CLASSES – MICROECONOMETRIA – LABORATORIO 5a

Titolo nota 05/06/2018

BINARY.DTA

$$GRADE_i = F(\beta_1 + \beta_2 GPA_i + \beta_3 TUCE_i + \beta_4 PSI_i) + U_i$$

- $GRADE_i$: (0, 1) DUMMY
- GPA_i: MEDIA VOTI
- $TUCE_i$: GRADO DI CONOSCENZA PRECEDENTE
- PSI_i: DUMMY (0, 1) METODO INSEGNAMENTO

LPM

$$GRADE_i = \beta_1 + \beta_2 GPA_i + \beta_3 TUCE_i + \beta_4 PSI_i + u_i$$

$$\widehat{GRADE}_i \equiv \hat{p}_i \qquad i = 1 \ldots N$$

REG GRADE GPA TUCE PSI

PREDICT PLP
SUM

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SCALAR  NN = N(N)

SUM  IF GRADE == 1
SCALAR  N1 = N(N)

SCALAR  N0 = NN - N1
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$$\hat{p}_x = \frac{N_1}{N}$$

SCALAR PCOST $= N1/NN$

PROBIT $\rightarrow$ CDF NORMALE STANDARD

$$GRADE_i = \Phi\left(\beta_1 + \beta_2 GPA_i + \beta_3 TUCE_i + \beta_4 PSI_i\right) + U_i$$

$$\max_{\beta_1,\beta_2,\beta_3,\beta_4} \log L = \sum_{i=1}^{N} \left[y_i \log p_i + (1-y_i) \log(1-p_i) \right] =$$

GRADE$_i$ — y_i — GRADE$_i$

DVC $p_i = E(y_i) = \Phi(\beta_2 + \beta_2 GPA_i + \beta_3 TUCE_i + \beta_4 PSI_i)$

PROBIT GRADE GPA TUCE PSI

SCALAR logL1 = e(LL)

$$GRADE_i = \Phi(\beta_1) + u_i$$

$$p_i \equiv E(GRADE_i) = \Phi(\beta_1) = p$$

↳ $$\boxed{\log L_0 = N_1 \cdot \log\left(\frac{N_1}{N}\right) + N_0 \cdot \log\left(\frac{N_0}{N}\right)}$$

SCALAR $\log L0 = e(LL\_0)$

$$\text{SCALAR } llLOO = N_1 * \log\left(\frac{N_1}{NN}\right) + N_0 * \log\left(\frac{N_0}{NN}\right)$$

SCALAR LIST llLOO

$$\boxed{\text{PSEUDOR2} = 1 - \frac{llL1}{llLO}}$$

SCALAR PSEUDOR2 = 1 - llL1/llLO

STATA SALVA I $\hat{\beta}$ IN UN VETTORE b

SCALAR B1 = $b[\_cons]$

SCALAR B2 = $b[GPA]$

SCALAR B3 = $b[TUCE]$

SCALAR B4 = $b[PSI]$

QUIETLY SUM GPA
SCALAR GPAX = R(MEAN)

QUIETLY SUM TUCE
SCALAR TUCEX = R(MEAN)

QUIETLY SUM PSI
SCALAR PSIX = R(MEAN)

CDF

$$\hat{p}_i = \Phi\left(\hat{\beta}_1 + \hat{\beta}_2 GPA_i + \hat{\beta}_3 TUCE_i + \hat{\beta}_4 PSI_i\right)$$

$i = 1 \ldots N$

GEN PIPB = NORMAL(B1 + B2 * GPA + B3 * TUCE + B4 * PSI)

PREDICT

- $\hat{p}_i = \Phi(x_i \hat{\beta}_{ML})$ (NO OPZIONI)
- $x_i \hat{\beta}_{ML}$ (OPZIONE: XB)

$$\hat{p}_i = \Phi\left(\hat{\beta}_1 + \hat{\beta}_2 GPA_i + \hat{\beta}_3 TUCE_i + \hat{\beta}_4 PSI_i\right)$$

$$\frac{\partial \hat{p}_i}{\partial GPA_i} = \frac{\partial \Phi(\cdot)}{\partial(\cdot)} \cdot \frac{\partial(\cdot)}{\partial GPA_i} = \phi\left(\hat{\beta}_1 + \hat{\beta}_2 GPA_i + \hat{\beta}_3 TUCE_i + \hat{\beta}_4 PSI_i\right) \cdot \hat{\beta}_2$$

$$\frac{\partial \hat{p}_i}{\partial TUCE_i} = \phi\left(\hat{\beta}_1 + \hat{\beta}_2 GPA_i + \hat{\beta}_3 TUCE_i + \hat{\beta}_4 PSI_i\right) \cdot \hat{\beta}_3$$

$\frac{\partial \hat{p}_i}{\partial PSI_i}$ NON HA SENSO

$\bullet$ = MEDIA CAMPIONARIA RISPETTO A $i = 1 \dots N$

$$\hat{p}_i|_{PSI_i=0} = \Phi\left(\hat{\beta}_1 + \hat{\beta}_2 GPA_\bullet + \hat{\beta}_3 TUCE_\bullet + \hat{\beta}_4 \cdot 0\right)$$

$$\hat{p}_i|_{PSI_i=1} = \Phi\left(\hat{\beta}_1 + \hat{\beta}_2 GPA_\bullet + \hat{\beta}_3 TUCE_\bullet + \hat{\beta}_4 \cdot 1\right)$$

$$EFFETTO_\bullet = \hat{p}_i|_{PSI_i=1} - \hat{p}_i|_{PSI_i=0}$$

SCALAR MFXGPA = NORMALDEN(B1 + B2*GPAX + B3*TUCEX + B4*PSIX) * B2

SCALAR MFXTUCE = NORMALDEN(B2 + B2*GPAX + B3*TUCEX + B4*PSIX) * B3

SCALAR FXPSI = NORMAL(B1 + B2*GPAX + B3*TUCEX + B4) - NORMAL(B1 + B2*GPAX + B3*TUCEX)