HIDRA RESEARCH

Concentration in the largest S&P 500 companies

Exploratory study using a historical proxy and integrated commissions

MCAP 01 · Editorial revision of 3 November 2026

Abstract

We study how portfolio returns and drawdowns change when investing annually in the largest companies in a historical S&P 500 proxy, in baskets of one to ten constituents, compared with holding SPY. We compare equal and capitalisation weights with USD 1 million initially, continuity of holdings and net adjustments at the first annual opening. Modelled commissions are deducted from wealth.

From January 2000 to 27 October 2026, equal-weighted TOP 2 achieves a compound annual growth rate (CAGR) of 10.23%, versus 8.21% for SPY. Every basket has deeper maximum drawdowns than SPY. To compare starting dates without changing the basket or endpoint, the same TOP 2 achieves 9.70% in 2000–2025 and 12.01% in 2001–2025. Weighting and the period matter; these results do not validate retrospective selection of a variant. The exploration of reweighting and exposure (V2), sensitivities and alpha retain their 2025 cutoff.

The universe and historical availability of capitalisations are not certified as an official reconstruction. Three historical securities require approximated execution intervals: the main scenario assumes a neutral move and is accompanied by sensitivities to fee prices and a ±10% stress. At the 2025 cutoff, this stress can reverse the comparison with SPY for equal-weighted TOP 4 and TOP 6. The study documents exploratory results without certifying a physical-share account or a future advantage.

Keywords: concentration, market capitalization, total return, rebalancing, trading costs.

Figures are truncated to a maximum of two decimal places. Calculations and differences use original precision before truncation.

Introduction and related research

Investing in the largest companies reduces the number of holdings relative to a broad portfolio, but does not itself determine whether returns compensate for losses and concentration. MCAP-01 asks what would have happened when annually selecting the largest companies in the available proxy, in baskets of one to ten constituents, compared with holding SPY. It examines constituent count, weighting and period dependence separately; V2 adds weight-restoration frequency and exposure adjustment.

Bessembinder (2018) documents that a minority of stocks accounts for aggregate US stock-market wealth creation and relates that concentration to skewed individual returns [7]. This provides background for studying the risk of omitting companies from a portfolio. Winners are classified after observing returns; the finding does not establish that capitalisation could identify them beforehand. MCAP-01 applies a different rule based on annual snapshots, whose availability through time remains a limitation.

Plyakha, Uppal and Vilkov (2012) compare equal, capitalisation and price weights in portfolios drawn from US stock indices [8]. In their design, monthly rebalanced equal weighting produces higher returns and higher risk; they distinguish factor exposure from the rebalancing effect. This motivates separating weighting and frequency in MCAP-01. Their sampled portfolios of one hundred stocks and their tests differ from our baskets of up to ten companies selected by capitalisation: their conclusions do not transfer automatically to this proxy.

This study contributes a traceable comparison of those baskets under the same continuity, cost and capital policy, retaining unfavourable variants and historical approximations. It proposes no new valuation theory and does not replicate the preceding studies. The specific questions are whether any basket exceeds SPY's compound return and with what drawdowns, how the comparison depends on weighting and the window, and what changes when V2 adjustments are varied.

Sections 1 and 4 describe data, execution and costs; sections 2 and 3 address portfolio and period comparisons. Section 5 interprets V2, and section 6 delimits sensitivity to incomplete opening prices. The appendices present paths, the additional risk comparison and reproduction materials. The design is exploratory: the questions organise existing results and are not new confirmatory hypotheses set before seeing them.

1 Data and portfolio rules

We start from 27 annual Portfolio123 (P123) snapshots, nominally dated 1999–2025. The ten highest capitalisation ranks are extracted from each full universe: 270 selected slots, not 270 distinct companies or the entire universe. The 26 complete years in 2000–2025 use 260 slot-years and 32 unique identifiers (UIDs); the 2025 snapshot supplies the selection for the partial 2026 extension. The provider's SP500 universe is an IVV-linked proxy updated monthly. The requested date does not certify the precise date of membership and capitalisation information. The 1999 snapshot predates IVV's inception and is retained as an approximation [1].

For each N from one to ten, we use the first N companies in the preceding snapshot. Weights are either 1/N or each company's market capitalization divided by the total capitalization of the selected companies. Securities are identified by UID, not just ticker, to avoid confusing different companies that reuse a symbol. The historical AT&T Corp is not replaced with the current AT&T Inc series.

In January, the old portfolio bears the move up to the first session's opening; only the difference between target and existing value is then traded. Excluded holdings are sold and new ones bought at that point. Common holdings are retained, and there is no terminal liquidation. For example, TOP 1 generates no Apple order when it remains selected in January 2015.

$$Net\ trade\ =\ target\ value\ after\ costs\ -\ existing\ value$$

Compounding starts from USD 1 million, with no capital ceiling. P123's adjusted daily price ratios retain implicit dividends and corporate actions. For annual transitions with coverage, Yahoo provides open, close and adjusted close prices to value the outgoing holdings and the intraday return of the new portfolio. The use of multiple sources is explicit; it does not turn adjusted prices into executable quotes [2].

No separate dividend is added, as doing so would double-count its contribution to total return. Reinvestment is implicit: payment dates, withholding taxes, dividend cash and delivery of new share classes are not modeled. SPY uses the same entry date, total-return policy and initial cost treatment, and remains invested without annual turnover.

Net figures deduct the IBKR Pro Tiered and NYSE Arca scenario frozen in September 2026. Each commission is paid before sizing the trade and reduces subsequent capital. Spreads, slippage, impact, taxes and explicit reinvestment costs are excluded; net of commissions does not mean net of all costs. Section 4 details the schedule and conversion to equivalent shares [3, 6].

CAGR is the compound annual growth rate between the starting and ending dates. Maximum drawdown is measured against the preceding peak in equity, including initial capital. Charts use a logarithmic vertical scale and common units. The findings are exploratory, not an out-of-sample validation.

2 Annual portfolio results after commissions

Table 1. 03/01/2000–27/10/2026. CAGR after modelled fees and maximum drawdown. TOP 4–10 retain the neutral approximation and hypothetical USD 1 fee price in section 6.

Portfolio	CAGR equal	CAGR cap.	DD equal	DD cap.
TOP 1	6.83%	6.83%	-81.95%	-81.95%
TOP 2	10.23%	9.97%	-64.35%	-65.87%
TOP 3	8.58%	8.46%	-64.24%	-64.96%
TOP 4	8.18%	8.10%	-74.14%	-71.87%
TOP 5	8.56%	8.54%	-69.38%	-67.53%
TOP 6	8.11%	8.46%	-68.04%	-66.45%
TOP 7	6.74%	7.64%	-73.25%	-70.87%
TOP 8	6.23%	7.21%	-74.59%	-72.18%
TOP 9	6.71%	7.39%	-71.39%	-70.38%
TOP 10	6.31%	7.08%	-73.42%	-71.72%

SPY achieves an 8.21% CAGR and a -55.18% maximum drawdown. TOP 2, TOP 3 and TOP 5 exceed its CAGR under both weighting schemes; TOP 6 does so only with capitalisation weights. Every basket in the table has a deeper maximum drawdown than SPY. Exceeding its CAGR therefore does not mean a joint improvement in return and risk. TOP 2 has the highest observed CAGR but is not validated for the future. Appendix A shows the full paths; Appendix E complements the risk discussion with its separate 2025 cutoff.

The main window includes 2000 and retains P123's adjusted losses. The approximation for the three historical securities affects specific execution intervals without coverage and the pricing of their order fees; it does not replace those companies' annual returns. Section 6 examines its sensitivity at the 2025 cutoff.

Comparison with a 2001 start

Table 2. Common 2001–2025 window, excluding the three affected historical UIDs. Independent accounts, each starting with USD 1 million. This window does not replace the one beginning in 2000.

Portfolio	CAGR equal	CAGR cap.	DD equal	DD cap.
TOP 1	11.00%	11.00%	-58.10%	-58.10%
TOP 2	12.01%	11.90%	-52.84%	-50.99%
TOP 3	10.39%	10.39%	-51.35%	-49.89%
TOP 4	10.59%	10.42%	-52.03%	-49.67%
TOP 5	10.74%	10.73%	-49.88%	-48.56%
TOP 6	10.24%	10.61%	-51.80%	-49.98%
TOP 7	8.82%	9.76%	-52.88%	-50.93%
TOP 8	8.76%	9.60%	-51.72%	-49.02%
TOP 9	8.85%	9.56%	-50.62%	-48.40%
TOP 10	8.29%	9.15%	-55.85%	-52.17%

Comparing starting dates requires a common endpoint. Through 31 December 2025, equal-weighted TOP 2 has a 9.70% CAGR when starting in 2000 (Table E1) and 12.01% when starting in 2001 (Table 2). SPY achieves 7.94% and 8.73%, respectively. The basket and weighting rule remain the same, but each account starts with its own initial capital: changing inception changes the initial selection and path. Appendix B shows the alternative account. Table 1 extends to October 2026 and must not be used to attribute its difference from Table 2 solely to inception.

3 Subperiods and persistence of results

The split between the first decade and 2010–2025 is retained from the earlier research. It was chosen after inspecting the initial curves and is not an out-of-sample test. Each subperiod uses equity at the close preceding its first session as its base, retaining the return across the year-end transition.

Table 3. CAGR after commissions by subperiod. Equally weighted portfolios; accounts started in 2000. TOP 4–10 retain the approximation in Table 1.

Portfolio	2000 to 2009	2010 to 2025
TOP 1	-12.21%	20.11%
TOP 2	-6.43%	21.16%
TOP 3	-6.82%	18.90%
TOP 4	-8.46%	19.54%
TOP 5	-7.49%	19.51%
TOP 6	-6.24%	17.91%
TOP 7	-7.24%	16.30%
TOP 8	-8.16%	16.25%
TOP 9	-7.20%	16.35%
TOP 10	-7.37%	15.68%
SPY	-1.10%	14.01%

The comparison shows why a sample dominated by recent years need not describe the full cycle. It also cannot establish that every concentrated portfolio fails in every crisis: companies, valuations, sectors and market conditions change simultaneously. Appendix E presents return, volatility, beta, alpha and maximum drawdown for those windows, with their inferential limits. Complete tables for both weighting schemes and V2 remain in the CSV files.

The gross-versus-net comparison retains the same continuous holdings and net-adjustment mechanism. It therefore identifies the effect of the commission scenario, including reduced capital for subsequent trades. Differences from versions that fully liquidated annually cannot be attributed to costs; that methodological change is documented in the version note in Appendix F.

4 Commissions and funding portfolio adjustments

We use IBKR Pro Tiered USA with the fee schedule archived on 8 September 2026, including minimums, maximums, monthly tiers, regulatory and clearing charges, and pass-through fees. The venue scenario adds ARCA opening charges of 0.15 US cents per share or closing charges of 0.12 US cents. This is a constant fee schedule applied retrospectively, not a reconstruction of historical invoices or actual order routing [3].

Each net adjustment is converted into equivalent shares using the reconstructed contemporaneous price. The quantity used to calculate commissions is rounded up, including adjustments smaller than one share. The traded value remains synthetic. This approximation avoids assigning zero cost to those adjustments, but is not a ledger of actual whole shares. Implicit reinvestment does not generate a separate order.

Before investing, we reserve the cost, recalculate targets and orders, and repeat until the portfolio can pay its commissions without negative cash. The calculated commission reduces cash that day; subsequent trades start from the reduced equity. The nominal sum of commissions is not simply subtracted from final capital. Monthly volume is tracked independently for each variant, with sales counted before purchases.

Table 4. 2000–2025 window. Nominal sum of commissions in the main scenario and reduction in CAGR, in annual basis points (1 bp = 0.01 percentage points).

Portfolio	USD equal	USD cap.	bp equal	bp cap.
TOP 1	582.18	582.18	0.62	0.62
TOP 2	1,180.2	930.99	0.50	0.40
TOP 3	1,029.6	808.39	0.50	0.40
TOP 4	2,522.48	1,848.63	1.36	0.99
TOP 5	2,262.25	1,631.02	1.12	0.85
TOP 6	2,169.72	1,580.69	1.01	0.77
TOP 7	3,296.64	2,442.12	1.60	1.22
TOP 8	3,491.89	2,731.94	1.76	1.38
TOP 9	3,301.73	2,581.37	1.58	1.27
TOP 10	3,059.44	2,441.75	1.45	1.19

SPY incurs USD 35.12 on entry. For the three historical securities, the main scenario uses a hypothetical commission price of USD 1; the USD 1,000 alternative is provided so that this cost is not mistaken for a known invoice. Bid–ask spreads, slippage, market impact, taxes and the cost of implicit reinvestment are excluded.

5 Reweighting and volatility-based exposure

V2 retains TOP 1/3/5/10 and annual selection. It combines annual, monthly or quarterly weight restoration with full exposure or exposure adjusted annually, monthly or quarterly. The annual capitalisation snapshot still determines target weights; capitalisations are not updated monthly. All 96 original variants, including equivalent cases, are retained.

Table 5. CAGR after commissions for 2000–2025 at full exposure, by weight-reset frequency. TOP 5/10 include the 2000 approximation.

Portfolio	Annual	Monthly	Quarterly
TOP 1 equal	6.47%	6.47%	6.47%
TOP 1 cap.	6.47%	6.47%	6.47%
TOP 3 equal	8.26%	8.37%	8.39%
TOP 3 cap.	8.13%	8.20%	8.24%
TOP 5 equal	8.30%	8.04%	8.32%
TOP 5 cap.	8.26%	8.10%	8.32%
TOP 10 equal	6.20%	6.26%	6.55%
TOP 10 cap.	6.90%	6.97%	7.20%

More frequent weight restoration does not uniformly improve CAGR: TOP 1 is unchanged; TOP 3 and TOP 10 improve at both frequencies; TOP 5 worsens with monthly adjustment and improves slightly with quarterly adjustment. Comparisons within each basket and weighting scheme identify no generally optimal frequency. Appendix C shows the paths.

Exposure uses 63 log returns preceding the trade. SPY volatility is compared with a fully invested gross portfolio with the same weight-adjustment frequency. The invested fraction is the minimum of one and the SPY/portfolio volatility ratio; exposure is 100% during the initial estimation period. There is no leverage and cash earns no interest.

Table 6. CAGR after commissions for 2000–2025 with equal weights restored annually, by exposure-adjustment frequency. The same approximation applies to TOP 5/10.

Portfolio	No adjustment	Annual	Monthly	Quarterly
TOP 1	6.47%	3.44%	5.16%	5.21%
TOP 3	8.26%	5.19%	7.05%	7.06%
TOP 5	8.30%	6.18%	7.56%	7.56%
TOP 10	6.20%	5.35%	6.34%	6.85%

Exposure adjustment reduces the CAGR of TOP 1, TOP 3 and TOP 5. For TOP 10 it reduces CAGR with annual adjustment and raises it with monthly or quarterly adjustment. The effect depends on the basket and frequency. This CAGR table does not establish a joint improvement in return and risk. Appendix D shows the paths.

Intermediate adjustments execute at the first session's close in each period; annual turnover executes at the opening. A weights-only change preserves the prior invested fraction after costs; an exposure-only change preserves the proportions implied by the assets. Coincident changes produce one net adjustment per security.

6 Sensitivity to missing opening prices

The three historical securities are AT&T Corp (T.2^05), Nortel (NRTLQ^15) and Lucent (LU.1^06). Coverage is incomplete for entry on 3 January 2000 and exit on 2 January 2001. Their daily losses during 2000 are present in P123; the missing elements are the execution bridge and contemporaneous unadjusted quotes for calculating commissions. P123 open fields that repeat close values are not accepted as observed opening prices.

The opening-price search recovered USD 13.75 for Lucent in January 2001 from a historical Yahoo copy retained in CRAN's zoo package [4], with a prior USD 13.50 close corroborated by CBS News [5]. It remains a candidate: corporate-event checks must be completed before treating the ratio as a total return. Five opening prices still have no recovered source.

The separate diagnostic assigns either no movement or a simultaneous ±10% stress to intervals without coverage. P123 close-to-close returns during 2000 are retained in full. Commissions for those three securities use hypothetical nominal prices of USD 1 and USD 1,000. These prices are not historical imputations: they stress the conversion of traded value into share quantities.

Retained cutoff: 31/12/2025. Table 7. Equally weighted TOP 4–10 from 2000. The first neutral column is the accepted main scenario; the others show sensitivities, not confidence intervals.

Portfolio	Neutral price 1	Neutral price 1000	Stress −10%	Stress +10%
TOP 4	7.88%	7.89%	7.77%	8.01%
TOP 5	8.30%	8.31%	8.22%	8.40%
TOP 6	7.96%	7.97%	7.89%	8.04%
TOP 7	6.61%	6.62%	6.44%	6.80%
TOP 8	6.17%	6.19%	5.98%	6.39%
TOP 9	6.65%	6.67%	6.50%	6.83%
TOP 10	6.20%	6.21%	6.06%	6.36%

The scenario range is not guaranteed: actual data could fall outside it. At the 2025 cutoff, stress can reverse the comparison with SPY for both equal-weighted TOP 4 and TOP 6. The issue can therefore change a relative conclusion close to the benchmark. Capitalisation-weighted results and all 58 affected variants, including V2, are retained across five scenarios. The neutral approximation completes the defined exploratory scope without certifying historical openings; its decision and date are documented in Appendix F.

7 Conclusions and limitations

The answer to the main question depends on the basket, weighting and period. Through 27 October 2026, some annual portfolios exceed SPY's CAGR, but all have deeper maximum drawdowns. With a common 2025 endpoint, inception also materially changes the result. A variant's observed lead does not establish a simultaneous improvement in return and risk or an ability to select future winners.

V2 likewise identifies no uniform improvement: more frequent weight restoration and volatility-based exposure adjustment have different effects across baskets and frequencies. Its CAGR tables do not establish a joint improvement in risk and return. For fully invested annual portfolios, Appendix E keeps those dimensions and alpha uncertainty separate. These observations are consistent with studying selection, weighting and rebalancing separately, as in the cited literature; they neither replicate those studies nor identify their mechanisms. Choosing the best-performing TOP now would introduce retrospective selection.

The conclusion depends on unresolved limits: official membership and capitalisation at every cutoff, information availability through time, the 2010 GE/Google boundary, adjustment discrepancies and distributions in kind, and historical opening prices. In sensitivity tests through 2025, equal-weighted TOP 4 and TOP 6 can switch sides relative to SPY. The account remains a synthetic total-return account, and commissions use equivalent shares. Physical accounting with payment dates, whole shares and every corporate event would be another study. Affected claims must be reviewed if those sources are resolved; manuscript presentation does not remove these limitations.

Reproduction

Verification of the archive through 2025. For the full window starting in 2000, the independent verifier reconstructs 1,804,764 daily valuations and 47,686 events, and recalculates 156,979 commissions using independent decimal arithmetic. The maximum daily difference is below 0.10 US cents. The 2001 window and gross-return reconciliation against V5 are checked separately. These controls verify arithmetic and consistency, not the historical accuracy of every source.

The daily, annual, metrics and events files retain dates, UIDs, values before and after trading, net traded value, cash, reconstructed or hypothetical prices, equivalent shares for fee calculation, cost components and the volatility window preceding the decision. The Cierre-v06, Costes-integrados-v06, Sensibilidad-aperturas-v06 and Comparacion-SPY-v06 guides identify series, formulae and controls. Appendix F collects their dossier locations and those of the 2026 extension [6]. Archived data allow calculation to be reproduced without new provider requests.

Data and code: https://hidraresearch.com/research/MCAP_reproducible.zip. Includes the archived inputs and a guide. Reproduction requires no accounts or provider requests and was tested in an independent Python environment on the same Windows PC. Source attribution and study limitations remain unchanged.

References

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[6] HIDRA Research. V6 integrated-cost protocol, V6 opening-price diagnosis and results guides, 1 October 2026; historical extension of 28 October 2026. Internal documents identified by version and location in Appendix F. V1–V5 predecessors retained.

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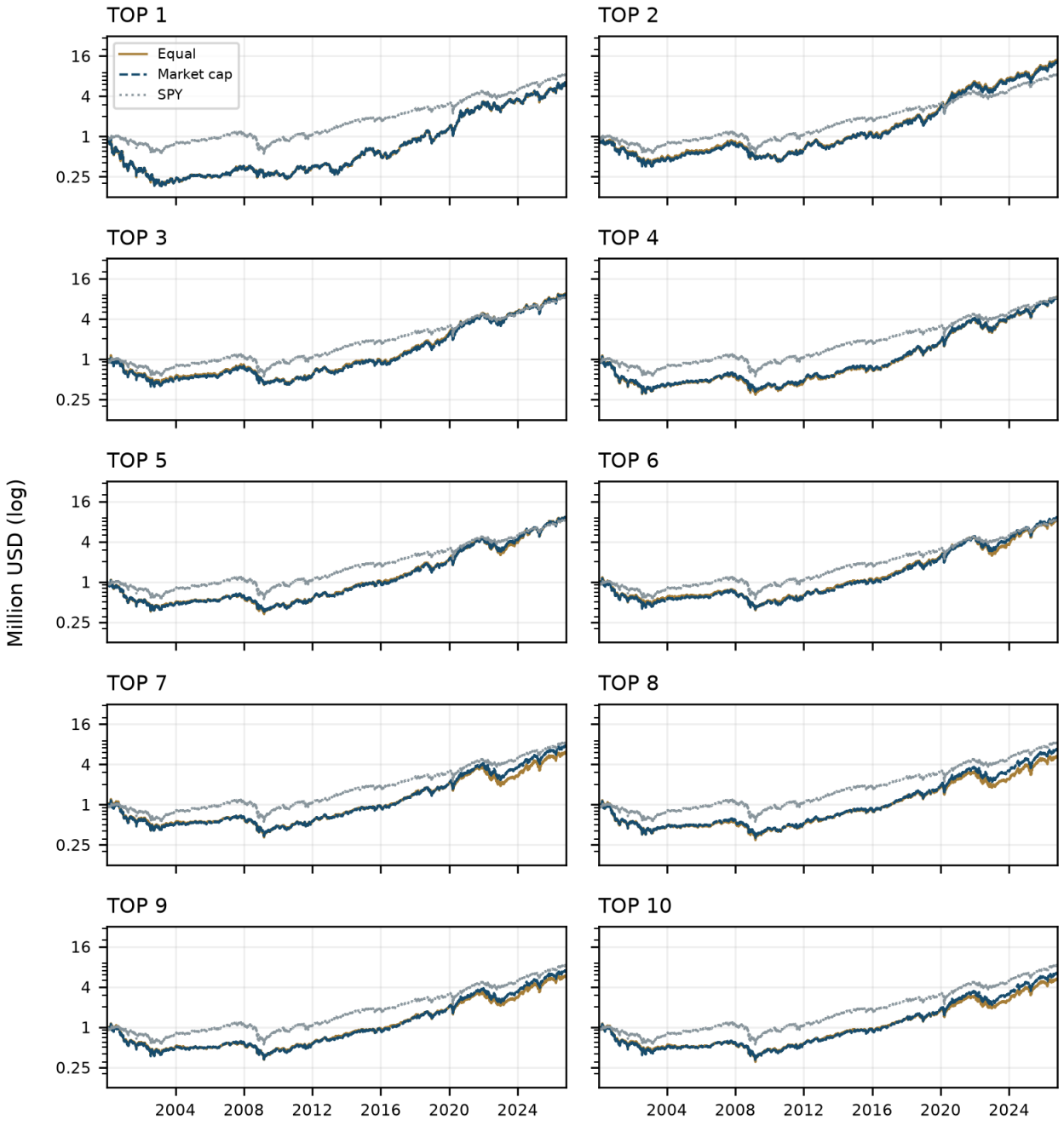
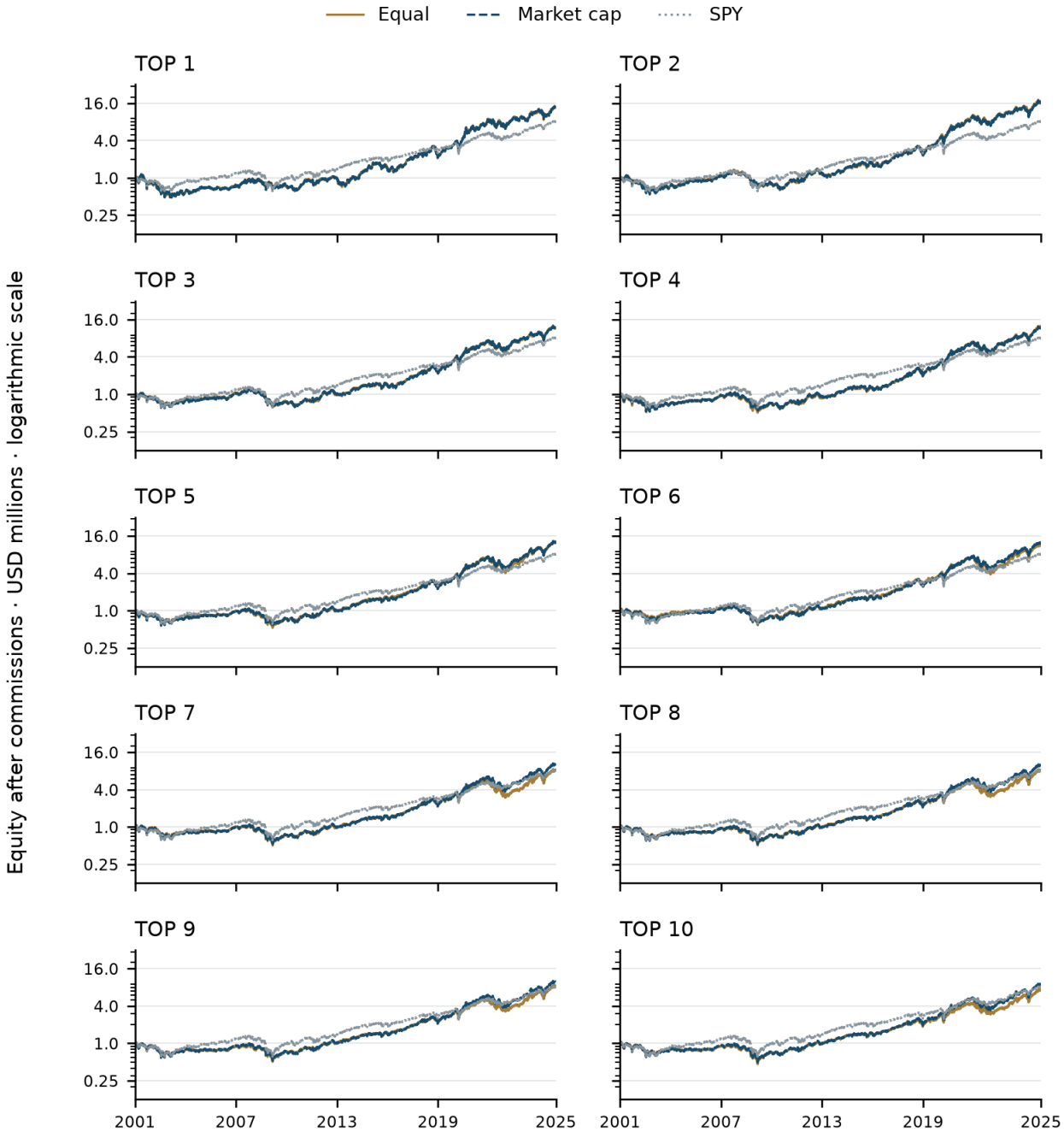
Appendix A Equity curves after commissions from 2000

03/01/2000–27/10/2026. TOP 1–10 and SPY, initial capital USD 1 million. TOP 4–10 retain the neutral approximation and USD 1 fee scenario. Common logarithmic scale; data: mcap_daily.csv, extension dated 28/10/2026.



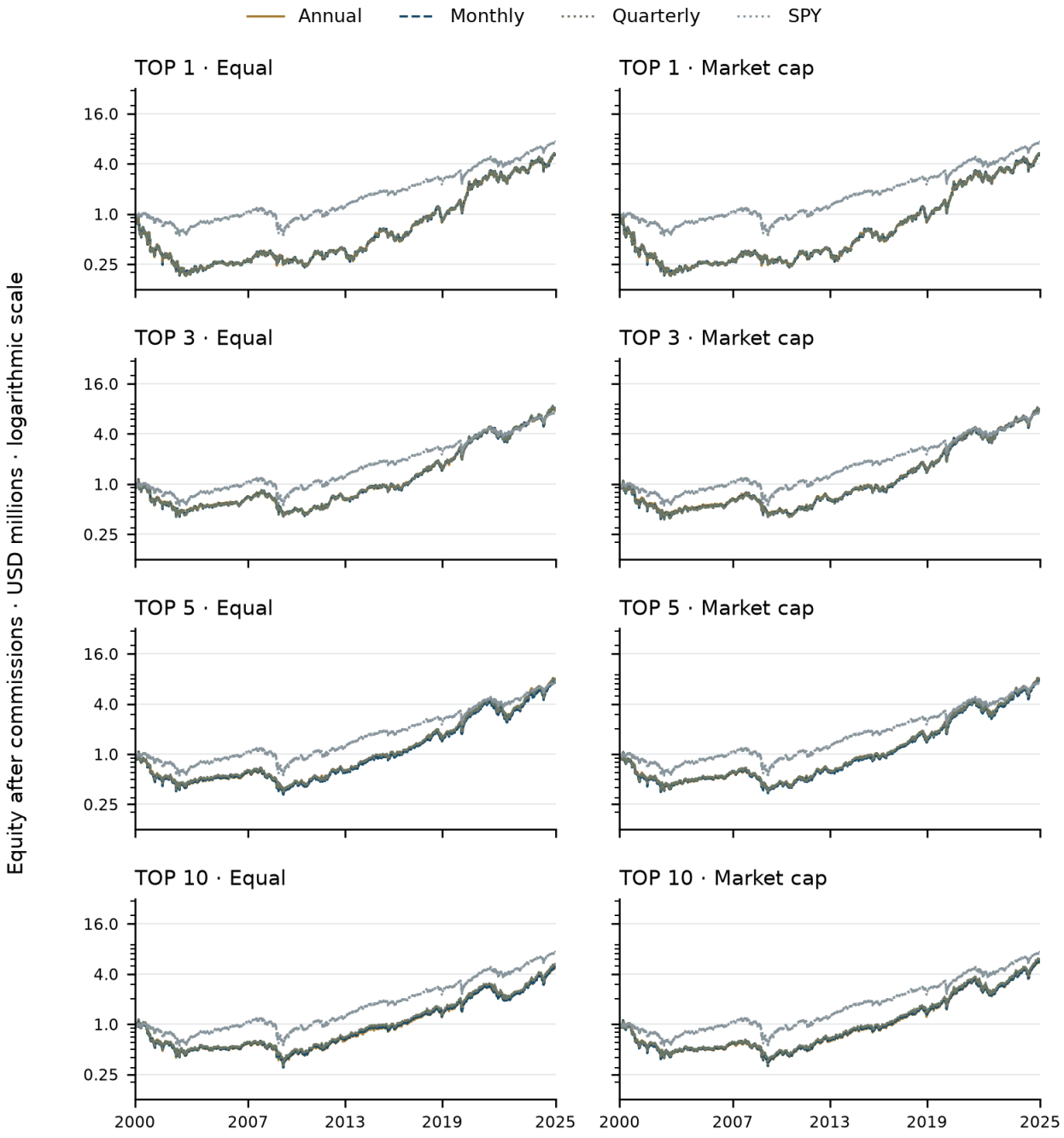
Appendix B Comparison from 2001

Retained cutoff: 31/12/2025. TOP 1–10 with commissions deducted from equity. This window excludes the three historical UIDs with incomplete coverage; it does not replace the 2000 window.



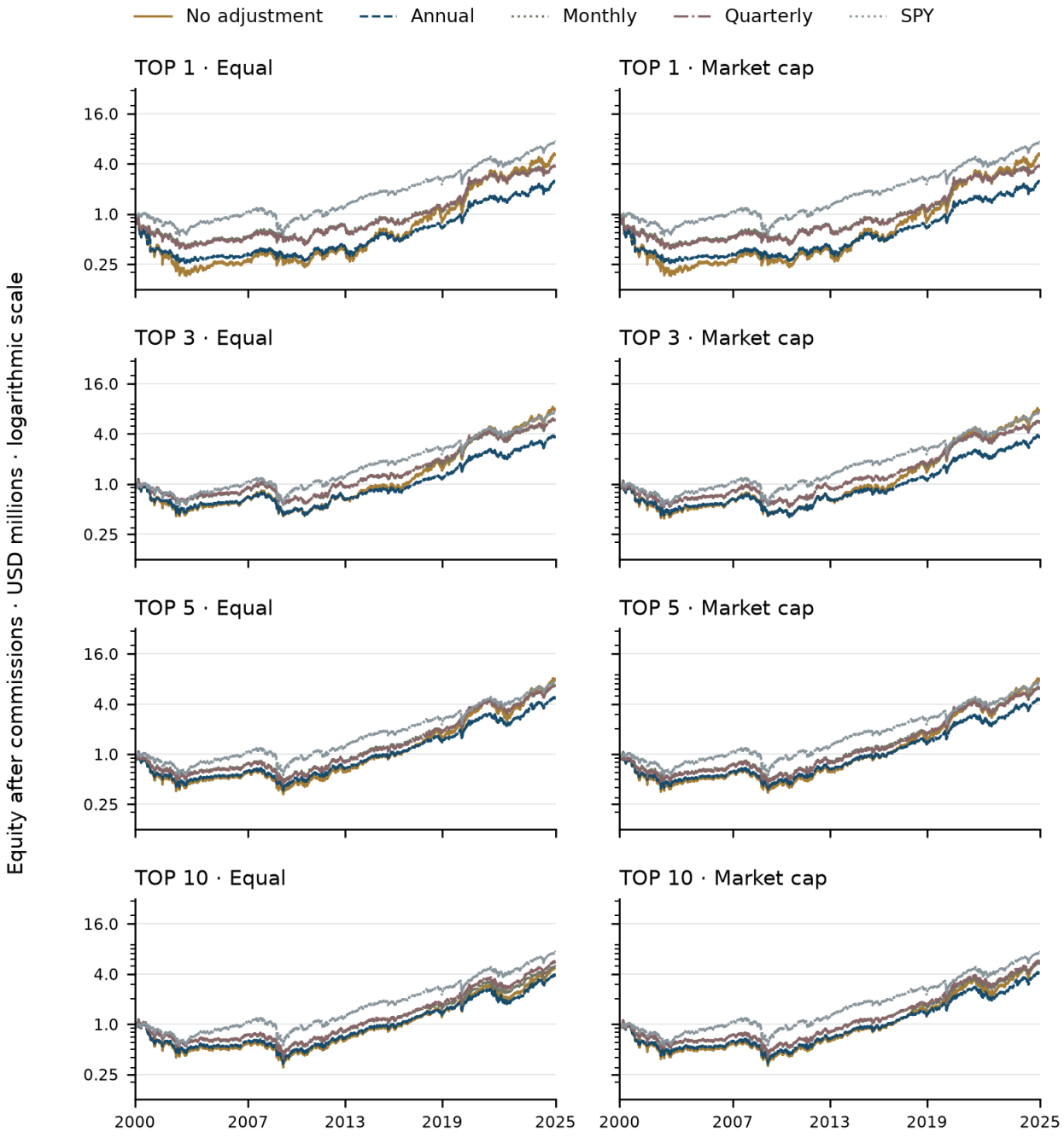
Appendix C Weight-reset frequency

Retained cutoff: 31/12/2025. V2 from 2000 at full exposure: annual, monthly and quarterly. TOP 5/10 include the approximation in Section 6. Annual selection, with commissions deducted.



Appendix D Exposure-adjustment frequency

Retained cutoff: 31/12/2025. V2 from 2000 with annual weights and costs. TOP 5/10 include the approximation in Section 6. Full exposure or annual, monthly and quarterly volatility-based adjustment.



Appendix E Return and risk relative to SPY

Retained cutoff: 31/12/2025. We compare all twenty annual TOP 1–10 variants with continuously held SPY, after modeled commissions. Tables E1–E3 distinguish realized historical returns, risk taken and estimated alpha relative to the benchmark. No curve is changed and no variant is selected using these additional metrics. Equal-weighted and market-cap-weighted TOP 1 are the same portfolio.

Excess CAGR is the percentage-point difference between the portfolio's and SPY's compound annual growth rates. Annual volatility uses the sample standard deviation of daily log returns multiplied by the square root of 252, as elsewhere in the study. Vol/SPY is the ratio of portfolio volatility to benchmark volatility: 1.50 means 50% more volatility. Maximum drawdown is calculated within each period and includes its initial equity.

Alpha is the intercept from a daily regression of the portfolio's simple return minus the risk-free rate on SPY's return minus the same rate. It is annualized by multiplying by 252; it is not a compound rate. Beta measures linear sensitivity to SPY's excess return. This single-factor alpha does not remove other factor exposures or demonstrate predictive ability.

$$Rportfolio,t - Rf,t = \alpha daily + \beta\,(RSPY,t - Rf,t) + \varepsilon t$$

Rf comes from the daily RF column of Kenneth R. French's Data Library, converted from percent to a fraction [9]. It uses a one-month US Treasury-bill reference; the provider changes in June 2024. Only RF is used, not the library's market factor. The original file and aligned series are retained with SHA-256 hashes. The regression excludes the study's first day, covering opening to close; the other metrics include that return.

The CSV files provide 95% alpha intervals using Newey–West HAC standard errors with five lags, together with correlation, tracking error, information ratio and Sharpe ratio. These intervals are approximate and are not adjusted for multiple portfolio comparisons; a positive alpha point estimate alone does not establish a statistical advantage. Annual detail reports each year's return and excess return, not an annualization based on trading-day counts.

The 2000–2009 and 2010–2025 windows are descriptive splits chosen after inspecting the study. They inherit the limitations of the constituent proxy and corporate-action treatment. The 2000 period and January 2001 exit retain the accepted approximations for the three historical securities. This appendix neither replaces the sensitivity scenarios nor constitutes an out-of-sample test.

RF source: Kenneth R. French Data Library [9], download archived on 1 October 2026. Appendix F identifies the original file and aligned series.

Comparison from 2000 to 2025

Table E1. Annual turnover and rebalancing, full exposure. Synthetic total return after commissions. Percentages except Vol/SPY and beta; excess return is in percentage points.

Portfolio	CAGR %	Excess pp	Vol. %	Vol/SPY	Beta	Alpha % annual	Max DD %
SPY	**7.94**	**0**	**19.38**	**1**	**1**	**0**	**-55.18**
TOP 1 equal	6.47	-1.47	30.00	1.54	1.11	0.30	-81.95
TOP 1 cap.	6.47	-1.47	30.00	1.54	1.11	0.30	-81.95
TOP 2 equal	9.70	1.75	25.41	1.31	1.06	2.46	-64.35
TOP 2 cap.	9.45	1.51	25.58	1.32	1.07	2.19	-65.87
TOP 3 equal	8.26	0.31	24.08	1.24	1.03	1.03	-64.24
TOP 3 cap.	8.13	0.18	24.14	1.24	1.04	0.84	-64.96
TOP 4 equal	7.88	-0.06	23.70	1.22	1.05	0.45	-74.14
TOP 4 cap.	7.78	-0.16	23.71	1.22	1.05	0.33	-71.87
TOP 5 equal	8.30	0.35	23.09	1.19	1.03	0.85	-69.38
TOP 5 cap.	8.26	0.32	23.08	1.19	1.03	0.75	-67.53
TOP 6 equal	7.96	0.01	22.83	1.17	1.03	0.45	-68.04
TOP 6 cap.	8.24	0.29	22.83	1.17	1.03	0.66	-66.45
TOP 7 equal	6.61	-1.33	23.19	1.19	1.06	-0.95	-73.25
TOP 7 cap.	7.44	-0.50	22.97	1.18	1.05	-0.18	-70.87
TOP 8 equal	6.17	-1.77	22.36	1.15	1.03	-1.34	-74.59
TOP 8 cap.	7.04	-0.90	22.47	1.15	1.03	-0.54	-72.18
TOP 9 equal	6.65	-1.28	21.10	1.08	0.98	-0.81	-71.39
TOP 9 cap.	7.24	-0.70	21.76	1.12	1.01	-0.32	-70.38
TOP 10 equal	6.20	-1.74	20.95	1.08	0.99	-1.36	-73.42
TOP 10 cap.	6.90	-1.04	21.67	1.11	1.02	-0.73	-71.72

Reading the equally weighted TOP 2 results: excess CAGR of 1.75 pp, volatility 1.31 times SPY's, and estimated annual alpha of 2.46%. Its 95% HAC interval is [-3.05%; 7.98%]. This illustrates how to read the table; it is not a portfolio selected for future use.

Volatility uses log returns; the regression uses simple returns and RF. Alpha and excess CAGR are not interchangeable. The remaining intervals and all 26 individual years are retained in the accompanying data.

Comparison from 2000 to 2009

Table E2. Annual turnover and rebalancing, full exposure. Synthetic total return after commissions. Percentages except Vol/SPY and beta; excess return is in percentage points.

Portfolio	CAGR %	Excess pp	Vol. %	Vol/SPY	Beta	Alpha % annual	Max DD %
SPY	**-1.10**	**0**	**22.37**	**1**	**1**	**0**	**-55.18**
TOP 1 equal	-12.21	-11.11	34.75	1.55	1.11	-8.40	-81.95
TOP 1 cap.	-12.21	-11.11	34.75	1.55	1.11	-8.40	-81.95
TOP 2 equal	-6.43	-5.33	27.21	1.21	0.97	-4.43	-64.35
TOP 2 cap.	-6.64	-5.54	27.63	1.23	1.00	-4.52	-65.87
TOP 3 equal	-6.82	-5.72	26.08	1.16	0.95	-5.17	-64.24
TOP 3 cap.	-7.09	-5.99	26.11	1.16	0.97	-5.43	-64.96
TOP 4 equal	-8.46	-7.36	25.76	1.15	0.99	-7.00	-74.14
TOP 4 cap.	-8.28	-7.18	25.82	1.15	1.00	-6.78	-71.87
TOP 5 equal	-7.49	-6.39	23.88	1.06	0.94	-6.45	-69.38
TOP 5 cap.	-7.59	-6.49	24.35	1.08	0.96	-6.43	-67.53
TOP 6 equal	-6.24	-5.14	24.10	1.07	0.94	-5.15	-68.04
TOP 6 cap.	-6.59	-5.49	24.31	1.08	0.96	-5.43	-66.45
TOP 7 equal	-7.24	-6.14	25.03	1.11	0.99	-5.94	-73.25
TOP 7 cap.	-7.34	-6.24	24.90	1.11	0.99	-6.05	-70.87
TOP 8 equal	-8.16	-7.06	24.40	1.09	0.96	-7.12	-74.59
TOP 8 cap.	-7.99	-6.89	24.41	1.09	0.97	-6.91	-72.18
TOP 9 equal	-7.20	-6.10	23.04	1.02	0.92	-6.44	-71.39
TOP 9 cap.	-7.45	-6.35	23.49	1.04	0.94	-6.57	-70.38
TOP 10 equal	-7.37	-6.27	23.75	1.06	0.97	-6.45	-73.42
TOP 10 cap.	-7.56	-6.46	23.86	1.06	0.97	-6.59	-71.72

Reading the equally weighted TOP 2 results: excess CAGR of -5.33 pp, volatility 1.21 times SPY's, and estimated annual alpha of -4.43%. Its 95% HAC interval is [-13.67%; 4.79%]. This illustrates how to read the table; it is not a portfolio selected for future use.

Volatility uses log returns; the regression uses simple returns and RF. Alpha and excess CAGR are not interchangeable. The remaining intervals and all 26 individual years are retained in the accompanying data.

Comparison from 2010 to 2025

Table E3. Annual turnover and rebalancing, full exposure. Synthetic total return after commissions. Percentages except Vol/SPY and beta; excess return is in percentage points.

Portfolio	CAGR %	Excess pp	Vol. %	Vol/SPY	Beta	Alpha % annual	Max DD %
SPY	**14.01**	**0**	**17.24**	**1**	**1**	**0**	**-33.71**
TOP 1 equal	20.11	6.09	26.58	1.54	1.11	5.76	-36.50
TOP 1 cap.	20.11	6.09	26.58	1.54	1.11	5.76	-36.50
TOP 2 equal	21.16	7.14	24.20	1.40	1.14	5.56	-32.71
TOP 2 cap.	20.89	6.87	24.20	1.40	1.14	5.36	-32.69
TOP 3 equal	18.90	4.89	22.73	1.31	1.11	3.76	-35.47
TOP 3 cap.	18.88	4.86	22.80	1.32	1.11	3.72	-34.75
TOP 4 equal	19.54	5.53	22.29	1.29	1.10	4.30	-39.36
TOP 4 cap.	19.22	5.21	22.27	1.29	1.10	4.02	-37.88
TOP 5 equal	19.51	5.49	22.57	1.30	1.12	4.08	-45.12
TOP 5 cap.	19.53	5.51	22.23	1.28	1.12	4.11	-40.89
TOP 6 equal	17.91	3.90	21.99	1.27	1.12	2.71	-48.50
TOP 6 cap.	18.69	4.67	21.84	1.26	1.11	3.37	-43.02
TOP 7 equal	16.30	2.29	21.95	1.27	1.12	1.19	-49.14
TOP 7 cap.	17.85	3.84	21.66	1.25	1.11	2.63	-43.47
TOP 8 equal	16.25	2.23	20.97	1.21	1.09	1.35	-42.95
TOP 8 cap.	17.67	3.65	21.15	1.22	1.10	2.56	-40.94
TOP 9 equal	16.35	2.33	19.77	1.14	1.05	1.78	-37.49
TOP 9 cap.	17.58	3.56	20.59	1.19	1.08	2.62	-39.25
TOP 10 equal	15.68	1.66	18.99	1.10	1.02	1.45	-35.29
TOP 10 cap.	17.07	3.05	20.16	1.16	1.06	2.28	-38.30

Reading the equally weighted TOP 2 results: excess CAGR of 7.14 pp, volatility 1.40 times SPY's, and estimated annual alpha of 5.56%. Its 95% HAC interval is [-1.27%; 12.41%]. This illustrates how to read the table; it is not a portfolio selected for future use.

Volatility uses log returns; the regression uses simple returns and RF. Alpha and excess CAGR are not interchangeable. The remaining intervals and all 26 individual years are retained in the accompanying data.

Appendix F Update and traceability

The extension adds 206 sessions in 2026 and reuses the ranking archived at the 2025 close. It does not reoptimise the twenty variants, restart capital or replace frozen history. The 2026 prices come from P123, including the reconstructed opening basis for fees; links are checked over overlapping dates. The historical combination with Yahoo applies to the earlier segment.

The extension uses mcap_daily.csv, mcap_metrics.json, mcap_movements.json and mcap_bridge.json under outputs/studies-extension-20261028/, relative to the HIDRA root. The manifest retains input and output hashes. The verifier reproduces new valuations without provider requests; its instructions are located below. Results remain retrospective and do not constitute a prospective record.

Tables 2–7 and E1–E3 and Appendices B–E retain their original periods. RF and V2 have not been extended. Direct comparison with updated Table 1 without aligning dates would be incorrect. Earlier editions remain in the research archive.

Version note

The 3 November 2026 edition revises structure, related research and interpretation from the 28 October edition. All its tables, equations and charts are retained without changing data, rules or calculations. The twenty annual variants retain their 27 October 2026 cutoff; auxiliary experiments retain 2025. This English translation was prepared on 5 November 2026.

Earlier versions with annual liquidation remain as predecessors. The continuity correction restored exposure between December and the January opening; its differences are not attributed solely to commissions. The owner accepted the neutral approximation and its sensitivities on 1 October 2026 to delimit this exercise, without certifying historical opening prices.

Reproduction locations

With 64-bit Python 3.12, extract the ZIP and run REPRODUCIR.cmd. Read LEEME.txt and, when finished, RESUMEN.txt in the results folder. The following paths identify the original dossier.

Data and design: Materiales/ORIGEN.md; Desarrollo/PROTOCOLO_ENSAYO_PROXY_P123_2026-09-28.md; Desarrollo/PROTOCOLO_V2_PESOS_Y_EXPOSICION_2026-09-28.md; Desarrollo/PROTOCOLO_CONTINUIDAD_APERTURA_V5_2026-10-01.md.

Costs and opening prices: Desarrollo/PROTOCOLO_COSTES_INTEGRADOS_V6_2026-10-01.md; Desarrollo/DIAGNOSTICO_APERTURAS_V6_2026-10-01.md; Desarrollo/ACEPTACION_APROXIMACION_V6_2026-10-01.md; Materiales/Privados/historical-opening-sources-v06/NOTAS_FUENTES.md.

Results through 2025: Resultados/Cierre-v06/LEEME.md; Resultados/Costes-integrados-v06/metrics_2001_2025.csv; Resultados/Sensibilidad-aperturas-v06/metrics.csv; Resultados/Comparacion-SPY-v06/LEEME.md. The last guide identifies comparacion_periodos.csv, annual data and rf_utilizado.csv; the original RF file is Materiales/Privados/french-rf-2026-10-01/factors_daily.zip.

2026 extension, relative to the HIDRA root: Articulos/Recursos/Actualizacion-estudios-20261028/LEEME.md and verify.py; outputs/studies-extension-20261028/manifest.json and mcap_* files. The guide connects acquisition, retained rules and checks without new requests.