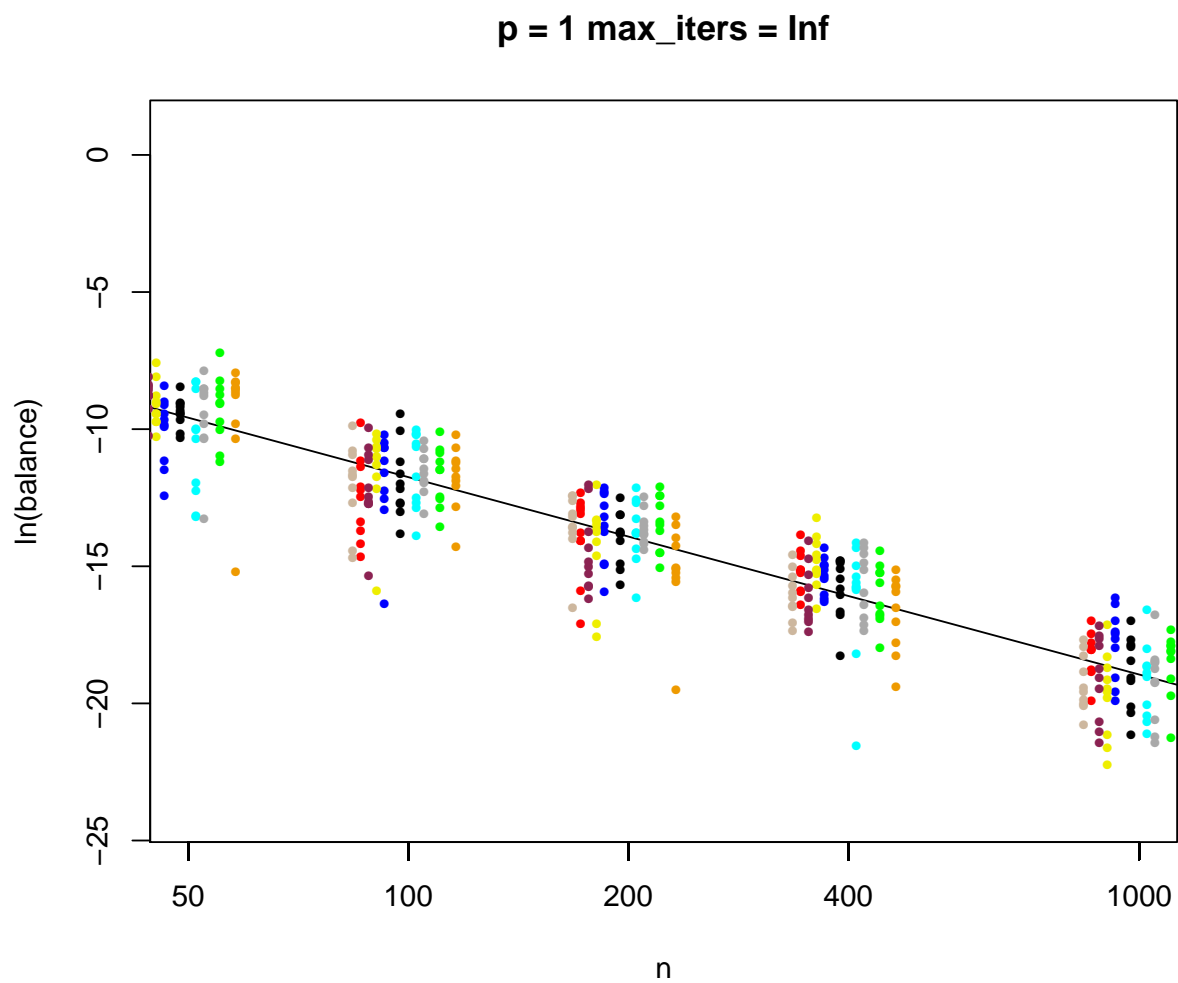


Simulation Result Report

Adam Kapelner

Sunday 15th February, 2015, 16:48

1 Results for each Run

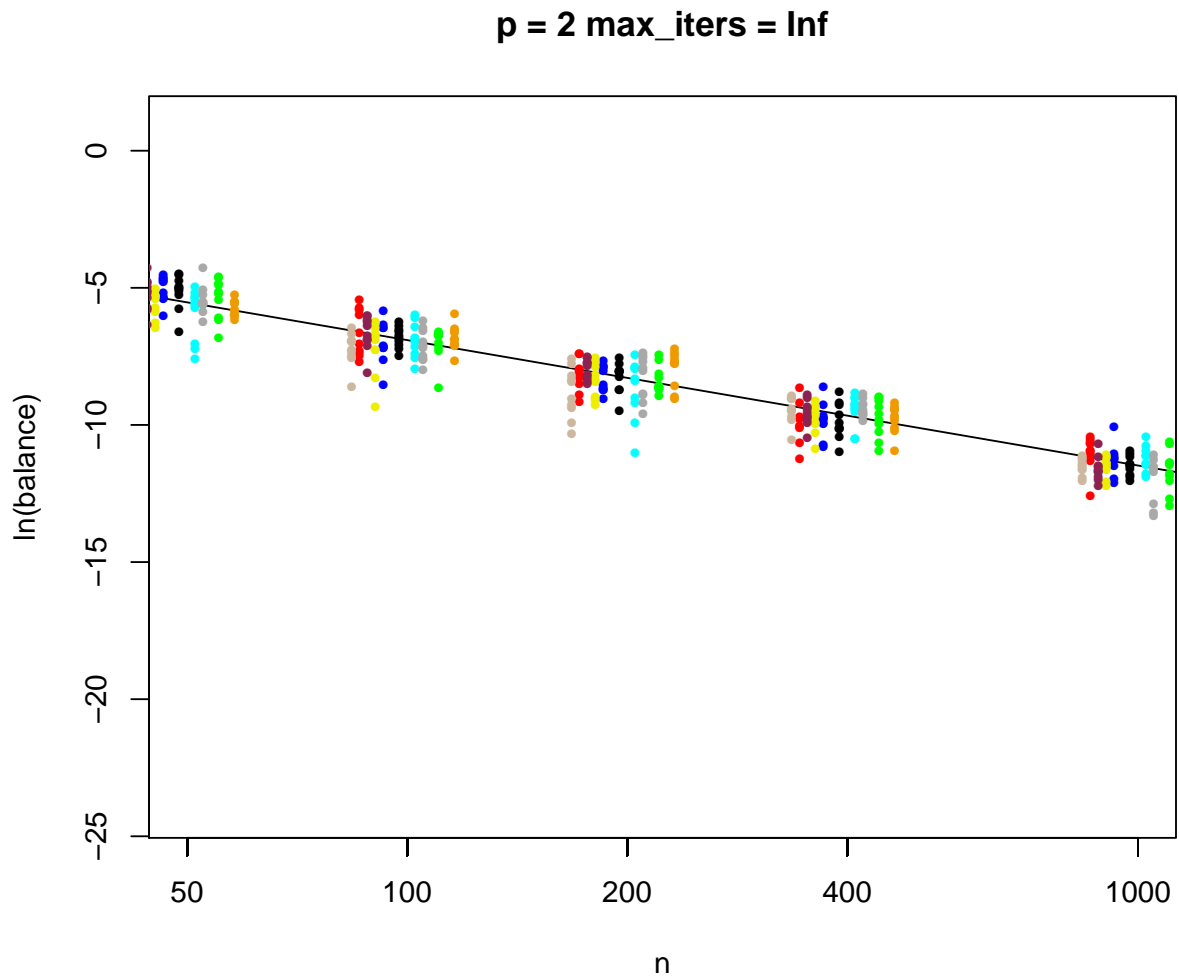


```
## p = 1 max_iters = Inf
##
##
## examine log-log linear regression
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept)  2.648    0.32724   8.092 4.538e-15
```

```

## lnx          -3.126    0.06011 -52.008 2.093e-203
## ensure log-law relationship
## Analysis of Variance Table
##
## Model 1: lny ~ poly(lnx, 1)
## Model 2: lny ~ poly(lnx, 4)
##   Res.Df RSS Df Sum of Sq    F Pr(>F)
## 1      498 983
## 2      495 970  3      12.5 2.12  0.096 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## ensure no dataset effect
## Analysis of Variance Table
##
## Model 1: lny ~ lnx
## Model 2: lny ~ lnx + dataset
##   Res.Df RSS Df Sum of Sq    F Pr(>F)
## 1      498 983
## 2      489 942  9      40.6 2.34  0.014 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## Analysis of Variance Table
##
## Model 1: lny ~ lnx
## Model 2: lny ~ lnx * dataset
##   Res.Df RSS Df Sum of Sq    F Pr(>F)
## 1      498 983
## 2      480 879 18      104 3.17 1.4e-05 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

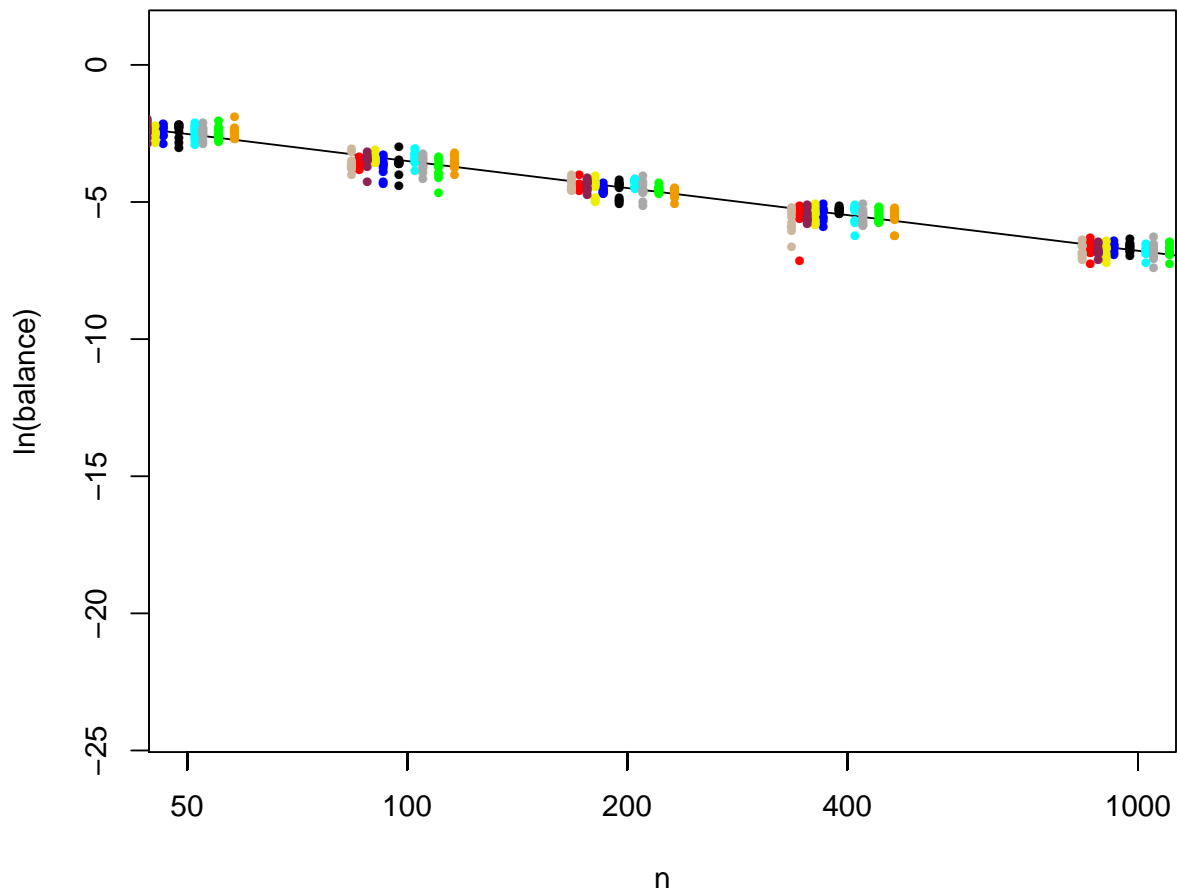
```



```
## p = 2 max_iters = Inf
##
##
## examine log-log linear regression
##           Estimate Std. Error t value   Pr(>|t|)
## (Intercept)   2.240    0.1476   15.18 4.707e-43
## ln x          -1.986    0.0271  -73.27 6.995e-269
## ensure log-law relationship
## Analysis of Variance Table
##
## Model 1: lny ~ poly(lnx, 1)
## Model 2: lny ~ poly(lnx, 4)
##   Res.Df RSS Df Sum of Sq   F Pr(>F)
## 1     498 200
## 2     495 199   3     0.553 0.46  0.71
## ensure no dataset effect
## Analysis of Variance Table
##
## Model 1: lny ~ lnx
```

```
## Model 2: lny ~ lnx + dataset
##   Res.Df RSS Df Sum of Sq   F Pr(>F)
## 1     498 200
## 2     489 195   9       4.56 1.27  0.25
## Analysis of Variance Table
##
## Model 1: lny ~ lnx
## Model 2: lny ~ lnx * dataset
##   Res.Df RSS Df Sum of Sq   F Pr(>F)
## 1     498 200
## 2     480 188 18       12.2 1.73  0.031 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

p = 5 max_iters = Inf

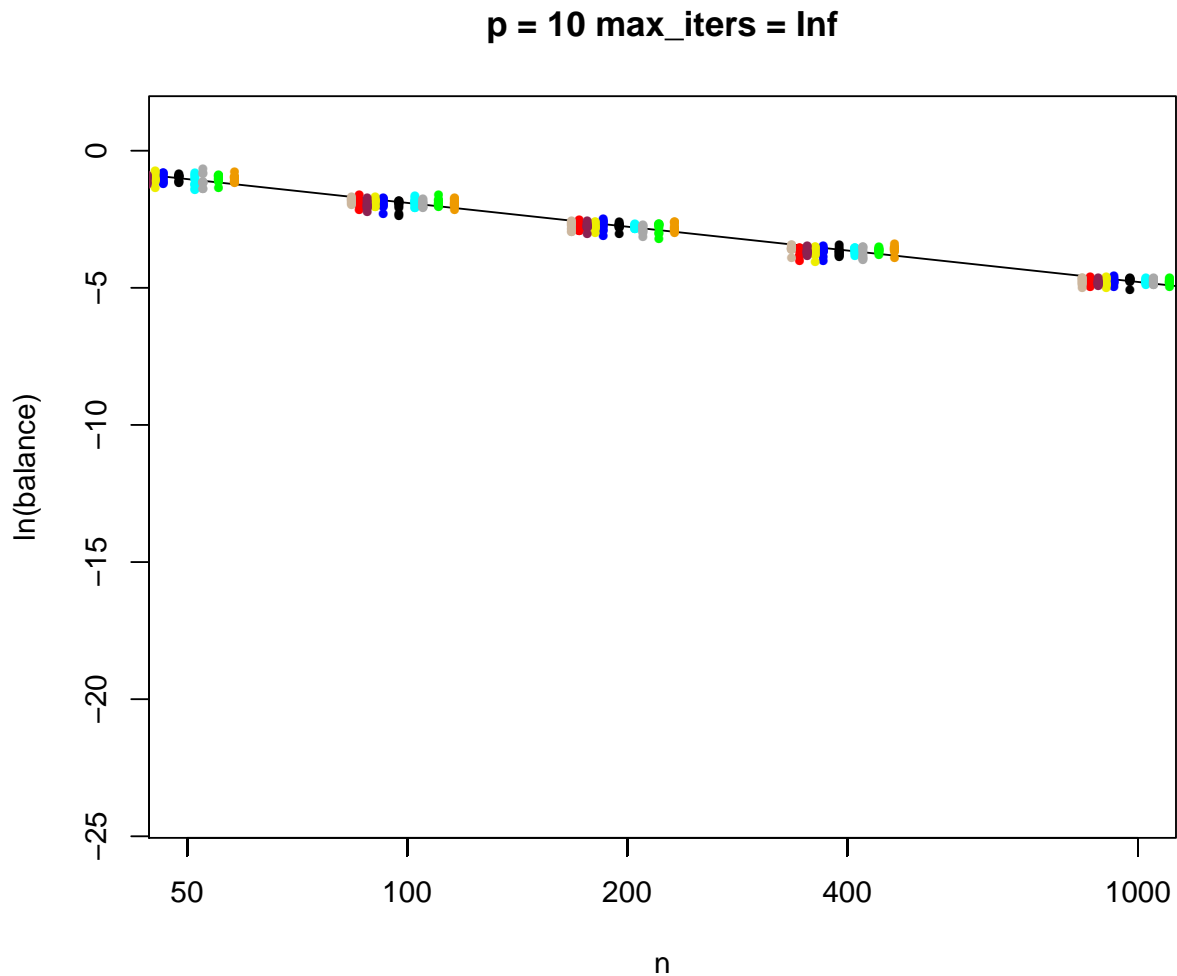


```
## p = 5 max_iters = Inf
##
##
## examine log-log linear regression
##       Estimate Std. Error t value  Pr(>|t|)
```

```

## (Intercept)      3.041      0.06357      47.84 2.432e-188
## lnx              -1.421      0.01168     -121.74 0.000e+00
## ensure log-law relationship
## Analysis of Variance Table
##
## Model 1: lny ~ poly(lnx, 1)
## Model 2: lny ~ poly(lnx, 4)
##   Res.Df  RSS Df Sum of Sq    F Pr(>F)
## 1      498 37.1
## 2      495 35.8   3      1.32 6.07 0.00046 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## ensure no dataset effect
## Analysis of Variance Table
##
## Model 1: lny ~ lnx
## Model 2: lny ~ lnx + dataset
##   Res.Df  RSS Df Sum of Sq    F Pr(>F)
## 1      498 37.1
## 2      489 36.2   9      0.853 1.28 0.25
## Analysis of Variance Table
##
## Model 1: lny ~ lnx
## Model 2: lny ~ lnx * dataset
##   Res.Df  RSS Df Sum of Sq    F Pr(>F)
## 1      498 37.1
## 2      480 35.6  18      1.46 1.09 0.36

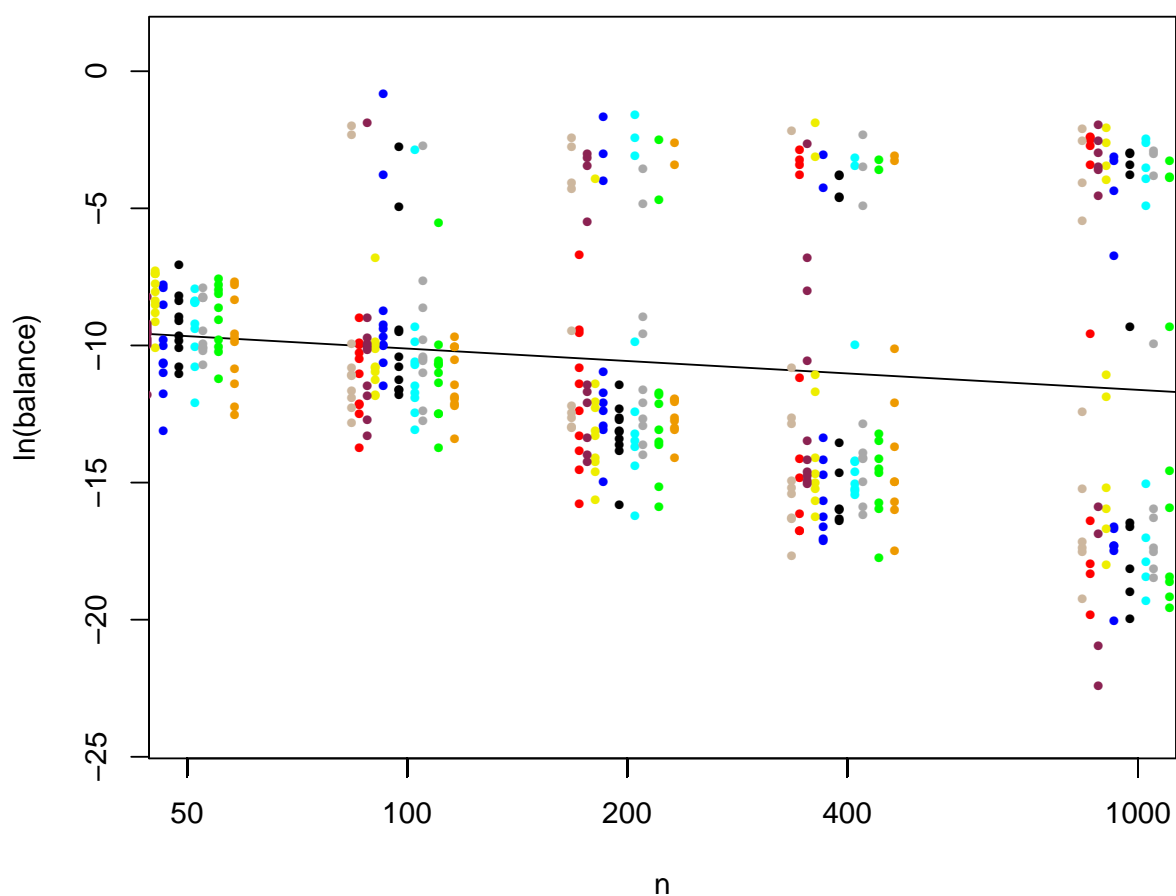
```



```
## p = 10 max_iters = Inf
##
##
## examine log-log linear regression
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept)   3.864   0.032841  117.7      0
## ln x         -1.252   0.006032 -207.6      0
## ensure log-law relationship
## Analysis of Variance Table
##
## Model 1: lny ~ poly(lnx, 1)
## Model 2: lny ~ poly(lnx, 4)
##    Res.Df  RSS Df Sum of Sq    F Pr(>F)
## 1      498 9.90
## 2      495 9.81  3    0.0948 1.59  0.19
## ensure no dataset effect
## Analysis of Variance Table
##
## Model 1: lny ~ lnx
```

```
## Model 2: lny ~ lnx + dataset
##   Res.Df  RSS Df Sum of Sq   F Pr(>F)
## 1     498  9.90
## 2     489  9.68   9     0.224 1.26   0.26
## Analysis of Variance Table
##
## Model 1: lny ~ lnx
## Model 2: lny ~ lnx * dataset
##   Res.Df  RSS Df Sum of Sq   F Pr(>F)
## 1     498  9.90
## 2     480  9.53  18     0.367 1.03   0.43
```

p = 1 max_iters = 2

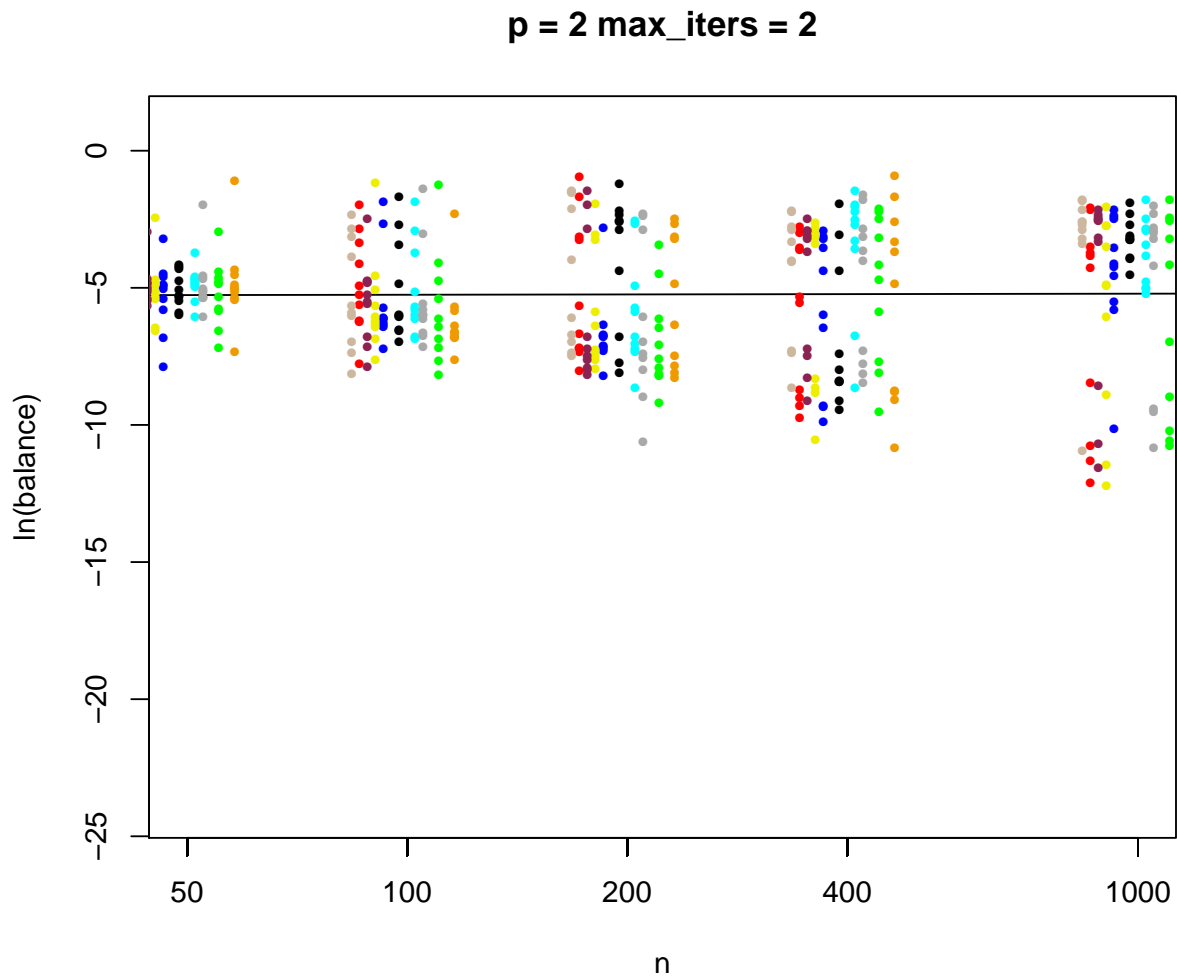


```
## p = 1 max_iters = 2
##
##
## examine log-log linear regression
##       Estimate Std. Error t value Pr(>|t|)
## (Intercept)  -7.102      1.0602  -6.699 5.691e-11
## lnx          -0.654      0.1947  -3.358 8.441e-04
```

```

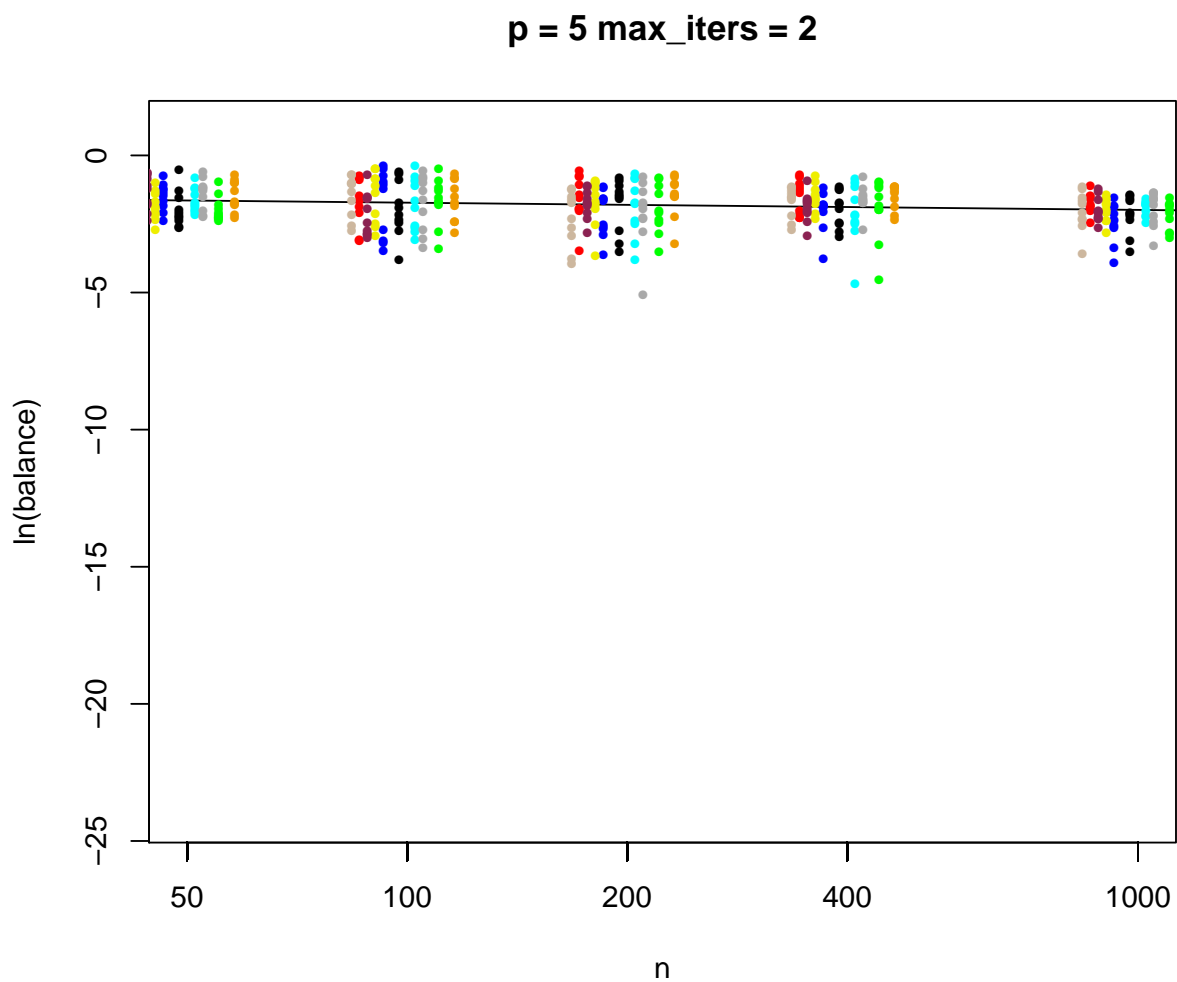
## ensure log-law relationship
## Analysis of Variance Table
##
## Model 1: lny ~ poly(lnx, 1)
## Model 2: lny ~ poly(lnx, 4)
##   Res.Df    RSS Df Sum of Sq    F Pr(>F)
## 1     498 10316
## 2     495 10163  3      153 2.48  0.06 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## ensure no dataset effect
## Analysis of Variance Table
##
## Model 1: lny ~ lnx
## Model 2: lny ~ lnx + dataset
##   Res.Df    RSS Df Sum of Sq    F Pr(>F)
## 1     498 10316
## 2     489 10260  9      56.6 0.3  0.97
## Analysis of Variance Table
##
## Model 1: lny ~ lnx
## Model 2: lny ~ lnx * dataset
##   Res.Df    RSS Df Sum of Sq    F Pr(>F)
## 1     498 10316
## 2     480 10135 18      182 0.48  0.97

```

```
## p = 2 max_iters = 2
##
##
## examine log-log linear regression
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept) -5.33102    0.5592  -9.5338 6.686e-20
## ln x         0.01698    0.1027   0.1653 8.687e-01
## ensure log-law relationship
## Analysis of Variance Table
##
## Model 1: lny ~ poly(lnx, 1)
## Model 2: lny ~ poly(lnx, 4)
##   Res.Df  RSS Df Sum of Sq   F Pr(>F)
## 1     498 2870
## 2     495 2831  3     39.1 2.28  0.079 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## ensure no dataset effect
## Analysis of Variance Table
```

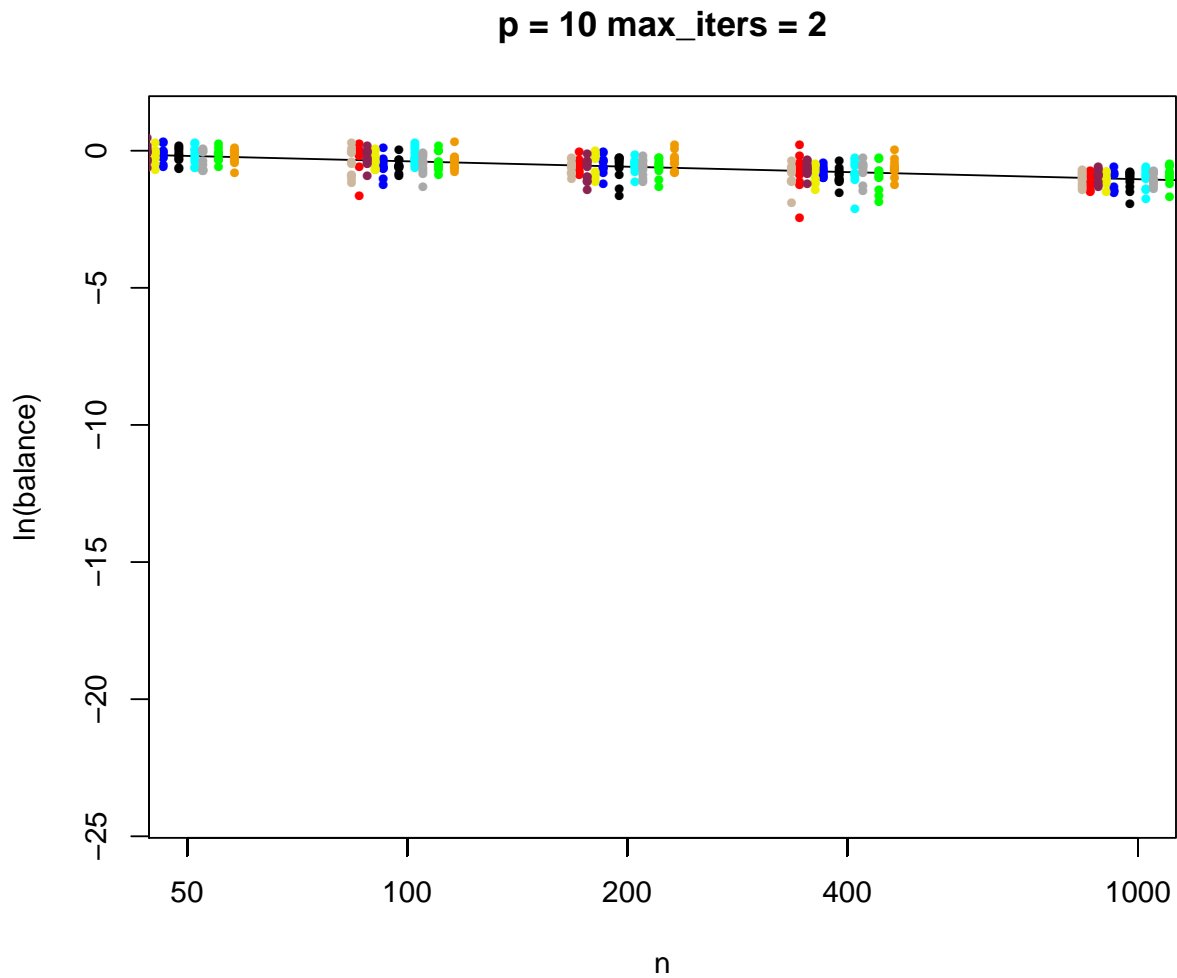
```
##
## Model 1: lny ~ lnx
## Model 2: lny ~ lnx + dataset
##   Res.Df  RSS Df Sum of Sq   F Pr(>F)
## 1     498 2870
## 2     489 2783   9      87.3 1.7  0.085 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## Analysis of Variance Table
##
## Model 1: lny ~ lnx
## Model 2: lny ~ lnx * dataset
##   Res.Df  RSS Df Sum of Sq   F Pr(>F)
## 1     498 2870
## 2     480 2697 18      173 1.71  0.034 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```



```

## p = 5 max iters = 2
##
##
## examine log-log linear regression
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept) -1.1958    0.17517  -6.827 2.537e-11
## ln timer     -0.1145    0.03218  -3.560 4.065e-04
## ensure log-law relationship
## Analysis of Variance Table
##
## Model 1: lny ~ poly(lnx, 1)
## Model 2: lny ~ poly(lnx, 4)
##   Res.Df RSS Df Sum of Sq    F Pr(>F)
## 1      498 282
## 2      495 280  3      1.59 0.94  0.42
## ensure no dataset effect
## Analysis of Variance Table
##
## Model 1: lny ~ lnx
## Model 2: lny ~ lnx + dataset
##   Res.Df RSS Df Sum of Sq    F Pr(>F)
## 1      498 282
## 2      489 273  9      8.21 1.63  0.1
## Analysis of Variance Table
##
## Model 1: lny ~ lnx
## Model 2: lny ~ lnx * dataset
##   Res.Df RSS Df Sum of Sq    F Pr(>F)
## 1      498 282
## 2      480 270 18     11.9 1.18  0.27

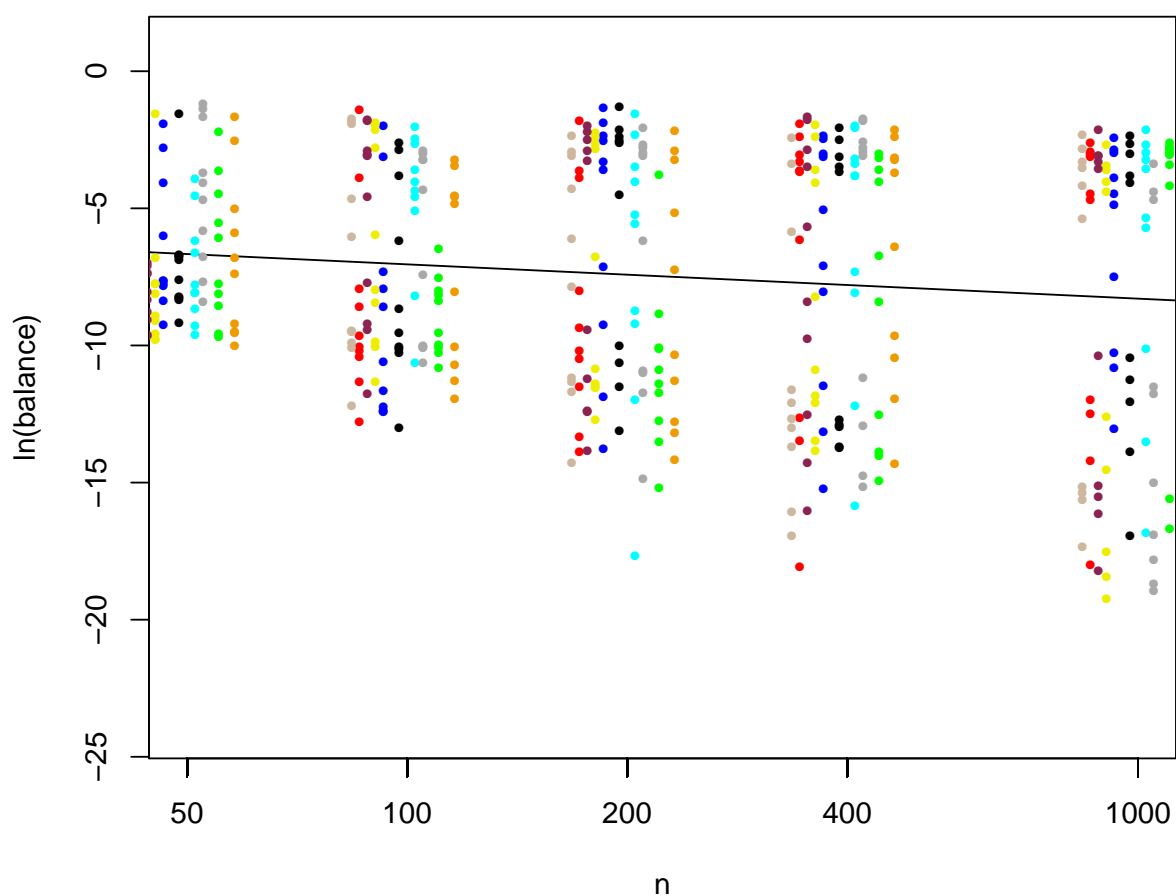
```



```
## p = 10 max_iters = 2
##
##
## examine log-log linear regression
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.9213    0.08125   11.34 1.141e-26
## ln timer     -0.2839    0.01492  -19.02 4.686e-61
## ensure log-law relationship
## Analysis of Variance Table
##
## Model 1: lny ~ poly(lnx, 1)
## Model 2: lny ~ poly(lnx, 4)
##    Res.Df  RSS Df Sum of Sq    F Pr(>F)
## 1      498 60.6
## 2      495 60.5  3     0.123 0.34    0.8
## ensure no dataset effect
## Analysis of Variance Table
##
## Model 1: lny ~ lnx
```

```
## Model 2: lny ~ lnx + dataset
##   Res.Df  RSS Df Sum of Sq   F Pr(>F)
## 1     498 60.6
## 2     489 59.3   9      1.24 1.14   0.33
## Analysis of Variance Table
##
## Model 1: lny ~ lnx
## Model 2: lny ~ lnx * dataset
##   Res.Df  RSS Df Sum of Sq   F Pr(>F)
## 1     498 60.6
## 2     480 58.6 18      2.02 0.92   0.55
```

p = 1 max_iters = 1

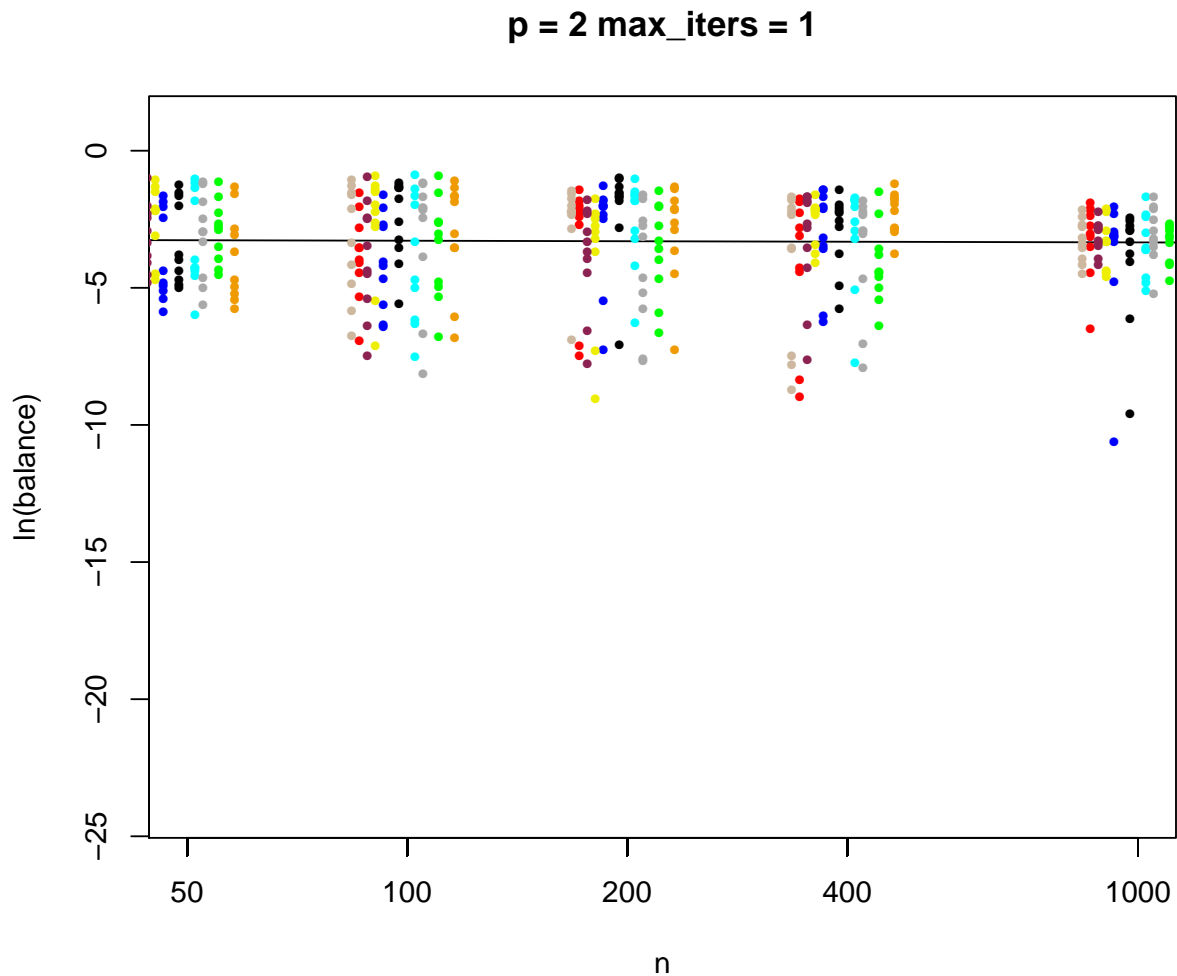


```
## p = 1 max_iters = 1
##
##
## examine log-log linear regression
##       Estimate Std. Error t value Pr(>|t|)
## (Intercept)  -4.542      1.045  -4.345 1.692e-05
## lnx          -0.543      0.192  -2.828 4.879e-03
```

```

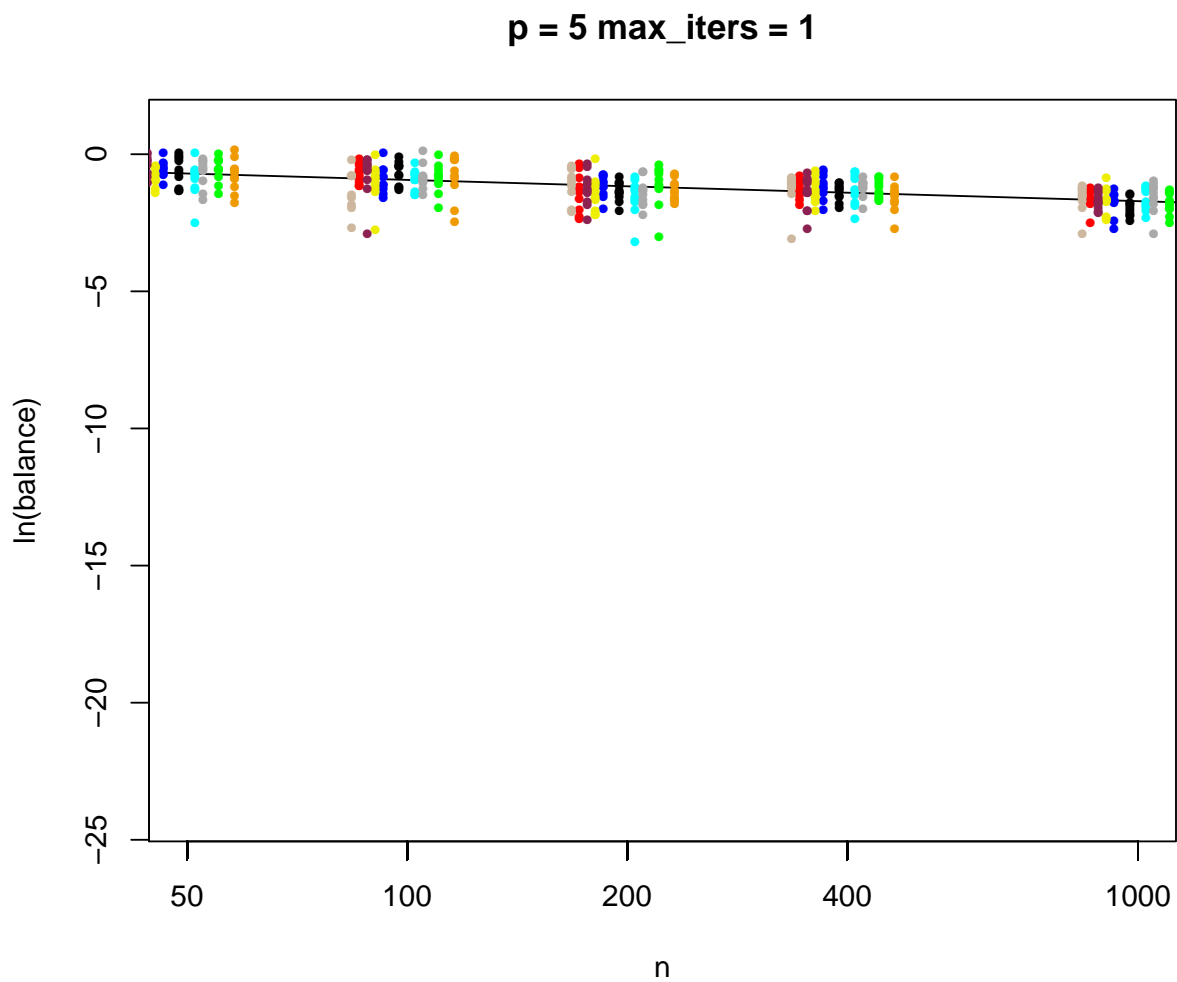
## ensure log-law relationship
## Analysis of Variance Table
##
## Model 1: lny ~ poly(lnx, 1)
## Model 2: lny ~ poly(lnx, 4)
##   Res.Df    RSS Df Sum of Sq   F Pr(>F)
## 1     498 10032
## 2     495 10028  3      4.01 0.07   0.98
## ensure no dataset effect
## Analysis of Variance Table
##
## Model 1: lny ~ lnx
## Model 2: lny ~ lnx + dataset
##   Res.Df    RSS Df Sum of Sq   F Pr(>F)
## 1     498 10032
## 2     489  9914  9      118 0.65   0.76
## Analysis of Variance Table
##
## Model 1: lny ~ lnx
## Model 2: lny ~ lnx * dataset
##   Res.Df    RSS Df Sum of Sq   F Pr(>F)
## 1     498 10032
## 2     480  9616 18      416 1.15   0.3

```



```
## p = 2 max_iters = 1
##
##
## examine log-log linear regression
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept) -3.16015    0.40802  -7.7452 5.383e-14
## ln x        -0.02654    0.07494  -0.3541 7.234e-01
## ensure log-law relationship
## Analysis of Variance Table
##
## Model 1: lny ~ poly(lnx, 1)
## Model 2: lny ~ poly(lnx, 4)
##   Res.Df  RSS Df Sum of Sq   F Pr(>F)
## 1     498 1528
## 2     495 1525  3     3.05 0.33   0.8
## ensure no dataset effect
## Analysis of Variance Table
##
## Model 1: lny ~ lnx
```

```
## Model 2: lny ~ lnx + dataset
##   Res.Df  RSS Df Sum of Sq   F Pr(>F)
## 1     498 1528
## 2     489 1506   9      21.6 0.78   0.64
## Analysis of Variance Table
##
## Model 1: lny ~ lnx
## Model 2: lny ~ lnx * dataset
##   Res.Df  RSS Df Sum of Sq   F Pr(>F)
## 1     498 1528
## 2     480 1489 18      39.3 0.7   0.81
```



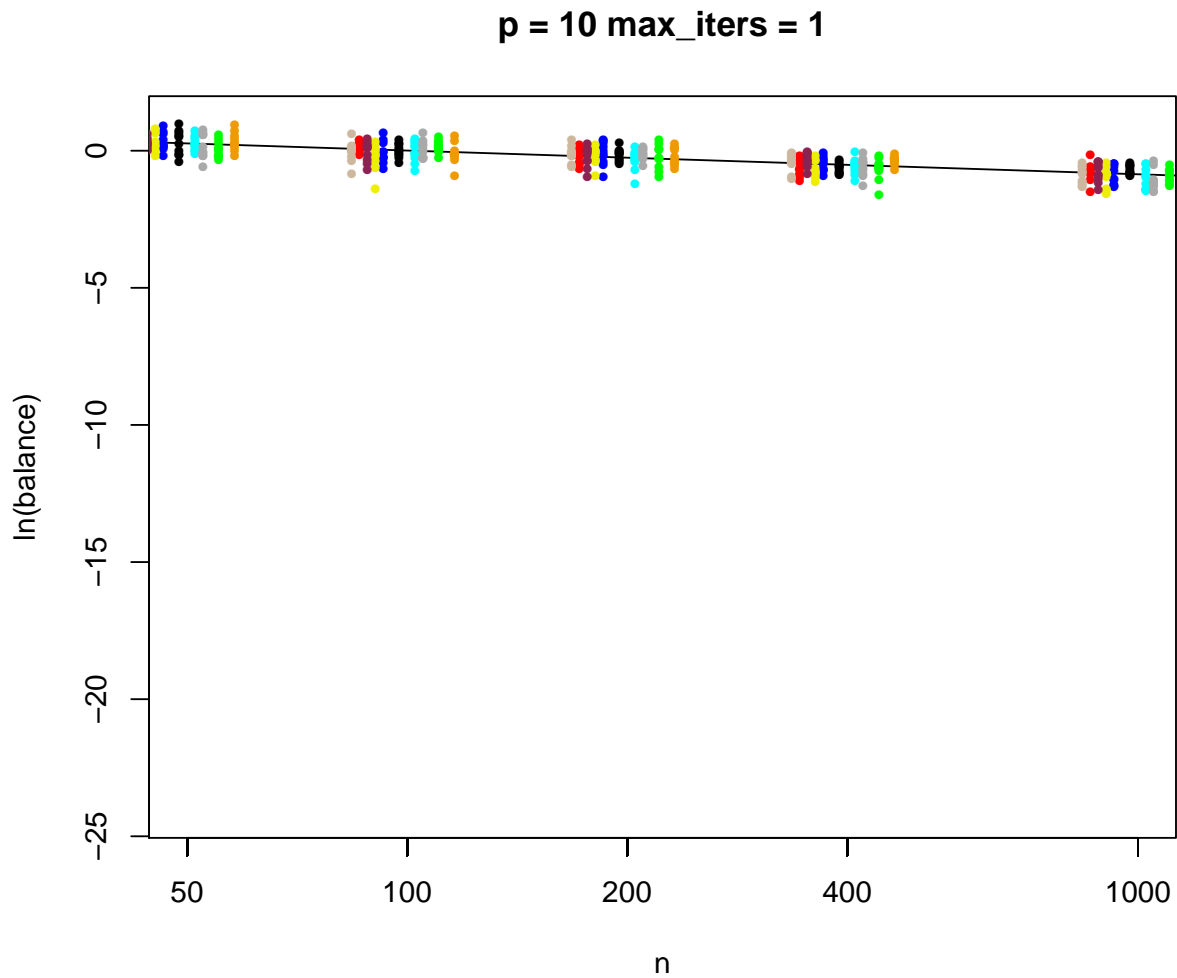
```
## p = 5 max_iters = 1
##
##
## examine log-log linear regression
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept)  0.6113    0.12485   4.896 1.322e-06
## lnx          -0.3361    0.02293 -14.656 1.082e-40
```



```

## ensure log-law relationship
## Analysis of Variance Table
##
## Model 1: lny ~ poly(lnx, 1)
## Model 2: lny ~ poly(lnx, 4)
##   Res.Df RSS Df Sum of Sq    F Pr(>F)
## 1     498 143
## 2     495 140  3      2.75 3.23 0.022 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## ensure no dataset effect
## Analysis of Variance Table
##
## Model 1: lny ~ lnx
## Model 2: lny ~ lnx + dataset
##   Res.Df RSS Df Sum of Sq    F Pr(>F)
## 1     498 143
## 2     489 141  9      2.33 0.9  0.53
## Analysis of Variance Table
##
## Model 1: lny ~ lnx
## Model 2: lny ~ lnx * dataset
##   Res.Df RSS Df Sum of Sq    F Pr(>F)
## 1     498 143
## 2     480 137 18      6.27 1.22 0.24

```



```
## p = 10 max_iters = 1
##
##
## examine log-log linear regression
##           Estimate Std. Error t value Pr(>|t|)
## (Intercept)  1.7364    0.07628   22.76 3.777e-79
## ln x        -0.3757    0.01401  -26.81 1.131e-98
## ensure log-law relationship
## Analysis of Variance Table
##
## Model 1: lny ~ poly(lnx, 1)
## Model 2: lny ~ poly(lnx, 4)
##   Res.Df  RSS Df Sum of Sq   F Pr(>F)
## 1     498 53.4
## 2     495 52.9  3     0.498 1.55   0.2
## ensure no dataset effect
## Analysis of Variance Table
##
## Model 1: lny ~ lnx
```

```
## Model 2: lny ~ lnx + dataset
##   Res.Df  RSS Df Sum of Sq   F Pr(>F)
## 1     498 53.4
## 2     489 52.1  9       1.35 1.41   0.18
## Analysis of Variance Table
##
## Model 1: lny ~ lnx
## Model 2: lny ~ lnx * dataset
##   Res.Df  RSS Df Sum of Sq   F Pr(>F)
## 1     498 53.4
## 2     480 51.5 18       1.95 1.01   0.45
```

2 Multiple and Rate Results over all Runs

	p	max_iters	int	slope
1	1.0000	Inf	2.6479	-3.1261
2	2.0000	Inf	2.2401	-1.9860
3	5.0000	Inf	3.0409	-1.4215
4	10.0000	Inf	3.8644	-1.2522
5	1.0000	2.0000	-7.1018	-0.6540
6	2.0000	2.0000	-5.3310	0.0170
7	5.0000	2.0000	-1.1958	-0.1145
8	10.0000	2.0000	0.9213	-0.2839
9	1.0000	1.0000	-4.5420	-0.5430
10	2.0000	1.0000	-3.1601	-0.0265
11	5.0000	1.0000	0.6113	-0.3361
12	10.0000	1.0000	1.7364	-0.3757

