The correct model specification is

$$m_0 = \beta_{01} u$$
$$m_1 = \beta_{11} + \beta_{12} u.$$

The true values of the MTR coefficients are $\beta_{01} = 6$, $\beta_{11} = 7$, and $\beta_{12} = 8$. The instrument $Z$ is equal to either 1 or 2, and the true propensity scores are

$$\mathbb{P}[D = 1 \mid Z = 1] = \phi_1 = 0.4$$
$$\mathbb{P}[D = 1 \mid Z = 2] = \phi_2 = 0.6.$$

The true ATU is 8.48.

The model is specified correctly for the estimator. A nonparametric probability model is estimated.

To estimate the coverage probabilities for the confidence intervals constructed in each simulation, I count the number of Monte Carlo simulations for which the coefficient of interest falls within the confidence interval, and then divide by the total number of Monte Carlo simulations (1000 for each sample size).

| | N100 | N1000 | N2000 |
|---|---|---|---|
| ATU: avg. estimate | 13.134 | 8.671 | 8.553 |
| ATU: avg. bootstrap s.e. estimate | 110.774 | 1.966 | 1.250 |
| ATU: population s.d. | 172.007 | 1.756 | 1.237 |
| Propensity: avg. coef. estimate, $\phi_1$ | 0.404 | 0.400 | 0.399 |
| Propensity: avg. coef. estimate, $\phi_2$ | 0.600 | 0.601 | 0.600 |
| Propensity: avg. bootstrap s.e., $\phi_1$ | 0.069 | 0.022 | 0.015 |
| Propensity: avg. bootstrap s.e., $\phi_2$ | 0.069 | 0.022 | 0.015 |
| Propensity: population s.d., $\phi_1$ | 0.071 | 0.021 | 0.015 |
| Propensity: population s.d., $\phi_2$ | 0.070 | 0.022 | 0.015 |
| MTR: avg. coef. estimate, $\beta_{01}$ | 6.033 | 6.001 | 6.003 |
| MTR: avg. coef. estimate, $\beta_{11}$ | 4.792 | 6.905 | 6.968 |
| MTR: avg. coef. estimate, $\beta_{12}$ | 17.279 | 8.376 | 8.140 |
| MTR: avg. bootstrap s.e., $\beta_{01}$ | 0.377 | 0.116 | 0.082 |
| MTR: avg. bootstrap s.e., $\beta_{11}$ | 54.574 | 0.991 | 0.632 |
| MTR: avg. bootstrap s.e., $\beta_{12}$ | 221.580 | 3.942 | 2.508 |
| MTR: population s.d., $\beta_{01}$ | 0.361 | 0.116 | 0.078 |
| MTR: population s.d., $\beta_{11}$ | 84.919 | 0.880 | 0.628 |
| MTR: population s.d., $\beta_{12}$ | 344.001 | 3.509 | 2.489 |
| ATU: 90% CI1 (quantile method) coverage prob. | 0.814 | 0.750 | 0.744 |
| ATU: 95% CI1 (quantile method) coverage prob. | 0.875 | 0.831 | 0.823 |

| | | | |
|---|---|---|---|
| ATU: 90% CI2 (percentile method) coverage prob. | 0.912 | 0.814 | 0.773 |
| ATU: 95% CI2 (percentilemethod) coverage prob. | 0.925 | 0.873 | 0.849 |
| Propensity: 90% CI1 coverage prob., $\phi_1$ | 0.745 | 0.762 | 0.756 |
| Propensity: 90% CI1 coverage prob., $\phi_2$ | 0.749 | 0.744 | 0.762 |
| Propensity: 95% CI1 coverage prob., $\phi_1$ | 0.825 | 0.840 | 0.835 |
| Propensity: 95% CI1 coverage prob., $\phi_2$ | 0.828 | 0.822 | 0.838 |
| Propensity: 90% CI2 coverage prob., $\phi_1$ | 0.745 | 0.762 | 0.757 |
| Propensity: 90% CI2 coverage prob., $\phi_2$ | 0.748 | 0.744 | 0.762 |
| Propensity: 95% CI2 coverage prob., $\phi_1$ | 0.823 | 0.841 | 0.836 |
| Propensity: 95% CI2 coverage prob., $\phi_2$ | 0.826 | 0.824 | 0.838 |
| MTR: 90% CI1 coverage prob., $\beta_{01}$ | 0.769 | 0.749 | 0.777 |
| MTR: 90% CI1 coverage prob., $\beta_{11}$ | 0.814 | 0.754 | 0.742 |
| MTR: 90% CI1 coverage prob., $\beta_{12}x$ | 0.814 | 0.752 | 0.742 |
| MTR: 95% CI1 coverage prob., $\beta_{01}$ | 0.846 | 0.829 | 0.853 |
| MTR: 95% CI1 coverage prob., $\beta_{11}$ | 0.875 | 0.835 | 0.822 |
| MTR: 95% CI1 coverage prob., $\beta_{12}$ | 0.875 | 0.832 | 0.823 |
| MTR: 90% CI2 coverage prob., $\beta_{01}$ | 0.773 | 0.749 | 0.777 |
| MTR: 90% CI2 coverage prob., $\beta_{11}$ | 0.912 | 0.815 | 0.770 |
| MTR: 90% CI2 coverage prob., $\beta_{12}$ | 0.912 | 0.815 | 0.771 |
| MTR: 95% CI2 coverage prob., $\beta_{01}$ | 0.850 | 0.830 | 0.854 |
| MTR: 95% CI2 coverage prob., $\beta_{11}$ | 0.925 | 0.875 | 0.846 |
| MTR: 95% CI2 coverage prob., $\beta_{12}$ | 0.926 | 0.874 | 0.848 |
| Bootstraps per simulation | 1000.000 | 1000.000 | 1000.000 |
| AVg. # bootstraps with collinearities | 2.729 | 0.000 | 0.000 |