

Report Parameters

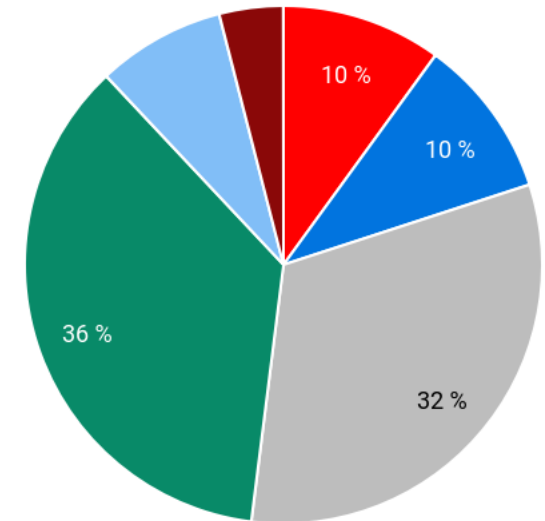
Initial Amount	€420,000
External Cashflows	Withdraw fixed amount periodically
Withdrawal Amount	€32,000
Frequency	Annually
Inflation Adjusted	No
Simulation Period	30
Simulation Model	Historical Returns
Bootstrap Model	Single Year
Tax Treatment	Pre-tax Returns
Sequence of Return Risk	No Adjustments
Inflation Model	Historical Inflation

Simulation Description

Monte Carlo simulation results for 10000 portfolios with €420,000 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 withdrawals (€32,000 per year not adjusted for inflation). The simulated inflation model used historical inflation with 4.07% mean and 1.20% standard deviation based on the Consumer Price Index (CPI-U) data from Jan 1995 to Dec 2023. The generated inflation samples were correlated with simulated asset returns based on historical correlations. 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%

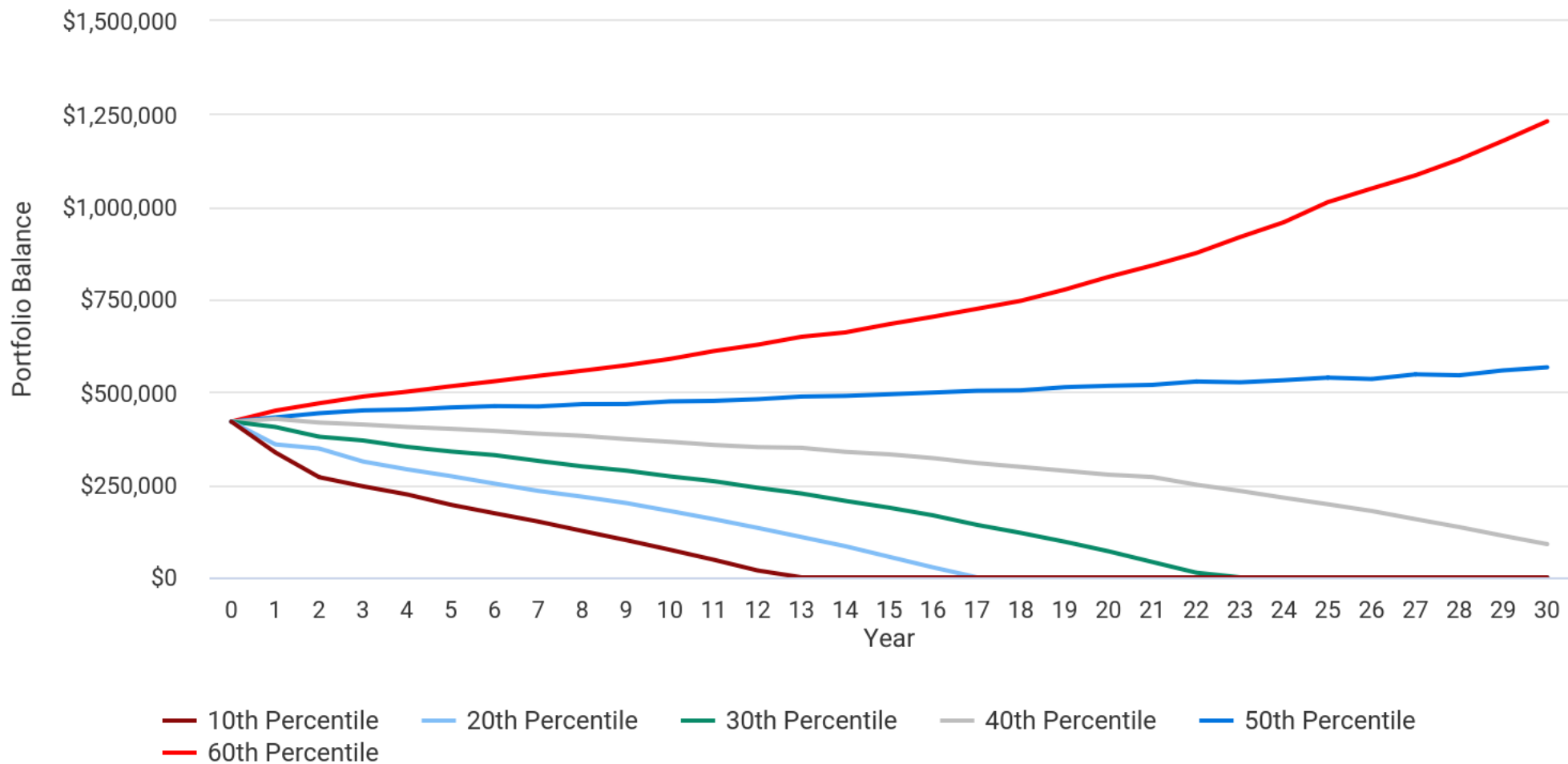


Summary Statistics

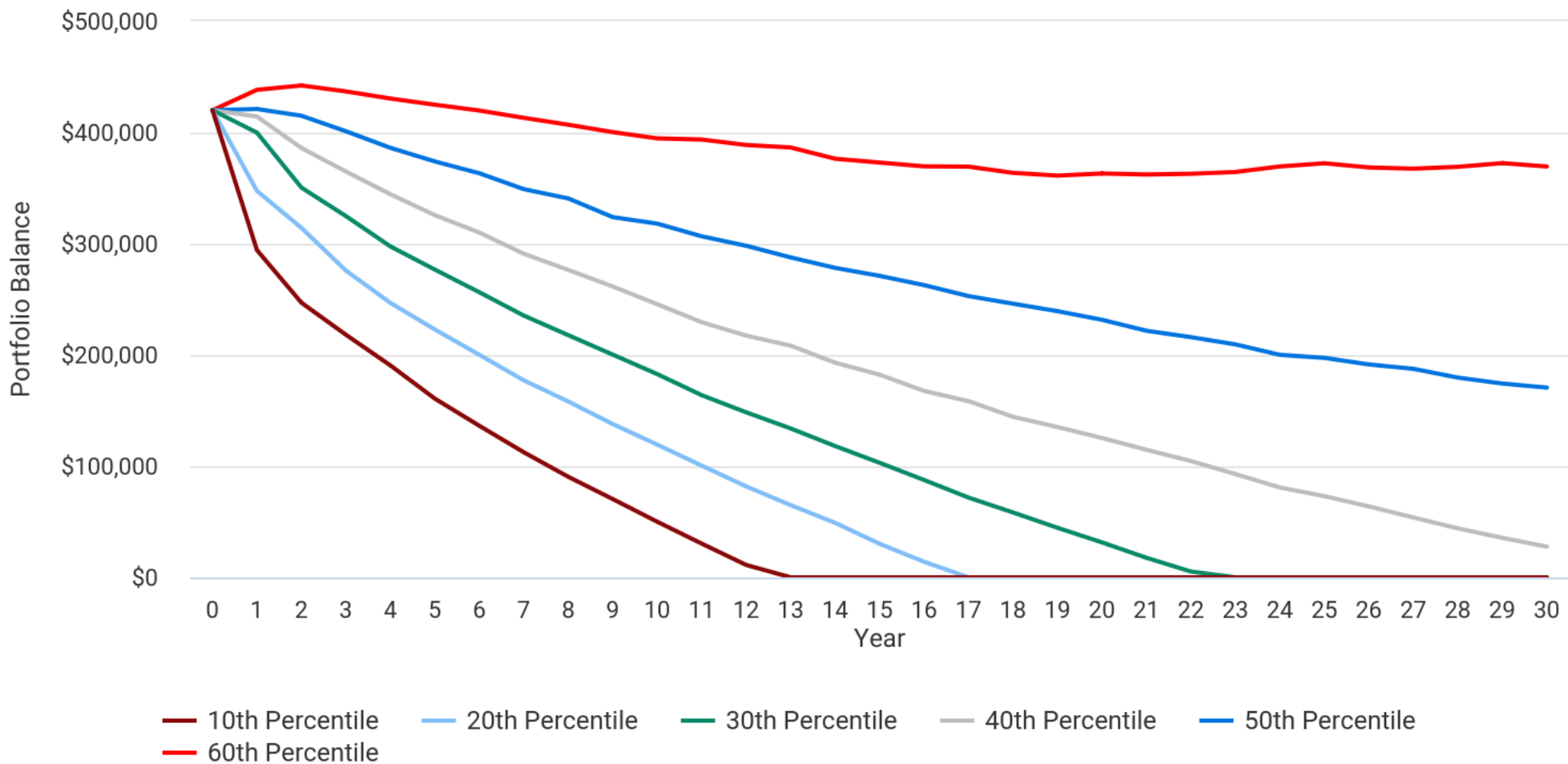
	10th Percentile	20th Percentile	30th Percentile	40th Percentile	50th Percentile	60th Percentile
Time Weighted Rate of Return (nominal)	3.58%	5.17%	6.40%	7.38%	8.30%	9.31%
Time Weighted Rate of Return (real)	-0.57%	1.00%	2.22%	3.16%	4.10%	5.03%
Portfolio End Balance (nominal)	€0.00	€0.00	€0.00	€89,554	€566,493	€1,230,104
Portfolio End Balance (real)	€0.00	€0.00	€0.00	€27,577	€170,555	€369,394
Annual Mean Return (nominal)	5.66%	7.15%	8.23%	9.15%	10.04%	10.95%
Annualized Volatility	13.60%	14.11%	14.44%	14.72%	15.01%	15.28%
Sharpe Ratio	0.17	0.27	0.35	0.41	0.47	0.54
Sortino Ratio	0.23	0.37	0.49	0.59	0.68	0.79
Maximum Drawdown	-100.00%	-100.00%	-100.00%	-88.46%	-66.41%	-56.66%
Maximum Drawdown Excluding Cashflows	-66.40%	-59.35%	-54.13%	-50.25%	-46.89%	-44.00%
Safe Withdrawal Rate	2.57%	3.39%	4.15%	4.87%	5.61%	6.42%
Perpetual Withdrawal Rate	0.00%	1.00%	2.18%	3.07%	3.94%	4.78%

6219 portfolios out of 10000 simulated portfolios (62.19%) survived all withdrawals.

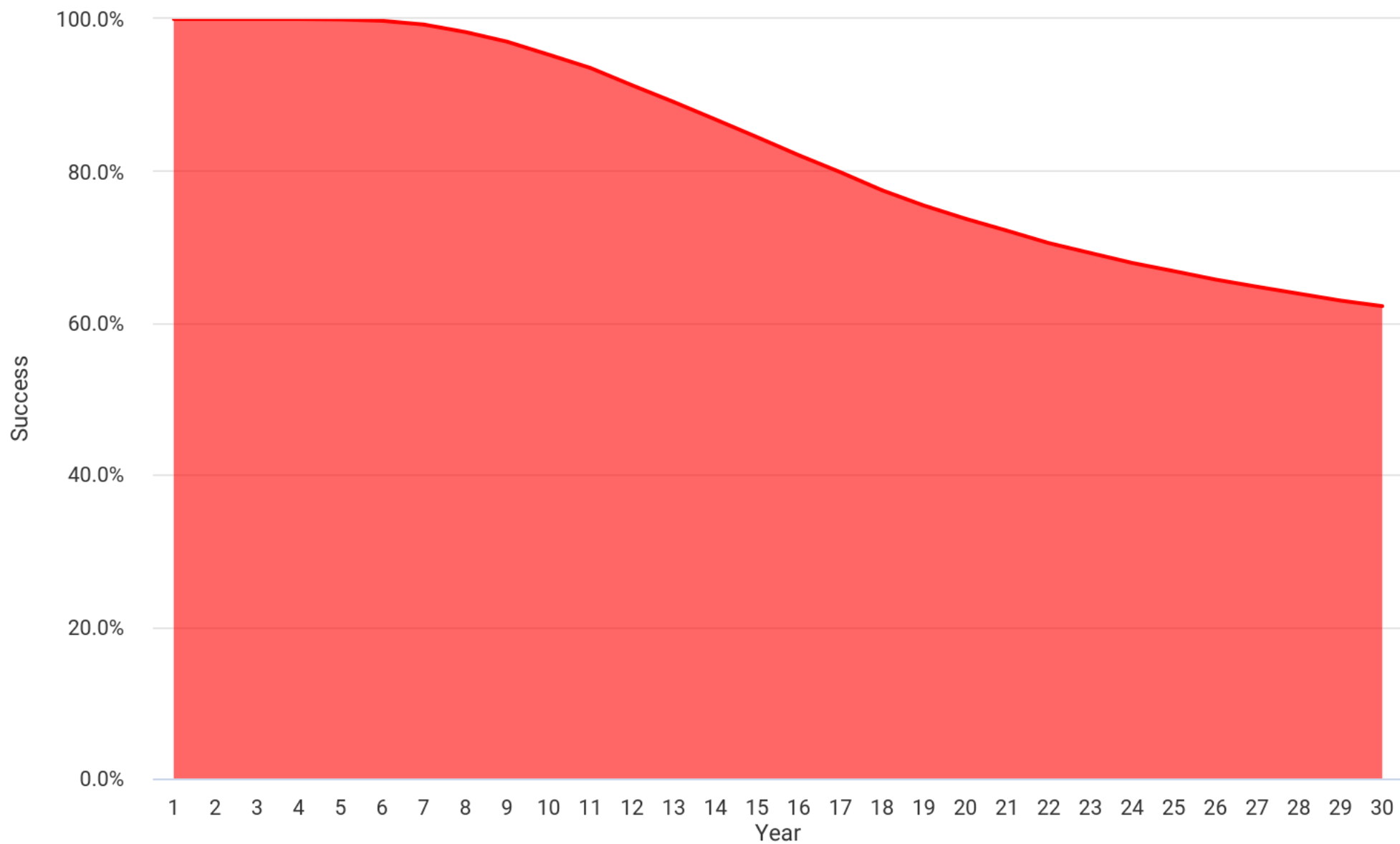
Portfolio Balance (nominal)



Portfolio Balance (inflation adjusted)



Portfolio Success



Portfolio Balances (nominal)

Year	10th Percentile Balance	20th Percentile Balance	30th Percentile Balance	40th Percentile Balance	50th Percentile Balance	60th Percentile Balance	Portfolio Success
1	€336,972	€358,624	€405,545	€427,486	€431,430	€449,579	100.00%
2	€270,182	€347,468	€379,290	€417,452	€442,719	€469,447	100.00%
3	€245,516	€312,413	€369,169	€412,226	€450,231	€487,680	100.00%
4	€223,745	€291,359	€351,959	€405,537	€452,597	€500,651	100.00%
5	€195,806	€273,042	€339,403	€400,678	€458,109	€515,356	99.94%
6	€172,763	€252,706	€329,619	€394,802	€461,817	€528,942	99.76%
7	€150,373	€233,070	€314,037	€387,504	€460,893	€543,412	99.27%
8	€125,142	€217,466	€299,249	€381,724	€467,155	€557,302	98.28%
9	€100,403	€200,371	€287,814	€372,832	€467,500	€571,960	97.01%
10	€74,290	€178,934	€272,346	€365,579	€474,517	€589,057	95.30%
11	€47,354	€156,906	€259,326	€357,076	€476,063	€610,351	93.55%
12	€18,428	€133,321	€241,479	€351,217	€480,447	€627,433	91.27%
13	€0.00	€108,677	€226,087	€349,298	€487,699	€648,935	89.07%
14	€0.00	€83,854	€206,142	€338,384	€489,344	€660,629	86.77%
15	€0.00	€55,296	€187,856	€331,687	€493,725	€683,077	84.44%
16	€0.00	€26,775	€167,087	€321,543	€498,412	€702,907	82.06%
17	€0.00	€0.00	€141,495	€308,229	€503,191	€724,293	79.82%
18	€0.00	€0.00	€119,754	€297,891	€504,339	€745,835	77.44%
19	€0.00	€0.00	€96,075	€287,413	€512,838	€776,143	75.44%
20	€0.00	€0.00	€70,245	€276,864	€516,651	€810,464	73.70%
21	€0.00	€0.00	€41,286	€270,616	€519,195	€841,225	72.12%
22	€0.00	€0.00	€12,480	€249,820	€528,228	€874,721	70.49%
23	€0.00	€0.00	€0.00	€233,053	€526,046	€917,864	69.18%
24	€0.00	€0.00	€0.00	€214,601	€531,719	€957,953	67.88%
25	€0.00	€0.00	€0.00	€197,105	€538,620	€1,012,057	66.80%
26	€0.00	€0.00	€0.00	€178,905	€534,897	€1,048,801	65.69%
27	€0.00	€0.00	€0.00	€156,931	€547,506	€1,084,393	64.74%
28	€0.00	€0.00	€0.00	€135,430	€544,945	€1,127,495	63.83%
29	€0.00	€0.00	€0.00	€111,985	€558,214	€1,177,662	62.92%
30	€0.00	€0.00	€0.00	€89,554	€566,493	€1,230,104	62.19%

Portfolio Balances (inflation adjusted)

Year	10th Percentile Balance	20th Percentile Balance	30th Percentile Balance	40th Percentile Balance	50th Percentile Balance	60th Percentile Balance	Portfolio Success
1	€294,181	€347,428	€399,826	€414,294	€421,086	€438,345	100.00%
2	€246,919	€314,160	€350,407	€386,019	€415,031	€442,227	100.00%
3	€218,105	€275,783	€324,789	€364,885	€401,070	€436,908	100.00%
4	€190,541	€246,774	€297,512	€344,457	€386,176	€430,490	100.00%
5	€160,659	€222,855	€276,694	€325,638	€373,942	€424,958	99.94%
6	€136,244	€200,069	€256,310	€310,014	€363,303	€419,712	99.76%
7	€112,421	€177,115	€235,318	€290,924	€349,009	€413,152	99.27%
8	€90,380	€158,110	€217,704	€276,364	€340,671	€406,950	98.28%
9	€70,351	€137,780	€200,242	€261,485	€323,856	€400,310	97.01%
10	€49,961	€119,296	€182,710	€245,568	€318,015	€394,666	95.30%
11	€30,300	€100,387	€163,748	€229,362	€306,612	€393,647	93.55%
12	€11,101	€81,721	€148,349	€217,331	€298,102	€388,722	91.27%
13	€0.00	€64,903	€133,849	€208,269	€287,633	€386,494	89.07%
14	€0.00	€48,977	€118,023	€192,953	€278,236	€376,370	86.77%
15	€0.00	€30,134	€102,964	€182,178	€271,060	€372,943	84.44%
16	€0.00	€13,945	€87,516	€167,609	€262,741	€369,524	82.06%
17	€0.00	€0.00	€71,668	€158,380	€252,838	€369,243	79.82%
18	€0.00	€0.00	€58,316	€144,320	€246,028	€363,662	77.44%
19	€0.00	€0.00	€44,509	€135,118	€239,305	€361,217	75.44%
20	€0.00	€0.00	€31,401	€125,264	€231,541	€363,091	73.70%
21	€0.00	€0.00	€17,531	€114,696	€221,691	€362,214	72.12%
22	€0.00	€0.00	€5,181	€104,553	€215,940	€362,826	70.49%
23	€0.00	€0.00	€0.00	€92,822	€209,428	€364,466	69.18%
24	€0.00	€0.00	€0.00	€80,760	€200,025	€369,425	67.88%
25	€0.00	€0.00	€0.00	€72,974	€197,327	€372,300	66.80%
26	€0.00	€0.00	€0.00	€63,754	€191,394	€368,529	65.69%
27	€0.00	€0.00	€0.00	€53,826	€187,471	€367,457	64.74%
28	€0.00	€0.00	€0.00	€43,995	€179,571	€369,084	63.83%
29	€0.00	€0.00	€0.00	€35,501	€174,237	€372,426	62.92%
30	€0.00	€0.00	€0.00	€27,577	€170,555	€369,394	62.19%

Portfolio Cashflows (nominal)

Year	10th Percentile Cashflow	20th Percentile Cashflow	30th Percentile Cashflow	40th Percentile Cashflow	50th Percentile Cashflow	60th Percentile Cashflow
1	-€32,000	-€32,000	-€32,000	-€32,000	-€32,000	-€32,000
2	-€32,000	-€32,000	-€32,000	-€32,000	-€32,000	-€32,000
3	-€32,000	-€32,000	-€32,000	-€32,000	-€32,000	-€32,000
4	-€32,000	-€32,000	-€32,000	-€32,000	-€32,000	-€32,000
5	-€32,000	-€32,000	-€32,000	-€32,000	-€32,000	-€32,000
6	-€32,000	-€32,000	-€32,000	-€32,000	-€32,000	-€32,000
7	-€32,000	-€32,000	-€32,000	-€32,000	-€32,000	-€32,000
8	-€32,000	-€32,000	-€32,000	-€32,000	-€32,000	-€32,000
9	-€32,000	-€32,000	-€32,000	-€32,000	-€32,000	-€32,000
10	-€32,000	-€32,000	-€32,000	-€32,000	-€32,000	-€32,000
11	-€32,000	-€32,000	-€32,000	-€32,000	-€32,000	-€32,000
12	-€32,000	-€32,000	-€32,000	-€32,000	-€32,000	-€32,000
13	-€19,103	-€32,000	-€32,000	-€32,000	-€32,000	-€32,000
14	€0.00	-€32,000	-€32,000	-€32,000	-€32,000	-€32,000
15	€0.00	-€32,000	-€32,000	-€32,000	-€32,000	-€32,000
16	€0.00	-€32,000	-€32,000	-€32,000	-€32,000	-€32,000
17	€0.00	-€28,701	-€32,000	-€32,000	-€32,000	-€32,000
18	€0.00	€0.00	-€32,000	-€32,000	-€32,000	-€32,000
19	€0.00	€0.00	-€32,000	-€32,000	-€32,000	-€32,000
20	€0.00	€0.00	-€32,000	-€32,000	-€32,000	-€32,000
21	€0.00	€0.00	-€32,000	-€32,000	-€32,000	-€32,000
22	€0.00	€0.00	-€32,000	-€32,000	-€32,000	-€32,000
23	€0.00	€0.00	-€13,236	-€32,000	-€32,000	-€32,000
24	€0.00	€0.00	€0.00	-€32,000	-€32,000	-€32,000
25	€0.00	€0.00	€0.00	-€32,000	-€32,000	-€32,000
26	€0.00	€0.00	€0.00	-€32,000	-€32,000	-€32,000
27	€0.00	€0.00	€0.00	-€32,000	-€32,000	-€32,000
28	€0.00	€0.00	€0.00	-€32,000	-€32,000	-€32,000
29	€0.00	€0.00	€0.00	-€32,000	-€32,000	-€32,000
30	€0.00	€0.00	€0.00	-€32,000	-€32,000	-€32,000

Asset Correlations

Name	ACWI SMALL CAP	EM IMI	EUROPE	NORTH AMERICA	JAPAN	PACIFIC ex JAPAN	U.S. Consumer Price Index
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
U.S. Consumer Price Index	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
10th Percentile	-12.15%	-7.01%	-3.37%	0.12%	1.55%	2.45%	3.10%	3.58%
20th Percentile	-6.99%	-0.88%	0.97%	3.01%	4.02%	4.51%	4.93%	5.17%
30th Percentile	4.18%	3.79%	4.23%	5.05%	5.67%	6.05%	6.22%	6.40%
40th Percentile	9.40%	7.09%	6.88%	6.92%	7.12%	7.27%	7.36%	7.38%
50th Percentile	10.34%	9.84%	9.24%	8.59%	8.42%	8.40%	8.38%	8.30%
60th Percentile	14.66%	12.48%	11.32%	10.23%	9.74%	9.54%	9.41%	9.31%

Annual Return Probabilities

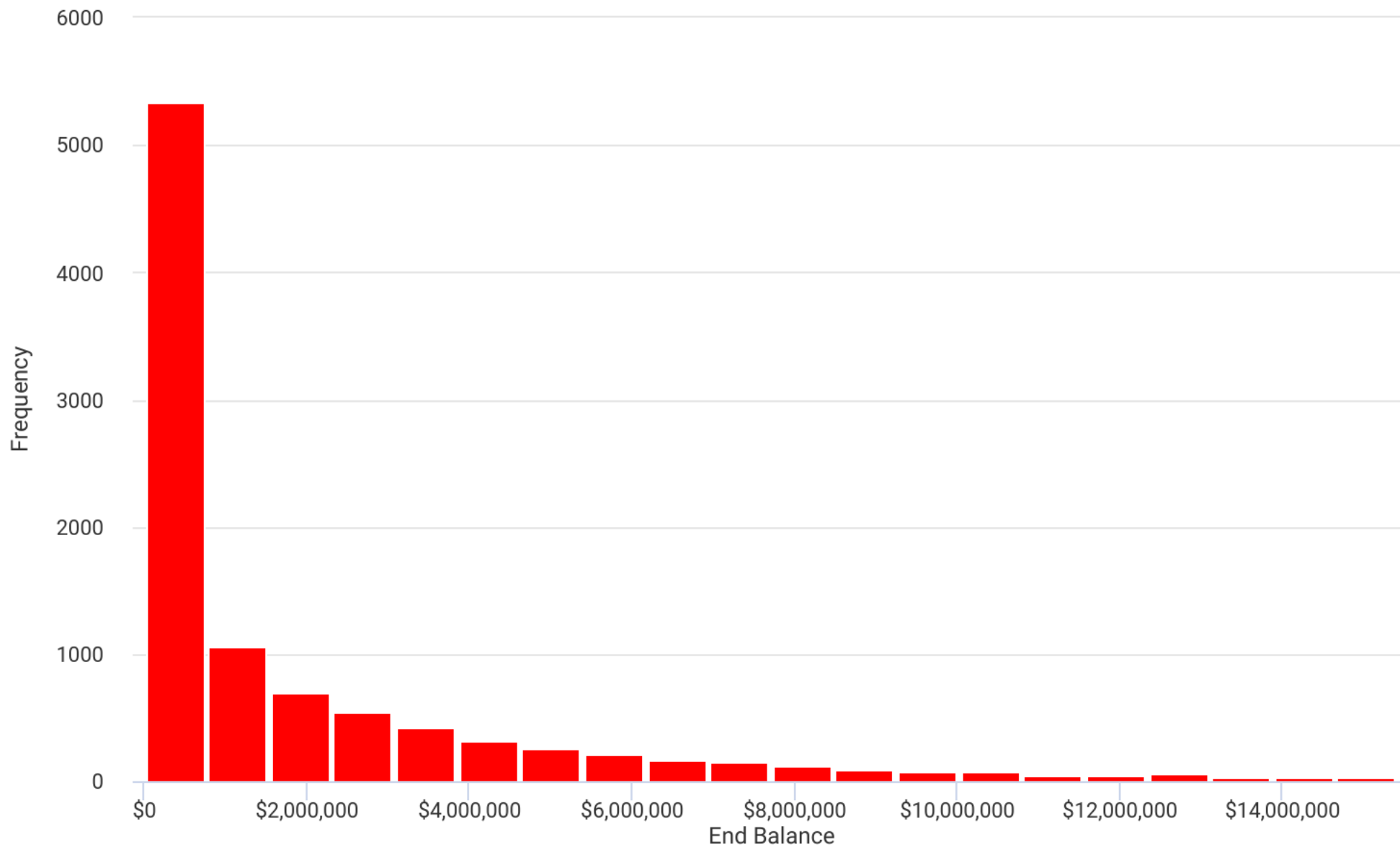
Return	1 Year	3 Years	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
>= 0.00%	75.48%	78.37%	82.65%	90.35%	94.16%	96.31%	97.58%	98.52%
>= 2.50%	71.98%	73.32%	75.56%	82.31%	86.83%	89.78%	92.17%	93.85%
>= 5.00%	68.60%	66.46%	67.16%	70.20%	74.30%	77.10%	79.48%	81.25%
>= 7.50%	68.60%	58.89%	57.39%	56.80%	57.16%	58.08%	58.54%	58.68%
>= 10.00%	55.10%	49.25%	46.49%	41.51%	38.25%	35.97%	34.81%	33.27%
>= 12.50%	44.76%	39.88%	34.73%	26.35%	21.32%	17.59%	15.59%	12.79%

Loss Probabilities

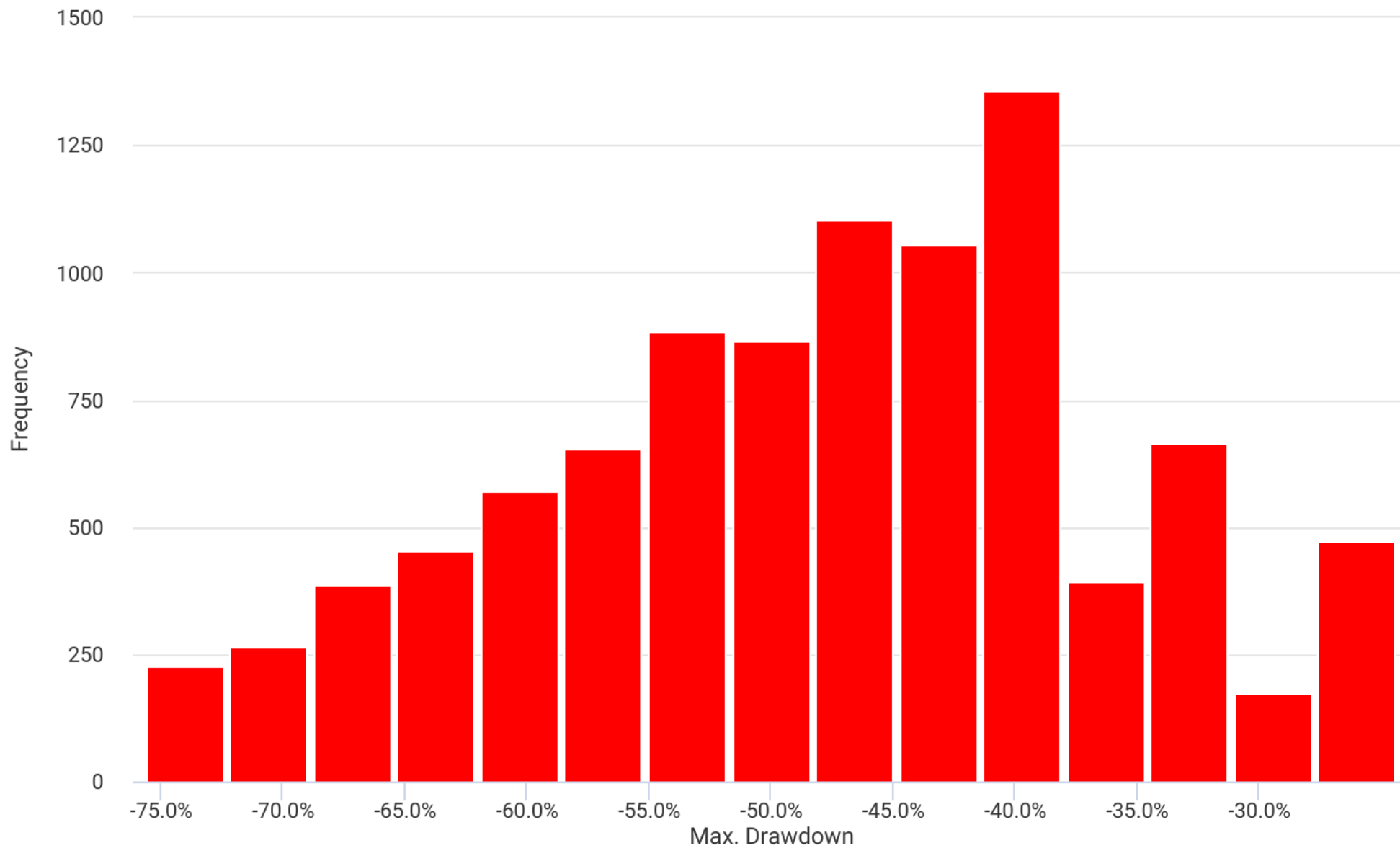
Loss	Loss Probability Excluding Cashflows		Loss Probability Including Cashflows	
	Within Time Period	End of Time Period	Within Time Period	End of Time Period
>= 2.50%	65.09%	1.37%	82.56%	47.05%
>= 5.00%	64.02%	1.30%	81.31%	46.81%
>= 7.50%	58.56%	1.27%	78.14%	46.59%
>= 10.00%	46.00%	1.12%	71.90%	46.40%
>= 12.50%	44.14%	1.04%	70.53%	46.13%
>= 15.00%	39.90%	0.98%	68.31%	45.95%
>= 17.50%	35.68%	0.93%	65.69%	45.78%
>= 20.00%	33.68%	0.86%	63.37%	45.58%
>= 22.50%	27.07%	0.77%	59.59%	45.35%
>= 25.00%	25.10%	0.72%	58.00%	45.06%
>= 27.50%	23.08%	0.67%	56.38%	44.80%
>= 30.00%	21.41%	0.63%	55.03%	44.54%
>= 32.50%	18.46%	0.57%	53.67%	44.29%
>= 35.00%	17.02%	0.51%	52.19%	44.10%
>= 37.50%	14.97%	0.43%	51.01%	43.85%
>= 40.00%	12.28%	0.40%	49.68%	43.63%

Loss is measured against the original portfolio balance.

Portfolio End Balance Histogram (95% of results)



Maximum Drawdown Histogram Excluding Cashflows (95% of results)



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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.
- Risk-free returns are calculated based on Euro Area 3-Month Interbank Rate.
- Inflation is calculated based on Europe Consumer Price Index.
- 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 2.10% risk-free rate.