Ministerio de Educación
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DiNIECE
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# Anexo B – Resultados de los modelos multinivel

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**Anexo B – Resultados de los modelos multinivel**

**Sigla de cada variable individual y grupal analizada.**

| Variables por sub-grupos | Siglas | |
|---|---|---|
| | Individuales | Grupales |
| **Variables de "control"** | | |
| Bienes y servicios | *Bien* | *ns* |
| Hacinamiento habitacional | *Hacina* | *Haciesc* |
| Educación familiar | *Edufam* | *Eduesc* |
| Cantidad de libros en el hogar | *Libro* | *Libresc* |
| Alumnos repitiente | *Repi* | *Repiesc* |
| Alumno mujer | *mujer* | *ns* |
| **El alumno** | | |
| Sentido de autoeficacia en lectura | *autoef* | *autoesc* |
| Motivación para lectura | *motiv* | |
| Esfuerzo del alumno en lengua | *esfuer* | |
| Afecto por la escuela | *afect* | *afecesc* |
| Leyó o lee libro | *leelib* | |
| Días de inasistencia | *inasis* | |
| **Práctica educativa** | | |
| Frecuencia de interrogación | *pregun* | *pregesc* |
| Didáctica clara y retroalimentación | *docen* | |
| Frecuencia tareas para la casa | *tarea* | *taresc* |
| Tareas de lectura para la casa | *tar_lect* | |
| Práctica lectura silenciosa | *voz_silt* | *vozsesc* |
| Practica lectura en voz alta | *voz_alt* | |
| **Clima pedagógico** | | |
| Disciplina en el aula | *disc* | |
| Exigencia académica | *acad* | |
| **Recursos** | | |
| Estado del aula | *infra* | *infresc* |
| Tenencia de útiles escolares | *utiles* | *utilesc* |
| Tiene libro de lengua en casa | *liblen* | *liblesc* |

**Cuadro 1 – Columna 1**

$\text{leng}_{ijk} \sim \text{N}(XB,\ \Omega)$

$\text{leng}_{ijk} = \beta_{0ijk}\text{cons}$

$\beta_{0ijk} = 388.960(3.679) + v_{0k} + u_{0jk} + e_{0ijk}$

$\left[v_{0k}\right] \sim \text{N}(0,\ \Omega_v)\ :\ \Omega_v = \left[308.453(93.700)\right]$

$\left[u_{0jk}\right] \sim \text{N}(0,\ \Omega_u)\ :\ \Omega_u = \left[1905.796(51.677)\right]$

$\left[e_{0ijk}\right] \sim \text{N}(0,\ \Omega_e)\ :\ \Omega_e = \left[6553.232(34.586)\right]$

*-2*loglikelihood(IGLS Deviance)* = 887639.421(75723 of 75723 cases in use)

**Cuadro 1 – Columna 2**

$\text{leng}_{ijk} \sim \text{N}(XB,\ \Omega)$

$\text{leng}_{ijk} = \beta_{0ijk}\text{cons} + -5.005(0.303)(\text{hacina-gm})_{ijk} + 2.592(0.121)(\text{edufam-gm})_{ijk} + 4.091(0.264)(\text{libro-gm})_{ijk} + 0.139(0.019)(\text{bien-gm})_{ijk}$

$\beta_{0ijk} = 389.573(2.922) + v_{0k} + u_{0jk} + e_{0ijk}$

$\left[v_{0k}\right] \sim \text{N}(0,\ \Omega_v)\ :\ \Omega_v = \left[192.268(58.891)\right]$

$\left[u_{0jk}\right] \sim \text{N}(0,\ \Omega_u)\ :\ \Omega_u = \left[1395.310(39.938)\right]$

$\left[e_{0ijk}\right] \sim \text{N}(0,\ \Omega_e)\ :\ \Omega_e = \left[6499.734(34.303)\right]$

*-2*loglikelihood(IGLS Deviance)* = 886044.779(75723 of 75723 cases in use)

**Cuadro 1 – Columna 3**

$\text{leng}_{ijk} \sim \text{N}(XB,\ \Omega)$

$\text{leng}_{ijk} = \beta_{0ijk}\text{cons} + -4.817(0.292)(\text{hacina-gm})_{ijk} + 2.481(0.116)(\text{edufam-gm})_{ijk} + 3.588(0.255)(\text{libro-gm})_{ijk} + -32.794(0.760)(\text{repi-gm})_{ijk} + 15.023(0.596)\text{mujer}_{ijk}$

$\beta_{0ijk} = 382.509(3.027) + v_{0k} + u_{0jk} + e_{0ijk}$

$\left[v_{0k}\right] \sim \text{N}(0,\ \Omega_v)\ :\ \Omega_v = \left[205.689(62.536)\right]$

$\left[u_{0jk}\right] \sim \text{N}(0,\ \Omega_u)\ :\ \Omega_u = \left[1304.954(37.659)\right]$

$\left[e_{0ijk}\right] \sim \text{N}(0,\ \Omega_e)\ :\ \Omega_e = \left[6288.548(33.187)\right]$

*-2*loglikelihood(IGLS Deviance)* = 883441.731(75723 of 75723 cases in use)

## Cuadro 1 – Columna 4

$leng_{ijk} \sim N(XB,\ \Omega)$

$leng_{ijk} = \beta_{0ijk}cons + -3.679(0.296)(hacina\text{-}gm)_{ijk} + 1.660(0.120)(edufam\text{-}gm)_{ijk} + 2.564(0.259)(libro\text{-}gm)_{ijk} + -30.889(0.760)(repi\text{-}gm)_{ijk} + 14.920(0.594)mujer_{ijk} + -11.681(1.689)(haciesc\text{-}gm)_{jk} + 5.664(0.549)(eduesc\text{-}gm)_{jk} + 14.000(1.586)(libresc\text{-}gm)_{jk}$

$\beta_{0ijk} = 383.331(1.999) + v_{0k} + u_{0jk} + e_{0ijk}$

$\begin{bmatrix} v_{0k} \end{bmatrix} \sim N(0,\ \Omega_v) : \Omega_v = \begin{bmatrix} 84.605(27.036) \end{bmatrix}$

$\begin{bmatrix} u_{0jk} \end{bmatrix} \sim N(0,\ \Omega_u) : \Omega_u = \begin{bmatrix} 928.757(29.045) \end{bmatrix}$

$\begin{bmatrix} e_{0ijk} \end{bmatrix} \sim N(0,\ \Omega_e) : \Omega_e = \begin{bmatrix} 6285.721(33.167) \end{bmatrix}$

*-2*loglikelihood(IGLS Deviance)* = 882388.418(75723 of 75723 cases in use)

## Cuadro 1 – Columna 5

$leng_{ijk} \sim N(XB,\ \Omega)$

$leng_{ijk} = \beta_{0ijk}cons + -3.688(0.296)(hacina\text{-}gm)_{ijk} + 1.663(0.120)(edufam\text{-}gm)_{ijk} + 2.569(0.259)(libro\text{-}gm)_{ijk} + -30.551(0.772)(repi\text{-}gm)_{ijk} + 14.926(0.594)mujer_{ijk} + -10.716(1.733)(haciesc\text{-}gm)_{jk} + 5.306(0.568)(eduesc\text{-}gm)_{jk} + 13.609(1.592)(libresc\text{-}gm)_{jk} + -10.483(4.271)(repiesc\text{-}gm)_{jk}$

$\beta_{0ijk} = 383.459(2.017) + v_{0k} + u_{0jk} + e_{0ijk}$

$\begin{bmatrix} v_{0k} \end{bmatrix} \sim N(0,\ \Omega_v) : \Omega_v = \begin{bmatrix} 86.228(27.479) \end{bmatrix}$

$\begin{bmatrix} u_{0jk} \end{bmatrix} \sim N(0,\ \Omega_u) : \Omega_u = \begin{bmatrix} 926.611(28.991) \end{bmatrix}$

$\begin{bmatrix} e_{0ijk} \end{bmatrix} \sim N(0,\ \Omega_e) : \Omega_e = \begin{bmatrix} 6285.729(33.167) \end{bmatrix}$

*-2*loglikelihood(IGLS Deviance)* = 882382.450(75723 of 75723 cases in use)

## Cuadro 2 – Columna 2

$leng_{ijk} \sim N(XB,\ \Omega)$

$leng_{ijk} = \beta_{0ijk}cons + 0.212(0.005)(autoef\text{-}gm)_{ijk} + 14.556(0.614)leelib_{ijk} + 0.016(0.005)(afect\text{-}gm)_{ijk}$

$\beta_{0ijk} = 382.721(3.798) + v_{0k} + u_{0jk} + e_{0ijk}$

$\begin{bmatrix} v_{0k} \end{bmatrix} \sim N(0,\ \Omega_v) : \Omega_v = \begin{bmatrix} 328.923(99.455) \end{bmatrix}$

$\begin{bmatrix} u_{0jk} \end{bmatrix} \sim N(0,\ \Omega_u) : \Omega_u = \begin{bmatrix} 1795.777(48.823) \end{bmatrix}$

$\begin{bmatrix} e_{0ijk} \end{bmatrix} \sim N(0,\ \Omega_e) : \Omega_e = \begin{bmatrix} 6288.552(33.190) \end{bmatrix}$

*-2*loglikelihood(IGLS Deviance)* = 884460.557(75723 of 75723 cases in use)

## Cuadro 2 – Columna 3

$$\text{leng}_{ijk} \sim \text{N}(XB,\ \Omega)$$

$$\text{leng}_{ijk} = \beta_{0ijk}\text{cons} + 0.205(0.005)(\text{autoef-gm})_{ijk} + 14.550(0.613)\text{leelib}_{ijk} + 0.015(0.005)(\text{afect-gm})_{ijk} + 0.435(0.034)(\text{autoesc-gm})_{jk}$$

$$\beta_{0ijk} = 383.099(3.987) + v_{0k} + u_{0jk} + e_{0ijk}$$

$$\begin{bmatrix} v_{0k} \end{bmatrix} \sim \text{N}(0,\ \Omega_v) \ :\ \Omega_v = \begin{bmatrix} 364.893(109.473) \end{bmatrix}$$

$$\begin{bmatrix} u_{0jk} \end{bmatrix} \sim \text{N}(0,\ \Omega_u) \ :\ \Omega_u = \begin{bmatrix} 1702.885(46.729) \end{bmatrix}$$

$$\begin{bmatrix} e_{0ijk} \end{bmatrix} \sim \text{N}(0,\ \Omega_e) \ :\ \Omega_e = \begin{bmatrix} 6289.768(33.195) \end{bmatrix}$$

*-2*loglikelihood(IGLS Deviance)* = 884305.152(75723 of 75723 cases in use)

## Cuadro 2 – Columna 4

$$\text{leng}_{ijk} \sim \text{N}(XB,\ \Omega)$$

$$\text{leng}_{ijk} = \beta_{0ijk}\text{cons} + 0.175(0.005)(\text{autoef-gm})_{ijk} + 10.912(0.609)\text{leelib}_{ijk} + -4.262(0.288)(\text{hacina-gm})_{ijk} + 2.091(0.115)(\text{edufam-gm})_{ijk} + 2.470(0.253)(\text{libro-gm})_{ijk} + -28.841(0.755)(\text{repi-gm})_{ijk} + 12.616(0.592)\text{mujer}_{ijk}$$

$$\beta_{0ijk} = 378.883(3.228) + v_{0k} + u_{0jk} + e_{0ijk}$$

$$\begin{bmatrix} v_{0k} \end{bmatrix} \sim \text{N}(0,\ \Omega_v) \ :\ \Omega_v = \begin{bmatrix} 234.552(71.420) \end{bmatrix}$$

$$\begin{bmatrix} u_{0jk} \end{bmatrix} \sim \text{N}(0,\ \Omega_u) \ :\ \Omega_u = \begin{bmatrix} 1324.662(37.959) \end{bmatrix}$$

$$\begin{bmatrix} e_{0ijk} \end{bmatrix} \sim \text{N}(0,\ \Omega_e) \ :\ \Omega_e = \begin{bmatrix} 6114.164(32.263) \end{bmatrix}$$

*-2*loglikelihood(IGLS Deviance)* = 881448.387(75723 of 75723 cases in use)

## Cuadro 2 – Columna 5

$$\text{leng}_{ijk} \sim \text{N}(XB,\ \Omega)$$

$$\text{leng}_{ijk} = \beta_{0ijk}\text{cons} + -3.161(0.293)(\text{hacina-gm})_{ijk} + 1.291(0.119)(\text{edufam-gm})_{ijk} + 1.467(0.256)(\text{libro-gm})_{ijk} + -26.646(0.766)(\text{repi-gm})_{ijk} + 12.481(0.591)\text{mujer}_{ijk} + -10.761(1.732)(\text{haciesc-gm})_{jk} + 5.398(0.569)(\text{eduesc-gm})_{jk} + 13.575(1.594)(\text{libresc-gm})_{jk} + -10.727(4.272)(\text{repiesc-gm})_{jk} + 0.174(0.005)(\text{autoef-gm})_{ijk} + 11.349(0.607)\text{leelib}_{ijk}$$

$$\beta_{0ijk} = 379.669(2.145) + v_{0k} + u_{0jk} + e_{0ijk}$$

$$\begin{bmatrix} v_{0k} \end{bmatrix} \sim \text{N}(0,\ \Omega_v) \ :\ \Omega_v = \begin{bmatrix} 97.746(30.726) \end{bmatrix}$$

$$\begin{bmatrix} u_{0jk} \end{bmatrix} \sim \text{N}(0,\ \Omega_u) \ :\ \Omega_u = \begin{bmatrix} 938.100(29.039) \end{bmatrix}$$

$$\begin{bmatrix} e_{0ijk} \end{bmatrix} \sim \text{N}(0,\ \Omega_e) \ :\ \Omega_e = \begin{bmatrix} 6111.604(32.249) \end{bmatrix}$$

*-2*loglikelihood(IGLS Deviance)* = 880373.070(75723 of 75723 cases in use)

## Cuadro 3 – Columna 2

$$\text{leng}_{ijk} \sim \text{N}(XB,\ \Omega)$$

$$\text{leng}_{ijk} = \beta_{0ijk}\text{cons} + 2.088(0.040)(\text{pregun-gm})_{ijk} + 0.141(0.006)(\text{docen-gm})_{ijk} + 6.233(0.363)(\text{tarea-gm})_{ijk} + 0.239(0.037)(\text{voz\_silt-gm})_{ijk} + 1.045(0.336)(\text{tar\_lect-gm})_{ijk}$$

$$\beta_{0ijk} = 389.230(3.262) + v_{0k} + u_{0jk} + e_{0ijk}$$

$$\begin{bmatrix} v_{0k} \end{bmatrix} \sim \text{N}(0,\ \Omega_v) \ :\ \Omega_v = \begin{bmatrix} 240.934(73.857) \end{bmatrix}$$

$$\begin{bmatrix} u_{0jk} \end{bmatrix} \sim \text{N}(0,\ \Omega_u) \ :\ \Omega_u = \begin{bmatrix} 1649.042(45.507) \end{bmatrix}$$

$$\begin{bmatrix} e_{0ijk} \end{bmatrix} \sim \text{N}(0,\ \Omega_e) \ :\ \Omega_e = \begin{bmatrix} 6294.651(33.221) \end{bmatrix}$$

*-2*loglikelihood(IGLS Deviance)* = 884248.760(75723 of 75723 cases in use)

## Cuadro 3 – Columna 3

$$\text{leng}_{ijk} \sim \text{N}(XB,\ \Omega)$$

$$\text{leng}_{ijk} = \beta_{0ijk}\text{cons} + 1.981(0.041)(\text{pregun-gm})_{ijk} + 0.140(0.006)(\text{docen-gm})_{ijk} + 4.909(0.370)(\text{tarea-gm})_{ijk} + 0.213(0.038)(\text{voz\_silt-gm})_{ijk} + 0.793(0.336)(\text{tar\_lect-gm})_{ijk} + 5.091(0.261)(\text{pregesc-gm})_{jk} + 30.605(1.475)(\text{taresc-gm})_{jk} + 1.450(0.260)(\text{vozsesc-gm})_{jk}$$

$$\beta_{0ijk} = 390.245(2.381) + v_{0k} + u_{0jk} + e_{0ijk}$$

$$\begin{bmatrix} v_{0k} \end{bmatrix} \sim \text{N}(0,\ \Omega_v) \ :\ \Omega_v = \begin{bmatrix} 124.188(39.278) \end{bmatrix}$$

$$\begin{bmatrix} u_{0jk} \end{bmatrix} \sim \text{N}(0,\ \Omega_u) \ :\ \Omega_u = \begin{bmatrix} 1305.810(37.683) \end{bmatrix}$$

$$\begin{bmatrix} e_{0ijk} \end{bmatrix} \sim \text{N}(0,\ \Omega_e) \ :\ \Omega_e = \begin{bmatrix} 6296.259(33.227) \end{bmatrix}$$

*-2*loglikelihood(IGLS Deviance)* = 883521.501(75723 of 75723 cases in use)

## Cuadro 3 – Columna 4

$$\text{leng}_{ijk} \sim \text{N}(XB,\ \Omega)$$

$$\text{leng}_{ijk} = \beta_{0ijk}\text{cons} + -4.612(0.287)(\text{hacina-gm})_{ijk} + 2.341(0.115)(\text{edufam-gm})_{ijk} + 3.554(0.251)(\text{libro-gm})_{ijk} + -29.847(0.750)(\text{repi-gm})_{ijk} + 10.841(0.592)\text{mujer}_{ijk} + 1.842(0.040)(\text{pregun-gm})_{ijk} + 0.118(0.005)(\text{docen-gm})_{ijk} + 5.593(0.334)(\text{tarea-gm})_{ijk}$$

$$\beta_{0ijk} = 384.733(2.680) + v_{0k} + u_{0jk} + e_{0ijk}$$

$$\begin{bmatrix} v_{0k} \end{bmatrix} \sim \text{N}(0,\ \Omega_v) \ :\ \Omega_v = \begin{bmatrix} 159.385(49.165) \end{bmatrix}$$

$$\begin{bmatrix} u_{0jk} \end{bmatrix} \sim \text{N}(0,\ \Omega_u) \ :\ \Omega_u = \begin{bmatrix} 1165.606(34.241) \end{bmatrix}$$

$$\begin{bmatrix} e_{0ijk} \end{bmatrix} \sim \text{N}(0,\ \Omega_e) \ :\ \Omega_e = \begin{bmatrix} 6095.375(32.166) \end{bmatrix}$$

*-2*loglikelihood(IGLS Deviance)* = 880826.231(75723 of 75723 cases in use)

**Cuadro 3 – Columna 5**

$$leng_{ijk} \sim N(XB,\ \Omega)$$

$$leng_{ijk} = \beta_{0ijk}\text{cons} + \text{-3.514(0.292)(hacina-gm)}_{ijk} + 1.547(0.119)(\text{edufam-gm})_{ijk} + 2.555(0.255)(\text{libro-gm})_{ijk} + \text{-27.743(0.763)(repi-gm)}_{ijk} + 10.828(0.591)\text{mujer}_{ijk} + \text{-7.829(1.658)(haciesc-gm)}_{jk} + 4.354(0.543)(\text{eduesc-gm})_{jk} + 10.395(1.523)(\text{libresc-gm})_{jk} + \text{-6.934(4.068)(repiesc-gm)}_{jk} + 0.117(0.005)(\text{docen-gm})_{ijk} + 1.769(0.041)(\text{pregun-gm})_{ijk} + 4.434(0.344)(\text{tarea-gm})_{ijk} + 0.141(0.037)(\text{voz\_silt-gm})_{ijk} + 2.354(0.225)(\text{pregesc-gm})_{jk} + 10.021(1.355)(\text{taresc-gm})_{jk}$$

$$\beta_{0ijk} = 385.655(1.612) + v_{0k} + u_{0jk} + e_{0ijk}$$

$$\begin{bmatrix} v_{0k} \end{bmatrix} \sim N(0,\ \Omega_v) \ :\ \Omega_v = \begin{bmatrix} 51.942(17.327) \end{bmatrix}$$

$$\begin{bmatrix} u_{0jk} \end{bmatrix} \sim N(0,\ \Omega_u) \ :\ \Omega_u = \begin{bmatrix} 814.064(26.165) \end{bmatrix}$$

$$\begin{bmatrix} e_{0ijk} \end{bmatrix} \sim N(0,\ \Omega_e) \ :\ \Omega_e = \begin{bmatrix} 6090.034(32.133) \end{bmatrix}$$

*-2*loglikelihood(IGLS Deviance)* = 879705.231(75723 of 75723 cases in use)

**Cuadro 4 – Columna 2**

$$leng_{ijk} \sim N(XB,\ \Omega)$$

$$leng_{ijk} = \beta_{0ijk}\text{cons} + 0.804(0.046)(\text{acad-gm})_{ijk} + 0.053(0.005)(\text{disc-gm})_{ijk}$$

$$\beta_{0ijk} = 388.974(3.513) + v_{0k} + u_{0jk} + e_{0ijk}$$

$$\begin{bmatrix} v_{0k} \end{bmatrix} \sim N(0,\ \Omega_v) \ :\ \Omega_v = \begin{bmatrix} 279.852(85.469) \end{bmatrix}$$

$$\begin{bmatrix} u_{0jk} \end{bmatrix} \sim N(0,\ \Omega_u) \ :\ \Omega_u = \begin{bmatrix} 1901.227(51.510) \end{bmatrix}$$

$$\begin{bmatrix} e_{0ijk} \end{bmatrix} \sim N(0,\ \Omega_e) \ :\ \Omega_e = \begin{bmatrix} 6503.636(34.325) \end{bmatrix}$$

*-2*loglikelihood(IGLS Deviance)* = 887079.064(75723 of 75723 cases in use)

**Cuadro 4 – Columna 3** Ninguna significativa.

## Cuadro 4 – Columna4

$$\text{leng}_{ijk} \sim \text{N}(XB,\ \Omega)$$

$$\text{leng}_{ijk} = \beta_{0ijk}\text{cons} + \underset{(0.291)}{-4.805}(\text{hacina-gm})_{ijk} + \underset{(0.116)}{2.505}(\text{edufam-gm})_{ijk} + \underset{(0.254)}{3.660}(\text{libro-gm})_{ijk} + \underset{(0.758)}{-32.164}(\text{repi-gm})_{ijk} + \underset{(0.594)}{14.799}\text{mujer}_{ijk} + \underset{(0.005)}{0.054}(\text{disc-gm})_{ijk} + \underset{(0.045)}{0.707}(\text{acad-gm})_{ijk}$$

$$\beta_{0ijk} = \underset{(2.868)}{382.627} + v_{0k} + u_{0jk} + e_{0ijk}$$

$$\left[v_{0k}\right] \sim \text{N}(0,\ \Omega_v)\ :\ \Omega_v = \left[\underset{(56.558)}{183.382}\right]$$

$$\left[u_{0jk}\right] \sim \text{N}(0,\ \Omega_u)\ :\ \Omega_u = \left[\underset{(37.581)}{1303.079}\right]$$

$$\left[e_{0ijk}\right] \sim \text{N}(0,\ \Omega_e)\ :\ \Omega_e = \left[\underset{(32.957)}{6245.341}\right]$$

*-2*loglikelihood(IGLS Deviance)* = 882933.890(75723 of 75723 cases in use)

## Cuadro 4 – Columna 5

$$\text{leng}_{ijk} \sim \text{N}(XB,\ \Omega)$$

$$\text{leng}_{ijk} = \beta_{0ijk}\text{cons} + \underset{(0.295)}{-3.697}(\text{hacina-gm})_{ijk} + \underset{(0.120)}{1.699}(\text{edufam-gm})_{ijk} + \underset{(0.258)}{2.657}(\text{libro-gm})_{ijk} + \underset{(0.770)}{-29.904}(\text{repi-gm})_{ijk} + \underset{(0.593)}{14.696}\text{mujer}_{ijk} + \underset{(1.734)}{-10.592}(\text{haciesc-gm})_{jk} + \underset{(0.569)}{5.177}(\text{eduesc-gm})_{jk} + \underset{(1.592)}{13.261}(\text{libresc-gm})_{jk} + \underset{(4.272)}{-12.219}(\text{repiesc-gm})_{jk} + \underset{(0.005)}{0.049}(\text{disc-gm})_{ijk} + \underset{(0.045)}{0.720}(\text{acad-gm})_{ijk}$$

$$\beta_{0ijk} = \underset{(1.925)}{383.605} + v_{0k} + u_{0jk} + e_{0ijk}$$

$$\left[v_{0k}\right] \sim \text{N}(0,\ \Omega_v)\ :\ \Omega_v = \left[\underset{(25.165)}{77.525}\right]$$

$$\left[u_{0jk}\right] \sim \text{N}(0,\ \Omega_u)\ :\ \Omega_u = \left[\underset{(29.070)}{931.774}\right]$$

$$\left[e_{0ijk}\right] \sim \text{N}(0,\ \Omega_e)\ :\ \Omega_e = \left[\underset{(32.940)}{6242.750}\right]$$

*-2*loglikelihood(IGLS Deviance)* = 881895.771(75723 of 75723 cases in use)

## Cuadro 5

$$\text{leng}_{ijk} \sim \text{N}(XB,\ \Omega)$$

$$\text{leng}_{ijk} = \beta_{0ijk}\text{cons} + \underset{(0.041)}{1.768}(\text{pregun-gm})_{ijk} + \underset{(0.006)}{0.117}(\text{docen-gm})_{ijk} + \underset{(0.343)}{4.384}(\text{tarea-gm})_{ijk} + \underset{(0.254)}{4.675}(\text{pregesc-gm})_{jk} + \underset{(1.466)}{27.619}(\text{taresc-gm})_{jk} + \underset{(0.256)}{0.995}(\text{vozsesc-gm})_{jk} + \underset{(0.005)}{0.221}(\text{autoef-gm})_{ijk} + \underset{(0.600)}{13.126}\text{leelib}_{ijk} + \underset{(0.031)}{0.236}(\text{autoesc-gm})_{jk} + \underset{(0.046)}{0.688}(\text{acad-gm})_{ijk} + \underset{(0.005)}{0.110}(\text{disc-gm})_{ijk} + \underset{(0.037)}{0.128}(\text{voz\_silt-gm})_{ijk}$$

$$\beta_{0ijk} = \underset{(2.413)}{384.692} + v_{0k} + u_{0jk} + e_{0ijk}$$

$$\left[v_{0k}\right] \sim \text{N}(0,\ \Omega_v)\ :\ \Omega_v = \left[\underset{(39.770)}{126.863}\right]$$

$$\left[u_{0jk}\right] \sim \text{N}(0,\ \Omega_u)\ :\ \Omega_u = \left[\underset{(35.408)}{1222.562}\right]$$

$$\left[e_{0ijk}\right] \sim \text{N}(0,\ \Omega_e)\ :\ \Omega_e = \left[\underset{(31.649)}{5997.249}\right]$$

*-2*loglikelihood(IGLS Deviance)* = 879786.097(75723 of 75723 cases in use)

## Cuadro 6

$leng_{ijk} \sim N(XB, \Omega)$

$leng_{ijk} = \beta_{0ijk}cons + -2.935(0.287)(hacina\text{-}gm)_{ijk} + 1.222(0.117)(edufam\text{-}gm)_{ijk} + 1.533(0.251)(libro\text{-}gm)_{ijk} + -23.198(0.754)(repi\text{-}gm)_{ijk} + 8.629(0.584)mujer_{ijk} + -7.657(1.664)(haciesc\text{-}gm)_{jk} + 4.196(0.545)(eduesc\text{-}gm)_{jk} + 9.769(1.530)(libresc\text{-}gm)_{jk} + -9.783(4.083)(repiesc\text{-}gm)_{jk} + 0.097(0.005)(disc\text{-}gm)_{ijk} + 0.616(0.045)(acad\text{-}gm)_{ijk} + 1.623(0.041)(pregun\text{-}gm)_{ijk} + 0.103(0.006)(docen\text{-}gm)_{ijk} + 3.940(0.339)(tarea\text{-}gm)_{ijk} + 0.190(0.005)(autoef\text{-}gm)_{ijk} + 10.647(0.598)leelib_{ijk} + 0.084(0.036)(voz\_silt\text{-}gm)_{ijk} + 2.309(0.226)(pregesc\text{-}gm)_{jk} + 11.069(1.360)(taresc\text{-}gm)_{jk}$

$\beta_{0ijk} = 382.117(1.628) + v_{0k} + u_{0jk} + e_{0ijk}$

$\begin{bmatrix} v_{0k} \end{bmatrix} \sim N(0, \Omega_v) : \Omega_v = \begin{bmatrix} 51.865(17.245) \end{bmatrix}$

$\begin{bmatrix} u_{0jk} \end{bmatrix} \sim N(0, \Omega_u) : \Omega_u = \begin{bmatrix} 839.296(26.475) \end{bmatrix}$

$\begin{bmatrix} e_{0ijk} \end{bmatrix} \sim N(0, \Omega_e) : \Omega_e = \begin{bmatrix} 5868.161(30.963) \end{bmatrix}$

*-2*loglikelihood(IGLS Deviance)* = 877083.010(75723 of 75723 cases in use)

## Cuadro 7 – Columna 1

$leng_{ijk} \sim N(XB, \Omega)$

$leng_{ijk} = \beta_{0ijk}cons + 6.588(0.348)(utiles\text{-}gm)_{ijk}$

$\beta_{0ijk} = 389.090(3.602) + v_{0k} + u_{0jk} + e_{0ijk}$

$\begin{bmatrix} v_{0k} \end{bmatrix} \sim N(0, \Omega_v) : \Omega_v = \begin{bmatrix} 295.638(90.281) \end{bmatrix}$

$\begin{bmatrix} u_{0jk} \end{bmatrix} \sim N(0, \Omega_u) : \Omega_u = \begin{bmatrix} 1808.980(49.798) \end{bmatrix}$

$\begin{bmatrix} e_{0ijk} \end{bmatrix} \sim N(0, \Omega_e) : \Omega_e = \begin{bmatrix} 6536.656(34.490) \end{bmatrix}$

*-2*loglikelihood(IGLS Deviance)* = 887285.684(75723 of 75723 cases in use)

$\text{leng}_{ijk} \sim \text{N}(XB,\ \Omega)$

$\text{leng}_{ijk} = \beta_{0ijk}\text{cons} + 0.359(0.016)(\text{infra-gm})_{ijk}$

$\beta_{0ijk} = 388.876(3.527) + v_{0k} + u_{0jk} + e_{0ijk}$

$\left[v_{0k}\right] \sim \text{N}(0,\ \Omega_v)\ :\ \Omega_v = \left[282.381(86.294)\right]$

$\left[u_{0jk}\right] \sim \text{N}(0,\ \Omega_u)\ :\ \Omega_u = \left[1869.332(50.788)\right]$

$\left[e_{0ijk}\right] \sim \text{N}(0,\ \Omega_e)\ :\ \Omega_e = \left[6512.238(34.370)\right]$

*-2*loglikelihood(IGLS Deviance)* = 887119.908(75723 of 75723 cases in use)

$\text{leng}_{ijk} \sim \text{N}(XB,\ \Omega)$

$\text{leng}_{ijk} = \beta_{0ijk}\text{cons} + 7.977(0.715)(\text{liblen-gm})_{ijk}$

$\beta_{0ijk} = 389.070(3.675) + v_{0k} + u_{0jk} + e_{0ijk}$

$\left[v_{0k}\right] \sim \text{N}(0,\ \Omega_v)\ :\ \Omega_v = \left[307.902(93.500)\right]$

$\left[u_{0jk}\right] \sim \text{N}(0,\ \Omega_u)\ :\ \Omega_u = \left[1871.971(50.893)\right]$

$\left[e_{0ijk}\right] \sim \text{N}(0,\ \Omega_e)\ :\ \Omega_e = \left[6547.308(34.555)\right]$

*-2*loglikelihood(IGLS Deviance)* = 887515.529(75723 of 75723 cases in use)

**Cuadro 7 – Columna 2**

$\text{leng}_{ijk} \sim \text{N}(XB,\ \Omega)$

$\text{leng}_{ijk} = \beta_{0ijk}\text{cons} + 0.333(0.016)(\text{infra-gm})_{ijk} + 5.553(0.352)(\text{utiles-gm})_{ijk} + 5.749(0.721)(\text{liblen-gm})_{ijk}$

$\beta_{0ijk} = 389.069(3.471) + v_{0k} + u_{0jk} + e_{0ijk}$

$\left[v_{0k}\right] \sim \text{N}(0,\ \Omega_v)\ :\ \Omega_v = \left[273.838(83.483)\right]$

$\left[u_{0jk}\right] \sim \text{N}(0,\ \Omega_u)\ :\ \Omega_u = \left[1768.128(48.473)\right]$

$\left[e_{0ijk}\right] \sim \text{N}(0,\ \Omega_e)\ :\ \Omega_e = \left[6496.829(34.288)\right]$

*-2*loglikelihood(IGLS Deviance)* = 886767.321(75723 of 75723 cases in use)

**Cuadro 7 – Columna 3**

$\text{leng}_{ijk} \sim \text{N}(XB,\ \Omega)$

$\text{leng}_{ijk} = \beta_{0ijk}\text{cons} + 0.324(0.016)(\text{infra-gm})_{ijk} + 4.136(0.357)(\text{utiles-gm})_{ijk} + 45.795(2.018)(\text{utilesc-gm})_{jk} + 4.326(0.729)(\text{liblen-gm})_{ijk} + 38.192(4.634)(\text{liblesc-gm})_{jk}$

$\beta_{0ijk} = 390.236(3.178) + v_{0k} + u_{0jk} + e_{0ijk}$

$\begin{bmatrix} v_{0k} \end{bmatrix} \sim \text{N}(0,\ \Omega_v)\ :\ \Omega_v = \begin{bmatrix} 229.836(70.040) \end{bmatrix}$

$\begin{bmatrix} u_{0jk} \end{bmatrix} \sim \text{N}(0,\ \Omega_u)\ :\ \Omega_u = \begin{bmatrix} 1373.867(39.587) \end{bmatrix}$

$\begin{bmatrix} e_{0ijk} \end{bmatrix} \sim \text{N}(0,\ \Omega_e)\ :\ \Omega_e = \begin{bmatrix} 6499.458(34.296) \end{bmatrix}$

*-2*loglikelihood(IGLS Deviance)* = 885998.138(75723 of 75723 cases in use)

## Cuadro 7 – Columna 4

$\text{leng}_{ijk} \sim \text{N}(XB,\ \Omega)$

$\text{leng}_{ijk} = \beta_{0ijk}\text{cons} + -3.551(0.297)(\text{hacina-gm})_{ijk} + 1.627(0.120)(\text{edufam-gm})_{ijk} + 2.517(0.259)(\text{libro-gm})_{ijk} + -29.837(0.773)(\text{repi-gm})_{ijk} + 14.265(0.594)\text{mujer}_{ijk} + -9.456(1.737)(\text{haciesc-gm})_{jk} + 5.224(0.566)(\text{eduesc-gm})_{jk} + 12.843(1.590)(\text{libresc-gm})_{jk} + -5.878(4.328)(\text{repiesc-gm})_{jk} + 0.308(0.015)(\text{infra-gm})_{ijk} + 1.454(0.352)(\text{utiles-gm})_{ijk} + 5.967(2.038)(\text{utilesc-gm})_{jk}$

$\beta_{0ijk} = 383.673(1.901) + v_{0k} + u_{0jk} + e_{0ijk}$

$\begin{bmatrix} v_{0k} \end{bmatrix} \sim \text{N}(0,\ \Omega_v)\ :\ \Omega_v = \begin{bmatrix} 75.544(24.355) \end{bmatrix}$

$\begin{bmatrix} u_{0jk} \end{bmatrix} \sim \text{N}(0,\ \Omega_u)\ :\ \Omega_u = \begin{bmatrix} 901.458(28.374) \end{bmatrix}$

$\begin{bmatrix} e_{0ijk} \end{bmatrix} \sim \text{N}(0,\ \Omega_e)\ :\ \Omega_e = \begin{bmatrix} 6253.030(32.994) \end{bmatrix}$

*-2*loglikelihood(IGLS Deviance)* = 881922.094(75723 of 75723 cases in use)

## Cuadro 7 – Columna 5

$\text{leng}_{ijk} \sim \text{N}(XB,\ \Omega)$

$\text{leng}_{ijk} = \beta_{0ijk}\text{cons} + -2.911(0.286)(\text{hacina-gm})_{ijk} + 1.222(0.117)(\text{edufam-gm})_{ijk} + 1.565(0.251)(\text{libro-gm})_{ijk} + -22.985(0.753)(\text{repi-gm})_{ijk} + 8.420(0.583)\text{mujer}_{ijk} + -7.445(1.656)(\text{haciesc-gm})_{jk} + 4.289(0.542)(\text{eduesc-gm})_{jk} + 9.804(1.520)(\text{libresc-gm})_{jk} + -8.920(4.059)(\text{repiesc-gm})_{jk} + 0.105(0.005)(\text{disc-gm})_{ijk} + 0.579(0.045)(\text{acad-gm})_{ijk} + 1.582(0.041)(\text{pregun-gm})_{ijk} + 0.096(0.006)(\text{docen-gm})_{ijk} + 3.779(0.339)(\text{tarea-gm})_{ijk} + 0.189(0.005)(\text{autoef-gm})_{ijk} + 10.406(0.597)\text{leelib}_{ijk} + 0.098(0.036)(\text{voz\_silt-gm})_{ijk} + 2.242(0.225)(\text{pregesc-gm})_{jk} + 10.907(1.353)(\text{taresc-gm})_{jk} + 0.242(0.015)(\text{infra-gm})_{ijk}$

$\beta_{0ijk} = 382.258(1.545) + v_{0k} + u_{0jk} + e_{0ijk}$

$\begin{bmatrix} v_{0k} \end{bmatrix} \sim \text{N}(0,\ \Omega_v)\ :\ \Omega_v = \begin{bmatrix} 45.659(15.550) \end{bmatrix}$

$\begin{bmatrix} u_{0jk} \end{bmatrix} \sim \text{N}(0,\ \Omega_u)\ :\ \Omega_u = \begin{bmatrix} 828.794(26.214) \end{bmatrix}$

$\begin{bmatrix} e_{0ijk} \end{bmatrix} \sim \text{N}(0,\ \Omega_e)\ :\ \Omega_e = \begin{bmatrix} 5850.023(30.867) \end{bmatrix}$

*-2*loglikelihood(IGLS Deviance)* = 876819.530(75723 of 75723 cases in use)