betaMC: Internal Tests

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Tests

```
#> test-betaMC-beta-mc-methods
#> Call:
#> BetaMC(object = object, R = R)
#>
#> Standardized regression slopes
#> type = "hc3"
#>           est     se R  0.05%   0.5%   2.5%  97.5%  99.5% 99.95%
#> NARTIC  0.4951 0.0913 5 0.3166 0.3193 0.3311 0.5358 0.5369 0.5372
#> PCTGRT  0.3915 0.1037 5 0.1801 0.1836 0.1988 0.4410 0.4441 0.4447
#> PCTSUPP 0.2632 0.0881 5 0.1532 0.1548 0.1621 0.3700 0.3716 0.3719
#> Call:
#> BetaMC(object = object, R = R)
#>
#> Standardized regression slopes
#> type = "hc3"
#> Call:
#> BetaMC(object = object, R = R)
#>
#> Standardized regression slopes
#> type = "hc3"
#>           est     se R 0.05%  0.5%   2.5%  97.5%  99.5% 99.95%
#> NARTIC 0.7622 0.0676 5 0.686 0.686 0.6864 0.8364 0.8397 0.8405
#> Call:
#> BetaMC(object = object, R = R)
#>
#> Standardized regression slopes
#> type = "hc3"

#> test-betaMC-diff-beta-mc-methods

#> Difference between standardized regression coefficients
#> type = "mvn"
#>                   est     se  R   0.05%    0.5%    2.5%  97.5%  99.5% 99.95%
#> NARTIC-PCTGRT  0.1037 0.1303 10 -0.1715 -0.1686 -0.1560 0.2391 0.2448 0.2461
#> NARTIC-PCTSUPP 0.2319 0.1050 10  0.0337  0.0353  0.0425 0.3351 0.3411 0.3424
```

```
#> PCTGRT-PCTSUPP 0.1282 0.1056 10 -0.0757 -0.0741 -0.0669 0.2380 0.2438 0.2452
#> Difference between standardized regression coefficients
#> type = "mvn"
#> Difference between standardized regression coefficients
#> type = "adf"
#>                   est     se  R   0.05%    0.5%    2.5%  97.5%  99.5% 99.95%
#> NARTIC-PCTGRT  0.1037 0.1220 10 -0.1714 -0.1631 -0.1261 0.2642 0.2825 0.2867
#> NARTIC-PCTSUPP 0.2319 0.1080 10  0.0713  0.0734  0.0825 0.4029 0.4194 0.4231
#> PCTGRT-PCTSUPP 0.1282 0.1208 10 -0.0283 -0.0272 -0.0223 0.2927 0.2942 0.2946
#> Difference between standardized regression coefficients
#> type = "adf"
#> Difference between standardized regression coefficients
#> type = "hc0"
#>                   est     se  R   0.05%    0.5%    2.5%  97.5%  99.5% 99.95%
#> NARTIC-PCTGRT  0.1037 0.1121 10 -0.1506 -0.1492 -0.1429 0.1493 0.1525 0.1532
#> NARTIC-PCTSUPP 0.2319 0.1088 10 -0.0124 -0.0103 -0.0007 0.3105 0.3224 0.3250
#> PCTGRT-PCTSUPP 0.1282 0.1056 10 -0.0827 -0.0789 -0.0618 0.2573 0.2673 0.2695
#> Difference between standardized regression coefficients
#> type = "hc0"
#> Difference between standardized regression coefficients
#> type = "hc1"
#>                   est     se  R   0.05%    0.5%    2.5%  97.5%  99.5% 99.95%
#> NARTIC-PCTGRT  0.1037 0.1103 10  0.0127  0.0138  0.0188 0.3327 0.3354 0.3360
#> NARTIC-PCTSUPP 0.2319 0.1251 10 -0.0055 -0.0022  0.0126 0.3630 0.3741 0.3765
#> PCTGRT-PCTSUPP 0.1282 0.1492 10 -0.2294 -0.2247 -0.2038 0.2253 0.2276 0.2281
#> Difference between standardized regression coefficients
#> type = "hc1"
#> Difference between standardized regression coefficients
#> type = "hc2"
#>                   est     se  R   0.05%    0.5%    2.5%  97.5%  99.5% 99.95%
#> NARTIC-PCTGRT  0.1037 0.1758 10 -0.2929 -0.2886 -0.2697 0.2650 0.2905 0.2963
#> NARTIC-PCTSUPP 0.2319 0.1448 10 -0.1409 -0.1351 -0.1094 0.3421 0.3526 0.3550
#> PCTGRT-PCTSUPP 0.1282 0.1301 10 -0.1360 -0.1301 -0.1038 0.3098 0.3222 0.3250
#> Difference between standardized regression coefficients
#> type = "hc2"
#> Difference between standardized regression coefficients
#> type = "hc3"
#>                   est     se  R   0.05%    0.5%    2.5%  97.5%  99.5% 99.95%
#> NARTIC-PCTGRT  0.1037 0.1747 10 -0.1109 -0.1104 -0.1079 0.3466 0.3474 0.3476
#> NARTIC-PCTSUPP 0.2319 0.1344 10 -0.0645 -0.0636 -0.0598 0.3050 0.3063 0.3066
#> PCTGRT-PCTSUPP 0.1282 0.1731 10 -0.1849 -0.1817 -0.1673 0.3594 0.4004 0.4097
#> Difference between standardized regression coefficients
#> type = "hc3"
#> Difference between standardized regression coefficients
#> type = "hc4"
#>                   est     se  R   0.05%    0.5%    2.5%  97.5%  99.5% 99.95%
```

```
#> NARTIC-PCTGRT  0.1037 0.1095 10 -0.0646 -0.0625 -0.0532 0.2572 0.2702 0.2732
#> NARTIC-PCTSUPP 0.2319 0.1252 10 -0.0145 -0.0123 -0.0023 0.3600 0.3602 0.3602
#> PCTGRT-PCTSUPP 0.1282 0.0988 10 -0.0320 -0.0295 -0.0183 0.2650 0.2678 0.2684
#> Difference between standardized regression coefficients
#> type = "hc4"
#> Difference between standardized regression coefficients
#> type = "hc4m"
#>                   est     se  R   0.05%    0.5%    2.5%  97.5%  99.5% 99.95%
#> NARTIC-PCTGRT  0.1037 0.1185 10 -0.1371 -0.1350 -0.1259 0.2263 0.2359 0.2381
#> NARTIC-PCTSUPP 0.2319 0.1095 10  0.0133  0.0142  0.0180 0.3438 0.3579 0.3611
#> PCTGRT-PCTSUPP 0.1282 0.1453 10 -0.1321 -0.1316 -0.1294 0.2848 0.2875 0.2881
#> Difference between standardized regression coefficients
#> type = "hc4m"
#> Difference between standardized regression coefficients
#> type = "hc5"
#>                   est     se  R   0.05%    0.5%    2.5%  97.5%  99.5% 99.95%
#> NARTIC-PCTGRT  0.1037 0.1755 10 -0.1691 -0.1688 -0.1676 0.3483 0.3728 0.3783
#> NARTIC-PCTSUPP 0.2319 0.1776 10  0.0300  0.0311  0.0358 0.5399 0.5765 0.5847
#> PCTGRT-PCTSUPP 0.1282 0.1549 10 -0.1294 -0.1251 -0.1060 0.3529 0.3553 0.3559
#> Difference between standardized regression coefficients
#> type = "hc5"
```

#> test-betaMC-diff-beta-mc

```
#> Difference between standardized regression coefficients
#> type = "mvn"
#> Test passed
#> Difference between standardized regression coefficients
#> type = "adf"
#> Test passed
#> Difference between standardized regression coefficients
#> type = "hc0"
#> Test passed
#> Difference between standardized regression coefficients
#> type = "hc1"
#> Test passed
#> Difference between standardized regression coefficients
#> type = "hc2"
#> Test passed
#> Difference between standardized regression coefficients
#> type = "hc3"
#> Test passed
#> Difference between standardized regression coefficients
#> type = "hc4"
#> Test passed
#> Difference between standardized regression coefficients
#> type = "hc4m"
```

```
#> Test passed
#> Difference between standardized regression coefficients
#> type = "hc5"
#> Test passed
#> Test passed
#> Test passed
#> Test passed
#> Test passed
#> Test passed
#> Test passed
#> Test passed
#> Test passed
#> Test passed
#> Test passed
```

#> test-betaMC-r-sq-beta-mc-methods

```
#> Multiple correlation
#> type = "mvn"
#>        est     se  R  0.05%   0.5%   2.5%  97.5%  99.5% 99.95%
#> rsq 0.8045 0.0953 10 0.6024 0.6071 0.6279 0.9220 0.9243 0.9248
#> adj 0.7906 0.1021 10 0.5740 0.5791 0.6013 0.9165 0.9189 0.9195
#> Multiple correlation
#> type = "mvn"
#> Multiple correlation
#> type = "adf"
#>        est     se  R  0.05%   0.5%   2.5%  97.5% 99.5% 99.95%
#> rsq 0.8045 0.0425 10 0.7122 0.7147 0.7257 0.8576  0.86 0.8605
#> adj 0.7906 0.0455 10 0.6916 0.6943 0.7061 0.8474  0.85 0.8506
#> Multiple correlation
#> type = "adf"
#> Multiple correlation
#> type = "hc0"
#>        est     se  R  0.05%   0.5%   2.5%  97.5%  99.5% 99.95%
#> rsq 0.8045 0.0275 10 0.7397 0.7413 0.7488 0.8394 0.8440 0.8450
#> adj 0.7906 0.0295 10 0.7211 0.7229 0.7309 0.8280 0.8328 0.8339
#> Multiple correlation
#> type = "hc0"
#> Multiple correlation
#> type = "hc1"
#>        est     se  R  0.05%   0.5%   2.5%  97.5%  99.5% 99.95%
#> rsq 0.8045 0.0446 10 0.6994 0.7033 0.7207 0.8597 0.8597 0.8597
#> adj 0.7906 0.0478 10 0.6779 0.6821 0.7007 0.8496 0.8496 0.8496
#> Multiple correlation
#> type = "hc1"
#> Multiple correlation
#> type = "hc2"
#>        est     se  R  0.05%   0.5%   2.5%  97.5%  99.5% 99.95%
```

```
#> rsq 0.8045 0.0540 10 0.6807 0.6822 0.6884 0.8375 0.8392 0.8395
#> adj 0.7906 0.0579 10 0.6579 0.6594 0.6662 0.8259 0.8277 0.8281
#> Multiple correlation
#> type = "hc2"
#> Multiple correlation
#> type = "hc3"
#>        est     se  R  0.05%   0.5%   2.5%  97.5%  99.5% 99.95%
#> rsq 0.8045 0.0316 10 0.7444 0.7452 0.7492 0.8465 0.8497 0.8504
#> adj 0.7906 0.0338 10 0.7261 0.7271 0.7313 0.8355 0.8389 0.8397
#> Multiple correlation
#> type = "hc3"
#> Multiple correlation
#> type = "hc4"
#>        est     se  R  0.05%   0.5%   2.5%  97.5%  99.5% 99.95%
#> rsq 0.8045 0.0645 10 0.6997 0.7000 0.7010 0.8599 0.8615 0.8618
#> adj 0.7906 0.0691 10 0.6783 0.6785 0.6797 0.8499 0.8516 0.8520
#> Multiple correlation
#> type = "hc4"
#> Multiple correlation
#> type = "hc4m"
#>        est     se  R  0.05%   0.5%   2.5%  97.5%  99.5% 99.95%
#> rsq 0.8045 0.0553 10 0.6833 0.6852 0.6940 0.8633 0.8653 0.8658
#> adj 0.7906 0.0592 10 0.6606 0.6627 0.6722 0.8536 0.8557 0.8562
#> Multiple correlation
#> type = "hc4m"
#> Multiple correlation
#> type = "hc5"
#>        est     se  R  0.05%   0.5%   2.5%  97.5%  99.5% 99.95%
#> rsq 0.8045 0.0494 10 0.7056 0.7066 0.7108 0.8406 0.8422 0.8426
#> adj 0.7906 0.0529 10 0.6846 0.6856 0.6902 0.8292 0.8309 0.8313
#> Multiple correlation
#> type = "hc5"
```

#> test-betaMC-r-sq-beta-mc

```
#> Multiple correlation
#> type = "mvn"
#> Test passed
#> Multiple correlation
#> type = "adf"
#> Test passed
#> Multiple correlation
#> type = "hc0"
#> Test passed
#> Multiple correlation
#> type = "hc1"
#> Test passed
```

```
#> Multiple correlation
#> type = "hc2"
#> Test passed
#> Multiple correlation
#> type = "hc3"
#> Test passed
#> Multiple correlation
#> type = "hc4"
#> Test passed
#> Multiple correlation
#> type = "hc4m"
#> Test passed
#> Multiple correlation
#> type = "hc5"
#> Test passed
#> Multiple correlation
#> type = "mvn"
#> Test passed
#> Multiple correlation
#> type = "adf"
#> Test passed
#> Multiple correlation
#> type = "hc0"
#> Test passed
#> Multiple correlation
#> type = "hc1"
#> Test passed
#> Multiple correlation
#> type = "hc2"
#> Test passed
#> Multiple correlation
#> type = "hc3"
#> Test passed
#> Multiple correlation
#> type = "hc4"
#> Test passed
#> Multiple correlation
#> type = "hc4m"
#> Test passed
#> Multiple correlation
#> type = "hc5"
#> Test passed
#> test-betaMC-vcov
#> Test passed
#> Test passed
```

```
#> Test passed
#> Test passed
#> Test passed
#> Test passed
#> Test passed
#> Test passed
#> [[1]]
#> [[1]][[1]]
#> [[1]][[1]]$value
#> [[1]][[1]]$value[[1]]
#>      2.5%     97.5%
#> 0.6863655 0.8364227
#>
#>
#> [[1]][[1]]$visible
#> [1] TRUE
#>
#>
#> [[1]][[2]]
#> [[1]][[2]]$value
#> [[1]][[2]]$value[[1]]
#>                         2.5%     97.5%
#> NARTIC-PCTGRT  -0.16761577 0.3483450
#> NARTIC-PCTSUPP  0.03575909 0.5399160
#> PCTGRT-PCTSUPP -0.10599604 0.3529417
#>
#>
#> [[1]][[2]]$visible
#> [1] TRUE
#>
#>
#> [[1]][[3]]
#> [[1]][[3]]$value
#> [[1]][[3]]$value[[1]]
#> [1] TRUE
#>
#>
#> [[1]][[3]]$visible
#> [1] TRUE
#>
#>
#> [[1]][[4]]
#> [[1]][[4]]$value
#> [[1]][[4]]$value[[1]]
#>          2.5%     97.5%
#> rsq 0.7108246 0.8405621
```

```
#> adj 0.6901692 0.8291736
#>
#>
#> [[1]][[4]]$visible
#> [1] TRUE
#>
#>
#> [[1]][[5]]
#> [[1]][[5]]$value
#> [[1]][[5]]$value[[1]]
#> [1] TRUE
#>
#>
#> [[1]][[5]]$visible
#> [1] TRUE
#>
#>
#> [[1]][[6]]
#> [[1]][[6]]$value
#> [[1]][[6]]$value[[1]]
#> Call:
#> BetaMC(object = object, R = 5L, decomposition = "svd")
#>
#> Standardized regression slopes
#> type = "hc3"
#>       est     se R  0.05%   0.5%   2.5%  97.5%  99.5% 99.95%
#> x1 0.4830 0.0163 5 0.4622 0.4623 0.4629 0.5021 0.5034 0.5037
#> x2 0.4857 0.0418 5 0.4440 0.4443 0.4458 0.5457 0.5516 0.5529
#>
#>
#> [[1]][[6]]$visible
#> [1] TRUE
```

Environment

```
ls()

#> [1] "nas1982"  "root"     "tex_file"
```

Class

```
#> [[1]]
#> [1] "data.frame"
#>
#> [[2]]
#> [1] "root_criterion"
#>
#> [[3]]
#> [1] "character"
```

References

R Core Team. (2022). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing. Vienna, Austria. https://www.R-project.org/