Assignment V

YEP

2/22/2018

Variance of the 3 estimators

$$\beta = 0$$

Variance of the true model is smaller

n	Alpha Res.	Alpha Unres.	Pos
50	0.022	0.042	0.026
100	0.010	0.021	0.014
150	0.007	0.013	0.009
200	0.005	0.010	0.006

Bias of the 3 estimators

Restricted model is biased

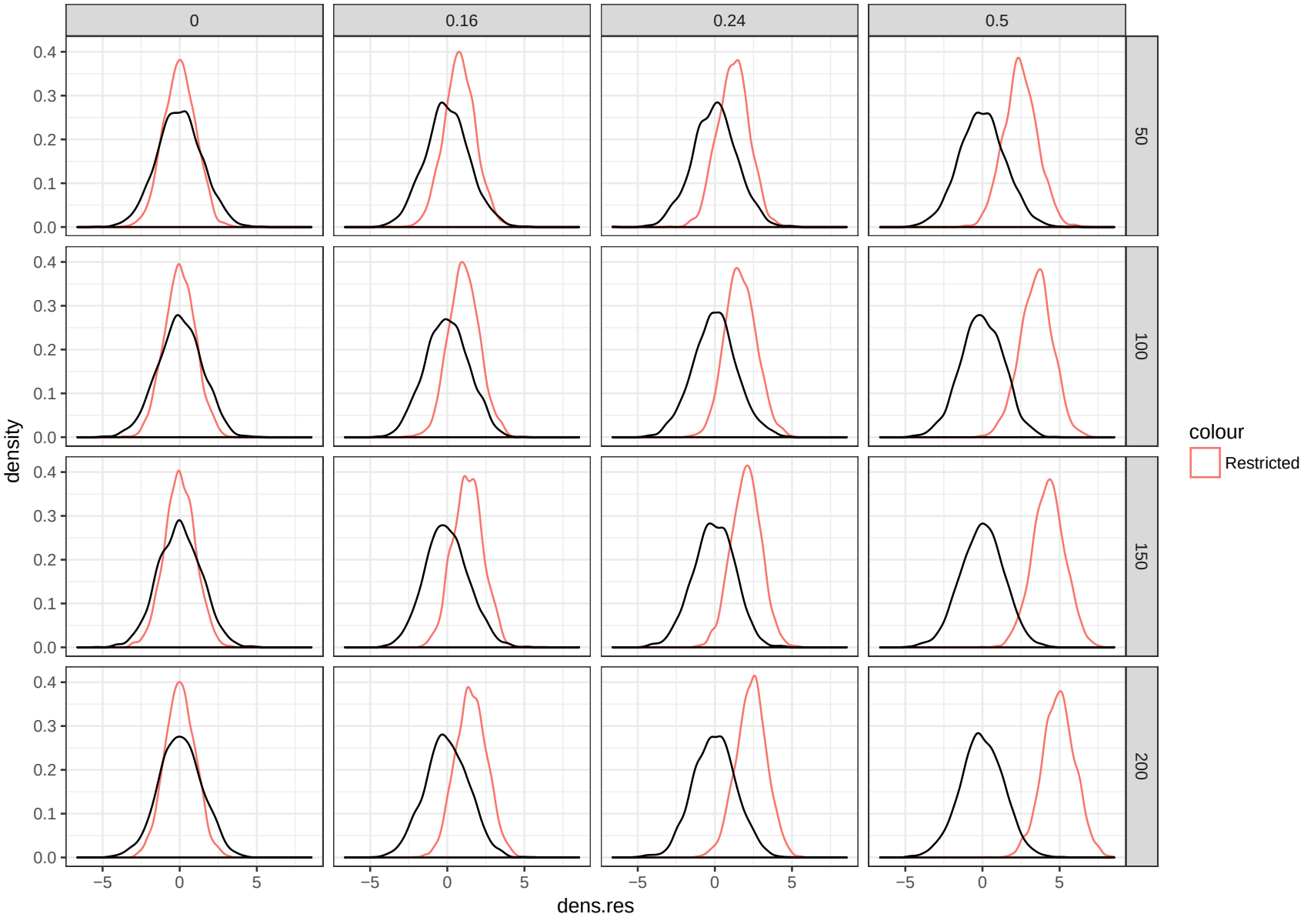
$$\alpha_{res} = \alpha_{unres} + E[x_1' x_1]^{-1} * E[x_1' x_2] * \beta = \alpha_{unres} + 0.7\beta$$

Beta	n	Alpha Res.	Alpha Unres.	Alpha Pos
0.16	50	0.114	-0.002	0.071
0.16	100	0.109	-0.002	0.056
0.16	150	0.109	-0.003	0.050
0.16	200	0.109	-0.003	0.041
0.24	50	0.169	-0.002	0.093
0.24	100	0.168	0.000	0.068
0.24	150	0.165	-0.005	0.039
0.24	200	0.167	-0.001	0.031
0.50	50	0.350	-0.001	0.062
0.50	100	0.349	-0.003	0.006
0.50	150	0.351	-0.001	-0.001
0.50	200	0.350	-0.002	-0.002

Average times where alpha is in the confidence interval

Beta	n	Mean Res.	Mean Unres.	Mean Pos
0.00	50	0.948	0.947	0.936
0.00	100	0.952	0.952	0.932
0.00	150	0.946	0.946	0.933
0.00	200	0.956	0.952	0.944
0.16	50	0.878	0.954	0.873
0.16	100	0.817	0.960	0.836
0.16	150	0.752	0.954	0.808
0.16	200	0.663	0.950	0.764
0.24	50	0.792	0.950	0.811
0.24	100	0.636	0.946	0.748
0.24	150	0.488	0.962	0.752
0.24	200	0.353	0.954	0.752
0.50	50	0.389	0.941	0.751
0.50	100	0.110	0.955	0.916
0.50	150	0.024	0.952	0.947
0.50	200	0.004	0.946	0.945

Density of standardized distribution



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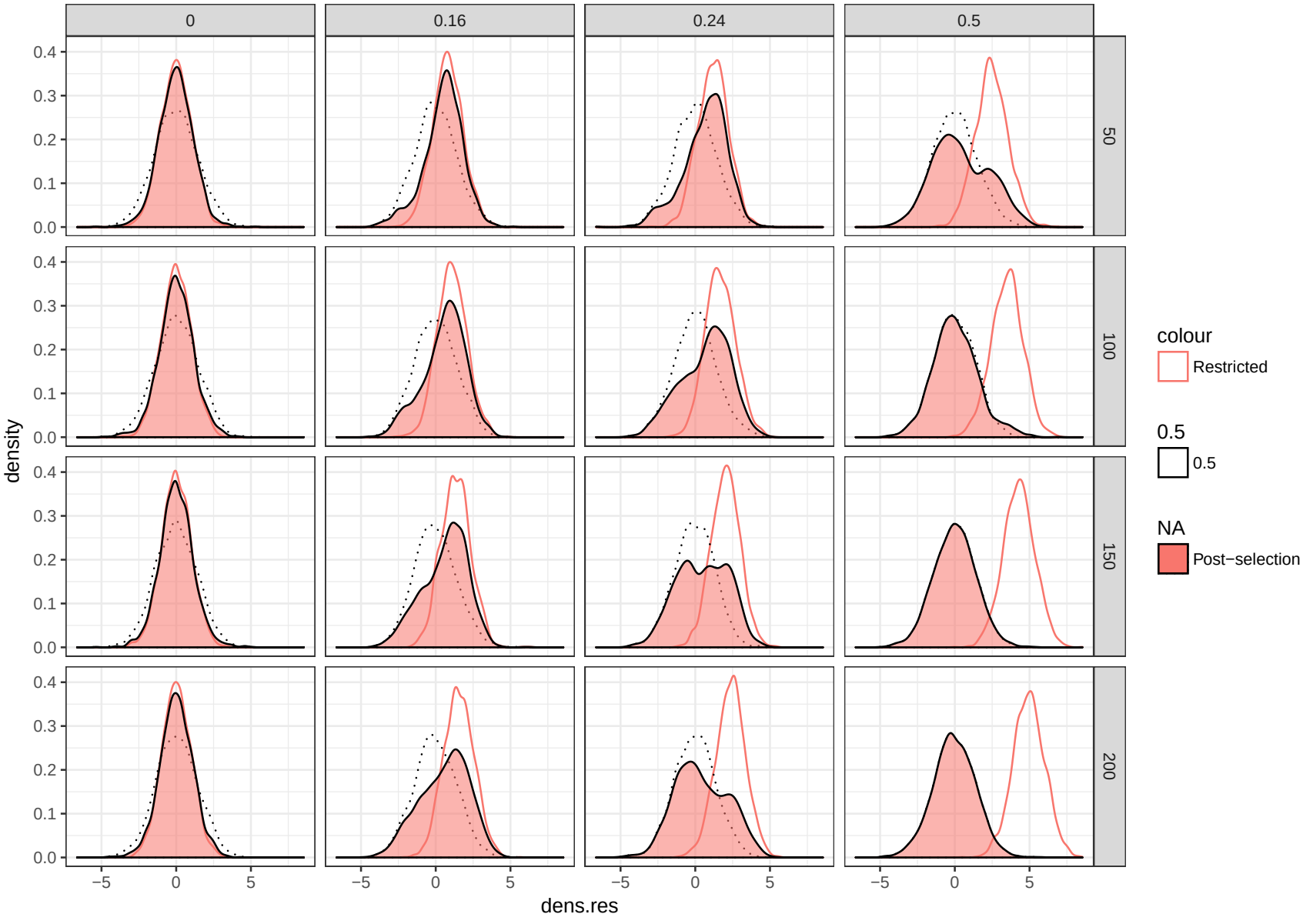

Percentage of rejection of the t-test for beta

n	beta	mean(beta.test)
50	0.00	0.046
50	0.16	0.128
50	0.24	0.215
50	0.50	0.680
100	0.00	0.059
100	0.16	0.218
100	0.24	0.378
100	0.50	0.950
150	0.00	0.050
150	0.16	0.292
150	0.24	0.560
150	0.50	0.994
200	0.00	0.054
200	0.16	0.382
200	0.24	0.662
200	0.50	0.999