Replicate script

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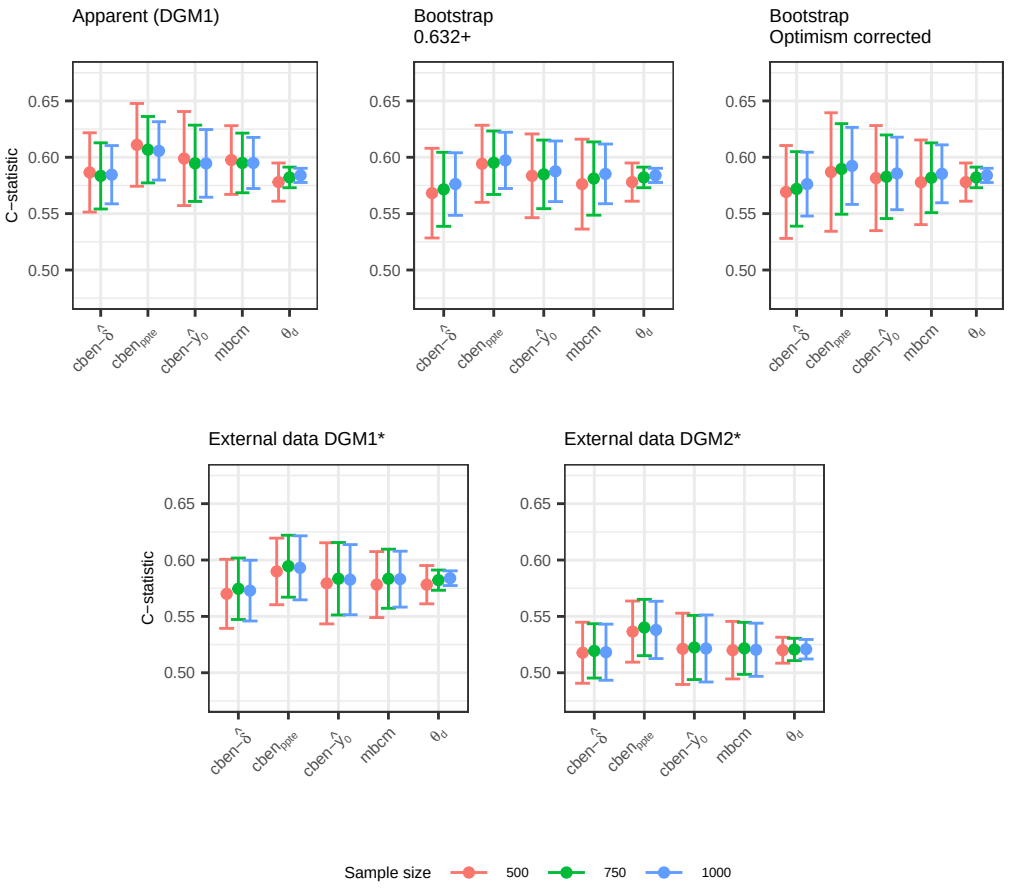
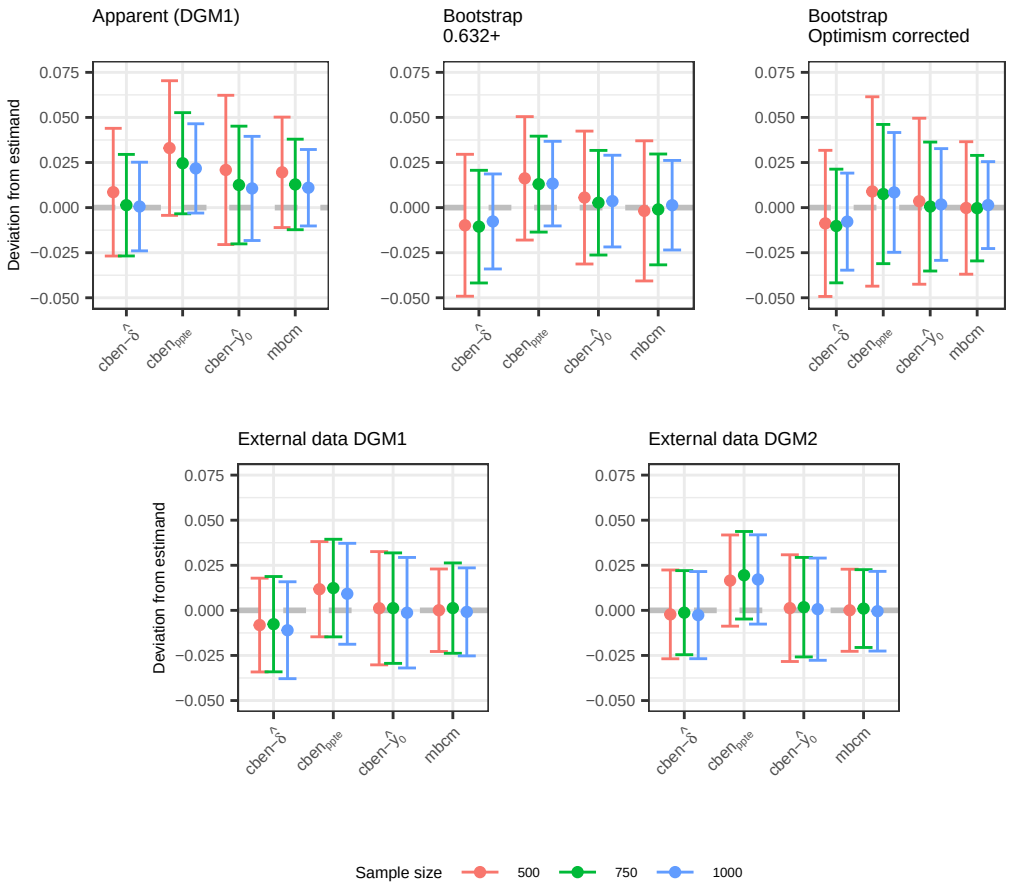
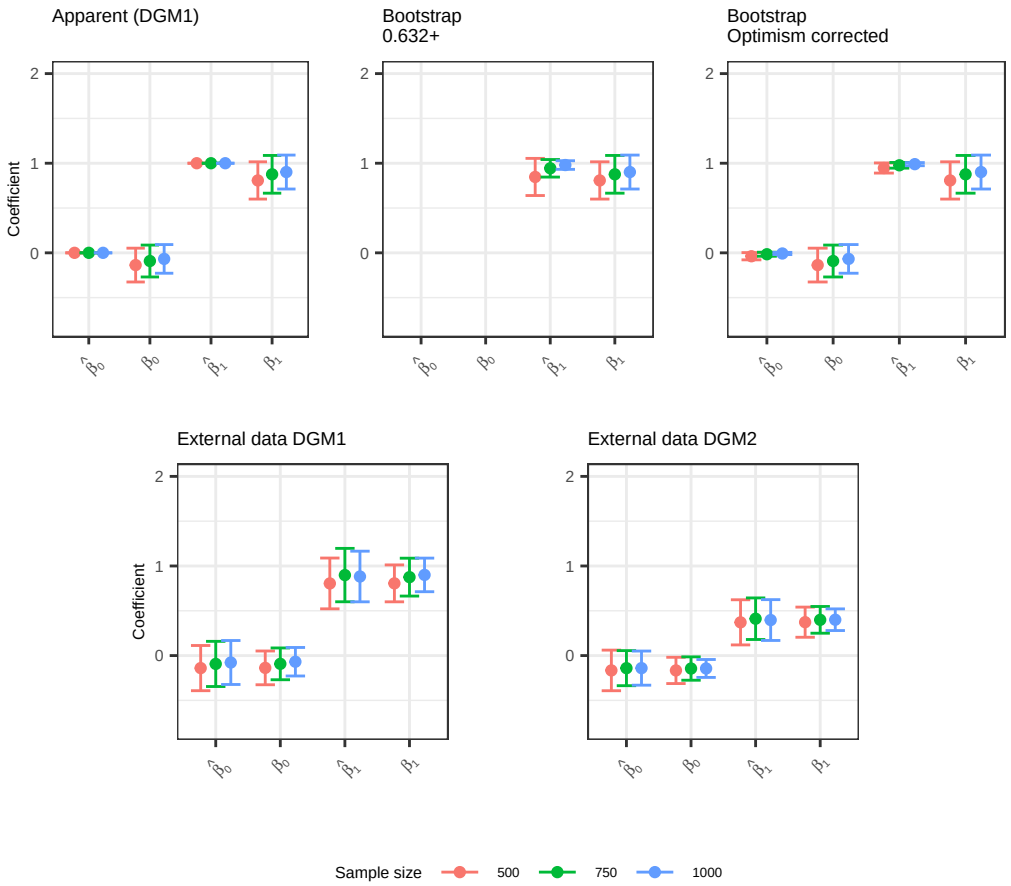
Plots




Apparent (DGM1)
Bootstrap
0.632+
Bootstrap
Optimism corrected
External data DGM1
External data DGM2
Deviation from estimand
0.075
0.050
0.025
0.000
−0.025
−0.050
cben−δ^
cben_ppie
cben−γ0^
mbcm
Sample size
500
750
1000


Apparent (DGM1)
Bootstrap
0.632+
Bootstrap
Optimism corrected
External data DGM1
External data DGM2
Coefficient
2
1
0
$\hat{\beta}_0$
β_0
$\hat{\beta}_1$
β_1
Sample size
500
750
1000

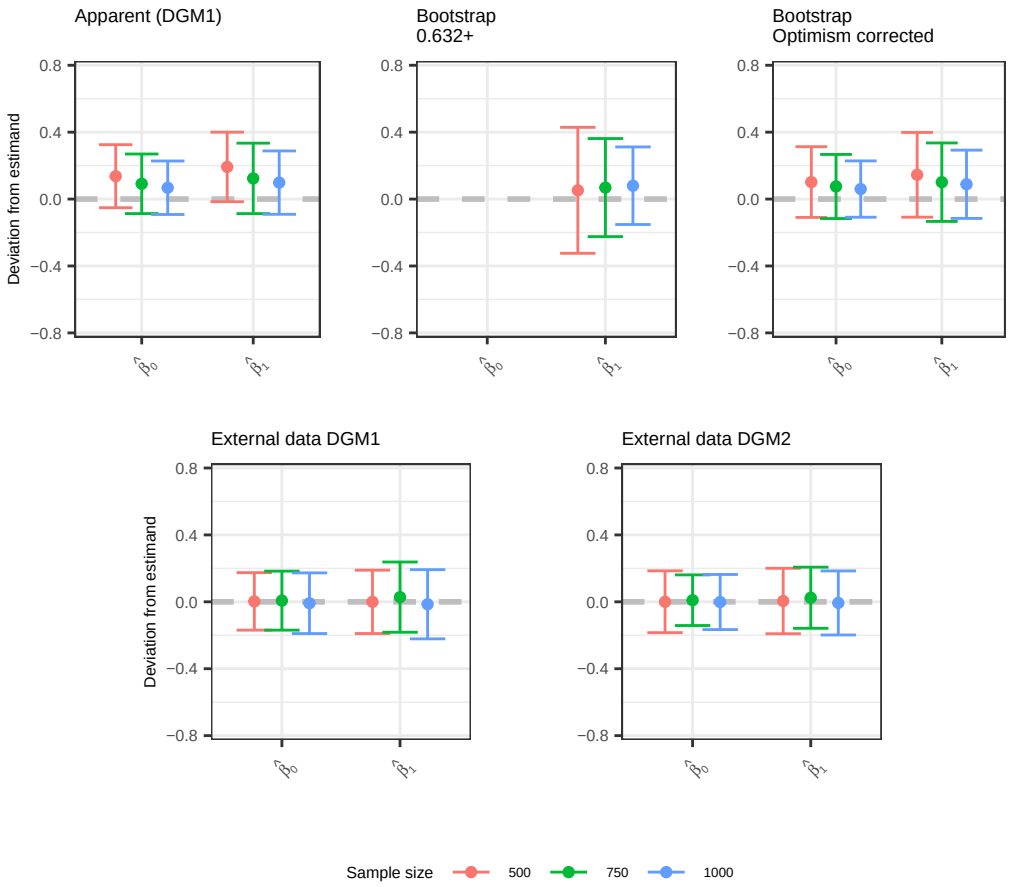


Table 1

Statistic	V1	V2	V3	V4
apparent.discr	0.036,0.028,0.025	0.05,0.037,0.033	0.046,0.035,0.031	0.036,0.028,0.024
ext1.app.discr	0.027,0.027,0.029	0.029,0.03,0.029	0.033,0.032,0.029	0.037,0.028,0.024
ext2.app.discr	0.025,0.023,0.024	0.03,0.031,0.03	0.042,0.042,0.042	0.085,0.08,0.078
boot0.632.discr	0.041,0.033,0.027	0.038,0.03,0.027	0.037,0.029,0.026	0.039,0.031,0.025
boot.opt.discr	0.041,0.033,0.028	0.053,0.039,0.034	0.046,0.036,0.031	0.037,0.029,0.024
ext1.total.discr	0.027,0.027,0.029	0.029,0.03,0.029	0.031,0.031,0.031	0.023,0.025,0.024
ext2.total.discr	0.025,0.023,0.024	0.03,0.031,0.03	0.03,0.028,0.028	0.023,0.022,0.022

Table 2

Statistic	V1	V2	V3	V4	V5	V6
apparent.cal	0.23	0.20	0.17	0.28	0.24	0.21
boot0.632.cal				0.38	0.30	0.24
boot.opt.cal	0.23	0.21	0.18	0.29	0.26	0.22
ext1.total.cal	0.17	0.18	0.18	0.19	0.21	0.21
ext2.total.cal	0.18	0.15	0.16	0.20	0.18	0.19

Session info

replicate.R

```
sessionInfo()
```

```
R version 4.4.2 (2024-10-31 ucrt)
Platform: x86_64-w64-mingw32/x64
Running under: Windows 11 x64 (build 22621)

Matrix products: default


locale:
[1] LC_COLLATE=English_United States.utf8
[2] LC_CTYPE=English_United States.utf8
[3] LC_MONETARY=English_United States.utf8
[4] LC_NUMERIC=C
[5] LC_TIME=English_United States.utf8

time zone: Europe/Amsterdam
tzcode source: internal

attached base packages:
[1] stats     graphics  grDevices utils     datasets  methods   base

other attached packages:
[1] DescTools_0.99.58 xtable_1.8-4      stringr_1.5.1     patchwork_1.3.0
```

```
[5] ggplot2_3.5.1

loaded via a namespace (and not attached):
 [1] gld_2.6.6               gtable_0.3.6            xfun_0.49
 [4] lattice_0.22-6          vctrs_0.6.5             tools_4.4.2
 [7] generics_0.1.3          tibble_3.2.1            proxy_0.4-27
[10] fansi_1.0.6             pkgconfig_2.0.3         Matrix_1.7-1
[13] data.table_1.16.4       uuid_1.2-1              readxl_1.4.3
[16] lifecycle_1.0.4         rootSolve_1.8.2.4       flextable_0.9.7
[19] compiler_4.4.2          farver_2.1.2            textshaping_0.4.1
[22] Exact_3.3               munsell_0.5.1           fontquiver_0.2.1
[25] fontLiberation_0.1.0    htmltools_0.5.8.1       class_7.3-22
[28] yaml_2.3.10             pillar_1.9.0            MASS_7.3-61
[31] openssl_2.2.2           boot_1.3-31             fontBitstreamVera_0.1.1
[34] zip_2.3.1               tidyselect_1.2.1        digest_0.6.37
[37] mvtnorm_1.3-2           stringi_1.8.4           dplyr_1.1.4
[40] labeling_0.4.3          forcats_1.0.0           fastmap_1.2.0
[43] grid_4.4.2              colorspace_2.1-1        lmom_3.2
[46] expm_1.0-0              cli_3.6.3               magrittr_2.0.3
[49] utf8_1.2.4              e1071_1.7-16            withr_3.0.2
[52] gdtools_0.4.1           scales_1.3.0            rmarkdown_2.29
[55] officer_0.6.7           httr_1.4.7              cellranger_1.1.0
[58] askpass_1.2.1           ragg_1.3.3              hms_1.1.3
[61] evaluate_1.0.1          knitr_1.49              haven_2.5.4
[64] rlang_1.1.4             Rcpp_1.0.13-1           glue_1.8.0
[67] xml2_1.3.6              rstudioapi_0.17.1       jsonlite_1.8.9
[70] R6_2.5.1                plyr_1.8.9              systemfonts_1.1.0
```

sim.R

```
load("results/info.RData")

info
```

```
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Platform: x86_64-w64-mingw32/x64
Running under: Windows 11 x64 (build 22621)

Matrix products: default
```

```
locale:
[1] LC_COLLATE=English_United States.utf8
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[3] LC_MONETARY=English_United States.utf8
[4] LC_NUMERIC=C
[5] LC_TIME=English_United States.utf8

time zone: Europe/Amsterdam
tzcode source: internal

attached base packages:
[1] parallel  stats     graphics  grDevices utils     datasets  methods
[8] base

other attached packages:
[1] pbapply_1.7-2     doParallel_1.0.17 iterators_1.0.14  foreach_1.5.2

loaded via a namespace (and not attached):
[1] compiler_4.4.2    tools_4.4.2       rstudioapi_0.17.1 codetools_0.2-20
```

population.R and support_functions.R

No packages loaded. Operating system and R version as above.