

Report Parameters

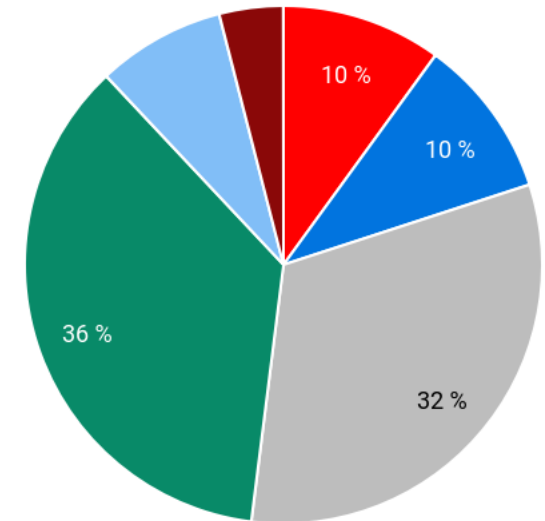
| | |
|--------------------------------|--------------------------------------|
| Initial Amount | \$300 |
| External Cashflows | Contribute fixed amount periodically |
| Contribution Amount | \$300 |
| Frequency | Monthly |
| Inflation Adjusted | No |
| Simulation Period | 35 |
| Simulation Model | Historical Returns |
| Bootstrap Model | Single Year |
| Tax Treatment | Pre-tax Returns |
| Sequence of Return Risk | No Adjustments |
| Inflation Model | Parameterized Inflation |
| Annual Inflation Mean | 2.00% |
| Annual Inflation Stdev | 3.00% |

Simulation Description

Monte Carlo simulation results for 10000 portfolios with \$300 initial portfolio balance using available historical returns data from Jan 1995 to Dec 2023 with annual sampling. The historical pre-tax return for the selected portfolio for this period was 9.98% mean return (8.19% CAGR) with 15.07% standard deviation of annual returns. The simulation results are based on generated nominal returns and specified contributions (\$300 per month not adjusted for inflation). The simulated inflation model used normal distribution with 2.00% mean and 3.00% standard deviation based on the parameters. The generated inflation samples were uncorrelated with simulated asset returns. The available historical data for the simulation inputs was constrained by ACWI SMALL CAP [Jun 1994 - Mar 2024].

Portfolio

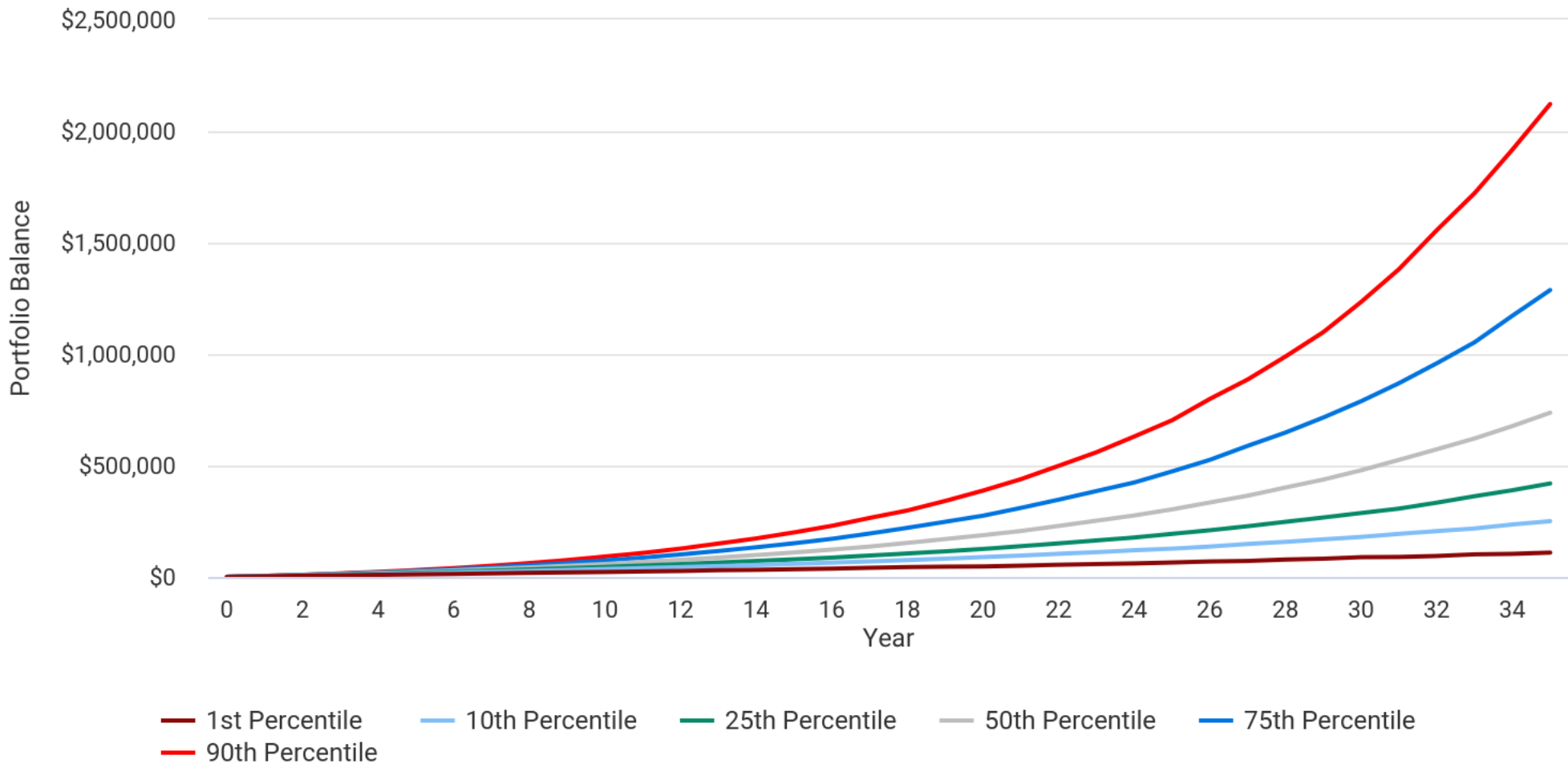
| Asset Class | Allocation | CAGR | Expected Annual Return | Annualized Volatility |
|------------------|------------|--------|------------------------|-----------------------|
| ACWI SMALL CAP | 10.00% | 8.26% | 9.79% | 16.69% |
| EM IMI | 10.00% | 4.64% | 6.97% | 20.80% |
| EUROPE | 32.00% | 7.31% | 8.63% | 15.63% |
| NORTH AMERICA | 36.00% | 10.27% | 11.71% | 16.14% |
| JAPAN | 8.00% | 2.24% | 3.81% | 17.55% |
| PACIFIC ex JAPAN | 4.00% | 6.52% | 8.50% | 19.10% |



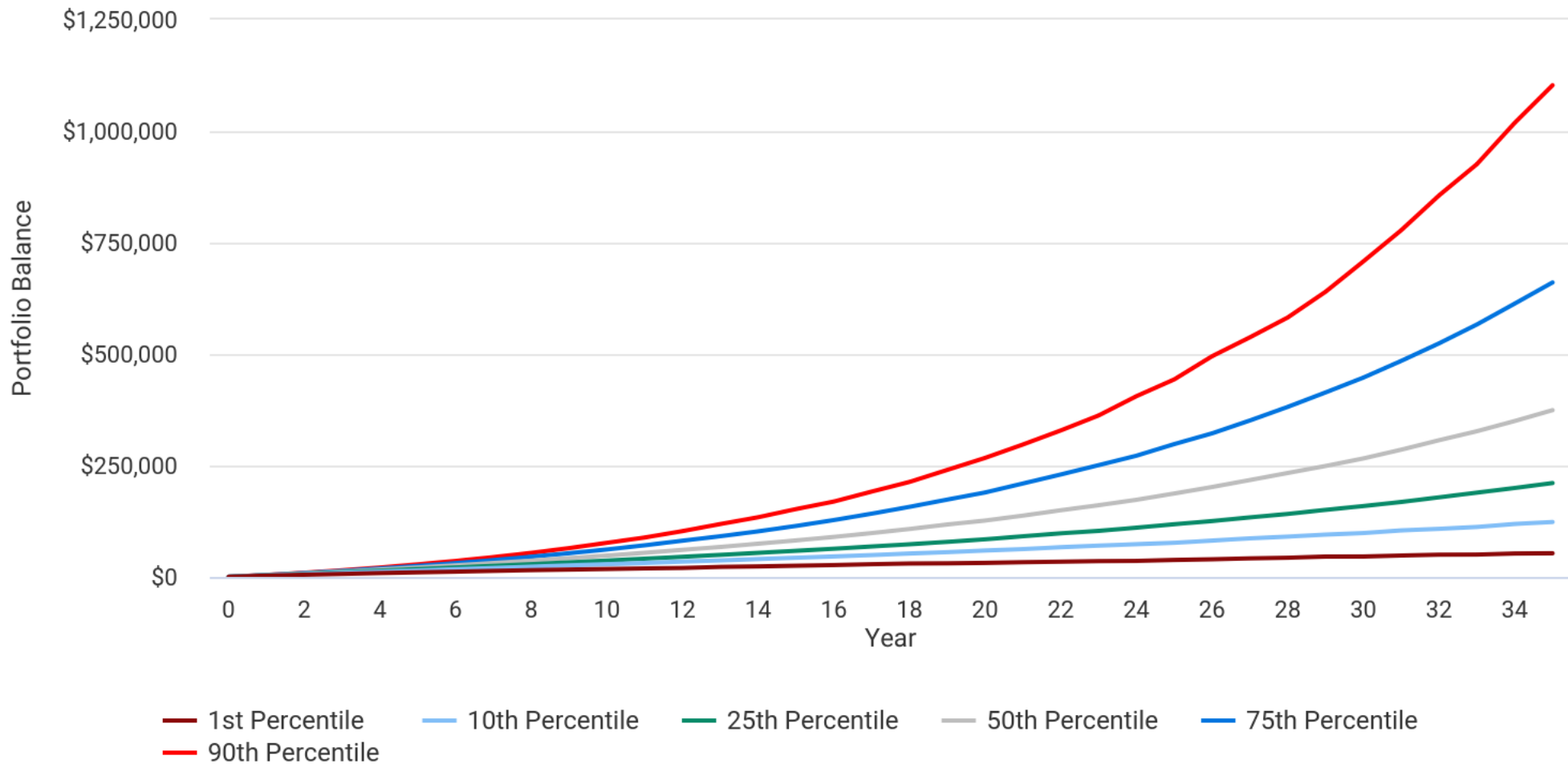
Summary Statistics

| | 1st Percentile | 10th Percentile | 25th Percentile | 50th Percentile | 75th Percentile | 90th Percentile |
|--|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Time Weighted Rate of Return (nominal) | 0.13% | 3.76% | 5.99% | 8.36% | 10.63% | 12.68% |
| Time Weighted Rate of Return (real) | -1.97% | 1.64% | 3.84% | 6.16% | 8.48% | 10.51% |
| Portfolio End Balance (nominal) | \$109,098 | \$250,212 | \$419,247 | \$736,725 | \$1,287,028 | \$2,121,485 |
| Portfolio End Balance (real) | \$53,055 | \$123,257 | \$210,597 | \$374,098 | \$660,584 | \$1,102,939 |
| Annual Mean Return (nominal) | 2.50% | 5.80% | 7.90% | 10.06% | 12.20% | 14.08% |
| Annualized Volatility | 12.69% | 13.73% | 14.35% | 15.02% | 15.67% | 16.27% |
| Sharpe Ratio | -0.05 | 0.17 | 0.31 | 0.46 | 0.61 | 0.75 |
| Sortino Ratio | -0.07 | 0.23 | 0.43 | 0.67 | 0.91 | 1.15 |
| Maximum Drawdown | -72.88% | -59.59% | -50.89% | -42.72% | -36.03% | -29.66% |
| Maximum Drawdown Excluding Cashflows | -82.20% | -67.98% | -58.56% | -48.67% | -40.54% | -33.55% |
| Safe Withdrawal Rate | 1.39% | 3.12% | 4.67% | 6.86% | 9.49% | 12.23% |
| Perpetual Withdrawal Rate | 0.00% | 1.69% | 3.78% | 5.87% | 7.88% | 9.58% |

Portfolio Balance (nominal)



Portfolio Balance (inflation adjusted)



Portfolio Balances (nominal)

| Year | 1st Percentile Balance | 10th Percentile Balance | 25th Percentile Balance | 50th Percentile Balance | 75th Percentile Balance | 90th Percentile Balance |
|------|------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| 1 | \$2,945 | \$3,545 | \$3,856 | \$4,195 | \$4,347 | \$4,521 |
| 2 | \$5,099 | \$6,829 | \$7,532 | \$8,404 | \$9,011 | \$9,594 |
| 3 | \$7,233 | \$9,770 | \$11,402 | \$13,025 | \$14,380 | \$15,701 |
| 4 | \$9,377 | \$12,917 | \$15,422 | \$17,982 | \$20,373 | \$22,599 |
| 5 | \$11,496 | \$16,137 | \$19,590 | \$23,448 | \$27,124 | \$30,679 |
| 6 | \$13,404 | \$19,679 | \$24,071 | \$29,342 | \$34,722 | \$39,587 |
| 7 | \$15,802 | \$23,270 | \$28,819 | \$35,712 | \$43,095 | \$50,087 |
| 8 | \$18,415 | \$27,104 | \$33,762 | \$42,737 | \$52,618 | \$61,984 |
| 9 | \$20,196 | \$31,272 | \$39,156 | \$50,110 | \$62,905 | \$75,574 |
| 10 | \$22,058 | \$35,248 | \$45,028 | \$58,039 | \$74,113 | \$91,530 |
| 11 | \$24,492 | \$39,628 | \$51,054 | \$67,205 | \$86,661 | \$107,640 |
| 12 | \$26,558 | \$44,093 | \$57,580 | \$76,753 | \$101,026 | \$126,943 |
| 13 | \$30,300 | \$48,413 | \$64,448 | \$86,837 | \$116,287 | \$149,807 |
| 14 | \$31,916 | \$53,700 | \$71,788 | \$98,084 | \$133,043 | \$172,721 |
| 15 | \$34,525 | \$58,838 | \$78,778 | \$109,758 | \$150,986 | \$199,809 |
| 16 | \$37,216 | \$64,076 | \$86,681 | \$122,685 | \$170,941 | \$229,224 |
| 17 | \$40,915 | \$69,482 | \$95,911 | \$136,213 | \$194,730 | \$264,674 |
| 18 | \$44,237 | \$75,532 | \$105,285 | \$152,714 | \$220,377 | \$298,179 |
| 19 | \$46,046 | \$81,832 | \$114,893 | \$169,869 | \$247,443 | \$340,941 |
| 20 | \$46,975 | \$89,116 | \$125,510 | \$187,326 | \$274,668 | \$387,531 |
| 21 | \$50,397 | \$95,736 | \$137,922 | \$205,979 | \$309,749 | \$438,515 |
| 22 | \$54,546 | \$103,981 | \$150,485 | \$228,830 | \$346,637 | \$498,518 |
| 23 | \$57,858 | \$111,002 | \$163,752 | \$252,330 | \$385,312 | \$559,355 |
| 24 | \$60,546 | \$119,778 | \$176,883 | \$275,835 | \$423,821 | \$630,059 |
| 25 | \$64,651 | \$126,843 | \$193,264 | \$303,126 | \$473,450 | \$702,962 |
| 26 | \$69,317 | \$136,188 | \$209,449 | \$334,023 | \$525,387 | \$798,728 |
| 27 | \$71,743 | \$147,879 | \$227,511 | \$364,529 | \$588,102 | \$885,844 |
| 28 | \$77,959 | \$157,291 | \$247,305 | \$401,102 | \$647,848 | \$988,996 |
| 29 | \$81,692 | \$168,637 | \$266,579 | \$436,833 | \$715,190 | \$1,098,234 |
| 30 | \$88,650 | \$179,436 | \$286,762 | \$478,496 | \$788,265 | \$1,233,610 |
| 31 | \$89,578 | \$193,186 | \$306,436 | \$525,095 | \$869,049 | \$1,380,443 |

| Year | 1st Percentile Balance | 10th Percentile Balance | 25th Percentile Balance | 50th Percentile Balance | 75th Percentile Balance | 90th Percentile Balance |
|------|------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| 32 | \$93,841 | \$205,613 | \$333,102 | \$572,623 | \$958,421 | \$1,555,449 |
| 33 | \$101,377 | \$217,366 | \$362,158 | \$621,181 | \$1,052,553 | \$1,721,395 |
| 34 | \$103,546 | \$235,288 | \$388,977 | \$676,819 | \$1,171,632 | \$1,916,596 |
| 35 | \$109,098 | \$250,212 | \$419,247 | \$736,725 | \$1,287,028 | \$2,121,485 |

Portfolio Balances (inflation adjusted)

| Year | 1st Percentile Balance | 10th Percentile Balance | 25th Percentile Balance | 50th Percentile Balance | 75th Percentile Balance | 90th Percentile Balance |
|------|------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| 1 | \$2,850 | \$3,482 | \$3,770 | \$4,087 | \$4,281 | \$4,473 |
| 2 | \$4,895 | \$6,454 | \$7,226 | \$8,044 | \$8,735 | \$9,359 |
| 3 | \$6,715 | \$9,137 | \$10,702 | \$12,236 | \$13,636 | \$14,951 |
| 4 | \$8,672 | \$11,853 | \$14,136 | \$16,626 | \$18,974 | \$21,174 |
| 5 | \$10,297 | \$14,539 | \$17,676 | \$21,234 | \$24,733 | \$28,227 |
| 6 | \$11,763 | \$17,331 | \$21,268 | \$26,072 | \$30,955 | \$35,887 |
| 7 | \$13,556 | \$20,080 | \$24,849 | \$31,167 | \$37,788 | \$44,503 |
| 8 | \$15,218 | \$22,964 | \$28,612 | \$36,512 | \$45,360 | \$53,987 |
| 9 | \$16,539 | \$25,961 | \$32,590 | \$42,183 | \$53,205 | \$64,686 |
| 10 | \$17,783 | \$28,583 | \$36,692 | \$47,884 | \$61,606 | \$76,537 |
| 11 | \$19,069 | \$31,323 | \$40,958 | \$54,165 | \$70,968 | \$88,451 |
| 12 | \$20,098 | \$34,323 | \$45,113 | \$60,783 | \$81,311 | \$102,828 |
| 13 | \$22,519 | \$36,998 | \$49,521 | \$67,230 | \$91,314 | \$118,685 |
| 14 | \$23,614 | \$40,059 | \$54,036 | \$74,543 | \$102,288 | \$133,893 |
| 15 | \$25,163 | \$43,032 | \$58,624 | \$81,935 | \$114,380 | \$152,255 |
| 16 | \$26,569 | \$45,925 | \$63,235 | \$89,769 | \$127,578 | \$169,108 |
| 17 | \$28,591 | \$49,008 | \$68,300 | \$98,349 | \$141,932 | \$191,485 |
| 18 | \$30,126 | \$52,587 | \$73,251 | \$107,555 | \$157,231 | \$213,134 |
| 19 | \$30,540 | \$55,530 | \$78,664 | \$117,680 | \$173,530 | \$240,156 |
| 20 | \$31,483 | \$59,309 | \$84,382 | \$126,466 | \$189,479 | \$267,064 |
| 21 | \$33,016 | \$62,405 | \$91,211 | \$137,533 | \$209,658 | \$297,126 |
| 22 | \$34,157 | \$66,696 | \$97,815 | \$149,592 | \$229,845 | \$328,655 |
| 23 | \$35,495 | \$70,194 | \$103,323 | \$160,883 | \$250,769 | \$362,235 |
| 24 | \$35,979 | \$73,439 | \$110,499 | \$173,037 | \$271,944 | \$405,485 |
| 25 | \$38,083 | \$76,533 | \$118,207 | \$187,186 | \$298,015 | \$443,147 |
| 26 | \$39,538 | \$81,504 | \$125,371 | \$201,738 | \$322,095 | \$495,148 |
| 27 | \$41,622 | \$86,538 | \$133,568 | \$217,381 | \$350,987 | \$537,554 |
| 28 | \$43,092 | \$90,429 | \$141,293 | \$233,182 | \$381,458 | \$582,025 |
| 29 | \$45,665 | \$94,969 | \$150,442 | \$248,877 | \$413,898 | \$639,751 |
| 30 | \$45,788 | \$98,399 | \$159,003 | \$265,841 | \$447,199 | \$707,884 |
| 31 | \$47,955 | \$104,352 | \$168,162 | \$285,461 | \$484,638 | \$777,775 |

| Year | 1st Percentile Balance | 10th Percentile Balance | 25th Percentile Balance | 50th Percentile Balance | 75th Percentile Balance | 90th Percentile Balance |
|------|------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| 32 | \$49,932 | \$107,919 | \$178,547 | \$306,684 | \$523,970 | \$855,852 |
| 33 | \$50,186 | \$112,062 | \$189,065 | \$326,849 | \$566,272 | \$925,888 |
| 34 | \$52,540 | \$118,830 | \$199,511 | \$349,717 | \$613,123 | \$1,018,612 |
| 35 | \$53,055 | \$123,257 | \$210,597 | \$374,098 | \$660,584 | \$1,102,939 |

Portfolio Cashflows (nominal)

| Year | 1st Percentile Cashflow | 10th Percentile Cashflow | 25th Percentile Cashflow | 50th Percentile Cashflow | 75th Percentile Cashflow | 90th Percentile Cashflow |
|------|-------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 1 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 |
| 2 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 |
| 3 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 |
| 4 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 |
| 5 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 |
| 6 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 |
| 7 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 |
| 8 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 |
| 9 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 |
| 10 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 |
| 11 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 |
| 12 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 |
| 13 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 |
| 14 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 |
| 15 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 |
| 16 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 |
| 17 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 |
| 18 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 |
| 19 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 |
| 20 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 |
| 21 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 |
| 22 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 |
| 23 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 |
| 24 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 |
| 25 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 |
| 26 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 |
| 27 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 |
| 28 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 |
| 29 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 |
| 30 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 |
| 31 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 |

| Year | 1st Percentile Cashflow | 10th Percentile Cashflow | 25th Percentile Cashflow | 50th Percentile Cashflow | 75th Percentile Cashflow | 90th Percentile Cashflow |
|------|-------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 32 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 |
| 33 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 |
| 34 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 |
| 35 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 | \$3,600 |

Asset Correlations

| Name | ACWI SMALL CAP | EM IMI | EUROPE | NORTH AMERICA | JAPAN | PACIFIC ex JAPAN | Inflation |
|------------------|----------------|--------|--------|---------------|-------|------------------|-----------|
| ACWI SMALL CAP | 1.00 | 0.81 | 0.84 | 0.86 | 0.69 | 0.81 | 0.00 |
| EM IMI | 0.81 | 1.00 | 0.73 | 0.70 | 0.58 | 0.87 | -0.00 |
| EUROPE | 0.84 | 0.73 | 1.00 | 0.82 | 0.57 | 0.75 | -0.02 |
| NORTH AMERICA | 0.86 | 0.70 | 0.82 | 1.00 | 0.62 | 0.72 | -0.01 |
| JAPAN | 0.69 | 0.58 | 0.57 | 0.62 | 1.00 | 0.59 | -0.01 |
| PACIFIC ex JAPAN | 0.81 | 0.87 | 0.75 | 0.72 | 0.59 | 1.00 | 0.02 |
| Inflation | 0.00 | -0.00 | -0.02 | -0.01 | -0.01 | 0.02 | 1.00 |

Asset correlations are based on monthly returns from Jan 1995 to Dec 2023

Expected Annual Return

| Percentile | 1 Year | 3 Years | 5 Years | 10 Years | 15 Years | 20 Years | 25 Years | 30 Years |
|-----------------|---------|---------|---------|----------|----------|----------|----------|----------|
| 1st Percentile | -39.41% | -21.08% | -13.94% | -7.91% | -4.33% | -2.80% | -1.66% | -0.69% |
| 10th Percentile | -12.15% | -6.66% | -3.25% | 0.16% | 1.52% | 2.34% | 3.00% | 3.44% |
| 25th Percentile | 0.68% | 1.80% | 2.73% | 4.32% | 4.95% | 5.26% | 5.56% | 5.79% |
| 50th Percentile | 10.34% | 9.92% | 9.30% | 8.75% | 8.57% | 8.46% | 8.36% | 8.36% |
| 75th Percentile | 22.13% | 16.93% | 15.06% | 13.01% | 12.10% | 11.53% | 11.17% | 10.88% |
| 90th Percentile | 31.61% | 22.77% | 19.78% | 16.65% | 15.10% | 14.17% | 13.53% | 12.99% |

Annual Return Probabilities

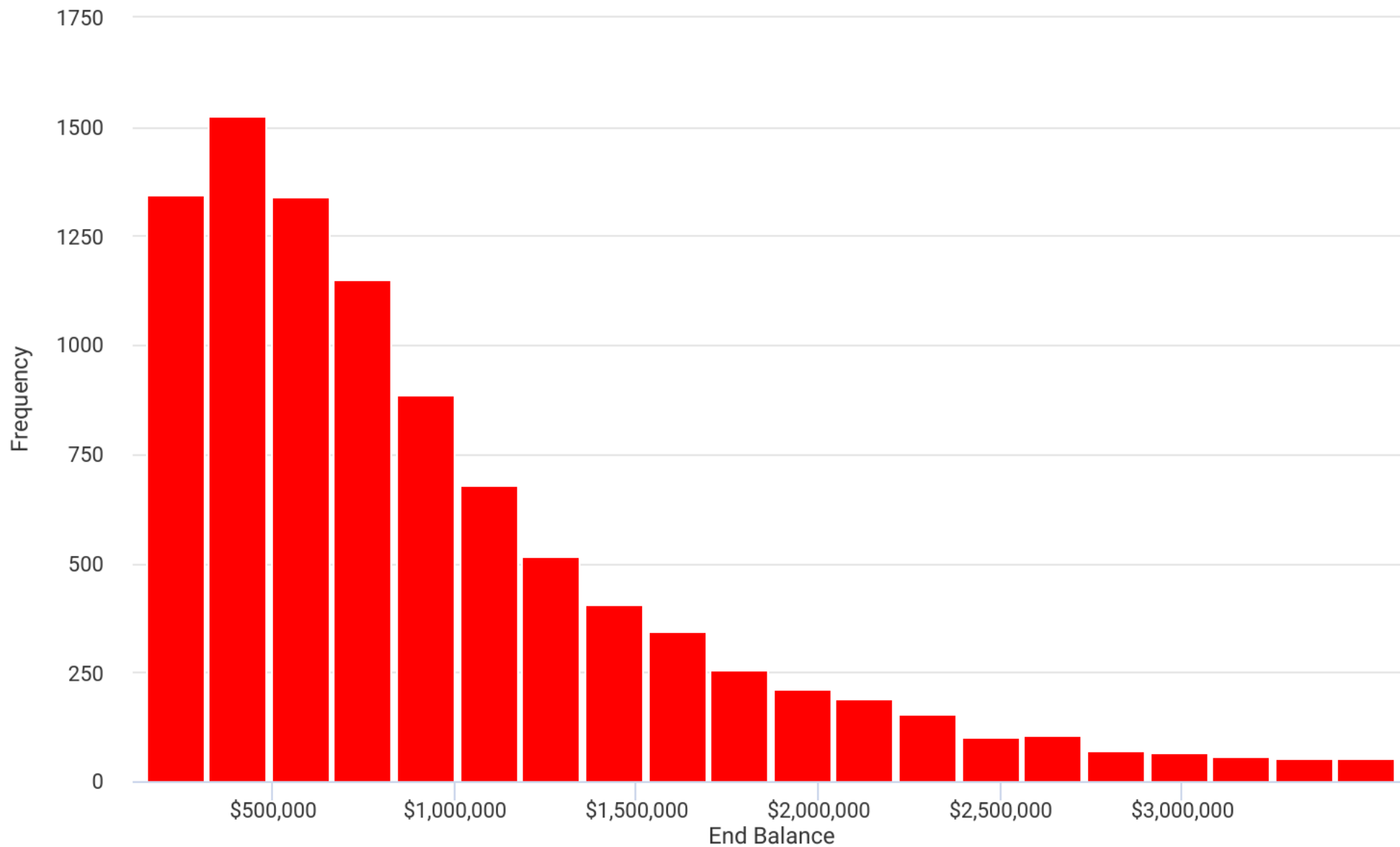
| Return | 1 Year | 3 Years | 5 Years | 10 Years | 15 Years | 20 Years | 25 Years | 30 Years |
|-----------|--------|---------|---------|----------|----------|----------|----------|----------|
| >= 0.00% | 75.83% | 78.58% | 82.96% | 90.34% | 93.86% | 96.25% | 97.60% | 98.54% |
| >= 2.50% | 72.69% | 73.23% | 75.61% | 82.98% | 86.59% | 89.37% | 91.87% | 93.51% |
| >= 5.00% | 69.28% | 65.80% | 67.32% | 71.79% | 74.65% | 76.91% | 79.00% | 81.15% |
| >= 7.50% | 69.28% | 58.79% | 57.74% | 57.50% | 57.99% | 58.12% | 58.39% | 59.20% |
| >= 10.00% | 55.93% | 49.61% | 46.78% | 42.45% | 39.46% | 36.85% | 35.12% | 33.05% |
| >= 12.50% | 45.72% | 40.81% | 35.96% | 27.83% | 22.43% | 18.43% | 15.45% | 13.04% |

Loss Probabilities

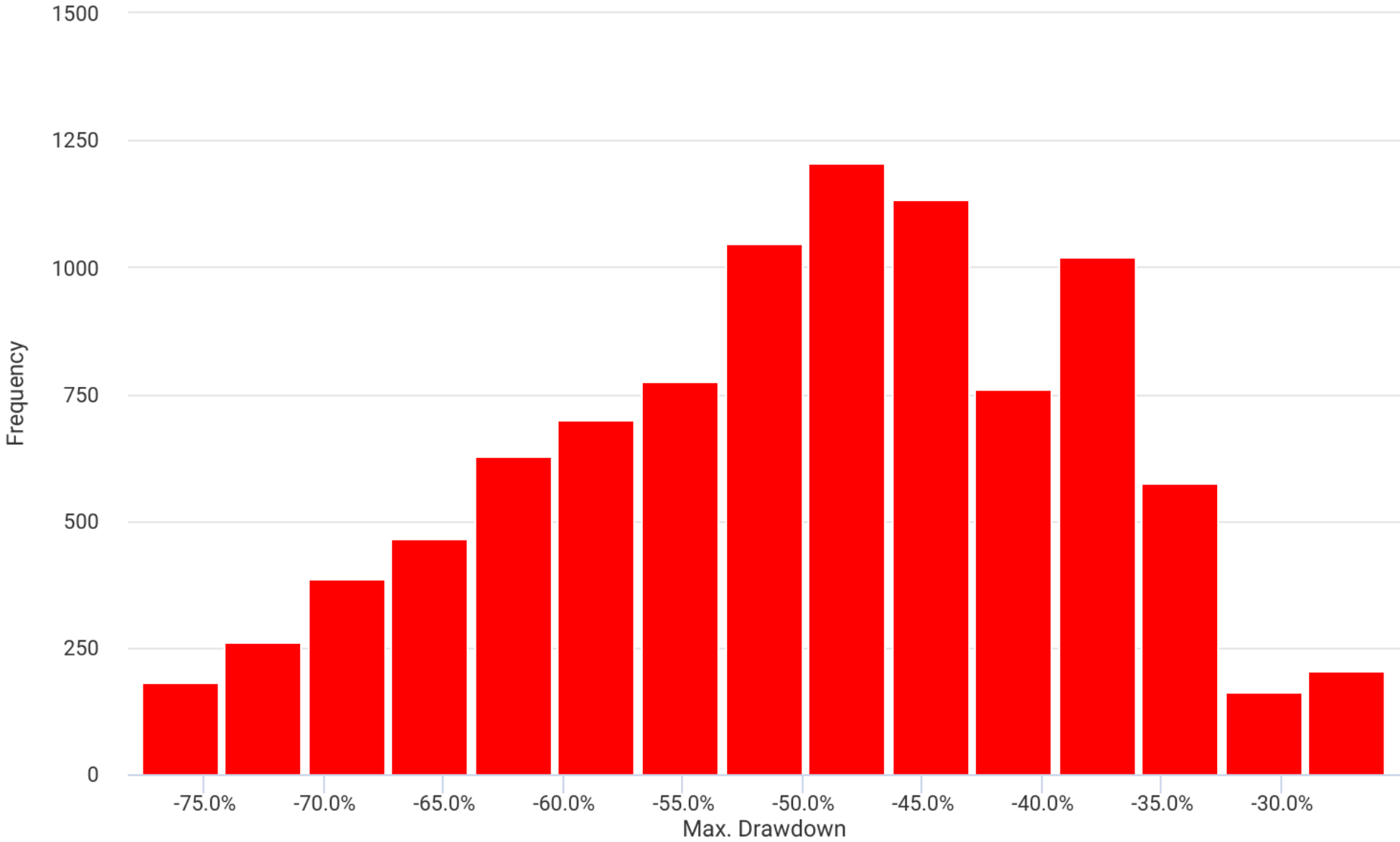
| Loss | Loss Probability Excluding Cashflows | | Loss Probability Including Cashflows | |
|-----------|--------------------------------------|--------------------|--------------------------------------|--------------------|
| | Within Time Period | End of Time Period | Within Time Period | End of Time Period |
| >= 2.50% | 64.34% | 0.92% | 0.00% | 0.00% |
| >= 5.00% | 63.30% | 0.86% | 0.00% | 0.00% |
| >= 7.50% | 58.06% | 0.78% | 0.00% | 0.00% |
| >= 10.00% | 44.92% | 0.73% | 0.00% | 0.00% |
| >= 12.50% | 43.35% | 0.68% | 0.00% | 0.00% |
| >= 15.00% | 39.07% | 0.62% | 0.00% | 0.00% |
| >= 17.50% | 35.29% | 0.59% | 0.00% | 0.00% |
| >= 20.00% | 33.14% | 0.54% | 0.00% | 0.00% |
| >= 22.50% | 26.53% | 0.51% | 0.00% | 0.00% |
| >= 25.00% | 24.59% | 0.48% | 0.00% | 0.00% |
| >= 27.50% | 22.80% | 0.47% | 0.00% | 0.00% |
| >= 30.00% | 20.98% | 0.46% | 0.00% | 0.00% |
| >= 32.50% | 17.97% | 0.44% | 0.00% | 0.00% |
| >= 35.00% | 16.34% | 0.42% | 0.00% | 0.00% |
| >= 37.50% | 14.25% | 0.37% | 0.00% | 0.00% |
| >= 40.00% | 11.89% | 0.34% | 0.00% | 0.00% |

Loss is measured against the original portfolio balance.

Portfolio End Balance Histogram (95% of results)



Maximum Drawdown Histogram Excluding Cashflows (95% of results)



Disclosures:

- Investieren in Aktien, Anleihen, Rohstoffe und Edelmetalle über börsengehandelte Indexfonds (ETF) und andere Anlagevehikel ist mit Risiken verbunden. Die Wertentwicklung in der Vergangenheit bietet keine Garantie für die zukünftige Entwicklung des Wertes einer Anlage. Fairvalue übernimmt keine Gewähr für die Richtigkeit der in diesem Report präsentierten Daten und Analysen. Fairvalue haftet nicht für Schäden, die aus der Umsetzung der in diesem Dokument berechneten Anlagestrategien entstehen. Die Analyse stellt keine Anlageberatung im Sinne des Wertpapierhandelsgesetzes dar.
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- **IMPORTANT:** The projections or other information generated by Portfolio Visualizer regarding the likelihood of various investment outcomes are hypothetical in nature, do not reflect actual investment results and are not guarantees of future results. Results may vary with each use and over time.
- The results do not constitute investment advice or recommendation, are provided solely for informational purposes, and are not an offer to buy or sell any securities. All use is subject to terms of service.
- Investing involves risk, including possible loss of principal. Past performance is not a guarantee of future results.
- Asset allocation and diversification strategies do not guarantee a profit or protect against a loss.
- Hypothetical returns do not reflect trading costs, transaction fees, commissions, or actual taxes due on investment returns.
- The results are based on information from a variety of sources we consider reliable, but we do not represent that the information is accurate or complete.
- Refer to the related documentation sections for more details on terms and definitions, methodology, and data sources.
- A Monte Carlo simulation is a mathematical technique used to provide a range of possible outcomes and to approximate the probability of certain outcomes by running multiple trial runs, called simulations, using random variables. The simulation results are displayed by percentile, a 5th percentile result means that 5% of the simulated portfolios did worse and 95% of simulated portfolios did better for the given return or risk metric. At the median point (50th percentile), half of the simulated portfolios did better and half did worse.
- The results are based on the total return of assets and assume that all received dividends and distributions are reinvested.
- Compound annualized growth rate (CAGR) is the annualized geometric mean return of the portfolio. It is calculated from the portfolio start and end balance and is thus impacted by any cashflows.
- The time-weighted rate of return (TWRR) is a measure of the compound rate of growth in a portfolio. This is calculated from the holding period returns (e.g. monthly returns), and TWRR will thus not be impacted by cashflows. If there are no external cashflows, TWRR will equal CAGR.
- The money-weighted rate of return (MWRR) is the internal rate of return (IRR) taking into account cashflows. This is the discount rate at which the present value of cash inflows equals the present value of cash outflows.
- Real return and balance are inflation adjusted values and show the growth of the purchasing power of the portfolio. Nominal return and balance show the portfolio gains without accounting for inflation.
- Standard deviation (Stdev) is used to measure the dispersion of returns around the mean and is often used as a measure of risk. A higher standard deviation implies greater the dispersion of data points around the mean.
- Correlation measures to what degree the returns of the two assets move in relation to each other. Correlation coefficient is a numerical value between -1 and +1. If one variable goes up by a certain amount, the correlation coefficient indicates which way the other variable moves and by how much. Asset correlations are calculated based on monthly returns.
- A drawdown refers to the decline in value of a single investment or an investment portfolio from a relative peak value to a relative trough. A maximum drawdown (Max Drawdown) is the maximum observed loss from a peak to a trough of a portfolio before a new peak is attained. Drawdown statistics are calculated from simulated monthly returns.
- All risk measures for the portfolio and portfolio assets are calculated based on monthly returns.
- The results are based on simulating 10000 portfolio return paths.
- The probability of success is based on the number of simulations the portfolio survives with a positive end balance.
- Safe withdrawal rate is the percentage of the original portfolio balance that can be withdrawn at the end of each year with inflation adjustment without the portfolio running out of money (dollar amount withdrawal).
- Perpetual withdrawal rate is the percentage of portfolio balance that can be withdrawn at the end of each year while retaining the inflation adjusted portfolio balance (percentage withdrawal).
- The results assume annual rebalancing of portfolio assets.
- Contributions and withdrawals are done at the end of each specified time period.
- Sharpe and Sortino ratios are calculated against the historical average 2.31% risk-free rate.