

ภาษาไทย

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ศูนย์วิทยทรัพยากร  
จุฬาลงกรณ์มหาวิทยาลัย

1. ผลการประมาณค่าสัมประสิทธิ์ด้วยวิธีกำลังสองน้อยที่สุด (OLS)

1.1 สาขาขนาดเล็ก

MODEL COMMAND: CRMODEL;LHS=C;RHS=ONE,Y1,P1,P2,P3\*

(( Ordinary Least Squares Regression ))						
Dependent Variable	C					
Mean of Dep. Var.	15.328188		Number of Observations			43
Std. Error of Regr.	.122264		Std. Dev. of Dep. Var.			.176648
R - squared	.666572		Sum of Sqrd. Residuals			.436987
Durbin Watson Stat.	1.758513		Adjusted R - Squared			.631474
Total Variation	1.310590		Estd. Autocorrelation			.120744
F( 4, 38)	18.9919		Regression Variation			.742543
Log-Likelihood	32.010796		Prob. Value for F			.00000
Chi-squared[ 4]	35.945357		Const. Log-L (for $\beta=0$ )			14.038118
			Prob Value =			.000000
Variable	Coefficient	Std. Error	T-ratio	Probit()	Mean of X	Std.D.of X
ONE	.391281	.181991	2.150	.04528	1.0000	.00000
Y1	.409844	.662647E-01	6.185	.00000	19.499	.29028
P1	.590454	.194685	3.033	.00435	11.708	.10172
P2	.225263E-01	.107678E-02	2.092	.04725	2.1998	.80032
P3	.108532E-01	.108874E-01	1.794	.07720	2.4663	.34662

MODEL COMMAND: CRMODEL;LHS=C;RHS=ONE,Y2,P1,P2,P3\*

(( Ordinary Least Squares Regression ))						
Dependent Variable	C					
Mean of Dep. Var.	15.328188		Number of Observations			43
Std. Error of Regr.	.122265		Std. Dev. of Dep. Var.			.176648
R - squared	.666571		Sum of Sqrd. Residuals			.436989
Durbin Watson Stat.	1.758511		Adjusted R - Squared			.631473
Total Variation	1.310590		Estd. Autocorrelation			.120745
F( 4, 38)	18.9919		Regression Variation			.742542
Log-Likelihood	32.010776		Prob. Value for F			.00000
Chi-squared[ 4]	35.945317		Const. Log-L (for $\beta=0$ )			14.038118
			Prob Value =			.000000
Variable	Coefficient	Std. Error	T-ratio	Probit()	Mean of X	Std.D.of X
ONE	.660896	.292350	2.256	.03525	1.0000	.00000
Y1	.409844	.662647E-01	6.185	.00000	19.499	.29028
P1	.590454	.194685	3.033	.00435	11.708	.10172
P2	.225263E-01	.107678E-02	2.092	.04725	2.1998	.80032
P3	.108532E-01	.108874E-01	1.794	.07720	2.4663	.34662

MODEL COMMAND: CRMODEL;LHS=C;RHS=ONE,Y3,P1,P2,P3\*

(( Ordinary Least Squares Regression ))						
Dependent Variable	C					
Mean of Dep. Var.	15.328188		Number of Observations			43
Std. Error of Regr.	.145515		Std. Dev. of Dep. Var.			.176648
R - squared	.586054		Sum of Sqrd. Residuals			.542513
Durbin Watson Stat.	1.629600		Adjusted R - Squared			.542481
Total Variation	1.310590		Estd. Autocorrelation			.235200
F( 4, 38)	13.4498		Regression Variation			.505958
Log-Likelihood	24.524915		Prob. Value for F			.00000
Chi-squared[ 4]	20.973594		Const. Log-L (for $\beta=0$ )			14.038118
			Prob Value =			.000321
Variable	Coefficient	Std. Error	T-ratio	Probit()	Mean of X	Std.D.of X
ONE	3.40510	1.58524	2.148	.04325	1.0000	.00000
Y3	.276917	.695938E-01	3.979	.00000	11.749	.33416
P1	.722511	.234891	3.076	.00000	11.708	.10172
P2	.167575E-01	.941432E-02	1.780	.08467	2.1998	.80032
P3	.100120	.458845E-02	2.182	.03853	2.4663	.34662

1.2 สาขาขนาดกลาง

MODEL COMMAND: CRMODEL;LHS=C;RHS=ONE,Y1,P1,P2,P3\$

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(( Ordinary Least Squares Regression ))
Dependent Variable C Number of Observations 42
Mean of Dep. Var. 15.567645 Std. Dev. of Dep. Var. .212860
Std. Error of Regr. .126424 Sum of Sqrd. Residuals .591373
R - squared .681662 Adjusted R - Squared .647247
Durbin Watson Stat. 1.879868 Estd. Autocorrelation .060066
Total Variation 1.857690 Regression Variation 1.266317
F( 4, 37) 19.8072 Prob. Value for F .00000
Log-Likelihood 29.927124 Const. Log-L (for B=0) 5.891525
Chi-squared[ 4] 48.071197 Prob Value = .000000
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Variable	Coefficient	Std. Error	T-ratio	Prob( t >=x)	Mean of X	Std.D.of X
ONE	-2.84738	1.30853	-2.176	.04019	1.0000	.00000
Y1	.538213	.769979E-01	6.990	.00000	19.957	.26310
P1	.666470	.153901	4.331	.00011	11.755	.13893
P2	.407973E-01	.227663E-01	1.792	.06983	2.0697	.85938
P3	.929677E-01	.558727E-01	1.784	.07017	2.6379	.35044

MODEL COMMAND: CRMODEL;LHS=C;RHS=ONE,Y2,P1,P2,P3\$

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(( Ordinary Least Squares Regression ))
Dependent Variable C Number of Observations 42
Mean of Dep. Var. 15.567645 Std. Dev. of Dep. Var. .212860
Std. Error of Regr. .126424 Sum of Sqrd. Residuals .591373
R - squared .681662 Adjusted R - Squared .647247
Durbin Watson Stat. 1.879867 Estd. Autocorrelation .060066
Total Variation 1.857690 Regression Variation 1.266316
F( 4, 37) 19.8072 Prob. Value for F .00000
Log-Likelihood 29.927102 Const. Log-L (for B=0) 5.891525
Chi-squared[ 4] 48.071154 Prob Value = .000000
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Variable	Coefficient	Std. Error	T-ratio	Prob( t >=x)	Mean of X	Std.D.of X
ONE	-2.49336	1.219843	-2.044	.04648	1.0000	.00000
Y2	.538212	.769979E-01	6.990	.00000	19.299	.26310
P1	.666471	.153901	4.331	.00011	11.755	.13893
P2	.407973E-01	.227663E-01	1.792	.06983	2.0697	.85938
P3	.929675E-01	.558727E-01	1.784	.07017	2.6379	.35044

MODEL COMMAND: CRMODEL;LHS=C;RHS=ONE,Y3,P1,P2,P3\$

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(( Ordinary Least Squares Regression ))
Dependent Variable C Number of Observations 42
Mean of Dep. Var. 15.567645 Std. Dev. of Dep. Var. .212860
Std. Error of Regr. .132779 Sum of Sqrd. Residuals .652315
R - squared .648857 Adjusted R - Squared .610896
Durbin Watson Stat. 2.129787 Estd. Autocorrelation -.064893
Total Variation 1.857690 Regression Variation 1.205375
F( 4, 37) 17.0925 Prob. Value for F .00000
Log-Likelihood 27.867429 Const. Log-L (for B=0) 5.891525
Chi-squared[ 4] 43.951806 Prob Value = .000000
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Variable	Coefficient	Std. Error	T-ratio	Prob( t >=x)	Mean of X	Std.D.of X
ONE	4.65130	2.01713	2.306	.02682	1.0000	.00000
Y3	.364689	.570675E-01	6.390	.00000	11.991	.39139
P1	.550826	.162525	3.389	.00168	11.755	.13893
P2	.319424E-01	.150129E-01	2.121	.04451	2.0697	.85938
P3	.283892E-01	.117602E-01	2.414	.02810	2.6379	.35044

## 1.3 สาขาขนาดใหญ่

MODEL COMMAND: CRMODEL;LHS=C;RHS=ONE,Y1,P1,P2,P3\$

(( Ordinary Least Squares Regression ))						
Dependent Variable	C				Number of Observations	63
Mean of Dep. Var.	16.019880				Std. Dev. of Dep. Var.	.212498
Std. Error of Regr.	.127854				Sum of Sqrd. Residuals	.668144
R - squared	.761347				Adjusted R - Squared	.744888
Durbin Watson Stat.	1.859845				Estd. Autocorrelation	.370078
Total Variation	2.799647				Regression Variation	1.851540
F( 4, 58)	46.2577				Prob. Value for F	.00000
Log-Likelihood	42.794161				Const. Log-L (for B=0)	8.689407
Chi-squared[ 4]	68.209509				Prob Value =	.000000
Variable	Coefficient	Std. Error	T-ratio	Probit(>=x	Mean of X	Std.D.of X
ONE	-.516522	.231936	-2.227	.03126	1.0000	.00000
Y1	.505069	.563685E-01	8.960	.00000	20.640	.31002
P1	.519447	.178256	2.914	.00506	11.803	.10629
P2	.405142E-01	.196053E-01	2.066	.00961	2.5269	.93611
P3	.357291E-01	.170544E-01	2.095	.00920	2.5204	.48197

MODEL COMMAND: CRMODEL;LHS=C;RHS=ONE,Y2,P1,P2,P3\$

(( Ordinary Least Squares Regression ))						
Dependent Variable	C				Number of Observations	63
Mean of Dep. Var.	16.019880				Std. Dev. of Dep. Var.	.212498
Std. Error of Regr.	.127854				Sum of Sqrd. Residuals	.668144
R - squared	.761347				Adjusted R - Squared	.744888
Durbin Watson Stat.	1.859845				Estd. Autocorrelation	.370078
Total Variation	2.799647				Regression Variation	1.851540
F( 4, 58)	46.2577				Prob. Value for F	.00000
Log-Likelihood	42.794159				Const. Log-L (for B=0)	8.689407
Chi-squared[ 4]	68.209504				Prob Value =	.000000
Variable	Coefficient	Std. Error	T-ratio	Probit(>=x	Mean of X	Std.D.of X
ONE	-.184296	.0885612	-2.081	.00961	1.0000	.00000
Y2	.505069	.563685E-01	8.960	.00000	19.982	.31002
P1	.519447	.178256	2.914	.00506	11.803	.10629
P2	.405143E-01	.196053E-01	2.066	.00961	2.5269	.93611
P3	.357295E-01	.170544E-01	2.095	.00920	2.5204	.48197

MODEL COMMAND: CRMODEL;LHS=C;RHS=ONE,Y3,P1,P2,P3\$

(( Ordinary Least Squares Regression ))						
Dependent Variable	C				Number of Observations	63
Mean of Dep. Var.	16.019880				Std. Dev. of Dep. Var.	.212498
Std. Error of Regr.	.163699				Sum of Sqrd. Residuals	0.994317
R - squared	.644842				Adjusted R - Squared	.620348
Durbin Watson Stat.	1.908167				Estd. Autocorrelation	.045317
Total Variation	2.799647				Regression Variation	1.245400
F( 4, 58)	26.3270				Prob. Value for F	.00000
Log-Likelihood	27.224382				Const. Log-L (for B=0)	8.689407
Chi-squared[ 4]	37.069950				Prob Value =	.000000
Variable	Coefficient	Std. Error	T-ratio	Probit(>=x	Mean of X	Std.D.of X
ONE	7.11091	2.69563	2.638	.01069	1.0000	.00000
Y3	.240141	.467775E-01	5.134	.00000	12.636	.46133
P1	.473717	.231457	2.047	.04523	11.803	.10629
P2	.383676E-01	.214583E-01	1.788	.07762	2.5269	.93611
P3	.739172E-01	.415498E-01	1.779	.07980	2.5204	.48197

## 1.4 สาขาทั้งหมด

MODEL COMMAND: CRMODEL;LHS=C;RHS=ONE,Y1,P1,P2,P3#

(( Ordinary Least Squares Regression ))						
Dependent Variable	C				Number of Observations	148
Mean of Dep. Var.	15.690578				Std. Dev. of Dep. Var.	.360285
Std. Error of Regr.	.128299				Sum of Sqrd. Residuals	2.353877
R - squared	.876640				Adjusted R - Squared	.873190
Durbin Watson Stat.	1.632562				Estd. Autocorrelation	.183719
Total Variation	19.081425				Regression Variation	16.727548
F( 4, 143)	254.0531				Prob. Value for F	.00000
Log-Likelihood	96.442081				Const. Log-L (for $\beta=0$ )	-58.407472
Chi-squared[ 4]	309.699104				Prob Value =	.000000
Variable	Coefficient	Std. Error	T-ratio	Probit(!)=x	Mean of X	Std.D.of X
ONE	-2.44978	1.10944	-2.208	.02883	1.0000	.00000
Y1	.536169	.199648E-01	26.856	.00000	20.115	.56564
P1	.628263	.977716E-01	6.426	.00000	11.762	.12118
P2	.137690E-01	.663886E-02	2.074	.03471	2.3021	.89372
P3	.259686E-01	.131954E-01	1.968	.05007	2.5381	.41357

MODEL COMMAND: CRMODEL;LHS=C;RHS=ONE,Y2,P1,P2,P3#

(( Ordinary Least Squares Regression ))						
Dependent Variable	C				Number of Observations	148
Mean of Dep. Var.	15.690578				Std. Dev. of Dep. Var.	.360285
Std. Error of Regr.	.128299				Sum of Sqrd. Residuals	2.353879
R - squared	.876640				Adjusted R - Squared	.873190
Durbin Watson Stat.	1.632563				Estd. Autocorrelation	.183719
Total Variation	19.081425				Regression Variation	16.727546
F( 4, 143)	254.0529				Prob. Value for F	.00000
Log-Likelihood	96.442028				Const. Log-L (for $\beta=0$ )	-58.407472
Chi-squared[ 4]	309.698998				Prob Value =	.000000
Variable	Coefficient	Std. Error	T-ratio	Probit(!)=x	Mean of X	Std.D.of X
ONE	-2.09709	1.10874	-1.891	.06059	1.0000	.00000
Y2	.536169	.199648E-01	26.856	.00000	19.457	.56564
P1	.628263	.977716E-01	6.426	.00000	11.762	.12118
P2	.137690E-01	.663886E-02	2.074	.03471	2.3021	.89372
P3	.259686E-01	.131954E-01	1.968	.05007	2.5381	.41357

MODEL COMMAND: CRMODEL;LHS=C;RHS=ONE,Y2,P1,P2,P3#

(( Ordinary Least Squares Regression ))						
Dependent Variable	C				Number of Observations	148
Mean of Dep. Var.	15.690578				Std. Dev. of Dep. Var.	.360285
Std. Error of Regr.	.128299				Sum of Sqrd. Residuals	2.353879
R - squared	.876640				Adjusted R - Squared	.873190
Durbin Watson Stat.	1.632563				Estd. Autocorrelation	.183719
Total Variation	19.081425				Regression Variation	16.727546
F( 4, 143)	254.0529				Prob. Value for F	.00000
Log-Likelihood	96.442028				Const. Log-L (for $\beta=0$ )	-58.407472
Chi-squared[ 4]	309.698998				Prob Value =	.000000
Variable	Coefficient	Std. Error	T-ratio	Probit(!)=x	Mean of X	Std.D.of X
ONE	-2.09709	1.10874	-1.891	.06059	1.0000	.00000
Y2	.536169	.199648E-01	26.856	.00000	19.457	.56564
P1	.628263	.977716E-01	6.426	.00000	11.762	.12118
P2	.137690E-01	.663886E-02	2.074	.03471	2.3021	.89372
P3	.259686E-01	.131954E-01	1.968	.05007	2.5381	.41357

## 2. ผลการประมาณค่าสัมประสิทธิ์ด้วยวิธีความแปรปรวนไม่คงที่ (GLS)

### 2.1 สาขาขนาดเล็ก

MODEL COMMAND: SURE;LHS=C;EQ1=ONE,Y1,P1,P2,P3\$

\*\*\*\*\*  
Multiple Equations GLS Estimator

Maximum iterations = 25

Iteration 0, Log-likelihood= 27.91229  
Iteration 1, Log-likelihood= 27.91229  
Log-likelihood has converged.

Log-likelihood = 27.91229  
Log-determinant of ? = -4.136123

Disturbance Covariance Matrix  
Kept as matrix SIGMA in your work area.

1-C

1-C .1598470E-01

Coefficient Estimates for Equation 1: C						
Variable	Coefficient	Std. Error	T-ratio	Probit(1)=x	Mean of X	Std.D.of X
ONE	.430516	.199315	2.160	.04290	1.0000	.00000
Y1	.450825	.685225E-01	6.579	.00000	19.499	.29028
P1	.649495	.201318	3.226	.00125	11.708	.10172
P2	.247813E-01	.137827E-01	1.798	.08310	2.1998	.80032
P3	.120507E-01	.667259E-02	1.806	.06647	2.4663	.34662

MODEL COMMAND: SURE;LHS=C;EQ1=ONE,Y2,P1,P2,P3\$

\*\*\*\*\*  
Multiple Equations GLS Estimator

Maximum iterations = 25

Iteration 0, Log-likelihood= 27.91226  
Iteration 1, Log-likelihood= 27.91226  
Log-likelihood has converged.

Log-likelihood = 27.91226  
Log-determinant of ? = -4.136122

Disturbance Covariance Matrix  
Kept as matrix SIGMA in your work area.

1-C

1-C .1598473E-01

Coefficient Estimates for Equation 1: C						
Variable	Coefficient	Std. Error	T-ratio	Probit(1)=x	Mean of X	Std.D.of X
ONE	.727067	.320016	2.272	.02726	1.0000	.00000
Y2	.450825	.685226E-01	6.579	.00000	18.842	.29028
P1	.649495	.201318	3.226	.00125	11.708	.10172
P2	.247810E-01	.137827E-01	1.798	.08310	2.1998	.80032
P3	.120506E-01	.667259E-02	1.806	.06647	2.4663	.34662



MODEL COMMAND: SURE;LHS=C;EQ1=ONE,Y3,P1,P2,P3\$

\*\*\*\*\*  
Multiple Equations GLS Estimator

Maximum iterations = 25

Iteration 0, Log-likelihood= 20.42669  
Iteration 1, Log-likelihood= 20.42669  
Log-likelihood has converged.

Log-likelihood = 20.42669  
Log-determinant of ? = -3.787956

Disturbance Covariance Matrix  
Kept as matrix SIGMA in your work area.

1-C

1-C .2264185E-01

Coefficient Estimates for Equation 1: C						
Variable	Coefficient	Std. Error	T-ratio	Probit()	Mean of X	Std.D.of X
ONE	3.74561	1.76505	2.221	.03211	1.0000	.00000
Y3	.304610	.719647E-01	4.233	.00002	11.749	.33416
P1	.794760	.242893	3.272	.00107	11.708	.10172
P2	.184325E-01	.114062E-01	1.616	.10761	2.1998	.80032
P3	.110133	.698493E-01	1.577	.11486	2.4663	.34662

ศูนย์วิทยทรัพยากร  
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## 2.2 สาขาขนาดกลาง

MODEL COMMAND: SURE;LHS=C;EQ1=ONE,Y1,P1,P2,P3\*

\*\*\*\*\*  
Multiple Equations GLS Estimator

Maximum iterations = 25

Iteration 0, Log-likelihood= 25.92379  
Iteration 1, Log-likelihood= 25.92379  
Log-likelihood has converged.Log-likelihood = 25.92379  
Log-determinant of ? = -4.072343Disturbance Covariance Matrix  
Kept as matrix SIGMA in your work area.

1-C

1-C .1703742E-01

Coefficient Estimates for Equation 1: C						
Variable	Coefficient	Std. Error	T-ratio	Prob( t >=x)	Mean of X	Std.D.of X
ONE	-3.13215	1.78674	-1.753	.07013	1.0000	.00000
Y1	.592036	.794971E-01	7.447	.00000	19.957	.26310
P1	.733116	.158896	4.614	.00000	11.755	.13893
P2	.448768E-01	.264539E-01	1.696	.08981	2.0697	.85938
P3	.102268	.646622E-01	1.582	.11375	2.6379	.35044

MODEL COMMAND: SURE;LHS=C;EQ1=ONE,Y2,P1,P2,P3\*

\*\*\*\*\*  
Multiple Equations GLS Estimator

Maximum iterations = 25

Iteration 0, Log-likelihood= 25.92378  
Iteration 1, Log-likelihood= 25.92378  
Log-likelihood has converged.Log-likelihood = 25.92378  
Log-determinant of ? = -4.072343Disturbance Covariance Matrix  
Kept as matrix SIGMA in your work area.

1-C

1-C .1703742E-01

Coefficient Estimates for Equation 1: C						
Variable	Coefficient	Std. Error	T-ratio	Prob( t >=x)	Mean of X	Std.D.of X
ONE	-2.74272	1.60205	-1.712	.04622	1.0000	.00000
Y2	.592036	.794971E-01	7.447	.00000	19.299	.26310
P1	.733117	.158896	4.614	.00000	11.755	.13893
P2	.448769E-01	.264539E-01	1.696	.08981	2.0697	.85938
P3	.102268	.646622E-01	1.582	.11375	2.6379	.35044

MODEL COMMAND: SURE;LHS=C;EQ1=ONE,Y3,P1,P2,P3\$  
 \*\*\*\*\*  
 Multiple Equations GLS Estimator

Maximum iterations = 25

Iteration 0, Log-likelihood= 23.86403  
 Iteration 1, Log-likelihood= 23.86403  
 Log-likelihood has converged.

Log-likelihood = 23.86403  
 Log-determinant of ? = -3.974260

Disturbance Covariance Matrix  
 Kept as matrix SIGMA in your work area.

1-C

1-C .1879321E-01

Coefficient Estimates for Equation 1: C						
Number of Observations =	42	Sum of Squared Residuals =	.684			
Mean of C =	15.56764	Disturbance Std. Dev. =	.13709			
S.D. of C =	.21286	Durbin - Watson Statistic =	2.1298			
Variable	Coefficient	Std. Error	T-ratio	Prob( t > x )	Mean of X	Std.D.of X
ONE	5.11646	2.08259	2.457	.01402	1.0000	.00000
Y3	.401159	.589199E-01	6.809	.00000	11.991	.39139
P1	.605906	.167800	3.611	.00031	11.755	.13893
P2	.350387E-01	.215093E-01	1.629	.11756	2.0697	.85938
P3	.312246E-01	.190277E-01	1.641	.10901	2.6379	.35044

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2.3 สาขาขนาดใหญ่

MODEL COMMAND: SURE;LHS=C;EQ1=ONE,Y1,P1,P2,P3\$  
 \*\*\*\*\*  
 Multiple Equations GLS Estimator

Maximum iterations = 25

Iteration 0, Log-likelihood= 36.78969  
 Iteration 1, Log-likelihood= 36.78969  
 Log-likelihood has converged.

Log-likelihood = 36.78969  
 Log-determinant of ? = -4.005804

Disturbance Covariance Matrix  
 Kept as matrix SIGMA in your work area.

1-C

1-C .1820965E-01

Coefficient Estimates for Equation 1: C						
Variable	Coefficient	Std. Error	T-ratio	Probit(I)=x	Mean of X	Std.D.of X
ONE	-.568192	.253997	-2.237	.03301	1.0000	.00000
Y1	.555576	.594939E-01	9.338	.00000	20.640	.31002
P1	.571394	.188139	3.037	.00239	11.803	.10629
P2	.445674E-02	.206923E-01	2.154	.04857	2.5269	.93611
P3	.392911E-01	.231260E-01	1.699	.08086	2.5205	.48197

MODEL COMMAND: SURE;LHS=C;EQ1=ONE,Y2,P1,P2,P3\$  
 \*\*\*\*\*  
 Multiple Equations GLS Estimator

Maximum iterations = 25

Iteration 0, Log-likelihood= 36.78960  
 Iteration 1, Log-likelihood= 36.78960  
 Log-likelihood has converged.

Log-likelihood = 36.78960  
 Log-determinant of ? = -4.005801

Disturbance Covariance Matrix  
 Kept as matrix SIGMA in your work area.

1-C

1-C .1820970E-01

Coefficient Estimates for Equation 1: C						
Variable	Coefficient	Std. Error	T-ratio	Probit(I)=x	Mean of X	Std.D.of X
ONE	-.202712	.972239E-01	-2.085	.05234	1.0000	.00000
Y2	.555575	.594940E-01	9.338	.00000	19.982	.31002
P1	.571392	.188140	3.037	.00239	11.803	.10629
P2	.445654E-01	.206923E-01	2.154	.04857	2.5269	.93611
P3	.392904E-01	.231260E-01	1.699	.08086	2.5205	.48197

MODEL COMMAND: SURE;LHS=C;EQ1=ONE,Y3,P1,P2,P3\$

\*\*\*\*\*  
Multiple Equations GLS Estimator

Maximum iterations = 25

Iteration 0, Log-likelihood= 21.21997  
Iteration 1, Log-likelihood= 21.21997  
Log-likelihood has converged.

Log-likelihood = 21.21997  
Log-determinant of ? = -3.511527

Disturbance Covariance Matrix  
Kept as matrix SIGMA in your work area.

1-C

1-C .2985130E-01

Coefficient Estimates for Equation 1: C						
Variable	Coefficient	Std. Error	T-ratio	Probit!)=x	Mean of X	Std.D.of X
ONE	7.82193	2.84509	2.749	.00597	1.0000	.00000
Y3	.264156	.493711E-01	5.350	.00000	12.636	.46133
P1	.521094	.244289	2.133	.03292	11.803	.10629
P2	.422039E-01	.254929E-01	1.656	.09782	2.5269	.93611
P3	.813098E-01	.494115E-01	1.646	.09985	2.5205	.48197

Number of Observations = 63  
Mean of C = 16.01988  
S.D. of C = .21250  
Sum of Squared Residuals = 1.058  
Disturbance Std. Dev. = .17278  
Durbin - Watson Statistic = 1.9082

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## 2.4 สาขาทั้งหมด

MODEL COMMAND: SURE;LHS=C;EQ1=ONE,Y1,P1,P2,P3\$  
 \*\*\*\*\*  
 Multiple Equations GLS Estimator

Maximum iterations = 25

Iteration 0, Log-likelihood= 82.33570  
 Iteration 1, Log-likelihood= 82.33570  
 Log-likelihood has converged.

Log-likelihood = 82.33570  
 Log-determinant of ? = -3.950522

Disturbance Covariance Matrix  
 Kept as matrix SIGMA in your work area.

1-C

1-C .1924466E-01

=====  
 Coefficient Estimates for Equation 1: C  
 Number of Observations = 148 Sum of Squared Residuals = 2.848  
 Mean of C = 15.69057 Disturbance Std. Dev. = .13873  
 S.D. of C = .36028 Durbin - Watson Statistic = 1.6326  
 =====

Variable	Coefficient	Std. Error	T-ratio	Probit( t )=x	Mean of X	Std.D.of X
ONE	-2.69475	1.19939	-2.246	.02468	1.0000	.00000
Y1	.589785	.215871E-01	27.321	.00000	20.115	.56564
P1	.691090	.105716	6.537	.00000	11.762	.12118
P2	.151459E-01	.845195E-02	1.792	.08465	2.3021	.89372
P3	.285650E-01	.143904E-01	1.985	.04858	2.5381	.41357

MODEL COMMAND: SURE;LHS=C;EQ1=ONE,Y2,P1,P2,P3\$  
 \*\*\*\*\*  
 Multiple Equations GLS Estimator

Maximum iterations = 25

Iteration 0, Log-likelihood= 82.33553  
 Iteration 1, Log-likelihood= 82.33553  
 Log-likelihood has converged.

Log-likelihood = 82.33553  
 Log-determinant of ? = -3.950519

Disturbance Covariance Matrix  
 Kept as matrix SIGMA in your work area.

1-C

1-C .1924470E-01

=====  
 Coefficient Estimates for Equation 1: C  
 Number of Observations = 148 Sum of Squared Residuals = 2.848  
 Mean of C = 15.69057 Disturbance Std. Dev. = .13873  
 S.D. of C = .36028 Durbin - Watson Statistic = 1.6326  
 =====

Variable	Coefficient	Std. Error	T-ratio	Probit( t )=x	Mean of X	Std.D.of X
ONE	-2.30680	1.19884	-1.924	.05433	1.0000	.00000
Y2	.589785	.215872E-01	27.321	.00000	19.457	.56564
P1	.691090	.105717	6.537	.00000	11.762	.12118
P2	.151460E-01	.845195E-02	1.792	.08465	2.3021	.89372
P3	.285649E-01	.143904E-01	1.985	.04858	2.5381	.41357

MODEL COMMAND: SURE;LHS=C;EQ1=ONE,Y3,P1,P2,P3\$

\*\*\*\*\*  
Multiple Equations GLS Estimator

Maximum iterations = 25

Iteration 0, Log-likelihood= 25.11917  
Iteration 1, Log-likelihood= 25.11917  
Log-likelihood has converged.

Log-likelihood = 25.11917  
Log-determinant of ? = -3.177325

Disturbance Covariance Matrix  
Kept as matrix SIGMA in your work area.

1-C

1-C .4169703E-01

Coefficient Estimates for Equation 1: C						
Variable	Coefficient	Std. Error	T-ratio	Prob( t >=x)	Mean of X	Std.D.of X
ONE	.581388	.336257	1.729	.07181	1.0000	.00000
Y3	.518312	.319506E-01	16.273	.00000	12.195	.56363
P1	.846504	.154637	5.472	.00000	11.762	.12118
P2	.205725E-01	.120447E-01	1.708	.07342	2.3021	.89372
P3	.139225	.421622E-01	3.302	.00096	2.5381	.41357

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ผนวก ข  
ข้อมูลที่ใช้ประมาณค่าสัมประสิทธิ์

ตัวอย่าง	C (บาท)	Y1 (บาท)	Y2 (ครั้ง)	Y3 (ครั้ง)	P1 (บาท/ปี)	P2 %	P3 (บาท/บัญชี)
1	4041336	261990592	195711127	102957	136107.00	12.819	16.13949
2	5020358	271001513	140378784	131152	137237.74	8.535	14.20676
3	3993502	290459883	150458219	97485	121889.63	15.655	9.74095
4	3988471	195176299	101101323	112744	122804.80	8.190	11.71212
5	5007959	367420131	190323628	122071	121270.87	7.084	7.57548
6	7968781	670088250	347105714	216680	117610.87	6.897	19.78468
7	4954189	262150109	135799756	112020	124566.78	6.619	10.97433
8	4905755	269560139	139632152	121305	136866.80	28.721	13.15058
9	5530715	299586408	155185759	54964	139092.82	16.315	16.68012
10	5051162	325068218	168385337	157956	137218.10	7.815	12.82152
11	5316745	320320501	165926019	136180	148325.94	38.272	8.75300
12	4085246	320183688	165855150	143226	137195.56	31.288	21.51422
13	4273017	242384197	125555014	94923	137440.75	5.828	11.16778
14	3303901	314535196	162929232	139192	109499.29	5.068	11.33023
15	3225472	283368835	146785057	39124	107709.07	3.575	18.49836
16	4420486	307559174	159315652	110265	125868.67	16.818	14.32369
17	4691637	323109537	167370740	157893	122018.17	5.063	11.51764
18	4459162	312506267	161878246	202609	113733.58	3.649	5.61816
19	3824940	268299131	138978950	129453	102597.39	5.072	7.35298
20	3505496	190314978	98583158	93958	117064.40	31.803	10.22446
21	5296656	416360445	215674711	147532	130797.86	4.531	8.92628
22	4651570	267359764	138492358	159084	114718.17	4.893	18.02047



## ข้อมูลที่ใช้ประมาณค่าสัมประสิทธิ์ (ต่อ)

ตัวอย่าง	C (บาท)	Y1 (บาท)	Y2 (ครั้ง)	Y3 (ครั้ง)	P1 (บาท/ปี)	P2 %	P3 (บาท/หน่วย)
23	4978951	304217107	157584462	113873	122699.86	4.545	9.75501
24	4630200	269492323	139597024	123447	126773.88	5.357	12.17414
25	6368290	550501785	285159924	172057	121025.62	9.304	10.76870
26	4745124	364396019	188757138	178141	110484.35	1.562	11.61439
27	3305433	167511510	86770962	120883	111483.20	17.548	9.11252
28	4464486	295545504	153092571	118000	132046.70	2.983	15.80196
29	3499289	192817628	99879531	66792	129208.00	5.586	9.54909
30	4972323	306540961	158788218	246396	112905.00	5.294	20.17182
31	4265359	291678392	151089407	131596	126893.72	2.404	14.12981
32	5292625	276524708	143239799	118000	140968.06	30.189	17.40041
33	4557676	298452442	154598365	148552	105828.72	8.048	9.37410
34	3928956	488771613	253183695	125814	108123.39	31.577	9.65508
35	3651189	130288267	67489322	153194	105488.31	26.474	8.76060
36	4057788	270764236	140255874	209614	105708.94	25.824	8.15877
37	4641906	204838351	106106266	141293	125334.39	9.333	9.68791
38	4631849	294619421	152612860	119901	114992.38	7.782	12.96517
39	4527219	334462669	173251662	128000	100171.94	3.534	11.94013
40	5081316	282579298	146376076	120628	134507.35	10.209	7.68269
41	5444247	332052744	172003322	146367	136778.89	14.435	9.78159
42	5243694	429343722	222400048	159075	105557.11	24.449	7.84841
43	5040591	322443143	167025548	96905	115613.78	8.065	32.99716

## ข้อมูลที่ใช้ประมาณค่าสัมประสิทธิ์ (ต่อ)

ตัวอย่าง	C	Y1	Y2	Y3	P1	P2	P3
	(บาท)	(บาท)	(ครั้ง)	(ครั้ง)	(บาท/ปี)	%	(บาท/หน่วย)
44	5815490	344411538	178405177	129794	139661.58	7.127	13.14418
45	5893250	315724484	163545283	135760	157444.75	9.150	11.54408
46	5394846	440320832	228086191	134928	127963.88	22.490	10.60342
47	4704668	337048902	174591331	113658	103230.00	10.152	9.88203
48	4917775	394314994	204255167	161873	119849.35	9.608	14.48645
49	5909114	397503471	205906798	152560	145376.31	15.370	9.20866
50	7753193	446688119	231384446	165853	155056.00	6.007	11.51615
51	5825183	581673651	301306951	229688	115395.89	21.304	5.68049
52	4410394	437595525	226674482	153544	114394.52	3.638	8.14983
53	6481906	342987596	177667575	232078	130747.72	8.765	15.06942
54	7228302	600635120	311128992	184382	123851.71	3.447	14.20042
55	7304888	510202613	264284953	272915	137014.15	25.625	10.88934
56	5302112	504960080	261569321	130812	116962.91	9.384	12.96155
57	4963313	439668830	227748454	103674	131450.41	33.431	19.26084
58	4449121	342822615	177582115	75417	150423.74	4.004	16.47960
59	7554891	499513612	258748051	294240	145064.32	12.261	10.77737
60	5599858	738931615	382766576	133643	127537.26	2.554	17.25234
61	4670708	327171641	169474910	87040	154635.58	8.377	15.42416
62	6726598	546258859	282962089	116655	124990.67	11.891	18.25726
63	5223177	551015343	285425948	198223	101375.18	2.094	21.69280
64	3692932	343850331	178114472	71793	113453.71	1.959	24.16902

## ข้อมูลที่ใช้ประมาณค่าสัมประสิทธิ์ (ต่อ)

ตัวอย่าง	C (บาท)	Y1 (บาท)	Y2 (ครั้ง)	Y3 (ครั้ง)	P1 (บาท/ปี)	P2 %	P3 (บาท/บัญชี)
65	4626588	466773148	241788491	157393	111946.35	6.658	22.66765
66	4728193	413417197	214150108	109543	105759.94	1.305	15.63628
67	5479183	363712722	188403190	161959	126090.67	43.077	8.29825
68	6110991	444086687	230036904	170916	121579.08	4.544	8.57527
69	6071101	637764853	330362194	238640	115664.36	2.886	16.69490
70	7636174	648130230	335731459	258784	124490.40	16.304	10.99156
71	6599657	571149768	295855580	247773	143729.87	12.583	10.04334
72	6426549	478321938	247770764	155483	131804.67	14.556	11.22243
73	3054319	363986028	188544763	79472	89654.55	6.628	32.07820
74	7594934	723786784	374921554	250885	170951.78	2.180	13.88184
75	5902522	546590540	283133900	165851	148899.00	4.113	12.25418
76	6696791	674836175	349565139	231950	107451.79	3.193	17.45636
77	4901935	441709108	228805318	188527	114672.33	5.455	19.47286
78	7978306	597614963	309564551	422445	136829.57	19.779	17.36181
79	6277692	345789942	179119190	172001	160472.26	35.136	12.96550
80	5505755	388116940	201044575	106379	124354.86	21.206	19.51904
81	5637165	434048558	224837153	229796	143175.30	17.006	14.85751
82	6171122	396361191	205315097	229945	132293.32	6.226	9.49384
83	8218062	989444062	512532024	163378	116651.47	4.328	24.18624
84	7152269	509409291	263874013	165816	127994.14	8.820	16.25192
85	4825299	349925866	181261598	107031	113046.30	4.902	18.62359

## ข้อมูลที่ใช้ประมาณค่าล้มประสิทธิ์ (ต่อ)

ตัวอย่าง	C (บาท)	Y1 (บาท)	Y2 (ครั้ง)	Y3 (ครั้ง)	P1 (บาท/ปี)	P2 %	P3 (บาท/หน่วย)
86	9237269	814839828	422087031	303387	141036.50	14.755	8.41255
87	8978804	806558023	417797056	300340	148365.92	48.943	7.79537
88	9716937	838915186	434558066	296034	150742.05	12.998	9.40496
89	9212688	724917359	375507192	98658	158818.34	9.684	7.53728
90	9864019	912963564	472915126	272536	150918.08	14.931	11.19658
91	14114063	1387504147	718727148	905710	165909.98	45.532	13.98948
92	9929519	780813386	404461334	170508	131209.33	68.198	13.84596
93	8695430	789126381	408767465	421170	132641.67	4.644	85.45681
94	8680637	860424706	445699998	214959	107694.83	0.706	22.76106
95	8718089	767124344	397370410	220810	113789.81	1.635	11.29622
96	6640580	695919895	360486506	193152	109190.33	4.343	17.69810
97	9430343	808078717	418584775	287975	147074.49	44.484	10.08012
98	11643367	1470165847	761545909	338536	146688.40	49.852	7.72073
99	11677555	1945767119	1007907368	358394	125967.22	47.611	89.45051
100	6555546	633302816	328050859	340348	124725.33	37.298	7.19751
101	8415574	873288502	452363444	324832	147119.56	21.477	13.41195
102	8578287	1128025471	584317194	706348	130187.51	17.249	9.01217
103	12875082	1717934375	889890006	596940	133422.43	21.937	8.28937
104	7034549	536586283	277951695	206891	135336.71	12.841	10.54452
105	6180075	624224399	323348239	141463	134722.12	31.452	10.70763
106	8138369	1187015323	614873938	279876	109714.19	17.308	24.43285

## ข้อมูลที่ใช้ประมาณค่าสัมประสิทธิ์ (ต่อ)

ตัวอย่าง	C	Y1	Y2	Y3	P1	P2	P3
	(บาท)	(บาท)	(ครั้ง)	(ครั้ง)	(บาท/ปี)	%	(บาท/บัญชี)
107	5964852	834485481	432263479	137571	110615.67	14.903	14.79621
108	11577313	1696856430	878971631	352131	142254.02	29.082	14.71076
109	9821106	1275950944	660942589	288737	145410.38	27.151	11.82833
110	9979804	1183683837	613148227	586303	131756.17	18.788	8.86454
111	6862957	735369406	380921352	189345	116850.44	2.625	23.82885
112	6932577	882262994	457012231	160188	138852.79	33.196	12.85578
113	9244238	760263013	393816241	206315	110766.89	27.238	14.84363
114	8043598	1030564143	533832226	189701	102004.64	10.713	23.17613
115	11516873	1670600523	865371071	419646	137188.95	23.428	13.05880
116	7232920	626961022	324765809	286502	125255.61	3.508	13.74110
117	5963063	684487676	354564616	193956	117065.44	4.882	10.71795
118	10135220	1184033721	613329467	298512	150497.00	13.566	10.81767
119	7084728	711851023	368738830	332847	131735.79	8.580	6.45304
120	7288745	771998182	399895058	222195	140774.71	7.530	9.06196
121	9927175	1132126356	586441452	398266	133088.49	10.687	12.06944
122	8380150	771130939	399445827	256014	134553.45	6.805	7.12479
123	8074722	732750118	379564561	326829	138029.33	10.040	10.34225
124	8167458	714462539	370091595	255019	127063.90	22.467	12.40868
125	10483577	1421396324	736283296	764386	121803.59	4.380	10.36263
126	8837885	813817194	421557306	390991	162224.35	9.931	8.00051
127	11230130	1312673931	679965096	348493	140003.44	13.104	10.19291

## ข้อมูลที่ใช้ประมาณค่าสัมประสิทธิ์ (ต่อ)

ตัวต่าง	C (บาท)	Y1 (บาท)	Y2 (ครั้ง)	Y3 (ครั้ง)	P1 (บาท/ปี)	P2 %	P3 (บาท/หน่วย)
128	10848891	1421396324	736283296	414990	138442.98	9.129	8.42779
129	8587891	835881333	432986531	341971	141723.50	3.211	11.38867
130	8133095	730668620	378486345	329637	149268.43	6.923	9.00702
131	7786052	691019939	357948328	359602	136242.39	9.083	10.20864
132	12864480	1627888765	843246380	454857	130442.83	9.700	12.63744
133	15251574	1438385356	745083614	420289	148777.43	8.241	12.55736
134	8652241	801388128	415119050	191472	152401.14	10.332	13.76105
135	6680172	817375160	423400333	182357	147581.14	9.354	13.37965
136	9735112	814845810	422090130	283059	141150.49	26.300	16.43313
137	7241059	514279665	266396867	151618	117235.42	4.462	19.68740
138	11327866	1031579201	534358026	742599	132463.02	15.313	10.73851
139	8503599	691383713	358136763	421593	137331.44	66.793	7.52331
140	9317700	976280211	505713149	416647	131131.13	15.902	9.66965
141	8050774	737754941	382157059	202164	113782.71	2.107	28.07390
142	11584069	1152863188	597183131	755295	137021.76	16.416	9.45745
143	11047340	924941967	479119939	176963	131653.07	20.689	9.75706
144	7644095	629359964	326008461	531031	140323.10	2.867	13.57685
145	11438936	1109350592	574643607	413189	149660.79	40.013	17.85098
146	9811564	695682909	360363747	314314	126263.65	12.542	10.38779
147	10435860	1059694724	548921867	480688	126819.98	10.042	14.71068
148	11943588	967057978	500936032	366836	134359.21	12.013	9.86407

## ประวัติผู้เขียน

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 เศรษฐศาสตรบัณฑิต จากคณะเศรษฐศาสตร์ มหาวิทยาลัยเชียงใหม่ ปี พ.ศ.2529 ศึกษาต่อ  
 ในระดับเศรษฐศาสตรมหาบัณฑิต ภาควิชาเศรษฐศาสตร์ บัณฑิตวิทยาลัย จุฬาลงกรณ์มหาวิทยาลัย  
 ในปี พ.ศ.2530



ศูนย์วิทยทรัพยากร  
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