fitDTVARMx: Internal Tests

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Tests

```
#> test-fitDTVARMx-fit-dt-var-id-mx-psi-diag
#> Running DTVAR with 12 parameters
#>
#> Beginning initial fit attempt
#> Running DTVAR with 12 parameters
#>
#>  Lowest minimum so far:   741.858019666399
#>
#> Solution found
```

```
#>
#>  Solution found!   Final fit=741.85802 (started at 3195.3436)  (1 attempt(s):  1
valid, 0 errors)
#>  Start values from best fit:
#> 0.744102359401248,0.471983549669145,-0.123485840970363,-0.00232191598171461,0.652661527232958,0.
#> Running DTVAR with 12 parameters
#>
#> Beginning initial fit attempt
#> Running DTVAR with 12 parameters
#>
#>  Lowest minimum so far:   823.404995013856
#>
#> Solution found
```

```
#>
#>  Solution found!   Final fit=823.405 (started at 2764.6005)  (1 attempt(s):  1 valid,
0 errors)
#>  Start values from best fit:
#> 0.654633086676883,0.509278984394305,-0.134962902847776,0.0271964367580654,0.606323423068992,0.42
#>
#> Means of the estimated paramaters per individual.
#>      beta_11      beta_21      beta_31      beta_12      beta_22      beta_32
#>  0.699367723  0.490631267 -0.129224372  0.012437260  0.629492475  0.439116493
```

```
#>      beta_13      beta_23      beta_33       psi_11       psi_22       psi_33
#>  0.008699698 -0.020536672  0.487354890  0.095762197  0.103896589  0.095903969
#>
#> Estimated paramaters per individual.
#>        beta_11   beta_21    beta_31      beta_12   beta_22   beta_32
#> [1,] 0.7441024 0.4719835 -0.1234858 -0.002321916 0.6526615 0.4504739
#> [2,] 0.6546331 0.5092790 -0.1349629  0.027196437 0.6063234 0.4277591
#>          beta_13     beta_23   beta_33     psi_11    psi_22     psi_33
#> [1,] 0.013953886  0.00239793 0.4659242 0.08813525 0.1052980 0.09439619
#> [2,] 0.003445509 -0.04347127 0.5087856 0.10338914 0.1024952 0.09741175
#> Test passed

#> Running DTVAR with 12 parameters
#>
#> Beginning initial fit attempt
#> Running DTVAR with 12 parameters
#>
#>  Lowest minimum so far:   741.858019666378
#>
#> Solution found

#>
#>  Solution found!   Final fit=741.85802 (started at 757.28572)  (1 attempt(s):  1
valid, 0 errors)
#>  Start values from best fit:
#> 0.744102418583201,0.471983559006466,-0.12348585991363,-0.00232201282800975,0.652661556937646,0.45
#> Running DTVAR with 12 parameters
#>
#> Beginning initial fit attempt
#> Running DTVAR with 12 parameters
#>
#>  Lowest minimum so far:   823.404995013852
#>
#> Solution found

#>
#>  Solution found!   Final fit=823.405 (started at 830.00116)  (1 attempt(s):  1 valid,
0 errors)
#>  Start values from best fit:
#> 0.654633081123348,0.509278968155817,-0.134962904254715,0.027196439106069,0.606323418161673,0.427

#>
#> Means of the estimated paramaters per individual.
#>      beta_11      beta_21      beta_31      beta_12      beta_22      beta_32
#>  0.699367750  0.490631264 -0.129224382  0.012437213  0.629492488  0.439116498
#>      beta_13      beta_23      beta_33       psi_11       psi_22       psi_33
```

```
#>  0.008699747 -0.020536680  0.487354900  0.095762199  0.103896585  0.095903966
#>
#> Estimated paramaters per individual.
#>        beta_11   beta_21    beta_31      beta_12   beta_22   beta_32
#> [1,] 0.7441024 0.4719836 -0.1234859 -0.002322013 0.6526616 0.4504739
#> [2,] 0.6546331 0.5092790 -0.1349629  0.027196439 0.6063234 0.4277591
#>          beta_13      beta_23   beta_33     psi_11    psi_22     psi_33
#> [1,] 0.013953981  0.002397895 0.4659242 0.08813525 0.1052980 0.09439619
#> [2,] 0.003445514 -0.043471254 0.5087856 0.10338915 0.1024952 0.09741174
#> Test passed
```

```
#> test-fitDTVARMx-fit-dt-var-id-mx-psi-full
#> Running DTVAR with 15 parameters
#>
#> Beginning initial fit attempt
#> Running DTVAR with 15 parameters
#>
#>  Lowest minimum so far:   736.768311313362
#>
#> Solution found
```

```
#>
#>  Solution found!   Final fit=736.76831 (started at 3195.3436)  (1 attempt(s):  1
valid, 0 errors)
#>  Start values from best fit:
#> 0.744111828443433,0.472027289781822,-0.123384441991236,-0.00232614070645446,0.652594561411527,0.4
#> Running DTVAR with 15 parameters
#>
#> Beginning initial fit attempt
#> Running DTVAR with 15 parameters
#>
#>  Lowest minimum so far:   822.432007525035
#>
#> Solution found
```

```
#>
#>  Solution found!   Final fit=822.43201 (started at 2764.6005)  (1 attempt(s):  1
valid, 0 errors)
#>  Start values from best fit:
#> 0.654616074304076,0.509265077043905,-0.134913420573332,0.0272177376211155,0.606319427287526,0.427

#>
#> Means of the estimated paramaters per individual.
#>       beta_11       beta_21       beta_31       beta_12       beta_22
#>  0.6993639514  0.4906461834 -0.1291489313  0.0124457985  0.6294569943
#>       beta_32       beta_13       beta_23       beta_33        psi_11
```

```
#>  0.4390182948  0.0086865121 -0.0204440908  0.4874007382  0.0957622670
#>        psi_21        psi_22        psi_31        psi_32        psi_33
#> -0.0031446795  0.1038929361 -0.0008354084 -0.0029423646  0.0959030699
#>
#> Estimated paramaters per individual.
#>        beta_11   beta_21    beta_31      beta_12   beta_22   beta_32
#> [1,] 0.7441118 0.4720273 -0.1233844 -0.002326141 0.6525946 0.4503418
#> [2,] 0.6546161 0.5092651 -0.1349134  0.027217738 0.6063194 0.4276948
#>          beta_13      beta_23   beta_33    psi_11       psi_21    psi_22
#> [1,] 0.013928278  0.002553338 0.4659789 0.0881366 -0.003608184 0.1052932
#> [2,] 0.003444746 -0.043441519 0.5088226 0.1033879 -0.002681175 0.1024927
#>             psi_31       psi_32     psi_33
#> [1,] -0.0005183741 -0.009283966 0.09439469
#> [2,] -0.0011524427  0.003399236 0.09741145
#> Test passed

#> Running DTVAR with 15 parameters
#>
#> Beginning initial fit attempt
#> Running DTVAR with 15 parameters
#>
#>  Lowest minimum so far:   736.768311313353
#>
#> Solution found
```

```
#>
#>  Solution found!   Final fit=736.76831 (started at 757.28572)  (1 attempt(s):  1
valid, 0 errors)
#>  Start values from best fit:
#> 0.744111835025889,0.4720272511107065,-0.123384408156667,-0.00232615532898741,0.652594563875736,0.4
#> Running DTVAR with 15 parameters
#>
#> Beginning initial fit attempt
#> Running DTVAR with 15 parameters
#>
#>  Lowest minimum so far:   822.432007525033
#>
#> Solution found
```

```
#>
#>  Solution found!   Final fit=822.43201 (started at 830.00116)  (1 attempt(s):  1
valid, 0 errors)
#>  Start values from best fit:
#> 0.654616093273062,0.509265068677969,-0.134913406408658,0.0272177372674195,0.606319423848777,0.427

#>
```

```
#> Means of the estimated paramaters per individual.
#>       beta_11       beta_21       beta_31       beta_12       beta_22
#>  0.6993639641  0.4906461599 -0.1291489073  0.0124457910  0.6294569939
#>       beta_32       beta_13       beta_23       beta_33        psi_11
#>  0.4390182812  0.0086865135 -0.0204440876  0.4874007381  0.0957622648
#>        psi_21        psi_22        psi_31        psi_32        psi_33
#> -0.0031446765  0.1038929353 -0.0008354051 -0.0029423614  0.0959030684
#>
#> Estimated paramaters per individual.
#>        beta_11   beta_21    beta_31      beta_12   beta_22   beta_32
#> [1,] 0.7441118 0.4720273 -0.1233844 -0.002326155 0.6525946 0.4503417
#> [2,] 0.6546161 0.5092651 -0.1349134  0.027217737 0.6063194 0.4276948
#>          beta_13      beta_23   beta_33     psi_11       psi_21    psi_22
#> [1,] 0.013928284  0.002553342 0.4659789 0.08813659 -0.003608181 0.1052932
#> [2,] 0.003444743 -0.043441517 0.5088226 0.10338794 -0.002681172 0.1024927
#>             psi_31       psi_32     psi_33
#> [1,] -0.0005183717 -0.009283960 0.09439468
#> [2,] -0.0011524386  0.003399237 0.09741145
#> Test passed
```

```
#> test-fitDTVARMx-fit-dt-var-id-mx-theta-diag
#> Running DTVAR with 15 parameters
#>
#> Beginning initial fit attempt
#> Running DTVAR with 15 parameters
#>
#>  Lowest minimum so far:   741.858019666395
#>
#> Solution found
```

```
#>
#>  Solution found!   Final fit=741.85802 (started at 2437.3594)  (1 attempt(s):  1
valid, 0 errors)
#>  Start values from best fit:
#> 0.744102312732812,0.471983595508954,-0.123485819979284,-0.00232199465694653,0.652661570082528,0.4
#> Running DTVAR with 15 parameters
#>
#> Beginning initial fit attempt
#> Running DTVAR with 15 parameters
#>
#>  Lowest minimum so far:   821.002435268409
#>
#> Solution found
```

```
#>
#>  Solution found!  Final fit=821.00244 (started at 2195.461)  (1 attempt(s):  1
valid, 0 errors)
#>  Start values from best fit:
#> 0.653299531827981,0.48753892395409,-0.147719001881108,0.0294606879907606,0.641755710002061,0.450
#>
#> Means of the estimated paramaters per individual.
#>        beta_11        beta_21        beta_31        beta_12        beta_22
#>   6.987009e-01   4.797613e-01  -1.356024e-01   1.356935e-02   6.472086e-01
#>        beta_32        beta_13        beta_23        beta_33         psi_11
#>   4.505207e-01   8.252568e-03  -2.882770e-02   4.826202e-01   9.575435e-02
#>         psi_22         psi_33       theta_11       theta_22       theta_33
#>   9.629485e-02   9.481189e-02  2.225074e-308   5.481672e-03  2.225074e-308
#>
#> Estimated paramaters per individual.
#>        beta_11   beta_21    beta_31      beta_12   beta_22   beta_32
#> [1,] 0.7441023 0.4719836 -0.1234858 -0.002321995 0.6526616 0.4504739
#> [2,] 0.6532995 0.4875389 -0.1477190  0.029460688 0.6417557 0.4505675
#>          beta_13      beta_23   beta_33     psi_11     psi_22     psi_33
#> [1,] 0.013954012  0.002397879 0.4659241 0.08813525 0.10529798 0.09439619
#> [2,] 0.002551124 -0.060053276 0.4993163 0.10337345 0.08729171 0.09522759
#>           theta_11      theta_22      theta_33
#> [1,] 2.225074e-308 2.225074e-308 2.225074e-308
#> [2,] 2.225074e-308  1.096334e-02 2.225074e-308
#> Test passed

#> Running DTVAR with 15 parameters
#>
#> Beginning initial fit attempt
#> Running DTVAR with 15 parameters
#>
#>  Lowest minimum so far:  741.858019666377
#>
#> Solution found
```

```
#>
#>  Solution found!  Final fit=741.85802 (started at 1274.7112)  (1 attempt(s):  1
valid, 0 errors)
#>  Start values from best fit:
#> 0.744102418959596,0.471983551826989,-0.123485864222315,-0.00232201566053201,0.652661564425077,0.4
#> Running DTVAR with 15 parameters
#>
#> Beginning initial fit attempt
#> Running DTVAR with 15 parameters
#>
```

```
#>  Lowest minimum so far:   821.002435268711
#>
#> Solution found
```

```
#>
#>  Solution found!   Final fit=821.00244 (started at 1276.6239)  (1 attempt(s):  1
valid, 0 errors)
#>  Start values from best fit:
#> 0.653299502877738,0.487538691185285,-0.147719056218907,0.0294606364759032,0.641755876109492,0.45

#>
#> Means of the estimated paramaters per individual.
#>       beta_11       beta_21       beta_31       beta_12       beta_22
#>  6.987010e-01  4.797611e-01 -1.356025e-01  1.356931e-02  6.472087e-01
#>       beta_32       beta_13       beta_23       beta_33        psi_11
#>  4.505208e-01  8.252606e-03 -2.882773e-02  4.826202e-01  9.575435e-02
#>        psi_22        psi_33      theta_11      theta_22      theta_33
#>  9.629478e-02  9.481186e-02  3.709507e-18  5.481699e-03  2.789189e-17
#>
#> Estimated paramaters per individual.
#>        beta_11   beta_21    beta_31      beta_12   beta_22   beta_32
#> [1,] 0.7441024 0.4719836 -0.1234859 -0.002322016 0.6526616 0.4504739
#> [2,] 0.6532995 0.4875387 -0.1477191  0.029460636 0.6417559 0.4505677
#>          beta_13      beta_23   beta_33     psi_11     psi_22     psi_33
#> [1,] 0.013953985  0.002397887 0.4659242 0.08813525 0.10529799 0.09439619
#> [2,] 0.002551228 -0.060053354 0.4993162 0.10337345 0.08729157 0.09522754
#>           theta_11     theta_22      theta_33
#> [1,]  7.419014e-18 8.003968e-17  5.578379e-17
#> [2,] 2.225074e-308 1.096340e-02 2.225074e-308
#> Test passed
```

```
#> test-fitDTVARMx-fit-dt-var-id-mx-theta-null
#> Running DTVAR with 12 parameters
#>
#> Beginning initial fit attempt
#> Running DTVAR with 12 parameters
#>
#>  Lowest minimum so far:   741.858019666399
#>
#> Solution found
```

```
#>
#>  Solution found!   Final fit=741.85802 (started at 3195.3436)  (1 attempt(s):  1
valid, 0 errors)
#>  Start values from best fit:
#> 0.744102359401248,0.471983549669145,-0.123485840970363,-0.00232191598171461,0.652661527232958,0.
```

```
#> Running DTVAR with 12 parameters
#>
#> Beginning initial fit attempt
#> Running DTVAR with 12 parameters
#>
#>  Lowest minimum so far:   823.404995013856
#>
#> Solution found
```

```
#>
#>  Solution found!   Final fit=823.405 (started at 2764.6005)  (1 attempt(s):  1 valid,
0 errors)
#>  Start values from best fit:
#> 0.654633086676883,0.509278984394305,-0.134962902847776,0.0271964367580654,0.606323423068992,0.42
```

```
#>
#> Means of the estimated paramaters per individual.
#>      beta_11      beta_21      beta_31      beta_12      beta_22      beta_32
#>  0.699367723  0.490631267 -0.129224372  0.012437260  0.629492475  0.439116493
#>      beta_13      beta_23      beta_33       psi_11       psi_22       psi_33
#>  0.008699698 -0.020536672  0.487354890  0.095762197  0.103896589  0.095903969
#>
#> Estimated paramaters per individual.
#>        beta_11   beta_21    beta_31      beta_12   beta_22   beta_32
#> [1,] 0.7441024 0.4719835 -0.1234858 -0.002321916 0.6526615 0.4504739
#> [2,] 0.6546331 0.5092790 -0.1349629  0.027196437 0.6063234 0.4277591
#>          beta_13     beta_23   beta_33     psi_11    psi_22     psi_33
#> [1,] 0.013953886  0.00239793 0.4659242 0.08813525 0.1052980 0.09439619
#> [2,] 0.003445509 -0.04347127 0.5087856 0.10338914 0.1024952 0.09741175
#> Test passed
```

```
#> Running DTVAR with 12 parameters
#>
#> Beginning initial fit attempt
#> Running DTVAR with 12 parameters
#>
#>  Lowest minimum so far:   741.858019666378
#>
#> Solution found
```

```
#>
#>  Solution found!   Final fit=741.85802 (started at 757.28572)  (1 attempt(s):  1
valid, 0 errors)
#>  Start values from best fit:
#> 0.744102418583201,0.471983559006466,-0.12348585991363,-0.00232201282800975,0.652661556937646,0.45
#> Running DTVAR with 12 parameters
```

```
#>
#> Beginning initial fit attempt
#> Running DTVAR with 12 parameters
#>
#>  Lowest minimum so far:   823.404995013852
#>
#> Solution found
```

```
#>
#>  Solution found!   Final fit=823.405 (started at 830.00116)  (1 attempt(s):  1 valid,
0 errors)
#>  Start values from best fit:
#> 0.654633081123348,0.509278968155817,-0.134962904254715,0.027196439106069,0.606323418161673,0.427

#>
#> Means of the estimated paramaters per individual.
#>      beta_11      beta_21      beta_31      beta_12      beta_22      beta_32
#>  0.699367750  0.490631264 -0.129224382  0.012437213  0.629492488  0.439116498
#>      beta_13      beta_23      beta_33       psi_11       psi_22       psi_33
#>  0.008699747 -0.020536680  0.487354900  0.095762199  0.103896585  0.095903966
#>
#> Estimated paramaters per individual.
#>        beta_11   beta_21    beta_31      beta_12   beta_22   beta_32
#> [1,] 0.7441024 0.4719836 -0.1234859 -0.002322013 0.6526616 0.4504739
#> [2,] 0.6546331 0.5092790 -0.1349629  0.027196439 0.6063234 0.4277591
#>          beta_13      beta_23   beta_33     psi_11    psi_22     psi_33
#> [1,] 0.013953981  0.002397895 0.4659242 0.08813525 0.1052980 0.09439619
#> [2,] 0.003445514 -0.043471254 0.5087856 0.10338915 0.1024952 0.09741174
#> Test passed

#> test-fitDTVARMx-fit-dt-var-mx-theta-null
#> Error in mxFitFunctionMultigroup(paste0("DTVAR", "_", ids)):  could not find function
"mxFitFunctionMultigroup"
```

Environment

```
ls()

#> [1] "root"
```

Class

```
#> [[1]]
#> [1] "root_criterion"
```

References

R Core Team. (2024). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing. Vienna, Austria. https://www.R-project.org/