Simulation Techniques FRM Examples

Exercises compilation for academic porpuses, Simulation Techniques Financial Risk Management.

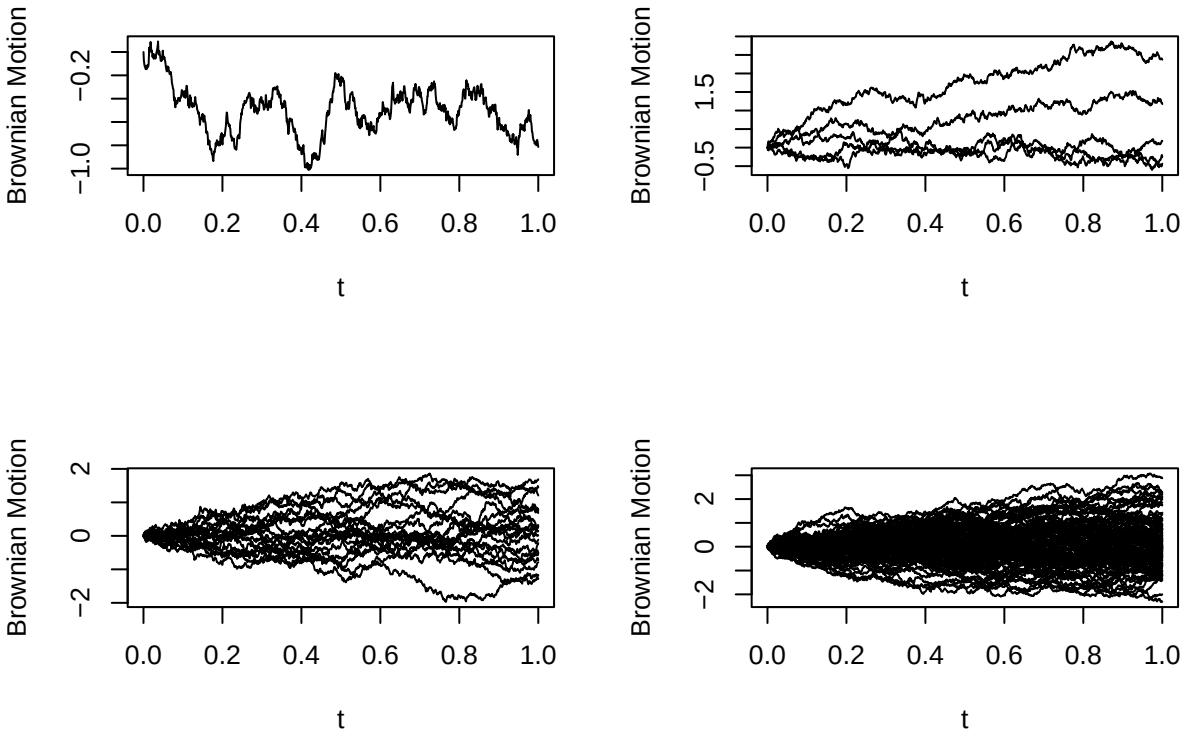
JDM

1/21/2024

Info

This file shows the result of some exercises in "ExercisesCompFRMbook.R"

Brownian Motion p15

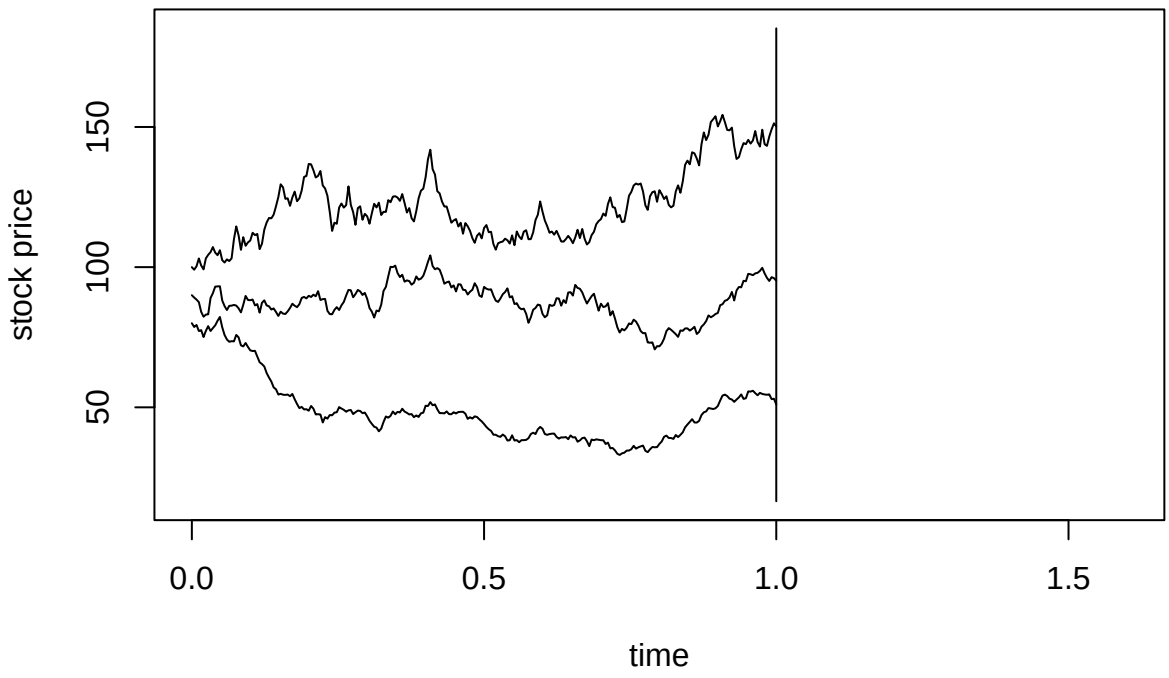


Excercise pg149

Basket options are often valued by assuming that the value of the portfolio of assets comprising follows the Black-Scholes dynamics jointly rather than each assetfollows the B&S individually.

```
##   [1] 270.0000 266.8858 268.1235 267.8070 262.1915 256.6260 263.4918 266.5355
##   [9] 271.5647 276.1509 277.4701 278.2679 281.4379 269.1720 263.5509 261.6741
##  [17] 261.7452 262.9855 269.9823 276.6537 271.5725 262.1588 268.9934 270.3024
##  [25] 268.6549 268.0336 270.7903 267.9508 266.7802 256.2835 261.0818 266.1104
##  [33] 264.5118 264.1921 261.4929 261.1102 262.1431 262.1296 268.5010 266.3906
##  [41] 262.1051 263.3378 261.2838 266.5942 266.0373 260.4188 261.0706 266.5771
##  [49] 270.8193 270.6990 275.3991 276.5152 274.2957 269.0823 271.5338 270.0326
##  [57] 262.3363 263.2281 255.8578 250.1458 243.2648 248.7359 249.4444 256.0257
##  [65] 258.6569 257.9440 260.3987 269.6154 263.0519 256.4672 253.7715 261.7513
##  [73] 261.7764 254.9046 257.9711 253.5630 246.1241 247.4439 247.7081 248.5511
##  [81] 248.6859 247.6129 256.0542 259.3935 266.8756 270.2345 273.6788 273.3655
##  [89] 271.1137 268.2647 272.8545 266.1803 262.8203 263.5363 258.8352 257.2117
##  [97] 263.8028 266.6305 271.0541 272.9946 281.8757 290.8054 297.9450 286.0859
## [105] 283.3231 276.0270 273.3167 268.2608 263.5492 264.7684 261.2621 256.1513
## [113] 258.4074 256.2839 256.7384 258.0261 252.2731 255.2749 250.7188 250.6463
## [121] 248.2563 249.7579 250.5986 247.6969 244.6136 250.9556 250.3213 246.6561
## [129] 246.2657 238.2768 234.5028 235.8027 237.1926 239.7698 240.9692 240.1471
## [137] 235.9392 240.9647 232.8345 238.1554 234.1056 233.2329 236.1827 234.8994
## [145] 229.1124 232.5632 238.1547 242.6938 247.5149 252.8545 245.4630 239.2161
## [153] 237.6515 239.3184 239.4766 238.6872 241.3025 238.7857 234.7060 236.6015
## [161] 236.6135 240.7311 241.0843 237.6654 243.6085 243.6666 240.8598 243.6212
## [169] 238.1901 233.0299 233.4372 239.5876 241.4005 241.3542 239.3475 242.3835
## [177] 243.1676 241.2351 247.1129 243.0962 241.1953 237.5328 229.7870 228.3294
## [185] 227.6200 227.5628 233.6236 239.9664 241.6158 246.6785 245.7029 244.3164
## [193] 243.1068 239.7769 233.0780 227.5816 233.3723 235.7634 233.4720 230.9472
## [201] 236.1515 236.6484 238.2866 242.3666 239.5075 238.0559 237.5278 243.2312
## [209] 243.6732 244.1586 248.9960 257.5203 260.0303 258.8576 264.7193 263.9228
## [217] 259.4388 258.4154 269.8020 275.8492 274.6208 279.7572 283.4500 284.7601
## [225] 286.7860 284.3550 290.8903 295.2829 294.3049 291.2934 291.0746 293.7088
## [233] 283.2280 283.0275 285.7133 289.4506 292.3764 292.0838 298.7181 297.1344
## [241] 298.2464 301.3697 296.9172 296.8652 303.5725 296.2511 293.9359 296.2527
## [249] 298.5332 300.4436 296.3667
```

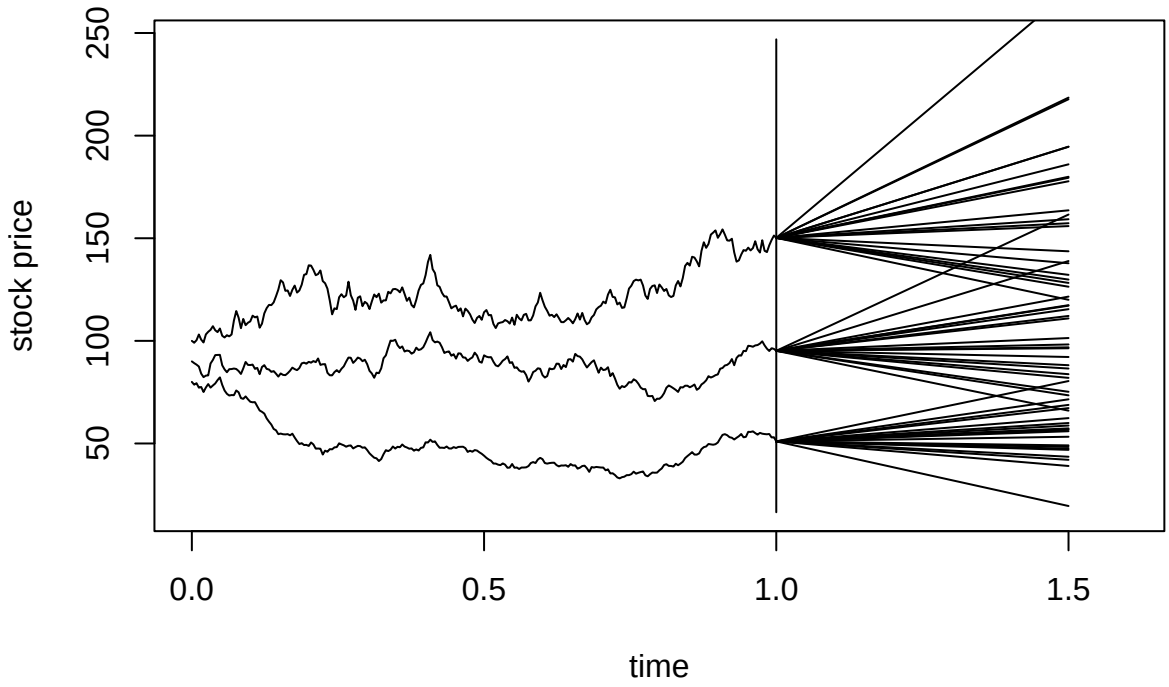
```
##           [,1]      [,2]      [,3]
## [1,] 1.0000000 0.2697929 0.2628024
## [2,] 0.2697929 1.0000000 0.3356665
## [3,] 0.2628024 0.3356665 1.0000000
```




```
## [1] 150.18302  95.15986  51.02380
```

```
## [1] 56.39023
```

```
## [1] 63.13539
```


stock price
250
200
150
100
50
0.0
0.5
1.0
1.5
time