Monte Carlo results for: Instrumental Variables with observed and unobserved heterogeneity of the treatment and instrument effect: A latent class approach.

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This document presents the main results for the Monte Carlo experiment. Although we performed three MC experiment, we only present the results for the first and third experiment.

1 Experiment 1

In this experiment:

Table 1: True values of the parameters for MC experiment 1

	β_0	γ	δ_0	δ_1	ρ	σ_ϵ	σ_υ	π
Class 1	-1	-1	-1	-1	0.5	1	1	0.3
Class 2	1	2	1	2	0.5	1	1	0.7

1.1 Results for parameters in each class

Table 2: Simulation results for LCIV parameters

	$N = 100$		$N = 500$		$N = 1000$		$N = 5000$	
	Bias	RMSE	Bias	RMSE	Bias	RMSE	Bias	RMSE
γ_1	-0.0048	0.0657	-0.0003	0.0281	0.0004	0.0197	0.0001	0.0085
γ_2	-0.0001	0.0206	0.0000	0.0089	-0.0001	0.0063	0.0001	0.0028
δ_{11}	0.0012	0.0671	-0.0008	0.0277	0.0000	0.0200	-0.0007	0.0090
δ_{12}	-0.0023	0.0414	0.0003	0.0183	0.0001	0.0129	-0.0003	0.0056

ρ_1	-0.0026	0.1577	-0.0033	0.0718	-0.0014	0.0491	-0.0011	0.0215
ρ_2	-0.0017	0.0933	0.0016	0.0421	0.0003	0.0282	-0.0002	0.0134
π_1	-0.0004	0.0144	0.0003	0.0063	-0.0002	0.0044	-0.0000	0.0021
π_2	0.0004	0.0144	-0.0003	0.0063	0.0002	0.0044	0.0000	0.0021

Figure 1: Distribution of γ and δ_1 for both classes by sample size

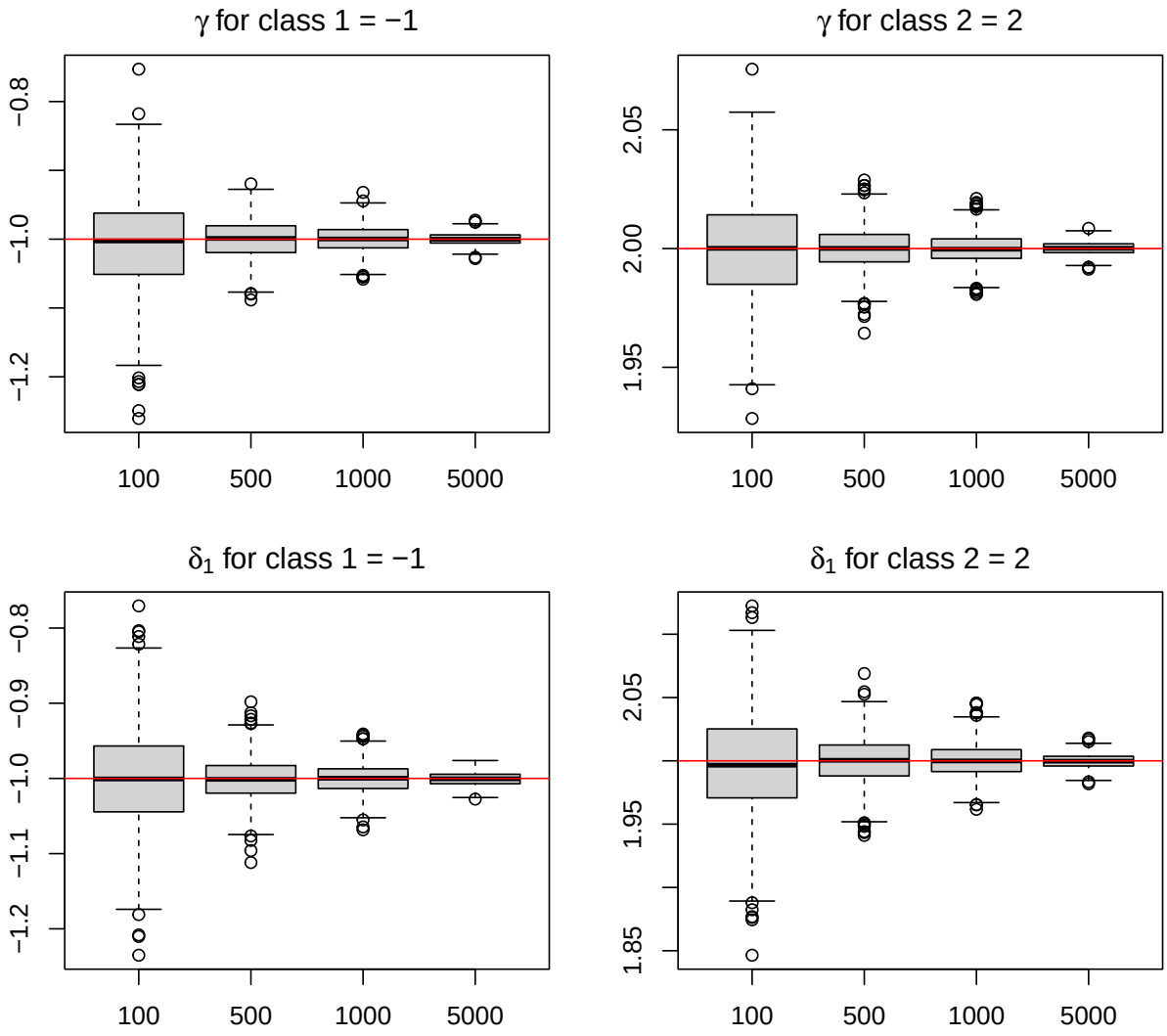
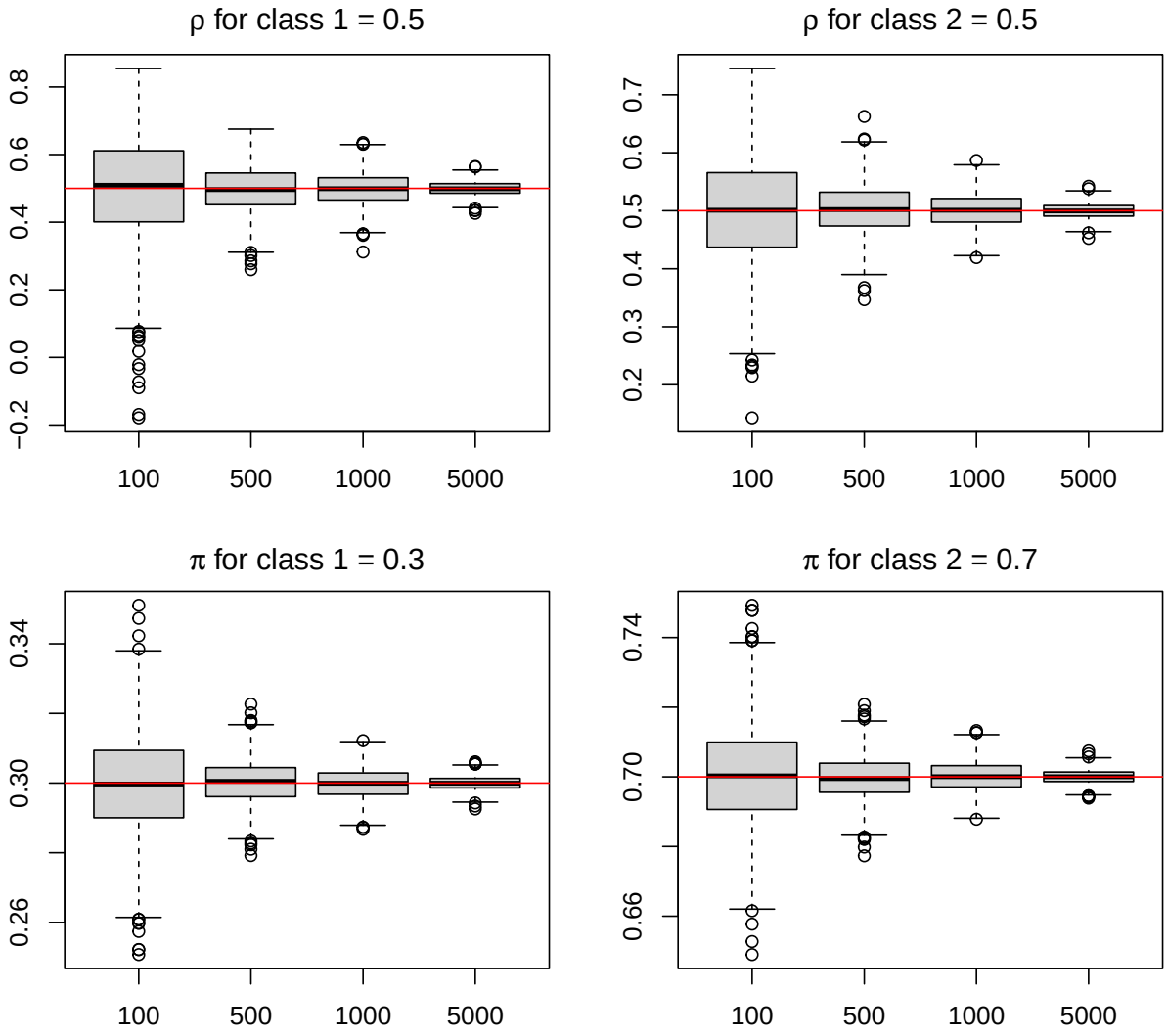


Figure 2: Distribution of ρ and π for both classes by sample size



1.2 Results for causal parameters

Figure 3: Distribution of causal parameters by sample size

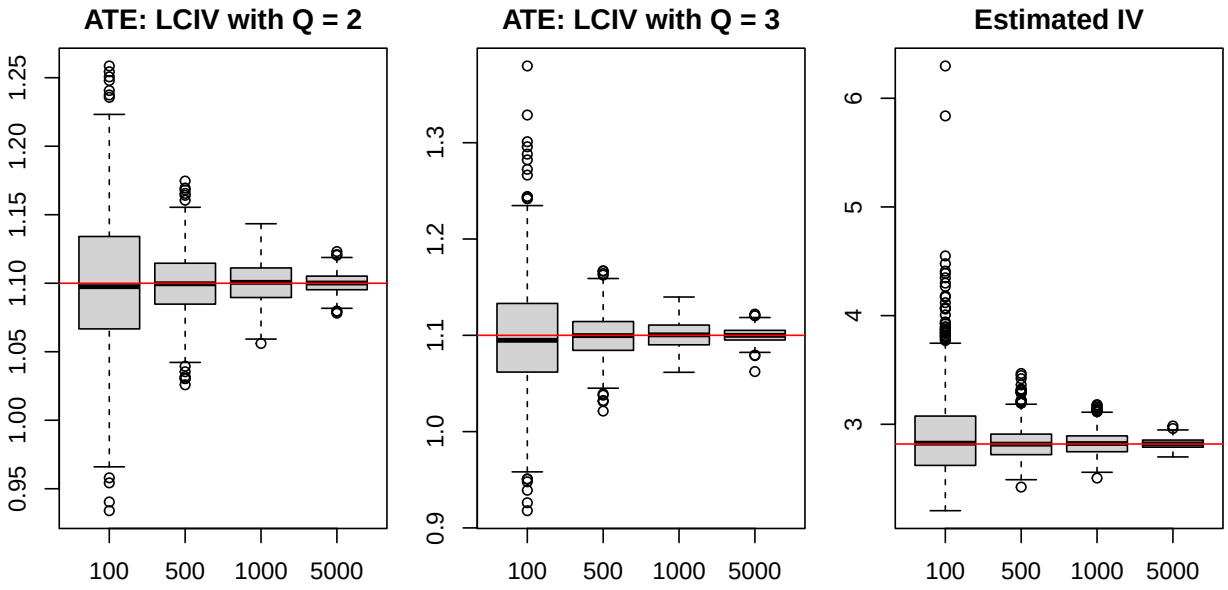


Table 3: Simulation results for causal parameters

	$N = 100$		$N = 500$		$N = 1000$		$N = 5000$	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
ATE	1.0998	0.0499	1.0992	0.0221	1.1005	0.0150	1.1002	0.0072
ATEM	1.0986	0.0589	1.0996	0.0223	1.1003	0.0147	1.1001	0.0073
IV	2.8966	0.4008	2.8252	0.1487	2.8252	0.1070	2.8213	0.0465
OLS	1.6930	0.0878	1.7004	0.0381	1.6991	0.0286	1.6993	0.0123

2 Experiment 2

In this experiment:

Table 4: True values of the parameters for MC experiment 3

	β_0	γ	δ_0	δ_1	ρ	σ_ϵ	σ_υ	π
Class 1	-1	-1	-1	0	0.5	1	1	0.3
Class 2	1	2	1	2	0.5	1	1	0.7

2.1 Results for parameters in each class

Table 5: Simulation results for LCIV parameters

	$N = 100$		$N = 500$		$N = 1000$		$N = 5000$	
	Bias	RMSE	Bias	RMSE	Bias	RMSE	Bias	RMSE
γ_1	0.6626	9.9453	0.3207	8.2491	0.4009	6.9113	0.8328	5.6113
γ_2	0.0010	0.0206	0.0006	0.0088	0.0006	0.0065	0.0004	0.0032
δ_{11}	0.0004	0.0674	0.0001	0.0270	0.0004	0.0193	0.0005	0.0085
δ_{12}	0.0037	0.0407	0.0006	0.0180	0.0006	0.0131	0.0005	0.0059
ρ_1	-0.5119	0.8873	-0.4634	0.8537	-0.4579	0.8507	-0.5182	0.8924
ρ_2	-0.0208	0.1162	-0.0125	0.0660	-0.0127	0.0597	-0.0145	0.0583
π_1	0.0003	0.0193	-0.0002	0.0086	-0.0001	0.0064	0.0001	0.0052
π_2	-0.0003	0.0193	0.0002	0.0086	0.0001	0.0064	-0.0001	0.0052

Figure 4: Distribution of γ and δ_1 for both classes by sample size

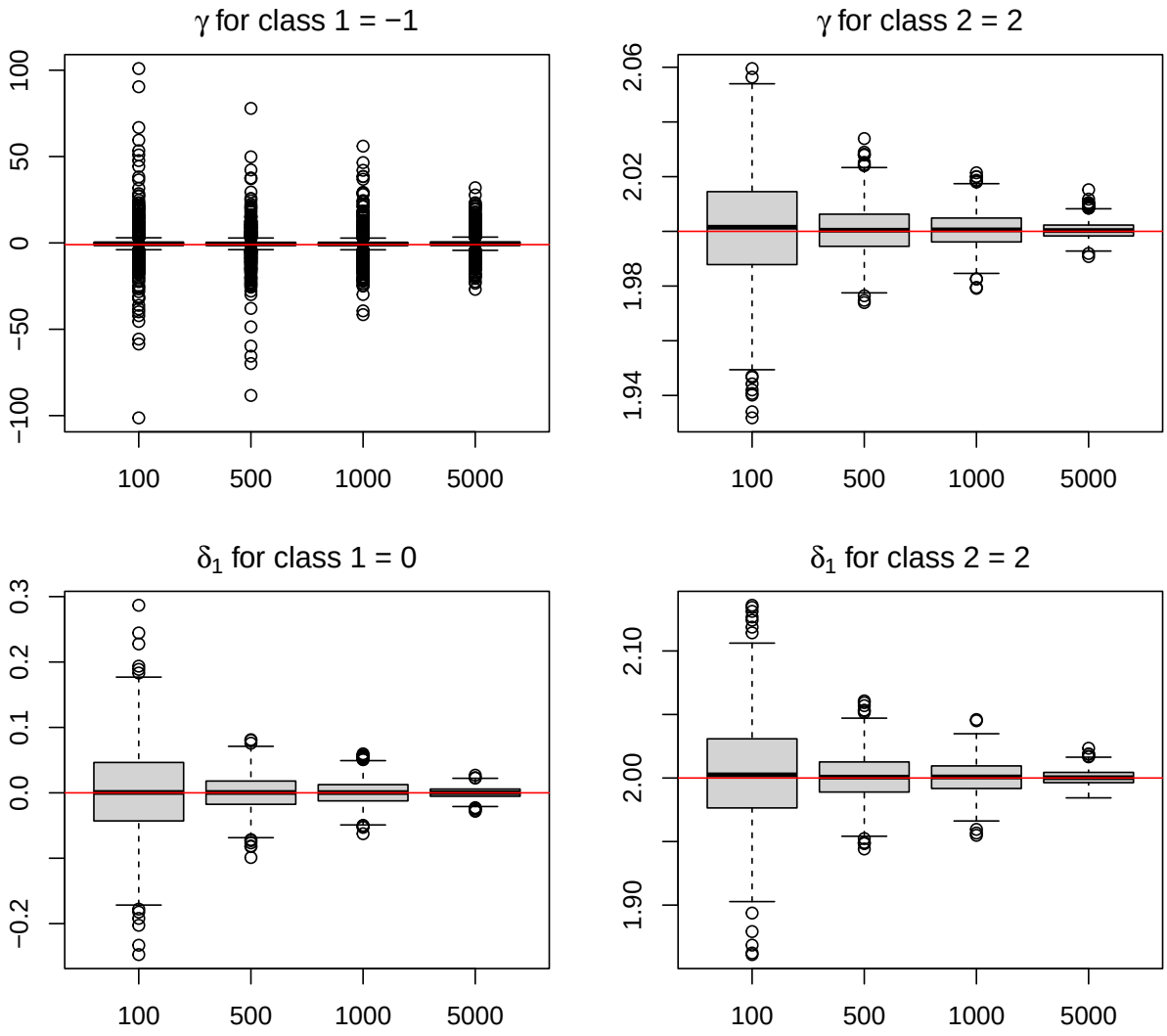
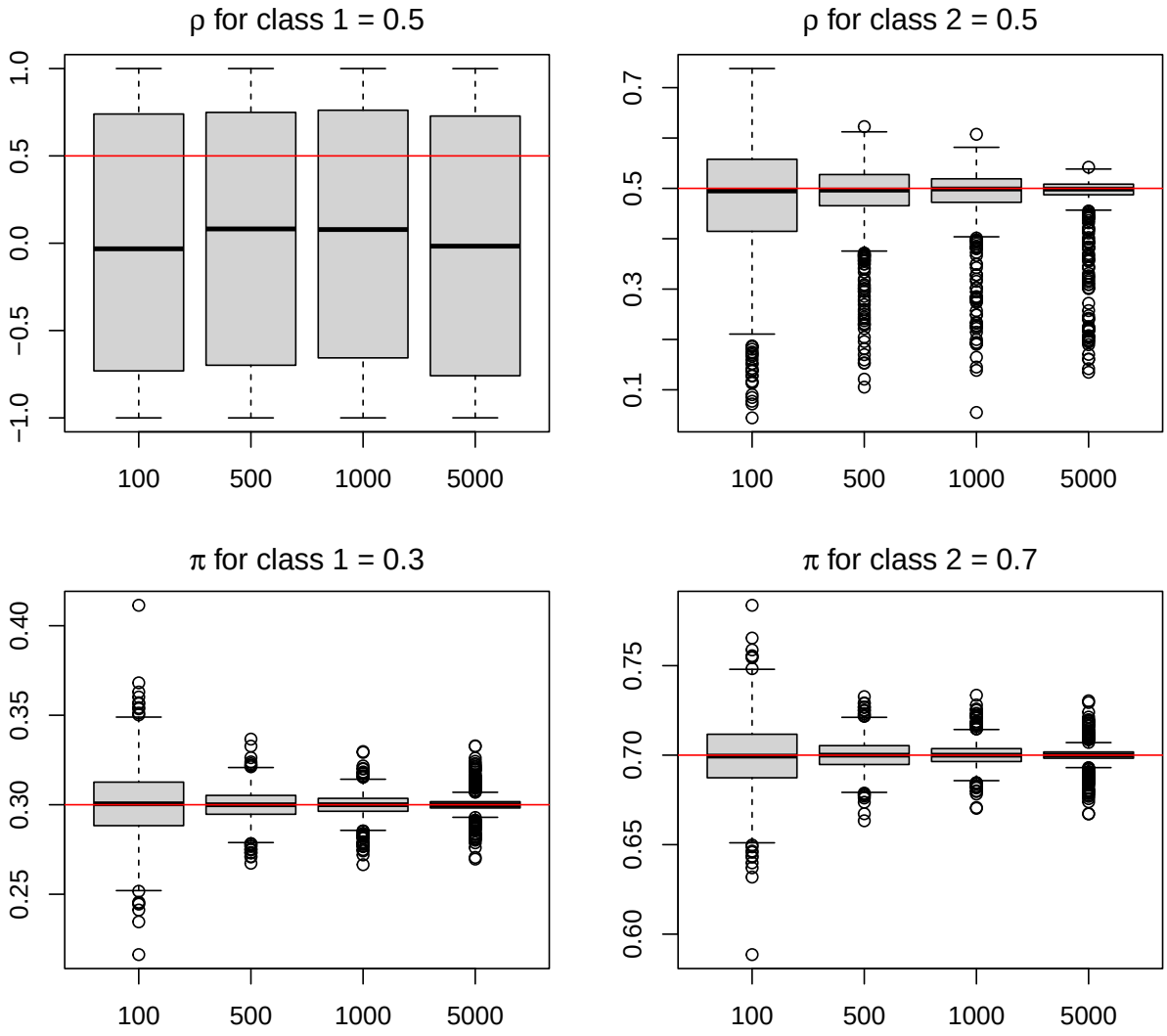


Figure 5: Distribution of ρ and π for both classes by sample size



3 Results for causal parameters

Figure 6: Distribution of causal parameters by sample size

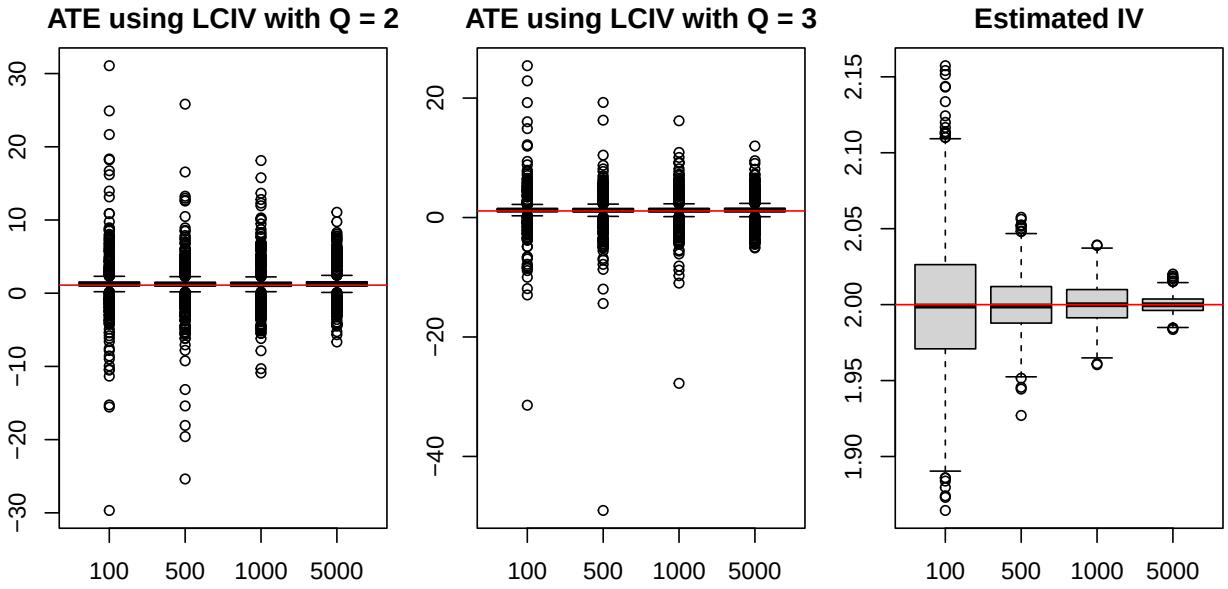


Table 6: Simulation results for causal parameters

	$N = 100$		$N = 500$		$N = 1000$		$N = 5000$	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
ATE	1.2961	2.9173	1.1983	2.4607	1.2203	2.0548	1.3516	1.6582
ATEM	1.2495	2.6833	1.1821	2.5962	1.1729	2.0715	1.2541	1.5848
IV	2.0000	0.0451	2.0001	0.0187	2.0002	0.0133	1.9999	0.0059
OLS	1.9693	0.0239	1.9695	0.0103	1.9699	0.0075	1.9696	0.0033