



Econometría I

Modelo Lineal General: Práctica con Eviews

Noviembre, 2004

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Los datos: Descripción

OBJETIVO: Modelizar el peso de un recién nacido en función de características de la madre y del período de gestación

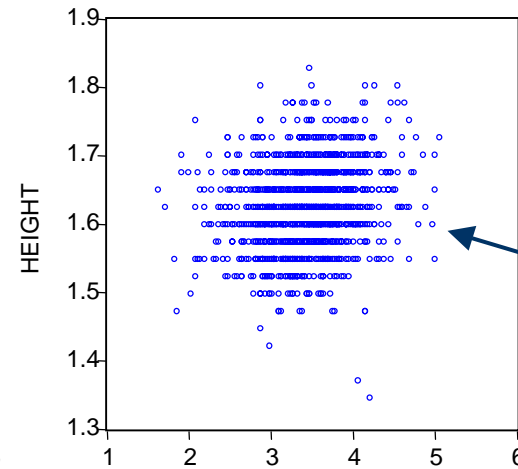
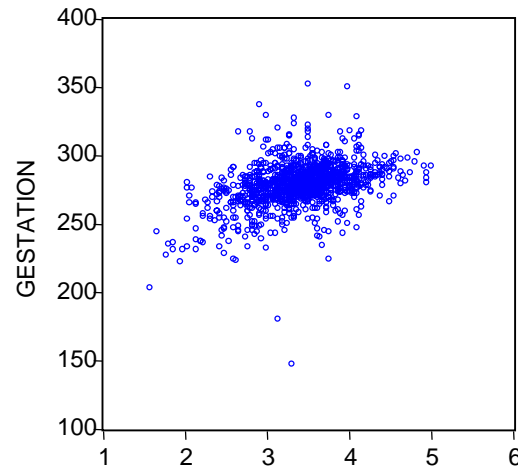
| Variable | Tamaño muestral | Definición | Métrica |
|-----------|-----------------|------------------------|---------|
| bwt | 1174 | Peso del bebe al nacer | Kilos |
| gestation | 1174 | Periodo de gestación | Días |
| parity | 1174 | Madre primípara | 1 - 0 |
| age | 1174 | Edad de la madre | Años |
| height | 1174 | Altura de la madre | Metros |
| weight | 1174 | Peso de la madre | Kilos |
| smoke | 1174 | Madre fumadora | 1 - 0 |

} Variable endógena o dependiente

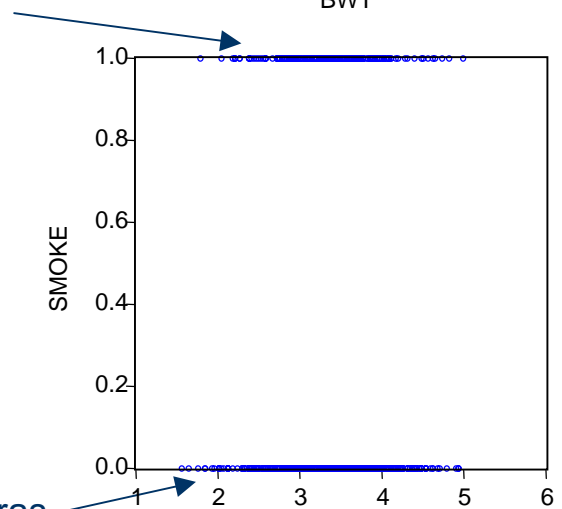
} Variables exógenas o explicativas

Fuente: <http://stat-www.berkeley.edu/users/statlabs/labs.html>

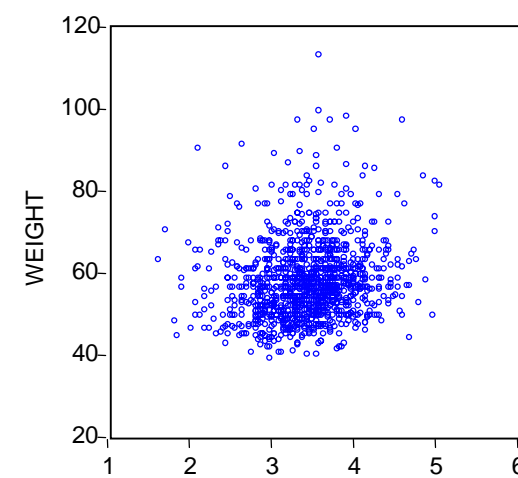
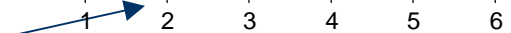
Los datos: Análisis (I)



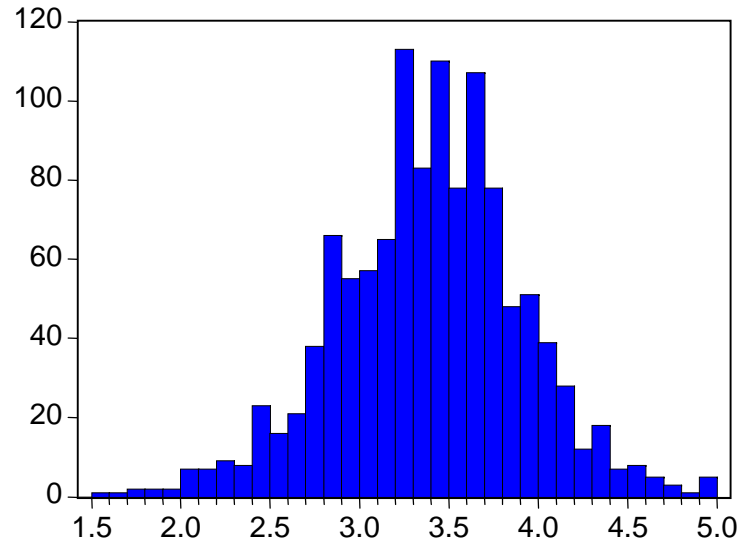
Madres fumadoras



Madres no fumadoras



Los datos: Análisis (II)



Series: **BWT**

Observations 1174

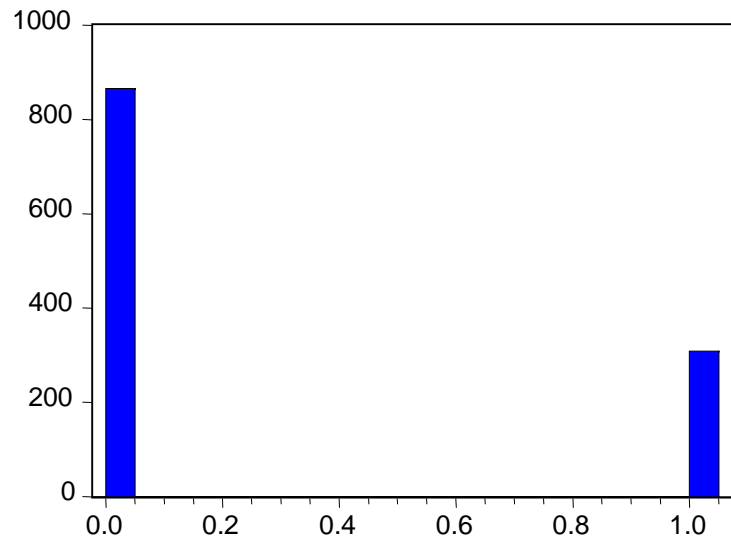
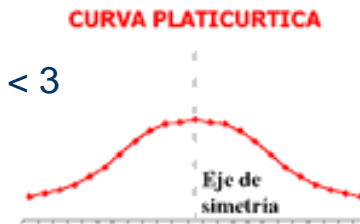
| | |
|--------------|---------|
| Mean | 3.3866 |
| Median | 3.4019 |
| Maximum | 4.9895 |
| Minimum | 1.5592 |
| Std. Dev. | 0.5196 |
| Skewness | -0.1331 |
| Kurtosis (K) | 3.4344 |
| Jarque-Bera | 12.701 |

Distribución aprox. normal

$K > 3$



$K < 3$



Series: **PARITY**

Observations 1174

| | |
|-------------|--------|
| Mean | 0.2623 |
| Median | 0.0000 |
| Maximum | 1.0000 |
| Minimum | 0.0000 |
| Std. Dev. | 0.4401 |
| Skewness | 1.0804 |
| Kurtosis | 2.1673 |
| Jarque-Bera | 262.32 |

Distribución binomial

Modelo de regresión M1

| Dependent Variable: BWT | | | | |
|-----------------------------|-------------|-----------------------|-------------|--------|
| Method: Least Squares | | | | |
| Date: 05/17/04 Time: 16:25 | | | | |
| Sample: 1 1174 | | | | |
| Included observations: 1174 | | | | |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| C | 3.489399 | 0.018839 | 185.2220 | 0.0000 |
| SMOKE | -0.262683 | 0.030129 | -8.718572 | 0.0000 |
| R-squared | 0.060908 | Mean dependent var | 3.386698 | |
| Adjusted R-squared | 0.060106 | S.D. dependent var | 0.519603 | |
| S.E. of regression | 0.503745 | Akaike info criterion | 1.468211 | |
| Sum squared resid | 297.4061 | Schwarz criterion | 1.476845 | |
| Log likelihood | -859.8397 | F-statistic | 76.01351 | |
| Durbin-Watson stat | 2.043942 | Prob(F-statistic) | 0.000000 | |

Capacidad explicativa del modelo muy pobre (6,1%)

Crerios de información (comparación de modelos)

Modelo de regresión M2

| Dependent Variable: BWT | | | | |
|-----------------------------|-------------|-----------------------|-------------|--------|
| Method: Least Squares | | | | |
| Date: 05/17/04 Time: 16:26 | | | | |
| Sample: 1 1174 | | | | |
| Included observations: 1174 | | | | |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| C | -2.279603 | 0.406714 | -5.604932 | 0.0000 |
| SMOKE | -0.238149 | 0.027040 | -8.807261 | 0.0000 |
| GESTATION | 0.012587 | 0.000825 | 15.25825 | 0.0000 |
| PARITY | -0.094323 | 0.032005 | -2.947156 | 0.0033 |
| HEIGHT | 1.288032 | 0.228823 | 5.628938 | 0.0000 |
| WEIGHT | 0.003135 | 0.001578 | 1.987370 | 0.0471 |
| AGE | -0.000254 | 0.002433 | -0.104270 | 0.9170 |
| R-squared | 0.257954 | Mean dependent var | 3.386698 | |
| Adjusted R-squared | 0.254138 | S.D. dependent var | 0.519603 | |
| S.E. of regression | 0.448746 | Akaike info criterion | 1.241227 | |
| Sum squared resid | 235.0026 | Schwarz criterion | 1.271446 | |
| Log likelihood | -721.6001 | F-statistic | 67.61297 | |
| Durbin-Watson stat | 2.061174 | Prob(F-statistic) | 0.000000 | |

Probabilidad de equivocarse al rechazar H_0

El modelo incumple el supuesto [H.1.3]

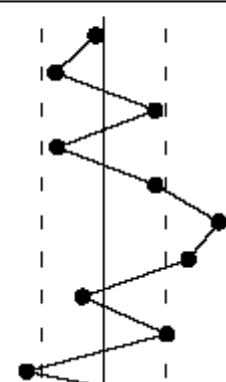
Capacidad explicativa del modelo más elevada

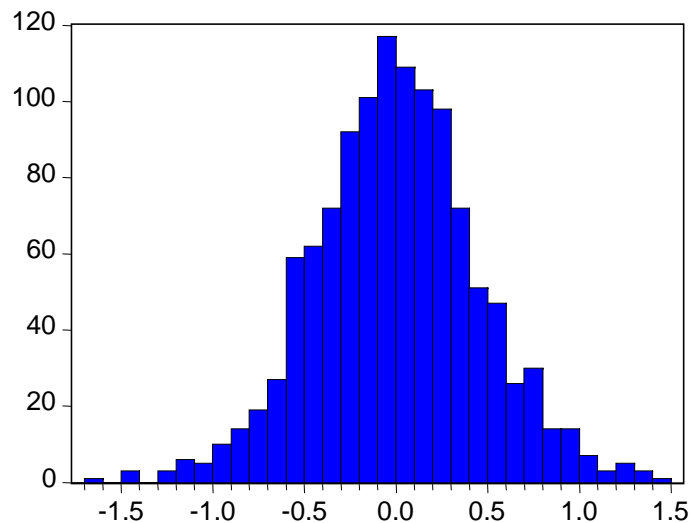
Modelo de regresión M3

| Dependent Variable: BWT | | | | |
|-----------------------------|-------------|-----------------------|-------------|----------|
| Method: Least Squares | | | | |
| Date: 05/18/04 Time: 11:00 | | | | |
| Sample: 1 1174 | | | | |
| Included observations: 1174 | | | | |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| C | -2.288172 | 0.398154 | -5.746947 | 0.0000 |
| SMOKE | -0.237955 | 0.026965 | -8.824655 | 0.0000 |
| GESTATION | 0.012589 | 0.000824 | 15.27602 | 0.0000 |
| PARITY | -0.093201 | 0.030130 | -3.093326 | 0.0020 |
| HEIGHT | 1.289092 | 0.228500 | 5.641537 | 0.0000 |
| WEIGHT | 0.003115 | 0.001564 | 1.990926 | 0.0467 |
| R-squared | 0.257947 | Mean dependent var | | 3.386698 |
| Adjusted R-squared | 0.254770 | S.D. dependent var | | 0.519603 |
| S.E. of regression | 0.448556 | Akaike info criterion | | 1.239532 |
| Sum squared resid | 235.0048 | Schwarz criterion | | 1.265435 |
| Log likelihood | -721.6055 | F-statistic | | 81.20215 |
| Durbin-Watson stat | 2.061181 | Prob(F-statistic) | | 0.000000 |

Residuos

y_t ← Valores ajustados: \hat{y}_t → $\hat{\varepsilon}_t$

| obs | Actual | Fitted | Residual | Residual Plot |
|-----|---------|---------|----------|---|
| 1 | 3.40190 | 3.45852 | -0.05662 |  |
| 2 | 3.20350 | 3.54827 | -0.34477 | |
| 3 | 3.62870 | 3.24429 | 0.38441 | |
| 4 | 3.06170 | 3.39442 | -0.33272 | |
| 5 | 3.85550 | 3.47381 | 0.38169 | |
| 6 | 3.91220 | 3.06514 | 0.84706 | |
| 7 | 3.74210 | 3.12227 | 0.61983 | |
| 8 | 3.40190 | 3.55678 | -0.15488 | |
| 9 | 4.05400 | 3.59123 | 0.46277 | |
| 10 | 3.96890 | 4.52671 | -0.55781 | |



| Series: Residuals | |
|-------------------|-----------|
| Observations | 1174 |
| Mean | 2.40E-14 |
| Median | -0.004501 |
| Maximum | 1.463372 |
| Minimum | -1.636238 |
| Std. Dev. | 0.447599 |
| Skewness | 0.028453 |
| Kurtosis | 3.410568 |
| Jarque-Bera | 8.404099 |

Histograma de los residuos

¿Incumplimiento de hipótesis del modelo?