



ภาคผนวก

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LR Statistic vs. MC	98.59094	.00000	.00000					
Degrees of Freedom	10.00000	.00000	.00000					
Prob. Value for LR	.00000	.00000	.00000					
Entropy for probs.	227.96340	277.25887	277.25887					
Normalized Entropy	.82220	1.00000	1.00000					
Entropy Ratio Stat.	98.59094	.00000	.00000					
Bayes Info Criterion	515.84145	614.43239	614.43239					
BIC - BIC(no model)	98.59094	.00000	.00000					
Pseudo R-squared	.17780	.00000	.00000					
Pct. Correct Prec.	67.75000	.00000	50.00000					
Means:	y=0	y=1	y=2	y=3	yu=4	y=5,	y=6	y>=7
Outcome	.5000	.5000	.0000	.0000	.0000	.0000	.0000	.0000
Pred.Pr	.5000	.5000	.0000	.0000	.0000	.0000	.0000	.0000

Notes: Entropy computed as  $\sum(i)\sum(j)Pfit(i,j)*\log Pfit(i,j)$ .  
Normalized entropy is computed against M0.  
Entropy ratio statistic is computed against M0.  
 $BIC = 2*critterion - \log(N)*degrees\ of\ freedom$ .  
If the model has only constants or if it has no constants,  
the statistics reported here are not useable.

Partial derivatives of probabilities with respect to the vector of characteristics. They are computed at the means of the Xs. Observations used are All Obs.

Variable	Coefficient	Standard Error	b/St.Er.	P[ Z >z]	Mean of X
Characteristics in numerator of Prob[Y = 1]					
Constant	-.5365505337	.22383684	-2.397	.0165	
Marginal effect for dummy variable is P 1 - P 0.					
X1	.2937245665	.74837194E-01	3.925	.0001	.79250000
X2	-.2252535952E-02	.33324676E-02	-.676	.4991	22.102500
Marginal effect for dummy variable is P 1 - P 0.					
X3	.1159629569	.69972540E-01	1.657	.0975	.67750000
Marginal effect for dummy variable is P 1 - P 0.					
X4	.3783917839	.50315368E-01	7.520	.0000	.45250000
Marginal effect for dummy variable is P 1 - P 0.					
X5	-.1831486235	.59669498E-01	-3.069	.0021	.33000000
Marginal effect for dummy variable is P 1 - P 0.					
X6	.7775351534E-01	.13108365	.593	.5531	.94250000
Marginal effect for dummy variable is P 1 - P 0.					
X7	-.2603407202E-01	.58685359E-01	-.444	.6573	.44750000
X8	.2401950710E-02	.63830848E-02	.376	.7067	27.605000
Marginal effect for dummy variable is P 1 - P 0.					
X9	.2549350352E-01	.95593389E-01	.267	.7897	.68750000
Marginal effect for dummy variable is P 1 - P 0.					
X10	-.1649141388E-01	.98321801E-01	-.168	.8668	.69250000

(Note: E+nn or E-nn means multiply by 10 to + or -nn power.)

Marginal Effects for

Variable	All Obs.
ONE	-.53655
X1	.29372
X2	-.00225
X3	.11596
X4	.37839
X5	-.18315
X6	.07775
X7	-.02603
X8	.00240
X9	.02549

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```
| X10 | -.01649 |
+-----+
```

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+-----+
| Fit Measures for Binomial Choice Model
| Logit model for variable Y
+-----+
| Proportions P0= .500000 P1= .500000
| N = 400 N0= 200 N1= 200
| LogL = -227.96340 LogL0 = -277.2589
| Estrella = 1-(L/L0)^(-2L0/n) = .23768
+-----+
| Efron | McFadden | Ben./Lerman
| .22118 | .17780 | .61184
| Cramer | Veall/Zim. | Rsqrd ML
| .22367 | .34038 | .21845
+-----+
| Information Akaike I.C. Schwarz I.C.
| Criteria 1.19482 521.83291
+-----+
```

```
Frequencies of actual & predicted outcomes
Predicted outcome has maximum probability.
Threshold value for predicting Y=1 = .5000
Predicted
```

Actual	0	1	Total
0	149	51	200
1	78	122	200
Total	227	173	400

```
=====  
Analysis of Binary Choice Model Predictions Based on Threshold = .5000  
=====
```

Prediction Success

```
Sensitivity = actual 1s correctly predicted 61.000%
Specificity = actual 0s correctly predicted 74.500%
Positive predictive value = predicted 1s that were actual 1s 70.520%
Negative predictive value = predicted 0s that were actual 0s 65.639%
Correct prediction = actual 1s and 0s correctly predicted 67.750%
```

Prediction Failure

```
False pos. for true neg. = actual 0s predicted as 1s 25.500%
False neg. for true pos. = actual 1s predicted as 0s 39.000%
False pos. for predicted pos. = predicted 1s actual 0s 29.480%
False neg. for predicted neg. = predicted 0s actual 1s 34.361%
False predictions = actual 1s and 0s incorrectly predicted 32.250%
```

```
=====  
--> RESET  
--> READ;FILE="D:\IS\Logit Run\b.xls"$  
--> LOGIT;Lhs=Y;Rhs=ONE,X1,X4,X5;Margin$  
Normal exit from iterations. Exit status=0.  
=====
```

```
+-----+
| Multinomial Logit Model
| Maximum Likelihood Estimates
| Model estimated: Sep 02, 2008 at 06:08:07PM.
| Dependent variable Y
| Weighting variable None
| Number of observations 400
| Iterations completed 5
| Log likelihood function -230.3723
| Restricted log likelihood -277.2589
| Chi squared 93.77321
| Degrees of freedom 3
| Prob[ChiSqd > value] = .0000000
| Hosmer-Lemeshow chi-squared = 16.47160
| P-value= .03611 with deg.fr. = 8
+-----+
```

```
+-----+
| Variable | Coefficient | Standard Error | b/St.Er. | P[|Z|>z] | Mean of X|
```

```

+-----+-----+-----+-----+-----+
                Characteristics in numerator of Prob[Y = 1]
Constant
X1          1.575426650          .31014698          5.080          .0000          .79250000
X4          1.565281788          .23112574          6.772          .0000          .45250000
X5          -.7598505741          .24365306          -3.119          .0018          .33000000
    
```

**Matrix: Last**  
**[4,4]**

```

+-----+-----+-----+-----+-----+
Information Statistics for Discrete Choice Model.
                M=Model MC=Constants Only M0=No Model
Criterion F (log L)  -230.37227          -277.25887          -277.25887
LR Statistic vs. MC  93.77321          .00000          .00000
Degrees of Freedom   3.00000          .00000          .00000
Prob. Value for LR   .00000          .00000          .00000
Entropy for probs.   230.37227          277.25887          277.25887
Normalized Entropy   .83089          1.00000          1.00000
Entropy Ratio Stat.  93.77321          .00000          .00000
Bayes Info Criterion 478.71892          572.49214          572.49214
BIC - BIC(no model) 93.77321          .00000          .00000
Pseudo R-squared    .16911          .00000          .00000
Pct. Correct Prec.  68.25000          .00000          50.00000
Means:      y=0      y=1      y=2      y=3      yu=4      y=5,      y=6      y>=7
Outcome    .5000   .5000   .0000   .0000   .0000   .0000   .0000   .0000
Pred.Pr    .5000   .5000   .0000   .0000   .0000   .0000   .0000   .0000
Notes: Entropy computed as Sum(i)Sum(j)Pfit(i,j)*logPfit(i,j).
        Normalized entropy is computed against M0.
        Entropy ratio statistic is computed against M0.
        BIC = 2*criterion - log(N)*degrees of freedom.
        If the model has only constants or if it has no constants,
        the statistics reported here are not useable.
    
```

```

+-----+-----+-----+-----+-----+
Partial derivatives of probabilities with
respect to the vector of characteristics.
They are computed at the means of the Xs.
Observations used are All Obs.
    
```

```

+-----+-----+-----+-----+-----+
|Variable | Coefficient | Standard Error |b/St.Er.|P[|Z|>z] | Mean of X|
+-----+-----+-----+-----+-----+
                Characteristics in numerator of Prob[Y = 1]
Constant  -.4323349249   .78695782E-01  -5.494   .0000
X1        .3563620064   .57295632E-01   6.220   .0000          .79250000
X4        .3722908089   .49639523E-01   7.500   .0000          .45250000
X5       -.1866585309   .57894364E-01  -3.224   .0013          .33000000
(Note: E+nn or E-nn means multiply by 10 to + or -nn power.)
    
```

```

+-----+-----+-----+-----+-----+
| Marginal Effects for |
+-----+-----+-----+-----+-----+
| Variable | All Obs. |
+-----+-----+-----+-----+-----+
| ONE      | -.43233  |
| X1       | .35636   |
| X4       | .37229   |
| X5       | -.18666  |
+-----+-----+-----+-----+-----+
    
```

+-----+-----+-----+-----+-----+

Fit Measures for Binomial Choice Model		
Logit model for variable Y		
Proportions P0=	.500000	P1= .500000
N =	400	N0= 200 N1= 200
LogL =	-230.37227	LogL0 = -277.2589
Estrella =	1 - (L/L0) <sup>(-2L0/n)</sup> = .22649	
Efron	McFadden	Ben./Lerman
.21208	.16911	.60693
Cramer	Veall/Zim.	Rsqr ML
.21386	.32690	.20898
Information Criteria	Akaike I.C.	Schwarz I.C.
	1.17186	484.71039

Frequencies of actual & predicted outcomes  
 Predicted outcome has maximum probability.  
 Threshold value for predicting Y=1 = .5000  
 Predicted

Actual	0	1	Total
0	161	39	200
1	88	112	200
Total	249	151	400

=====  
 Analysis of Binary Choice Model Predictions Based on Threshold = .5000  
 =====

Prediction Success

Sensitivity = actual 1s correctly predicted	56.000%
Specificity = actual 0s correctly predicted	80.500%
Positive predictive value = predicted 1s that were actual 1s	74.172%
Negative predictive value = predicted 0s that were actual 0s	64.659%
Correct prediction = actual 1s and 0s correctly predicted	68.250%

Prediction Failure

False pos. for true neg. = actual 0s predicted as 1s	19.500%
False neg. for true pos. = actual 1s predicted as 0s	44.000%
False pos. for predicted pos. = predicted 1s actual 0s	25.828%
False neg. for predicted neg. = predicted 0s actual 1s	35.341%
False predictions = actual 1s and 0s incorrectly predicted	31.750%

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