Linear Model Simulations

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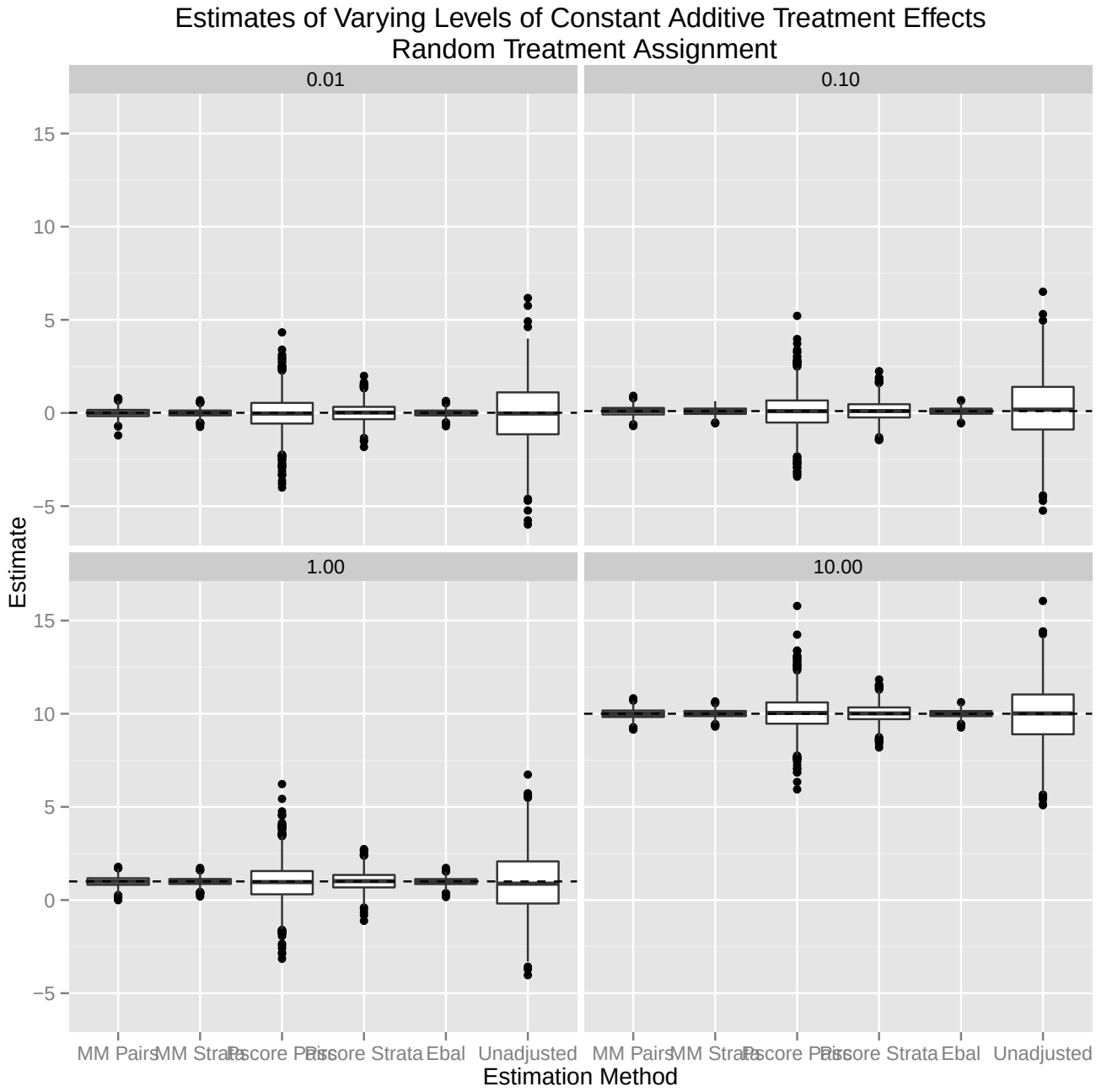
Set simulation parameters

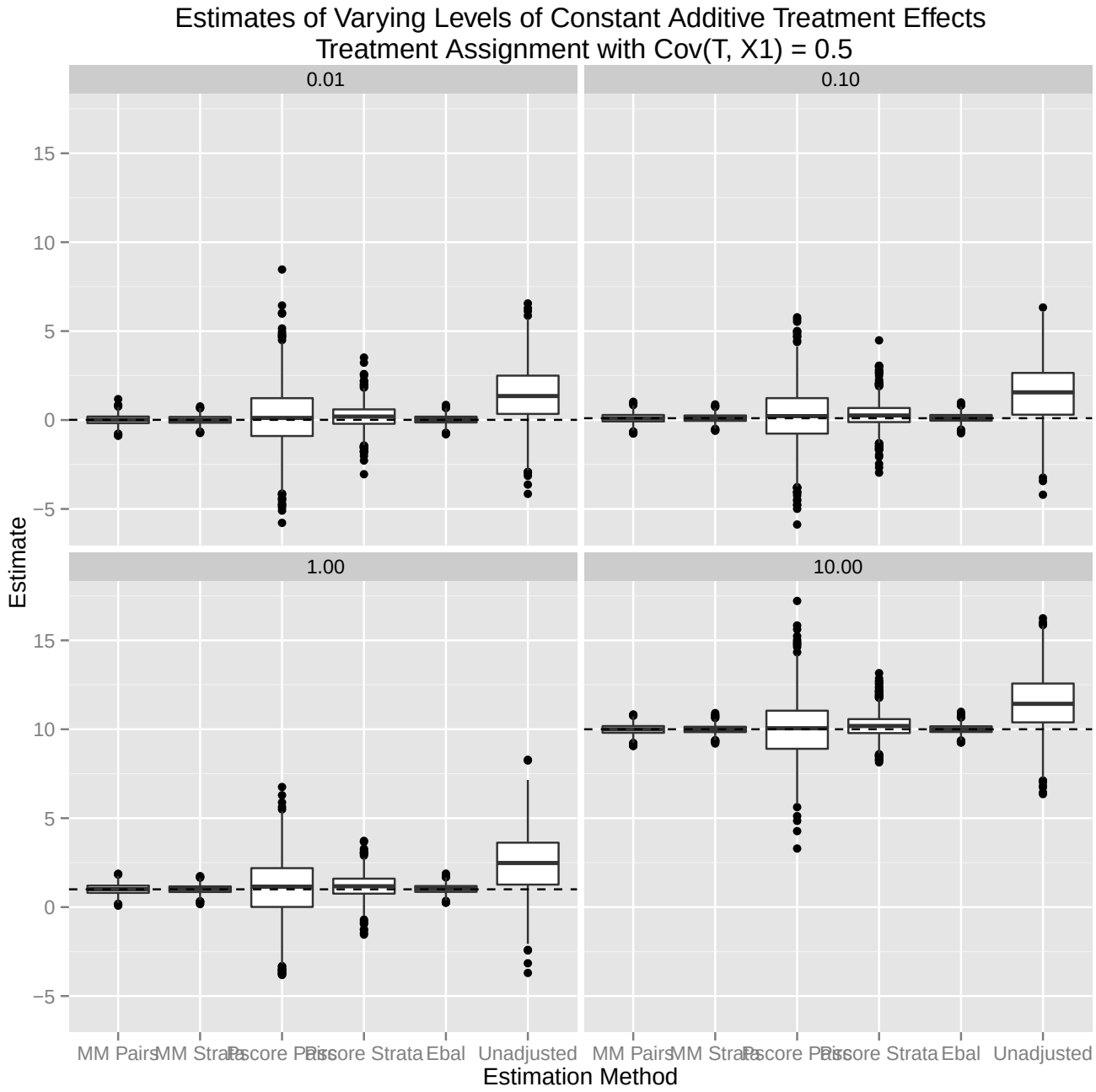
```
set.seed(321)
gamma <- c(0.01, 0.1, 1, 10)
B <- 1000
N <- 100
```

1 Gaussian Errors in the Linear Model



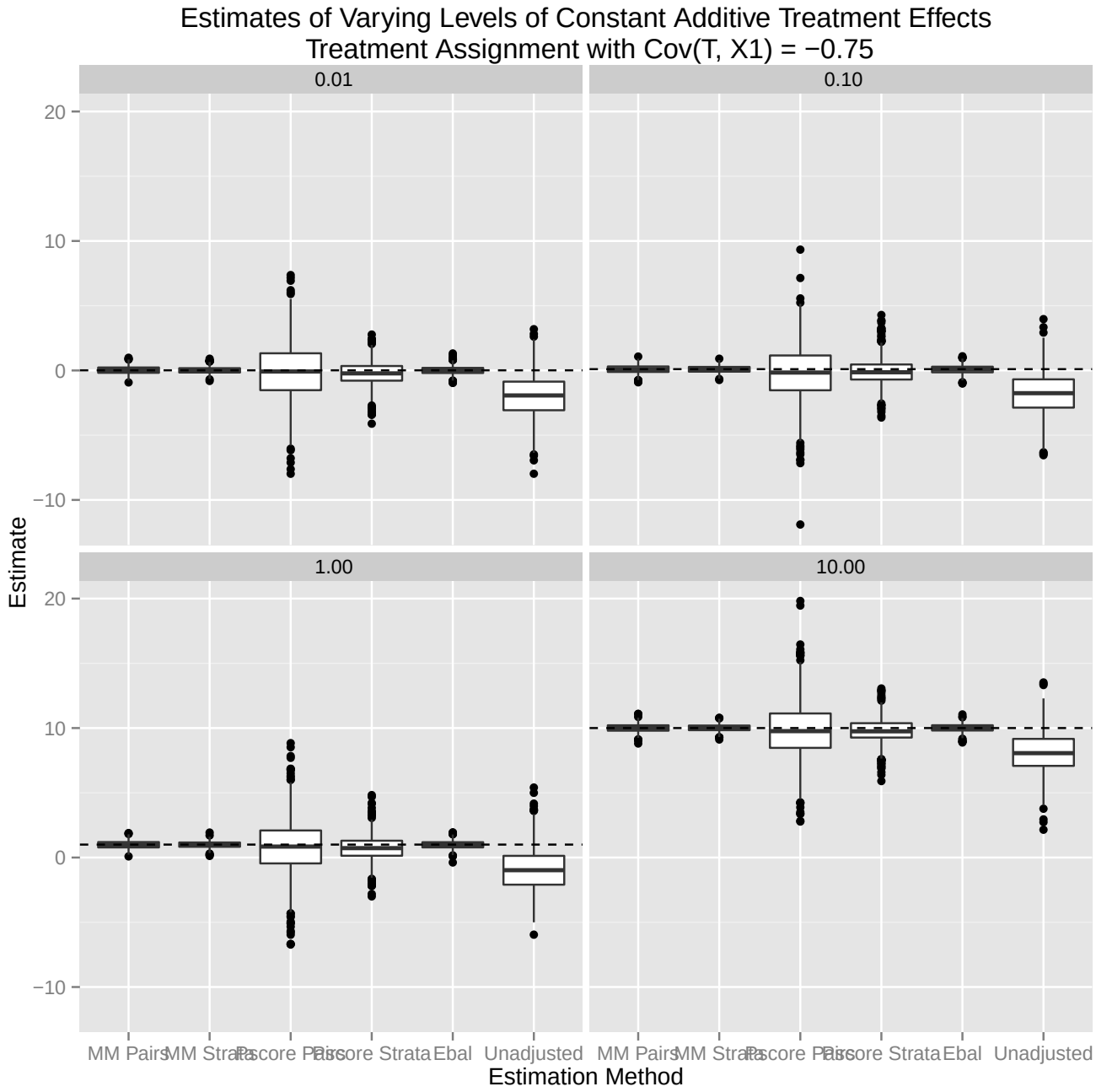
	0.01	0.1	1	10
MM Pairs	0.257	0.263	0.264	0.260
MM Strata	0.203	0.200	0.210	0.204
Pscore Pairs	1.030	1.033	1.139	1.043
Pscore Strata	0.520	0.548	0.519	0.512
Ebal	0.206	0.201	0.212	0.205
Unadjusted	1.683	1.705	1.646	1.579

Table 1: RMSE for various treatment effects; Random Treatment Assignment



	0.01	0.1	1	10
MM Pairs	0.287	0.291	0.296	0.296
MM Strata	0.239	0.234	0.234	0.237
Pscore Pairs	1.736	1.661	1.686	1.701
Pscore Strata	0.705	0.735	0.683	0.689
Ebal	0.250	0.243	0.251	0.248
Unadjusted	2.132	2.220	2.238	2.229

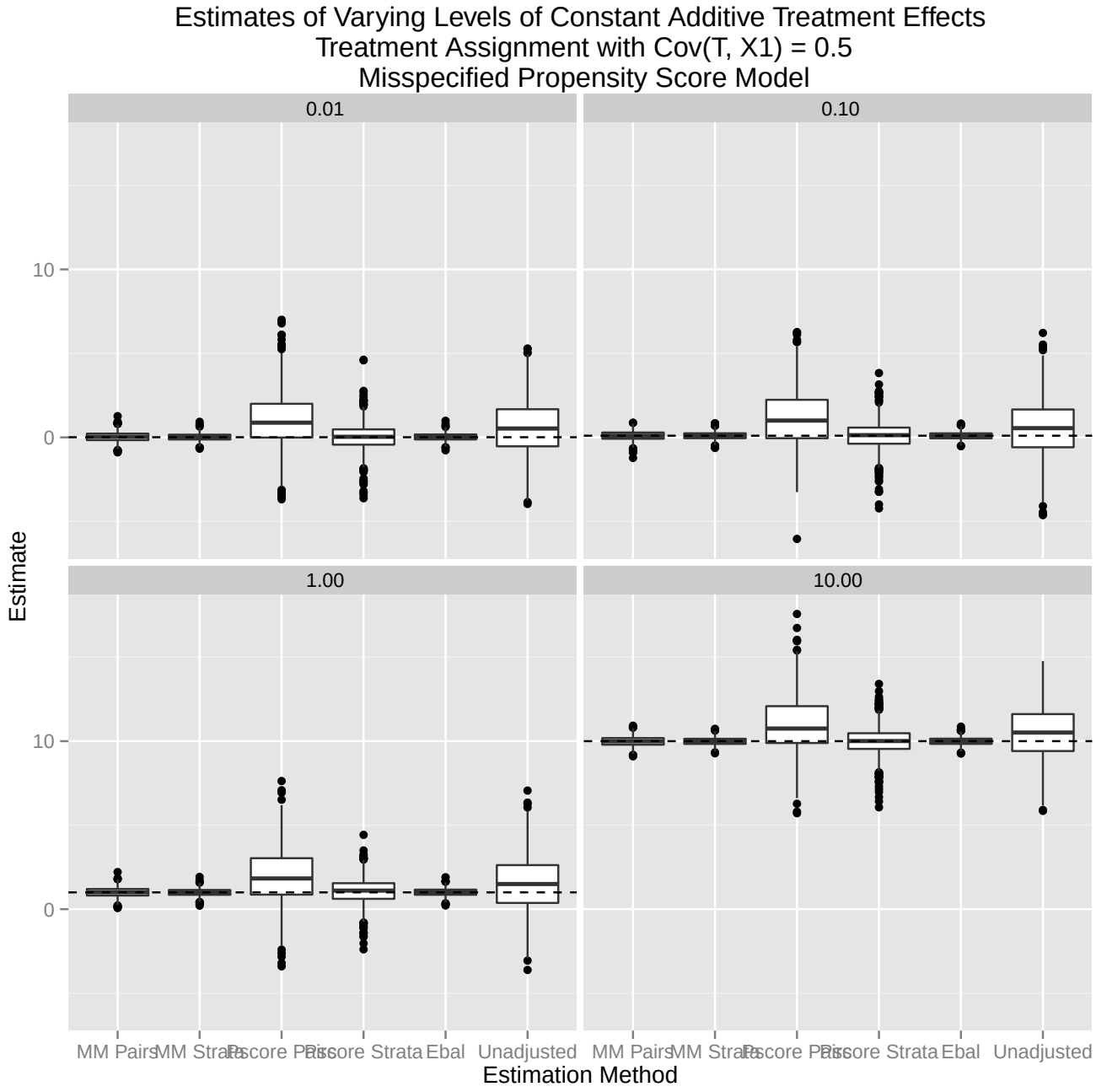
Table 2: RMSE for various treatment effects; Treatment Assignment with $cov(T, X_1) = 0.5$



	0.01	0.1	1	10
MM Pairs	0.302	0.313	0.292	0.304
MM Strata	0.256	0.266	0.245	0.262
Pscore Pairs	2.143	2.160	2.134	2.164
Pscore Strata	0.945	1.057	0.991	0.967
Ebal	0.310	0.319	0.300	0.308
Unadjusted	2.555	2.476	2.564	2.489

Table 3: RMSE for various treatment effects; Treatment Assignment with $cov(T, X_1) = -0.75$

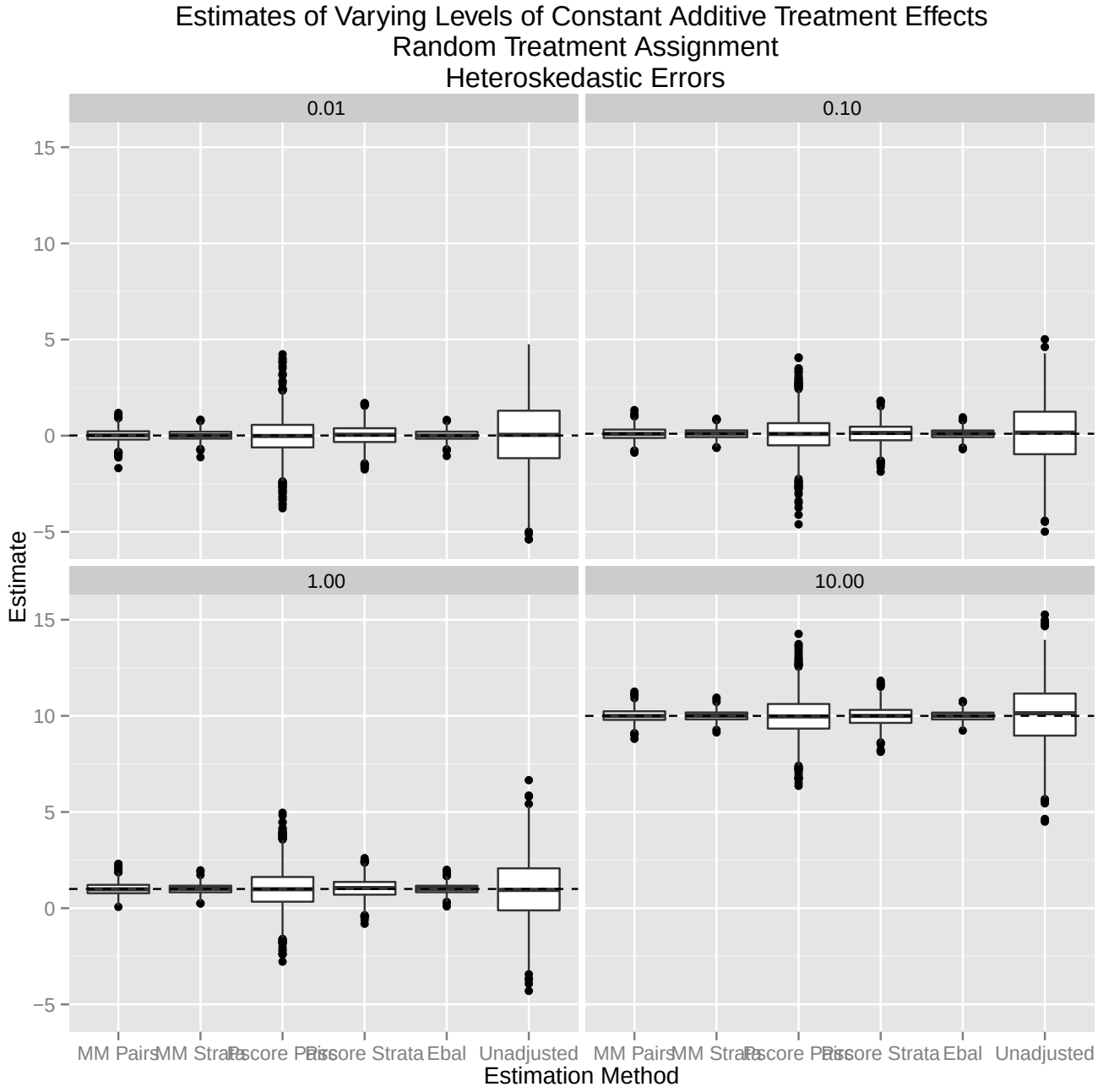
2 Misspecified Propensity Score Estimates



	0.01	0.1	1	10
MM Pairs	0.293	0.288	0.292	0.288
MM Strata	0.222	0.219	0.220	0.221
Pscore Pairs	1.892	1.953	1.887	1.918
Pscore Strata	0.850	0.839	0.780	0.829
Ebal	0.221	0.217	0.222	0.223
Unadjusted	1.766	1.694	1.769	1.725

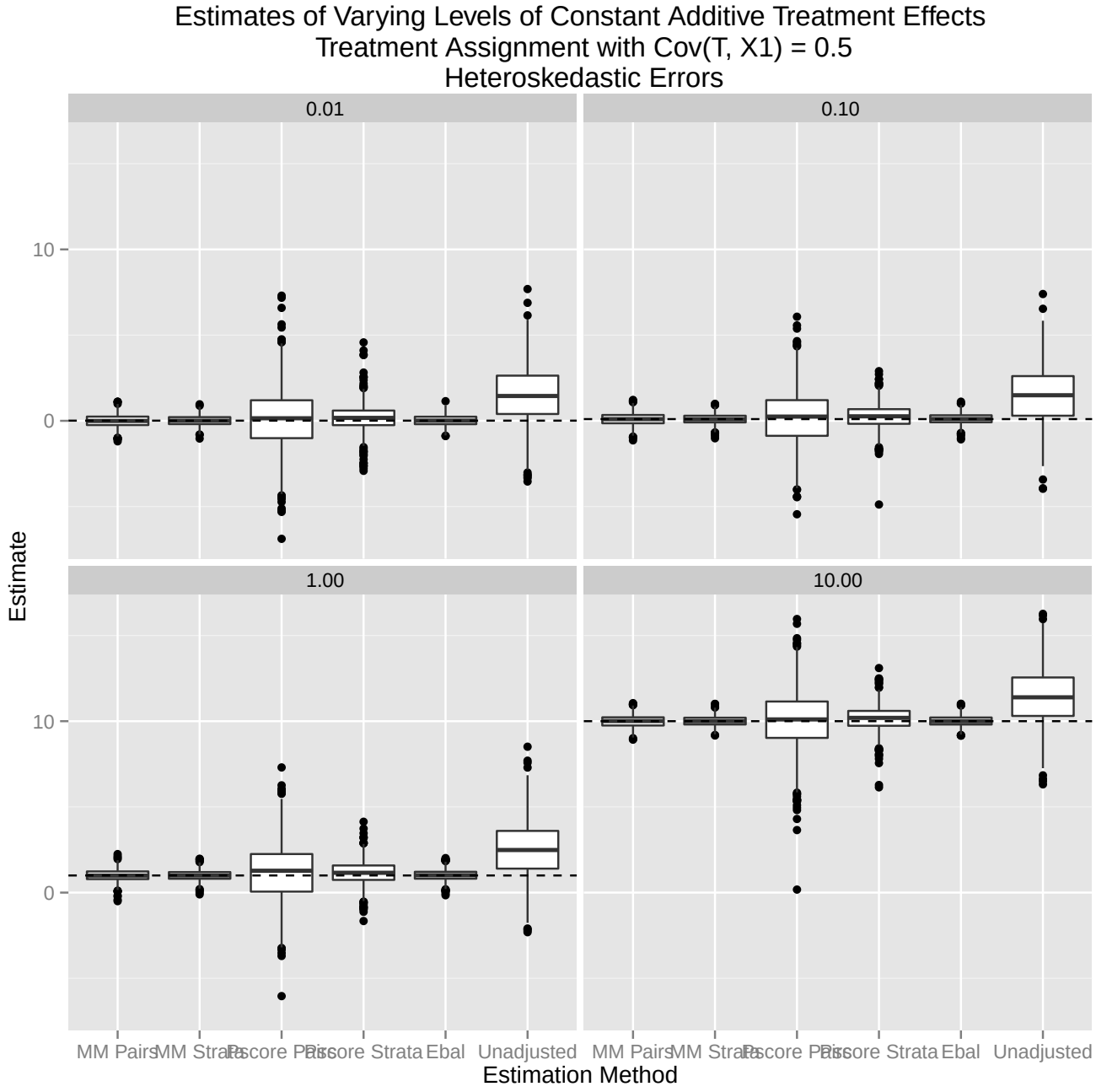
Table 4: RMSE for various treatment effects; Treatment Assignment with $cov(T, X_1) = 0.5$; Misspecified Propensity Score Model

3 Heteroskedastic Linear Model Errors



	0.01	0.1	1	10
MM Pairs	0.335	0.330	0.322	0.339
MM Strata	0.267	0.262	0.251	0.256
Pscore Pairs	1.077	1.088	1.146	1.091
Pscore Strata	0.548	0.548	0.521	0.538
Ebal	0.268	0.263	0.259	0.256
Unadjusted	1.753	1.640	1.641	1.627

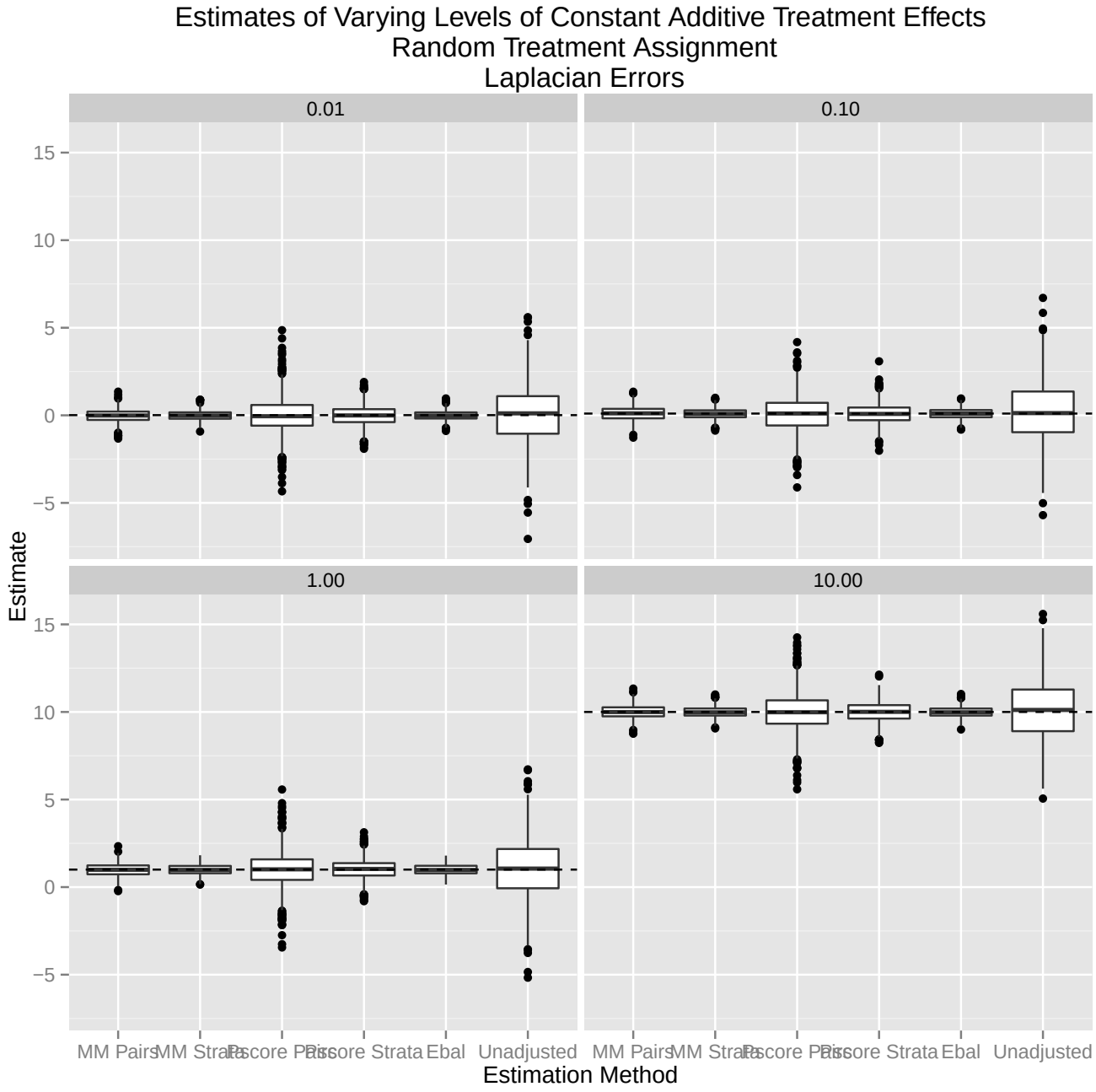
Table 5: RMSE for various treatment effects; Random Treatment Assignment; Heteroskedastic Errors



	0.01	0.1	1	10
MM Pairs	0.369	0.371	0.359	0.357
MM Strata	0.299	0.297	0.297	0.296
Pscore Pairs	1.789	1.679	1.692	1.735
Pscore Strata	0.782	0.706	0.692	0.735
Ebal	0.312	0.313	0.313	0.309
Unadjusted	2.246	2.099	2.257	2.205

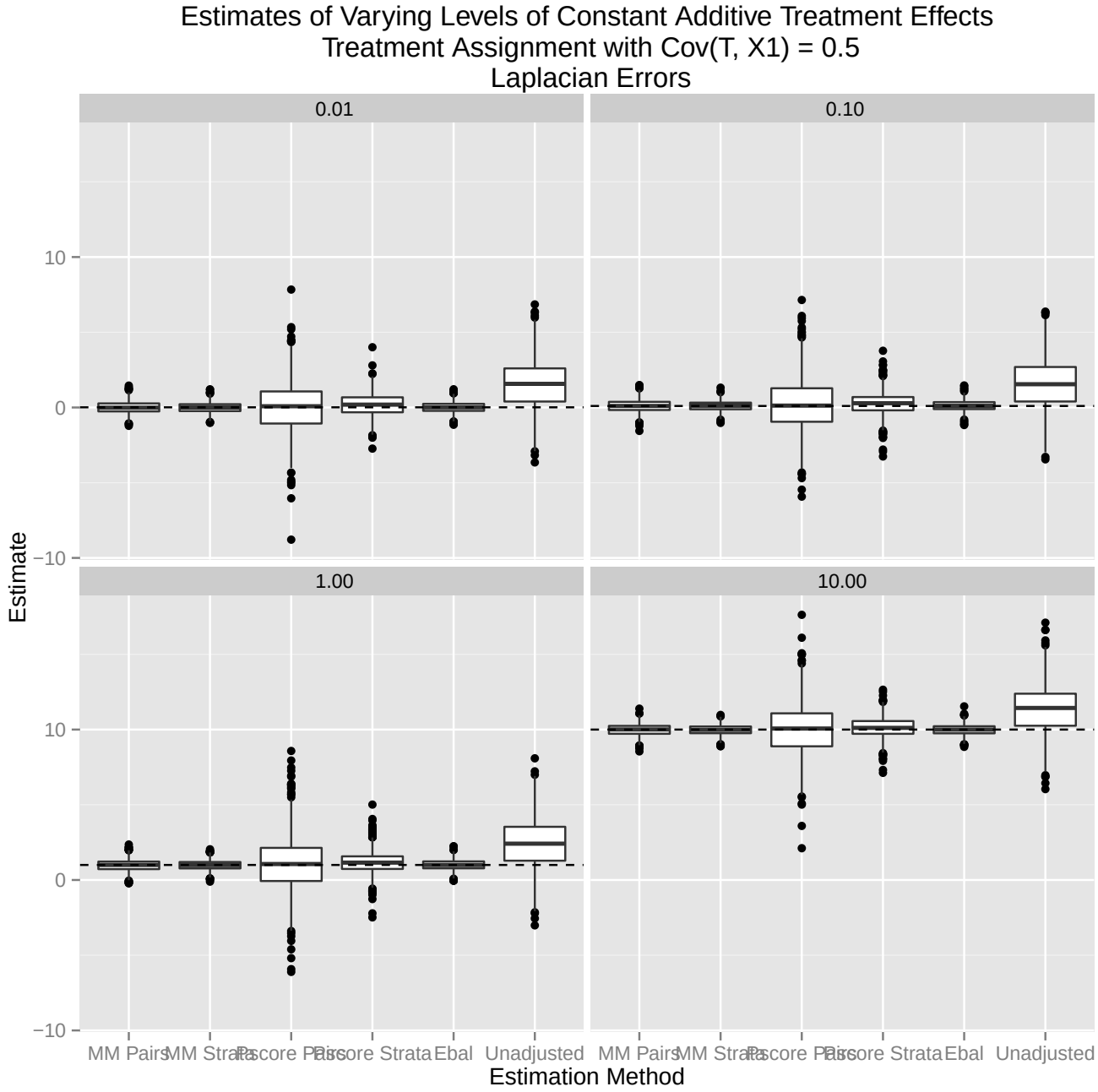
Table 6: RMSE for various treatment effects; Treatment Assignment with $cov(T, X_1) = 0.5$; Heteroskedastic Errors

4 Heavy-tailed Linear Model Errors



	0.01	0.1	1	10
MM Pairs	0.372	0.386	0.378	0.380
MM Strata	0.282	0.299	0.293	0.303
Pscore Pairs	1.076	1.043	1.063	1.134
Pscore Strata	0.569	0.572	0.566	0.573
Ebal	0.276	0.296	0.291	0.303
Unadjusted	1.670	1.700	1.694	1.722

Table 7: RMSE for various treatment effects; Random Treatment Assignment; Laplacian Errors

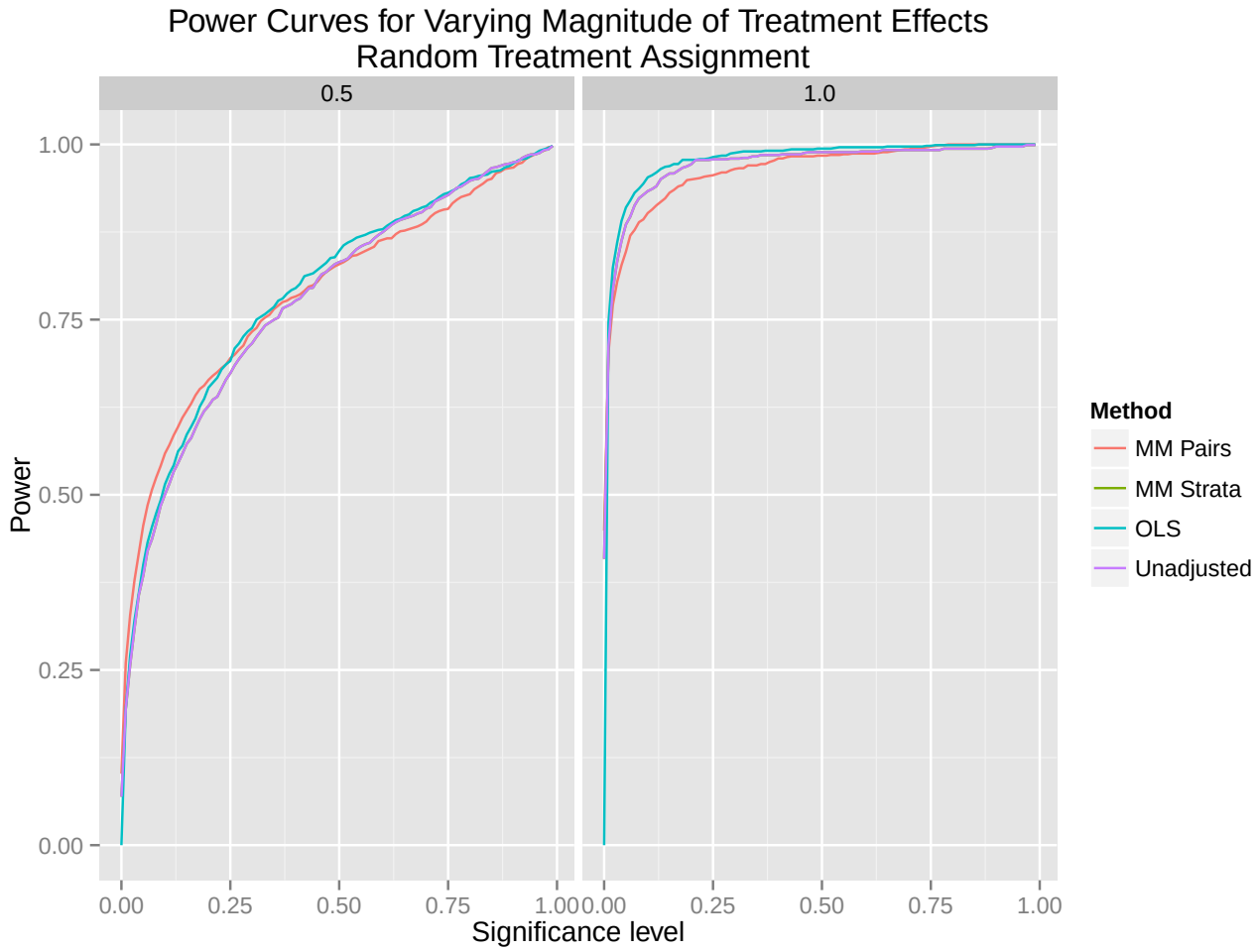


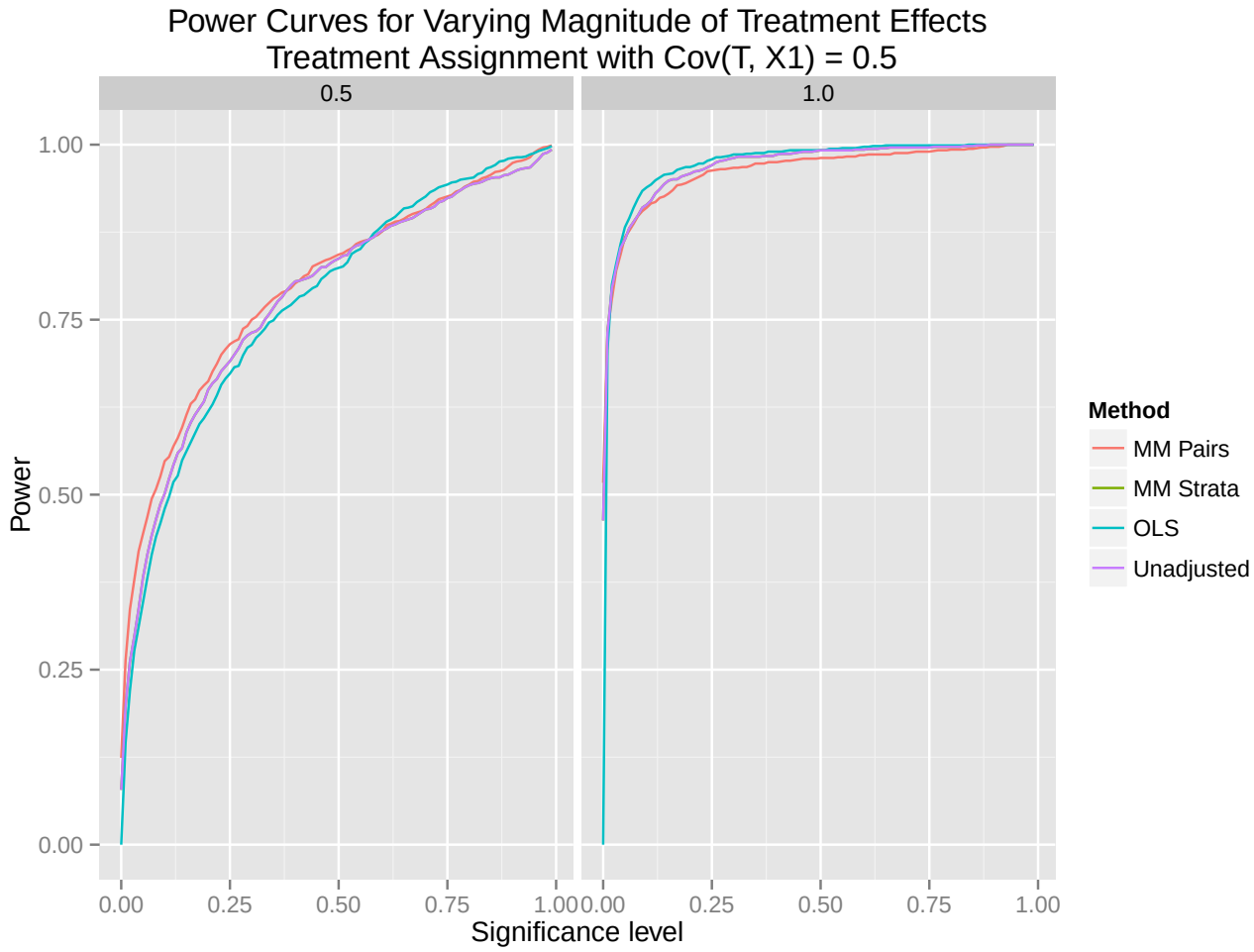
	0.01	0.1	1	10
MM Pairs	0.402	0.411	0.397	0.398
MM Strata	0.337	0.333	0.330	0.332
Pscore Pairs	1.688	1.752	1.831	1.721
Pscore Strata	0.729	0.767	0.775	0.682
Ebal	0.362	0.355	0.353	0.351
Unadjusted	2.263	2.211	2.205	2.153

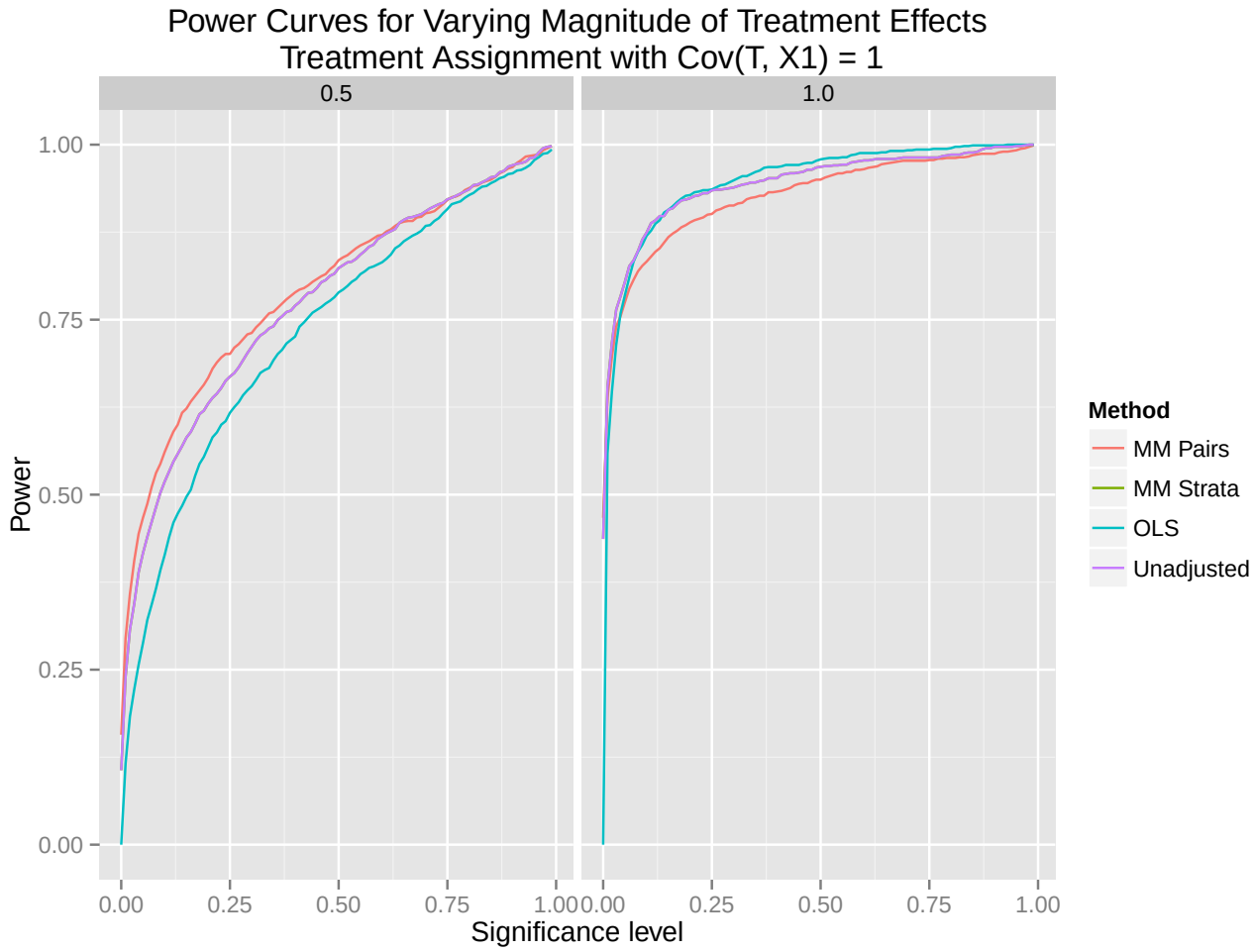
Table 8: RMSE for various treatment effects; Treatment Assignment with $cov(T, X_1) = 0.5$; Laplacian Errors

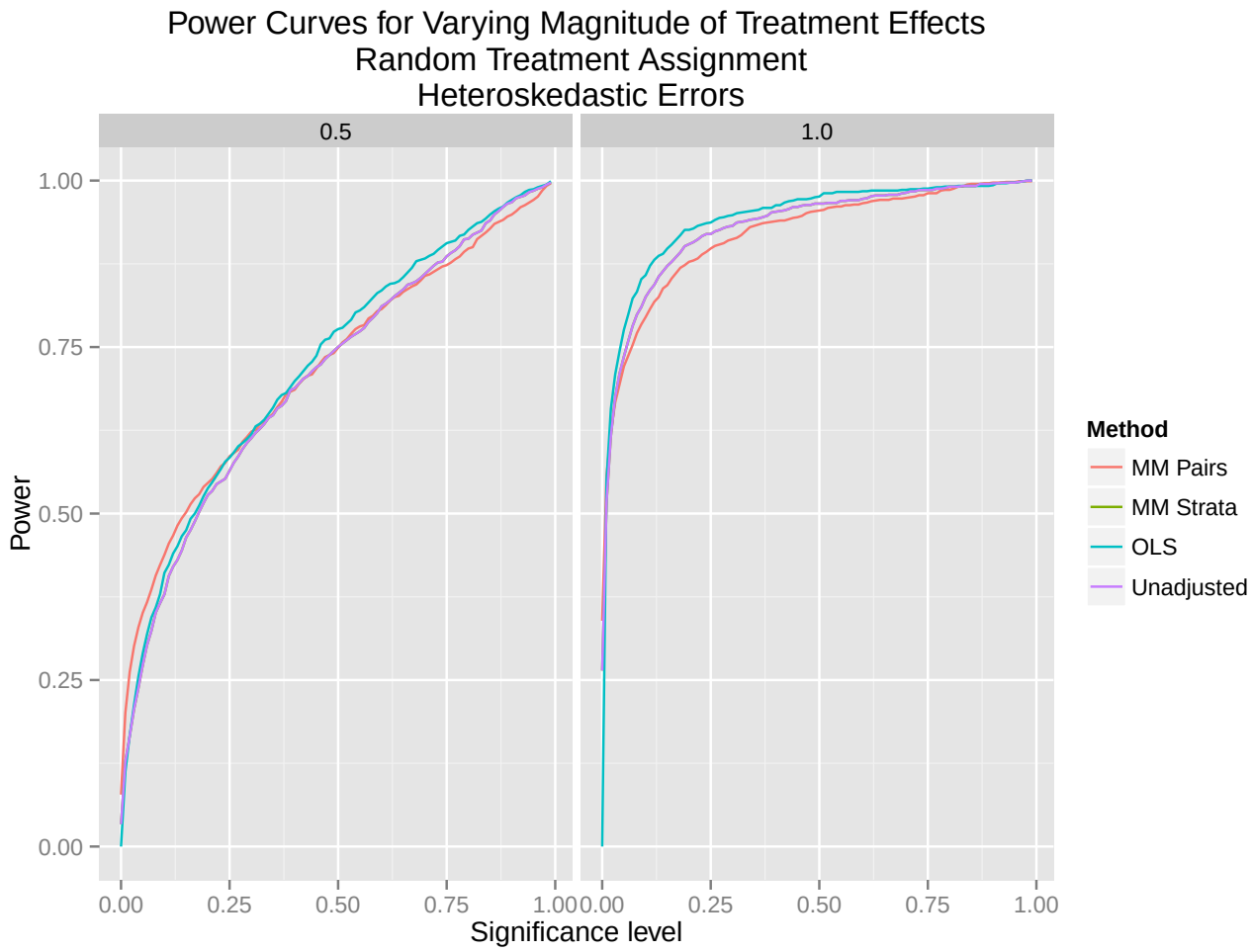
5 Hypothesis Testing

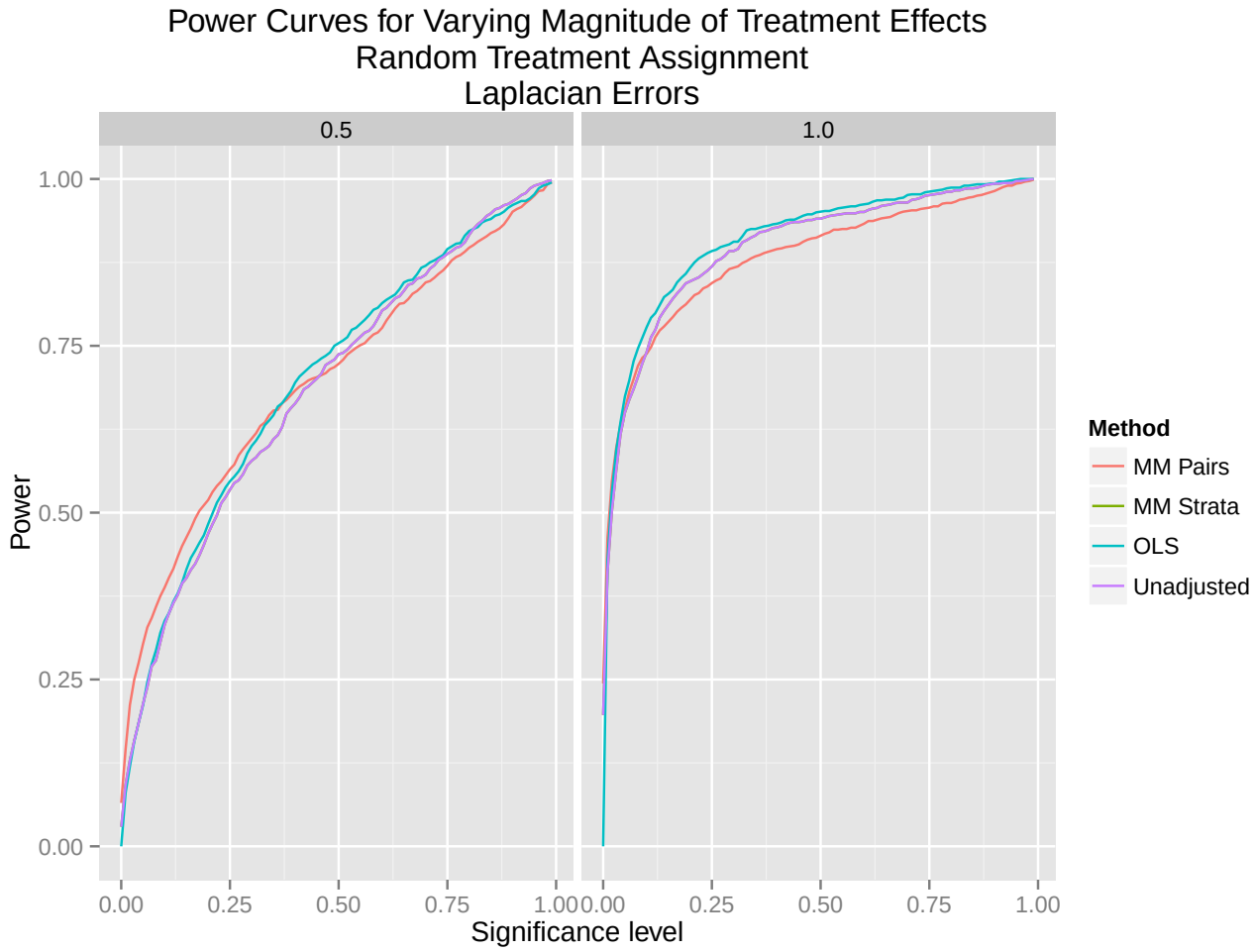
We compare the power of stratified permutation tests using model-based matching with pairs and with strata to the t-test from OLS and an unstratified permutation test.




Power Curves for Varying Magnitude of Treatment Effects
Treatment Assignment with Cov(T, X1) = 0.5
0.5
1.0
Power
1.00
0.75
0.50
0.25
0.00
0.00
0.25
0.50
0.75
1.00
Significance level
Method
MM Pairs
MM Strata
OLS
Unadjusted


Power Curves for Varying Magnitude of Treatment Effects
Treatment Assignment with Cov(T, X1) = 1
0.5
1.0
Power
1.00
0.75
0.50
0.25
0.00
0.00
0.25
0.50
0.75
1.00
Significance level
Method
MM Pairs
MM Strata
OLS
Unadjusted


Power Curves for Varying Magnitude of Treatment Effects
Random Treatment Assignment
Heteroskedastic Errors
0.5
1.0
Power
1.00
0.75
0.50
0.25
0.00
0.00
0.25
0.50
0.75
1.00
Significance level
Method
MM Pairs
MM Strata
OLS
Unadjusted


Power Curves for Varying Magnitude of Treatment Effects
Random Treatment Assignment
Laplacian Errors
0.5
1.0
Power
1.00
0.75
0.50
0.25
0.00
0.00
0.25
0.50
0.75
1.00
Significance level
Method
MM Pairs
MM Strata
OLS
Unadjusted