

Table 1: Result of SimExact x SimLNS x SimSA-VaR

| Inst | n | δ | SimExact | | SimLNS | | SimSA-VaR | | | | | | GAP _{c×a} | GAP _{c×b} |
|------|-----|----------|--------------------|---------|--------------------|---------|-----------|--------------------|----------|--------|----------|----------|--------------------|--------------------|
| | | | V-RPD ^a | T(s) | V-RPD ^b | T(s) | D-RPD | V-RPD ^c | SD | T(s) | ρ_S | ρ_L | | |
| 1 | 25 | 0.1 | 22.28 | 259.05 | 20.83 | 22.20 | 0.14 | 19.87 | 7020.50 | 7.37 | 356 | 3217 | -10.83% | -4.60% |
| 2 | 25 | 0.1 | 22.10 | 244.85 | 23.45 | 18.18 | 1.96 | 20.33 | 6132.15 | 7.83 | 354 | 3261 | -8.00% | -13.28% |
| 3 | 25 | 0.1 | 27.49 | 178.94 | 25.13 | 14.76 | 1.10 | 24.52 | 7436.79 | 8.68 | 391 | 3808 | -10.79% | -2.40% |
| 4 | 25 | 0.1 | 21.96 | 472.48 | 21.88 | 17.68 | 0.88 | 21.89 | 7785.56 | 7.87 | 452 | 3640 | -0.29% | 0.07% |
| 5 | 25 | 0.1 | 22.20 | 342.72 | 22.40 | 14.86 | 1.00 | 21.11 | 7160.78 | 7.80 | 405 | 3436 | -4.90% | -5.76% |
| 6 | 25 | 0.1 | 27.46 | 304.41 | 22.12 | 18.00 | 1.08 | 22.22 | 6872.62 | 6.65 | 349 | 3438 | -19.11% | 0.42% |
| 7 | 25 | 0.1 | 22.10 | 4480.63 | 22.13 | 15.84 | 0.36 | 20.56 | 7353.05 | 7.02 | 374 | 3392 | -6.99% | -7.11% |
| 8 | 25 | 0.1 | 21.26 | 482.83 | 22.51 | 16.22 | 1.11 | 19.72 | 7478.86 | 6.86 | 338 | 3514 | -7.28% | -12.42% |
| 9 | 25 | 0.1 | 25.68 | 446.01 | 20.21 | 15.85 | 0.29 | 20.48 | 7975.93 | 7.28 | 373 | 3431 | -20.27% | 1.33% |
| 10 | 25 | 0.1 | 33.41 | 347.60 | 26.60 | 19.98 | 1.86 | 23.60 | 7262.66 | 7.97 | 391 | 3558 | -29.37% | -11.30% |
| 11 | 25 | 0.1 | 28.84 | 470.55 | 22.50 | 14.55 | 1.89 | 20.64 | 7385.18 | 7.30 | 427 | 3393 | -28.41% | -8.23% |
| 12 | 25 | 0.1 | 27.63 | 226.53 | 20.11 | 17.41 | 0.62 | 18.64 | 7232.86 | 6.59 | 374 | 3341 | -32.54% | -7.31% |
| 13 | 25 | 0.1 | 33.24 | 363.98 | 19.14 | 15.65 | 0.98 | 18.54 | 5557.89 | 6.79 | 265 | 2711 | -44.22% | -3.13% |
| 14 | 25 | 0.1 | 29.50 | 440.17 | 27.41 | 17.63 | 3.98 | 26.86 | 4566.47 | 9.08 | 456 | 3671 | -8.95% | -2.01% |
| 15 | 25 | 0.1 | 22.06 | 332.77 | 22.74 | 16.79 | 1.91 | 21.33 | 6013.25 | 7.08 | 331 | 3051 | -3.33% | -6.20% |
| 16 | 25 | 0.1 | 24.80 | 496.11 | 24.51 | 17.52 | 2.46 | 23.43 | 5441.35 | 7.47 | 350 | 3552 | -5.52% | -4.41% |
| 17 | 25 | 0.1 | 26.20 | 317.91 | 23.63 | 14.97 | 1.51 | 20.81 | 6894.14 | 6.27 | 330 | 3217 | -20.57% | -11.93% |
| 18 | 25 | 0.1 | 36.67 | 286.41 | 23.27 | 16.45 | 1.57 | 22.23 | 6612.78 | 8.09 | 454 | 3645 | -39.38% | -4.47% |
| 19 | 25 | 0.1 | 21.94 | 311.76 | 22.08 | 16.90 | 1.23 | 21.69 | 7036.68 | 7.31 | 410 | 3597 | -1.15% | -1.75% |
| 20 | 25 | 0.1 | 21.44 | 468.68 | 21.78 | 16.07 | 0.08 | 20.47 | 7724.96 | 7.51 | 387 | 3216 | -4.54% | -6.05% |
| 21 | 25 | 0.1 | 26.74 | 4484.27 | 19.02 | 16.33 | 0.60 | 20.07 | 7796.28 | 6.85 | 373 | 3269 | -24.92% | 5.55% |
| 22 | 25 | 0.1 | 31.12 | 392.43 | 30.73 | 21.66 | 4.16 | 27.83 | 4885.45 | 9.19 | 489 | 4593 | -10.56% | -9.43% |
| 23 | 25 | 0.1 | 21.44 | 413.26 | 22.55 | 16.24 | 1.04 | 19.46 | 6426.99 | 6.87 | 330 | 3197 | -9.24% | -13.70% |
| 24 | 25 | 0.1 | 25.10 | 254.44 | 20.97 | 16.57 | 1.39 | 20.21 | 7127.25 | 6.59 | 369 | 3149 | -19.47% | -3.60% |
| 25 | 25 | 0.1 | 20.73 | 459.73 | 19.86 | 16.60 | 0.70 | 19.97 | 7337.85 | 6.59 | 319 | 3142 | -3.65% | 0.57% |
| 26 | 25 | 0.5 | 48.63 | 311.55 | 45.48 | 104.76 | 0.31 | 44.74 | 15806.67 | 64.85 | 1632 | 15189 | -8.00% | -1.63% |
| 27 | 25 | 0.5 | 51.26 | 313.30 | 52.48 | 85.02 | 2.25 | 49.17 | 14481.46 | 81.35 | 1873 | 16388 | -4.07% | -6.31% |
| 28 | 25 | 0.5 | 51.90 | 221.73 | 53.17 | 37.13 | 1.76 | 49.66 | 16038.49 | 83.49 | 1798 | 16498 | -4.32% | -6.60% |
| 29 | 25 | 0.5 | 47.66 | 536.15 | 47.40 | 79.33 | 0.77 | 47.52 | 16856.09 | 69.31 | 1733 | 15740 | -0.30% | 0.26% |
| 30 | 25 | 0.5 | 49.98 | 414.90 | 47.48 | 34.47 | 1.00 | 47.06 | 15829.10 | 65.22 | 1785 | 15492 | -5.83% | -0.87% |
| 31 | 25 | 0.5 | 55.45 | 387.04 | 49.57 | 108.42 | 1.36 | 49.83 | 15575.85 | 73.21 | 1832 | 16164 | -10.14% | 0.53% |
| 32 | 25 | 0.5 | 46.77 | 4546.77 | 46.69 | 61.76 | 0.25 | 46.39 | 16368.64 | 64.26 | 1705 | 15401 | -0.81% | -0.63% |
| 33 | 25 | 0.5 | 48.32 | 551.90 | 47.39 | 91.35 | 0.99 | 45.91 | 16754.99 | 81.22 | 1815 | 16074 | -4.99% | -3.12% |
| 34 | 25 | 0.5 | 47.49 | 434.33 | 44.80 | 85.75 | 0.48 | 45.45 | 17400.49 | 68.82 | 1749 | 15146 | -4.29% | 1.45% |
| 35 | 25 | 0.5 | 53.51 | 393.82 | 53.46 | 87.45 | 1.66 | 51.40 | 16172.84 | 75.59 | 1736 | 16094 | -3.94% | -3.84% |
| 36 | 25 | 0.5 | 51.36 | 528.79 | 49.83 | 34.45 | 1.97 | 46.16 | 16569.78 | 68.34 | 1729 | 15779 | -10.12% | -7.37% |
| 37 | 25 | 0.5 | 49.83 | 265.28 | 45.03 | 92.32 | 0.12 | 46.61 | 16765.49 | 72.27 | 1854 | 16291 | -6.46% | 3.52% |
| 38 | 25 | 0.5 | 56.62 | 407.64 | 46.82 | 62.15 | 2.14 | 47.18 | 14110.03 | 71.92 | 1755 | 15993 | -16.67% | 0.77% |
| 39 | 25 | 0.5 | 63.49 | 567.28 | 65.36 | 132.66 | 3.98 | 60.62 | 11114.26 | 111.76 | 2226 | 19812 | -4.52% | -7.25% |
| 40 | 25 | 0.5 | 50.80 | 406.68 | 48.28 | 81.14 | 1.88 | 48.81 | 14222.46 | 73.38 | 1802 | 15716 | -3.90% | 1.11% |
| 41 | 25 | 0.5 | 55.68 | 583.49 | 54.27 | 112.75 | 2.12 | 53.67 | 12897.46 | 85.00 | 1951 | 17977 | -3.61% | -1.10% |
| 42 | 25 | 0.5 | 49.59 | 364.33 | 48.05 | 56.82 | 1.92 | 46.79 | 15549.15 | 68.05 | 1740 | 14993 | -5.66% | -2.62% |
| 43 | 25 | 0.5 | 55.03 | 321.92 | 49.78 | 78.56 | 1.57 | 49.52 | 14746.00 | 77.68 | 1823 | 16458 | -10.01% | -0.53% |
| 44 | 25 | 0.5 | 49.37 | 380.80 | 48.99 | 68.68 | 1.27 | 48.75 | 15675.67 | 71.79 | 1750 | 16277 | -1.26% | -0.49% |
| 45 | 25 | 0.5 | 47.44 | 534.74 | 45.77 | 65.25 | 0.08 | 45.08 | 17193.35 | 67.31 | 1622 | 14887 | -4.97% | -1.52% |
| 46 | 25 | 0.5 | 48.94 | 4520.87 | 44.72 | 78.76 | 0.58 | 46.45 | 17530.82 | 62.22 | 1777 | 15217 | -5.07% | 3.87% |
| 47 | 25 | 0.5 | 63.56 | 519.14 | 63.78 | 118.49 | 4.34 | 60.74 | 10938.49 | 133.89 | 2301 | 20598 | -4.44% | -4.77% |
| 48 | 25 | 0.5 | 48.37 | 482.05 | 46.26 | 79.29 | 1.23 | 44.80 | 14601.18 | 73.44 | 1862 | 15301 | -7.38% | -3.17% |
| 49 | 25 | 0.5 | 51.85 | 311.20 | 47.88 | 72.47 | 1.28 | 45.51 | 16222.22 | 65.61 | 1759 | 15234 | -12.23% | -4.95% |
| 50 | 25 | 0.5 | 46.92 | 526.07 | 46.43 | 63.77 | 0.65 | 46.48 | 16861.89 | 70.74 | 1726 | 15316 | -0.93% | 0.11% |
| 51 | 25 | 2.0 | 91.24 | 1107.83 | 89.49 | 821.65 | 0.10 | 89.85 | 30647.28 | 812.21 | 5580 | 50722 | -1.52% | 0.40% |
| 52 | 25 | 2.0 | 96.59 | 1308.60 | 97.70 | 1051.69 | 1.68 | 95.91 | 27915.25 | 934.54 | 6173 | 54516 | -0.71% | -1.83% |
| 53 | 25 | 2.0 | 95.76 | 936.16 | 95.06 | 234.37 | 0.86 | 95.39 | 30506.99 | 816.68 | 5940 | 52879 | -0.38% | 0.35% |
| 54 | 25 | 2.0 | 90.92 | 1417.75 | 90.53 | 818.78 | 0.69 | 90.08 | 31566.11 | 880.62 | 5604 | 49754 | -0.93% | -0.50% |
| 55 | 25 | 2.0 | 92.32 | 1361.00 | 91.30 | 532.75 | 1.69 | 91.85 | 30244.34 | 739.75 | 5382 | 50276 | -0.51% | 0.60% |
| 56 | 25 | 2.0 | 96.41 | 1363.07 | 95.21 | 996.17 | 1.33 | 92.97 | 29133.36 | 830.17 | 5676 | 50705 | -3.56% | -2.35% |
| 57 | 25 | 2.0 | 87.93 | 5464.84 | 87.93 | 652.78 | 0.46 | 87.28 | 30555.14 | 740.33 | 5276 | 48661 | -0.74% | -0.74% |
| 58 | 25 | 2.0 | 90.28 | 1488.45 | 91.65 | 614.90 | 1.08 | 90.04 | 31829.88 | 921.69 | 5857 | 52196 | -0.27% | -1.76% |

Continued on the next page

Table 1: Result of SimExact x SimLNS x SimSA-VaR (continued)

| Inst | n | δ | SimExact | | SimLNS | | SimSA-VaR | | | | | | GAP _{c×a} | GAP _{c×b} |
|------|-----|----------|--------------------|---------|--------------------|---------|-----------|--------------------|----------|---------|----------|----------|--------------------|--------------------|
| | | | V-RPD ^a | T(s) | V-RPD ^b | T(s) | D-RPD | V-RPD ^c | SD | T(s) | ρ_S | ρ_L | | |
| 59 | 25 | 2.0 | 90.23 | 1070.69 | 89.31 | 620.01 | 0.07 | 89.78 | 33537.24 | 758.08 | 5389 | 49555 | -0.50% | 0.52% |
| 60 | 25 | 2.0 | 94.85 | 1089.17 | 95.34 | 850.34 | 1.88 | 94.30 | 30030.01 | 799.48 | 5651 | 50504 | -0.58% | -1.10% |
| 61 | 25 | 2.0 | 94.30 | 1332.26 | 93.15 | 226.39 | 1.02 | 91.33 | 31787.40 | 823.41 | 5780 | 51793 | -3.15% | -1.96% |
| 62 | 25 | 2.0 | 93.99 | 964.11 | 89.26 | 804.00 | 0.10 | 90.20 | 31707.85 | 949.97 | 5612 | 52311 | -4.03% | 1.05% |
| 63 | 25 | 2.0 | 96.22 | 1045.22 | 92.53 | 658.27 | 1.82 | 92.51 | 26837.56 | 850.33 | 5903 | 50982 | -3.85% | -0.02% |
| 64 | 25 | 2.0 | 123.18 | 2775.06 | 125.18 | 1857.26 | 3.98 | 122.43 | 23059.35 | 1755.35 | 8020 | 71840 | -0.61% | -2.20% |
| 65 | 25 | 2.0 | 98.47 | 1542.58 | 95.50 | 969.86 | 3.66 | 97.06 | 28320.35 | 928.76 | 6396 | 55394 | -1.43% | 1.63% |
| 66 | 25 | 2.0 | 108.87 | 1995.46 | 106.89 | 1146.62 | 2.21 | 107.83 | 25408.69 | 1264.23 | 6466 | 60508 | -0.95% | 0.88% |
| 67 | 25 | 2.0 | 92.72 | 1122.74 | 91.68 | 208.80 | 2.00 | 91.84 | 30169.65 | 781.64 | 5669 | 50402 | -0.96% | 0.16% |
| 68 | 25 | 2.0 | 100.47 | 970.54 | 96.95 | 695.53 | 1.10 | 96.35 | 28154.36 | 865.14 | 6130 | 53474 | -4.11% | -0.63% |
| 69 | 25 | 2.0 | 96.33 | 1477.40 | 93.13 | 839.61 | 0.75 | 94.27 | 29939.22 | 819.18 | 5553 | 52357 | -2.14% | 1.22% |
| 70 | 25 | 2.0 | 88.02 | 1391.97 | 86.70 | 187.86 | 0.04 | 86.27 | 32517.01 | 689.49 | 5384 | 48145 | -1.99% | -0.50% |
| 71 | 25 | 2.0 | 90.19 | 5087.40 | 86.57 | 694.37 | 0.71 | 84.34 | 32242.26 | 669.43 | 5361 | 46983 | -6.48% | -2.58% |
| 72 | 25 | 2.0 | 123.03 | 2597.16 | 126.07 | 1446.32 | 4.09 | 122.75 | 22157.42 | 1821.40 | 8044 | 71598 | -0.23% | -2.63% |
| 73 | 25 | 2.0 | 91.06 | 1447.12 | 90.05 | 775.61 | 0.88 | 89.78 | 28129.75 | 811.49 | 5478 | 50576 | -1.41% | -0.30% |
| 74 | 25 | 2.0 | 92.81 | 1112.03 | 91.94 | 977.13 | 1.20 | 89.20 | 31110.58 | 743.61 | 5563 | 50509 | -3.89% | -2.98% |
| 75 | 25 | 2.0 | 89.54 | 1432.91 | 87.80 | 679.46 | 0.42 | 88.92 | 31862.71 | 756.95 | 5237 | 49366 | -0.69% | 1.28% |
| 76* | 50 | 0.1 | 23.42 | 4497.95 | 22.46 | 38.83 | 2.24 | 21.12 | 6038.23 | 11.61 | 323 | 3028 | -9.84% | -5.99% |
| 77* | 50 | 0.1 | 23.26 | 4497.03 | 22.61 | 42.29 | 1.79 | 21.79 | 6925.01 | 14.01 | 440 | 3607 | -6.29% | -3.62% |
| 78* | 50 | 0.1 | 20.80 | 4498.19 | 19.74 | 41.25 | 0.46 | 20.05 | 7708.82 | 12.90 | 413 | 3399 | -3.62% | 1.56% |
| 79* | 50 | 0.1 | 25.49 | 4497.70 | 20.93 | 41.13 | 2.73 | 20.15 | 5370.91 | 11.36 | 328 | 2776 | -20.97% | -3.73% |
| 80* | 50 | 0.1 | 20.45 | 4499.46 | 19.96 | 41.98 | 0.55 | 20.29 | 7526.05 | 12.21 | 356 | 3304 | -0.79% | 1.65% |
| 81* | 50 | 0.1 | 21.09 | 4497.12 | 21.69 | 44.42 | 0.65 | 19.67 | 6833.40 | 13.50 | 402 | 3178 | -6.70% | -9.32% |
| 82* | 50 | 0.1 | 20.57 | 4498.80 | 20.95 | 41.83 | 1.28 | 20.33 | 6565.18 | 12.36 | 378 | 3167 | -1.20% | -2.95% |
| 83* | 50 | 0.1 | 20.81 | 4499.17 | 20.12 | 43.16 | 0.56 | 19.61 | 7146.15 | 12.94 | 391 | 3403 | -5.79% | -2.54% |
| 84* | 50 | 0.1 | 22.16 | 4497.57 | 21.23 | 43.97 | 1.43 | 21.18 | 7338.04 | 11.90 | 374 | 3430 | -4.43% | -0.27% |
| 85* | 50 | 0.1 | 25.37 | 4497.86 | 21.75 | 41.87 | 2.25 | 21.30 | 5958.44 | 12.44 | 308 | 3057 | -16.05% | -2.07% |
| 86* | 50 | 0.1 | 21.02 | 4495.45 | 20.65 | 42.79 | 1.28 | 19.87 | 7474.66 | 11.28 | 349 | 3207 | -5.50% | -3.78% |
| 87* | 50 | 0.1 | 22.97 | 4498.38 | 20.53 | 43.52 | 1.05 | 20.95 | 7543.59 | 31.07 | 372 | 3332 | -8.81% | 2.06% |
| 88* | 50 | 0.1 | 24.21 | 4496.62 | 21.07 | 44.73 | 1.76 | 21.72 | 6969.80 | 12.48 | 411 | 3478 | -10.29% | 3.10% |
| 89* | 50 | 0.1 | 20.69 | 4499.43 | 20.20 | 42.41 | 1.48 | 20.66 | 7293.63 | 11.79 | 332 | 3157 | -0.15% | 2.28% |
| 90* | 50 | 0.1 | 22.51 | 4498.84 | 22.84 | 41.94 | 1.68 | 22.28 | 6603.14 | 11.52 | 382 | 3431 | -1.01% | -2.46% |
| 91* | 50 | 0.1 | 24.12 | 4498.29 | 20.99 | 43.68 | 1.44 | 21.01 | 7420.97 | 11.98 | 379 | 3231 | -12.87% | 0.10% |
| 92* | 50 | 0.1 | 22.25 | 4498.41 | 20.43 | 44.68 | 1.13 | 20.64 | 7263.39 | 13.69 | 364 | 3377 | -7.20% | 1.03% |
| 93* | 50 | 0.1 | 22.33 | 4497.34 | 20.25 | 41.67 | 1.58 | 19.79 | 7018.46 | 11.20 | 321 | 2989 | -11.40% | -2.30% |
| 94* | 50 | 0.1 | 22.22 | 4499.35 | 20.46 | 41.84 | 1.79 | 20.74 | 6327.49 | 11.67 | 377 | 3131 | -6.66% | 1.37% |
| 95* | 50 | 0.1 | 19.46 | 4500.12 | 19.31 | 41.95 | 1.17 | 19.11 | 7693.56 | 12.70 | 326 | 3128 | -1.83% | -1.03% |
| 96* | 50 | 0.1 | 23.23 | 4501.01 | 21.51 | 42.46 | 2.25 | 21.20 | 6590.15 | 12.31 | 318 | 3396 | -8.74% | -1.41% |
| 97* | 50 | 0.1 | 21.31 | 4498.81 | 20.68 | 42.63 | 1.32 | 19.57 | 6742.73 | 10.61 | 371 | 3106 | -8.16% | -5.36% |
| 98* | 50 | 0.1 | 21.78 | 4498.98 | 18.10 | 42.67 | 0.73 | 17.07 | 6483.44 | 12.14 | 337 | 3445 | -21.62% | -5.65% |
| 99* | 50 | 0.1 | 20.68 | 4484.08 | 20.51 | 42.14 | 1.46 | 19.27 | 7041.86 | 11.91 | 396 | 3296 | -6.81% | -6.05% |
| 100* | 50 | 0.1 | 22.59 | 4484.72 | 21.03 | 43.15 | 0.81 | 19.75 | 6953.71 | 13.22 | 371 | 3169 | -12.54% | -6.08% |
| 101* | 50 | 0.5 | 49.69 | 4573.64 | 48.24 | 57.94 | 2.30 | 49.57 | 14419.38 | 75.38 | 1638 | 15725 | -0.23% | 2.77% |
| 102* | 50 | 0.5 | 51.00 | 4586.62 | 50.23 | 118.52 | 1.77 | 48.14 | 15287.89 | 83.58 | 1783 | 16158 | -5.61% | -4.15% |
| 103* | 50 | 0.5 | 47.29 | 4575.77 | 47.36 | 99.90 | 0.53 | 44.88 | 17172.33 | 81.23 | 1804 | 15587 | -5.09% | -5.22% |
| 104* | 50 | 0.5 | 51.37 | 4578.43 | 49.44 | 107.90 | 2.43 | 49.35 | 13481.73 | 83.53 | 1820 | 15950 | -3.93% | -0.19% |
| 105* | 50 | 0.5 | 46.37 | 4582.45 | 45.33 | 122.83 | 0.47 | 43.49 | 16360.19 | 72.09 | 1674 | 14631 | -6.21% | -4.05% |
| 106* | 50 | 0.5 | 47.73 | 4573.84 | 47.10 | 96.03 | 0.69 | 45.61 | 15468.96 | 82.48 | 1728 | 14953 | -4.43% | -3.15% |
| 107* | 50 | 0.5 | 47.63 | 4586.28 | 46.71 | 92.85 | 1.47 | 46.06 | 15016.09 | 79.89 | 1445 | 15175 | -3.29% | -1.39% |
| 108* | 50 | 0.5 | 47.78 | 4584.96 | 46.89 | 105.47 | 0.65 | 47.73 | 16559.09 | 91.53 | 1870 | 16493 | -0.09% | 1.80% |
| 109* | 50 | 0.5 | 47.56 | 4576.40 | 48.05 | 104.09 | 1.51 | 47.07 | 16243.01 | 80.56 | 1719 | 15429 | -1.03% | -2.03% |
| 110* | 50 | 0.5 | 52.63 | 4578.49 | 51.37 | 130.71 | 2.33 | 50.03 | 14451.55 | 98.42 | 1813 | 16330 | -4.93% | -2.60% |
| 111* | 50 | 0.5 | 47.35 | 4571.90 | 47.87 | 103.35 | 1.23 | 45.83 | 16965.09 | 75.15 | 1673 | 15242 | -3.21% | -4.25% |
| 112* | 50 | 0.5 | 48.50 | 4569.20 | 46.85 | 97.97 | 1.16 | 47.27 | 16923.80 | 263.84 | 1726 | 15406 | -2.54% | 0.89% |
| 113* | 50 | 0.5 | 49.37 | 4569.43 | 48.85 | 129.54 | 1.82 | 48.55 | 15809.32 | 90.63 | 1741 | 16373 | -1.66% | -0.61% |
| 114* | 50 | 0.5 | 48.31 | 4586.62 | 46.94 | 102.26 | 1.23 | 47.48 | 16733.69 | 73.67 | 1797 | 15296 | -1.72% | 1.14% |
| 115* | 50 | 0.5 | 50.13 | 4581.82 | 48.85 | 103.86 | 1.73 | 49.40 | 14985.40 | 79.81 | 1830 | 16022 | -1.45% | 1.13% |
| 116* | 50 | 0.5 | 50.51 | 4576.76 | 48.49 | 128.34 | 1.37 | 47.98 | 17037.27 | 72.08 | 1729 | 15610 | -5.00% | -1.06% |

Continued on the next page

Table 1: Result of SimExact x SimLNS x SimSA-VaR (continued)

| Inst | n | δ | SimExact | | SimLNS | | SimSA-VaR | | | | | | GAP _{c×a} | GAP _{c×b} |
|------|-----|----------|--------------------|---------|--------------------|---------|-----------|--------------------|----------|---------|----------|----------|--------------------|--------------------|
| | | | V-RPD ^a | T(s) | V-RPD ^b | T(s) | D-RPD | V-RPD ^c | SD | T(s) | ρ_S | ρ_L | | |
| 117* | 50 | 0.5 | 50.24 | 4574.11 | 48.66 | 122.59 | 1.41 | 46.70 | 16349.24 | 87.19 | 1759 | 15748 | -7.05% | -4.02% |
| 118* | 50 | 0.5 | 48.64 | 4579.04 | 46.46 | 95.86 | 1.39 | 46.95 | 16618.64 | 53.89 | 1571 | 15342 | -3.49% | 1.05% |
| 119* | 50 | 0.5 | 50.19 | 4587.51 | 47.55 | 121.46 | 2.06 | 47.95 | 14661.25 | 77.63 | 1728 | 15323 | -4.46% | 0.85% |
| 120* | 50 | 0.5 | 45.39 | 4572.78 | 45.28 | 99.24 | 1.12 | 44.95 | 17706.59 | 78.40 | 1674 | 15220 | -0.97% | -0.73% |
| 121* | 50 | 0.5 | 50.43 | 4590.81 | 49.29 | 99.96 | 1.78 | 49.35 | 15314.58 | 86.64 | 1853 | 16710 | -2.13% | 0.13% |
| 122* | 50 | 0.5 | 48.14 | 4579.62 | 46.96 | 97.56 | 1.91 | 46.68 | 15786.74 | 79.68 | 1616 | 15474 | -3.02% | -0.59% |
| 123* | 50 | 0.5 | 49.59 | 4573.25 | 43.63 | 130.53 | 1.01 | 44.72 | 15004.30 | 97.09 | 1927 | 16856 | -9.82% | 2.51% |
| 124* | 50 | 0.5 | 48.79 | 4518.42 | 48.13 | 107.53 | 1.65 | 47.53 | 16234.58 | 75.46 | 1733 | 15909 | -2.57% | -1.24% |
| 125* | 50 | 0.5 | 47.11 | 4512.43 | 45.99 | 119.19 | 0.64 | 47.00 | 16341.11 | 81.03 | 1786 | 16022 | -0.24% | 2.18% |
| 126* | 50 | 2.0 | 95.49 | 5568.60 | 93.85 | 247.01 | 2.06 | 93.90 | 27594.92 | 799.93 | 5810 | 51842 | -1.67% | 0.06% |
| 127* | 50 | 2.0 | 95.18 | 5720.70 | 96.66 | 716.41 | 1.50 | 94.94 | 29592.80 | 886.94 | 5885 | 53578 | -0.25% | -1.78% |
| 128* | 50 | 2.0 | 90.59 | 5560.47 | 89.88 | 977.22 | 0.46 | 90.40 | 33246.72 | 824.41 | 5718 | 51858 | -0.22% | 0.57% |
| 129* | 50 | 2.0 | 103.60 | 5642.49 | 95.75 | 1079.51 | 2.54 | 97.64 | 26459.76 | 979.69 | 5889 | 54293 | -5.75% | 1.97% |
| 130* | 50 | 2.0 | 87.51 | 5548.79 | 85.46 | 776.70 | 0.48 | 86.89 | 31819.13 | 815.26 | 5478 | 49460 | -0.70% | 1.67% |
| 131* | 50 | 2.0 | 89.56 | 5546.15 | 89.10 | 847.05 | 0.76 | 88.69 | 30024.45 | 916.27 | 5542 | 50752 | -0.97% | -0.45% |
| 132* | 50 | 2.0 | 91.96 | 5698.33 | 92.42 | 809.53 | 1.61 | 91.83 | 29467.31 | 893.80 | 5968 | 52211 | -0.14% | -0.64% |
| 133* | 50 | 2.0 | 95.27 | 5752.30 | 91.79 | 742.70 | 0.54 | 92.96 | 31744.20 | 906.48 | 5990 | 54015 | -2.43% | 1.28% |
| 134* | 50 | 2.0 | 89.27 | 5582.01 | 87.55 | 630.66 | 1.60 | 88.79 | 30878.36 | 943.88 | 5735 | 50209 | -0.54% | 1.42% |
| 135* | 50 | 2.0 | 99.22 | 5734.17 | 99.00 | 899.43 | 2.29 | 99.06 | 28223.77 | 1046.28 | 6106 | 55256 | -0.16% | 0.06% |
| 136* | 50 | 2.0 | 89.52 | 5524.11 | 87.76 | 756.16 | 1.29 | 88.02 | 32037.25 | 1777.40 | 5479 | 49047 | -1.68% | 0.29% |
| 137* | 50 | 2.0 | 89.68 | 5523.06 | 88.99 | 625.97 | 1.00 | 88.42 | 31769.49 | 794.71 | 5698 | 49799 | -1.41% | -0.64% |
| 138* | 50 | 2.0 | 96.44 | 5642.95 | 93.37 | 865.18 | 1.74 | 95.79 | 30519.29 | 1019.10 | 6242 | 53915 | -0.68% | 2.59% |
| 139* | 50 | 2.0 | 90.66 | 5646.83 | 91.19 | 889.41 | 1.18 | 90.64 | 32107.86 | 858.35 | 5612 | 50797 | -0.02% | -0.61% |
| 140* | 50 | 2.0 | 96.46 | 5768.14 | 96.44 | 567.39 | 1.67 | 95.18 | 28729.93 | 854.46 | 5697 | 52928 | -1.33% | -1.30% |
| 141* | 50 | 2.0 | 94.66 | 5551.85 | 91.43 | 864.20 | 1.49 | 92.37 | 32765.29 | 867.07 | 5819 | 51426 | -2.41% | 1.03% |
| 142* | 50 | 2.0 | 94.71 | 5668.47 | 94.63 | 843.45 | 1.27 | 92.94 | 31749.88 | 935.24 | 5738 | 52095 | -1.87% | -1.79% |
| 143* | 50 | 2.0 | 92.93 | 5636.68 | 92.31 | 509.46 | 1.24 | 92.08 | 32196.22 | 912.59 | 5625 | 51506 | -0.91% | -0.25% |
| 144* | 50 | 2.0 | 97.60 | 5825.90 | 96.80 | 1017.64 | 2.06 | 96.47 | 29525.33 | 1009.55 | 5879 | 55229 | -1.15% | -0.34% |
| 145* | 50 | 2.0 | 88.48 | 5425.86 | 86.19 | 781.52 | 0.78 | 87.60 | 33719.82 | 787.04 | 5685 | 49746 | -0.99% | 1.64% |
| 146* | 50 | 2.0 | 97.57 | 5769.41 | 98.35 | 812.95 | 1.92 | 97.28 | 29402.35 | 1038.52 | 6075 | 54637 | -0.30% | -1.09% |
| 147* | 50 | 2.0 | 92.33 | 5628.70 | 91.25 | 794.94 | 2.63 | 91.71 | 30060.15 | 800.97 | 5658 | 50298 | -0.67% | 0.50% |
| 148* | 50 | 2.0 | 93.70 | 4970.25 | 90.42 | 1244.89 | 1.37 | 90.88 | 28718.64 | 1110.95 | 6282 | 54758 | -3.01% | 0.51% |
| 149* | 50 | 2.0 | 92.41 | 4810.62 | 91.11 | 721.51 | 1.61 | 91.41 | 30768.96 | 976.56 | 5763 | 51711 | -1.09% | 0.33% |
| 150* | 50 | 2.0 | 88.99 | 4757.95 | 88.23 | 630.28 | 0.85 | 87.55 | 30231.09 | 868.40 | 5562 | 49506 | -1.63% | -0.77% |
| 151* | 75 | 0.1 | 22.49 | 4494.21 | 19.33 | 81.18 | 1.65 | 20.45 | 7108.74 | 16.59 | 371 | 3191 | -9.08% | 5.80% |
| 152* | 75 | 0.1 | 21.97 | 4489.05 | 21.06 | 82.60 | 1.72 | 20.51 | 6320.43 | 17.36 | 341 | 3230 | -6.67% | -2.64% |
| 153* | 75 | 0.1 | 21.71 | 4491.80 | 22.89 | 82.96 | 1.07 | 20.69 | 6611.60 | 19.23 | 337 | 3301 | -4.66% | -9.58% |
| 154* | 75 | 0.1 | 19.90 | 4490.85 | 18.32 | 82.42 | 0.01 | 18.90 | 6907.41 | 18.09 | 385 | 3376 | -5.01% | 3.13% |
| 155* | 75 | 0.1 | 20.29 | 4492.05 | 19.45 | 82.66 | 1.67 | 19.60 | 6575.33 | 17.23 | 309 | 2939 | -3.41% | 0.77% |
| 156* | 75 | 0.1 | 19.75 | 4491.46 | 19.95 | 86.64 | 0.80 | 19.31 | 7003.98 | 18.65 | 331 | 3302 | -2.23% | -3.25% |
| 157* | 75 | 0.1 | 23.15 | 4490.76 | 20.32 | 85.05 | 1.66 | 19.35 | 6613.48 | 17.46 | 341 | 3134 | -16.42% | -4.80% |
| 158* | 75 | 0.1 | 21.02 | 4491.67 | 20.27 | 82.66 | 1.80 | 19.65 | 6109.05 | 17.87 | 308 | 2968 | -6.50% | -3.05% |
| 159* | 75 | 0.1 | 20.66 | 4491.79 | 20.86 | 83.17 | 1.94 | 20.58 | 7378.45 | 18.07 | 368 | 3249 | -0.39% | -1.34% |
| 160* | 75 | 0.1 | 21.23 | 4491.94 | 20.30 | 80.33 | 2.12 | 20.67 | 6313.40 | 17.91 | 360 | 3161 | -2.64% | 1.83% |
| 161* | 75 | 0.1 | 21.62 | 4489.75 | 21.50 | 87.50 | 1.89 | 20.66 | 6133.68 | 18.44 | 358 | 3245 | -4.45% | -3.92% |
| 162* | 75 | 0.1 | 22.26 | 4491.53 | 20.92 | 76.97 | 0.99 | 19.33 | 6910.52 | 21.51 | 362 | 3189 | -13.16% | -7.59% |
| 163* | 75 | 0.1 | 20.00 | 4489.80 | 19.25 | 80.16 | 0.57 | 19.07 | 6891.25 | 20.00 | 341 | 3065 | -4.66% | -0.95% |
| 164* | 75 | 0.1 | 22.31 | 4491.98 | 19.64 | 95.53 | 1.21 | 20.39 | 6941.02 | 26.66 | 372 | 3270 | -8.59% | 3.82% |
| 165* | 75 | 0.1 | 22.90 | 4492.03 | 22.50 | 81.16 | 2.47 | 22.12 | 6331.56 | 27.87 | 370 | 3260 | -3.43% | -1.70% |
| 166* | 75 | 0.1 | 22.03 | 4490.98 | 21.06 | 81.42 | 1.64 | 19.94 | 6841.69 | 26.57 | 328 | 3077 | -9.53% | -5.32% |
| 167* | 75 | 0.1 | 22.75 | 4492.46 | 22.70 | 82.04 | 1.80 | 22.54 | 7179.13 | 26.94 | 412 | 3585 | -0.92% | -0.69% |
| 168* | 75 | 0.1 | 21.33 | 4493.10 | 21.13 | 87.88 | 2.12 | 20.51 | 6545.32 | 27.69 | 370 | 3191 | -3.85% | -2.92% |
| 169* | 75 | 0.1 | 24.78 | 4491.09 | 20.64 | 85.95 | 1.05 | 19.87 | 6843.96 | 27.20 | 338 | 3357 | -19.81% | -3.74% |
| 170* | 75 | 0.1 | 24.43 | 4492.54 | 21.90 | 81.04 | 1.92 | 21.65 | 6770.14 | 24.30 | 386 | 3260 | -11.38% | -1.16% |
| 171* | 75 | 0.1 | 21.49 | 4492.77 | 21.18 | 85.73 | 2.35 | 20.84 | 6780.63 | 22.82 | 374 | 3173 | -3.00% | -1.62% |
| 172* | 75 | 0.1 | 20.78 | 4489.54 | 19.64 | 82.40 | 1.48 | 20.12 | 7142.48 | 31.08 | 326 | 3039 | -3.19% | 2.45% |
| 173* | 75 | 0.1 | 21.87 | 4492.95 | 21.06 | 85.04 | 1.96 | 20.96 | 6709.09 | 17.64 | 377 | 3320 | -4.16% | -0.47% |
| 174* | 75 | 0.1 | 22.24 | 4491.81 | 20.25 | 80.50 | 1.06 | 20.58 | 7419.87 | 18.89 | 394 | 3291 | -7.48% | 1.62% |

Continued on the next page

Table 1: Result of SimExact x SimLNS x SimSA-VaR (continued)

| Inst | n | δ | SimExact | | SimLNS | | SimSA-VaR | | | | | | $\text{GAP}_{c \times a}$ | $\text{GAP}_{c \times b}$ |
|------|-----|----------|--------------------|---------|--------------------|---------|-----------|--------------------|----------|---------|----------|----------|---------------------------|---------------------------|
| | | | V-RPD ^a | T(s) | V-RPD ^b | T(s) | D-RPD | V-RPD ^c | SD | T(s) | ρ_S | ρ_L | | |
| 175* | 75 | 0.1 | 21.05 | 4490.49 | 21.53 | 83.08 | 1.30 | 20.99 | 6161.75 | 40.07 | 331 | 3304 | -0.27% | -2.48% |
| 176* | 75 | 0.5 | 47.58 | 4522.78 | 47.05 | 141.20 | 1.78 | 47.28 | 16346.81 | 91.55 | 1668 | 15496 | -0.63% | 0.47% |
| 177* | 75 | 0.5 | 50.63 | 4526.83 | 49.09 | 178.75 | 1.71 | 49.36 | 15037.49 | 102.41 | 1771 | 16723 | -2.50% | 0.55% |
| 178* | 75 | 0.5 | 49.23 | 4534.28 | 49.22 | 157.46 | 1.13 | 48.89 | 15439.79 | 104.97 | 1761 | 16345 | -0.69% | -0.68% |
| 179* | 75 | 0.5 | 46.65 | 4529.26 | 44.86 | 161.27 | 0.15 | 45.43 | 15704.57 | 90.62 | 1707 | 15906 | -2.61% | 1.27% |
| 180* | 75 | 0.5 | 47.74 | 4535.02 | 46.75 | 138.95 | 1.62 | 47.13 | 15691.92 | 85.66 | 1813 | 15455 | -1.27% | 0.82% |
| 181* | 75 | 0.5 | 48.16 | 4533.80 | 48.00 | 154.21 | 0.86 | 46.94 | 16023.76 | 94.76 | 1705 | 15747 | -2.53% | -2.21% |
| 182* | 75 | 0.5 | 50.16 | 4526.85 | 47.09 | 119.09 | 1.66 | 49.29 | 15721.92 | 98.18 | 1808 | 16140 | -1.73% | 4.67% |
| 183* | 75 | 0.5 | 47.93 | 4533.23 | 46.22 | 142.41 | 1.46 | 47.11 | 14565.69 | 90.64 | 1713 | 15486 | -1.71% | 1.94% |
| 184* | 75 | 0.5 | 47.79 | 4530.61 | 46.84 | 170.25 | 1.07 | 47.46 | 16963.59 | 86.96 | 1720 | 15709 | -0.68% | 1.32% |
| 185* | 75 | 0.5 | 49.72 | 4532.65 | 48.14 | 145.65 | 2.12 | 48.58 | 14769.15 | 69.41 | 1803 | 15797 | -2.29% | 0.91% |
| 186* | 75 | 0.5 | 51.18 | 4538.02 | 48.85 | 187.14 | 1.97 | 49.78 | 14681.88 | 117.75 | 1838 | 16788 | -2.72% | 1.92% |
| 187* | 75 | 0.5 | 49.63 | 4536.46 | 48.26 | 100.34 | 1.00 | 47.61 | 16192.78 | 109.94 | 1850 | 15954 | -4.06% | -1.35% |
| 188* | 75 | 0.5 | 46.35 | 4528.64 | 45.81 | 143.48 | 0.87 | 46.32 | 16284.45 | 93.88 | 1679 | 15551 | -0.08% | 1.11% |
| 189* | 75 | 0.5 | 49.39 | 4533.40 | 48.86 | 117.67 | 1.06 | 46.07 | 15667.02 | 115.49 | 1601 | 15373 | -6.74% | -5.71% |
| 190* | 75 | 0.5 | 50.32 | 4535.88 | 48.92 | 184.16 | 3.04 | 48.63 | 14419.75 | 141.26 | 1813 | 15308 | -3.35% | -0.58% |
| 191* | 75 | 0.5 | 48.28 | 4529.91 | 47.69 | 142.54 | 1.33 | 47.47 | 16129.67 | 127.78 | 1644 | 15698 | -1.68% | -0.47% |
| 192* | 75 | 0.5 | 49.93 | 4536.05 | 49.61 | 172.24 | 1.84 | 48.94 | 15881.24 | 142.19 | 1832 | 16291 | -1.99% | -1.37% |
| 193* | 75 | 0.5 | 48.28 | 4534.42 | 48.34 | 178.94 | 2.12 | 46.59 | 14973.89 | 144.24 | 1766 | 15470 | -3.51% | -3.62% |
| 194* | 75 | 0.5 | 51.56 | 4530.29 | 47.36 | 163.87 | 1.20 | 46.91 | 15748.19 | 157.85 | 1892 | 16226 | -9.02% | -0.94% |
| 195* | 75 | 0.5 | 51.26 | 4535.54 | 49.11 | 185.12 | 2.18 | 48.88 | 15620.46 | 135.70 | 1741 | 15866 | -4.63% | -0.46% |
| 196* | 75 | 0.5 | 50.49 | 4537.22 | 48.28 | 158.17 | 1.93 | 49.43 | 15989.43 | 110.61 | 1829 | 16197 | -2.10% | 2.40% |
| 197* | 75 | 0.5 | 47.87 | 4531.54 | 48.06 | 167.65 | 1.40 | 47.48 | 17019.32 | 313.37 | 1856 | 15827 | -0.80% | -1.19% |
| 198* | 75 | 0.5 | 50.88 | 4539.02 | 48.49 | 134.41 | 2.19 | 48.49 | 15482.98 | 95.23 | 1804 | 16084 | -4.70% | -0.01% |
| 199* | 75 | 0.5 | 47.38 | 4533.15 | 46.58 | 119.84 | 1.03 | 45.81 | 16679.78 | 87.76 | 1599 | 15224 | -3.32% | -1.66% |
| 200* | 75 | 0.5 | 50.52 | 4534.14 | 124.37 | 718.67 | 1.49 | 50.38 | 14574.37 | 273.04 | 1899 | 16820 | -0.27% | -59.49% |
| 201* | 75 | 2.0 | 92.08 | 4773.49 | 74.37 | 1078.55 | 1.36 | 89.01 | 30852.93 | 805.10 | 5624 | 50126 | -3.34% | 19.67% |
| 202* | 75 | 2.0 | 97.59 | 4827.19 | 100.77 | 814.50 | 1.72 | 96.74 | 28974.81 | 1075.36 | 6231 | 54897 | -0.87% | -4.00% |
| 203* | 75 | 2.0 | 94.71 | 4898.71 | 97.79 | 895.09 | 1.09 | 92.90 | 29207.56 | 962.04 | 5746 | 52913 | -1.91% | -5.00% |
| 204* | 75 | 2.0 | 89.49 | 4811.57 | 92.91 | 1007.23 | 0.12 | 88.10 | 29767.19 | 853.01 | 5440 | 51468 | -1.55% | -5.17% |
| 205* | 75 | 2.0 | 92.50 | 4857.72 | 92.44 | 751.22 | 1.57 | 91.90 | 30343.53 | 868.23 | 5601 | 51330 | -0.65% | -0.59% |
| 206* | 75 | 2.0 | 92.70 | 4840.08 | 84.84 | 667.96 | 0.80 | 89.67 | 30549.40 | 894.96 | 5664 | 51767 | -3.28% | 5.69% |
| 207* | 75 | 2.0 | 92.28 | 4808.45 | 79.75 | 666.36 | 1.47 | 91.79 | 29913.66 | 882.18 | 5683 | 52845 | -0.54% | 15.09% |
| 208* | 75 | 2.0 | 89.37 | 4824.77 | 117.89 | 771.62 | 1.42 | 88.98 | 27358.20 | 829.28 | 5416 | 49902 | -0.44% | -24.53% |
| 209* | 75 | 2.0 | 88.88 | 4789.65 | 66.32 | 522.44 | 1.51 | 88.37 | 31979.95 | 875.81 | 5357 | 50442 | -0.57% | 33.24% |
| 210* | 75 | 2.0 | 94.29 | 4850.71 | 87.76 | 1107.32 | 2.12 | 93.27 | 28459.66 | 923.77 | 5580 | 52874 | -1.09% | 6.28% |
| 211* | 75 | 2.0 | 96.68 | 4929.55 | 121.62 | 309.98 | 1.45 | 96.24 | 28256.03 | 1199.62 | 6220 | 55392 | -0.46% | -20.87% |
| 212* | 75 | 2.0 | 95.60 | 4836.51 | 91.14 | 961.97 | 1.05 | 91.26 | 30897.10 | 1169.74 | 5982 | 52747 | -4.54% | 0.13% |
| 213* | 75 | 2.0 | 90.40 | 4828.50 | 84.54 | 484.80 | 1.07 | 88.43 | 30737.15 | 1476.87 | 5588 | 50239 | -2.18% | 4.60% |
| 214* | 75 | 2.0 | 92.21 | 4823.23 | 74.51 | 869.14 | 1.01 | 91.09 | 30209.49 | 970.98 | 5645 | 51329 | -1.22% | 22.24% |
| 215* | 75 | 2.0 | 94.26 | 4863.72 | 114.99 | 727.34 | 2.51 | 92.52 | 27592.69 | 1506.54 | 5667 | 51146 | -1.85% | -19.54% |
| 216* | 75 | 2.0 | 92.23 | 4813.42 | 85.20 | 730.32 | 1.32 | 91.61 | 31047.73 | 1601.18 | 5650 | 52014 | -0.67% | 7.52% |
| 217* | 75 | 2.0 | 93.80 | 4853.00 | 86.48 | 732.99 | 1.77 | 93.63 | 30111.62 | 1549.23 | 5580 | 51978 | -0.18% | 8.27% |
| 218* | 75 | 2.0 | 91.72 | 4829.50 | 99.41 | 911.48 | 2.11 | 91.09 | 28776.10 | 1572.07 | 5500 | 51339 | -0.68% | -8.37% |
| 219* | 75 | 2.0 | 95.20 | 4831.48 | 91.76 | 1058.93 | 1.18 | 92.62 | 30115.08 | 1817.35 | 5952 | 52912 | -2.70% | 0.94% |
| 220* | 75 | 2.0 | 95.29 | 4850.26 | 94.71 | 1006.18 | 1.91 | 94.99 | 30230.57 | 814.28 | 6127 | 53179 | -0.31% | 0.30% |
| 221* | 75 | 2.0 | 91.55 | 4850.31 | 105.90 | 917.74 | 2.26 | 90.61 | 29418.13 | 1068.59 | 5614 | 49771 | -1.02% | -14.44% |
| 222* | 75 | 2.0 | 91.02 | 4834.34 | 73.83 | 861.04 | 1.80 | 90.87 | 31967.58 | 1699.16 | 5376 | 49563 | -0.16% | 23.07% |
| 223* | 75 | 2.0 | 95.98 | 4900.25 | 110.25 | 674.52 | 1.96 | 93.06 | 29654.87 | 972.87 | 5853 | 53094 | -3.04% | -15.59% |
| 224* | 75 | 2.0 | 90.47 | 4836.64 | 5.25 | 136.26 | 1.37 | 88.68 | 31753.84 | 2299.05 | 5265 | 50209 | -1.98% | 1587.66% |
| 225* | 75 | 2.0 | 97.30 | 4882.21 | 31.17 | 131.87 | 1.24 | 96.39 | 27989.96 | 3701.19 | 6139 | 55005 | -0.93% | 209.25% |
| 226* | 100 | 0.1 | 22.30 | 4495.50 | 24.38 | 134.93 | 2.42 | 21.36 | 6330.50 | 56.91 | 331 | 3135 | -4.23% | -12.38% |
| 227* | 100 | 0.1 | 22.03 | 4495.67 | 26.31 | 136.44 | 1.89 | 21.00 | 6662.17 | 53.09 | 411 | 3309 | -4.69% | -20.18% |
| 228* | 100 | 0.1 | 21.91 | 4497.49 | 35.62 | 135.09 | 1.20 | 20.04 | 6574.01 | 55.35 | 372 | 3230 | -8.55% | -43.74% |
| 229* | 100 | 0.1 | 21.08 | 4497.65 | 18.13 | 136.50 | 2.40 | 20.49 | 6766.31 | 58.48 | 335 | 3120 | -2.79% | 13.01% |
| 230* | 100 | 0.1 | 21.83 | 4498.39 | 9.15 | 130.49 | 1.86 | 20.29 | 7304.49 | 57.60 | 333 | 3146 | -7.05% | 121.70% |
| 231* | 100 | 0.1 | 20.62 | 4496.17 | 23.18 | 135.68 | 1.00 | 20.15 | 6827.06 | 51.13 | 370 | 3290 | -2.30% | -13.06% |
| 232* | 100 | 0.1 | 21.66 | 4499.04 | 27.01 | 131.22 | 1.92 | 21.60 | 6835.76 | 29.17 | 410 | 3340 | -0.26% | -20.03% |

Continued on the next page

Table 1: Result of SimExact x SimLNS x SimSA-VaR (continued)

| Inst | n | δ | SimExact | | SimLNS | | SimSA-VaR | | | | | | GAP _{c×a} | GAP _{c×b} |
|------|-----|----------|--------------------|---------|--------------------|---------|-----------|--------------------|----------|---------|----------|----------|--------------------|--------------------|
| | | | V-RPD ^a | T(s) | V-RPD ^b | T(s) | D-RPD | V-RPD ^c | SD | T(s) | ρ_S | ρ_L | | |
| 233* | 100 | 0.1 | 20.32 | 4498.73 | 22.91 | 136.64 | 1.93 | 20.17 | 6910.40 | 27.36 | 341 | 3217 | -0.74% | -11.96% |
| 234* | 100 | 0.1 | 21.35 | 4499.01 | 8.23 | 131.60 | 1.93 | 20.95 | 6965.44 | 28.88 | 349 | 3141 | -1.89% | 154.47% |
| 235* | 100 | 0.1 | 21.06 | 4499.03 | 22.90 | 136.47 | 1.91 | 19.09 | 6885.19 | 27.88 | 357 | 3095 | -9.37% | -16.64% |
| 236* | 100 | 0.1 | 21.57 | 4497.94 | 33.14 | 135.80 | 1.17 | 20.50 | 6401.28 | 28.16 | 356 | 3366 | -4.97% | -38.15% |
| 237* | 100 | 0.1 | 20.99 | 4497.56 | 18.81 | 142.47 | 1.59 | 19.45 | 7024.53 | 28.46 | 350 | 3089 | -7.35% | 3.40% |
| 238* | 100 | 0.1 | 23.26 | 4499.76 | 16.86 | 132.65 | 1.67 | 20.84 | 6964.62 | 26.92 | 374 | 3227 | -10.42% | 23.58% |
| 239* | 100 | 0.1 | 21.79 | 4497.47 | 8.77 | 135.52 | 2.21 | 21.78 | 7238.84 | 27.89 | 364 | 3374 | -0.05% | 148.36% |
| 240* | 100 | 0.1 | 21.08 | 4497.40 | 16.81 | 134.93 | 1.68 | 21.07 | 6753.18 | 27.11 | 370 | 3173 | -0.03% | 25.34% |
| 241* | 100 | 0.1 | 21.43 | 4495.84 | 31.93 | 133.90 | 2.50 | 21.06 | 6171.71 | 28.53 | 314 | 3064 | -1.75% | -34.04% |
| 242* | 100 | 0.1 | 21.94 | 4497.84 | 24.55 | 132.00 | 1.73 | 20.37 | 6402.56 | 29.00 | 355 | 3064 | -7.17% | -17.02% |
| 243* | 100 | 0.1 | 22.12 | 4498.30 | 15.69 | 140.80 | 2.24 | 20.63 | 6612.34 | 29.65 | 377 | 2988 | -6.73% | 31.45% |
| 244* | 100 | 0.1 | 22.52 | 4498.14 | 13.90 | 134.51 | 2.21 | 21.89 | 6973.65 | 30.18 | 360 | 3354 | -2.78% | 57.47% |
| 245* | 100 | 0.1 | 22.23 | 4497.42 | 30.95 | 135.04 | 1.61 | 21.40 | 6481.64 | 28.09 | 341 | 3205 | -3.74% | -30.85% |
| 246* | 100 | 0.1 | 20.88 | 4498.07 | 21.97 | 135.65 | 2.30 | 20.59 | 6235.65 | 27.99 | 333 | 3006 | -1.40% | -6.30% |
| 247* | 100 | 0.1 | 20.14 | 4496.82 | 24.43 | 133.70 | 1.34 | 20.05 | 7028.72 | 29.19 | 375 | 3211 | -0.41% | -17.92% |
| 248* | 100 | 0.1 | 23.27 | 4497.84 | 33.68 | 136.55 | 2.12 | 22.15 | 6743.44 | 27.67 | 353 | 3482 | -4.81% | -34.22% |
| 249* | 100 | 0.1 | 20.14 | 4497.10 | 23.41 | 145.78 | 1.37 | 20.00 | 7473.05 | 29.35 | 368 | 3340 | -0.68% | -14.59% |
| 250* | 100 | 0.1 | 20.92 | 4496.38 | 33.58 | 202.46 | 1.75 | 20.62 | 7142.67 | 28.31 | 349 | 3280 | -1.40% | -38.59% |
| 251* | 100 | 0.5 | 50.99 | 4548.04 | 53.18 | 202.90 | 2.46 | 49.84 | 15080.57 | 286.12 | 1754 | 16370 | -2.25% | -6.28% |
| 252* | 100 | 0.5 | 49.49 | 4546.62 | 47.39 | 169.05 | 1.83 | 47.45 | 15188.91 | 240.37 | 1745 | 15750 | -4.12% | 0.12% |
| 253* | 100 | 0.5 | 48.32 | 4542.60 | 53.87 | 203.49 | 1.23 | 46.57 | 15036.93 | 259.03 | 1593 | 15514 | -3.63% | -13.56% |
| 254* | 100 | 0.5 | 49.08 | 4549.14 | 57.80 | 198.80 | 2.19 | 47.28 | 15622.34 | 247.90 | 1612 | 15282 | -3.66% | -18.20% |
| 255* | 100 | 0.5 | 48.13 | 4548.76 | 34.60 | 205.71 | 1.88 | 46.92 | 16814.91 | 272.75 | 1812 | 15283 | -2.50% | 35.60% |
| 256* | 100 | 0.5 | 47.29 | 4546.30 | 46.19 | 202.67 | 0.96 | 46.32 | 15425.41 | 261.16 | 1781 | 15600 | -2.06% | 0.27% |
| 257* | 100 | 0.5 | 50.26 | 4554.62 | 53.27 | 199.27 | 1.94 | 49.76 | 15847.64 | 128.77 | 1808 | 16402 | -0.99% | -6.58% |
| 258* | 100 | 0.5 | 49.24 | 4551.08 | 50.27 | 198.68 | 1.94 | 47.95 | 15995.45 | 122.05 | 1744 | 15777 | -2.62% | -4.61% |
| 259* | 100 | 0.5 | 49.82 | 4553.64 | 49.08 | 228.74 | 2.16 | 49.77 | 16636.69 | 135.87 | 1756 | 16460 | -0.10% | 1.40% |
| 260* | 100 | 0.5 | 48.45 | 4553.91 | 33.26 | 207.55 | 2.06 | 46.78 | 16169.51 | 127.35 | 1754 | 15558 | -3.45% | 40.67% |
| 261* | 100 | 0.5 | 50.35 | 4548.92 | 67.44 | 201.87 | 0.96 | 49.09 | 14898.99 | 140.86 | 1804 | 16557 | -2.50% | -27.20% |
| 262* | 100 | 0.5 | 48.73 | 4549.31 | 43.17 | 225.79 | 1.50 | 47.09 | 16488.44 | 131.52 | 1702 | 15576 | -3.35% | 9.08% |
| 263* | 100 | 0.5 | 50.88 | 4551.98 | 50.39 | 192.72 | 1.67 | 49.72 | 16419.88 | 122.84 | 1760 | 16388 | -2.28% | -1.32% |
| 264* | 100 | 0.5 | 48.80 | 4547.48 | 44.61 | 148.35 | 2.00 | 48.13 | 16265.56 | 121.68 | 1827 | 15654 | -1.36% | 7.89% |
| 265* | 100 | 0.5 | 49.47 | 4549.85 | 40.18 | 227.79 | 1.66 | 48.53 | 15755.03 | 128.32 | 1745 | 15900 | -1.88% | 20.80% |
| 266* | 100 | 0.5 | 50.00 | 4545.56 | 55.83 | 212.95 | 2.38 | 49.87 | 15042.39 | 138.88 | 1905 | 16586 | -0.27% | -10.68% |
| 267* | 100 | 0.5 | 49.45 | 4559.86 | 54.57 | 194.61 | 1.54 | 49.00 | 15547.61 | 135.98 | 1728 | 16401 | -0.91% | -10.19% |
| 268* | 100 | 0.5 | 49.94 | 4550.41 | 48.16 | 204.70 | 2.08 | 48.57 | 15799.72 | 127.58 | 1698 | 15609 | -2.76% | 0.84% |
| 269* | 100 | 0.5 | 49.17 | 4548.13 | 41.35 | 206.71 | 2.21 | 48.86 | 16002.94 | 130.33 | 1891 | 16064 | -0.63% | 18.15% |
| 270* | 100 | 0.5 | 49.42 | 4548.32 | 47.97 | 205.28 | 1.55 | 48.47 | 15153.78 | 118.57 | 1737 | 16116 | -1.93% | 1.05% |
| 271* | 100 | 0.5 | 49.50 | 4548.53 | 61.93 | 211.51 | 2.28 | 49.18 | 15175.64 | 135.87 | 1776 | 16173 | -0.63% | -20.58% |
| 272* | 100 | 0.5 | 47.99 | 4548.13 | 35.15 | 217.82 | 1.66 | 47.74 | 16418.80 | 127.10 | 1701 | 15909 | -0.52% | 35.80% |
| 273* | 100 | 0.5 | 51.16 | 4549.55 | 67.42 | 183.34 | 1.90 | 50.26 | 15328.63 | 127.35 | 1678 | 16504 | -1.77% | -25.46% |
| 274* | 100 | 0.5 | 47.80 | 4543.77 | 41.60 | 211.50 | 1.25 | 46.98 | 16912.83 | 124.96 | 1808 | 15663 | -1.72% | 12.94% |
| 275* | 100 | 0.5 | 47.55 | 4545.01 | 69.93 | 861.00 | 1.72 | 47.39 | 16272.86 | 131.25 | 1839 | 15690 | -0.33% | -32.23% |
| 276* | 100 | 2.0 | 98.25 | 4894.01 | 96.96 | 655.45 | 2.34 | 97.64 | 29112.55 | 3559.52 | 5805 | 53747 | -0.62% | 0.70% |
| 277* | 100 | 2.0 | 92.05 | 4865.05 | 91.34 | 901.38 | 2.55 | 92.03 | 29566.98 | 2438.37 | 5663 | 53280 | -0.02% | 0.76% |
| 278* | 100 | 2.0 | 91.40 | 4842.57 | 89.70 | 810.04 | 1.21 | 91.20 | 29206.67 | 3528.99 | 5838 | 52780 | -0.22% | 1.67% |
| 279* | 100 | 2.0 | 91.11 | 4863.30 | 90.15 | 783.50 | 2.13 | 90.89 | 30070.65 | 3466.42 | 6202 | 50798 | -0.25% | 0.82% |
| 280* | 100 | 2.0 | 89.37 | 4851.83 | 88.03 | 1061.69 | 1.90 | 89.26 | 32010.95 | 3261.40 | 5657 | 49838 | -0.12% | 1.40% |
| 281* | 100 | 2.0 | 91.92 | 4861.97 | 90.44 | 934.33 | 0.97 | 91.61 | 29811.03 | 1899.49 | 5986 | 51852 | -0.33% | 1.30% |
| 282* | 100 | 2.0 | 93.68 | 4944.96 | 93.83 | 1185.73 | 1.91 | 93.12 | 30425.20 | 1304.04 | 6066 | 54522 | -0.60% | -0.76% |
| 283* | 100 | 2.0 | 91.92 | 4896.42 | 91.91 | 989.69 | 1.98 | 91.56 | 30532.89 | 1212.35 | 5650 | 52251 | -0.39% | -0.39% |
| 284* | 100 | 2.0 | 94.89 | 4912.16 | 93.42 | 915.89 | 2.19 | 94.35 | 31217.26 | 1210.46 | 5724 | 52029 | -0.57% | 1.00% |
| 285* | 100 | 2.0 | 89.24 | 4923.95 | 90.16 | 1099.10 | 1.95 | 89.15 | 30497.01 | 1120.46 | 5529 | 50090 | -0.10% | -1.12% |
| 286* | 100 | 2.0 | 96.18 | 4932.51 | 95.95 | 895.56 | 1.00 | 96.04 | 29160.86 | 1523.19 | 6280 | 56341 | -0.14% | 0.10% |
| 287* | 100 | 2.0 | 89.67 | 4887.47 | 90.57 | 1159.06 | 1.51 | 89.40 | 31666.60 | 1295.00 | 6028 | 52423 | -0.30% | -1.29% |
| 288* | 100 | 2.0 | 94.65 | 4897.83 | 94.70 | 1070.55 | 1.83 | 93.62 | 31313.49 | 1296.92 | 5736 | 53561 | -1.08% | -1.14% |
| 289* | 100 | 2.0 | 92.92 | 4857.50 | 91.67 | 822.17 | 2.24 | 92.71 | 30934.79 | 1233.52 | 5494 | 50742 | -0.23% | 1.14% |
| 290* | 100 | 2.0 | 92.32 | 4910.24 | 92.83 | 379.55 | 1.68 | 91.93 | 30101.18 | 1166.07 | 5871 | 52295 | -0.43% | -0.97% |

Continued on the next page

Table 1: Result of SimExact x SimLNS x SimSA-VaR (continued)

| Inst | n | δ | SimExact | | SimLNS | | SimSA-VaR | | | | | | $\text{GAP}_{c \times a}$ | $\text{GAP}_{c \times b}$ |
|------|-----|----------|--------------------|---------|--------------------|---------|-----------|--------------------|----------|---------|----------|----------|---------------------------|---------------------------|
| | | | V-RPD ^a | T(s) | V-RPD ^b | T(s) | D-RPD | V-RPD ^c | SD | T(s) | ρ_S | ρ_L | | |
| 291* | 100 | 2.0 | 96.97 | 4885.83 | 95.04 | 1124.71 | 2.39 | 96.18 | 29285.97 | 1501.95 | 6003 | 55948 | -0.82% | 1.20% |
| 292* | 100 | 2.0 | 91.52 | 4870.97 | 90.06 | 1051.83 | 1.63 | 90.55 | 29784.96 | 1297.04 | 6396 | 54597 | -1.06% | 0.54% |
| 293* | 100 | 2.0 | 94.24 | 4867.31 | 91.59 | 782.33 | 1.98 | 92.93 | 30311.71 | 1227.71 | 5989 | 51653 | -1.40% | 1.45% |
| 294* | 100 | 2.0 | 94.27 | 4889.40 | 93.45 | 990.62 | 2.06 | 92.66 | 30782.29 | 1243.64 | 5921 | 53630 | -1.71% | -0.84% |
| 295* | 100 | 2.0 | 93.99 | 4865.36 | 91.90 | 966.28 | 1.90 | 93.54 | 29268.00 | 1235.75 | 5875 | 53543 | -0.48% | 1.78% |
| 296* | 100 | 2.0 | 92.98 | 4888.11 | 92.87 | 911.75 | 2.28 | 92.61 | 28716.86 | 1247.77 | 5702 | 52264 | -0.40% | -0.28% |
| 297* | 100 | 2.0 | 90.29 | 4870.32 | 87.42 | 811.04 | 1.37 | 90.22 | 31188.26 | 1180.60 | 6192 | 51769 | -0.09% | 3.20% |
| 298* | 100 | 2.0 | 96.09 | 4900.46 | 94.86 | 1316.11 | 1.92 | 96.04 | 29609.91 | 1422.10 | 6032 | 55057 | -0.05% | 1.25% |
| 299* | 100 | 2.0 | 89.04 | 4872.60 | 87.12 | 747.31 | 1.28 | 88.91 | 32211.96 | 1340.36 | 5514 | 51351 | -0.15% | 2.04% |
| 300* | 100 | 2.0 | 90.05 | 4858.85 | 89.25 | 1123.54 | 1.78 | 88.78 | 30358.32 | 1082.22 | 5493 | 49261 | -1.41% | -0.53% |