

Preliminary Results

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DGP 1: One treatment group, TE is unit-and time- homogeneous

```
print(analyze_sim_results(load_sim_results("Sim_1"), "static"))
```

```
## Loaded file: Sim_1_2023-06-21_22-17-58.rds
## # A tibble: 7 x 7
##   Estimator   Min  Mean   Max 'Mean SE'      Bias  RMSE
##   <chr>      <dbl> <dbl> <dbl>    <dbl>    <dbl> <dbl>
## 1 TRUE        1     1     1     0        0        0
## 2 MC-NNM     0.968 1.00   1.03   0.0109   0.000000491 0.0108
## 3 DiD        0.968 1.00   1.03   0.00639 0.000000491 0.0108
## 4 CS         0.885 0.981  1.08   0.0331  -0.0192    0.0391
## 5 SA         0.885 0.981  1.08   0.0331  -0.0192    0.0391
## 6 dCdH       0.857 0.996  1.13   NA       -0.00383    0.0459
## 7 BJS        0.950 0.980  1.01   0.0108  -0.0195    0.0223
```

DGP 2: One treatment group, TE is unit-homogeneous, time-varying

```
print(analyze_sim_results(load_sim_results("Sim_2"), "dynamic"))
```

```
## Loaded file: Sim_2_2023-06-22_01-19-14.rds
## # A tibble: 7 x 7
##   Estimator   Min  Mean   Max 'Mean SE'      Bias  RMSE
##   <chr>      <dbl> <dbl> <dbl>    <dbl>    <dbl> <dbl>
## 1 TRUE        0.588 0.637 0.687     0        0        0
## 2 MC-NNM     0.583 0.631 0.679   0.0220   0.638    0.0156
## 3 DiD        0.526 0.643 0.735   0.0498   0.638    0.0350
## 4 CS         0.566 0.637 0.696   0.0278   0.612    0.0213
## 5 SA         0.526 0.643 0.735   0.0498   0.612    0.0350
## 6 dCdH       NA      NA      NA      NA     -0.588    NA
## 7 BJS        0.588 0.637 0.686   0.0226   0.613    0.0145
```

DGP 3: Multiple Treatment Groups, Time-Invariant Homogeneous TE

```
print(analyze_sim_results(load_sim_results("Sim_3"), "static"))
```

```
## Loaded file: Sim_3_2023-06-22_06-39-02.rds
## # A tibble: 7 x 7
##   Estimator   Min  Mean   Max 'Mean SE'      Bias  RMSE
```

	<chr>	<dbl>	<dbl>	<dbl>	<dbl>	<dbl>	<dbl>
## 1	TRUE	1	1	1	0	0	0
## 2	MC-NNM	0.947	1.00	1.04	0.0154	-0.000205	0.0157
## 3	DiD	0.946	0.990	1.03	0.0112	-0.0101	0.0173
## 4	CS	0.857	0.999	1.14	0.0509	-0.00107	0.0502
## 5	SA	0.823	0.998	1.17	0.0557	-0.00171	0.0563
## 6	dCdH	0.807	0.997	1.16	NA	-0.00260	0.0621
## 7	BJS	0.950	1.00	1.04	0.0154	-0.000232	0.0155

DGP 4: Multiple Treatment Groups, Time-Invariant Heterogeneous TE

```
print(analyze_sim_results(load_sim_results("Sim_4"), "static"))
```

```
## Loaded file: Sim_4_2023-06-22_10-46-18.rds
## # A tibble: 7 x 7
##   Estimator   Min  Mean  Max 'Mean SE'   Bias  RMSE
##   <chr>      <dbl> <dbl> <dbl>    <dbl>    <dbl> <dbl>
## 1 TRUE      0.769 0.813 0.869    0         0       0
## 2 MC-NNM    0.963 1.02  1.09    0.0225    0.212   0.213
## 3 DiD       0.733 0.781 0.825    0.0114   -0.0320  0.0359
## 4 CS        0.959 1.14  1.27    0.0519    0.324   0.328
## 5 SA        0.827 1.02  1.20    0.0558    0.209   0.217
## 6 dCdH      0.624 0.813 1.02    NA        -0.000715 0.0641
## 7 BJS       0.959 1.02  1.09    0.0154    0.207   0.209
```

DGP 5: Multiple Treatment Groups, Time-Varying Homogeneous TE

```
print(analyze_sim_results(load_sim_results("Sim_5"), "dynamic"))
```

```
## Loaded file: Sim_5_2023-06-22_01-57-39.rds
## # A tibble: 7 x 7
##   Estimator   Min  Mean  Max 'Mean SE'   Bias  RMSE
##   <chr>      <dbl> <dbl> <dbl>    <dbl>    <dbl> <dbl>
## 1 TRUE      0.963 1.05  1.12    0         0       0
## 2 MC-NNM    0.937 1.02  1.11    0.0676    0.478   0.0404
## 3 DiD       1.48  1.66  1.86    0.0938   -0.572   0.617
## 4 CS        0.898 1.04  1.19    0.0837    0.243   0.0504
## 5 SA        0.856 1.04  1.21    0.108     0.497   0.0570
## 6 dCdH      NA     NA    NA     NA        -0.997  NA
## 7 BJS       1.53  1.66  1.80    0.0730    0.499   0.616
```

DGP 6: Multiple Treatment Groups, Time-Varying Heterogeneous TE

```
print(analyze_sim_results(load_sim_results("Sim_6"), "dynamic"))
```

```
## Loaded file: Sim_6_2023-06-22_04-28-27.rds
## # A tibble: 7 x 7
##   Estimator   Min  Mean  Max 'Mean SE'   Bias  RMSE
##   <chr>      <dbl> <dbl> <dbl>    <dbl>    <dbl> <dbl>
## 1 TRUE      1.31  1.39  1.46    0         0       0
## 2 MC-NNM    1.27  1.35  1.42    0.0422    0.724   0.0492
```

## 3 DiD	1.95	2.08	2.20	0.0644	-0.207	0.686
## 4 CS	1.30	1.39	1.48	0.0493	0.327	0.0329
## 5 SA	1.19	1.31	1.42	0.0643	0.766	0.0934
## 6 dCdH	NA	NA	NA	NA	-1.29	NA
## 7 BJS	1.95	2.08	2.20	0.0553	0.765	0.686

DGP 7: Multiple Treatment Groups, Time-Varying Heterogeneous TE, **Unconditional Parallel Trends Violated**

```
print(analyze_sim_results(load_sim_results("Sim_7"), "dynamic"))
```

```
## Loaded file: Sim_7_2023-06-22_13-55-49.rds
## # A tibble: 7 x 7
##   Estimator      Min  Mean   Max 'Mean SE'   Bias   RMSE
##   <chr>      <dbl> <dbl> <dbl>    <dbl> <dbl> <dbl>
## 1 TRUE        1.26  1.39  1.50      0      0      0
## 2 MC-NNM      1.21  1.35  1.47    0.0578  0.723  0.0617
## 3 DiD     -10.1  -9.83 -9.61    0.102  -0.664 11.2
## 4 CS       -11.4  -3.46  3.57    2.69   -5.66  5.25
## 5 SA       -0.488  1.34  3.43    1.44    0.851  0.655
## 6 dCdH      NA     NA     NA     NA     -1.28  NA
## 7 BJS        1.86  2.07  2.29    0.0914  0.764  0.686
```