Computing 5

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2/21/2018

Preliminary Questions

- $P(\hat{\beta} \neq 0) = 0.05$ for any n
- When $\beta = 0$, the post-test estimator will not be consistent
- When $\beta \neq 0$, the post-test estimator will be consistent
- With uncertainty about β, the post-test estimator is not consistent
- Similarly, $\hat{\alpha}$ is not consistent, but. . .

For $\beta = 0$, the restricted model has the lowest variance

	long alpha	short alpha	everyday alpha
n = 50	0.0429056	0.0218680	0.0285080
n = 100	0.0202663	0.0108968	0.0133417
n = 150	0.0137500	0.0071143	0.0086422
n = 200	0.0102637	0.0052706	0.0065090

- With $\beta = 0$, the restriction is true. Since the everyday OLS introduces false negatives, the short regression estimator is more efficient than the everyday OLS.
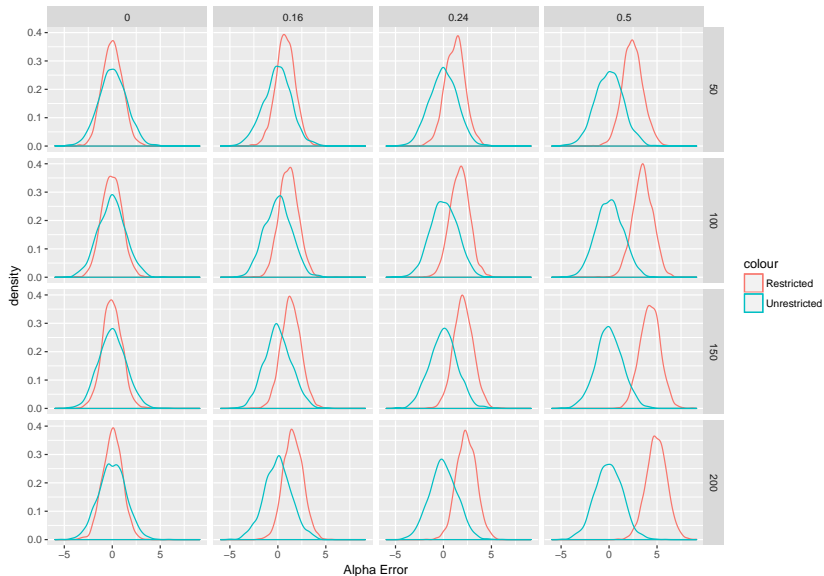
Estimator bias

Beta2	N	Long alpha bias	Short alpha bias	Everyday alpha bias
0.16	50	-0.0080340	0.1118507	0.0643711
0.16	100	0.0023183	0.1135265	0.0641954
0.16	150	0.0010844	0.1112080	0.0527960
0.16	200	0.0003279	0.1124314	0.0458716
0.24	50	-0.0016249	0.1695473	0.0913369
0.24	100	0.0064142	0.1703543	0.0711528
0.24	150	0.0008033	0.1692693	0.0443151
0.24	200	-0.0005418	0.1689150	0.0286376
0.50	50	0.0021256	0.3488637	0.0695676
0.50	100	0.0052937	0.3513548	0.0178096
0.50	150	0.0012170	0.3495075	0.0022488
0.50	200	-0.0023110	0.3494535	-0.0022434

Confidence intervals

Beta2	N	Long alpha in CI	Short alpha in CI	Everyday alpha in CI
0.00	50	0.9525	0.9525	0.9435
0.00	100	0.9480	0.9455	0.9380
0.00	150	0.9490	0.9445	0.9410
0.00	200	0.9465	0.9460	0.9380
0.16	50	0.9500	0.8870	0.8800
0.16	100	0.9660	0.8125	0.8330
0.16	150	0.9470	0.7335	0.7835
0.16	200	0.9425	0.6515	0.7520
0.24	50	0.9530	0.7950	0.8115
0.24	100	0.9590	0.6165	0.7405
0.24	150	0.9525	0.4880	0.7350
0.24	200	0.9430	0.3560	0.7630
0.50	50	0.9455	0.4045	0.7525
0.50	100	0.9545	0.0995	0.8950
0.50	150	0.9490	0.0205	0.9430
0.50	200	0.9435	0.0055	0.9435

Density of standardized distributions

The restricted specificiation is biased upwards

All estimators together:
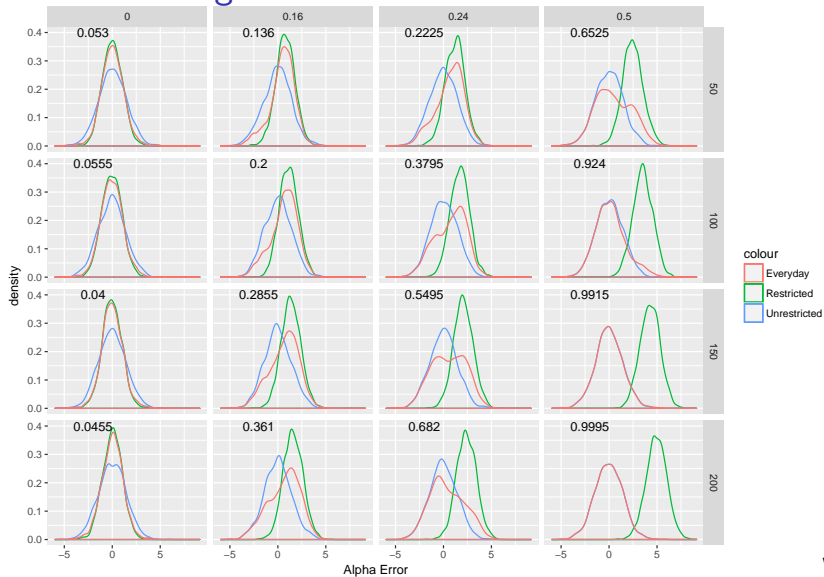
When the sample sizes is large, or the potentially-omitted variable is highly significant, the everyday approaches the unrestricted specification.