

# BAYESREG OBJECT lc3y051115b: regression procedure

## Response:

Number of observations: 4753  
 Response Variable: LANDCF  
 Family: negative binomial

## Predictor:

$$\begin{aligned} \eta = & \gamma_{const}const + \gamma_{is2003}is2003 + \gamma_{is2004}is2004 + \gamma_{LOG\_MA\_A}LOG\_MA\_A + \\ & \gamma_{FGT\_2}FGT\_2 + \gamma_{MALELITR}MALELITR + \\ & f_{LOG\_LOAD}(LOG\_LOAD) + f_{rankFHHHRT}(rankFHHHRT) + \\ & f_{rankPOPDNS}(rankPOPDNS) + f_{rankLPOP9802}(rankLPOP9802) + \\ & f_{rankTOILET}(rankTOILET) + f_{WATALL}(WATALL) + \\ & f_{rankF614SL}(rankF614SL) + f_{KHUMCODE}(KHUMCODE) + \\ & f_{DIST\_COD}(DIST\_COD) \end{aligned}$$

## Priors:

Fixed effects:  
 diffuse priors

$f_{LOG\_LOAD}(LOG\_LOAD)$ :  
 P-spline with second order random walk penalty  
 Number of knots: 20  
 Knot choice: equidistant  
 Degree of Splines: 3  
 Inverse gamma prior for variance component with hyperparameters a=0.001  
 and b=0.001

$f_{rankFHHHRT}(rankFHHHRT)$ :  
 P-spline with second order random walk penalty  
 Number of knots: 20  
 Knot choice: equidistant

Degree of Splines: 3  
Inverse gamma prior for variance component with hyperparameters  $a=0.001$   
and  $b=0.001$

$f_{rankPOPDNS}(rankPOPDNS)$ :  
P-spline with second order random walk penalty  
Number of knots: 20  
Knot choice: equidistant  
Degree of Splines: 3  
Inverse gamma prior for variance component with hyperparameters  $a=0.001$   
and  $b=0.001$

$f_{rankLPOP9802}(rankLPOP9802)$ :  
P-spline with second order random walk penalty  
Number of knots: 20  
Knot choice: equidistant  
Degree of Splines: 3  
Inverse gamma prior for variance component with hyperparameters  $a=0.001$   
and  $b=0.001$

$f_{rankTOILET}(rankTOILET)$ :  
P-spline with second order random walk penalty  
Number of knots: 20  
Knot choice: equidistant  
Degree of Splines: 3  
Inverse gamma prior for variance component with hyperparameters  $a=0.001$   
and  $b=0.001$

$f_{WATALL}(WATALL)$ :  
P-spline with second order random walk penalty  
Number of knots: 20  
Knot choice: equidistant  
Degree of Splines: 3  
Inverse gamma prior for variance component with hyperparameters  $a=0.001$   
and  $b=0.001$

$f_{rankF614SL}(rankF614SL)$ :

P-spline with second order random walk penalty

Number of knots: 20

Knot choice: equidistant

Degree of Splines: 3

Inverse gamma prior for variance component with hyperparameters a=0.001 and b=0.001

$f_{KHUMCODE}(KHUMCODE)$

Markov random field

Inverse gamma prior for variance component with hyperparameters a=0.001 and b=0.001

$f_{DIST\_COD}(DIST\_COD)$

i.i.d. Gaussian random effects

Inverse gamma prior for variance component with hyperparameters a=0.001 and b=0.001

## MCMC Options:

Levels for credible intervals:

Level 1: 95

Level 2: 80

Number of Iterations: 102000

Burn in: 2000

Thinning Parameter: 10

## Estimation results for the deviance:

### Unstandardized deviance

Mean: 29799.655

Std. Dev: 74.933332

2.5% Quantile: 29656.595

10% Quantile: 29704.637

50% Quantile: 29799.096

90% Quantile: 29895.907

97.5% Quantile: 29950.959

### **Saturated deviance**

Mean:	5263.8916
Std. Dev:	96.690616
2.5% Quantile:	5076.5468
10% Quantile:	5141.3461
50% Quantile:	5263.1419
90% Quantile:	5387.418
97.5% Quantile:	5456.3606

### **Estimation results for the DIC:**

#### **DIC based on the unstandardized deviance**

deviance( $\bar{\mu}$ )	28525.242
pD	1274.4133
DIC	31074.069

#### **DIC based on the saturated deviance**

deviance( $\bar{\mu}$ )	3992.5967
pD	1271.2949
DIC	6535.1865

### **Estimation results for the scale parameter:**

Mean	5.12431
Std. dev.:	0.202228
2.5% Quantile:	4.73847
10% Quantile:	4.86811
50% Quantile:	5.11927
90% Quantile:	5.38585
97.5% Quantile:	5.53881

**Fixed Effects:**

Variable	Mean	STD	2.5%-Quant.	Median	97.5%-Quant.
const	-0.841207	0.11678	-1.07465	-0.841641	-0.612453
is2003	-0.0899217	0.020448	-0.130281	-0.089764	-0.0494489
is2004	-0.0550247	0.0214884	-0.0969439	-0.0549303	-0.0131868
LOG_MA_A	0.0394042	0.00866956	0.0221065	0.0394519	0.0564722
FGT_2	0.786663	0.501125	-0.189193	0.785785	1.76345
MALELITR	0.131529	0.257154	-0.371357	0.131703	0.631269

Plots:

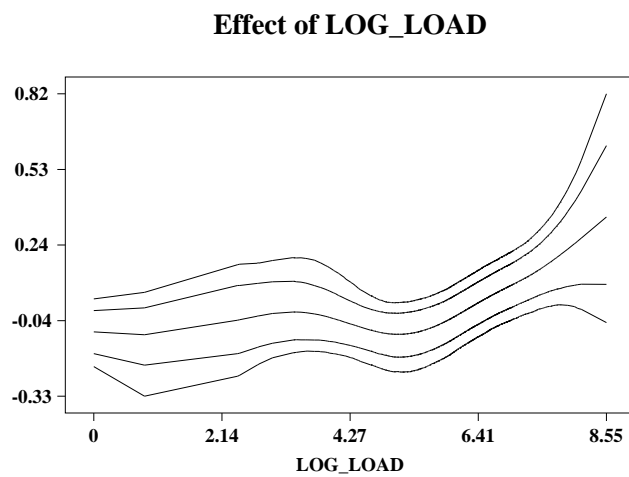


Figure 1: Non-linear Effect of 'LOG\_LOAD'. Shown are the posterior means together with 95% and 80% pointwise credible intervals.

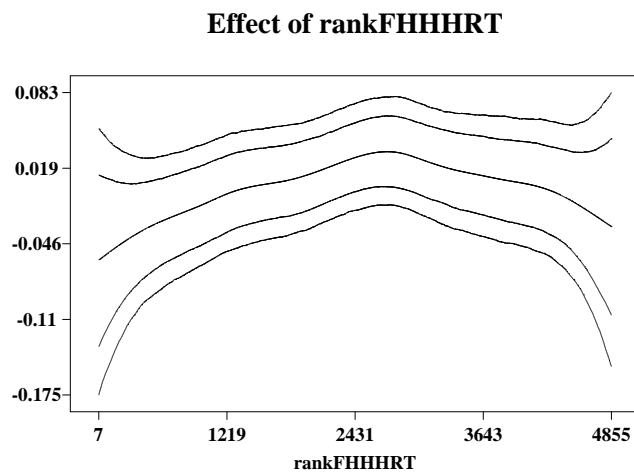


Figure 2: Non-linear Effect of 'rankFHHHRT'. Shown are the posterior means together with 95% and 80% pointwise credible intervals.

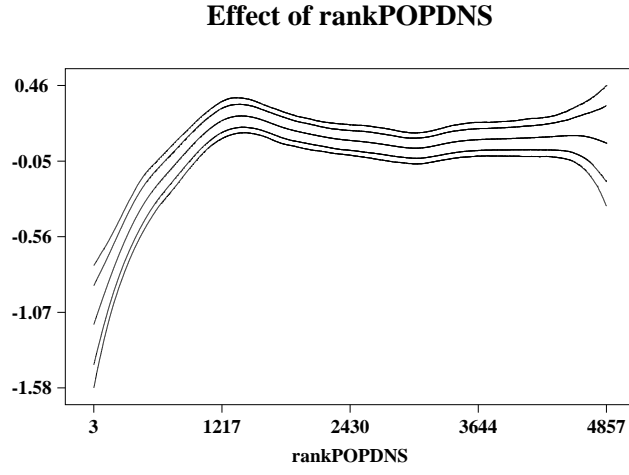


Figure 3: Non-linear Effect of 'rankPOPDNS'. Shown are the posterior means together with 95% and 80% pointwise credible intervals.

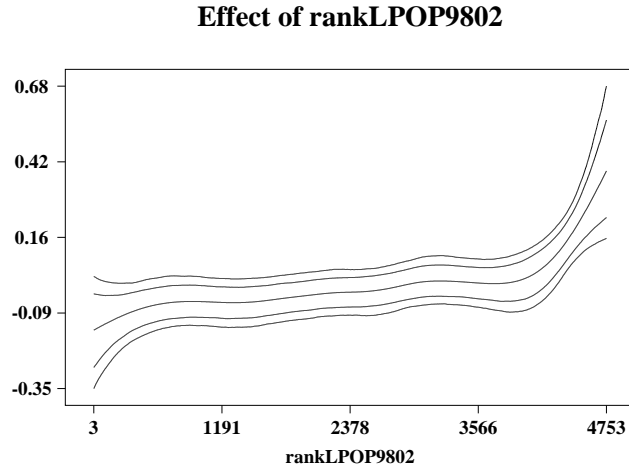


Figure 4: Non-linear Effect of 'rankLPOP9802'. Shown are the posterior means together with 95% and 80% pointwise credible intervals.

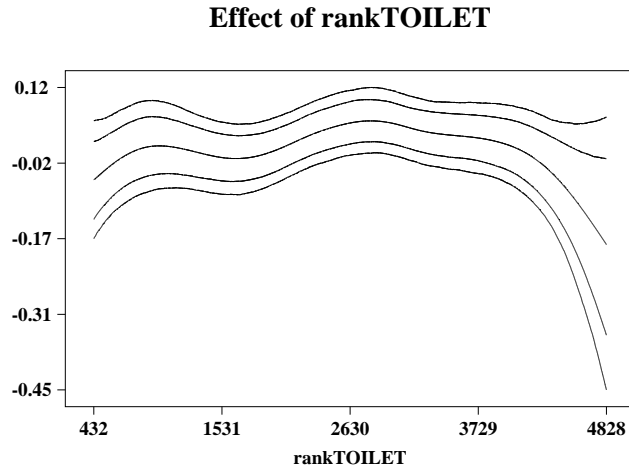


Figure 5: Non-linear Effect of 'rankTOILET'. Shown are the posterior means together with 95% and 80% pointwise credible intervals.

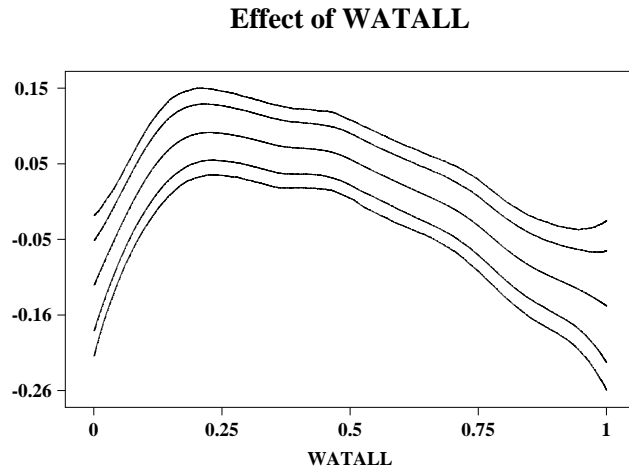


Figure 6: Non-linear Effect of 'WATALL'. Shown are the posterior means together with 95% and 80% pointwise credible intervals.

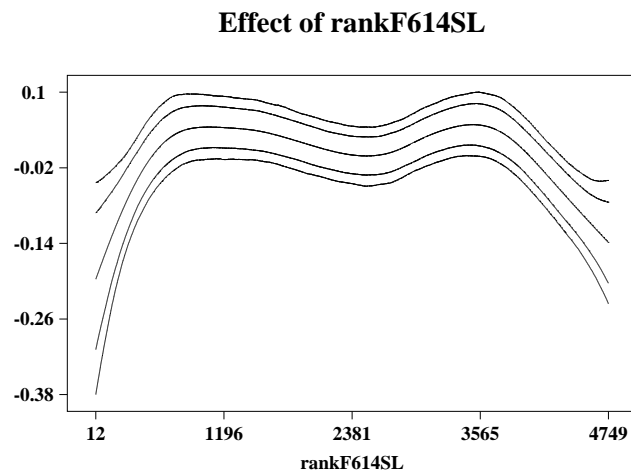


Figure 7: Non-linear Effect of 'rankF614SL'. Shown are the posterior means together with 95% and 80% pointwise credible intervals.