

Initiation à l'économétrie des variables qualitatives

François LEGENDRE

Centre d'Études de l'Emploi

Résultats des différentes proc du système Sas

Listing 1 – Résultat de la PROC univariate pour la variable x

```

The UNIVARIATE Procedure
Variable:  x
Moments
N              100      Sum Weights              100
Mean           -0.1542365  Sum Observations      -15.42365
Std Deviation  0.99718784      Variance              0.99438359
Skewness       -0.0600521  Kurtosis              -0.3885106
Uncorrected SS 100.822865      Corrected SS          98.4439752
Coeff Variation -646.53169  Std Error Mean        0.09971878

Basic Statistical Measures
Location              Variability
Mean      -0.15424      Std Deviation      0.99719
Median    -0.08181      Variance           0.99438
Mode      .              Range             4.45723
                        Interquartile Range      1.39555

Tests for Location: Mu0=0
Test      -Statistic-      -----p Value-----
Student's t      t      -1.54671      Pr > |t|      0.1251
Sign            M           -3      Pr >= |M|      0.6173
Signed Rank     S          -404      Pr >= |S|      0.1659

Quantiles (Definition 5)
Quantile      Estimate
100% Max      1.9619524
99%           1.9448348
95%           1.4803890
90%           1.1469454
75% Q3        0.5179294
50% Median    -0.0818143
25% Q1        -0.8776198
10%           -1.4762179
5%            -1.8061362
1%            -2.4436325
0% Min        -2.4952741

Extreme Observations
-----Lowest-----      -----Highest-----
Value      Obs      Value      Obs
-2.49527      6      1.48449      82
-2.39199     16      1.76367      71
-2.13123     19      1.89842      47
-1.87612     93      1.92772      23
-1.86573     41      1.96195       7
    
```

Listing 2 – Résultat de la PROC univariate pour la variable ye

The UNIVARIATE Procedure				
Variable: ye				
Moments				
N	100	Sum Weights		100
Mean	-0.5225101	Sum Observations		-52.251007
Std Deviation	4.07199786	Variance		16.5811666
Skewness	0.35430939	Kurtosis		-0.2907447
Uncorrected SS	1668.83717	Corrected SS		1641.53549
Coeff Variation	-779.31471	Std Error Mean		0.40719979
Basic Statistical Measures				
Location		Variability		
Mean	-0.52251	Std Deviation		4.07200
Median	-1.07247	Variance		16.58117
Mode	.	Range		18.98275
		Interquartile Range		5.67967
Tests for Location: Mu0=0				
Test	-Statistic-	-----p Value-----		
Student's t	t -1.28318	Pr > t		0.2024
Sign	M -11	Pr >= M		0.0352
Signed Rank	S -427	Pr >= S		0.1429
Quantiles (Definition 5)				
	Quantile	Estimate		
	100% Max	9.62907		
	99%	9.49242		
	95%	7.06341		
	90%	5.28943		
	75% Q3	2.40252		
	50% Median	-1.07247		
	25% Q1	-3.27715		
	10%	-5.79465		
	5%	-6.43466		
	1%	-8.73232		
	0% Min	-9.35368		
Extreme Observations				
-----Lowest-----		-----Highest-----		
Value	Obs	Value		Obs
-9.35368	52	7.20324		47
-8.11096	6	7.50777		31
-6.47873	87	8.08672		91
-6.44005	32	9.35578		65
-6.43775	10	9.62907		56

Listing 3 – Résultat de la PROC univariate pour la variable y

```

The UNIVARIATE Procedure
      Variable:  y
      Moments
N              100      Sum Weights              100
Mean           0.39      Sum Observations         39
Std Deviation  0.49020713  Variance              0.24030303
Skewness       0.45794886  Kurtosis              -1.8272391
Uncorrected SS          39      Corrected SS          23.79
Coeff Variation  125.694136  Std Error Mean        0.04902071

      Basic Statistical Measures
      Location              Variability
Mean      0.390000      Std Deviation          0.49021
Median    0.000000      Variance                0.24030
Mode      0.000000      Range                  1.00000
                        Interquartile Range          1.00000

      Tests for Location: Mu0=0
Test      -Statistic-      -----p Value-----
Student's t      t      7.955821      Pr > |t|      <.0001
Sign           M           19.5      Pr >= |M|      <.0001
Signed Rank     S           390      Pr >= |S|      <.0001

      Quantiles (Definition 5)
      Quantile      Estimate
      100% Max              1
      99%                   1
      95%                   1
      90%                   1
      75% Q3                 1
      50% Median             0
      25% Q1                 0
      10%                   0
      5%                     0
      1%                     0
      0% Min                 0

The UNIVARIATE Procedure
      Variable:  y
      Extreme Observations
      ----Lowest----      ----Highest----
Value      Obs      Value      Obs
      0      100      1      93
      0      99      1      94
      0      95      1      96
      0      90      1      97
      0      87      1      98

```

Listing 4 – Résultat de la première estimation *logit*

```

Probit Procedure
Model Information
Data Set                WORK.TABLE
Dependent Variable      y
Number of Observations 100
Name of Distribution     Logistic
Log Likelihood          -19.17411768
Number of Observations Read 100
Number of Observations Used 100
Class Level Information
Name      Levels  Values
y         2      0 1
Response Profile
Ordered      Total
Value  y      Frequency
1      0          61
2      1          39
PROC PROBIT is modeling the probabilities of levels of y having LOWER Ordered
Values in the response profile table.
Algorithm converged.
Type III Analysis of Effects
Wald
Effect      DF      Chi-Square      Pr > ChiSq
x            1      15.9199          <.0001
z            1      18.9943          <.0001
Analysis of Parameter Estimates
Standard      95% Confidence      Chi-
Parameter  DF  Estimate      Error      Limits      Square  Pr > ChiSq
Intercept  1   0.8987      0.4504      0.0159  1.7814      3.98      0.0460
x          1  -2.5221      0.6321     -3.7609  -1.2832     15.92     <.0001
z          1   4.4130      1.0126      2.4284   6.3976     18.99     <.0001

```

Listing 5 – Résultat de la seconde estimation *logit*

```

                                Probit Procedure
                                Iteration History for Parameter Estimates
Iter   Ridge   Loglikelihood   Intercept   x   z
  0     0     -69.314718      0           0   0
  1     0    -32.206671    -0.298450754  0.7523464797 -1.276731112
  2     0    -23.271781    -0.486774086  1.3400021078 -2.270333705
  3     0    -20.020918    -0.68132742   1.9058139525 -3.275741359
  4     0    -19.244783    -0.831278927  2.327172657  -4.05066938
  5     0    -19.174928    -0.891445712  2.5004007601 -4.372741598
  6     0    -19.174118    -0.898569905  2.5217756871 -4.412465511
  7     0    -19.174118    -0.898658959  2.5220530527 -4.412979725
  8     0    -19.174118    -0.898658959  2.5220530527 -4.412979725

                                Model Information
Data Set                               WORK.TABLE
Dependent Variable                     ybis
Number of Observations                 100
Name of Distribution                   Logistic
Log Likelihood                         -19.17411768
Number of Observations Read            100
Number of Observations Used            100

                                Class Level Information
Name      Levels  Values
ybis      2      0 1
Parameter Information
Parameter Effect
Intercept Intercept
x          x
z          z

                                Response Profile
Ordered      Total
Value      ybis  Frequency
  1         0      39
  2         1     61

                                Probit Procedure
PROC PROBIT is modeling the probabilities of levels of ybis having LOWER Ordered
Values in the response profile table.
Last Evaluation of the Negative of the Gradient
Intercept      x      z
7.5007364E-9  -2.718033E-8  6.7665646E-8
Last Evaluation of the Negative of the Hessian
Intercept      x      z
Intercept 5.7614718296 -0.834447828 -1.332708422
x          -0.834447828  6.8334612322  3.5114881799
z          -1.332708422  3.5114881799  2.9241510386

Algorithm converged.

                                Type III Analysis of Effects
                                Wald
Effect      DF      Chi-Square  Pr > ChiSq
x           1       15.9199    <.0001
z           1       18.9943    <.0001

                                Analysis of Parameter Estimates
Standard      95% Confidence      Chi-
Parameter  DF Estimate  Error  Limits  Square Pr > ChiSq
Intercept  1  -0.8987  0.4504  -1.7814 -0.0159  3.98  0.0460
x          1  2.5221  0.6321  1.2832  3.7609  15.92 <.0001
z          1  -4.4130  1.0126  -6.3976 -2.4284  18.99 <.0001

```

Listing 6 – Résultat de l'estimation par les MCO

The REG Procedure						
Model: MODEL1						
Dependent Variable: ybis						
Number of Observations Read		100				
Number of Observations Used		100				
Analysis of Variance						
Source	DF	Sum of Squares	Mean Square	F Value	Pr > F	
Model	2	14.65585	7.32793	77.82	<.0001	
Error	97	9.13415	0.09417			
Corrected Total	99	23.79000				
Root MSE		0.30687	R-Square	0.6161		
Dependent Mean		0.61000	Adj R-Sq	0.6081		
Coeff Var		50.30584				
Parameter Estimates						
Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > t	
Intercept	1	0.57461	0.03106	18.50	<.0001	
x	1	-0.18809	0.03095	-6.08	<.0001	
z	1	0.31918	0.02868	11.13	<.0001	