Simulation 1_1

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Simulation Settings

Consistency simulation for Estimator performed over 1000 rep simulation.

Data generative model :

$$Y_{it,1}|H_t, A_t = I_{(A_{it}=1)}(\beta_1 + \beta_2 Z_{it} + \beta_3 t) + I_{(A_{i,t}=2)}(\beta_4 + \beta_5 Z_{it} + \beta_6 t) + (0.2 I_{Z_{it}=0} + 0.5 I_{Z_{it}=1} + 0.4 I_{Z_{it}=2}) + \alpha t + \epsilon_{i,t}$$

$\beta_1 = 0.1$ (Intercept of treatment 1)

$\beta_2 = 0.3$ (slope of treatment 1)

$\beta_3 = 0.2$ (Intercept of treatment 2)

$\beta_4 = 0.1$ (slope of treatment 2)

$$\begin{aligned} I_t &\sim Bern(1) \\ A_{i,t} &= \{0, 1, 2\} \\ P(A_{it} = 0|H_t) &= \tilde{p_0} = 0.2 \\ P(A_{it} = 1|H_t) &= \tilde{p_1} = 0.5 \\ P(A_{it} = 2|H_t) &= \tilde{p_2} = 0.3 \end{aligned}$$

Working model :

$$Y_{it,1}|H_t, A_t = I_{(A_{it}=1)}(\beta_1 + \beta_2 Z_{it} + \beta_3 t) + I_{(A_{i,t}=2)}(\beta_4 + \beta_5 Z_{it} + \beta_6 t) + (0.2 I_{Z_{it}=0} + 0.5 I_{Z_{it}=1} + 0.4 I_{Z_{it}=2}) + \alpha t + \epsilon_{i,t}$$

$\beta_1 = 0.1$ (Intercept of treatment 1)

$\beta_2 = 0.3$ (slope of treatment 1)

$\beta_3 = 0.2$ (Intercept of treatment 2)

$\beta_4 = 0.1$ (slope of treatment 2)

Parameter

Table 1: Performance of MEE

		Intercept					Zt					t				
Trt	Sample size	Bias	RMSE	CP	CP(z-adj)	CP(t-adj)	Bias	RMSE	CP	CP(z-adj)	CP(t-adj)	Bias	RMSE	CP	CP(z-adj)	CP(t-adj)
1	20	0.005	0.034	0.920	0.945	0.964	0.002	0.389	0.923	0.945	0.961	-0.001	0.197	0.928	0.948	0.969
	30	0.009	0.030	0.934	0.952	0.966	-0.008	0.324	0.924	0.943	0.956	0.000	0.164	0.936	0.950	0.962
	40	0.006	0.025	0.925	0.935	0.940	-0.005	0.282	0.922	0.941	0.947	0.000	0.141	0.933	0.944	0.956
2	20	-0.003	0.037	0.911	0.940	0.959	0.001	0.034	0.911	0.939	0.954	0.001	0.389	0.905	0.930	0.954
	30	0.017	0.035	0.924	0.933	0.952	-0.006	0.030	0.932	0.945	0.958	-0.001	0.324	0.929	0.945	0.953
	40	-0.004	0.027	0.926	0.938	0.949	-0.006	0.025	0.937	0.952	0.965	0.002	0.282	0.935	0.948	0.958

Table 2: β_1 Confidence Interval with different adjustment

	unadjusted		adjusted with z dist		adjusted with t dist	
Sample size	lower ci	upper ci	lower ci	upper ci	lower ci	upper ci
20	-0.595	0.805	-0.666	0.877	-0.761	0.971
30	-0.478	0.695	-0.516	0.734	-0.554	0.772
40	-0.399	0.611	-0.424	0.636	-0.445	0.657

Table 3: β_2 Confidence Interval with different adjustment

	unadjusted		adjusted with z dist		adjusted with t dist	
Sample size	lower ci	upper ci	lower ci	upper ci	lower ci	upper ci
20	-0.049	0.654	-0.087	0.691	-0.135	0.739
30	-0.002	0.587	-0.022	0.607	-0.042	0.626
40	0.042	0.549	0.029	0.562	0.019	0.572

Table 4: β_3 Confidence Interval with different adjustment

	unadjusted		adjusted with z dist		adjusted with t dist	
Sample size	lower ci	upper ci	lower ci	upper ci	lower ci	upper ci
20	-0.057	0.076	-0.064	0.083	-0.073	0.092
30	-0.046	0.066	-0.050	0.069	-0.053	0.073
40	-0.038	0.058	-0.040	0.060	-0.042	0.062

Table 5: β_4 Confidence Interval with different adjustment

	unadjusted		adjusted with z dist		adjusted with t dist	
Sample size	lower ci	upper ci	lower ci	upper ci	lower ci	upper ci
20	-0.316	1.209	-0.396	1.289	-0.499	1.392
30	-0.168	1.102	-0.210	1.145	-0.252	1.186
40	-0.107	0.999	-0.135	1.027	-0.159	1.051