Homework 3

Group 1

Contents

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Group 1

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1   Introduction

Crime has a high cost to all parts of society and it can have severe long term impact on neighborhoods. If crime rises in the neighborhood or it is invaded by criminals, then families and those with the economic means to leave for more stable areas will do so[1]. Additionally, crime can even have a health cost to the community in that the perception of a dangerous neighborhood was associated with significantly lower odds of having high physical activity among both men and women[2]. It is important to understand the propensity for crime levels of a neighborhood before investing in that neighborhood.

2   Statement of the Problem

The purpose of this report is to develop a statisical model to determine the variables that are independently associated with neighborhoods with crime rates above or below the median. Note that neighborhoods with crime rates above or below the median have been provided in our evaluation data set.

3   Data Exploration

3.1   Variables Explained

The variables provided in our evaluation data set our explained below:

Variable Abbreviation	Variable Definition
zn	proportion of residential land zoned for large lots (over 25000 square feet)
indus	proportion of non-retail business acres per suburb
chas	a dummy var. for whether the suburb borders the Charles River (1) or not (0)
nox	nitrogen oxides concentration (parts per 10 million)
rm	average number of rooms per dwelling
age	proportion of owner-occupied units built prior to 1940
dis	weighted mean of distances to five Boston employment centers
rad	index of accessibility to radial highways
tax	full-value property-tax rate per $10,000
ptratio	pupil-teacher ratio by town
black	1000(Bk - 0.63)2 where Bk is the proportion of blacks by town
lstat	lower status of the population (percent)
medv	median value of owner-occupied homes in $1000s

3.2   Exploration of Variables

The skewness of each input variable is shown below. The two variables with the strongest skew are the proportion of residential land zoned for large lots and the proportion of blacks by town. Respectively the magnitudes of the skewness of these two variables are 2.18 and 2.92. This indicates that the distributions for these two variables are far from symmetrical. The skewness of the dummy variable (whether the suburb

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[1]Effect of Crime on Real Estate Values. (1952). The Journal of Criminal Law, Criminology, and Police Science, 43(3), 357-357. Retrieved from http://www.jstor.org.remote.baruch.cuny.edu/stable/1139159

[2]Bennett GG, McNeill LH, Wolin KY, Duncan DT, Puleo E, Emmons KM (2007) Safe To Walk? Neighborhood Safety and Physical Activity Among Public Housing Residents. PLoS Med 4(10): e306. doi:10.1371/journal.pmed.0040306

borders the river or not) can be neglected because it is a binary variable. All of the other variables skewnesses that are approximately of magnitude 1 or less. This indicates that the distributions for those variables can be considered symmetric even though for three of the variables (concentration of nitrogen oxides, index of accessibility to radial highways, and median value of owner-occupied homes) are multimodal.

According to the standard deviations of each variable, the variable that has the highest difference from the mean is tax.

```
## matrixStats v0.51.0 (2016-10-08) successfully loaded. See ?matrixStats for help.

##
## Attaching package: 'matrixStats'

## The following object is masked from 'package:itertools':
##
##     product

## The following object is masked from 'package:dplyr':
##
##     count

##          zn       indus        chas         nox          rm         age
## 2.17681518 0.28854503 3.33548988 0.74632807 0.47932023 0.57770755
##         dis         rad         tax     ptratio       black       lstat
## 0.99889262 1.01027875 0.65931363 0.75426808 2.91631077 0.90558642
##        medv      target
## 1.07669198 0.03422935

##    variables               sd
## 1         zn  23.3646511279634
## 2      indus  6.84585491881262
## 3       chas 0.256791996193711
## 4        nox 0.116666665669521
## 5         rm 0.704851288243787
## 6        age  28.3213784029166
## 7        dis  2.10694955535994
## 8        rad  8.68592724130043
## 9        tax  167.900088684704
## 10    ptratio  2.19684473073614
## 11      black  91.3211298387792
## 12      lstat  7.10189067779907
## 13       medv  9.23968141143397
## 14     target 0.500463581298941
```

Histograms of all of the variables have been plotted below so that distribution can be visualized.

Table 1 : Descriptive Statistics
13 Variables   466 Observations

zn

n	missing	unique	Info	Mean	.05	.10	.25	.50	.75	.90	.95
466	0	26	0.61	12	0	0	0	0	16	45	80

lowest :   0 12 18 18 20, highest: 82 85 90 95 100

indus

n	missing	unique	Info	Mean	.05	.10	.25	.50	.75	.90	.95
466	0	73	0.98	11	2	3	5	10	18	20	21

lowest : 0.5 0.7 1.2 1.2 1.2, highest: 18.1 19.6 21.9 25.6 27.7

chas

	n	missing	unique	Info	Sum	Mean
	466	0	2	0.2	33	0.07

nox

	n	missing	unique	Info	Mean	.05	.10	.25	.50	.75	.90	.95
	466	0	79	1	0.6	0.4	0.4	0.4	0.5	0.6	0.7	0.8

```
lowest : 0.4 0.4 0.4 0.4 0.4, highest: 0.7 0.7 0.7 0.8 0.9
```

rm

	n	missing	unique	Info	Mean	.05	.10	.25	.50	.75	.90	.95
	466	0	419	1	6	5	6	6	6	7	7	8

```
lowest : 4 4 4 5 5, highest: 8 8 9 9 9
```

age

	n	missing	unique	Info	Mean	.05	.10	.25	.50	.75	.90	.95
	466	0	333	1	68	18	26	44	77	94	99	100

```
lowest :   3   6   6   6   7, highest:  99  99  99  99 100
```

dis

	n	missing	unique	Info	Mean	.05	.10	.25	.50	.75	.90	.95
	466	0	380	1	4	1	2	2	3	5	7	8

```
lowest :  1  1  1  1  1, highest:  9  9 11 11 12
```

rad

	n	missing	unique	Info	Mean
	466	0	9	0.96	10

```
           1   2   3   4   5   6   7   8   24
Frequency 17  20  36 103 109  25  15  20 121
%          4   4   8  22  23   5   3   4  26
```

tax

	n	missing	unique	Info	Mean	.05	.10	.25	.50	.75	.90	.95
	466	0	63	0.98	410	222	233	281	334	666	666	666

```
lowest : 187 188 193 198 216, highest: 432 437 469 666 711
```

ptratio

	n	missing	unique	Info	Mean	.05	.10	.25	.50	.75	.90	.95
	466	0	46	0.98	18	15	15	17	19	20	21	21

```
lowest : 13 13 14 14 15, highest: 21 21 21 21 22
```

black

	n	missing	unique	Info	Mean	.05	.10	.25	.50	.75	.90	.95
	466	0	331	0.99	357	88	295	376	391	396	397	397

```
lowest :   0.3   2.5   2.6   3.5   3.6
highest: 396.3 396.3 396.3 396.4 396.9
```

lstat

	n	missing	unique	Info	Mean	.05	.10	.25	.50	.75	.90	.95
	466	0	424	1	13	4	5	7	11	17	23	27

```
lowest :  2  2  2  2  3, highest: 34 34 35 37 38
```

medv

	n	missing	unique	Info	Mean	.05	.10	.25	.50	.75	.90	.95
	466	0	218	1	23	10	13	17	21	25	35	43

```
lowest :  5  6  6  7  7, highest: 46 47 48 49 50
```

3.3 Correlation Matrix

We implement a correlation matrix to better understand the correlation between variables in the data set. The below matrix is the results and as expected, Number of Wins appears to be most correlated to Base Hits by batters (1B,2B,3B,HR).
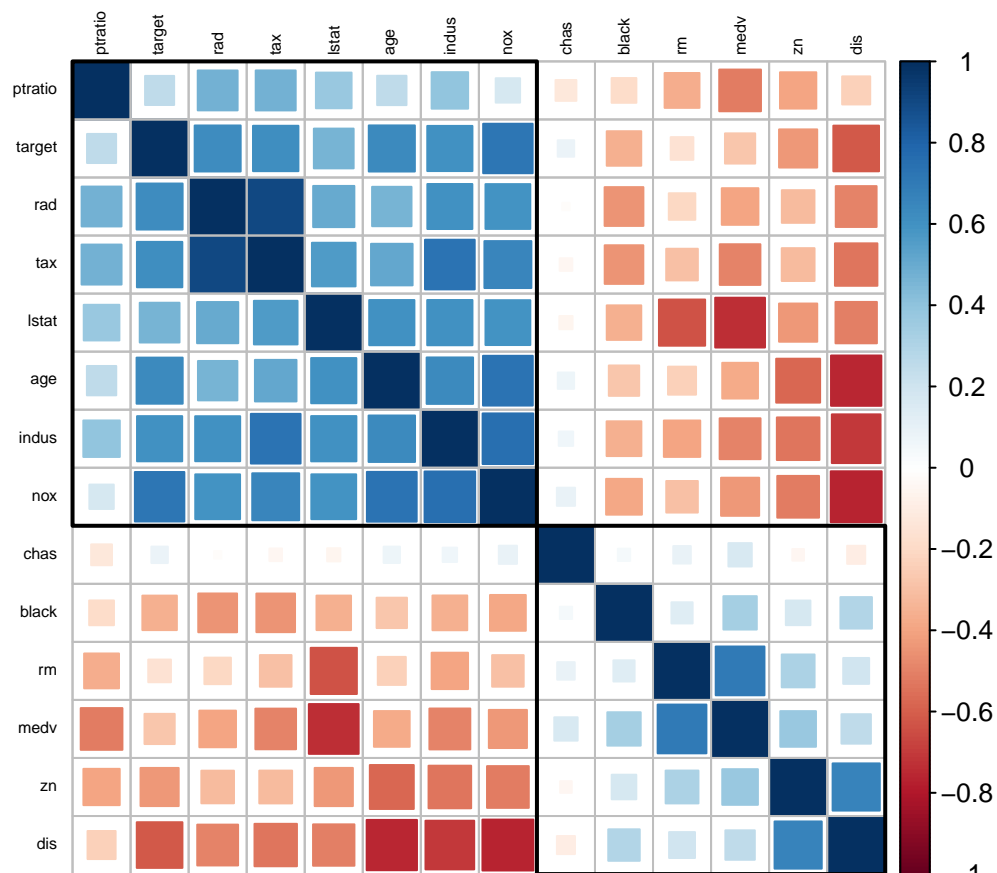
Figure 1: Correlation Plot of Training Data Set

3.4 Outliers Treatment

We chose winsorizing as the method to address outliers. Instead of trimming values, winsorizing uses the interquantile range to replace values that are above or below the interquantile range multiplied by a factor. Those values above or below the range multiplied by the factor are then replaced with max and min value of the interquantile range. Using the factor 2.2 for winsorizing outliers is a method developed my Hoaglin and Iglewicz and published Journal of American Statistical Association in 1987[3].

The below table is the summary results of the winsorizing of the data.

			Table 2:		
Statistic	N	Mean	St. Dev.	Min	Max
zn	466	−4.024	5.144	−7.162	5.024
indus	466	1.942	0.662	−0.804	2.882
chas	466	0.071	0.257	0	1
nox	466	−0.879	0.367	−1.571	−0.148
rm	466	1.900	0.117	1.518	2.201
age	466	2,735.940	1,734.456	3.705	4,997.945
dis	466	0.802	0.269	0.117	1.253
rad	466	1.324	0.464	0.000	1.955
tax	466	0.997	0.001	0.995	0.999
ptratio	466	171.129	38.664	78.868	241.452
black	466	72,528.400	8,276.700	54,853.990	78,731.590
lstat	466	1.910	0.401	0.522	2.672
medv	466	3.574	0.541	1.753	4.582
target	466	0.491	0.500	0	1

4 Models Built

4.1 Model 1 - Backwards Selection Method

```
fullModel <- lm(target ~ zn + indus + chas + nox + rm + age + dis + rad + tax + ptratio + black + lstat
fit <- glm(step(fullModel, direction = "backward", trace = F))
summary(fit)
```

```
##
## Call:
## glm(formula = step(fullModel, direction = "backward", trace = F))
##
## Deviance Residuals:
##     Min       1Q    Median       3Q       Max
## -0.69247  -0.17644  -0.01989   0.15883   0.98933
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept) -6.619e+01  2.190e+01  -3.022  0.00266 **
## nox          7.416e-01  8.820e-02   8.409 5.29e-16 ***
```

---

[3]Hoaglin, D. C., and Iglewicz, B. (1987), Fine tuning some resistant rules for outlier labeling, Journal of American Statistical Association, 82, 1147-1149.

```
## age            5.891e-05  1.463e-05   4.027 6.62e-05 ***
## dis            2.638e-01  1.117e-01   2.362  0.01861 *
## rad            2.206e-01  4.416e-02   4.995 8.39e-07 ***
## tax            6.678e+01  2.192e+01   3.047  0.00245 **
## black         -5.795e-06  1.932e-06  -2.999  0.00286 **
## medv           1.365e-01  3.313e-02   4.122 4.46e-05 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for gaussian family taken to be 0.09004793)
##
##     Null deviance: 116.466  on 465  degrees of freedom
## Residual deviance:  41.242  on 458  degrees of freedom
## AIC: 210.53
##
## Number of Fisher Scoring iterations: 2
```

4.2 Model 2 - Forwards Selection Method

4.3 Model 3 - Subset Selection Method

```
library(glmulti)
library(stargazer)
glmultiLogisticOut <-
    glmulti(target ~ zn + indus + chas + nox + rm + age + dis + rad + tax + ptratio + black + lstat + me
```

```
## Initialization...
## TASK: Exhaustive screening of candidate set.
## Fitting...
##
## After 50 models:
## Best model: target~1+zn+indus+chas+nox+rm
## Crit= 285.382246537684
## Mean crit= 386.015859916975
```
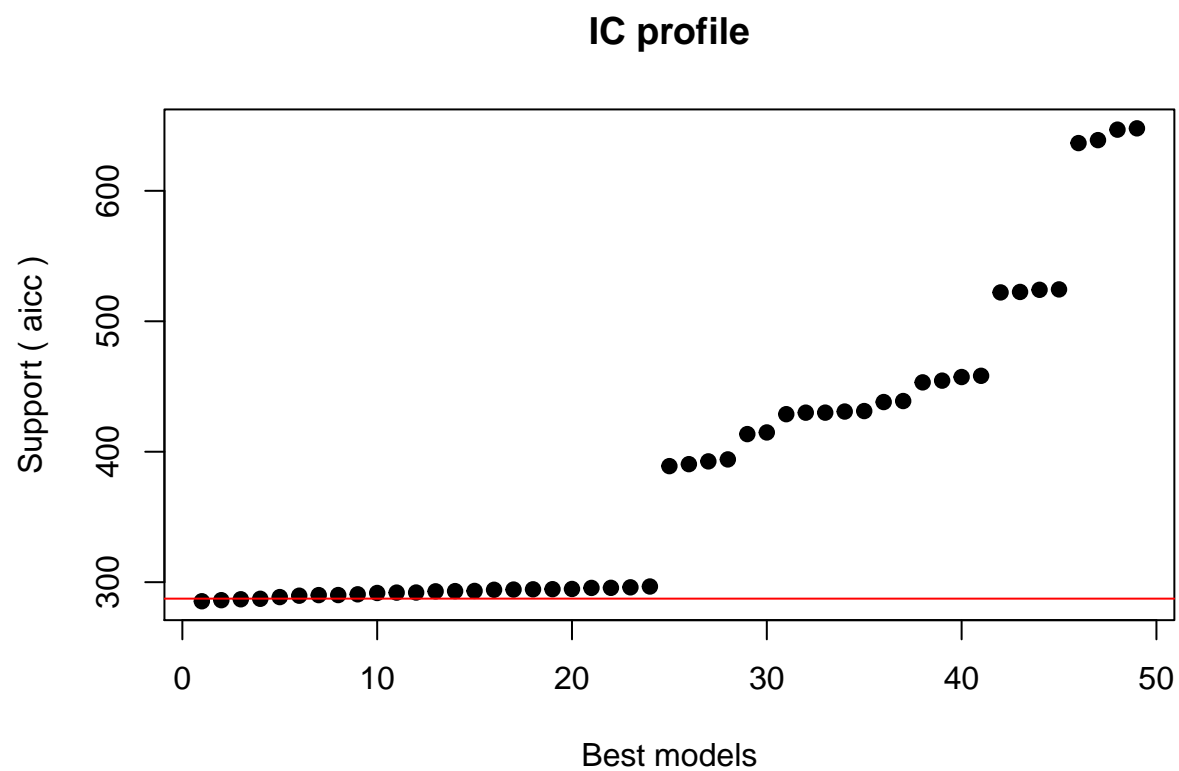
IC profile


```
##
## After 100 models:
## Best model: target~1+zn+chas+nox+rm+dis
## Crit= 280.3705607486
## Mean crit= 366.033368551381
```

IC profile
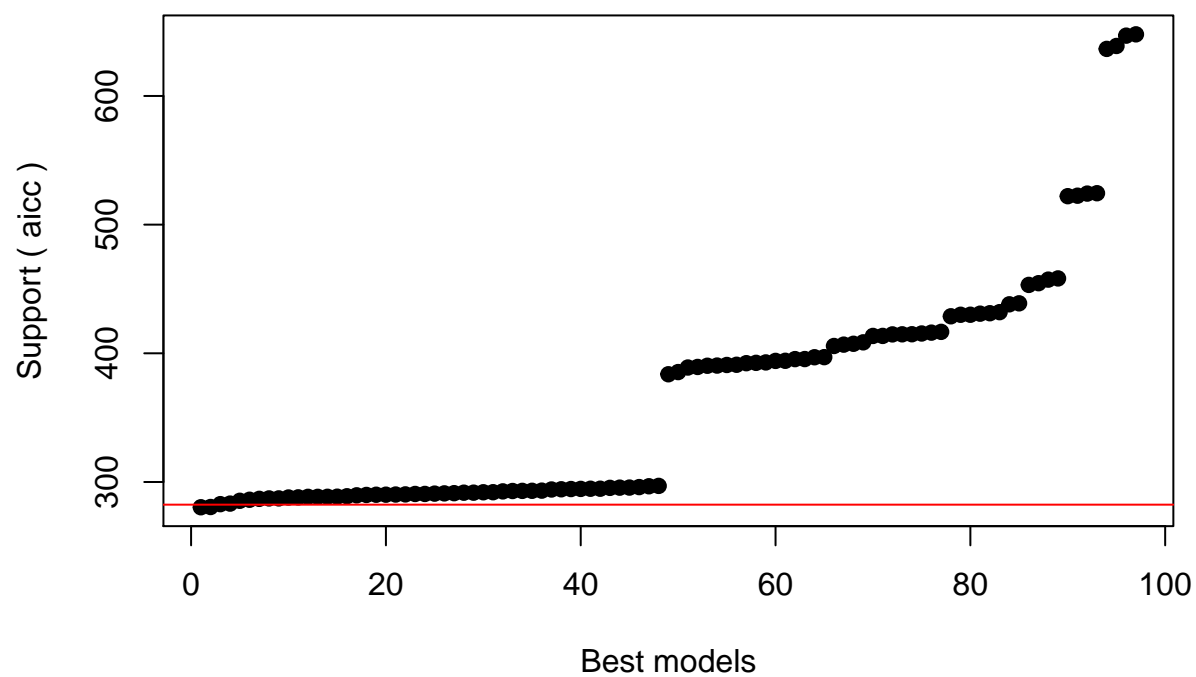
Best models

```
##
## After 150 models:
## Best model: target~1+zn+indus+chas+nox+rad
## Crit= 238.424671502169
## Mean crit= 352.658552358951
```

IC profile
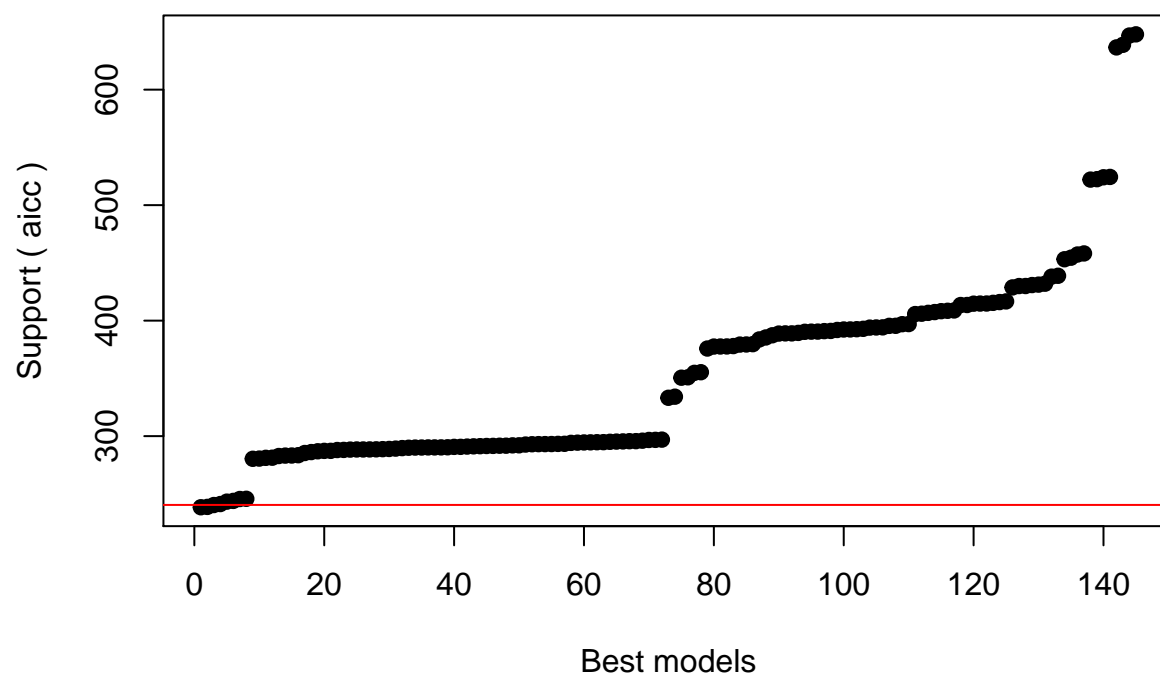

```
##
## After 200 models:
## Best model: target~1+zn+indus+chas+nox+rm+rad
## Crit= 237.724550491411
## Mean crit= 334.018114040581
```

IC profile
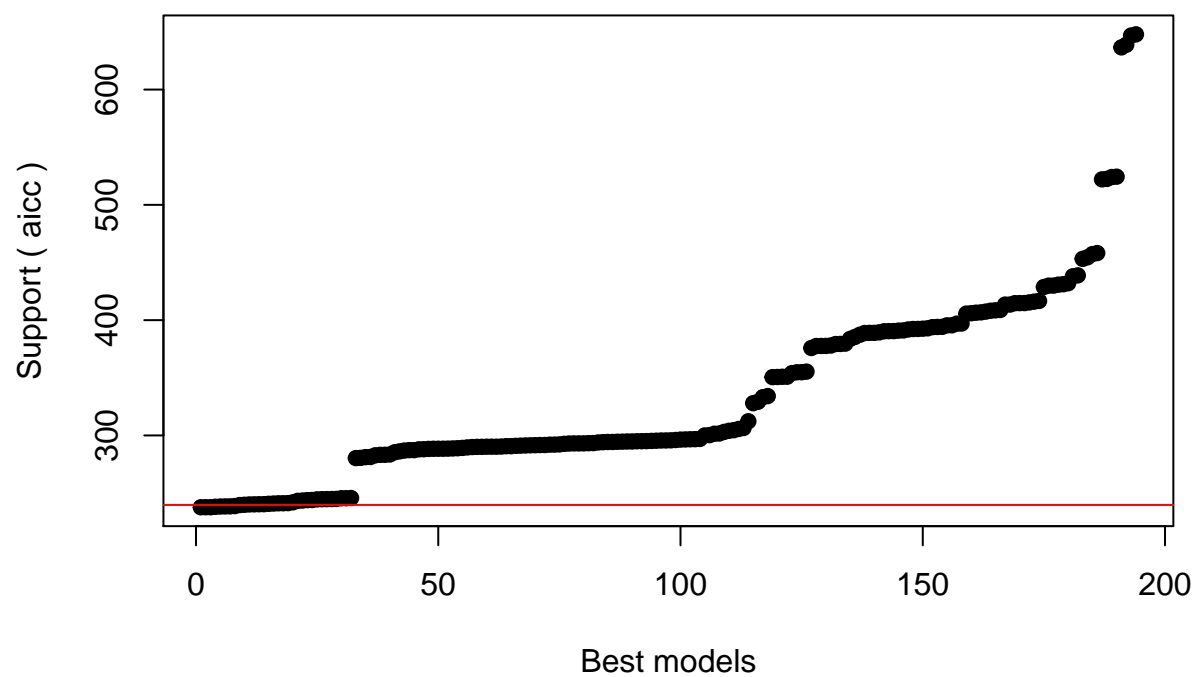

```
##
## After 250 models:
## Best model: target~1+zn+indus+chas+nox+rm+dis+rad
## Crit= 231.946515235317
## Mean crit= 294.485007136313
```
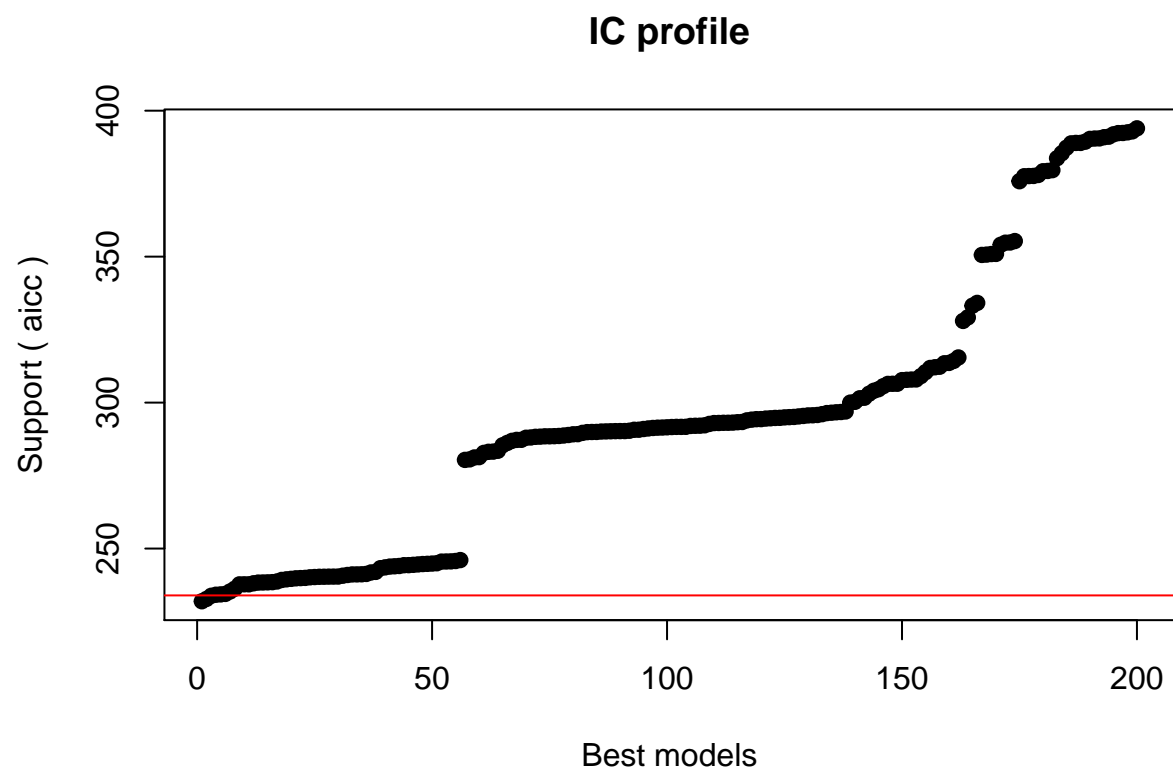
IC profile


```
##
## After 300 models:
## Best model: target~1+zn+indus+chas+nox+rm+age+dis+rad
## Crit= 230.378225441697
## Mean crit= 278.185922135409
```

IC profile
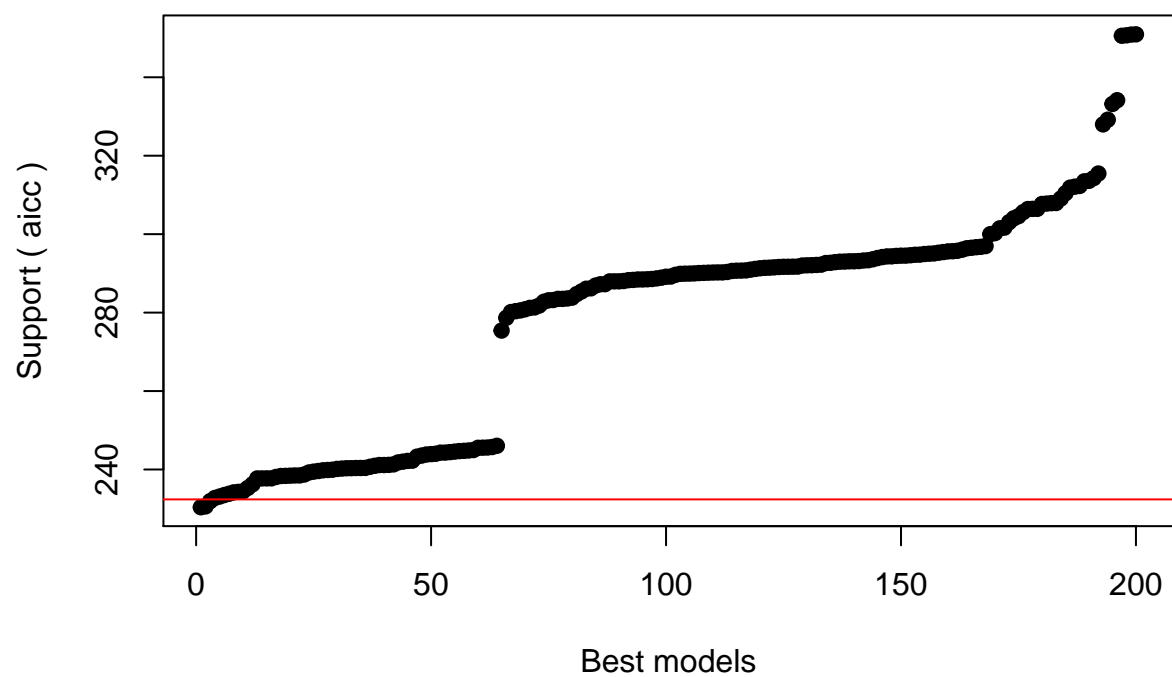

```
##
## After 350 models:
## Best model: target~1+zn+indus+chas+nox+rm+age+dis+rad
## Crit= 230.378225441697
## Mean crit= 274.14528852909
```
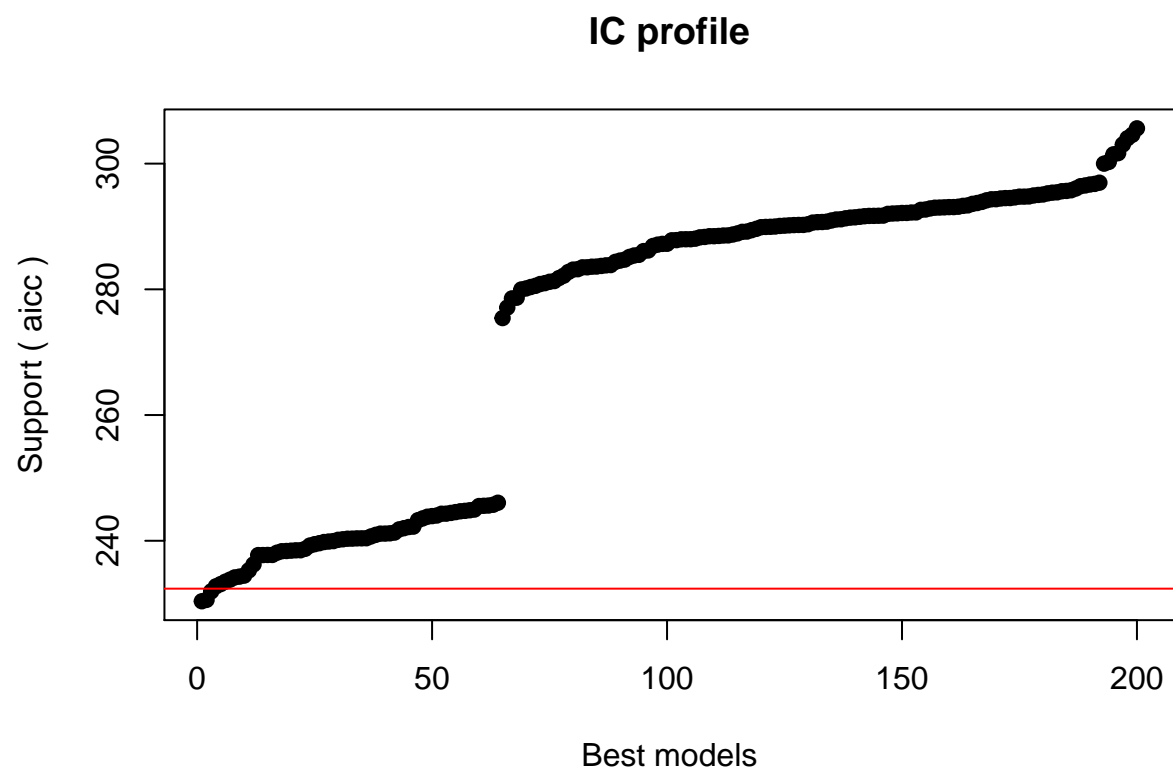
IC profile


```
##
## After 400 models:
## Best model: target~1+zn+indus+chas+nox+rm+age+dis+rad
## Crit= 230.378225441697
## Mean crit= 272.187478330154
```
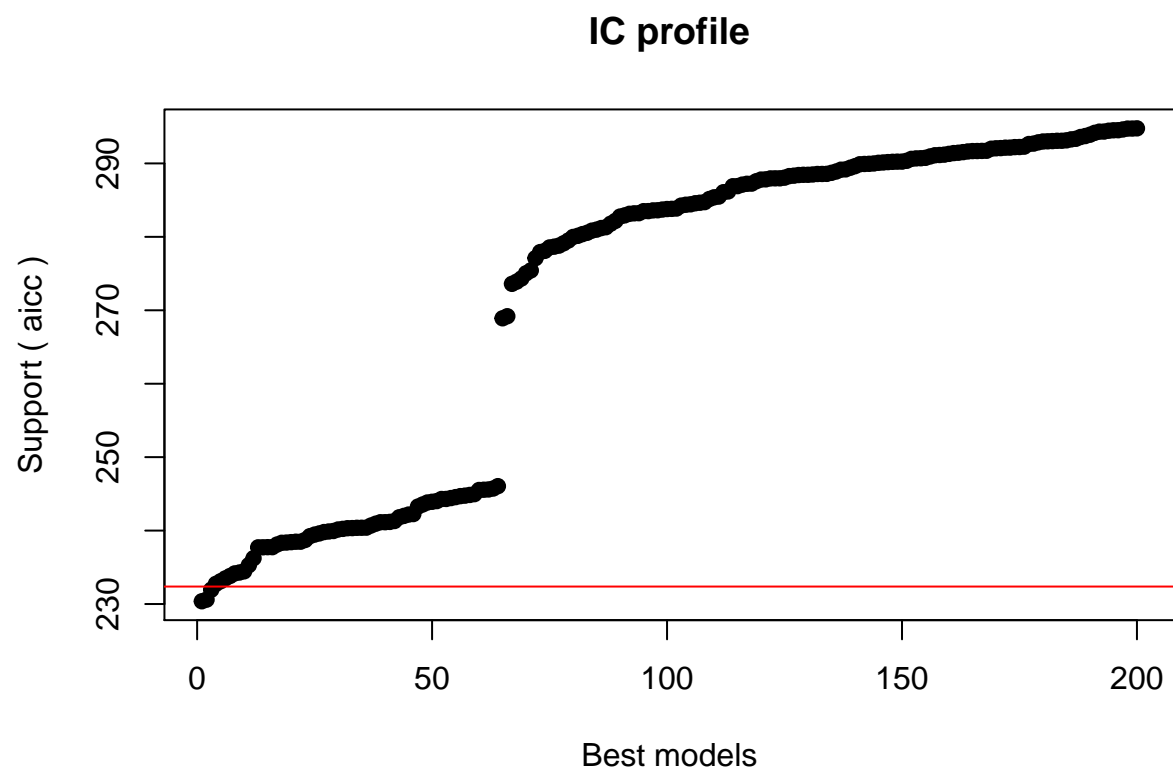
IC profile


```
##
## After 450 models:
## Best model: target~1+zn+nox+age+rad+tax
## Crit= 228.804426442315
## Mean crit= 264.796355583349
```

IC profile
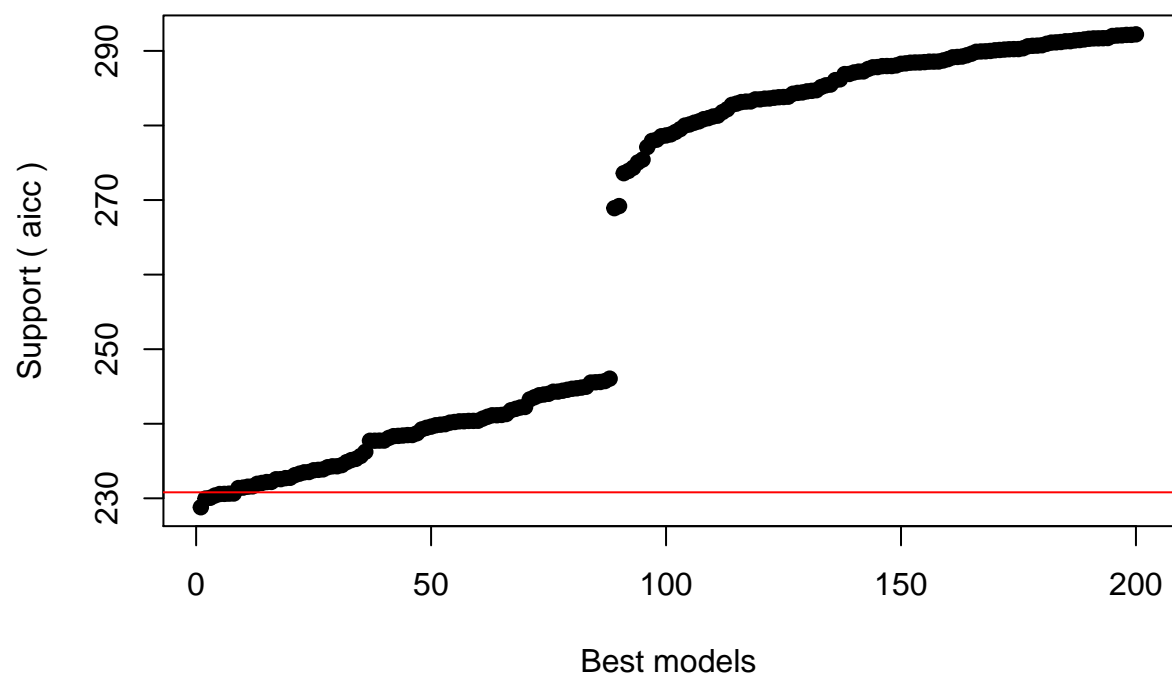
After 500 models:
Best model: target~1+zn+nox+rm+dis+rad+tax
Crit= 227.011811052459
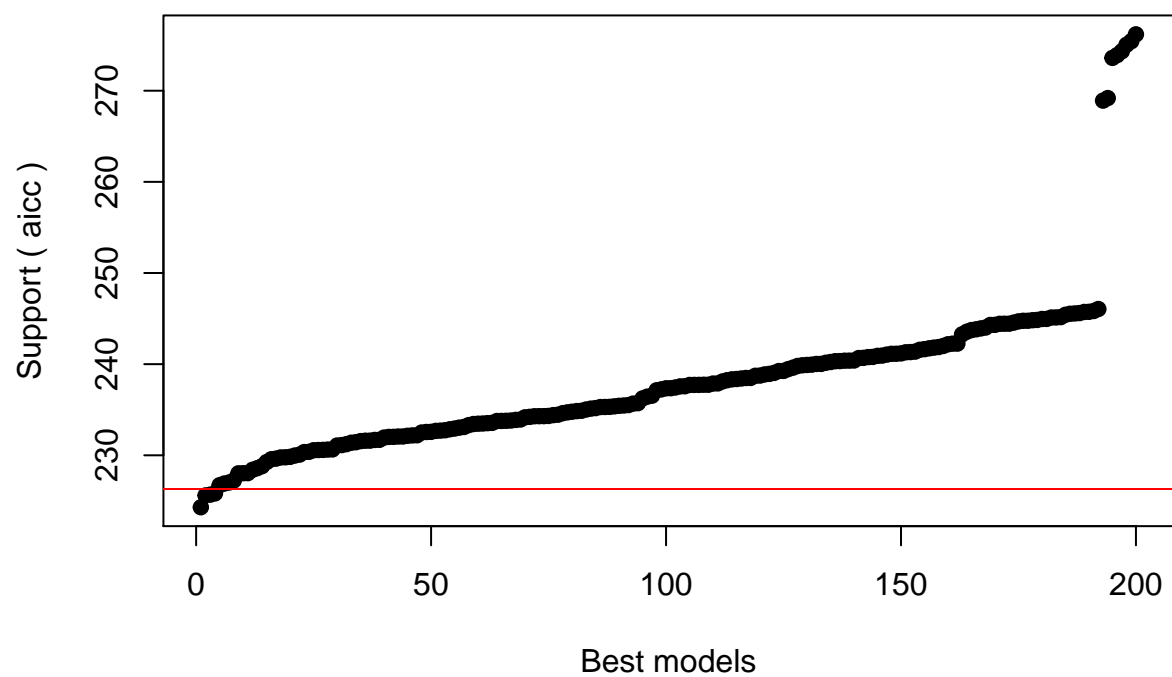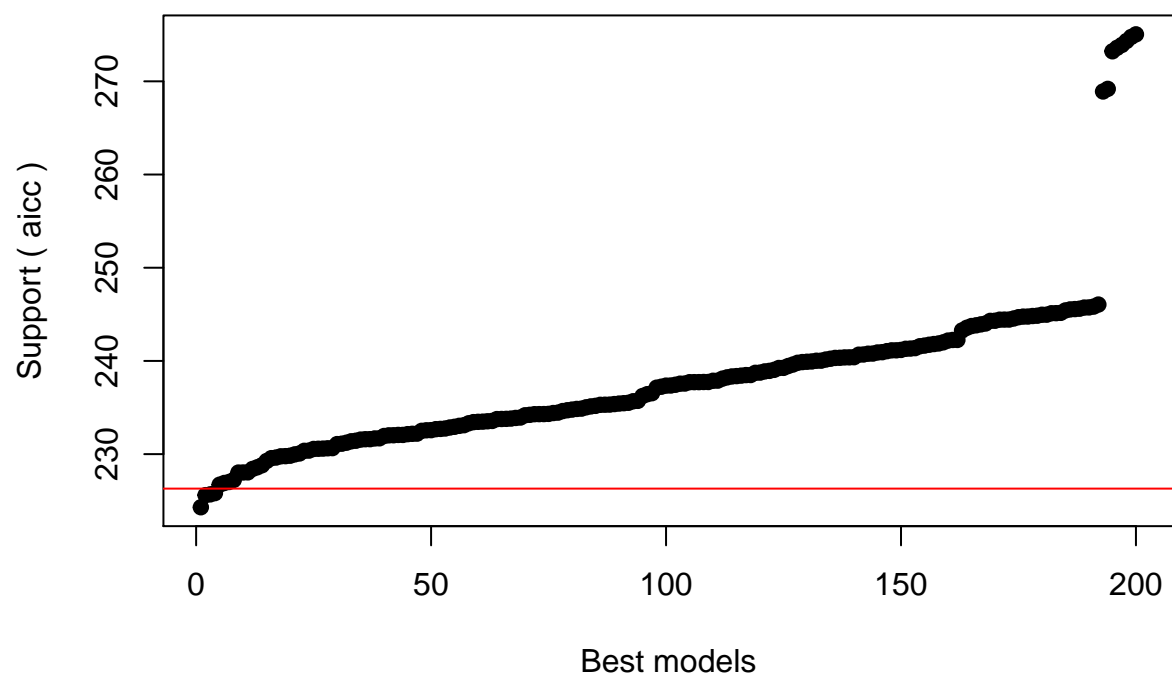## Mean crit= 257.552420288521

IC profile
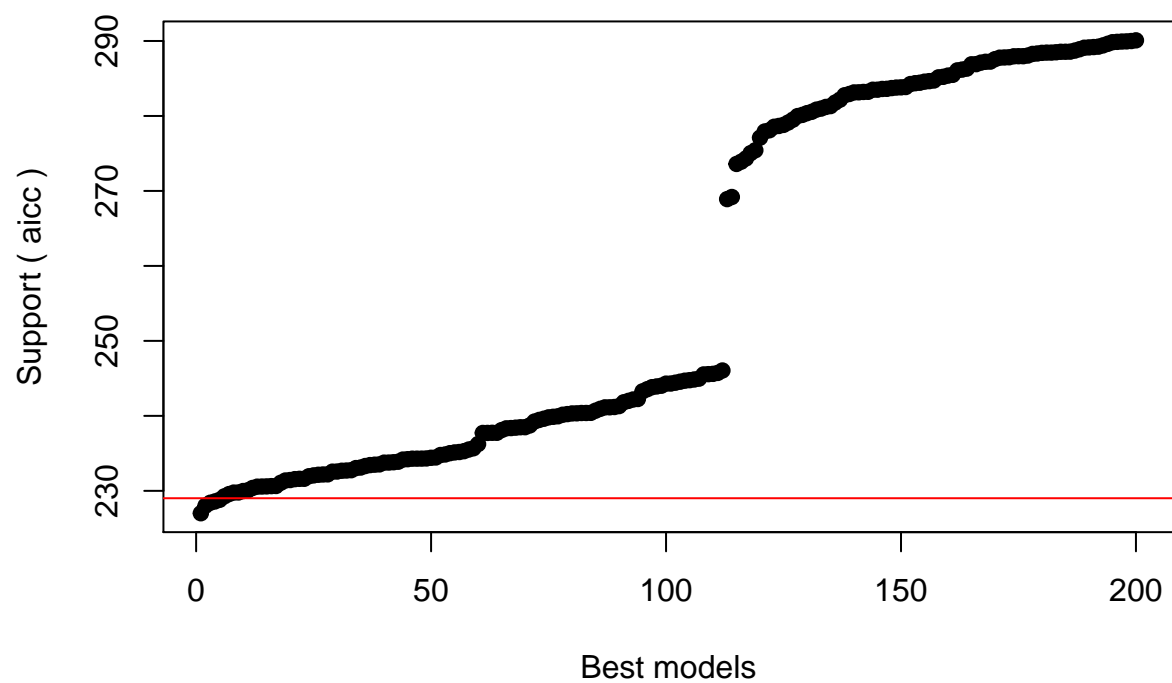

```
## 
## After 550 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax
## Crit= 224.302234388414
## Mean crit= 252.66079316199
```
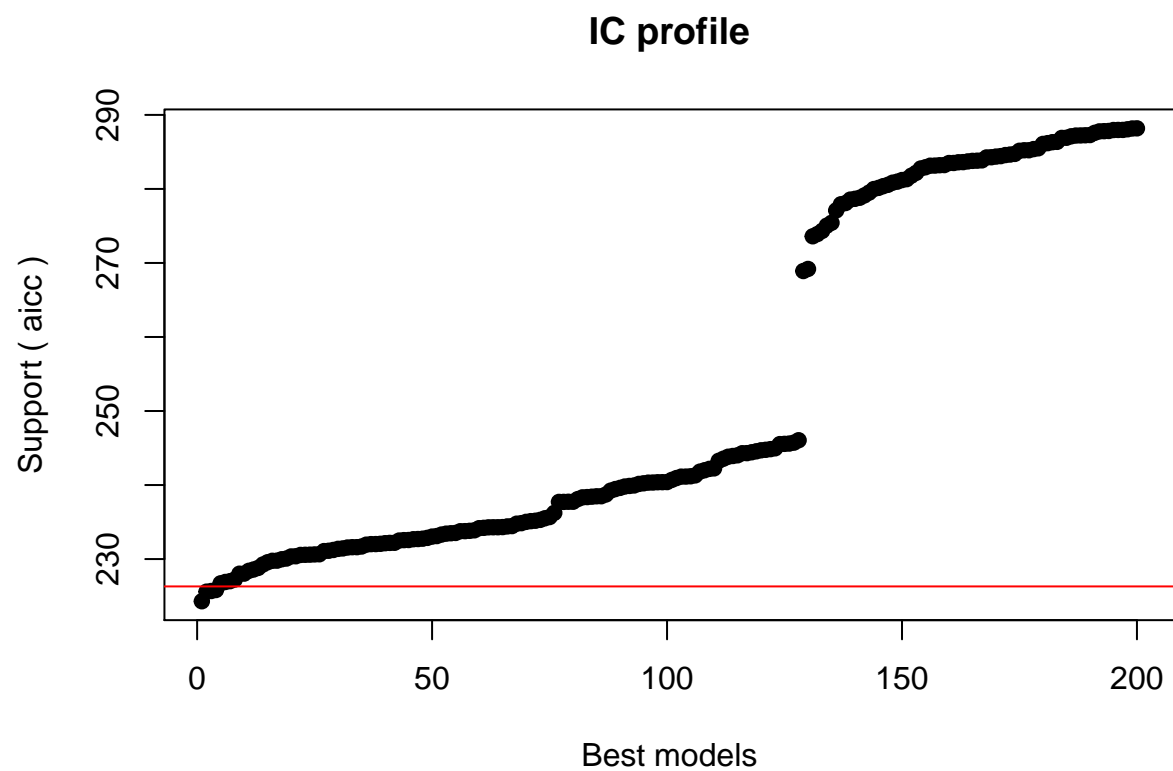
IC profile


```
## 
## After 600 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax
## Crit= 224.302234388414
## Mean crit= 252.400286449297
```

IC profile
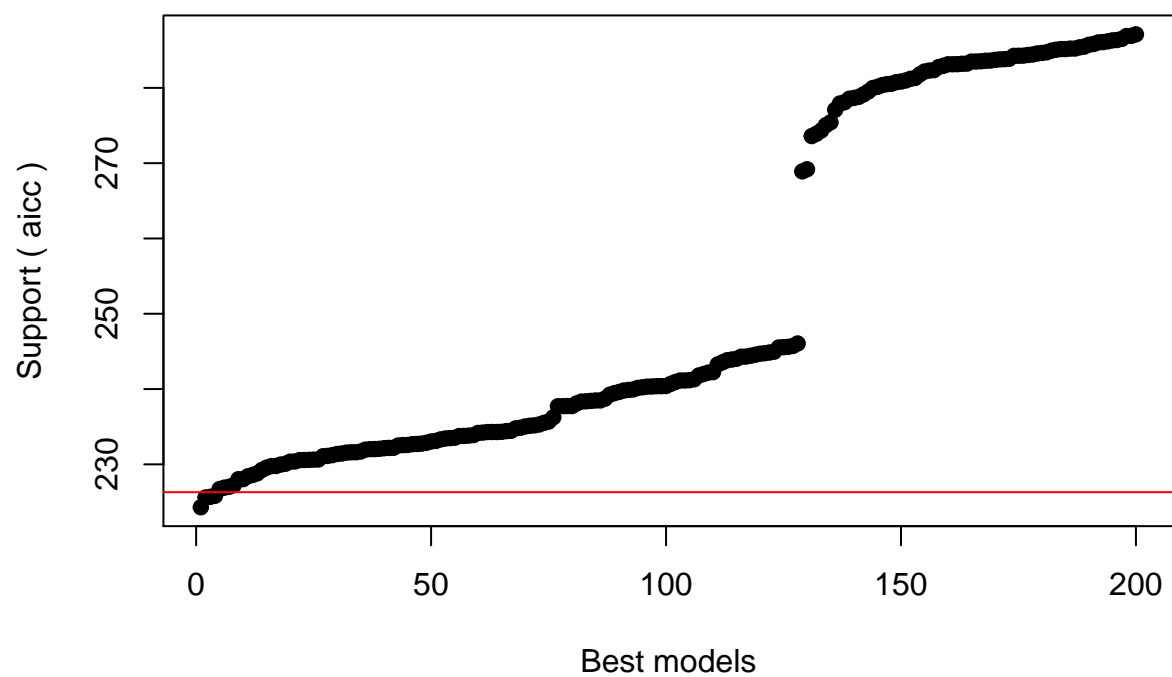

```
## 
## After 650 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax
## Crit= 224.302234388414
## Mean crit= 252.176107903063
```
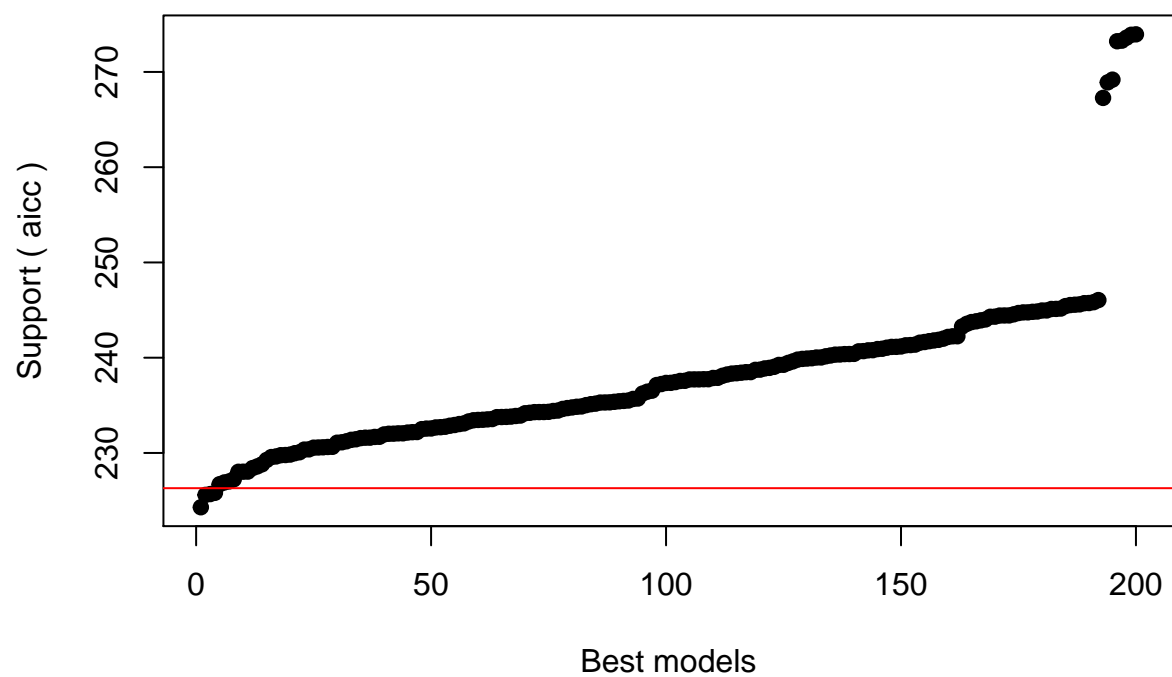
IC profile
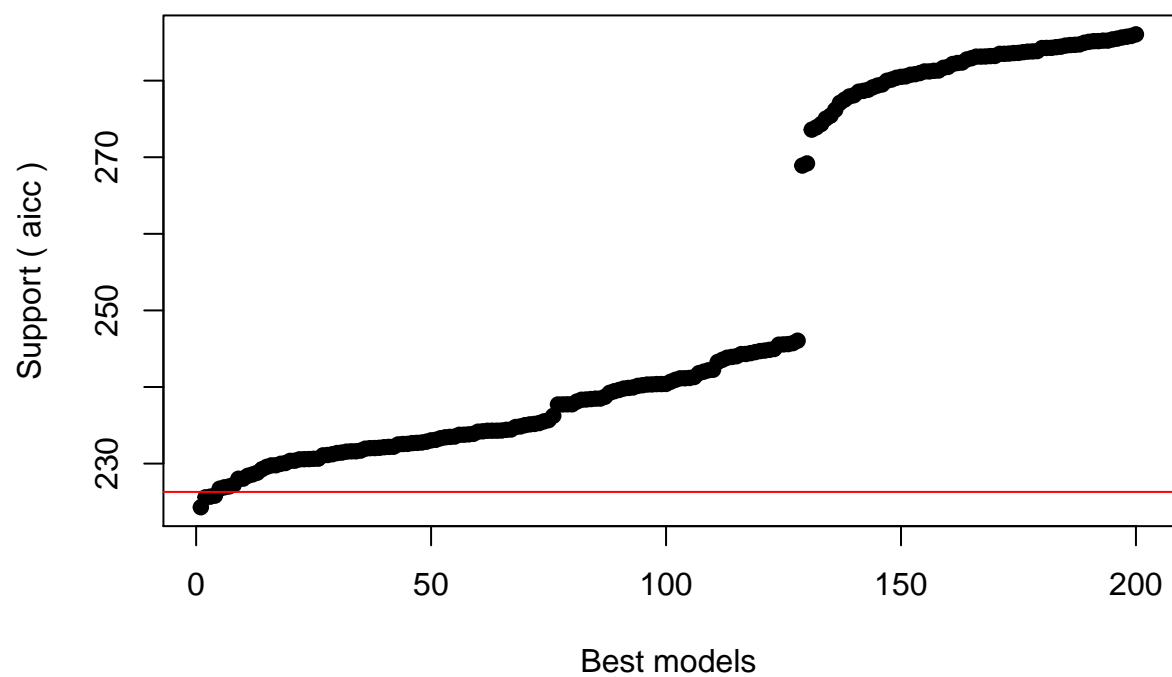

```
## 
## After 700 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax
## Crit= 224.302234388414
## Mean crit= 248.43836249478
```

IC profile
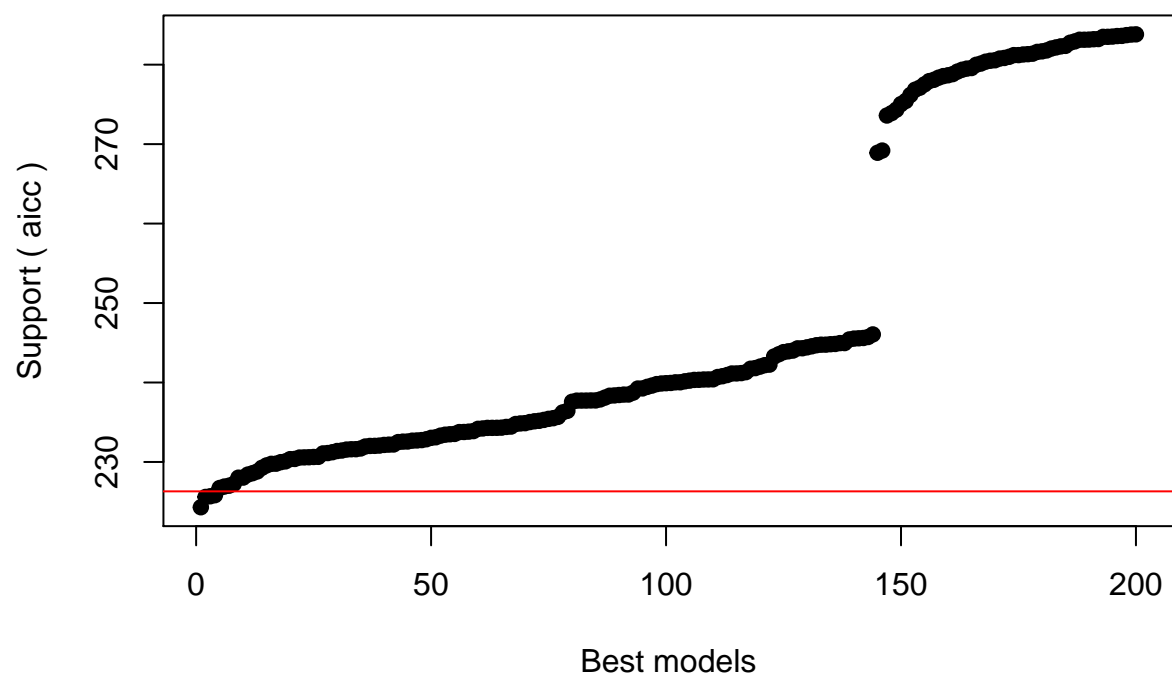
Best models

```
##
## After 750 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax
## Crit= 224.302234388414
## Mean crit= 243.344838191947
```

IC profile
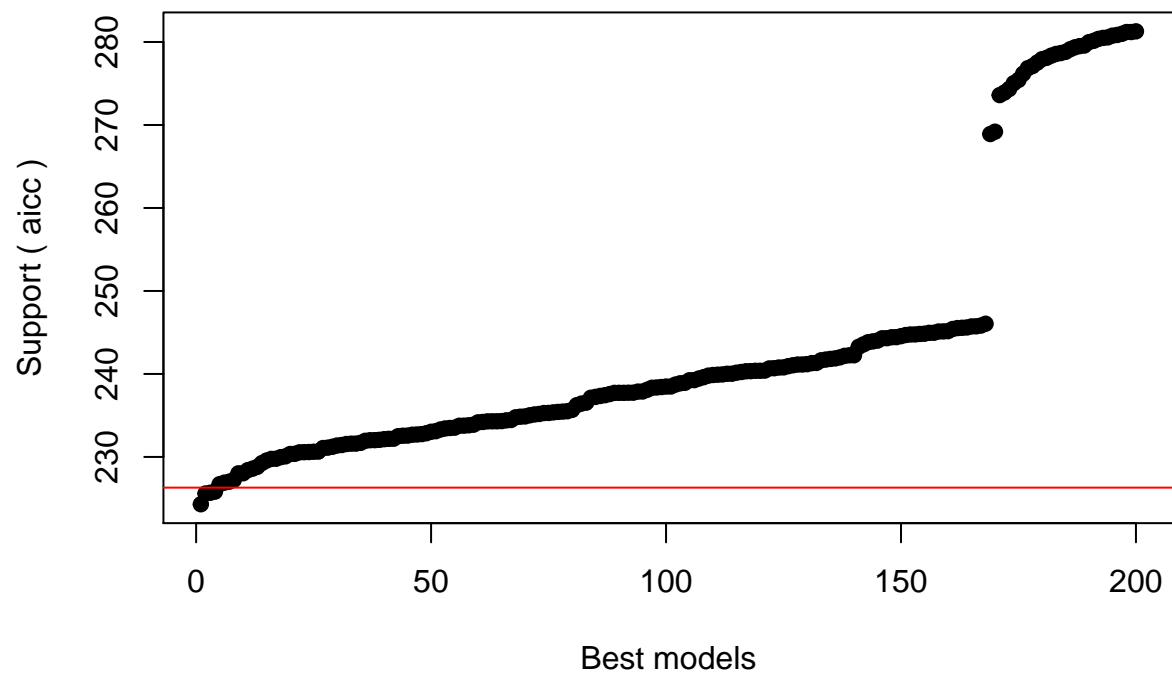

```
## 
## After 800 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax
## Crit= 224.302234388414
## Mean crit= 238.120001933159
```
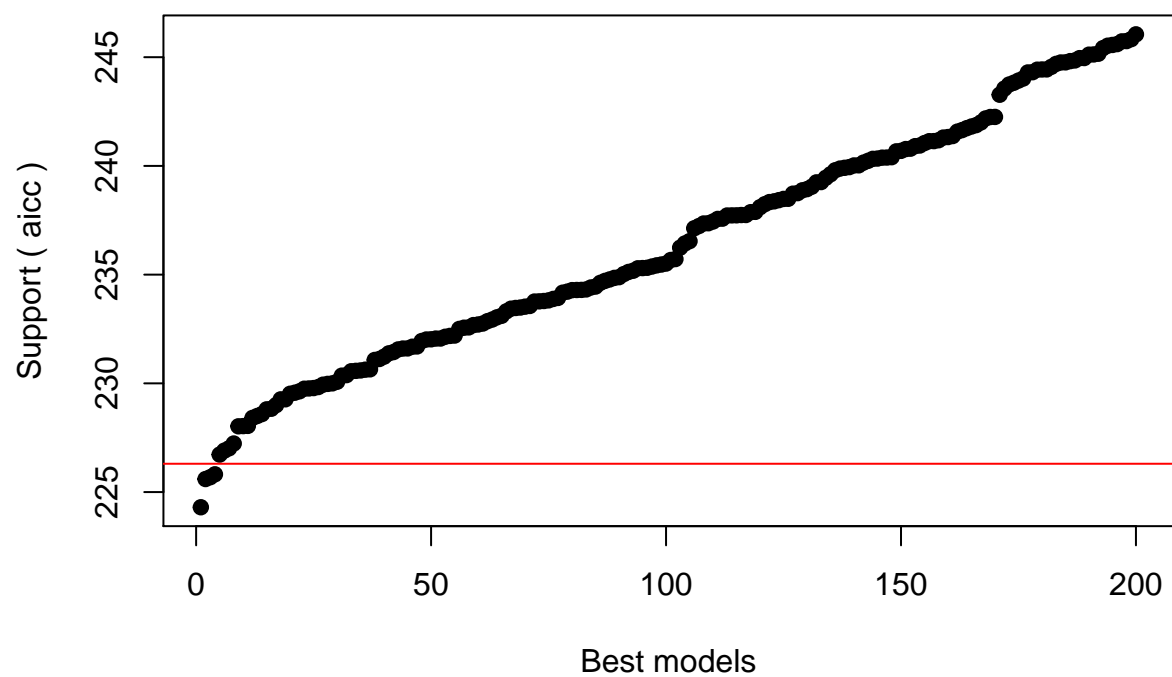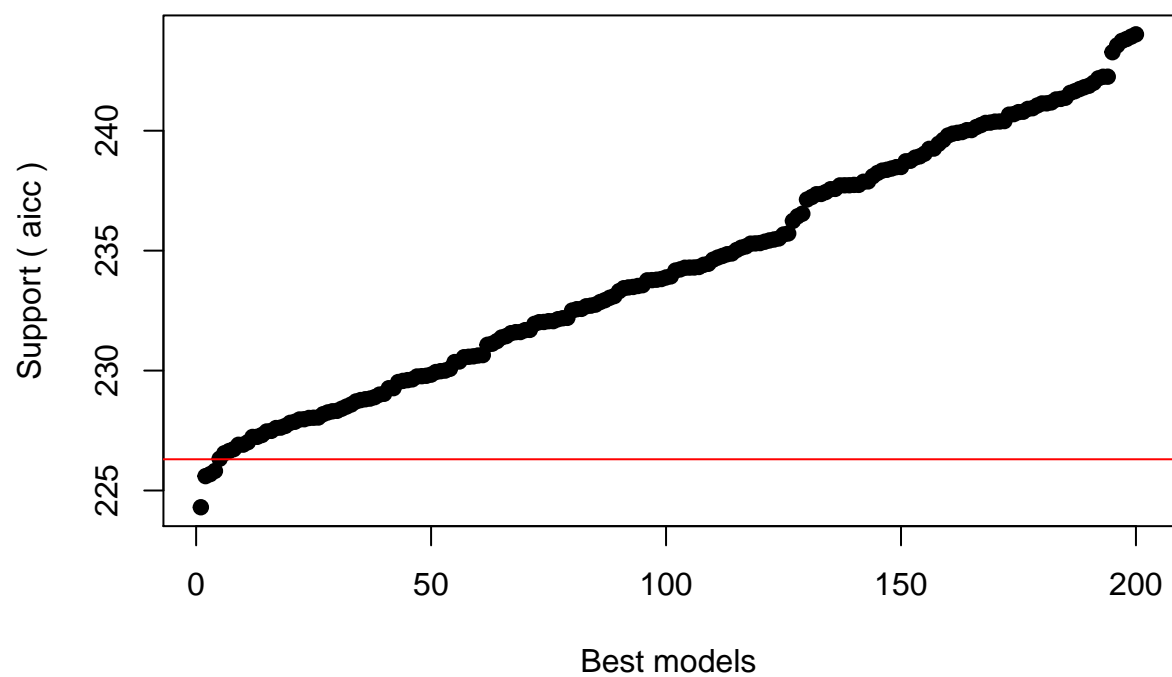
IC profile


```
##
## After 850 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax
## Crit= 224.302234388414
## Mean crit= 238.101908027803
```

IC profile


```
##
## After 900 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax
## Crit= 224.302234388414
## Mean crit= 238.053769101321
```

IC profile


```
##
## After 950 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax
## Crit= 224.302234388414
## Mean crit= 236.361130412541
```
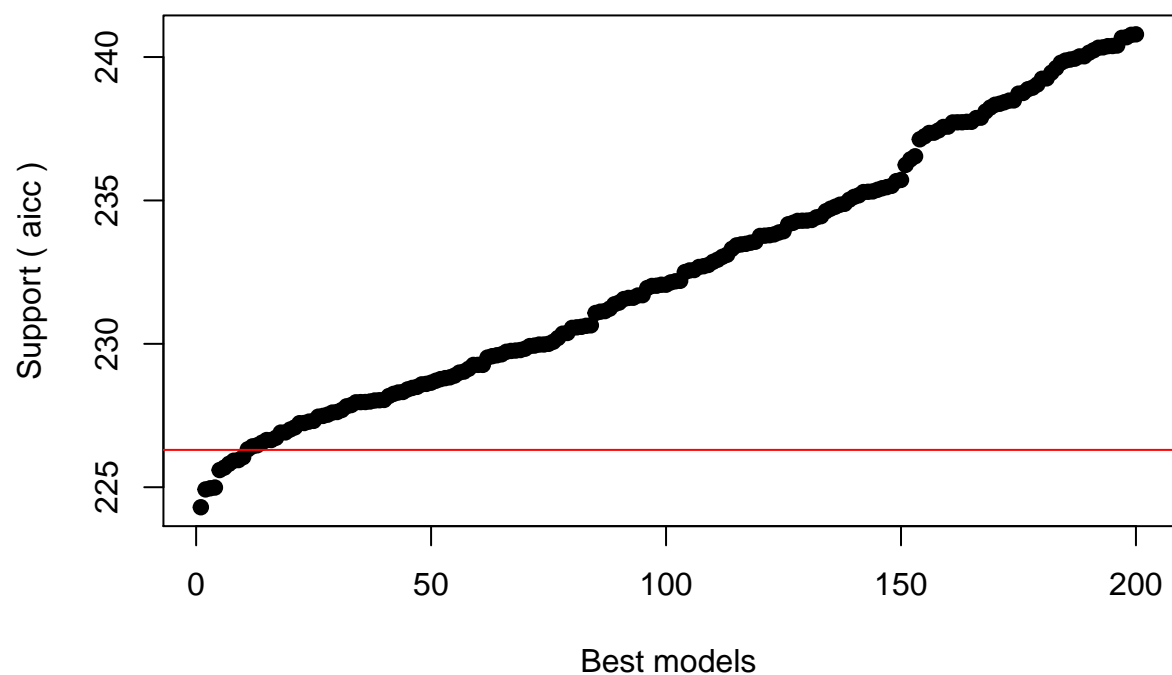
IC profile


```
##
## After 1000 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax
## Crit= 224.302234388414
## Mean crit= 234.298204588418
```

IC profile


```
## 
## After 1050 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax
## Crit= 224.302234388414
## Mean crit= 232.574418408886
```
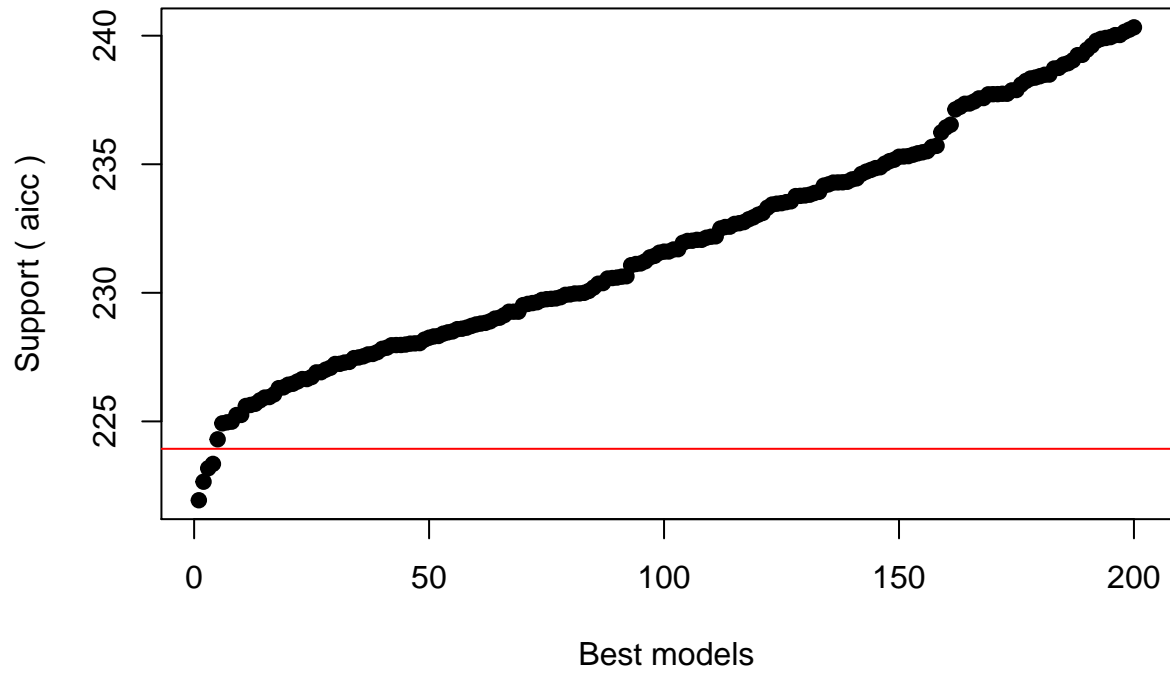
IC profile


```
##
## After 1100 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio
## Crit= 221.933270717489
## Mean crit= 231.91995408526

##
## After 1150 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio
## Crit= 221.933270717489
## Mean crit= 231.91995408526
```
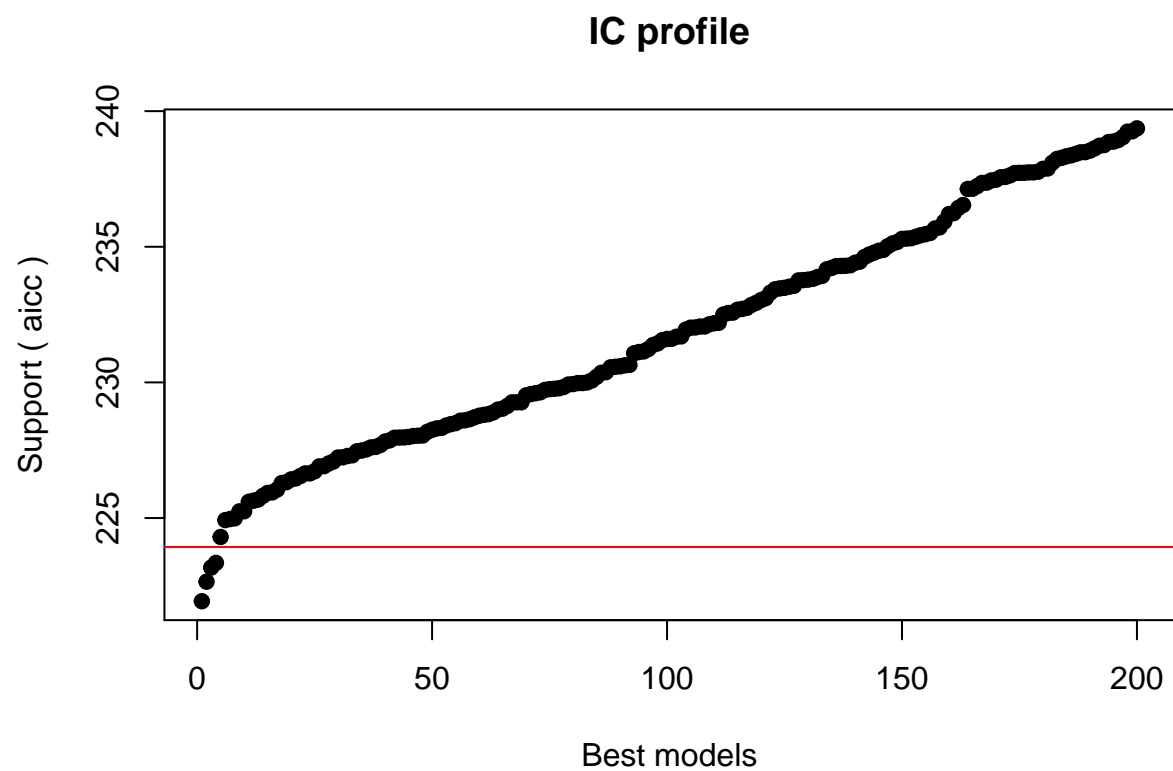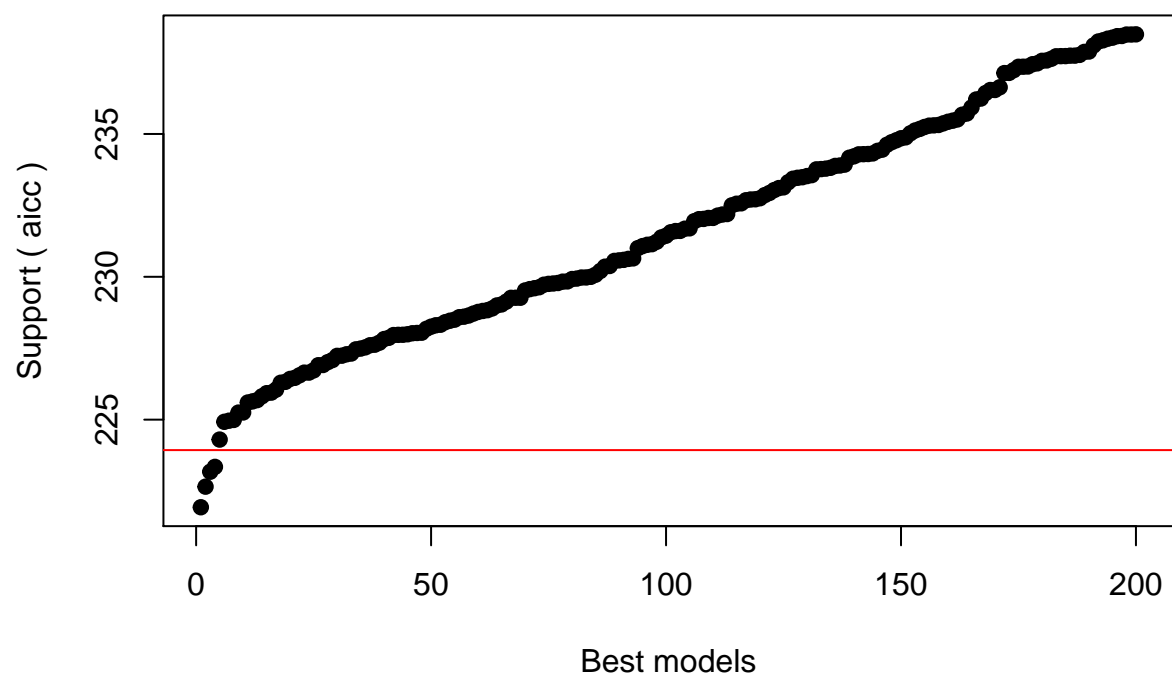
IC profile


```
##
## After 1200 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio
## Crit= 221.933270717489
## Mean crit= 231.91995408526

##
## After 1250 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio
## Crit= 221.933270717489
## Mean crit= 231.802270592507
```

IC profile


```
##
## After 1300 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio
## Crit= 221.933270717489
## Mean crit= 231.577513472014
```
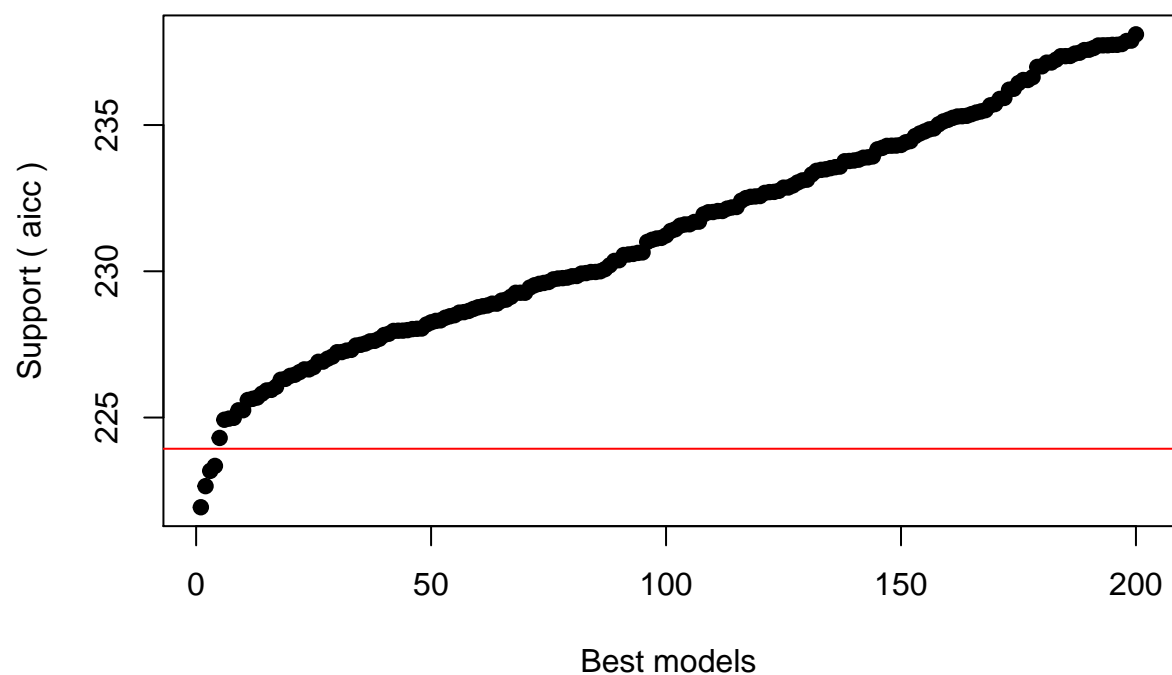
IC profile

Best models

```
##
## After 1350 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio
## Crit= 221.933270717489
## Mean crit= 231.347977855869

##
## After 1400 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio
## Crit= 221.933270717489
## Mean crit= 231.347977855869
```
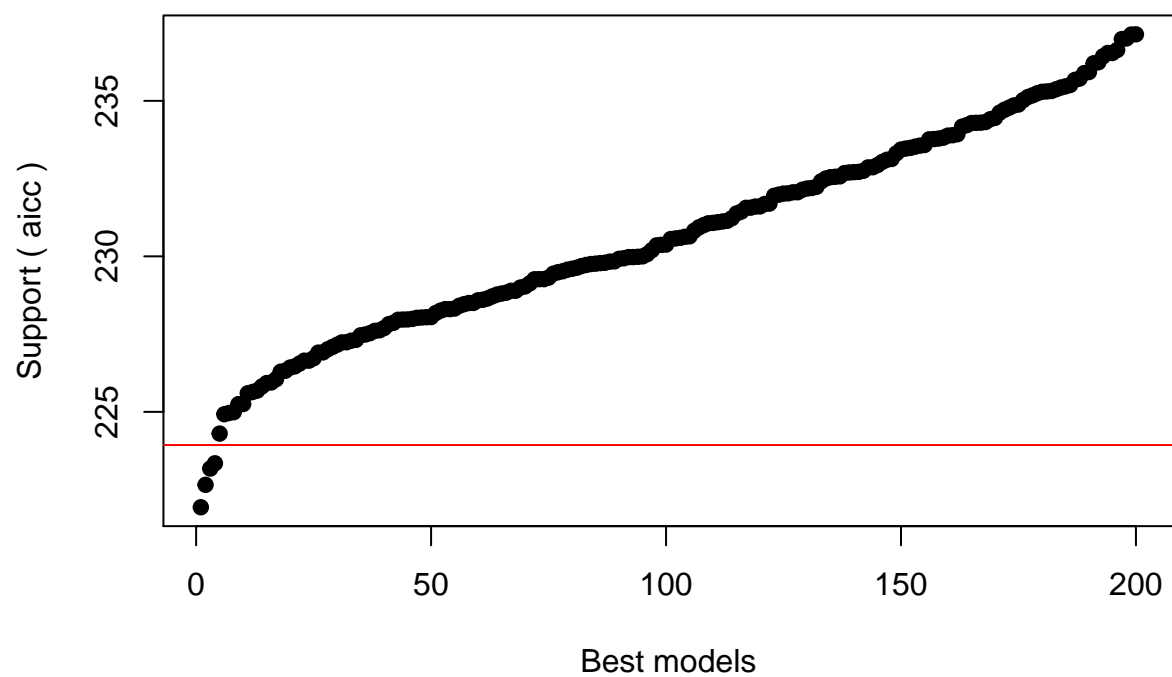
IC profile


```
##
## After 1450 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio
## Crit= 221.933270717489
## Mean crit= 231.347977855869

##
## After 1500 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio
## Crit= 221.933270717489
## Mean crit= 230.676905588494
```
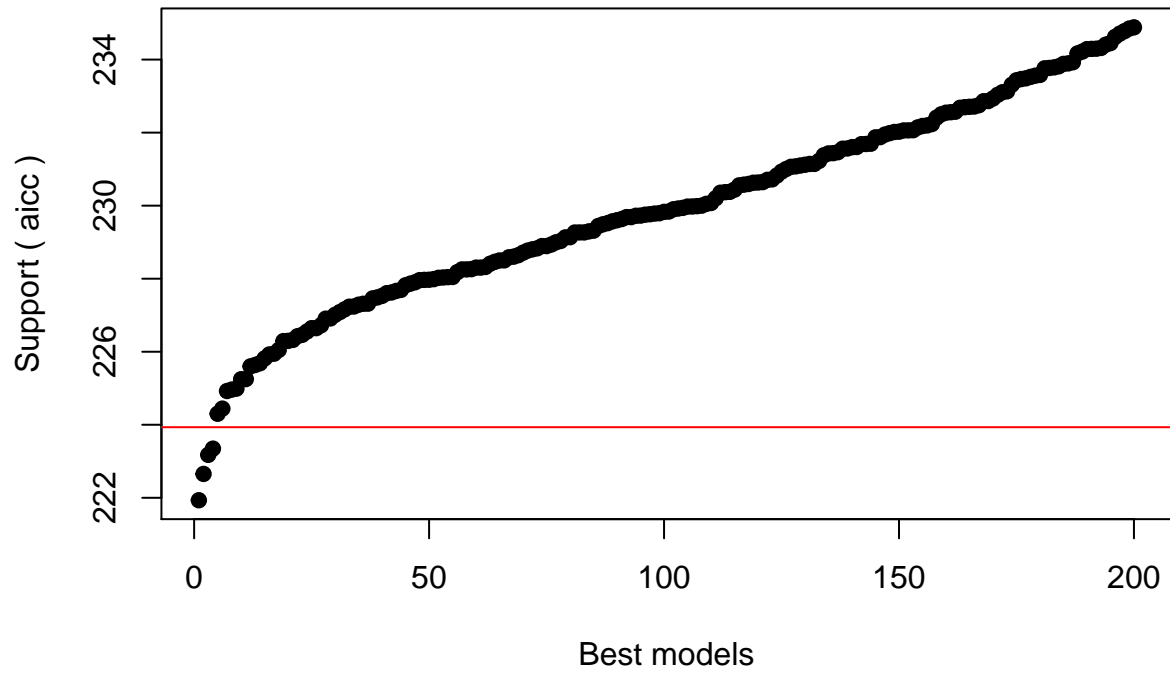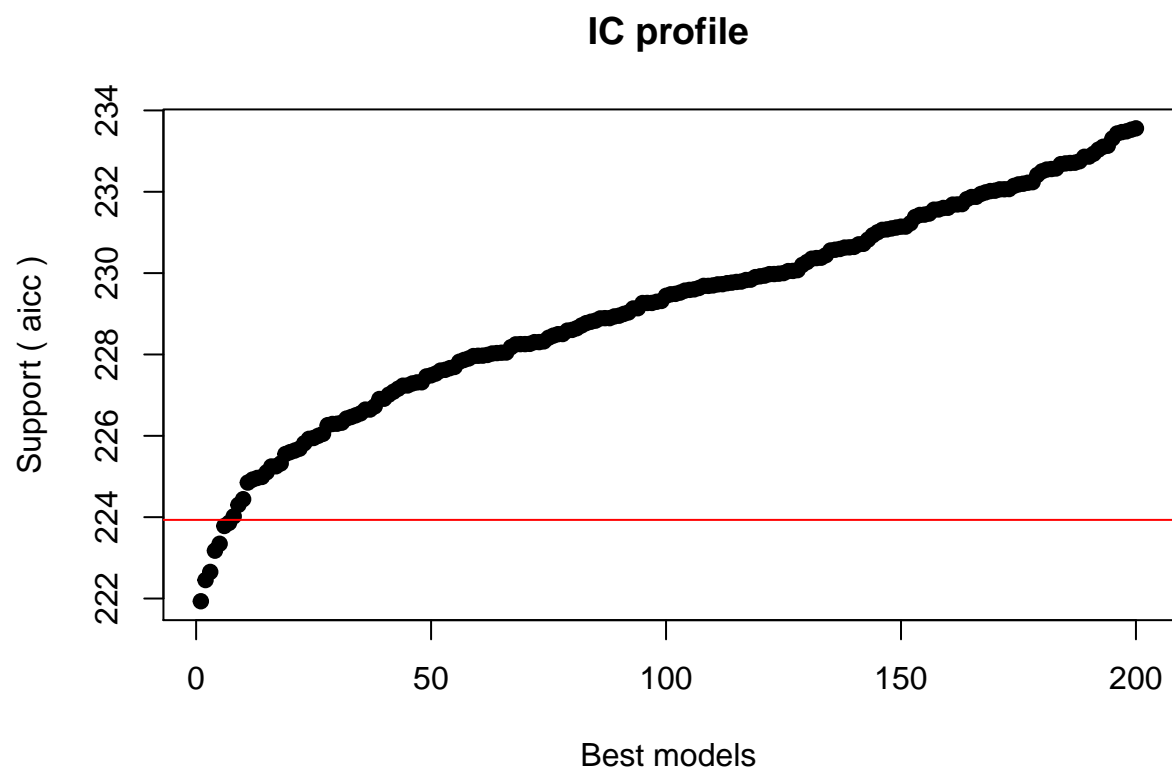
IC profile

After 1550 models:
Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio
Crit= 221.933270717489
Mean crit= 229.889894779206

IC profile


```
## 
## After 1600 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio
## Crit= 221.933270717489
## Mean crit= 229.161010035078

## 
## After 1650 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio
## Crit= 221.933270717489
## Mean crit= 229.161010035078
```
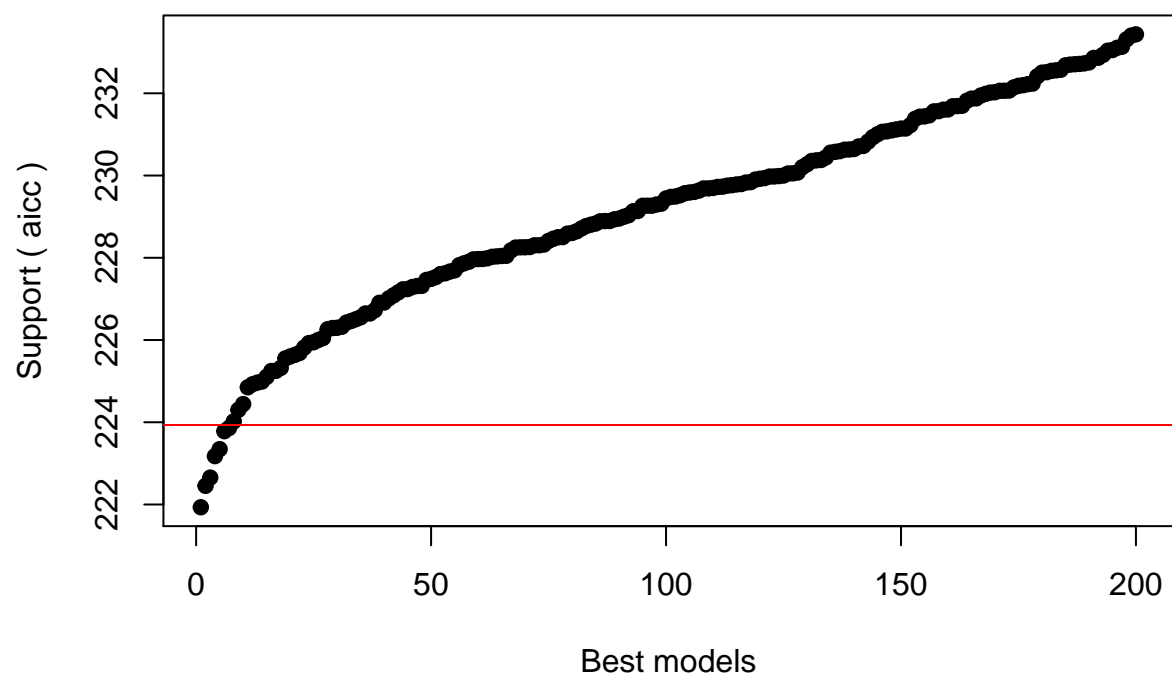
IC profile


```
## 
## After 1700 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio
## Crit= 221.933270717489
## Mean crit= 229.161010035078

## 
## After 1750 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio
## Crit= 221.933270717489
## Mean crit= 229.161010035078

## 
## After 1800 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio
## Crit= 221.933270717489
## Mean crit= 229.149299908865
```
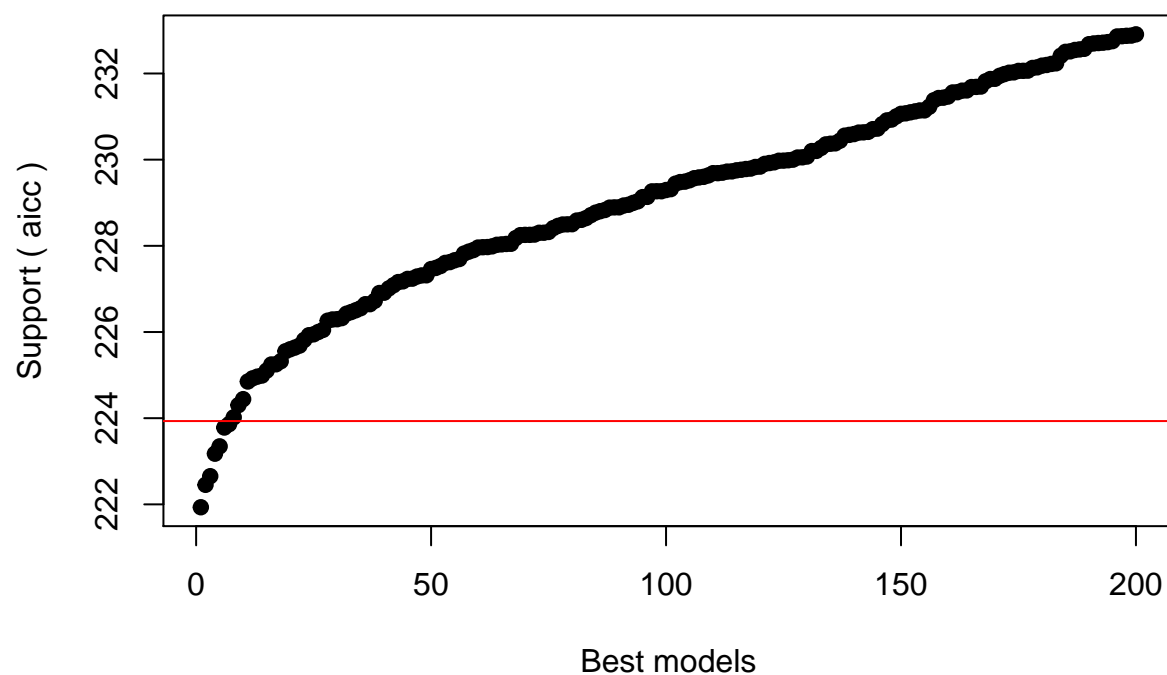
IC profile


```
##
## After 1850 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio
## Crit= 221.933270717489
## Mean crit= 229.060112810927
```

IC profile


```
##
## After 1900 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio
## Crit= 221.933270717489
## Mean crit= 229.00463321431

##
## After 1950 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio
## Crit= 221.933270717489
## Mean crit= 229.00463321431
```

IC profile


```
##
## After 2000 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio
## Crit= 221.933270717489
## Mean crit= 228.831991220555
```

IC profile


```
##
## After 2050 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio
## Crit= 221.933270717489
## Mean crit= 228.033089689856
```

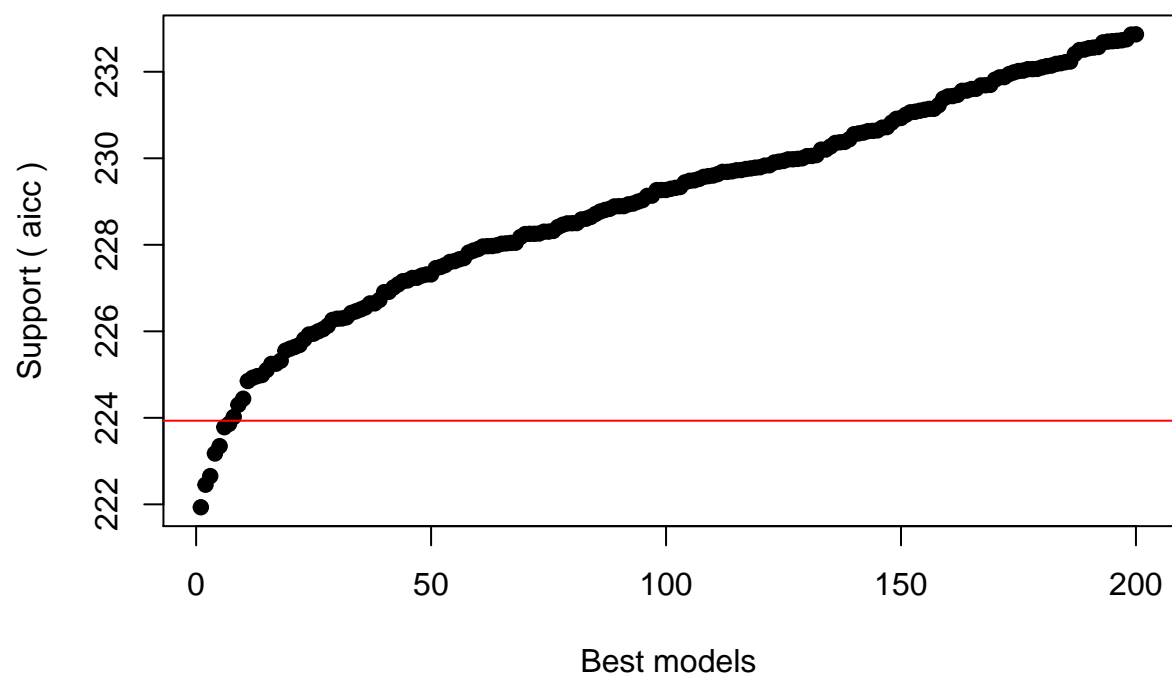**IC profile**
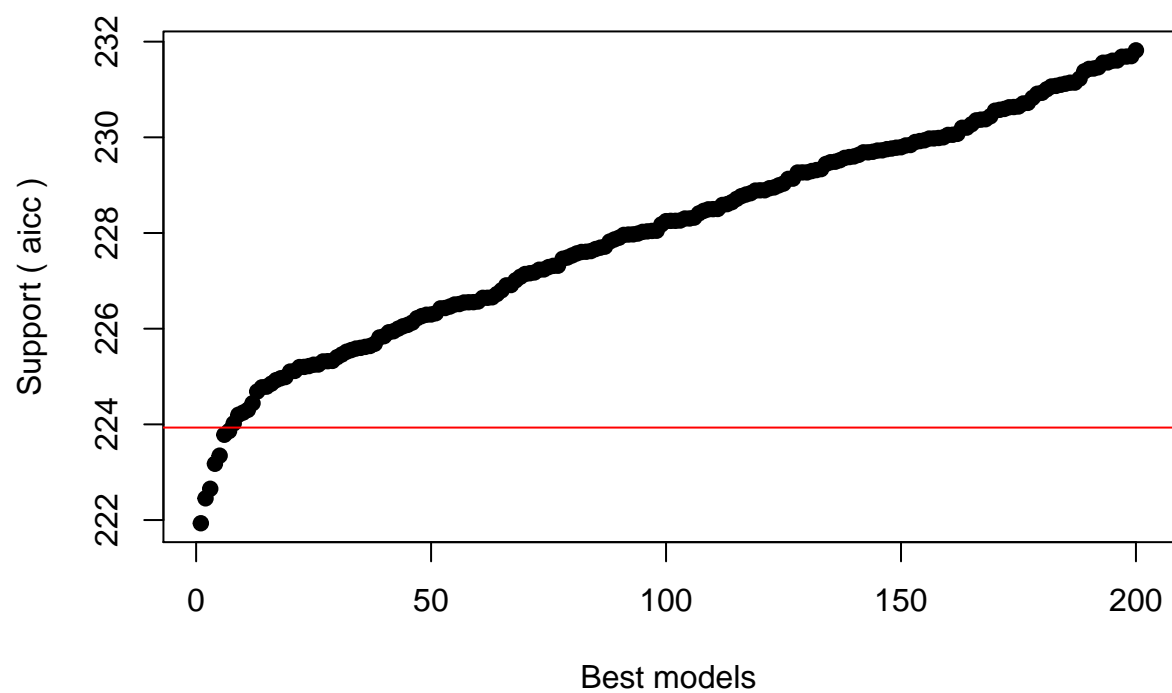

```
##
## After 2100 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio
## Crit= 221.933270717489
## Mean crit= 227.319763038232
```
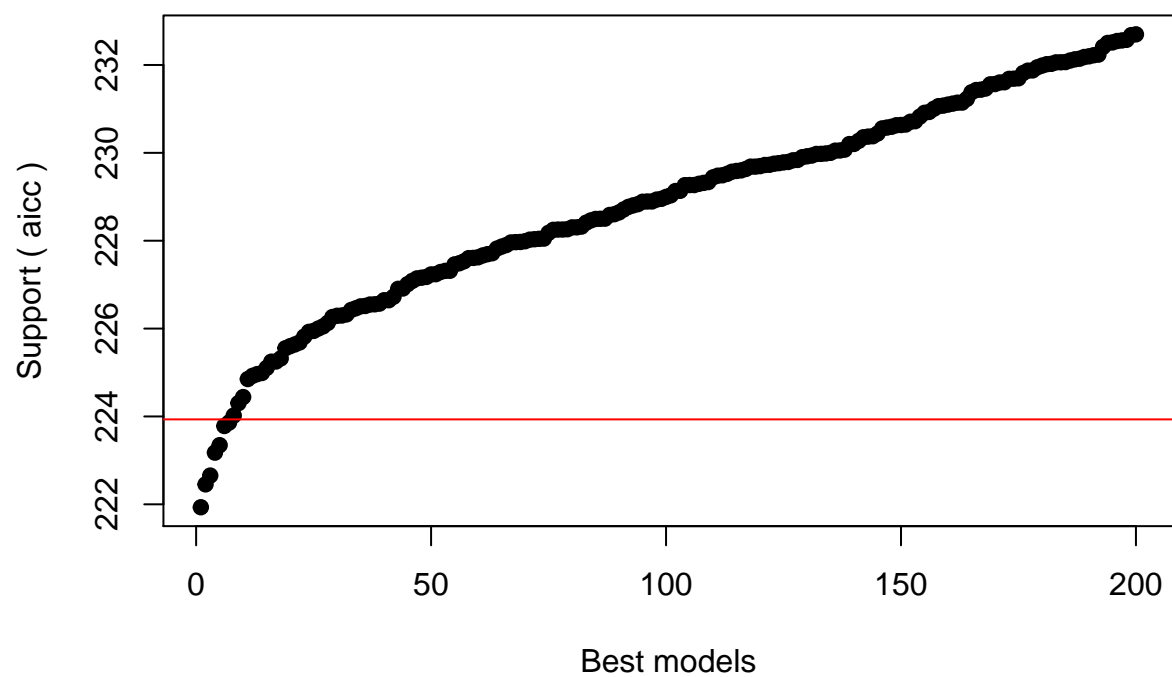
IC profile


```
## 
## After 2150 models: 
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black 
## Crit= 220.039388663467 
## Mean crit= 226.91237860124 

## 
## After 2200 models: 
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black 
## Crit= 220.039388663467 
## Mean crit= 226.91237860124 
```
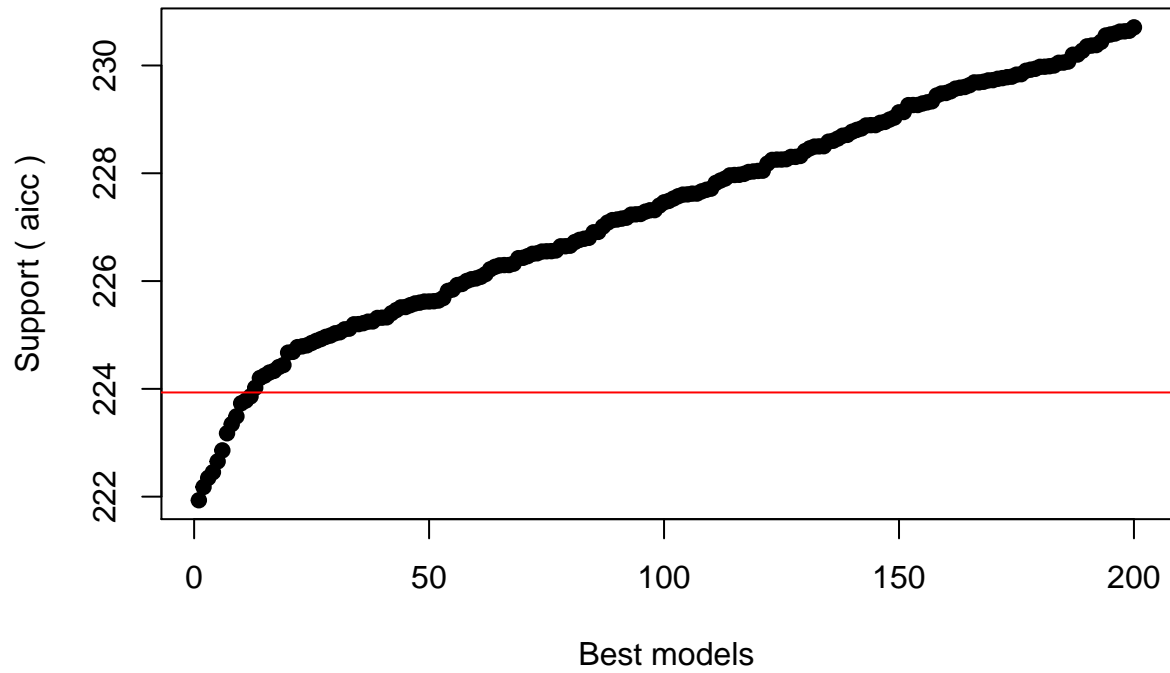
IC profile


```
## 
## After 2250 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
## Mean crit= 226.91237860124

## 
## After 2300 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
## Mean crit= 226.91237860124

## 
## After 2350 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
## Mean crit= 226.91237860124

## 
## After 2400 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
## Mean crit= 226.91237860124

## 
## After 2450 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
```

```
## Mean crit= 226.91237860124

##
## After 2500 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
## Mean crit= 226.91237860124

##
## After 2550 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
## Mean crit= 226.900659213684
```

IC profile

Best models

```
##
## After 2600 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
## Mean crit= 226.899320897187
```
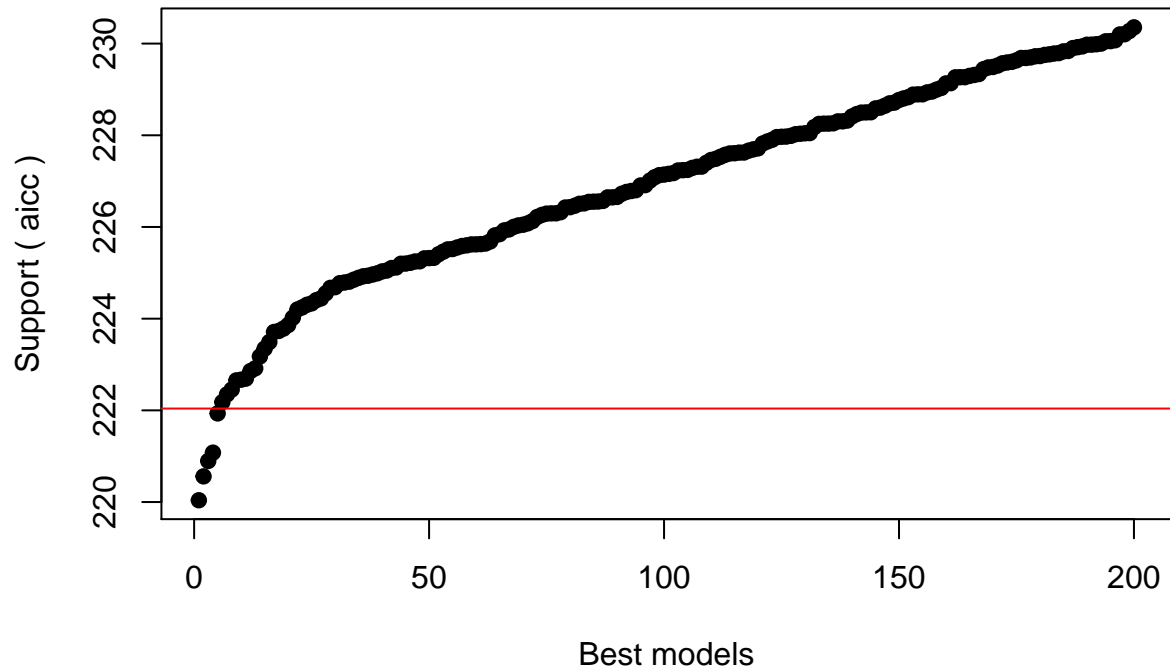
IC profile


```
## 
## After 2650 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
## Mean crit= 226.723282081433

## 
## After 2700 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
## Mean crit= 226.723282081433
```
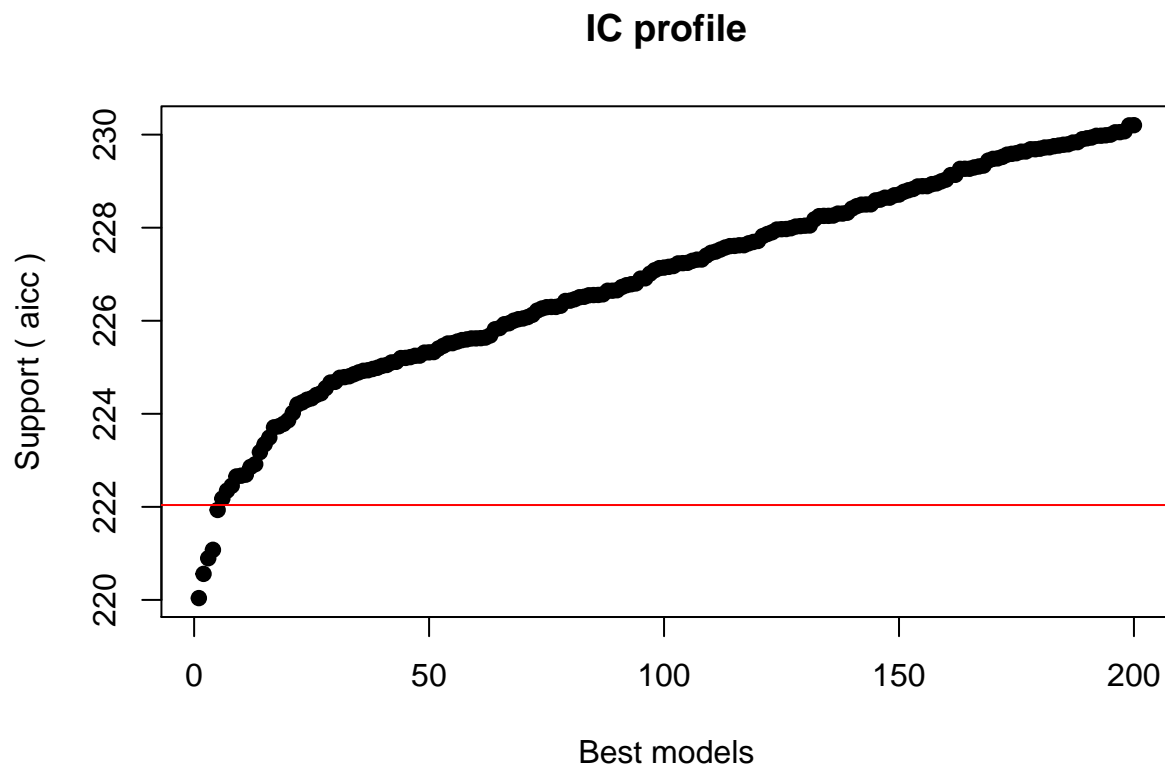
IC profile


```
##
## After 2750 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
## Mean crit= 226.723282081433

##
## After 2800 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
## Mean crit= 226.723282081433

##
## After 2850 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
## Mean crit= 226.723282081433

##
## After 2900 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
## Mean crit= 226.721371389374
```
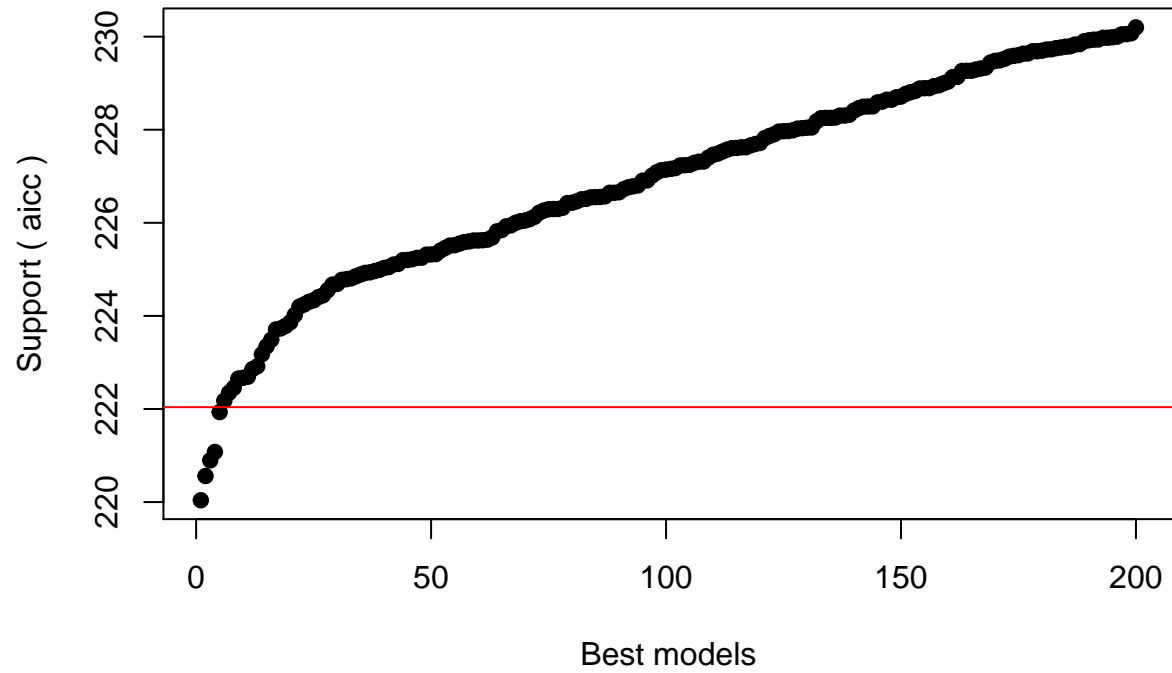
IC profile


```
##
## After 2950 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
## Mean crit= 226.720953891686

##
## After 3000 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
## Mean crit= 226.720953891686
```
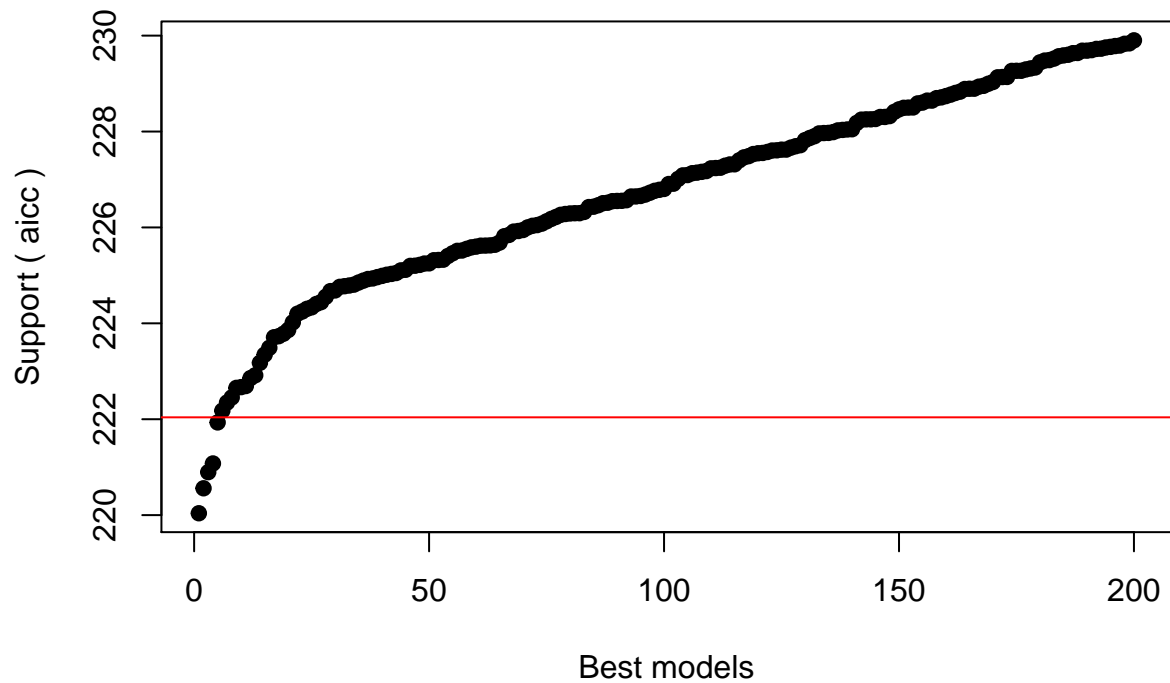
IC profile


```
##
## After 3050 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
## Mean crit= 226.720953891686

##
## After 3100 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
## Mean crit= 226.626201621152
```

IC profile


```
##
## After 3150 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
## Mean crit= 226.451595764505
```
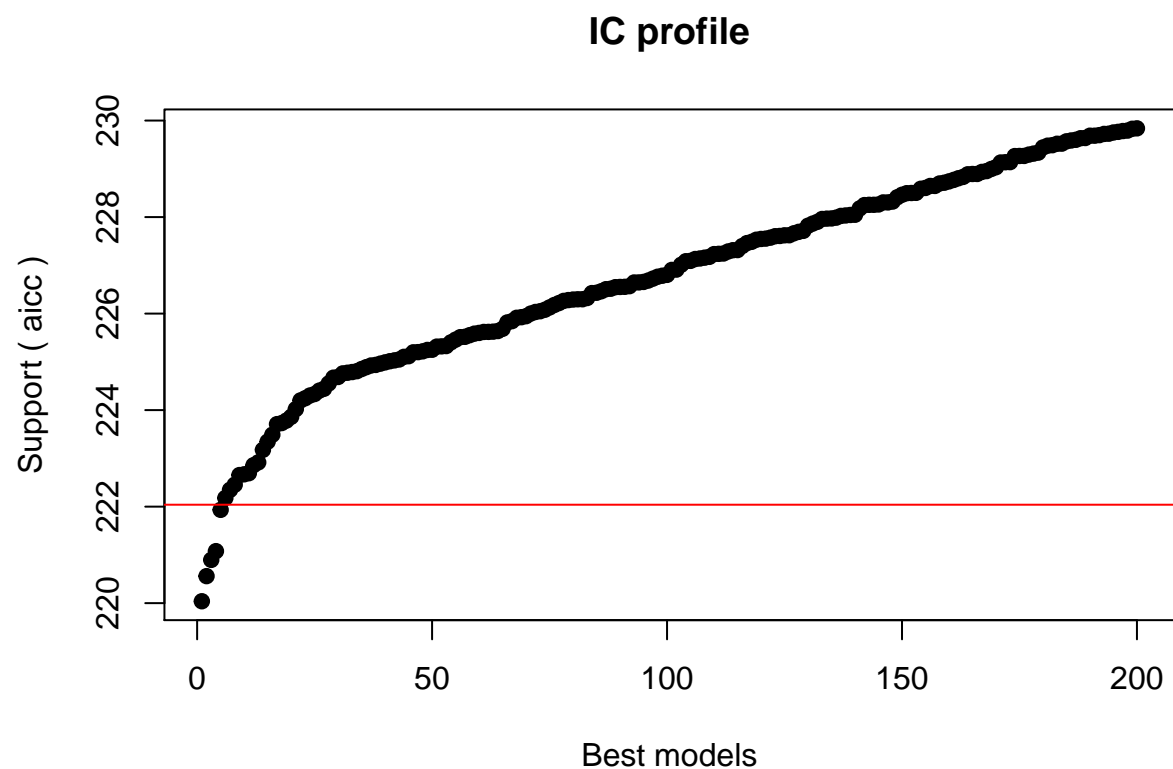
IC profile


```
##
## After 3200 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
## Mean crit= 226.274862125722

##
## After 3250 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
## Mean crit= 226.274862125722
```
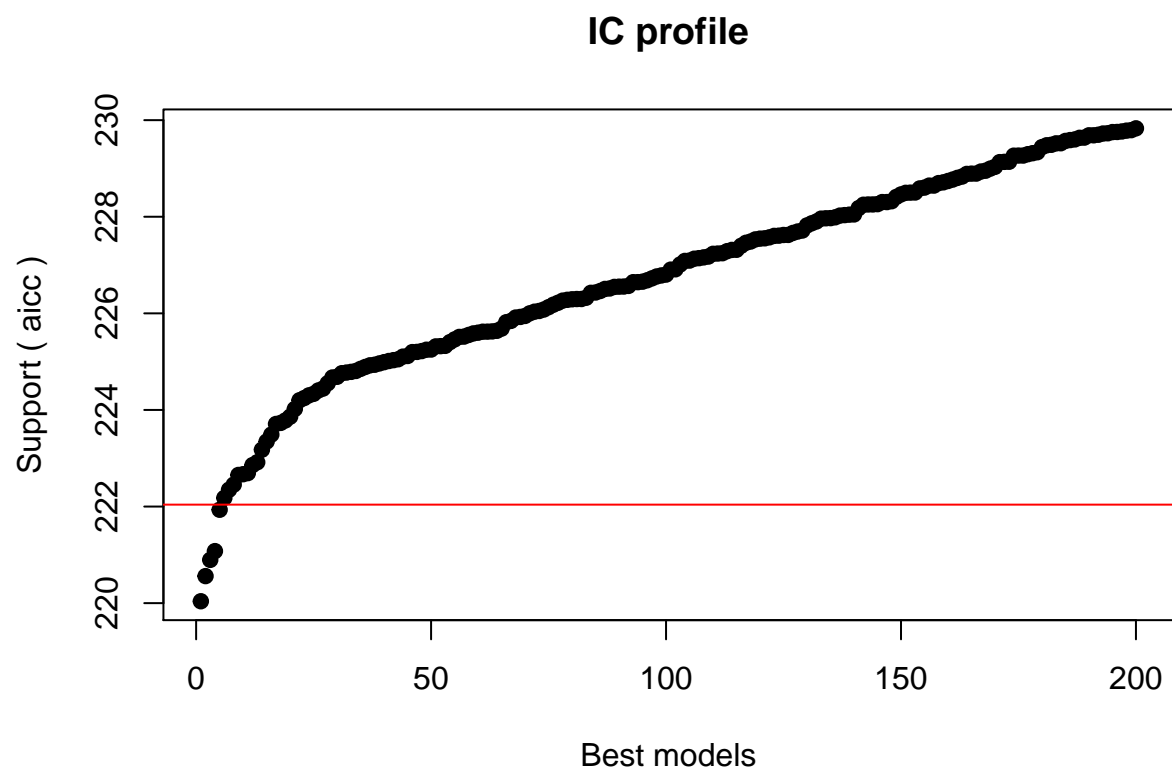
IC profile


```
##
## After 3300 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
## Mean crit= 226.274862125722

##
## After 3350 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
## Mean crit= 226.274862125722

##
## After 3400 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
## Mean crit= 226.274862125722

##
## After 3450 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
## Mean crit= 226.274862125722

##
## After 3500 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
```
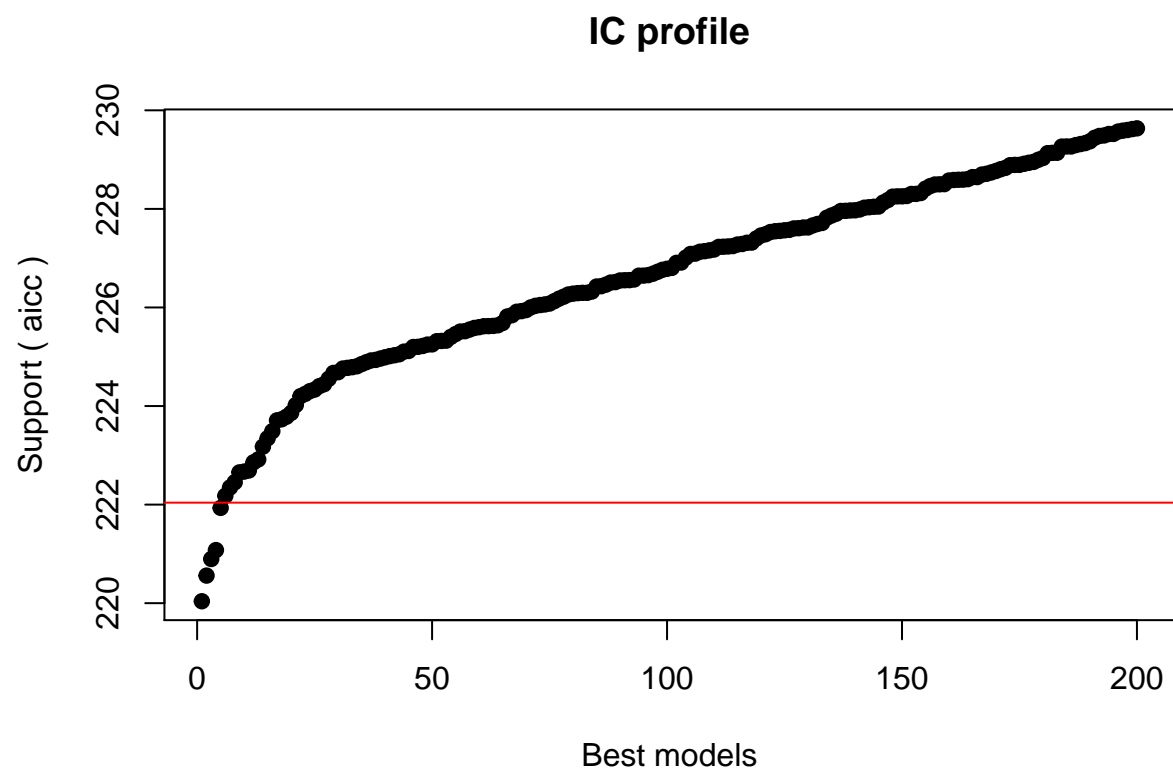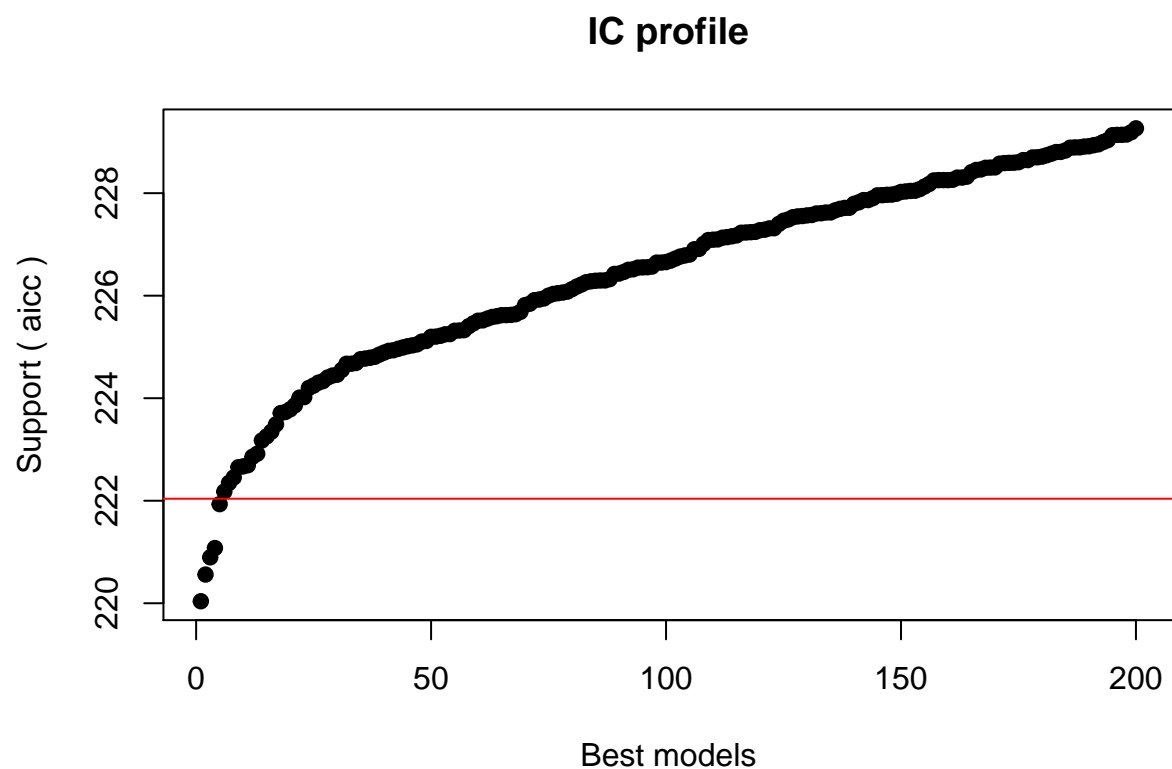
```
## Mean crit= 226.274862125722

##
## After 3550 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
## Mean crit= 226.274862125722

##
## After 3600 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
## Mean crit= 226.274862125722

##
## After 3650 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
## Mean crit= 226.254712435507
```

IC profile
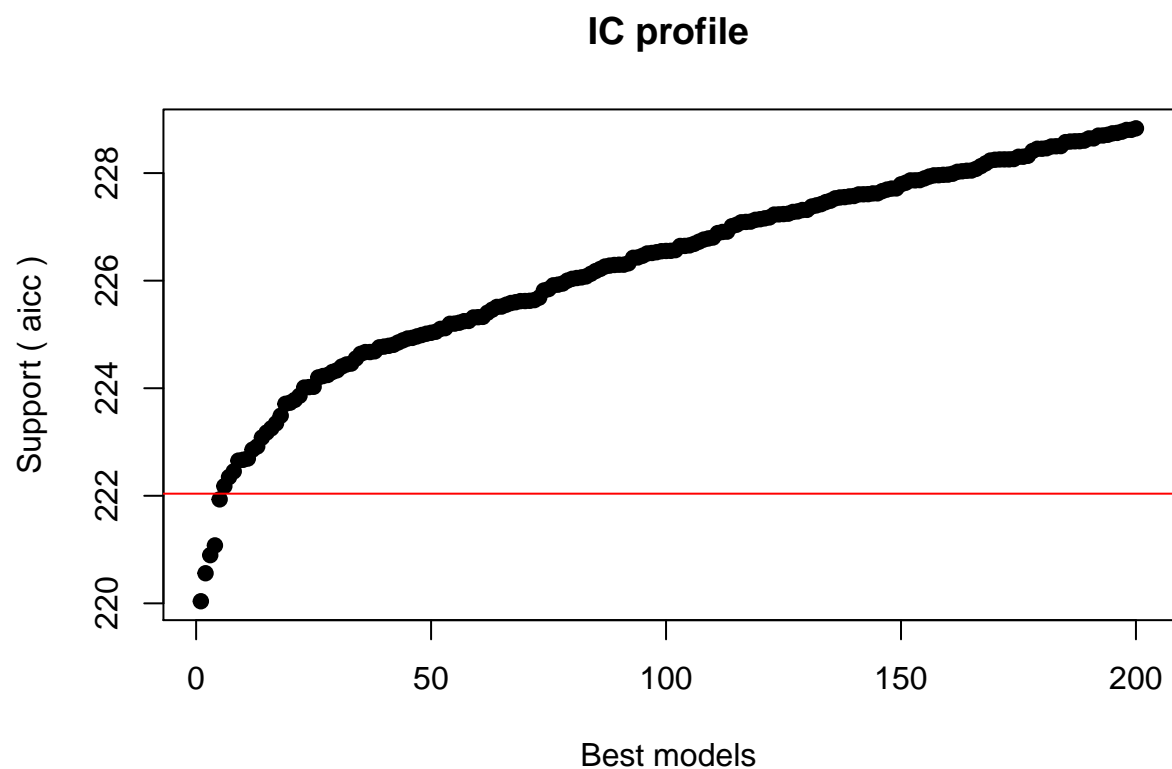


```
##
## After 3700 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
## Mean crit= 226.123735981383
```

IC profile


```
##
## After 3750 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
## Mean crit= 226.040169253129

##
## After 3800 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
## Mean crit= 226.040169253129
```

IC profile


```
## 
## After 3850 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
## Mean crit= 226.040169253129

## 
## After 3900 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
## Mean crit= 226.040169253129

## 
## After 3950 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
## Mean crit= 226.034330208852
```

IC profile

Best models

```
##
## After 4000 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
## Mean crit= 226.03109265275

##
## After 4050 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
## Mean crit= 226.03109265275
```
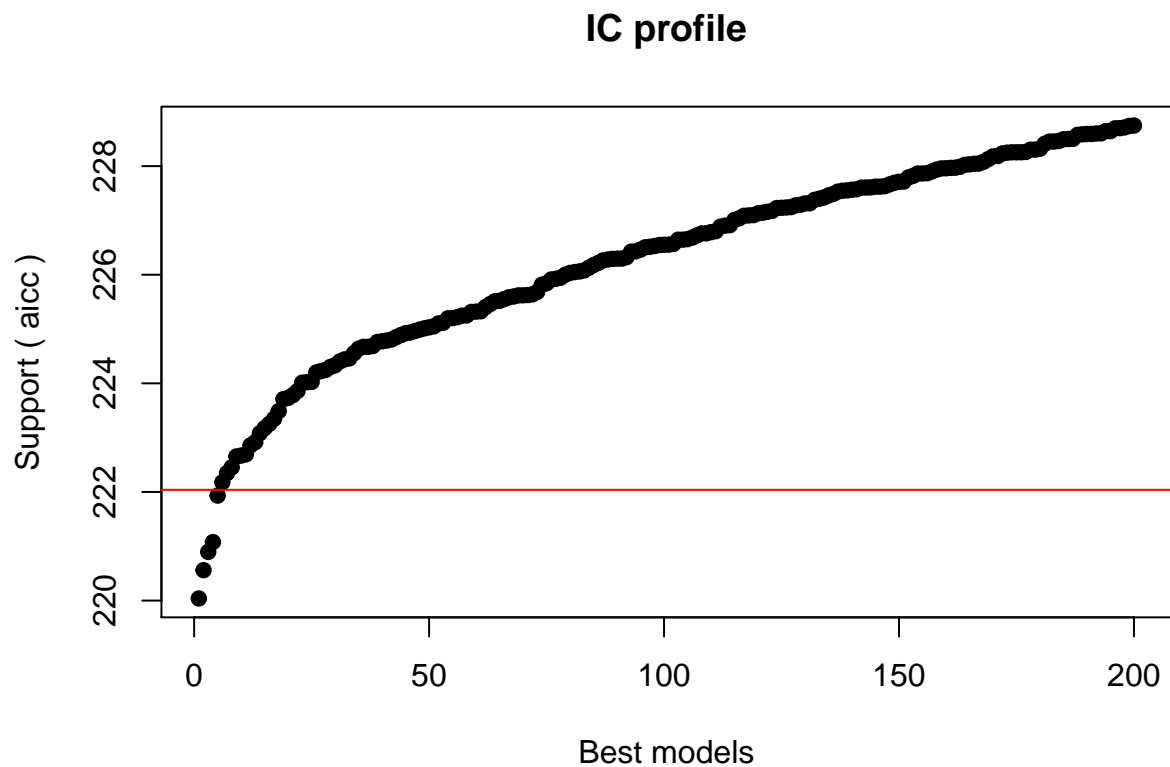
IC profile


```
##
## After 4100 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
## Mean crit= 226.03109265275

##
## After 4150 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
## Mean crit= 225.87985399444
```

IC profile
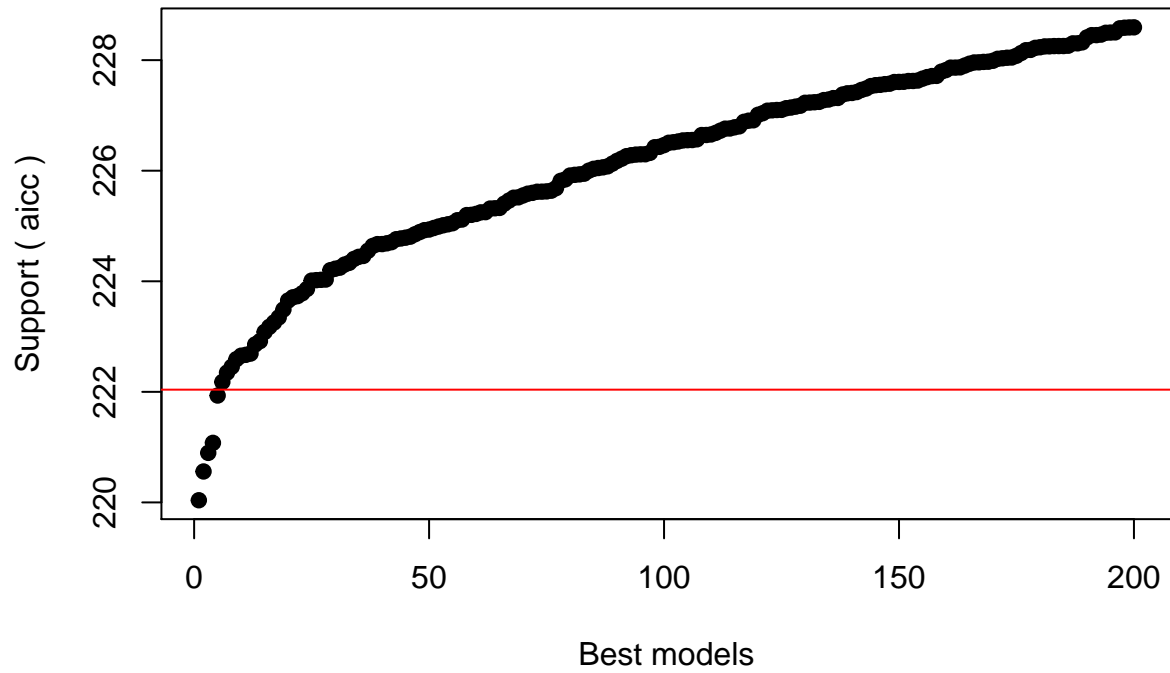


```
##
## After 4200 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
## Mean crit= 225.691609008902
```

IC profile


```
## 
## After 4250 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
## Mean crit= 225.345740072215

## 
## After 4300 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
## Mean crit= 225.345740072215
```
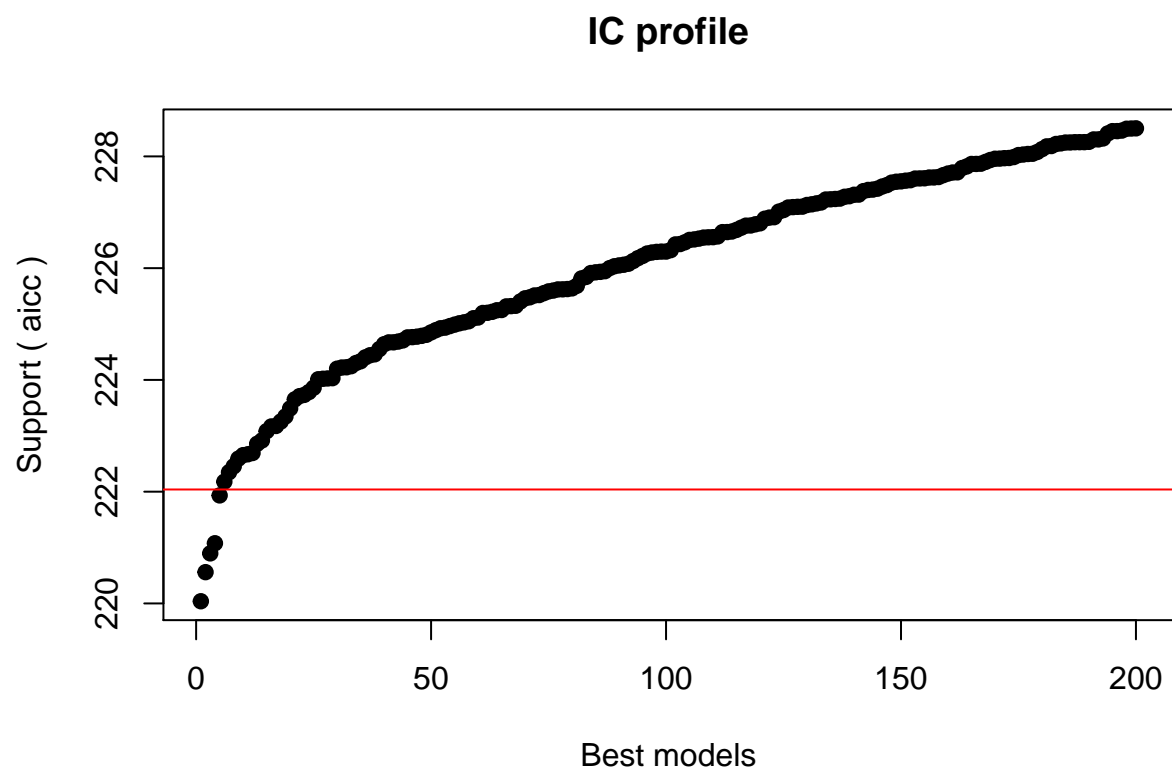
IC profile
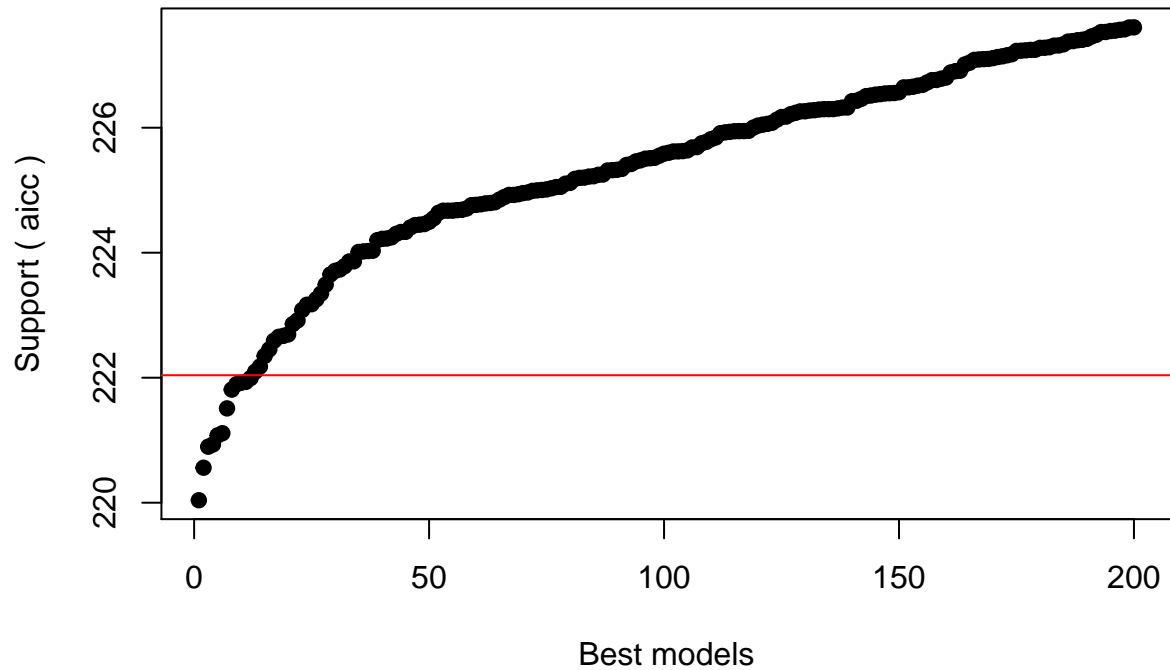

```
##
## After 4350 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
## Mean crit= 225.345740072215

##
## After 4400 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
## Mean crit= 225.345740072215

##
## After 4450 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
## Mean crit= 225.345740072215

##
## After 4500 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
## Mean crit= 225.337986858511

##
## After 4550 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
```
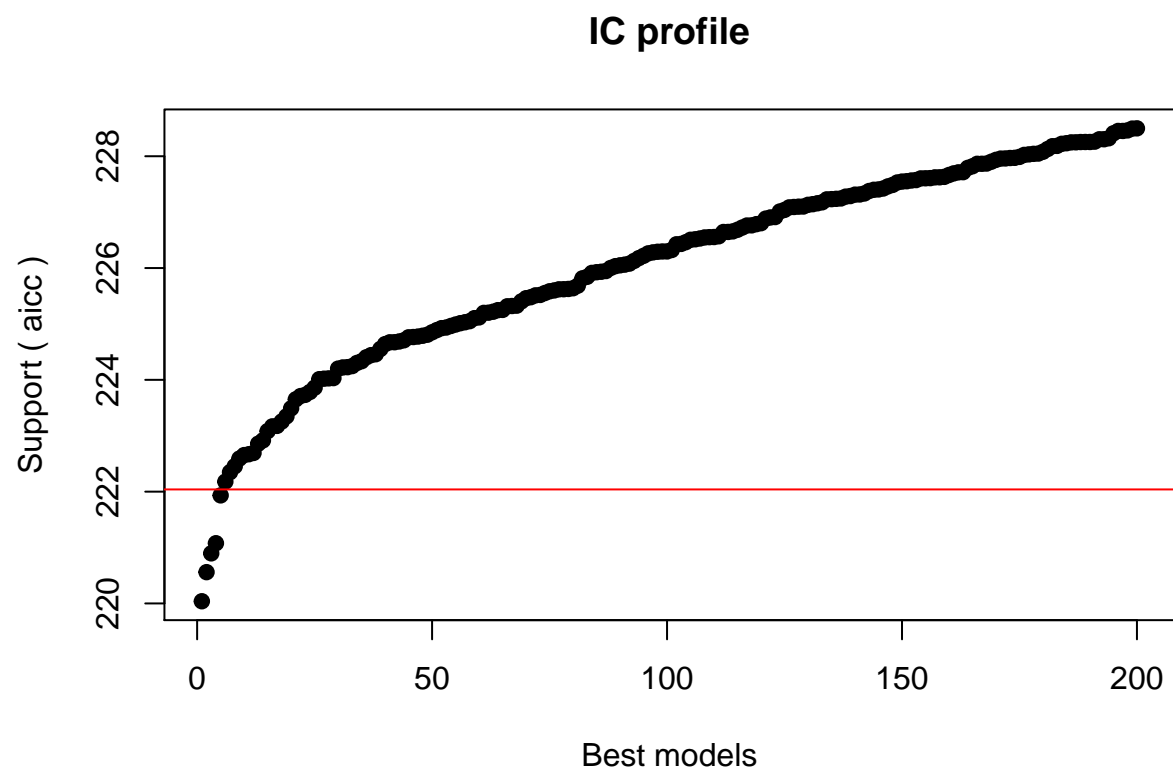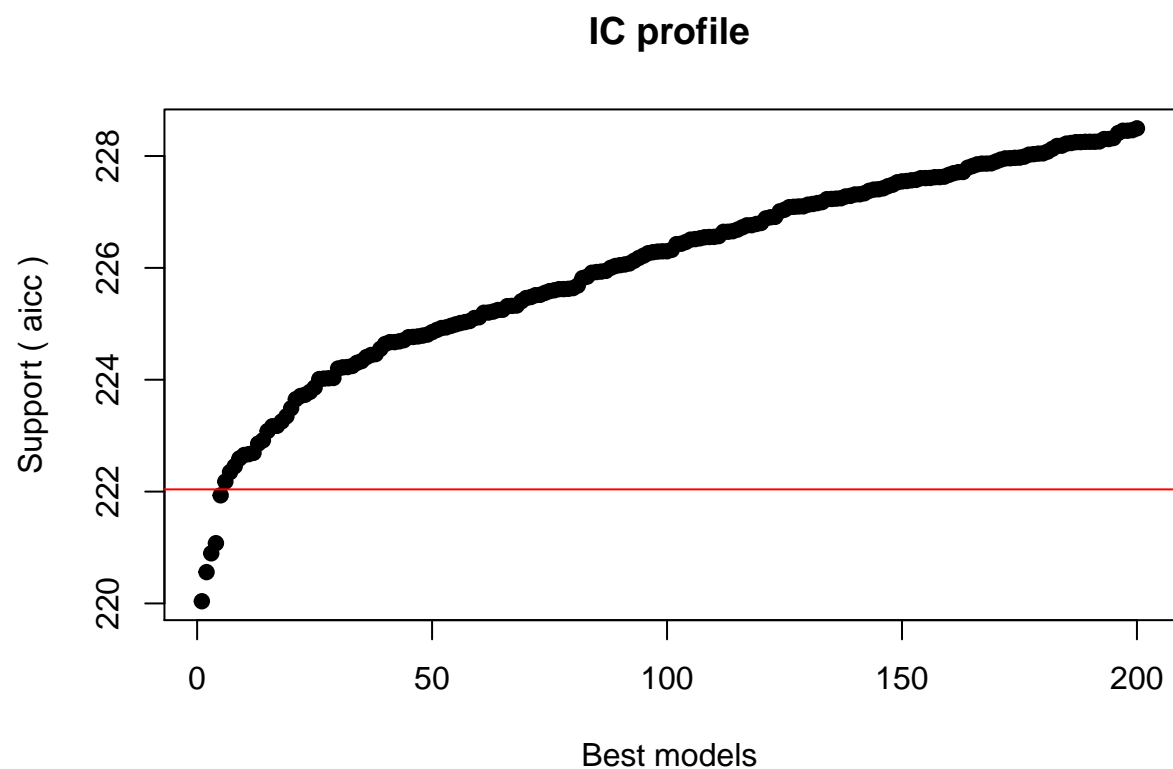
```
## Mean crit= 225.337986858511
```

IC profile
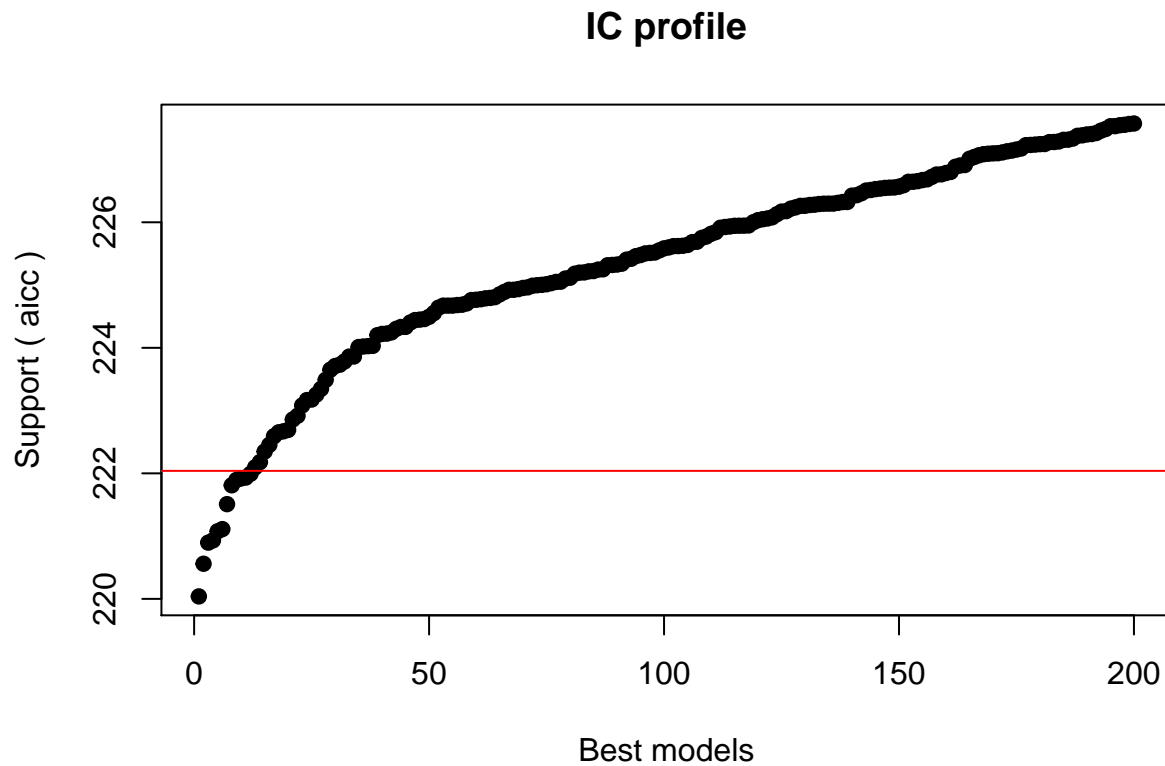

```
##
## After 4600 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
## Mean crit= 225.337986858511

##
## After 4650 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
## Mean crit= 225.337986858511

##
## After 4700 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
## Mean crit= 225.337986858511

##
## After 4750 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
## Mean crit= 225.267605472561
```
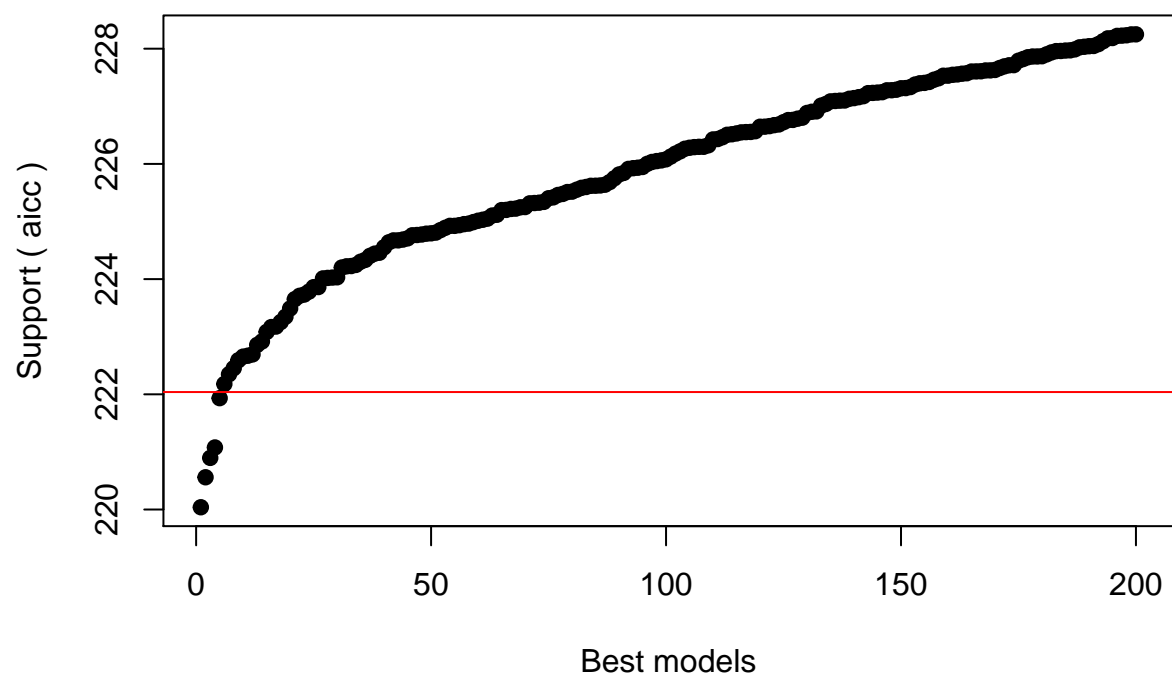
IC profile
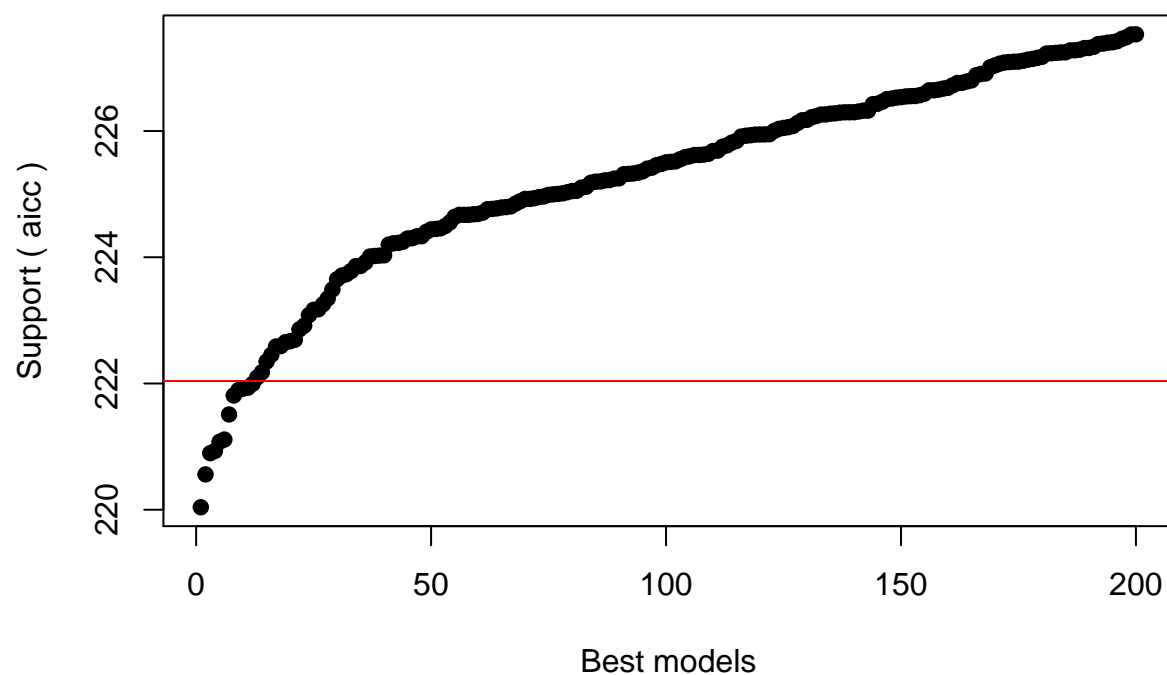

```
##
## After 4800 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
## Mean crit= 225.239932377848

##
## After 4850 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
## Mean crit= 225.239932377848
```
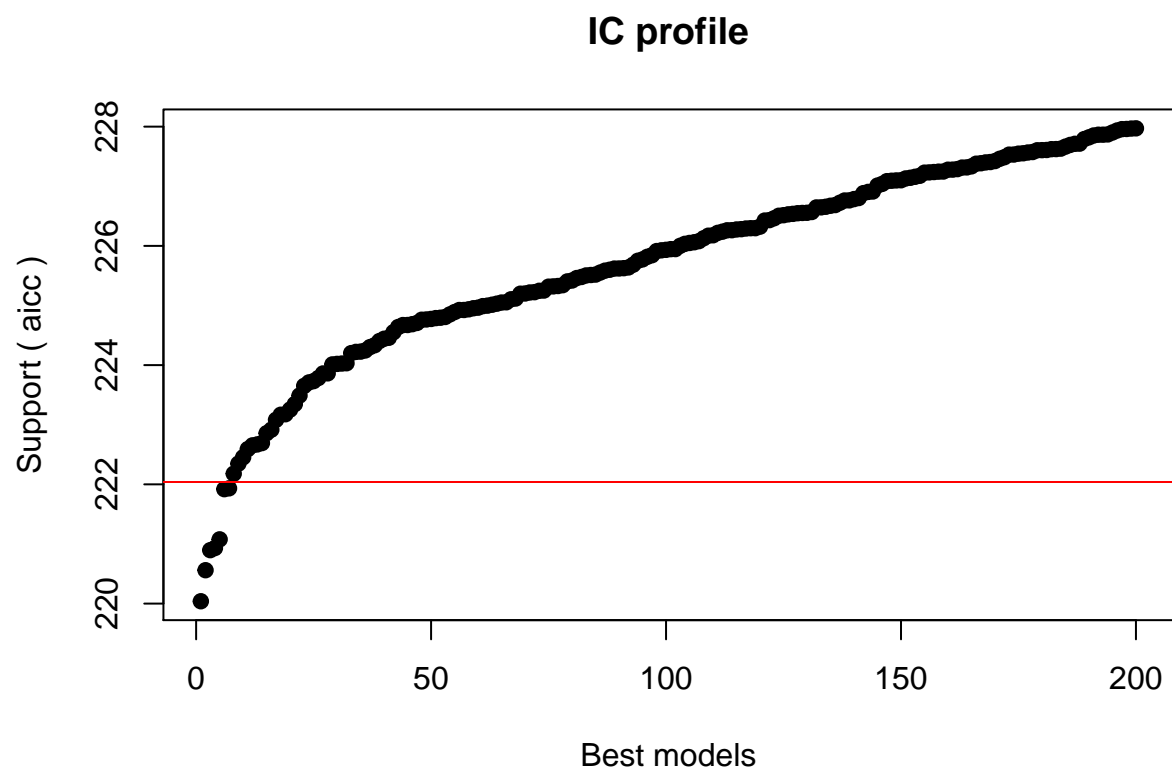
IC profile
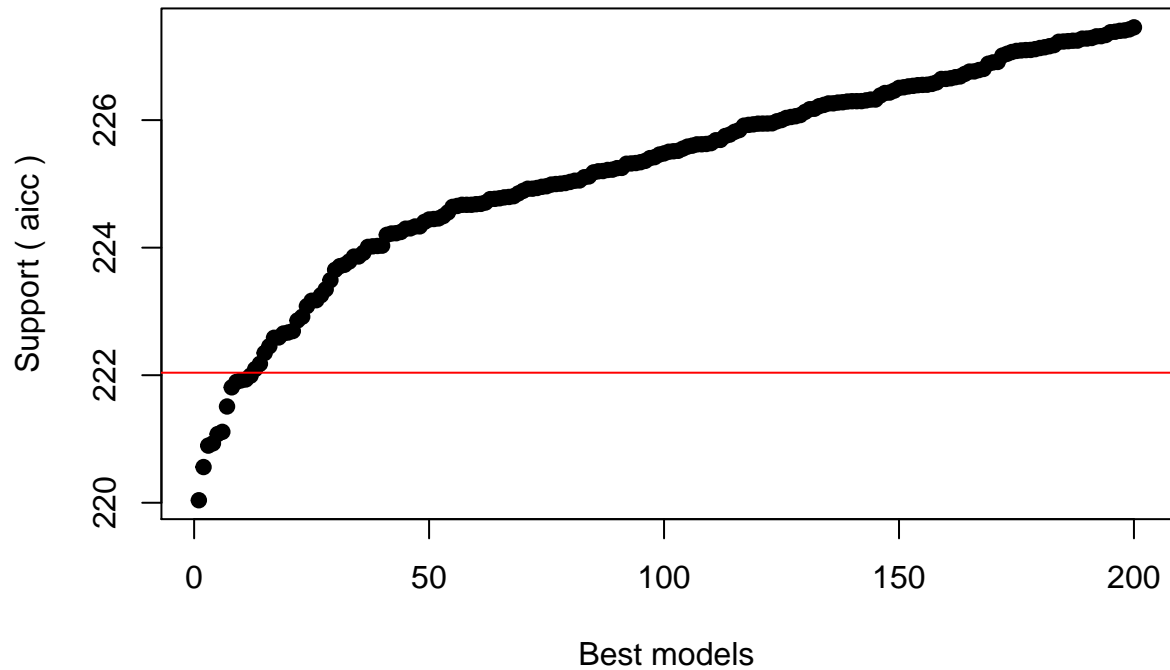

```
##
## After 4900 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
## Mean crit= 225.239932377848

##
## After 4950 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
## Mean crit= 225.239932377848

##
## After 5000 models:
## Best model: target~1+zn+nox+rm+age+dis+rad+tax+ptratio+black
## Crit= 220.039388663467
## Mean crit= 225.233384165617
```

IC profile
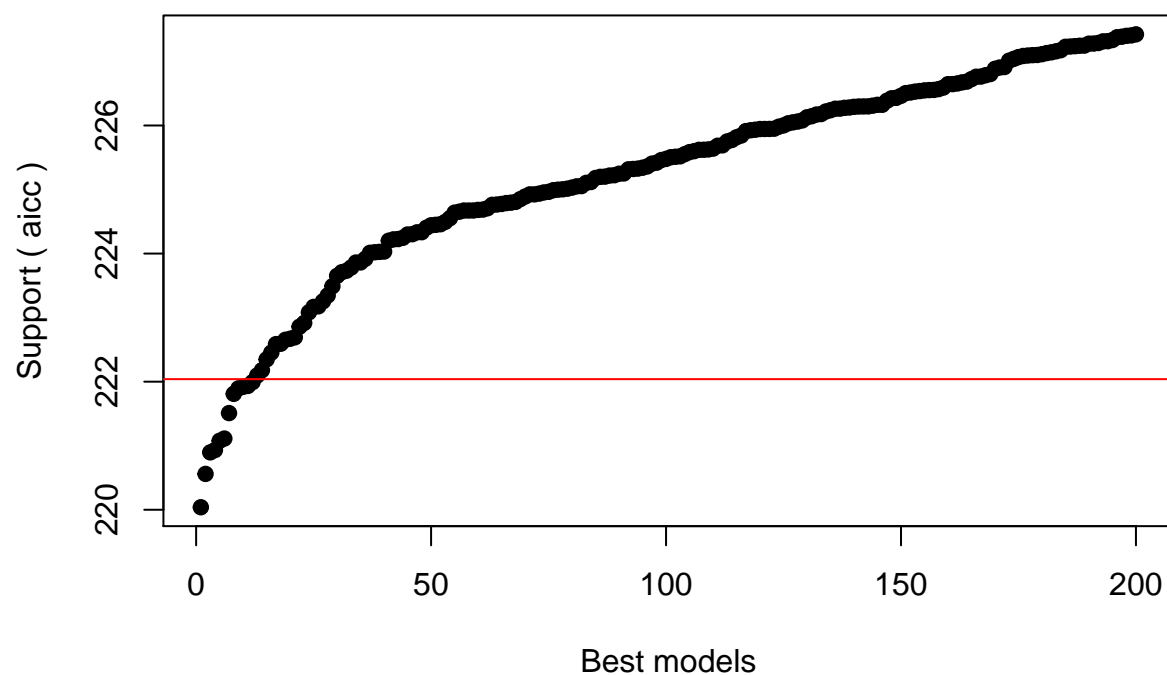

```
## 
## After 5050 models:
## Best model: target~1+zn+indus+chas+nox+age+dis+rad+ptratio+medv
## Crit= 219.311567679387
## Mean crit= 224.971376001335

## 
## After 5100 models:
## Best model: target~1+zn+indus+chas+nox+age+dis+rad+ptratio+medv
## Crit= 219.311567679387
## Mean crit= 224.971376001335
```

IC profile

Best models

```
##
## After 5150 models:
## Best model: target~1+zn+indus+chas+nox+age+dis+rad+ptratio+medv
## Crit= 219.311567679387
## Mean crit= 224.971376001335

##
## After 5200 models:
## Best model: target~1+zn+indus+chas+nox+age+dis+rad+ptratio+medv
## Crit= 219.311567679387
## Mean crit= 224.968892010611
```

IC profile

Best models

```
##
## After 5250 models:
## Best model: target~1+zn+indus+chas+nox+age+dis+rad+ptratio+medv
## Crit= 219.311567679387
## Mean crit= 224.783725757671
```

IC profile
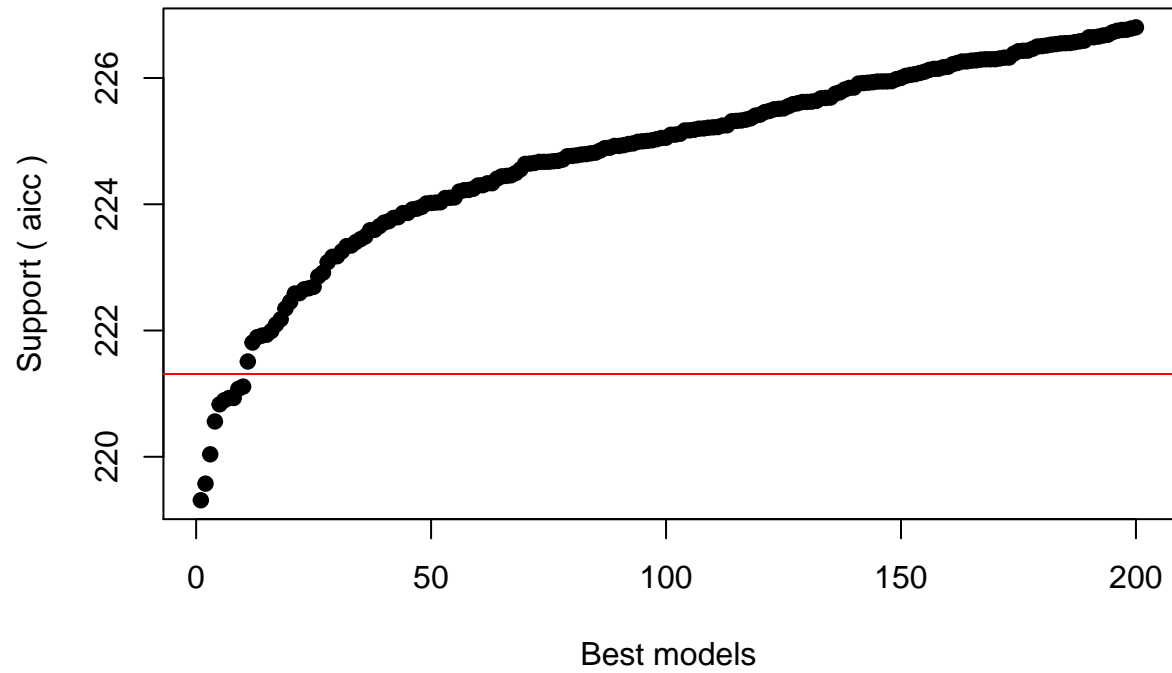

```
##
## After 5300 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+medv
## Crit= 215.717589622456
## Mean crit= 224.106084793973

##
## After 5350 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+medv
## Crit= 215.717589622456
## Mean crit= 224.106084793973
```

IC profile


```
## 
## After 5400 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+medv
## Crit= 215.717589622456
## Mean crit= 224.106084793973

## 
## After 5450 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+medv
## Crit= 215.717589622456
## Mean crit= 224.106084793973

## 
## After 5500 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+medv
## Crit= 215.717589622456
## Mean crit= 224.106084793973

## 
## After 5550 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+medv
## Crit= 215.717589622456
## Mean crit= 224.088684938653
```

IC profile


```
##
## After 5600 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+medv
## Crit= 215.717589622456
## Mean crit= 224.088450371427

##
## After 5650 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+medv
## Crit= 215.717589622456
## Mean crit= 224.088450371427
```

IC profile
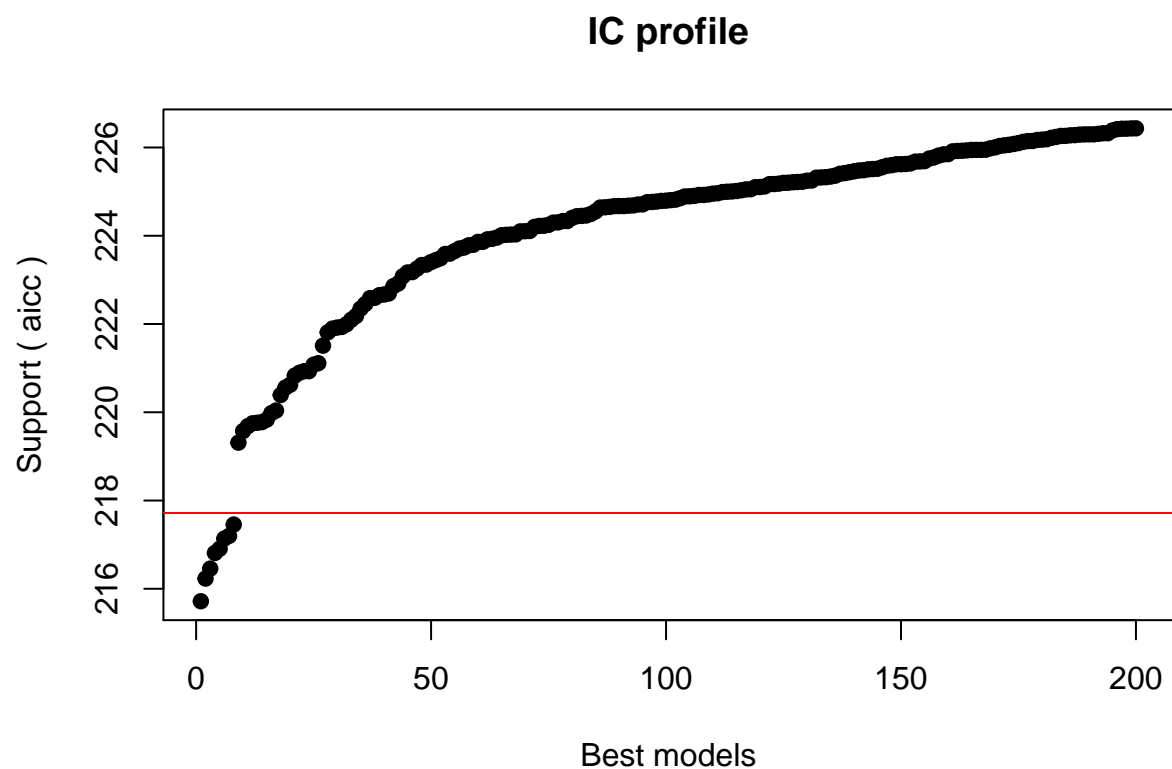

```
## 
## After 5700 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+medv
## Crit= 215.717589622456
## Mean crit= 224.088450371427

## 
## After 5750 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+medv
## Crit= 215.717589622456
## Mean crit= 224.088450371427

## 
## After 5800 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+medv
## Crit= 215.717589622456
## Mean crit= 224.076622677562
```
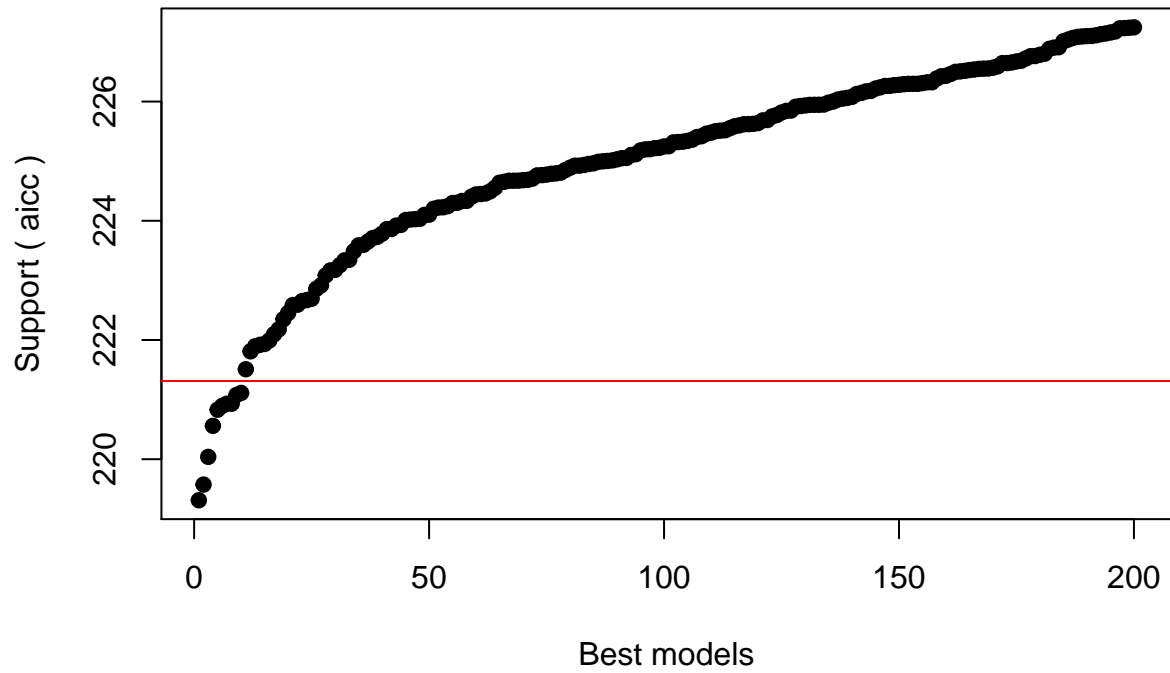
IC profile
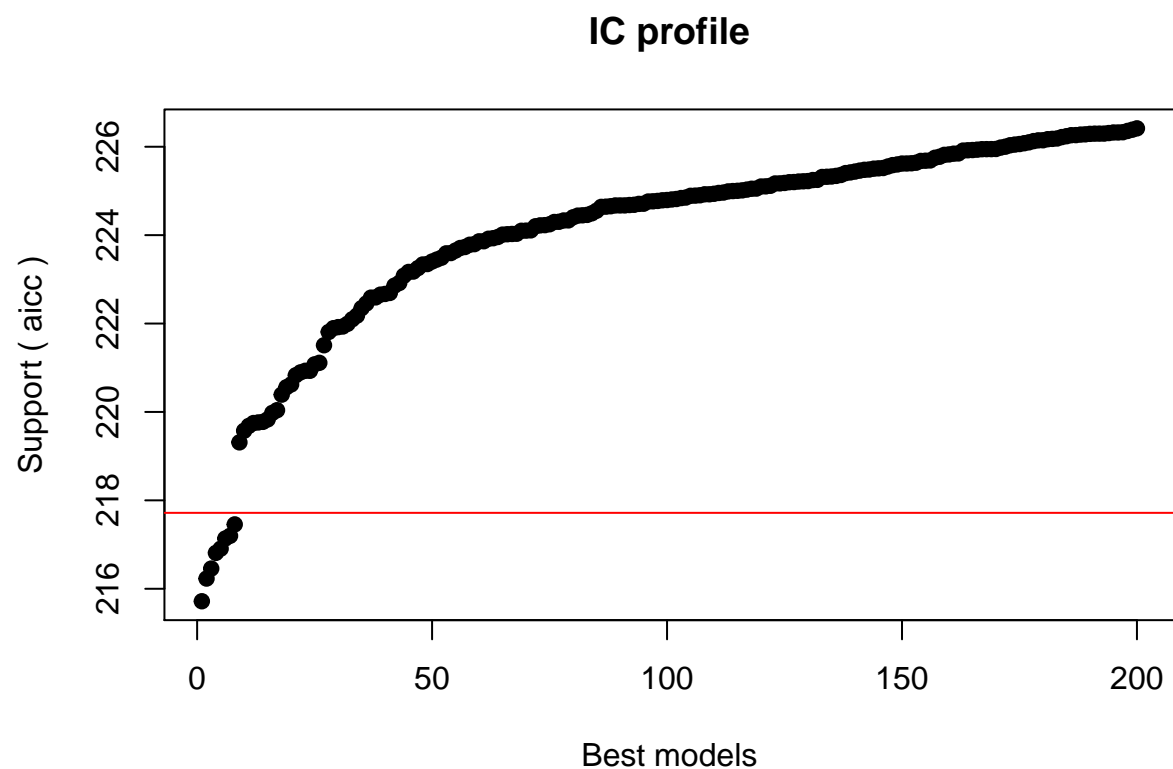

```
##
## After 5850 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+medv
## Crit= 215.717589622456
## Mean crit= 223.929196132353

##
## After 5900 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+medv
## Crit= 215.717589622456
## Mean crit= 223.929196132353
```
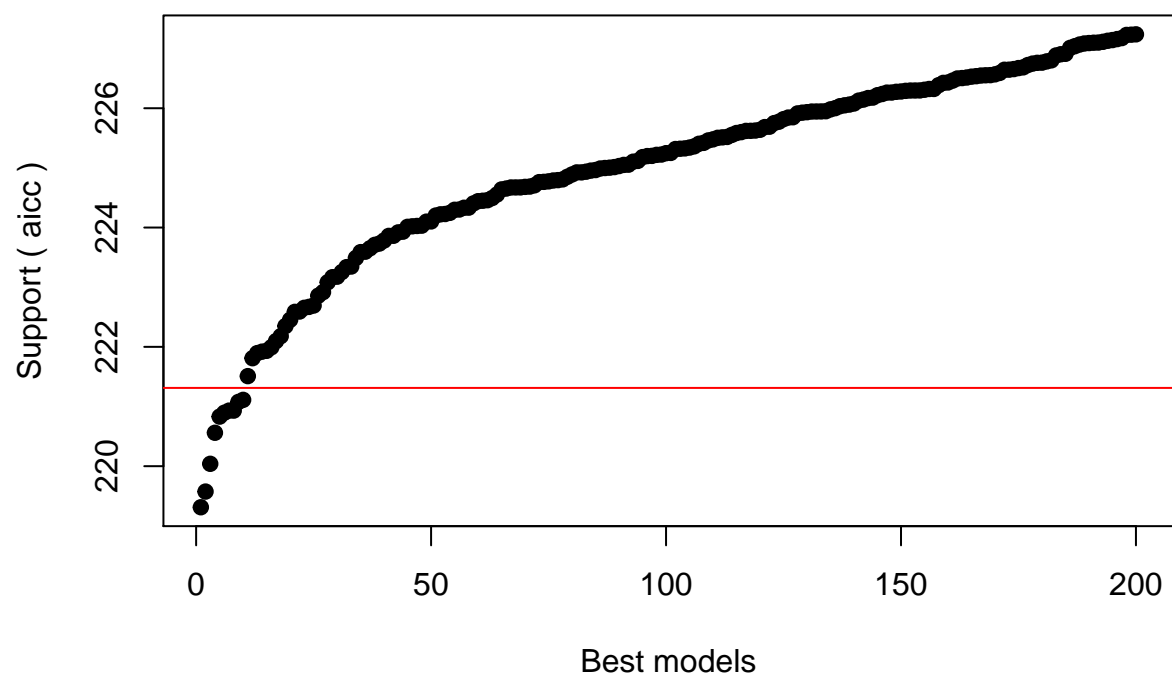
IC profile
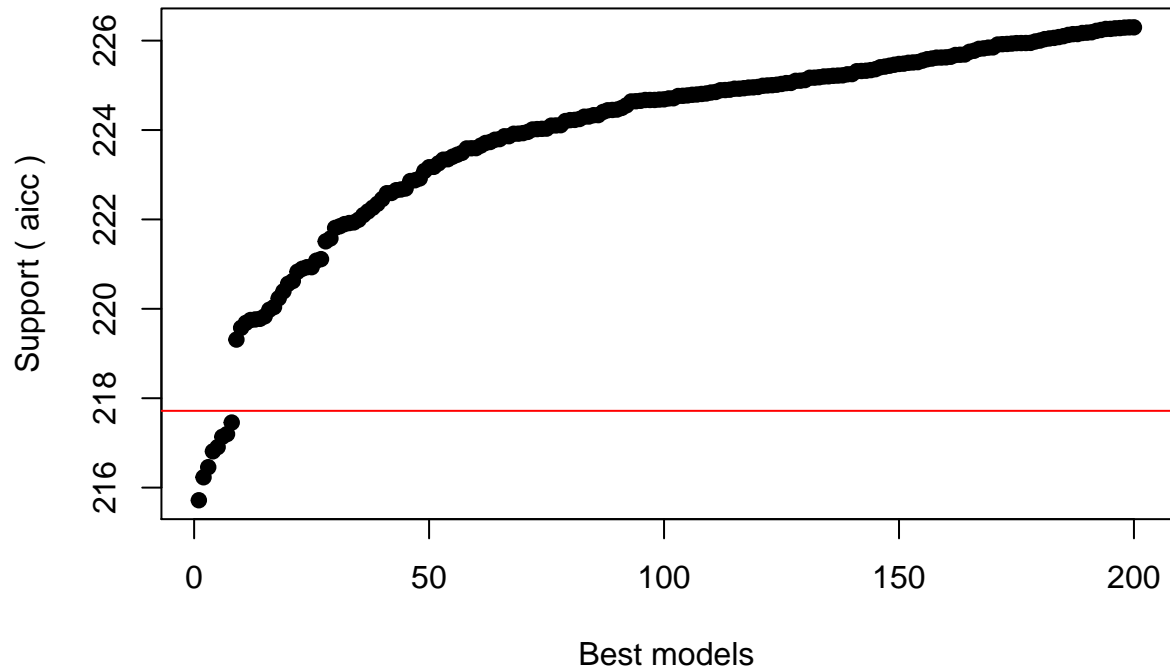

```
##
## After 5950 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+medv
## Crit= 215.717589622456
## Mean crit= 223.929196132353

##
## After 6000 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+medv
## Crit= 215.717589622456
## Mean crit= 223.929196132353

##
## After 6050 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+medv
## Crit= 215.717589622456
## Mean crit= 223.908434794793
```

IC profile
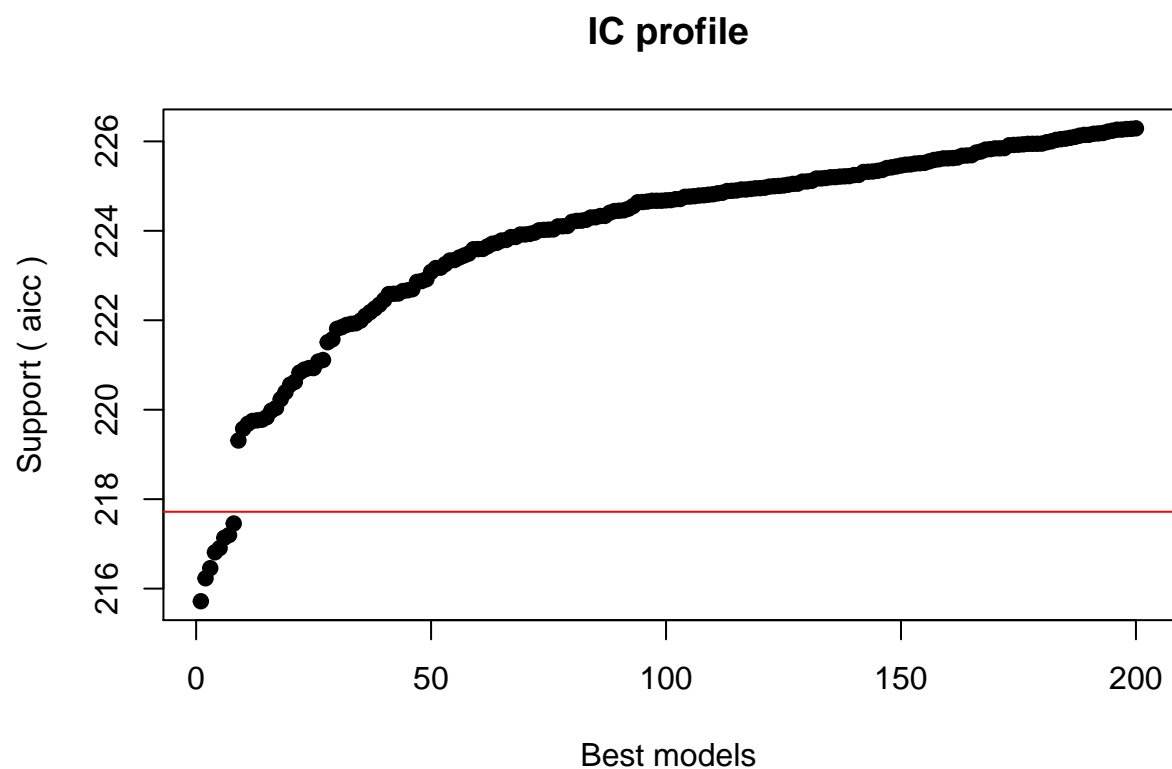

```
##
## After 6100 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+medv
## Crit= 215.717589622456
## Mean crit= 223.540065559545

##
## After 6150 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+medv
## Crit= 215.717589622456
## Mean crit= 223.540065559545
```
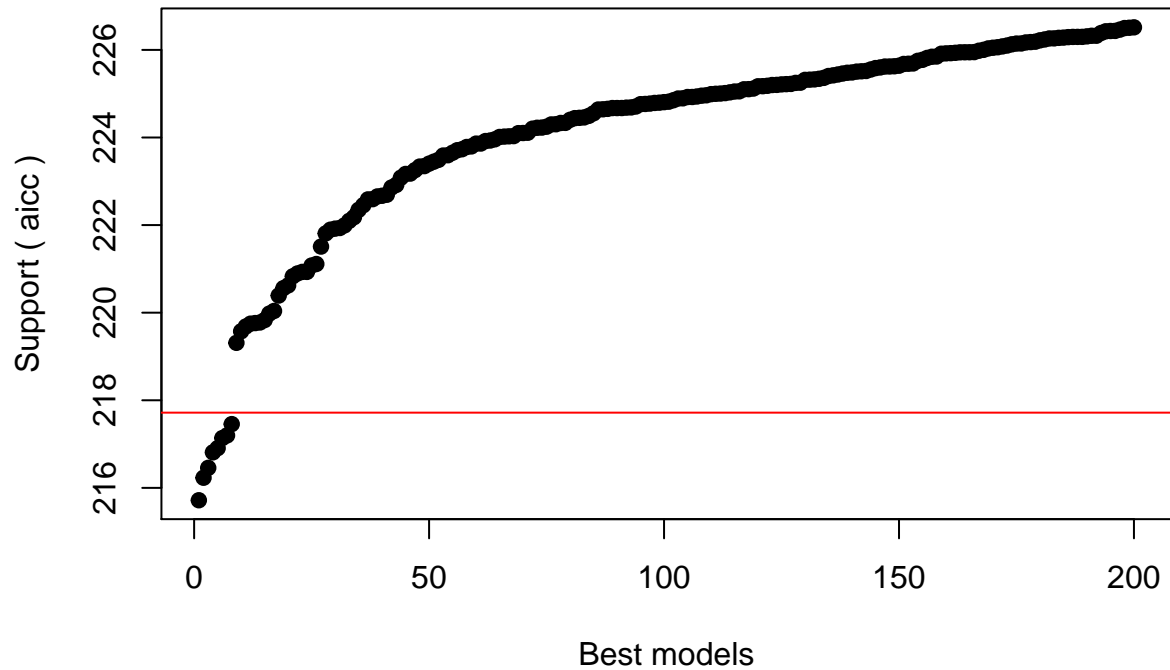
IC profile
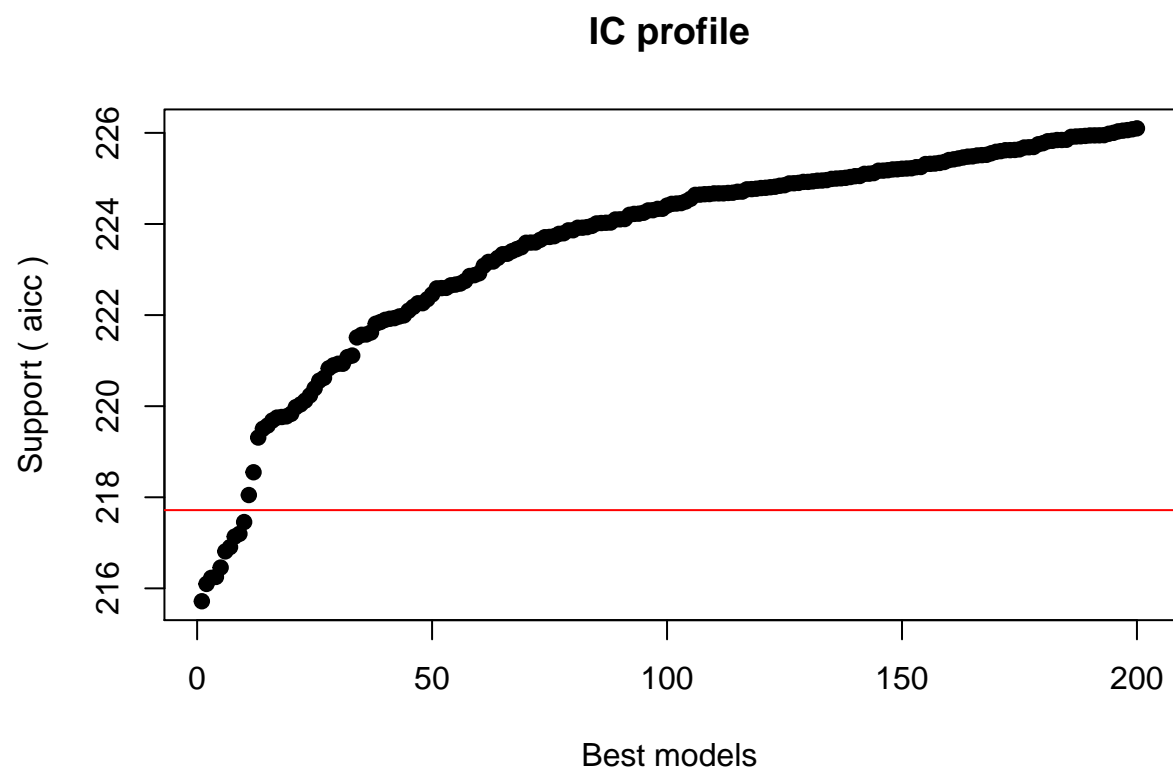

```
## 
## After 6200 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+medv
## Crit= 215.717589622456
## Mean crit= 223.540065559545

## 
## After 6250 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+medv
## Crit= 215.717589622456
## Mean crit= 223.471077239181
```

IC profile
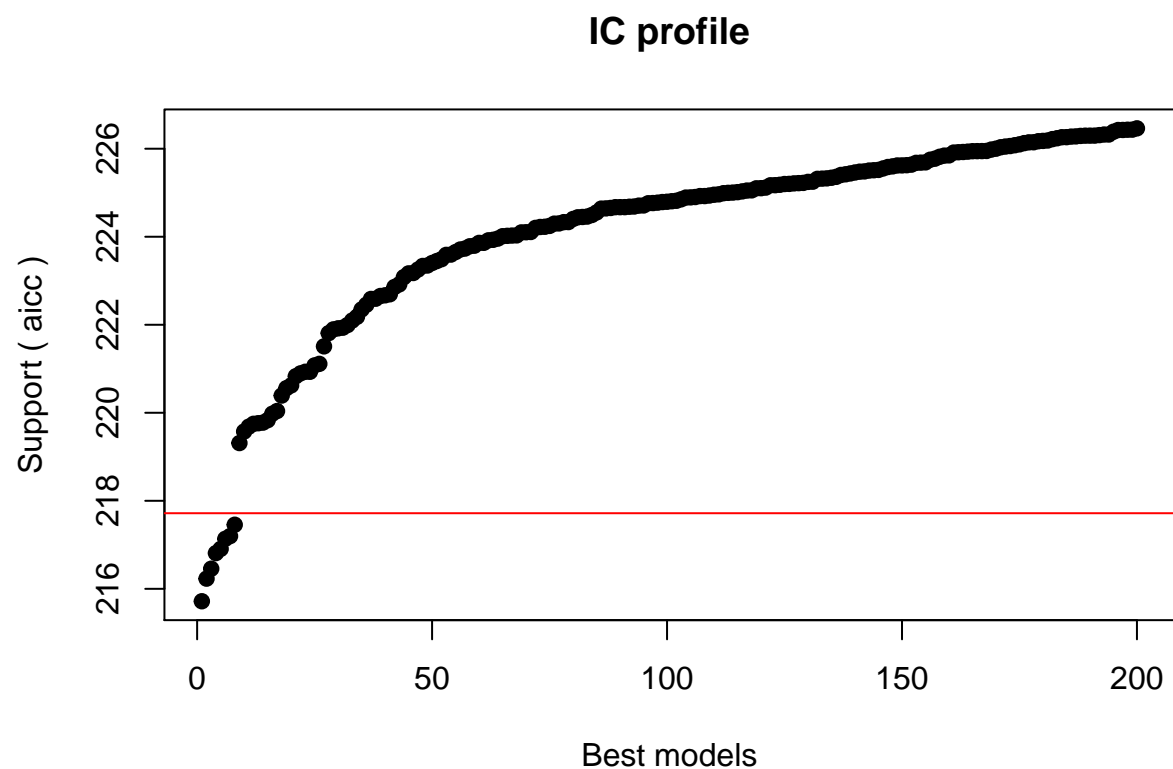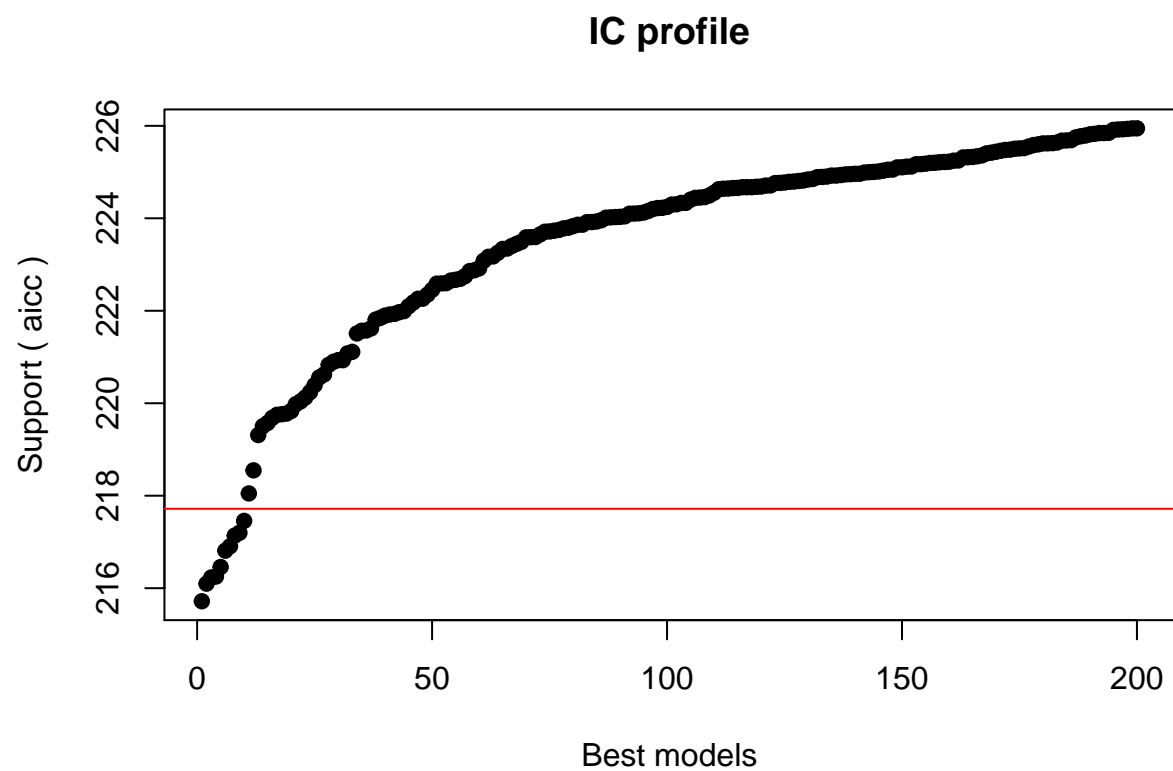


```
##
## After 6300 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+medv
## Crit= 215.717589622456
## Mean crit= 223.166660194341
```

IC profile
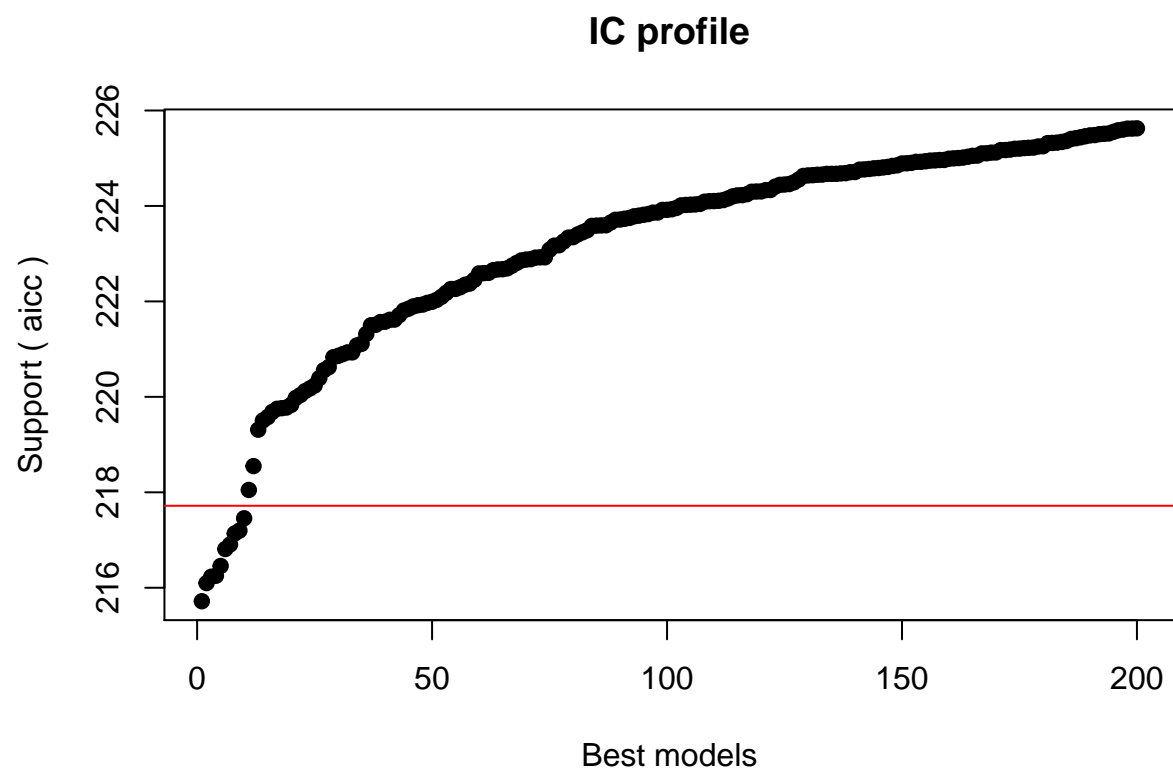
Best models

```
##
## After 6350 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+black+medv
## Crit= 213.050419265871
## Mean crit= 222.422680241852
```

IC profile
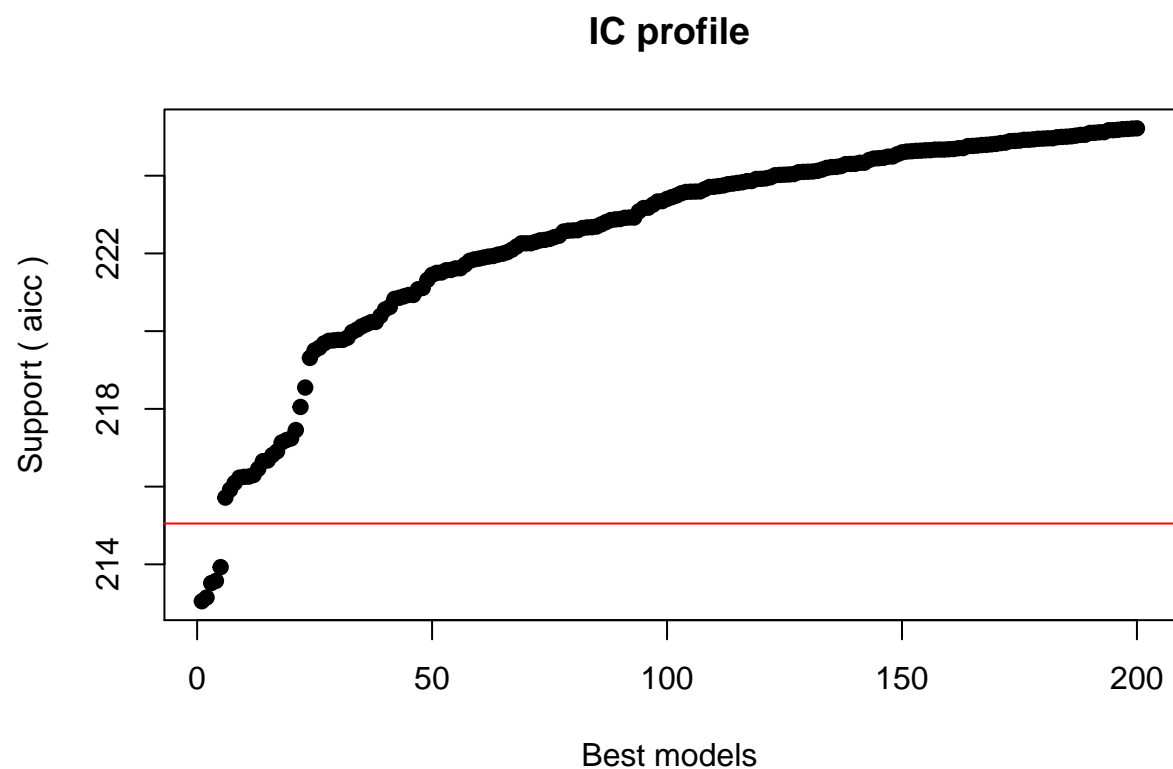

```
##
## After 6400 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+black+medv
## Crit= 213.050419265871
## Mean crit= 222.158345255993

##
## After 6450 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+black+medv
## Crit= 213.050419265871
## Mean crit= 222.158345255993
```

IC profile


```
##
## After 6500 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+black+medv
## Crit= 213.050419265871
## Mean crit= 222.158345255993

##
## After 6550 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+black+medv
## Crit= 213.050419265871
## Mean crit= 222.158345255993

##
## After 6600 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+black+medv
## Crit= 213.050419265871
## Mean crit= 222.158345255993

##
## After 6650 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+black+medv
## Crit= 213.050419265871
## Mean crit= 222.158345255993

##
## After 6700 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+black+medv
## Crit= 213.050419265871
```

```
## Mean crit= 222.158345255993

##
## After 6750 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+black+medv
## Crit= 213.050419265871
## Mean crit= 222.158345255993

##
## After 6800 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+black+medv
## Crit= 213.050419265871
## Mean crit= 222.158345255993

##
## After 6850 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+black+medv
## Crit= 213.050419265871
## Mean crit= 222.158345255993

##
## After 6900 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+black+medv
## Crit= 213.050419265871
## Mean crit= 222.14578611558

##
## After 6950 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+black+medv
## Crit= 213.050419265871
## Mean crit= 222.14578611558
```

IC profile


```
## 
## After 7000 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+black+medv
## Crit= 213.050419265871
## Mean crit= 222.14578611558

## 
## After 7050 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+black+medv
## Crit= 213.050419265871
## Mean crit= 222.14578611558

## 
## After 7100 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+black+medv
## Crit= 213.050419265871
## Mean crit= 222.141563385815
```

IC profile


```
##
## After 7150 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+black+medv
## Crit= 213.050419265871
## Mean crit= 222.062825719026

##
## After 7200 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+black+medv
## Crit= 213.050419265871
## Mean crit= 222.062825719026
```

IC profile

Support (aicc)

Best models

```
##
## After 7250 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+black+medv
## Crit= 213.050419265871
## Mean crit= 222.062825719026

##
## After 7300 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+black+medv
## Crit= 213.050419265871
## Mean crit= 222.062825719026

##
## After 7350 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+black+medv
## Crit= 213.050419265871
## Mean crit= 222.056466529248
```

IC profile


```
##
## After 7400 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+black+medv
## Crit= 213.050419265871
## Mean crit= 221.700322905469
```

IC profile

Support (aicc) vs Best models
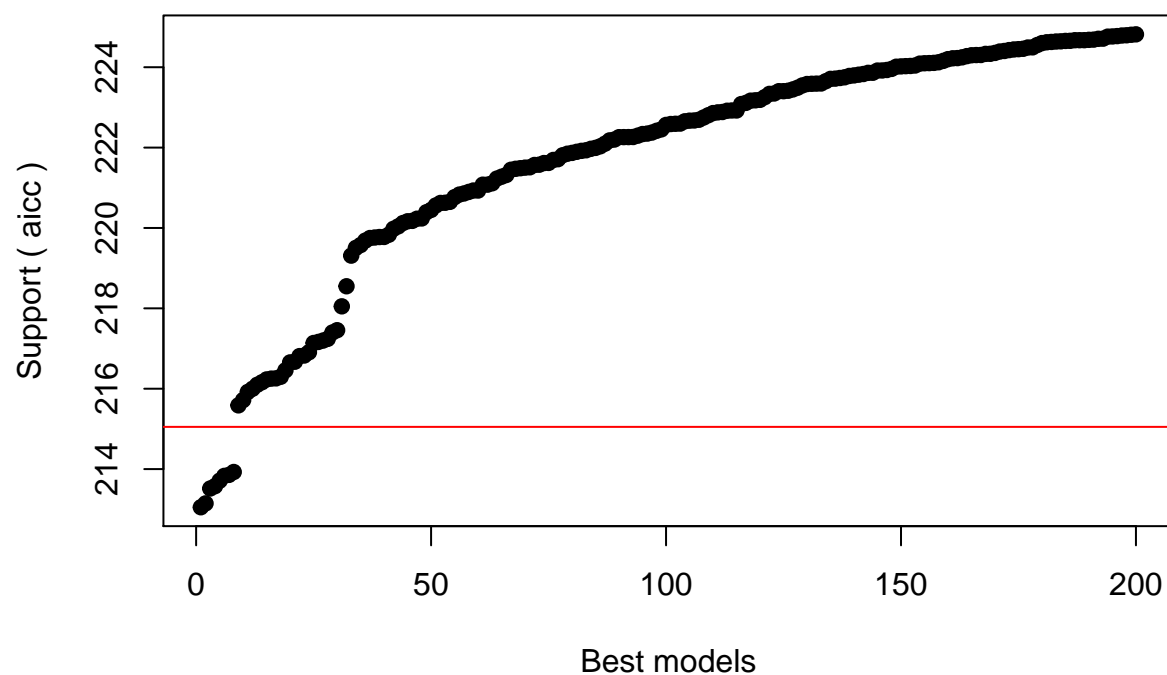
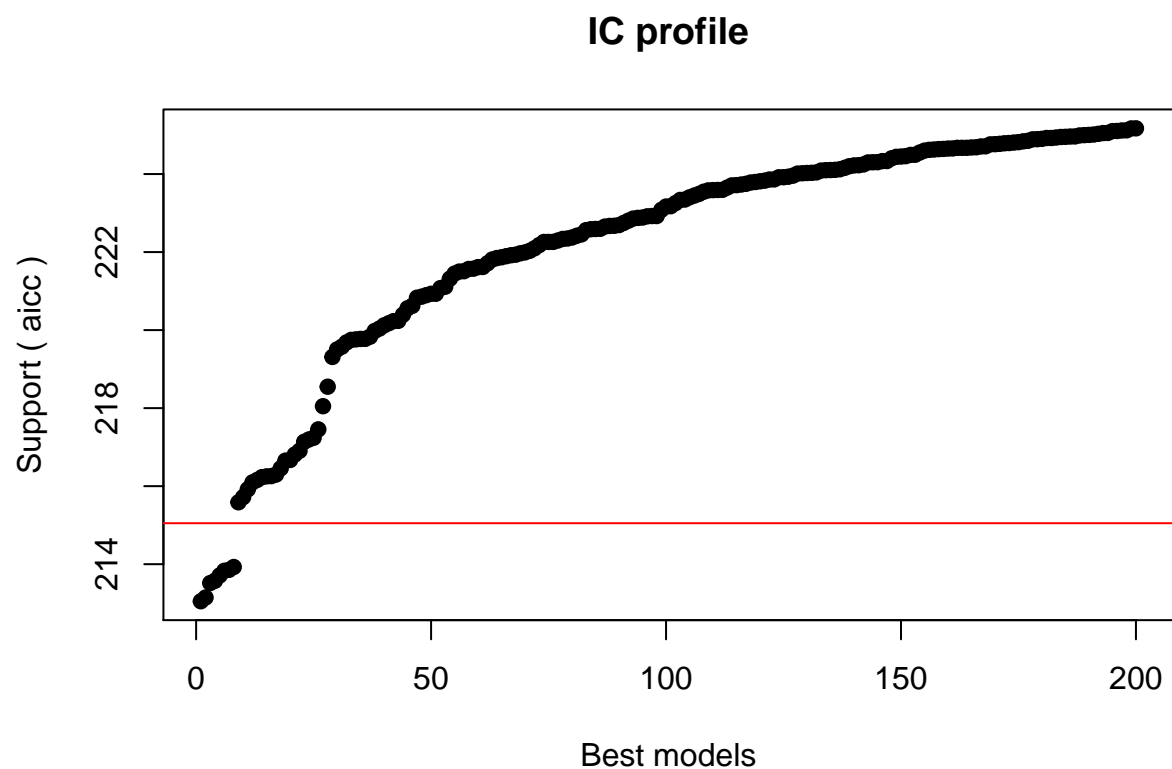```
##
After 7450 models:
Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+black+medv
Crit= 213.050419265871
Mean crit= 221.508361709676

##
After 7500 models:
Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+black+medv
Crit= 213.050419265871
Mean crit= 221.508361709676
```

## IC profile
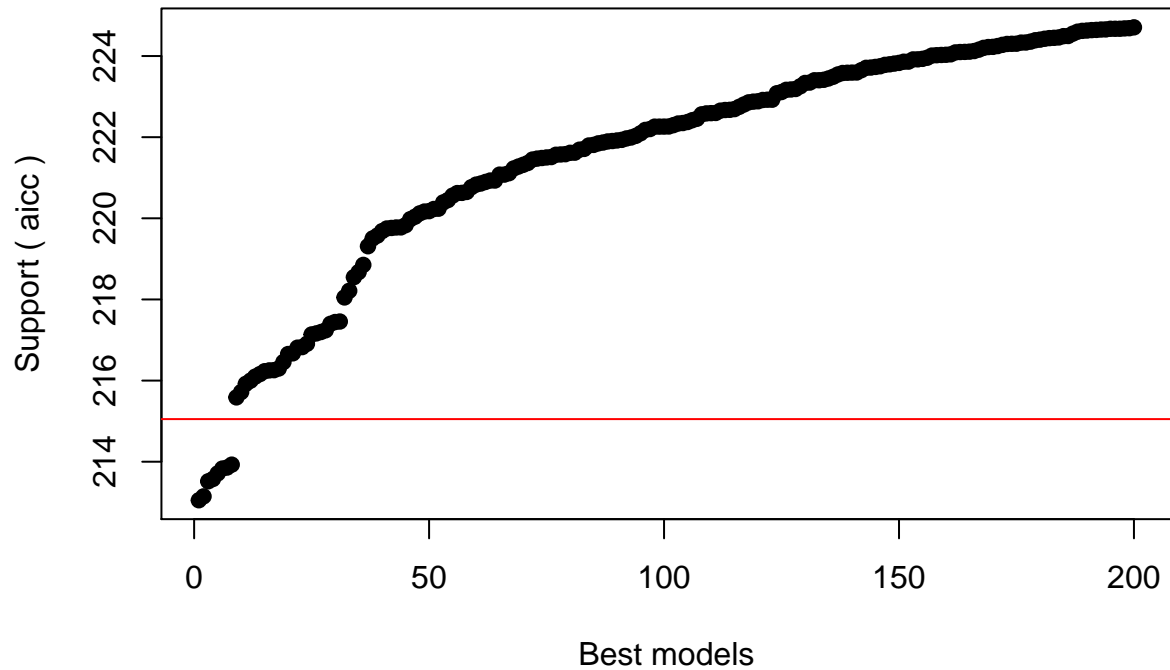


```
## 
## After 7550 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+black+medv
## Crit= 213.050419265871
## Mean crit= 221.508361709676

## 
## After 7600 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+black+medv
## Crit= 213.050419265871
## Mean crit= 221.508361709676

## 
## After 7650 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+black+medv
## Crit= 213.050419265871
## Mean crit= 221.508361709676

## 
## After 7700 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+black+medv
## Crit= 213.050419265871
## Mean crit= 221.508361709676

## 
## After 7750 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+black+medv
## Crit= 213.050419265871
```

```
## Mean crit= 221.508361709676

##
## After 7800 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+black+medv
## Crit= 213.050419265871
## Mean crit= 221.508361709676

##
## After 7850 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+black+medv
## Crit= 213.050419265871
## Mean crit= 221.508361709676

##
## After 7900 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+black+medv
## Crit= 213.050419265871
## Mean crit= 221.501933917621
```
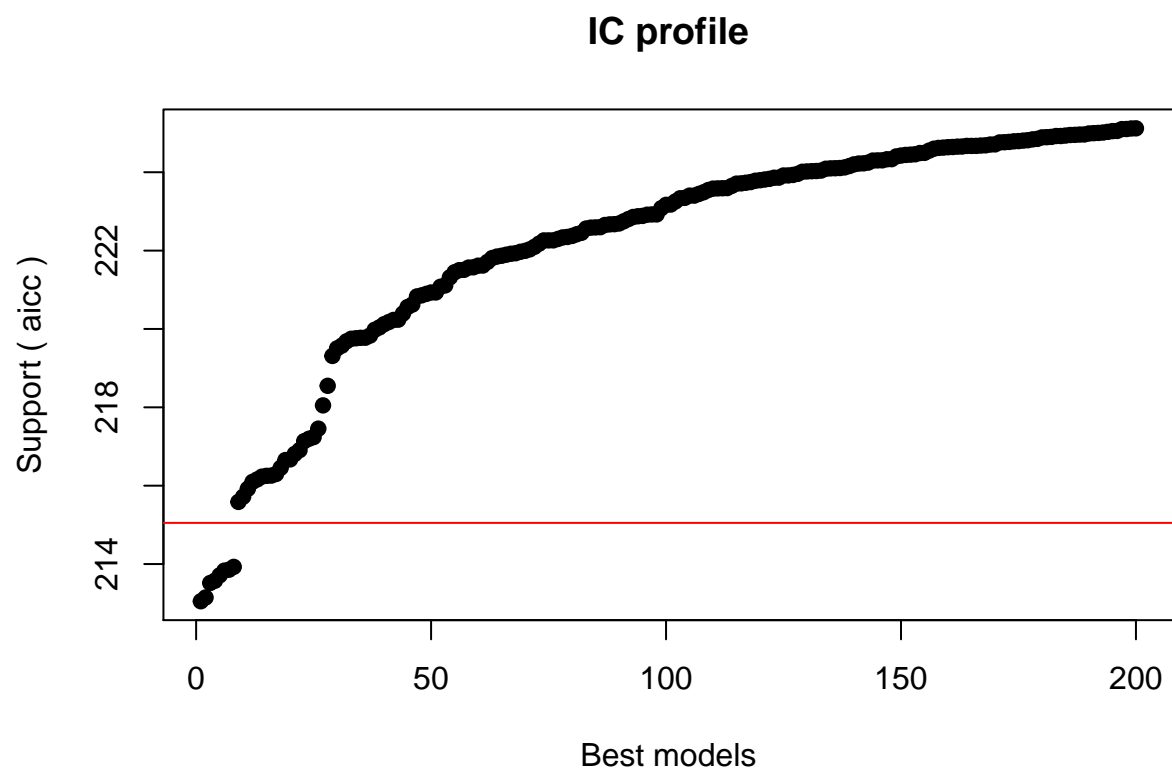
IC profile
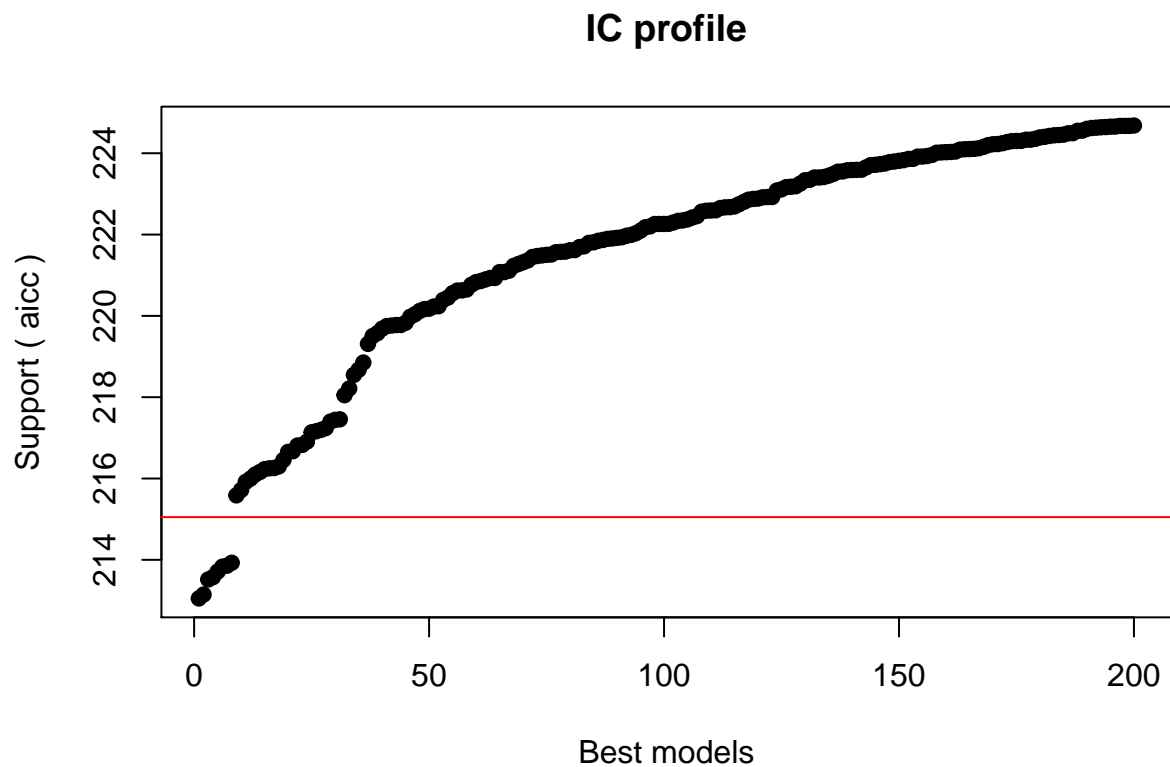

```
##
## After 7950 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+black+medv
## Crit= 213.050419265871
## Mean crit= 221.440348047147

##
## After 8000 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+black+medv
```

```
## Crit= 213.050419265871
## Mean crit= 221.440348047147
```

IC profile
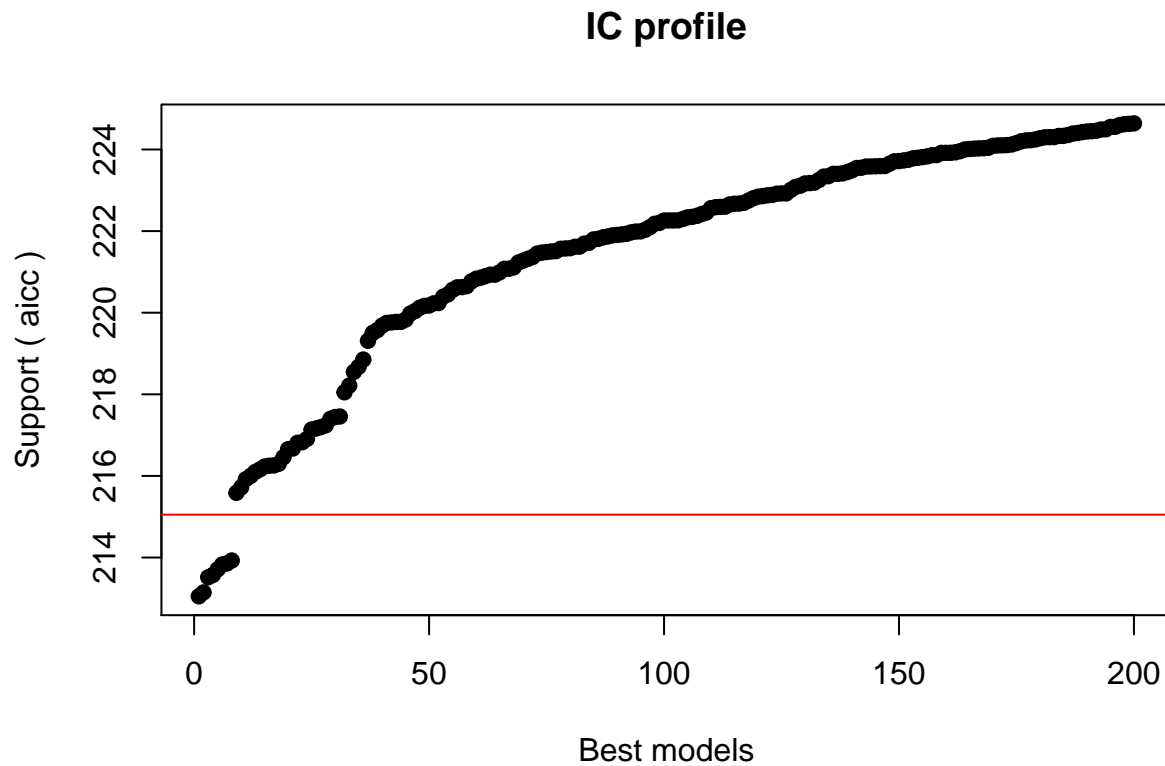

```
##
## After 8050 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+black+medv
## Crit= 213.050419265871
## Mean crit= 221.440348047147

##
## After 8100 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+black+medv
## Crit= 213.050419265871
## Mean crit= 221.440348047147

##
## After 8150 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+black+medv
## Crit= 213.050419265871
## Mean crit= 221.440348047147

##
## After 8200 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+black+medv
## Crit= 213.050419265871
## Mean crit= 221.308153170295
```
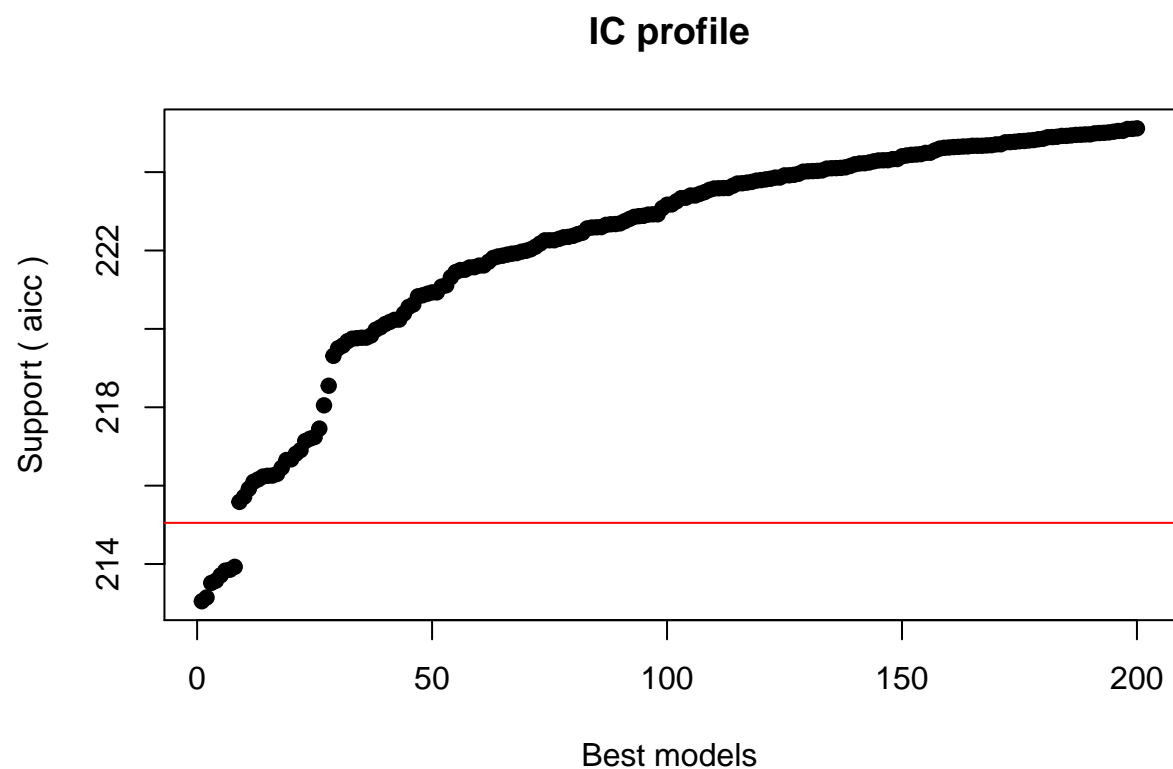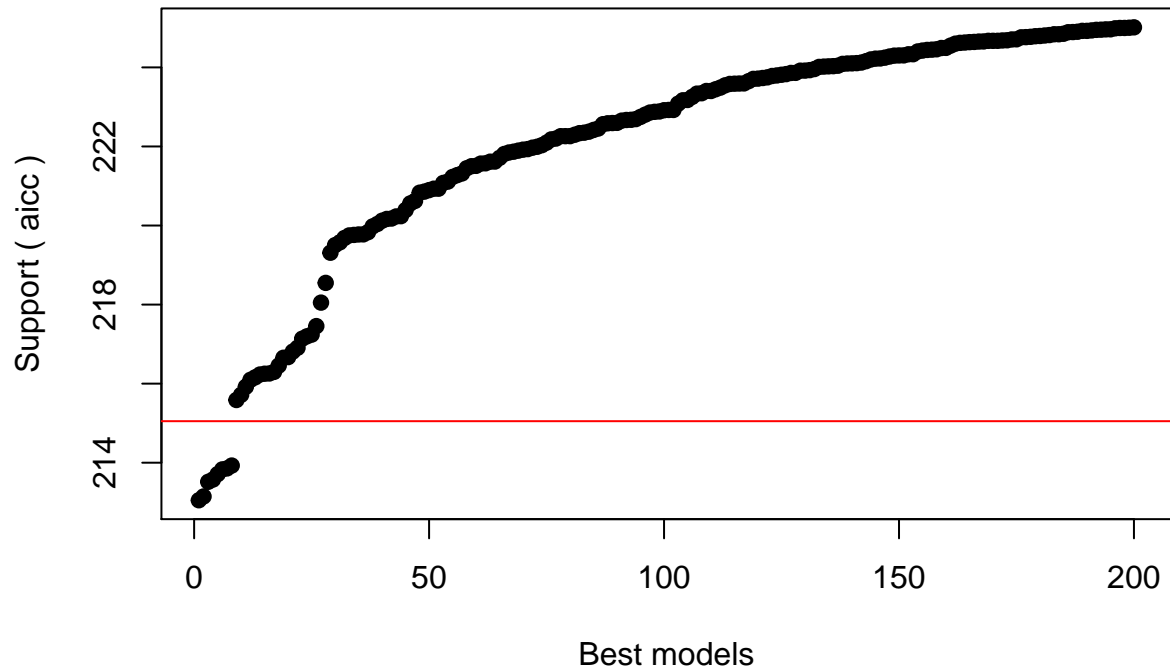
IC profile
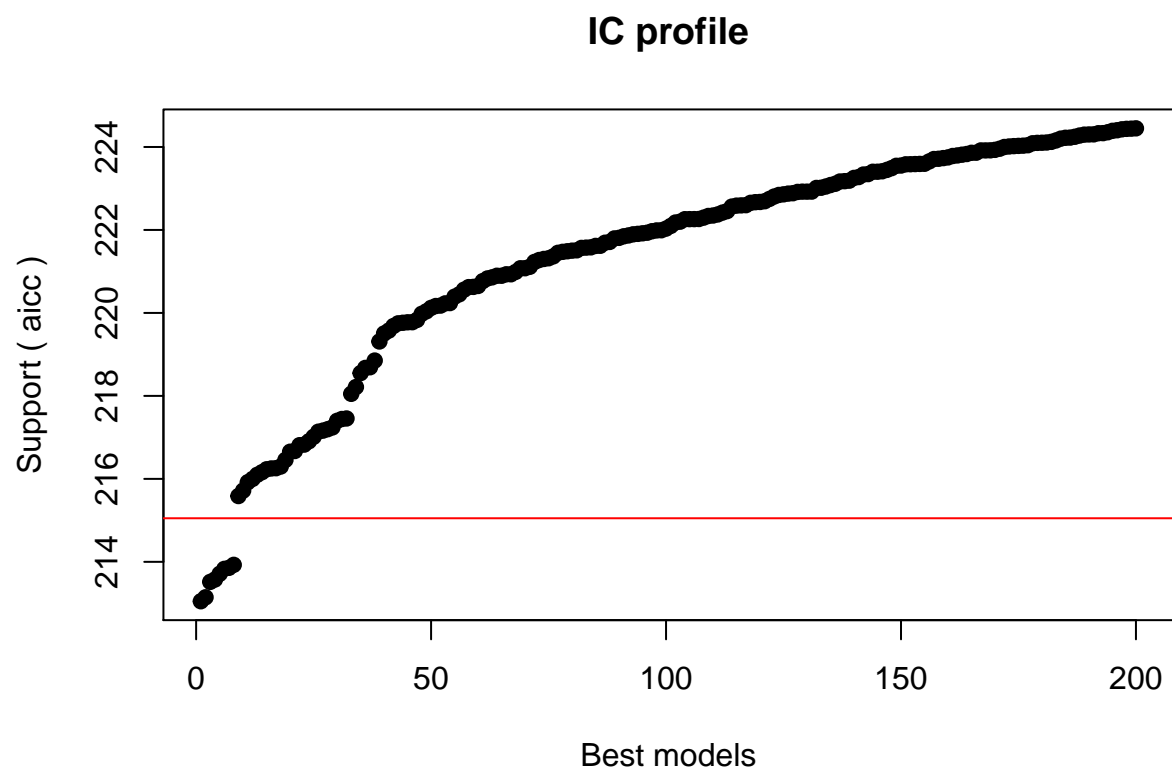

```
## 
## After 8250 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+black+medv
## Crit= 213.050419265871
## Mean crit= 221.228502861837

## 
## After 8300 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+black+medv
## Crit= 213.050419265871
## Mean crit= 221.228502861837
```

IC profile
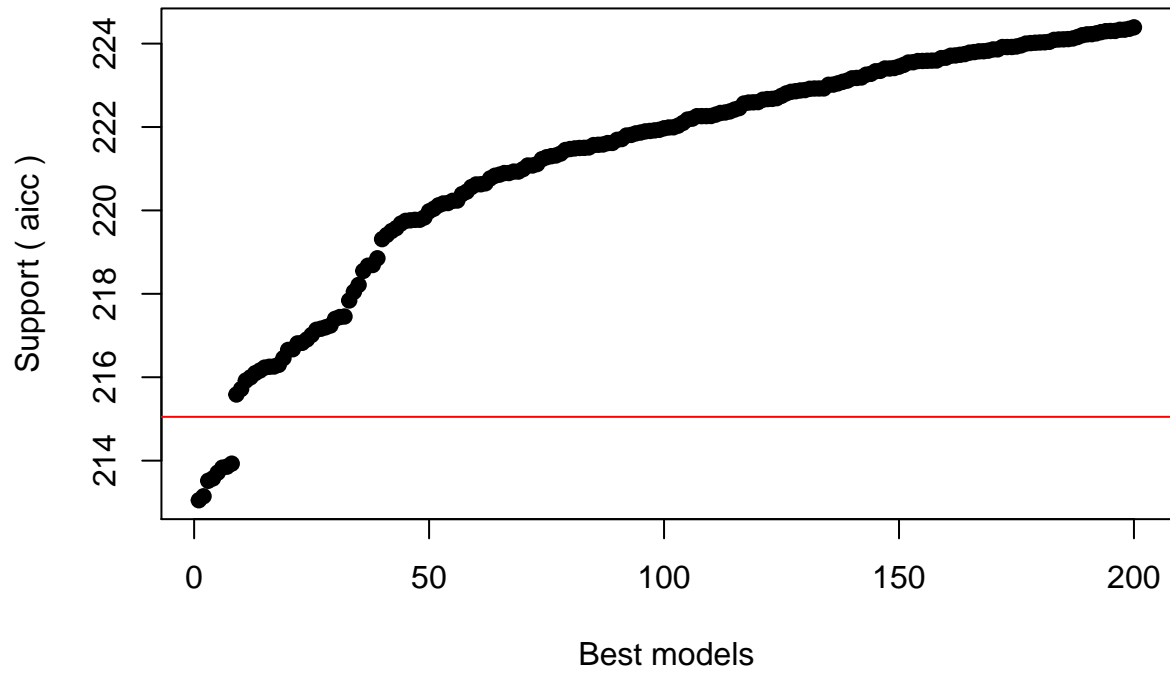

```
## 
## After 8350 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+black+medv
## Crit= 213.050419265871
## Mean crit= 221.228502861837

## 
## After 8400 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+black+medv
## Crit= 213.050419265871
## Mean crit= 221.112903079422
```
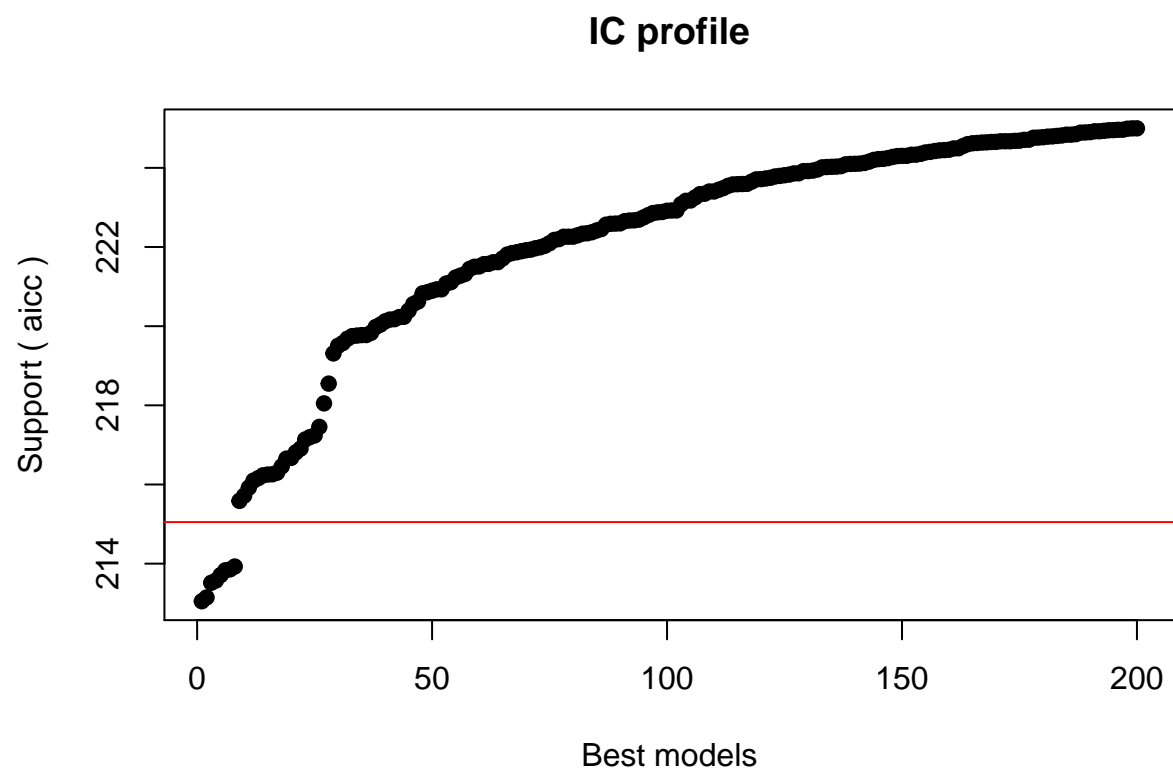
IC profile
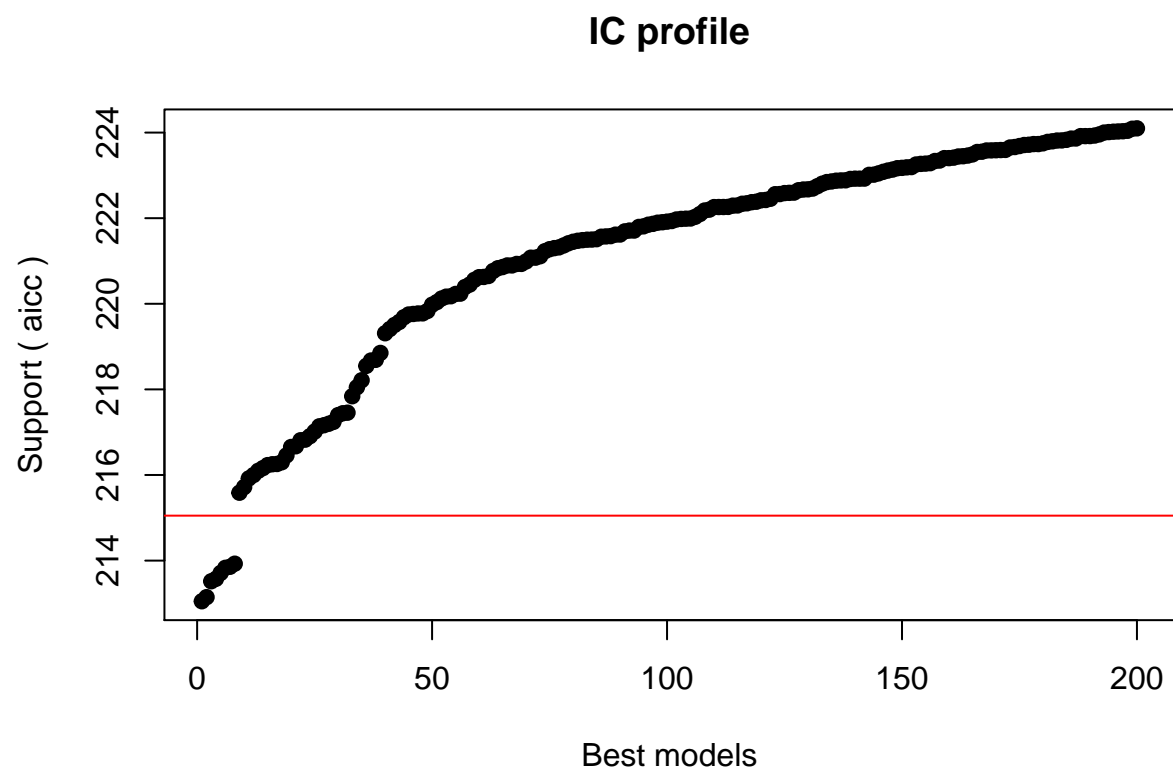
Best models

```
##
## After 8450 models:
## Best model: target~1+zn+nox+age+dis+rad+tax+ptratio+black+medv
## Crit= 213.050419265871
## Mean crit= 220.805727068827
```

IC profile
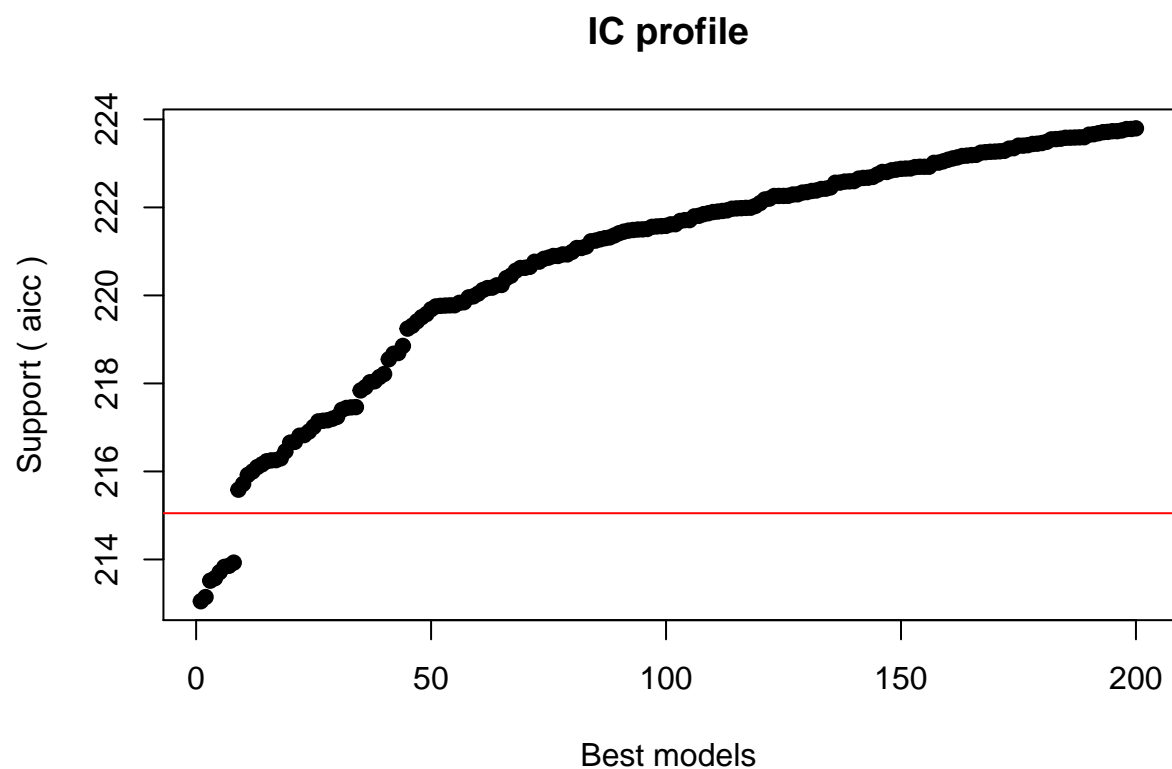
Completed.

```
glmultiLogisticOut@formulas
```

```
## [[1]]
## target ~ 1 + zn + nox + age + dis + rad + tax + ptratio + black +
##     medv
## <environment: 0x000000005fdc0800>
##
## [[2]]
## target ~ 1 + zn + nox + age + dis + rad + tax + ptratio + black +
##     lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[3]]
## target ~ 1 + zn + nox + rm + age + dis + rad + tax + ptratio +
##     black + medv
## <environment: 0x000000005fdc0800>
##
## [[4]]
## target ~ 1 + zn + chas + nox + age + dis + rad + tax + ptratio +
##     black + medv
## <environment: 0x000000005fdc0800>
##
## [[5]]
## target ~ 1 + zn + indus + chas + nox + age + dis + rad + tax +
##     ptratio + black + medv
```

```
## <environment: 0x000000005fdc0800>
##
## [[6]]
## target ~ 1 + zn + indus + nox + age + dis + rad + tax + ptratio +
##     black + lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[7]]
## target ~ 1 + zn + indus + chas + nox + rm + age + dis + rad +
##     tax + ptratio + black + medv
## <environment: 0x000000005fdc0800>
##
## [[8]]
## target ~ 1 + zn + chas + nox + rm + age + dis + rad + tax + ptratio +
##     black + medv
## <environment: 0x000000005fdc0800>
##
## [[9]]
## target ~ 1 + zn + indus + chas + nox + age + dis + rad + tax +
##     ptratio + black + lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[10]]
## target ~ 1 + zn + indus + nox + rm + age + dis + rad + tax +
##     ptratio + black + medv
## <environment: 0x000000005fdc0800>
##
## [[11]]
## target ~ 1 + zn + indus + nox + age + dis + rad + tax + ptratio +
##     black + medv
## <environment: 0x000000005fdc0800>
##
## [[12]]
## target ~ 1 + zn + chas + nox + age + dis + rad + tax + ptratio +
##     black + lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[13]]
## target ~ 1 + zn + nox + rm + age + dis + rad + tax + ptratio +
##     black + lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[14]]
## target ~ 1 + zn + indus + nox + rm + age + dis + rad + tax +
##     ptratio + black + lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[15]]
## target ~ 1 + zn + indus + chas + nox + rm + age + dis + rad +
##     tax + ptratio + black + lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[16]]
## target ~ 1 + zn + chas + nox + rm + age + dis + rad + tax + ptratio +
```

```
##      black + lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[17]]
## target ~ 1 + indus + chas + nox + rm + age + dis + rad + tax +
##      ptratio + black + medv
## <environment: 0x000000005fdc0800>
##
## [[18]]
## target ~ 1 + zn + nox + age + dis + rad + tax + ptratio + medv
## <environment: 0x000000005fdc0800>
##
## [[19]]
## target ~ 1 + indus + chas + nox + age + dis + rad + tax + ptratio +
##      black + medv
## <environment: 0x000000005fdc0800>
##
## [[20]]
## target ~ 1 + zn + nox + age + dis + rad + tax + ptratio + lstat +
##      medv
## <environment: 0x000000005fdc0800>
##
## [[21]]
## target ~ 1 + zn + indus + chas + nox + rm + age + dis + rad +
##      ptratio + black + medv
## <environment: 0x000000005fdc0800>
##
## [[22]]
## target ~ 1 + chas + nox + rm + age + dis + rad + tax + ptratio +
##      black + medv
## <environment: 0x000000005fdc0800>
##
## [[23]]
## target ~ 1 + zn + nox + rm + age + dis + rad + tax + ptratio +
##      medv
## <environment: 0x000000005fdc0800>
##
## [[24]]
## target ~ 1 + zn + indus + chas + nox + age + dis + rad + ptratio +
##      black + medv
## <environment: 0x000000005fdc0800>
##
## [[25]]
## target ~ 1 + nox + rm + age + dis + rad + tax + ptratio + black +
##      medv
## <environment: 0x000000005fdc0800>
##
## [[26]]
## target ~ 1 + chas + nox + age + dis + rad + tax + ptratio + black +
##      medv
## <environment: 0x000000005fdc0800>
##
## [[27]]
## target ~ 1 + zn + chas + nox + age + dis + rad + tax + ptratio +
```

```
##     medv
## <environment: 0x000000005fdc0800>
##
## [[28]]
## target ~ 1 + indus + chas + nox + age + dis + rad + tax + ptratio +
##     black + lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[29]]
## target ~ 1 + indus + nox + rm + age + dis + rad + tax + ptratio +
##     black + medv
## <environment: 0x000000005fdc0800>
##
## [[30]]
## target ~ 1 + nox + age + dis + rad + tax + ptratio + black +
##     medv
## <environment: 0x000000005fdc0800>
##
## [[31]]
## target ~ 1 + zn + indus + nox + age + dis + rad + tax + ptratio +
##     medv
## <environment: 0x000000005fdc0800>
##
## [[32]]
## target ~ 1 + zn + indus + nox + age + dis + rad + tax + ptratio +
##     lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[33]]
## target ~ 1 + zn + indus + chas + nox + age + dis + rad + tax +
##     ptratio + medv
## <environment: 0x000000005fdc0800>
##
## [[34]]
## target ~ 1 + zn + indus + chas + nox + age + dis + rad + ptratio +
##     black + lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[35]]
## target ~ 1 + zn + indus + nox + rm + age + dis + rad + tax +
##     ptratio + medv
## <environment: 0x000000005fdc0800>
##
## [[36]]
## target ~ 1 + nox + age + dis + rad + tax + ptratio + black +
##     lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[37]]
## target ~ 1 + zn + chas + nox + age + dis + rad + tax + ptratio +
##     lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[38]]
```

```
## target ~ 1 + zn + chas + nox + rm + age + dis + rad + tax + ptratio +
##     medv
## <environment: 0x000000005fdc0800>
##
## [[39]]
## target ~ 1 + chas + nox + age + dis + rad + tax + ptratio + black +
##     lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[40]]
## target ~ 1 + indus + nox + age + dis + rad + tax + ptratio +
##     black + medv
## <environment: 0x000000005fdc0800>
##
## [[41]]
## target ~ 1 + indus + chas + nox + rm + age + dis + rad + tax +
##     ptratio + black + lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[42]]
## target ~ 1 + zn + indus + chas + nox + age + dis + rad + tax +
##     ptratio + lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[43]]
## target ~ 1 + indus + nox + age + dis + rad + tax + ptratio +
##     black + lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[44]]
## target ~ 1 + zn + nox + rm + age + dis + rad + tax + ptratio +
##     lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[45]]
## target ~ 1 + zn + indus + chas + nox + rm + age + dis + rad +
##     tax + ptratio + medv
## <environment: 0x000000005fdc0800>
##
## [[46]]
## target ~ 1 + zn + nox + dis + rad + tax + ptratio + black + lstat +
##     medv
## <environment: 0x000000005fdc0800>
##
## [[47]]
## target ~ 1 + nox + rm + age + dis + rad + tax + ptratio + black +
##     lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[48]]
## target ~ 1 + zn + indus + chas + nox + rm + age + dis + rad +
##     ptratio + black + lstat + medv
## <environment: 0x000000005fdc0800>
##
```

```
## [[49]]
## target ~ 1 + zn + indus + chas + nox + dis + rad + tax + ptratio +
##     black + lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[50]]
## target ~ 1 + chas + nox + rm + age + dis + rad + tax + ptratio +
##     black + lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[51]]
## target ~ 1 + zn + chas + nox + dis + rad + tax + ptratio + black +
##     lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[52]]
## target ~ 1 + zn + indus + nox + rm + age + dis + rad + ptratio +
##     black + medv
## <environment: 0x000000005fdc0800>
##
## [[53]]
## target ~ 1 + indus + nox + rm + age + dis + rad + tax + ptratio +
##     black + lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[54]]
## target ~ 1 + zn + indus + nox + dis + rad + tax + ptratio + black +
##     lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[55]]
## target ~ 1 + zn + indus + nox + rm + age + dis + rad + tax +
##     ptratio + lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[56]]
## target ~ 1 + zn + indus + nox + age + dis + rad + ptratio + black +
##     medv
## <environment: 0x000000005fdc0800>
##
## [[57]]
## target ~ 1 + zn + chas + nox + rm + age + dis + rad + tax + ptratio +
##     lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[58]]
## target ~ 1 + zn + indus + nox + age + dis + rad + ptratio + black +
##     lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[59]]
## target ~ 1 + zn + indus + chas + nox + rm + age + dis + rad +
##     tax + ptratio + lstat + medv
## <environment: 0x000000005fdc0800>
```

```
##
## [[60]]
## target ~ 1 + zn + nox + rm + dis + rad + tax + ptratio + black +
##     lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[61]]
## target ~ 1 + zn + indus + chas + nox + age + dis + rad + ptratio +
##     medv
## <environment: 0x000000005fdc0800>
##
## [[62]]
## target ~ 1 + zn + indus + nox + rm + age + dis + rad + ptratio +
##     black + lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[63]]
## target ~ 1 + indus + chas + nox + rm + age + dis + rad + ptratio +
##     black + medv
## <environment: 0x000000005fdc0800>
##
## [[64]]
## target ~ 1 + zn + indus + chas + nox + rm + age + dis + rad +
##     ptratio + medv
## <environment: 0x000000005fdc0800>
##
## [[65]]
## target ~ 1 + chas + nox + age + dis + rad + tax + ptratio + medv
## <environment: 0x000000005fdc0800>
##
## [[66]]
## target ~ 1 + nox + rm + age + dis + rad + tax + ptratio + medv
## <environment: 0x000000005fdc0800>
##
## [[67]]
## target ~ 1 + nox + age + dis + rad + tax + ptratio + medv
## <environment: 0x000000005fdc0800>
##
## [[68]]
## target ~ 1 + zn + indus + chas + nox + rm + dis + rad + tax +
##     ptratio + black + lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[69]]
## target ~ 1 + zn + chas + nox + dis + rad + tax + ptratio + black +
##     medv
## <environment: 0x000000005fdc0800>
##
## [[70]]
## target ~ 1 + indus + chas + nox + age + dis + rad + tax + ptratio +
##     medv
## <environment: 0x000000005fdc0800>
##
## [[71]]
```

```
## target ~ 1 + indus + chas + nox + rm + age + dis + rad + tax +
##     ptratio + medv
## <environment: 0x000000005fdc0800>
##
## [[72]]
## target ~ 1 + zn + chas + nox + rm + dis + rad + tax + ptratio +
##     black + lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[73]]
## target ~ 1 + zn + indus + nox + rm + dis + rad + tax + ptratio +
##     black + lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[74]]
## target ~ 1 + chas + nox + rm + age + dis + rad + tax + ptratio +
##     medv
## <environment: 0x000000005fdc0800>
##
## [[75]]
## target ~ 1 + zn + nox + rm + age + dis + rad + tax + ptratio +
##     black
## <environment: 0x000000005fdc0800>
##
## [[76]]
## target ~ 1 + indus + chas + nox + age + dis + rad + ptratio +
##     black + medv
## <environment: 0x000000005fdc0800>
##
## [[77]]
## target ~ 1 + zn + indus + chas + nox + age + dis + rad + ptratio +
##     lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[78]]
## target ~ 1 + zn + nox + dis + rad + tax + ptratio + black + medv
## <environment: 0x000000005fdc0800>
##
## [[79]]
## target ~ 1 + zn + indus + chas + nox + dis + rad + tax + ptratio +
##     black + medv
## <environment: 0x000000005fdc0800>
##
## [[80]]
## target ~ 1 + zn + nox + age + dis + rad + tax + black + medv
## <environment: 0x000000005fdc0800>
##
## [[81]]
## target ~ 1 + indus + nox + rm + age + dis + rad + tax + ptratio +
##     medv
## <environment: 0x000000005fdc0800>
##
## [[82]]
## target ~ 1 + nox + age + dis + rad + tax + ptratio + lstat +
```

```
##      medv
## <environment: 0x000000005fdc0800>
##
## [[83]]
## target ~ 1 + zn + chas + nox + rm + age + dis + rad + tax + ptratio +
##      black
## <environment: 0x000000005fdc0800>
##
## [[84]]
## target ~ 1 + indus + nox + age + dis + rad + tax + ptratio +
##      medv
## <environment: 0x000000005fdc0800>
##
## [[85]]
## target ~ 1 + zn + nox + dis + rad + tax + ptratio + lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[86]]
## target ~ 1 + indus + chas + nox + age + dis + rad + tax + ptratio +
##      lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[87]]
## target ~ 1 + indus + chas + nox + dis + rad + tax + ptratio +
##      black + lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[88]]
## target ~ 1 + chas + nox + age + dis + rad + tax + ptratio + lstat +
##      medv
## <environment: 0x000000005fdc0800>
##
## [[89]]
## target ~ 1 + zn + indus + nox + rm + age + dis + rad + ptratio +
##      medv
## <environment: 0x000000005fdc0800>
##
## [[90]]
## target ~ 1 + nox + age + rad + tax + ptratio + black + medv
## <environment: 0x000000005fdc0800>
##
## [[91]]
## target ~ 1 + zn + indus + chas + nox + dis + rad + ptratio +
##      black + lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[92]]
## target ~ 1 + zn + indus + chas + nox + rm + age + dis + rad +
##      tax + ptratio + black
## <environment: 0x000000005fdc0800>
##
## [[93]]
## target ~ 1 + zn + indus + nox + age + dis + rad + ptratio + medv
## <environment: 0x000000005fdc0800>
```

```
## 
## [[94]]
## target ~ 1 + zn + nox + rm + dis + rad + tax + ptratio + black +
##     lstat
## <environment: 0x000000005fdc0800>
## 
## [[95]]
## target ~ 1 + zn + nox + age + dis + rad + tax + black + lstat +
##     medv
## <environment: 0x000000005fdc0800>
## 
## [[96]]
## target ~ 1 + indus + nox + age + dis + rad + tax + ptratio +
##     lstat + medv
## <environment: 0x000000005fdc0800>
## 
## [[97]]
## target ~ 1 + zn + indus + nox + rm + age + dis + rad + tax +
##     ptratio + black
## <environment: 0x000000005fdc0800>
## 
## [[98]]
## target ~ 1 + zn + nox + rm + age + dis + rad + tax + ptratio +
##     black + lstat
## <environment: 0x000000005fdc0800>
## 
## [[99]]
## target ~ 1 + zn + indus + nox + age + dis + rad + ptratio + lstat +
##     medv
## <environment: 0x000000005fdc0800>
## 
## [[100]]
## target ~ 1 + chas + nox + dis + rad + tax + ptratio + black +
##     lstat + medv
## <environment: 0x000000005fdc0800>
## 
## [[101]]
## target ~ 1 + zn + indus + chas + nox + rm + age + dis + rad +
##     ptratio + lstat + medv
## <environment: 0x000000005fdc0800>
## 
## [[102]]
## target ~ 1 + indus + chas + nox + age + dis + rad + ptratio +
##     black + lstat + medv
## <environment: 0x000000005fdc0800>
## 
## [[103]]
## target ~ 1 + zn + nox + age + rad + tax + ptratio + black + medv
## <environment: 0x000000005fdc0800>
## 
## [[104]]
## target ~ 1 + nox + rm + age + dis + rad + tax + ptratio + lstat +
##     medv
## <environment: 0x000000005fdc0800>
```

```
## 
## [[105]]
## target ~ 1 + nox + age + rad + tax + ptratio + black + lstat +
##     medv
## <environment: 0x000000005fdc0800>
## 
## [[106]]
## target ~ 1 + zn + indus + nox + dis + rad + tax + ptratio + black +
##     medv
## <environment: 0x000000005fdc0800>
## 
## [[107]]
## target ~ 1 + zn + chas + nox + dis + rad + tax + ptratio + lstat +
##     medv
## <environment: 0x000000005fdc0800>
## 
## [[108]]
## target ~ 1 + zn + indus + nox + dis + rad + tax + ptratio + lstat +
##     medv
## <environment: 0x000000005fdc0800>
## 
## [[109]]
## target ~ 1 + indus + chas + nox + rm + age + dis + rad + ptratio +
##     black + lstat + medv
## <environment: 0x000000005fdc0800>
## 
## [[110]]
## target ~ 1 + chas + nox + age + rad + tax + ptratio + black +
##     medv
## <environment: 0x000000005fdc0800>
## 
## [[111]]
## target ~ 1 + zn + chas + nox + rm + dis + rad + tax + ptratio +
##     black + lstat
## <environment: 0x000000005fdc0800>
## 
## [[112]]
## target ~ 1 + nox + dis + rad + tax + ptratio + black + lstat +
##     medv
## <environment: 0x000000005fdc0800>
## 
## [[113]]
## target ~ 1 + zn + chas + nox + age + dis + rad + ptratio + black +
##     medv
## <environment: 0x000000005fdc0800>
## 
## [[114]]
## target ~ 1 + zn + indus + nox + age + dis + rad + tax + black +
##     medv
## <environment: 0x000000005fdc0800>
## 
## [[115]]
## target ~ 1 + indus + chas + nox + rm + age + dis + rad + tax +
##     ptratio + lstat + medv
```

```
## <environment: 0x000000005fdc0800>
##
## [[116]]
## target ~ 1 + indus + chas + nox + age + rad + tax + ptratio +
##     black + medv
## <environment: 0x000000005fdc0800>
##
## [[117]]
## target ~ 1 + zn + chas + nox + rm + age + dis + rad + ptratio +
##     black + medv
## <environment: 0x000000005fdc0800>
##
## [[118]]
## target ~ 1 + zn + indus + chas + nox + dis + rad + tax + ptratio +
##     lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[119]]
## target ~ 1 + zn + nox + age + rad + tax + ptratio + black + lstat +
##     medv
## <environment: 0x000000005fdc0800>
##
## [[120]]
## target ~ 1 + indus + nox + age + rad + tax + ptratio + black +
##     medv
## <environment: 0x000000005fdc0800>
##
## [[121]]
## target ~ 1 + chas + nox + rm + age + dis + rad + tax + ptratio +
##     lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[122]]
## target ~ 1 + zn + indus + chas + nox + rm + dis + rad + tax +
##     ptratio + black + lstat
## <environment: 0x000000005fdc0800>
##
## [[123]]
## target ~ 1 + zn + chas + nox + age + dis + rad + tax + black +
##     medv
## <environment: 0x000000005fdc0800>
##
## [[124]]
## target ~ 1 + zn + chas + nox + rm + dis + rad + tax + ptratio +
##     black + medv
## <environment: 0x000000005fdc0800>
##
## [[125]]
## target ~ 1 + zn + chas + nox + rm + age + dis + rad + tax + ptratio +
##     black + lstat
## <environment: 0x000000005fdc0800>
##
## [[126]]
## target ~ 1 + indus + nox + rm + age + dis + rad + tax + ptratio +
```

```
##     lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[127]]
## target ~ 1 + zn + indus + nox + rm + dis + rad + tax + ptratio +
##     black + lstat
## <environment: 0x000000005fdc0800>
##
## [[128]]
## target ~ 1 + zn + nox + rm + age + dis + rad + tax + ptratio
## <environment: 0x000000005fdc0800>
##
## [[129]]
## target ~ 1 + zn + nox + rm + age + dis + rad + ptratio + black +
##     medv
## <environment: 0x000000005fdc0800>
##
## [[130]]
## target ~ 1 + indus + nox + dis + rad + tax + ptratio + black +
##     lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[131]]
## target ~ 1 + indus + nox + age + rad + tax + ptratio + black +
##     lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[132]]
## target ~ 1 + zn + indus + nox + age + dis + rad + tax + black +
##     lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[133]]
## target ~ 1 + zn + indus + nox + rm + age + dis + rad + tax +
##     ptratio + black + lstat
## <environment: 0x000000005fdc0800>
##
## [[134]]
## target ~ 1 + nox + rm + age + rad + tax + ptratio + black + medv
## <environment: 0x000000005fdc0800>
##
## [[135]]
## target ~ 1 + zn + indus + chas + nox + rm + age + dis + rad +
##     tax + ptratio + black + lstat
## <environment: 0x000000005fdc0800>
##
## [[136]]
## target ~ 1 + zn + chas + nox + rm + dis + rad + tax + ptratio +
##     black
## <environment: 0x000000005fdc0800>
##
## [[137]]
## target ~ 1 + zn + indus + nox + rm + age + dis + rad + ptratio +
##     lstat + medv
```

```
## <environment: 0x000000005fdc0800>
##
## [[138]]
## target ~ 1 + zn + nox + age + dis + rad + ptratio + black + medv
## <environment: 0x000000005fdc0800>
##
## [[139]]
## target ~ 1 + zn + nox + rm + dis + rad + tax + ptratio + black +
##     medv
## <environment: 0x000000005fdc0800>
##
## [[140]]
## target ~ 1 + zn + nox + rm + age + dis + rad + tax + black +
##     medv
## <environment: 0x000000005fdc0800>
##
## [[141]]
## target ~ 1 + zn + nox + rm + dis + rad + tax + ptratio + lstat +
##     medv
## <environment: 0x000000005fdc0800>
##
## [[142]]
## target ~ 1 + indus + chas + nox + age + rad + tax + ptratio +
##     black + lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[143]]
## target ~ 1 + zn + indus + nox + age + rad + tax + ptratio + black +
##     medv
## <environment: 0x000000005fdc0800>
##
## [[144]]
## target ~ 1 + zn + indus + chas + nox + rm + dis + rad + tax +
##     ptratio + black + medv
## <environment: 0x000000005fdc0800>
##
## [[145]]
## target ~ 1 + zn + nox + rm + dis + rad + tax + ptratio + black
## <environment: 0x000000005fdc0800>
##
## [[146]]
## target ~ 1 + zn + chas + nox + age + rad + tax + ptratio + black +
##     medv
## <environment: 0x000000005fdc0800>
##
## [[147]]
## target ~ 1 + zn + indus + nox + age + rad + tax + ptratio + black +
##     lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[148]]
## target ~ 1 + chas + nox + dis + rad + tax + ptratio + black +
##     medv
## <environment: 0x000000005fdc0800>
```

```
##
## [[149]]
## target ~ 1 + chas + nox + age + rad + tax + ptratio + black +
##     lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[150]]
## target ~ 1 + zn + nox + rm + age + dis + rad + tax + black
## <environment: 0x000000005fdc0800>
##
## [[151]]
## target ~ 1 + zn + nox + rad + tax + ptratio + black + lstat +
##     medv
## <environment: 0x000000005fdc0800>
##
## [[152]]
## target ~ 1 + indus + chas + nox + dis + rad + tax + ptratio +
##     black + medv
## <environment: 0x000000005fdc0800>
##
## [[153]]
## target ~ 1 + zn + nox + age + dis + rad + tax + medv
## <environment: 0x000000005fdc0800>
##
## [[154]]
## target ~ 1 + zn + nox + rm + dis + rad + tax + black + lstat
## <environment: 0x000000005fdc0800>
##
## [[155]]
## target ~ 1 + zn + indus + chas + nox + dis + rad + ptratio +
##     black + medv
## <environment: 0x000000005fdc0800>
##
## [[156]]
## target ~ 1 + zn + chas + nox + rm + age + dis + rad + tax + ptratio
## <environment: 0x000000005fdc0800>
##
## [[157]]
## target ~ 1 + indus + chas + nox + rm + age + dis + rad + tax +
##     ptratio + black
## <environment: 0x000000005fdc0800>
##
## [[158]]
## target ~ 1 + zn + indus + chas + nox + age + rad + tax + ptratio +
##     black + medv
## <environment: 0x000000005fdc0800>
##
## [[159]]
## target ~ 1 + chas + nox + rm + age + dis + rad + tax + ptratio +
##     black
## <environment: 0x000000005fdc0800>
##
## [[160]]
## target ~ 1 + indus + nox + rm + age + dis + rad + ptratio + black +
```

```
##      medv
## <environment: 0x000000005fdc0800>
##
## [[161]]
## target ~ 1 + indus + nox + rm + age + rad + tax + ptratio + black +
##      medv
## <environment: 0x000000005fdc0800>
##
## [[162]]
## target ~ 1 + indus + chas + nox + rm + dis + rad + tax + ptratio +
##      black + lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[163]]
## target ~ 1 + zn + chas + nox + age + dis + rad + tax + black +
##      lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[164]]
## target ~ 1 + zn + indus + chas + nox + rm + dis + rad + tax +
##      ptratio + black
## <environment: 0x000000005fdc0800>
##
## [[165]]
## target ~ 1 + zn + indus + chas + nox + age + dis + rad + tax +
##      black + medv
## <environment: 0x000000005fdc0800>
##
## [[166]]
## target ~ 1 + nox + rad + tax + ptratio + black + lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[167]]
## target ~ 1 + chas + nox + rm + age + rad + tax + ptratio + black +
##      medv
## <environment: 0x000000005fdc0800>
##
## [[168]]
## target ~ 1 + nox + rm + age + dis + rad + tax + ptratio + black
## <environment: 0x000000005fdc0800>
##
## [[169]]
## target ~ 1 + indus + chas + nox + rm + age + rad + tax + ptratio +
##      black + medv
## <environment: 0x000000005fdc0800>
##
## [[170]]
## target ~ 1 + zn + nox + rm + age + rad + tax + ptratio + black +
##      medv
## <environment: 0x000000005fdc0800>
##
## [[171]]
## target ~ 1 + zn + indus + chas + nox + rm + dis + rad + ptratio +
##      black + lstat + medv
```

```
## <environment: 0x000000005fdc0800>
##
## [[172]]
## target ~ 1 + zn + nox + rm + age + dis + rad + tax + black +
##     lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[173]]
## target ~ 1 + zn + indus + nox + dis + rad + ptratio + black +
##     lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[174]]
## target ~ 1 + zn + chas + nox + age + dis + rad + ptratio + black +
##     lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[175]]
## target ~ 1 + zn + nox + rm + age + dis + rad + tax + ptratio +
##     lstat
## <environment: 0x000000005fdc0800>
##
## [[176]]
## target ~ 1 + zn + chas + nox + rm + dis + rad + tax + ptratio +
##     lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[177]]
## target ~ 1 + zn + chas + nox + age + rad + tax + ptratio + black +
##     lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[178]]
## target ~ 1 + zn + nox + rm + age + dis + rad + tax + black +
##     lstat
## <environment: 0x000000005fdc0800>
##
## [[179]]
## target ~ 1 + zn + indus + nox + rm + age + dis + rad + tax +
##     ptratio
## <environment: 0x000000005fdc0800>
##
## [[180]]
## target ~ 1 + zn + indus + nox + rm + dis + rad + tax + ptratio +
##     lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[181]]
## target ~ 1 + zn + indus + chas + nox + age + rad + tax + ptratio +
##     black + lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[182]]
## target ~ 1 + nox + rm + age + rad + tax + ptratio + black + lstat +
```

```
##      medv
## <environment: 0x000000005fdc0800>
##
## [[183]]
## target ~ 1 + zn + nox + rm + dis + rad + tax + ptratio + lstat
## <environment: 0x000000005fdc0800>
##
## [[184]]
## target ~ 1 + chas + nox + rm + dis + rad + tax + ptratio + black +
##      lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[185]]
## target ~ 1 + indus + chas + nox + rad + tax + ptratio + black +
##      lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[186]]
## target ~ 1 + zn + nox + age + dis + rad + ptratio + black + lstat +
##      medv
## <environment: 0x000000005fdc0800>
##
## [[187]]
## target ~ 1 + zn + indus + nox + rad + tax + ptratio + black +
##      lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[188]]
## target ~ 1 + indus + chas + nox + rm + age + dis + rad + ptratio +
##      medv
## <environment: 0x000000005fdc0800>
##
## [[189]]
## target ~ 1 + zn + indus + chas + nox + rm + age + dis + rad +
##      tax + ptratio
## <environment: 0x000000005fdc0800>
##
## [[190]]
## target ~ 1 + zn + nox + age + dis + rad + tax + lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[191]]
## target ~ 1 + zn + chas + nox + dis + rad + tax + ptratio + medv
## <environment: 0x000000005fdc0800>
##
## [[192]]
## target ~ 1 + zn + indus + chas + nox + rm + dis + rad + tax +
##      ptratio + lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[193]]
## target ~ 1 + chas + nox + rad + tax + ptratio + black + lstat +
##      medv
## <environment: 0x000000005fdc0800>
```

```
##
## [[194]]
## target ~ 1 + zn + nox + dis + rad + tax + ptratio + medv
## <environment: 0x000000005fdc0800>
##
## [[195]]
## target ~ 1 + indus + nox + rad + tax + ptratio + black + lstat +
##     medv
## <environment: 0x000000005fdc0800>
##
## [[196]]
## target ~ 1 + zn + nox + age + dis + rad + tax + ptratio + black
## <environment: 0x000000005fdc0800>
##
## [[197]]
## target ~ 1 + zn + indus + nox + rm + dis + rad + tax + ptratio +
##     black + medv
## <environment: 0x000000005fdc0800>
##
## [[198]]
## target ~ 1 + zn + nox + dis + rad + tax + black + lstat + medv
## <environment: 0x000000005fdc0800>
##
## [[199]]
## target ~ 1 + nox + rm + dis + rad + tax + ptratio + black + lstat +
##     medv
## <environment: 0x000000005fdc0800>
##
## [[200]]
## target ~ 1 + nox + dis + rad + tax + ptratio + black + medv
## <environment: 0x000000005fdc0800>
```

```r
x <- summary(glmultiLogisticOut@objects[[1]])
x
```

```
##
## Call:
## fitfunc(formula = as.formula(x), family = ..2, data = data, maxit = 50)
##
## Deviance Residuals:
##     Min       1Q   Median       3Q      Max
## -2.2719  -0.1695  -0.0022   0.0022   3.4083
##
## Coefficients:
##               Estimate Std. Error z value Pr(>|z|)
## (Intercept) -33.252218   6.510006  -5.108 3.26e-07 ***
## zn           -0.065747   0.031905  -2.061  0.03933 *
## nox          42.893366   6.744624   6.360 2.02e-10 ***
## age           0.031946   0.010928   2.923  0.00346 **
## dis           0.661897   0.216100   3.063  0.00219 **
## rad           0.724580   0.150914   4.801 1.58e-06 ***
## tax          -0.008216   0.002731  -3.009  0.00262 **
## ptratio       0.339874   0.114950   2.957  0.00311 **
## black        -0.011726   0.006535  -1.794  0.07276 .
## medv          0.117392   0.036009   3.260  0.00111 **
```

```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
##     Null deviance: 645.88  on 465  degrees of freedom
## Residual deviance: 192.57  on 456  degrees of freedom
## AIC: 212.57
##
## Number of Fisher Scoring iterations: 9
```