Table 1: Comparative analysis for the impact of cross-fitting on TMLEs and one-step estimators in conjunction with the use of random forests. RF refers to random forest with 500 trees and a minimum node size of 5 for a continuous variable and 1 for binary, and CF denotes random forest with cross fitting using 5 folds.

| | TMLEs | | | | | | One-step estimators | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Univariate Binary* | | *Univariate Continuous* | | | | *Univariate Binary* | | *Univariate Continuous* | | | |
| | $\psi_1(\hat{Q}^\star)$ | | $\psi_{2a}(\hat{Q}^\star)$ | | $\psi_{2b}(\hat{Q}^\star)$ | | $\psi_1^+(\hat{Q})$ | | $\psi_{2a}^+(\hat{Q})$ | | $\psi_{2b}^+(\hat{Q})$ | |
| | RF | CF | RF | CF | RF | CF | RF | CF | RF | CF | RF | CF |
| **n=500** | | | | | | | | | | | | |
| Bias | -0.513 | -0.033 | -0.100 | 0.311 | -0.205 | 0.030 | -0.471 | -0.038 | 0.557 | 0.328 | -0.210 | 0.057 |
| SD | 0.260 | 0.142 | 0.238 | 0.429 | 0.196 | 0.311 | 0.208 | 0.133 | 0.384 | 0.376 | 0.148 | 0.326 |
| MSE | 0.331 | 0.021 | 0.066 | 0.280 | 0.080 | 0.098 | 0.265 | 0.019 | 0.457 | 0.249 | 0.066 | 0.110 |
| CI coverage | 34.8% | 84.5% | 97.3% | 71.1% | 51.3% | 86.3% | 38% | 86.1% | 50.7% | 72.1% | 51.7% | 84.5% |
| CI width | 0.828 | 0.413 | 1.108 | 1.047 | 0.441 | 0.923 | 0.827 | 0.409 | 1.115 | 1.045 | 0.441 | 0.926 |
| **n=1e+03** | | | | | | | | | | | | |
| Bias | -0.507 | -0.029 | -0.148 | 0.161 | -0.199 | 0.020 | -0.463 | -0.031 | 0.432 | 0.253 | -0.211 | 0.042 |
| SD | 0.186 | 0.100 | 0.148 | 0.237 | 0.143 | 0.239 | 0.151 | 0.097 | 0.247 | 0.259 | 0.110 | 0.247 |
| MSE | 0.292 | 0.011 | 0.044 | 0.082 | 0.060 | 0.057 | 0.237 | 0.010 | 0.247 | 0.131 | 0.057 | 0.063 |
| CI coverage | 13.7% | 88.7% | 93.3% | 78.4% | 38.2% | 84.7% | 13.1% | 89.4% | 37.6% | 65.7% | 32.8% | 83.3% |
| CI width | 0.590 | 0.329 | 0.722 | 0.709 | 0.323 | 0.692 | 0.591 | 0.327 | 0.726 | 0.709 | 0.322 | 0.693 |
| **n=2e+03** | | | | | | | | | | | | |
| Bias | -0.508 | -0.024 | -0.129 | 0.172 | -0.176 | 0.038 | -0.462 | -0.024 | 0.397 | 0.256 | -0.200 | 0.057 |
| SD | 0.129 | 0.075 | 0.097 | 0.161 | 0.097 | 0.168 | 0.107 | 0.074 | 0.153 | 0.177 | 0.076 | 0.172 |
| MSE | 0.274 | 0.006 | 0.026 | 0.056 | 0.041 | 0.030 | 0.224 | 0.006 | 0.181 | 0.097 | 0.046 | 0.033 |
| CI coverage | 1.1% | 89.6% | 84.6% | 70.6% | 27.2% | 87.4% | 1.1% | 90% | 16% | 48.5% | 13% | 85.5% |
| CI width | 0.421 | 0.254 | 0.454 | 0.528 | 0.235 | 0.520 | 0.422 | 0.253 | 0.456 | 0.528 | 0.235 | 0.521 |