

Supplementary Material for “Sparse principal component regression via singular value decomposition approach”

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Additional tables for TPR and TNR in the Monte Carlo simulations

Table S.1: Mean (standard deviation) values of TPR and TNR for Case 2. The bold values correspond to the largest means.

| σ | n | k | | SPCRsvd-LADMM | SPCRsvd-ADMM | SPCR | SPLS |
|----------|-----|-----|-----|-------------------------|------------------|-------------------------|-------------------------|
| 1 | 50 | 1 | TPR | 1 (0) | 0.960 (0.136) | 1 (0) | 0.860 (0.225) |
| | | | TNR | 0.501 (0.131) | 0.644 (0.195) | 0.280 (0.030) | 0.920 (0.139) |
| | | 5 | TPR | 1 (0) | 1 (0) | 1 (0) | 1 (0) |
| | | | TNR | 0.450 (0.135) | 0.531 (0.127) | 0.641 (0.176) | 0.946 (0.119) |
| | 200 | 1 | TPR | 1 (0) | 0.960 (0.136) | 1 (0) | 0.930 (0.174) |
| | | | TNR | 0.624 (0.174) | 0.829 (0.193) | 0.277 (0.019) | 0.969 (0.069) |
| | | 5 | TPR | 1 (0) | 0.995 (0.05) | 1 (0) | 1 (0) |
| | | | TNR | 0.543 (0.201) | 0.704 (0.163) | 0.731 (0.192) | 0.951 (0.088) |
| 2 | 50 | 1 | TPR | 0.990 (0.100) | 0.945 (0.157) | 0.990 (0.100) | 0.855 (0.228) |
| | | | TNR | 0.402 (0.108) | 0.535 (0.195) | 0.286 (0.076) | 0.916 (0.146) |
| | | 5 | TPR | 1 (0) | 1 (0) | 1 (0) | 1 (0) |
| | | | TNR | 0.372 (0.091) | 0.460 (0.130) | 0.570 (0.157) | 0.945 (0.117) |
| | 200 | 1 | TPR | 1 (0) | 0.875 (0.217) | 1 (0) | 0.93 (0.174) |
| | | | TNR | 0.476 (0.123) | 0.738 (0.213) | 0.276 (0.017) | 0.961 (0.073) |
| | | 5 | TPR | 1 (0) | 0.985 (0.085) | 1 (0) | 1 (0) |
| | | | TNR | 0.430 (0.134) | 0.573 (0.165) | 0.702 (0.169) | 0.951 (0.088) |

Table S.2: Mean (standard deviation) values of TPR and TNR for Case 3. The bold values correspond to the largest means.

| σ | n | k | | SPCR _{svd} -LADMM | SPCR _{svd} -ADMM | SPCR | SPLS |
|----------|-----|-----|-----|----------------------------|---------------------------|------------------|-------------------------|
| 1 | 50 | 1 | TPR | 1 (0) | 1 (0) | 0.990 (0.100) | 0.580 (0.297) |
| | | | TNR | 0.173 (0.112) | 0.384 (0.204) | 0.182 (0.151) | 0.707 (0.308) |
| | | 5 | TPR | 1 (0) | 1 (0) | 1 (0) | 0.985 (0.053) |
| | | | TNR | 0.185 (0.144) | 0.421 (0.247) | 0.20 (0.134) | 0.71 (0.186) |
| | 200 | 1 | TPR | 1 (0) | 1 (0) | 1 (0) | 0.826 (0.190) |
| | | | TNR | 0.246 (0.119) | 0.607 (0.270) | 0.200 (0.121) | 0.839 (0.186) |
| | | 5 | TPR | 1 (0) | 1 (0) | 1 (0) | 0.998 (0.016) |
| | | | TNR | 0.259 (0.193) | 0.521 (0.278) | 0.195 (0.133) | 0.890 (0.111) |
| 2 | 50 | 1 | TPR | 1 (0) | 1 (0) | 0.990 (0.100) | 0.518 (0.307) |
| | | | TNR | 0.083 (0.079) | 0.227 (0.169) | 0.113 (0.130) | 0.738 (0.292) |
| | | 5 | TPR | 1 (0) | 1 (0) | 1 (0) | 0.981 (0.057) |
| | | | TNR | 0.111 (0.116) | 0.276 (0.201) | 0.117 (0.095) | 0.615 (0.227) |
| | 200 | 1 | TPR | 0.990 (0.100) | 0.990 (0.100) | 0.980 (0.140) | 0.785 (0.209) |
| | | | TNR | 0.134 (0.135) | 0.445 (0.255) | 0.175 (0.158) | 0.847 (0.186) |
| | | 5 | TPR | 0.990 (0.100) | 1 (0) | 0.980 (0.140) | 0.998 (0.016) |
| | | | TNR | 0.137 (0.142) | 0.397 (0.242) | 0.181 (0.157) | 0.870 (0.145) |

Table S.3: Mean (standard deviation) values of TPR and TNR for Case 4. The bold values correspond to the largest means.

| σ | n | k | | SPCR _{svd} -LADMM | SPCR _{svd} -ADMM | SPCR | SPLS |
|----------|-----|-----|-----|----------------------------|---------------------------|----------|--------------|
| 1 | 50 | 1 | TPR | 1 | 1 | 1 | 0.500 |
| | | | | (0) | (0) | (0) | (0) |
| | | | TNR | 0.114 | 0.390 | 0.121 | 0.998 |
| | | | | (0.082) | (0.240) | (0.089) | (0.007) |
| | | 5 | TPR | 1 | 1 | 1 | 0.975 |
| | | | | (0) | (0) | (0) | (0.074) |
| | 200 | | TNR | 0.078 | 0.253 | 0.147 | 0.723 |
| | | | | (0.084) | (0.205) | (0.090) | (0.198) |
| | | 1 | TPR | 1 | 1 | 1 | 0.505 |
| | | | | (0) | (0) | (0) | (0.029) |
| | | | TNR | 0.200 | 0.793 | 0.183 | 0.990 |
| | | | | (0.099) | (0.254) | (0.104) | (0.043) |
| 2 | 50 | 5 | TPR | 1 | 1 | 1 | 1 |
| | | | | (0) | (0) | (0) | (0) |
| | | | TNR | 0.156 | 0.449 | 0.190 | 0.909 |
| | | | | (0.120) | (0.255) | (0.105) | (0.090) |
| | 200 | 1 | TPR | 1 | 0.999 | 0.999 | 0.499 |
| | | | | (0) | (0.008) | (0.008) | (0.014) |
| | | | TNR | 0.048 | 0.220 | 0.065 | 0.995 |
| | | | | (0.055) | (0.200) | (0.060) | (0.025) |
| | | 5 | TPR | 1 | 0.983 | 0.999 | 0.931 |
| | | | | (0) | (0.111) | (0.008) | (0.122) |
| | | | TNR | 0.047 | 0.243 | 0.076 | 0.724 |
| | | | | (0.061) | (0.211) | (0.063) | (0.203) |
| | 200 | 1 | TPR | 1 | 1 | 1 | 0.505 |
| | | | | (0) | (0) | (0) | (0.028) |
| | | | TNR | 0.089 | 0.697 | 0.100 | 0.990 |
| | | | | (0.076) | (0.258) | (0.076) | (0.044) |
| | | 5 | TPR | 1 | 0.998 | 1 | 1 |
| | | | | (0) | (0.016) | (0) | (0) |
| | | | TNR | 0.078 | 0.393 | 0.110 | 0.895 |
| | | | | (0.077) | (0.215) | (0.078) | (0.113) |

Table S.4: Mean (standard deviation) values of TPR and TNR for Case 5. The bold values correspond to the largest means.

| σ | n | k | | SPCR _{svd} -LADMM | SPCR _{svd} -ADMM | SPCR | SPLS |
|----------|-----|-----|-----|----------------------------|---------------------------|------------------|-------------------------|
| 1 | 50 | 1 | TPR | 1 (0) | 1 (0) | 1 (0) | 0.343 (0.296) |
| | | | TNR | 0.157 (0.089) | 0.333 (0.157) | 0.187 (0.107) | 0.787 (0.314) |
| | | 5 | TPR | 1 (0) | 1 (0) | 1 (0) | 0.918 (0.105) |
| | | | TNR | 0.142 (0.114) | 0.272 (0.194) | 0.194 (0.113) | 0.652 (0.204) |
| | 200 | 1 | TPR | 1 (0) | 0.990 (0.100) | 0.990 (0.100) | 0.635 (0.258) |
| | | | TNR | 0.227 (0.097) | 0.670 (0.223) | 0.209 (0.135) | 0.751 (0.286) |
| | | 5 | TPR | 1 (0) | 0.998 (0.020) | 1 (0) | 1 (0) |
| | | | TNR | 0.214 (0.151) | 0.421 (0.241) | 0.213 (0.117) | 0.848 (0.122) |
| 2 | 50 | 1 | TPR | 0.999 (0.010) | 0.999 (0.010) | 0.988 (0.100) | 0.338 (0.299) |
| | | | TNR | 0.079 (0.065) | 0.229 (0.169) | 0.128 (0.123) | 0.792 (0.297) |
| | | 5 | TPR | 1 (0) | 0.998 (0.014) | 0.998 (0.014) | 0.879 (0.171) |
| | | | TNR | 0.079 (0.081) | 0.195 (0.131) | 0.126 (0.083) | 0.630 (0.236) |
| | 200 | 1 | TPR | 1 (0) | 1 (0) | 0.990 (0.100) | 0.569 (0.268) |
| | | | TNR | 0.119 (0.072) | 0.555 (0.192) | 0.170 (0.122) | 0.797 (0.279) |
| | | 5 | TPR | 1 (0) | 0.999 (0.010) | 1 (0) | 0.999 (0.010) |
| | | | TNR | 0.104 (0.093) | 0.338 (0.196) | 0.169 (0.091) | 0.809 (0.155) |