
+.156*g.grainp+.496*h.grainp=-.073;
cx:srestrict .073*b.meatp+.139*c.meatp+.031*d.meatp+.055*e.meatp+.051*f.meatp
+.156*g.meatp+.496*h.meatp=-.139;
dx:srestrict .073*b.fishp+.139*c.fishp+.031*d.fishp+.055*e.fishp+.051*f.fishp
+.156*g.fishp+.496*h.fishp=-.031;
ex:srestrict .073*b.vegip+.139*c.vegip+.031*d.vegip+.055*e.vegip+.051*f.vegip
+.156*g.vegip+.496*h.vegip=-.055;
fx:srestrict .073*b.sinp+.139*c.sinp+.031*d.sinp+.055*e.sinp+.051*f.sinp
+.156*g.sinp+.496*h.sinp=-.051;
gx:srestrict .073*b.othrfp+.139*c.othrfp+.031*d.othrfp+.055*e.othrfp+.051*f.othrfp
+.156*g.othrfp+.496*h.othrfp=-.156;
hx:srestrict .073*b.zxp+.139*c.zxp+.031*d.zxp+.055*e.zxp+.051*f.zxp
+.156*g.zxp+.496*h.zxp=-.496;

x:srestrict .073*b.lx+.139*c.lx+.031*d.lx+.055*e.lx+.051*f.lx
+.156*g.lx+.496*h.lx=1;

```

```
bs:stest .073*b.lx+b.grainp ;  
cs:stest .139*c.lx+c.meatp ;  
ds:stest .031*d.lx+d.fishp ;  
es:stest .055*e.lx+e.vegip ;  
fs:stest .051*f.lx+f.sinp ;  
gs:stest .156*g.lx+g.othrfp ;  
hs:stest .496*h.lx+h.zxp ;
```

```
run;
```





08:15 Monday, October 5, 1998

Variable	Label	N	Mean	Std Dev	Minimum	Maximum
FOODEXP	FOODEXP	90	0.5039451	0.0388654	0.4348118	0.6272794
CLOTHEXP	CLOTHEXP	90	0.1408516	0.0323415	0.0644684	0.1996651
HOUSEXP	HOUSEXP	90	0.0641567	0.0139427	0.0319109	0.1056578
FURNEXP	FURNEXP	90	0.0844430	0.0165962	0.0467906	0.1211629
TRCMEXP	TRCMEXP	90	0.0426995	0.0116924	0.0212721	0.0788976
ENTRTEXP	ENTRTEXP	90	0.0892746	0.0112096	0.0618096	0.1196988
MEDICEXP	MEDICEXP	90	0.0299373	0.0090351	0.0126263	0.0541192
OTHREXP	OTHREXP	90	0.0446921	0.0073914	0.0310906	0.0699533
GRAINEXP	GRAINEXP	90	0.0728327	0.0177423	0.0379001	0.1162181
MEATEXP	MEATEXP	90	0.1387946	0.0249342	0.1015655	0.2113853
FISHEXP	FISHEXP	90	0.0306285	0.0207419	0.0085253	0.0818286
VEGIEXP	VEGIEXP	90	0.0549686	0.0080832	0.0438782	0.0846572
SINEXP	SINEXP	90	0.0508871	0.0140324	0.0200442	0.0867886
OTHRFEXP	OTHRFEXP	90	0.1558337	0.0148753	0.1303679	0.1945405

The SAS System 170

08:15 Monday, October 5, 1998

SYSLIN Procedure  
Ordinary Least Squares Estimation

Model: B  
Dependent variable: GRAIN GRAIN

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	8	6.47032	0.80879	26.612	0.0001
Error	81	2.46173	0.03039		
C Total	89	8.93206			
Root MSE		0.17433	R-Square	0.7244	
Dep Mean		0.32216	Adj R-SQ	0.6972	
C.V.		54.11387			

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob >  T	Variable Label
INTERCEP	1	-0.716008	2.830461	-0.253	0.8009	Interc
GRAINP	1	-1.192592	0.348586	-3.421	0.0010	GRAINP
MEATP	1	-0.766004	0.460893	-1.662	0.1004	MEATP
FISHP	1	-0.716414	0.376603	-1.902	0.0607	FISHP
VEGIP	1	-0.060895	0.303845	-0.200	0.8417	VEGIP
SINP	1	-0.448110	0.699441	-0.641	0.5235	SINP
OTHRFP	1	2.094885	0.650776	3.219	0.0019	OTHRFP
ZXP	1	0.732839	0.260314	2.815	0.0061	
LX	1	0.340651	0.101704	3.349	0.0012	

The SAS System 171

08:15 Monday, October 5, 1998

SYSLIN Procedure  
Ordinary Least Squares Estimation

Model: C  
Dependent variable: MEAT MEAT

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	8	10.46382	1.30798	57.027	0.0001



Error	81	1.85783	0.02294	
C Total	89	12.32165		
Root MSE		0.15145	R-Square	0.8492
Dep Mean		1.07538	Adj R-SQ	0.8343
C.V.		14.08306		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob >  T	Variable Label
INTERCEP	1	-4.799875	2.458895	-1.952	0.0544	Interc
GRAINP	1	0.064764	0.302825	0.214	0.8312	GRAINP
MEATP	1	-1.165479	0.400390	-2.911	0.0047	MEATP
FISHP	1	-0.160691	0.327165	-0.491	0.6246	FISHP
VEGIP	1	0.340453	0.263958	1.290	0.2008	VEGIP
SINP	1	1.127897	0.607623	1.856	0.0671	SINP
OTHRFP	1	-0.339093	0.565346	-0.600	0.5503	OTHRFP
ZXP	1	-0.768628	0.226141	-3.399	0.0011	
LX	1	1.326076	0.088353	15.009	0.0001	

The SAS System 172  
08:15 Monday, October 5, 1998

SYSLIN Procedure  
Ordinary Least Squares Estimation

Model: D  
Dependent variable: FISH FISH

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	8	43.60137	5.45017	31.689	0.0001
Error	81	13.93121	0.17199		
C Total	89	57.53258			

  

Root MSE	0.41472	R-Square	0.7579
Dep Mean	-0.54830	Adj R-SQ	0.7339
C.V.	-75.63723		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob >  T	Variable Label
INTERCEP	1	-13.497470	6.733348	-2.005	0.0484	Interc
GRAINP	1	0.577727	0.829246	0.697	0.4880	GRAINP
MEATP	1	-1.679216	1.096413	-1.532	0.1295	MEATP
FISHP	1	3.183512	0.895897	3.553	0.0006	FISHP
VEGIP	1	-0.028067	0.722814	-0.039	0.9691	VEGIP
SINP	1	-1.335800	1.663892	-0.803	0.4244	SINP
OTHRFP	1	-0.780788	1.548123	-0.504	0.6154	OTHRFP
ZXP	1	-1.397954	0.619257	-2.257	0.0267	
LX	1	2.554038	0.241943	10.556	0.0001	

The SAS System 173  
08:15 Monday, October 5, 1998

SYSLIN Procedure  
Ordinary Least Squares Estimation

Model: E  
Dependent variable: VEGI VEGI

Analysis of Variance

Sum of Mean

Source	DF	Squares	Square	F Value	Prob>F
Model	8	5.34962	0.66870	36.281	0.0001
Error	81	1.49294	0.01843		
C Total	89	6.84256			
	Root MSE	0.13576	R-Square	0.7818	
	Dep Mean	0.14059	Adj R-SQ	0.7603	
	C.V.	96.56563			

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob >  T	Variable Label
INTERCEP	1	-2.335017	2.204234	-1.059	0.2926	Interc
GRAINP	1	-0.470779	0.271463	-1.734	0.0867	GRAINP
MEATP	1	-0.258694	0.358923	-0.721	0.4731	MEATP
FISHP	1	-0.001659	0.293282	-0.006	0.9955	FISHP
VEGIP	1	-0.865469	0.236621	-3.658	0.0005	VEGIP
SINP	1	0.301648	0.544693	0.554	0.5812	SINP
OTHRFP	1	0.492344	0.506795	0.971	0.3342	OTHRFP
ZXP	1	-0.075843	0.202720	-0.374	0.7093	
LX	1	0.866223	0.079203	10.937	0.0001	

The SAS System 174  
08:15 Monday, October 5, 1998

SYSLIN Procedure  
Ordinary Least Squares Estimation

Model: F  
Dependent variable: SIN SIN

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	8	3.60382	0.45048	6.893	0.0001
Error	81	5.29371	0.06535		
C Total	89	8.89753			
	Root MSE	0.25565	R-Square	0.4050	
	Dep Mean	0.19322	Adj R-SQ	0.3463	
	C.V.	132.30875			

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob >  T	Variable Label
INTERCEP	1	10.797762	4.150656	2.601	0.0110	Interc
GRAINP	1	0.063841	0.511174	0.125	0.9009	GRAINP
MEATP	1	0.362633	0.675865	0.537	0.5931	MEATP
FISHP	1	0.167571	0.552260	0.303	0.7623	FISHP
VEGIP	1	-0.335699	0.445566	-0.753	0.4534	VEGIP
SINP	1	-4.218793	1.025678	-4.113	0.0001	SINP
OTHRFP	1	0.633383	0.954313	0.664	0.5088	OTHRFP
ZXP	1	0.270993	0.381730	0.710	0.4798	
LX	1	0.446271	0.149141	2.992	0.0037	

The SAS System 175  
08:15 Monday, October 5, 1998

SYSLIN Procedure  
Ordinary Least Squares Estimation

Model: G  
Dependent variable: OTHRFP OTHRFP

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	8	8.60661	1.07583	126.371	0.0001
Error	81	0.68957	0.00851		
C Total	89	9.29618			
	Root MSE	0.09227	R-Square	0.9258	
	Dep Mean	1.22031	Adj R-SQ	0.9185	
	C.V.	7.56094			

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob >  T	Variable Label
INTERCEP	1	-1.890195	1.498050	-1.262	0.2107	Interc
GRAINP	1	0.091985	0.184492	0.499	0.6194	GRAINP
MEATP	1	0.413730	0.243932	1.696	0.0937	MEATP
FISHP	1	-0.036843	0.199321	-0.185	0.8538	FISHP
VEGIP	1	-0.021938	0.160813	-0.136	0.8918	VEGIP
SINP	1	-0.197662	0.370186	-0.534	0.5948	SINP
OTHRFP	1	-1.407702	0.344430	-4.087	0.0001	OTHRFP
ZXP	1	0.007771	0.137774	0.056	0.9552	
LX	1	1.089387	0.053828	20.238	0.0001	

The SAS System 176  
08:15 Monday, October 5, 1998

SYSLIN Procedure  
Ordinary Least Squares Estimation

Model: H  
Dependent variable: ZX

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Prob>F
Model	8	4.10380	0.51297	77.305	0.0001
Error	81	0.53749	0.00664		
C Total	89	4.64129			
	Root MSE	0.08146	R-Square	0.8842	
	Dep Mean	2.22239	Adj R-SQ	0.8728	
	C.V.	3.66543			

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob >  T	Variable Label
INTERCEP	1	-0.405516	1.322585	-0.307	0.7599	Interc
GRAINP	1	0.006252	0.162883	0.038	0.9695	GRAINP
MEATP	1	0.126675	0.215361	0.588	0.5580	MEATP
FISHP	1	-0.212752	0.175975	-1.209	0.2302	FISHP
VEGIP	1	-0.082160	0.141977	-0.579	0.5644	VEGIP
SINP	1	0.097482	0.326827	0.298	0.7663	SINP
OTHRFP	1	-0.063376	0.304087	-0.208	0.8354	OTHRFP
ZXP	1	-0.834203	0.121636	-6.858	0.0001	
LX	1	0.935809	0.047523	19.692	0.0001	

The SAS System 177  
08:15 Monday, October 5, 1998

SYSLIN Procedure  
Iterative Seemingly Unrelated Regression Estimation

Cross Model Covariance

Sigma	B	C	D	E
B	0.0360851087	0.0077546181	-0.008552219	0.0072437854
C	0.0077546181	0.0237471528	0.0187525049	0.0082853002
D	-0.008552219	0.0187525049	0.2581045177	0.0238232021
E	0.0072437854	0.0082853002	0.0238232021	0.0189016265
F	0.0128177628	-0.015823652	-0.013768213	-0.002126948
G	-0.007497263	-0.000976582	-0.009960951	-0.0011834
H	-0.008048793	-0.008456145	-0.020616409	-0.006898397

Sigma	F	G	H
B	0.0128177628	-0.007497263	-0.008048793
C	-0.015823652	-0.000976582	-0.008456145
D	-0.013768213	-0.009960951	-0.020616409
E	-0.002126948	-0.0011834	-0.006898397
F	0.0776567528	-0.000629688	-0.003748174
G	-0.000629688	0.0092032531	-0.000330148
H	-0.003748174	-0.000330148	0.007144357

Cross Model Correlation

Corr	B	C	D	E
B	1	0.2649052886	-0.088616992	0.2773652027
C	0.2649052886	1	0.2395276816	0.3910685466
D	-0.088616992	0.2395276816	1	0.3410772427
E	0.2773652027	0.3910685466	0.3410772427	1
F	0.2421355791	-0.368477817	-0.097250126	-0.055515946
G	-0.411403593	-0.066059026	-0.204377146	-0.089724575
H	-0.501285559	-0.649209825	-0.480102153	-0.593631601

Corr	F	G	H
B	0.2421355791	-0.411403593	-0.501285559
C	-0.368477817	-0.066059026	-0.649209825
D	-0.097250126	-0.204377146	-0.480102153
E	-0.055515946	-0.089724575	-0.593631601
F	1	-0.023554018	-0.159128713
G	-0.023554018	1	-0.040715202
H	-0.159128713	-0.040715202	1

The SAS System 178  
08:15 Monday, October 5, 1998

SYSLIN Procedure  
Iterative Seemingly Unrelated Regression Estimation

Cross Model Inverse Correlation

Inv Corr	B	C	D	E
B	4.2400629201	2.0928721268	3.0133303835	0.581740294
C	2.0928721268	4.5947421428	2.4249255935	0.7485575987
D	3.0133303835	2.4249255935	3.8463488411	0.5298513681
E	0.581740294	0.7485575987	0.5298513681	1.77776845
F	1.0193788922	2.4853232387	1.5155209123	0.6537864912
G	2.8007635954	2.0349783018	2.4967762438	0.6622964238
H	5.5524873912	6.1189986004	5.5888210417	2.2183130048

Inv Corr	F	G	H
B	1.0193788922	2.8007635954	5.5524873912

C	2.4853232387	2.0349783018	6.1189986004
D	1.5155209123	2.4967762438	5.5888210417
E	0.6537864912	0.6622964238	2.2183130048
F	2.4655144134	1.1598479514	3.6797669353
G	1.1598479514	3.0720741392	4.6266232187
H	3.6797669353	4.6266232187	12.529891945

Cross Model Inverse Covariance

Inv Sigma	B	C	D	E
B	117.50173597	71.494545732	31.223741178	22.274888964
C	71.494545732	193.48602219	30.973825004	35.332133317
D	31.223741178	30.973825004	14.902291814	7.5858922182
E	22.274888964	35.332133317	7.5858922182	94.053728459
F	19.25670663	57.874532191	10.704700404	17.064624665
G	153.68863773	137.65225382	51.228440811	50.214846391
H	345.81354263	469.7783576	130.14899697	190.89372883

Inv Sigma	F	G	H
B	19.25670663	153.68863773	345.81354263
C	57.874532191	137.65225382	469.7783576
D	10.704700404	51.228440811	130.14899697
E	17.064624665	50.214846391	190.89372883
F	31.748873406	43.385116098	156.22449323
G	43.385116098	333.80307069	570.57386588
H	156.22449323	570.57386588	1753.8165986

System Weighted MSE: 0.94186 with 602 degrees of freedom.  
System Weighted R-Square: 0.9876

The SAS System 179  
08:15 Monday, October 5, 1998

SYSLIN Procedure  
Iterative Seemingly Unrelated Regression Estimation

Model: B  
Dependent variable: GRAIN GRAIN

The SAS System 180  
08:15 Monday, October 5, 1998

SYSLIN Procedure  
Iterative Seemingly Unrelated Regression Estimation

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob >  T	Variable Label
INTERCEP	1	-0.621843	0.258354	-2.407	0.0184	Interc
GRAINP	1	-1.565433	0.261760	-5.980	0.0001	GRAINP
MEATP	1	0.090150	0.242289	0.372	0.7108	MEATP
FISHP	1	-0.019230	0.032849	-0.585	0.5599	FISHP
VEGIP	1	-0.277507	0.127109	-2.183	0.0319	VEGIP
SINP	1	-0.488277	0.215756	-2.263	0.0263	SINP
OTHRFP	1	1.081960	0.317959	3.403	0.0010	OTHRFP
ZXP	1	0.878399	0.200754	4.375	0.0001	
LX	1	0.299938	0.089081	3.367	0.0012	

Model: C  
Dependent variable: MEAT MEAT

The SAS System 181  
08:15 Monday, October 5, 1998

SYSLIN Procedure  
Iterative Seemingly Unrelated Regression Estimation

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob >  T	Variable Label
INTERCEP	1	-2.845927	0.213547	-13.327	0.0001	Interc
GRAINP	1	-0.028600	0.127185	-0.225	0.8226	GRAINP
MEATP	1	-1.118933	0.235239	-4.757	0.0001	MEATP
FISHP	1	0.011921	0.027921	0.427	0.6706	FISHP
VEGIP	1	0.010146	0.085494	0.119	0.9058	VEGIP
SINP	1	0.506632	0.157492	3.217	0.0019	SINP
OTHRFP	1	0.079537	0.212722	0.374	0.7095	OTHRFP
ZXP	1	-0.802405	0.166635	-4.815	0.0001	
LX	1	1.341702	0.073939	18.146	0.0001	

Model: D  
Dependent variable: FISH FISH

The SAS System 182  
08:15 Monday, October 5, 1998

SYSLIN Procedure  
Iterative Seemingly Unrelated Regression Estimation

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob >  T	Variable Label
INTERCEP	1	-8.174499	0.638270	-12.807	0.0001	Interc
GRAINP	1	-0.208090	0.080883	-2.573	0.0119	GRAINP
MEATP	1	-0.110865	0.130235	-0.851	0.3971	MEATP
FISHP	1	-0.883569	0.024650	-35.845	0.0001	FISHP
VEGIP	1	-0.054807	0.050950	-1.076	0.2853	VEGIP
SINP	1	0.078974	0.098232	0.804	0.4238	SINP
OTHRFP	1	-0.174535	0.113973	-1.531	0.1296	OTHRFP
ZXP	1	-1.176249	0.184272	-6.383	0.0001	
LX	1	2.529140	0.214057	11.815	0.0001	

Model: E  
Dependent variable: VEGI VEGI

The SAS System 183  
08:15 Monday, October 5, 1998

SYSLIN Procedure  
Iterative Seemingly Unrelated Regression Estimation

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob >  T	Variable Label
INTERCEP	1	-2.367123	0.195426	-12.113	0.0001	Interc
GRAINP	1	-0.407043	0.167560	-2.429	0.0173	GRAINP
MEATP	1	0.095206	0.214317	0.444	0.6581	MEATP
FISHP	1	0.021177	0.027906	0.759	0.4501	FISHP
VEGIP	1	-0.966460	0.170396	-5.672	0.0001	VEGIP
SINP	1	0.137147	0.175391	0.782	0.4365	SINP
OTHRFP	1	0.220309	0.283569	0.777	0.4395	OTHRFP
ZXP	1	0.058884	0.156491	0.376	0.7077	
LX	1	0.840780	0.068784	12.223	0.0001	

Model: F  
Dependent variable: SIN SIN

The SAS System 184  
08:15 Monday, October 5, 1998

SYSLIN Procedure  
Iterative Seemingly Unrelated Regression Estimation

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob >  T	Variable Label
INTERCEP	1	-1.110713	0.390912	-2.841	0.0057	Interc
GRAINP	1	-0.704723	0.309550	-2.277	0.0254	GRAINP
MEATP	1	1.516095	0.430774	3.519	0.0007	MEATP
FISHP	1	0.113319	0.058324	1.943	0.0555	FISHP
VEGIP	1	0.173424	0.191303	0.907	0.3673	VEGIP
SINP	1	-0.829068	0.443656	-1.869	0.0653	SINP
OTHRFP	1	-1.114458	0.426476	-2.613	0.0107	OTHRFP
ZXP	1	0.464280	0.310486	1.495	0.1387	
LX	1	0.381132	0.137667	2.769	0.0070	

Model: G

Dependent variable: OTHRF OTHRF

The SAS System

185

08:15 Monday, October 5, 1998

SYSLIN Procedure  
Iterative Seemingly Unrelated Regression Estimation

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob >  T	Variable Label
INTERCEP	1	-2.268702	0.135520	-16.741	0.0001	Interc
GRAINP	1	0.447851	0.148892	3.008	0.0035	GRAINP
MEATP	1	0.104890	0.189750	0.553	0.5819	MEATP
FISHP	1	0.009541	0.021191	0.450	0.6538	FISHP
VEGIP	1	0.063664	0.101250	0.629	0.5313	VEGIP
SINP	1	-0.400550	0.139162	-2.878	0.0051	SINP
OTHRFP	1	-1.323097	0.291566	-4.538	0.0001	OTHRFP
ZXP	1	0.000577	0.115570	0.005	0.9960	
LX	1	1.097126	0.047468	23.113	0.0001	

Model: H

Dependent variable: ZX

The SAS System

186

08:15 Monday, October 5, 1998

SYSLIN Procedure  
Iterative Seemingly Unrelated Regression Estimation

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob >  T	Variable Label
INTERCEP	1	-0.611416	0.102572	-5.961	0.0001	Intercep
GRAINP	1	0.080980	0.025365	3.193	0.0020	GRAINP
MEATP	1	-0.172445	0.039480	-4.368	0.0001	MEATP
FISHP	1	-0.024788	0.006782	-3.655	0.0005	FISHP
VEGIP	1	-0.000149	0.014787	-0.010	0.9920	VEGIP
SINP	1	0.018144	0.027576	0.658	0.5124	SINP
OTHRFP	1	0.021160	0.032226	0.657	0.5133	OTHRFP
ZXP	1	-0.885347	0.077747	-11.388	0.0001	
LX	1	0.962444	0.035641	27.004	0.0001	

The SAS System

187

08:15 Monday, October 5, 1998

SYSLIN Procedure  
Iterative Seemingly Unrelated Regression Estimation

Cross Model Restrictions:

Parameter Estimates						
Variable	DF	Parameter Estimate	Standard Error	T for H0: Parameter=0	Prob >  T	Variable Label
RESTRICT	-1	-127.011337	547.395250	-0.232	0.8182	B
RESTRICT	-1	-1194.297513	720.483906	-1.658	0.0976	C
RESTRICT	-1	-896.664371	206.975400	-4.332	0.0001	D
RESTRICT	-1	-556.456716	559.686450	-0.994	0.3231	E
RESTRICT	-1	-936.242271	321.517832	-2.912	0.0030	F
RESTRICT	-1	-1114.343786	744.411435	-1.497	0.1353	G
RESTRICT	-1	4338.949892	1807.936291	2.400	0.0154	H
RESTRICT	-1	-68.333990	87.040585	-0.785	0.4358	BC
RESTRICT	-1	-61.176577	15.165496	-4.034	0.0001	BD
RESTRICT	-1	-32.850230	49.826787	-0.659	0.5131	BE
RESTRICT	-1	-61.286858	32.409883	-1.891	0.0581	BF
RESTRICT	-1	-59.577269	81.227266	-0.733	0.4667	BG
RESTRICT	-1	382.673407	365.267269	1.048	0.2977	BH
RESTRICT	-1	-87.289366	29.898387	-2.920	0.0029	CD
RESTRICT	-1	-11.511651	86.283203	-0.133	0.8948	CE
RESTRICT	-1	-68.648172	47.636024	-1.441	0.1507	CF
RESTRICT	-1	30.789687	133.605222	0.230	0.8194	CG
RESTRICT	-1	1193.217378	547.902774	2.178	0.0285	CH
RESTRICT	-1	32.054448	19.661481	1.630	0.1034	DE
RESTRICT	-1	16.773900	9.546489	1.757	0.0788	DF
RESTRICT	-1	104.778203	32.609650	3.213	0.0010	DG
RESTRICT	-1	574.554874	144.697375	3.971	0.0001	DH
RESTRICT	-1	-22.885179	33.180550	-0.690	0.4938	EF
RESTRICT	-1	25.344781	89.156483	0.284	0.7782	EG
RESTRICT	-1	513.625118	329.374912	1.559	0.1195	EH
RESTRICT	-1	88.418162	61.354026	1.441	0.1507	FG
RESTRICT	-1	682.384177	216.507977	3.152	0.0013	FH
RESTRICT	-1	1227.929892	600.894208	2.044	0.0402	GH
RESTRICT	-1	1897.603635	7484.538962	0.254	0.8016	BX
RESTRICT	-1	8595.458602	5169.840814	1.663	0.0966	CX
RESTRICT	-1	28972	6707.810450	4.319	0.0001	DX
RESTRICT	-1	10065	10134	0.993	0.3237	EX
RESTRICT	-1	18273	6299.276682	2.901	0.0031	FX
RESTRICT	-1	7192.984566	4758.038702	1.512	0.1314	GX
RESTRICT	-1	-8817.518238	3655.496826	-2.412	0.0149	HX
RESTRICT	-0	0	.	.	.	X

Test: BS  
 Numerator: 34.67327 DF: 1 F Value: 36.8136  
 Denominator: 0.94186 DF: 602 Prob>F: 0.0001

Test: CS  
 Numerator: 15.53905 DF: 1 F Value: 16.4983  
 Denominator: 0.94186 DF: 602 Prob>F: 0.0001

The SAS System 188  
 08:15 Monday, October 5, 1998

SYSLIN Procedure  
 Iterative Seemingly Unrelated Regression Estimation

Test: DS  
 Numerator: 753.6599 DF: 1 F Value: 800.1821  
 Denominator: 0.94186 DF: 602 Prob>F: 0.0001

Test: ES  
 Numerator: 29.50919 DF: 1 F Value: 31.3307



Denominator: 0.94186 DF: 602 Prob>F: 0.0001

Test: FS

Numerator: 3.306894 DF: 1 F Value: 3.5110  
Denominator: 0.94186 DF: 602 Prob>F: 0.0614

Test: GS

Numerator: 15.50892 DF: 1 F Value: 16.4663  
Denominator: 0.94186 DF: 602 Prob>F: 0.0001

Test: HS

Numerator: 36.93761 DF: 1 F Value: 39.2177  
Denominator: 0.94186 DF: 602 Prob>F: 0.0001

NOTE: Restrictions in effect for model tested.