INSTITUTIONAL RESEARCH SERIES · STUDY TWO

# The Securities Exchange Study

Exchange operators, electronic trading platforms and data businesses, 2005–2026. Fifteen listed companies sorted into three buckets by dominant revenue and run as equal-weighted total-return baskets, to test whether the plumbing of the securities markets is one exposure or three.

| HEADLINE WINDOW | BASKET | DATA SNAPSHOT | VERSION |
|---|---|---|---|
| 3 Jan 2005 – 14 Aug 2026 | 15 companies, 3 buckets | v3_2026-08-17 | 2.1 · 28 Aug 2026 |

THE RESULT

## They do not behave as one thing

Cross-bucket correlations of daily returns run 0.53 to 0.67, against 0.79 for the data bucket alone versus the S&P 500 — a 3.4-point spread in annual return and three materially different recovery profiles from an identical trough date.

This edition supersedes SECURITIES_EXCHANGE_STUDY_v1.0 and the compiled findings report for all published figures. Every figure here is the corrected v3 figure.

EXCHANGES, ANNUALISED

**17.83%**

Sharpe 0.68 — highest of the three

DAYS BACK TO PEAK

**2,219**

Exchanges · 918 for data

CROSS-BUCKET CORRELATION

**0.53–0.67**

Daily returns, full window

BALANCED PANEL, 2020 ON

**Inverts**

Platforms 18.43%, data 8.20%

EXCHANGE OPERATORS · DATA AND ANALYTICS · ELECTRONIC PLATFORMS
BENCHMARKS — S&P 500 TR, FINANCIALS

SECTION ONE

# The question, and the findings

How have exchange operators compared with electronic trading platforms and data businesses in returns, drivers, cyclicality, valuations, and diversification potential? Three distinct business models sit under the single heading of capital markets infrastructure — the exchanges that match trades, the platforms that route orders and make markets, and the data businesses that sell the information the market runs on. Each is habitually described as a toll booth on market activity, and portfolios frequently hold them interchangeably.

## 01

### They are not one exposure

Cross-bucket correlations run 0.53 to 0.67, against 0.79 for data alone versus the market.

## 02

### Exchanges led on return and on risk-adjusted return

17.83% a year against 14.77% for data, 14.48% for platforms, 11.12% for the market. Sharpe 0.68, 0.62, 0.51 against 0.55.

## 03

### All three fell together and recovered separately

Every bucket troughed on 20 November 2008, −63.5% to −75.3%. Back to the prior peak: 918 days for data, 1,624 for platforms, 2,219 for exchanges.

## 04

### Data and analytics is the consistency asset

Worst five-year stretch −1.19% annualised against −8.57% for platforms and −11.44% for exchanges; negative in 0.1% of rolling five-year windows against 7.5% and 11.3%.

## 05

### Exchanges are geared to volatility; data businesses are not

Controlling for market beta, a 10% VIX spike added about 24 basis points to the exchange bucket's daily return, 17 to platforms, 3 to data.

## 06

### The whole category beat financials, decisively

XLF compounded at 6.13% with a −82.69% maximum drawdown and 3,043 days to recover.

## 07

### A modest allocation improved the market portfolio

20% of the exchange bucket blended into an S&P 500 position lifted return to 12.78% and Sharpe to 0.622, with volatility essentially unchanged.

## 08

### The ranking is window-dependent

On the balanced panel the order inverts. This is the study's most important caveat, and it bounds every reading above.

### WHERE THE FIVE SUB-QUESTIONS STAND

| | | | |
|---|---|---|---|
| Returns | **Answered** | Cyclicality | **Answered** |
| Diversification | **Answered** | Drivers — revenue, margin, multiple | **Not built** |
| Valuations — P/E, EV/EBITDA, re-rating | **Not built** | | |

Both unbuilt sub-questions need point-in-time fundamentals for fifteen companies across two decades; no free source carries that at research quality, and this work was run on free and open sources by design. They are a deliberate descope. Any statement about why a bucket performed as it did describes the return series, not an attribution to fundamentals.

SECTION TWO

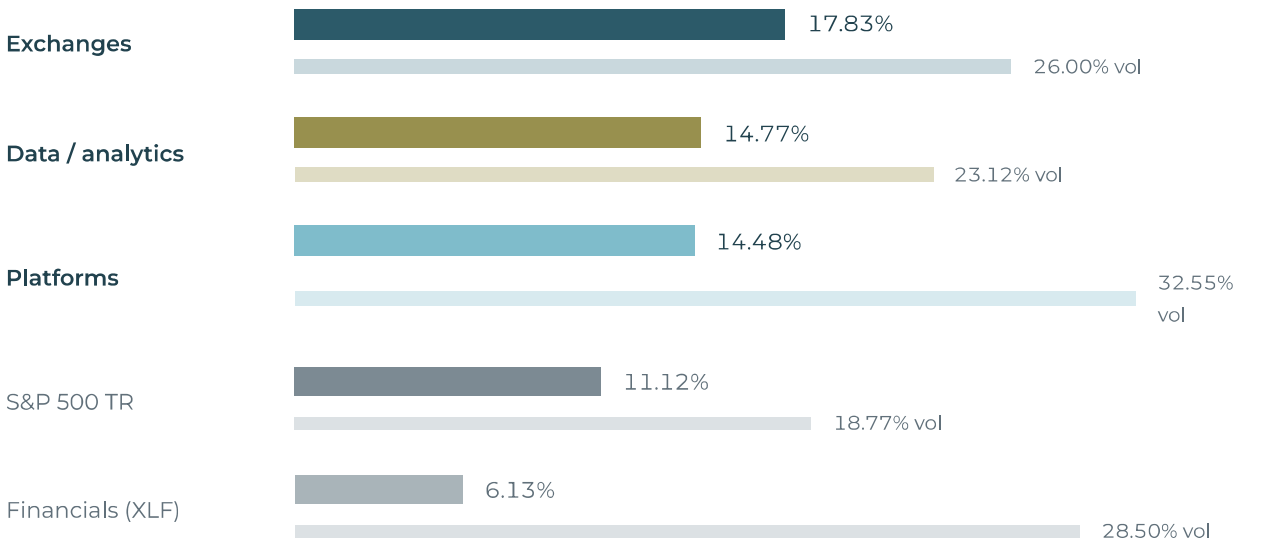
# The exhibits

Five exhibits in the order the argument is built: return and risk, depth against recovery, consistency, the window test, and correlation. Every figure is computed from snapshot v3_2026-08-17 and nothing else.

EXHIBIT 1

## Return and risk by bucket

Annualised total return in USD, with annualised volatility shown pale beneath it.

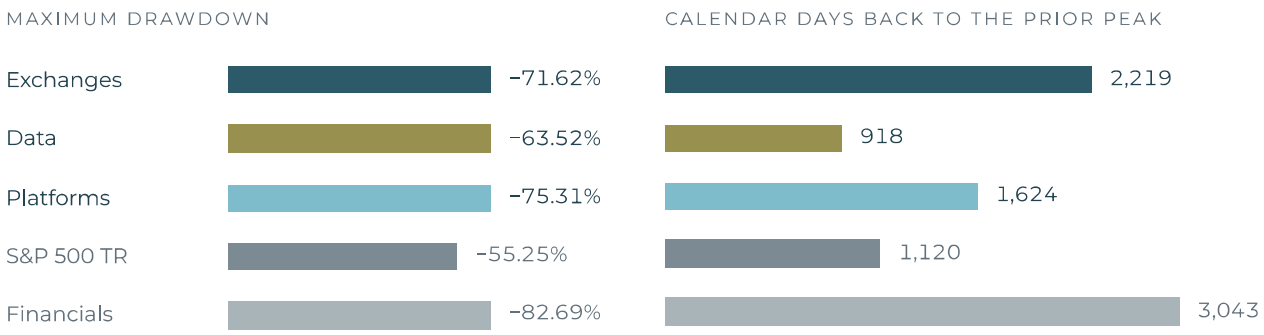



Exchanges lead on raw return and do it on less volatility than platforms. Data and analytics earns 14.77% on the lowest volatility of the three. Financials, at 6.13%, is not in the same conversation. Equal-weighted within each bucket, re-set on the first US trading day of each year; total return via adjusted close.

EXHIBIT 2

## Depth is shared; recovery is not

Maximum peak-to-trough decline, and calendar days from the trough back to the prior peak. Every bucket troughed on 20 November 2008.

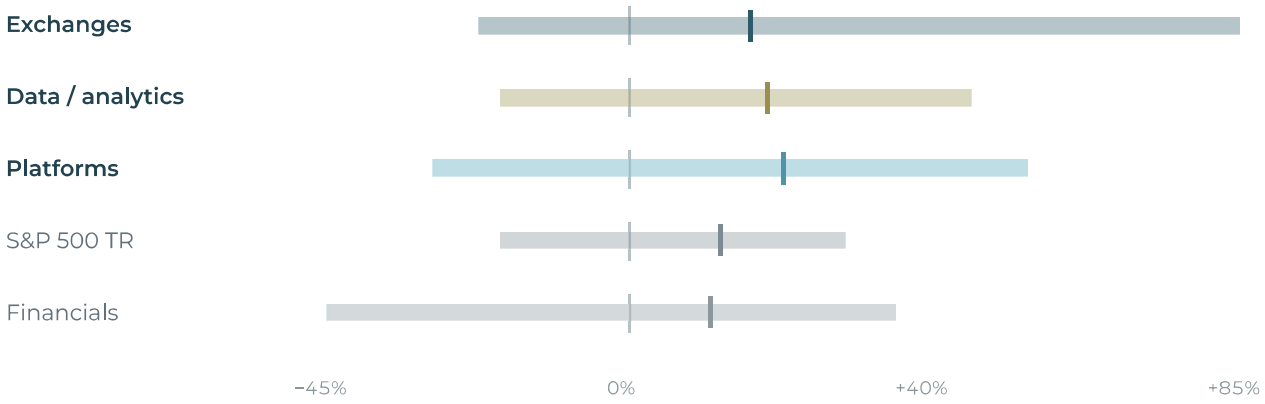



On depth the three sit within twelve points of each other. On recovery they are barely comparable: data was whole again in 918 days, platforms took 1,624, exchanges 2,219 — just over six years — from a hole eight points deeper. Two holdings can fall the same distance and be entirely different propositions if one spends two and a half years underwater and the other spends six.

EXHIBIT 3

## Consistency through time

Rolling three-year annualised returns: worst window to best, with the median marked. Zero line dashed.



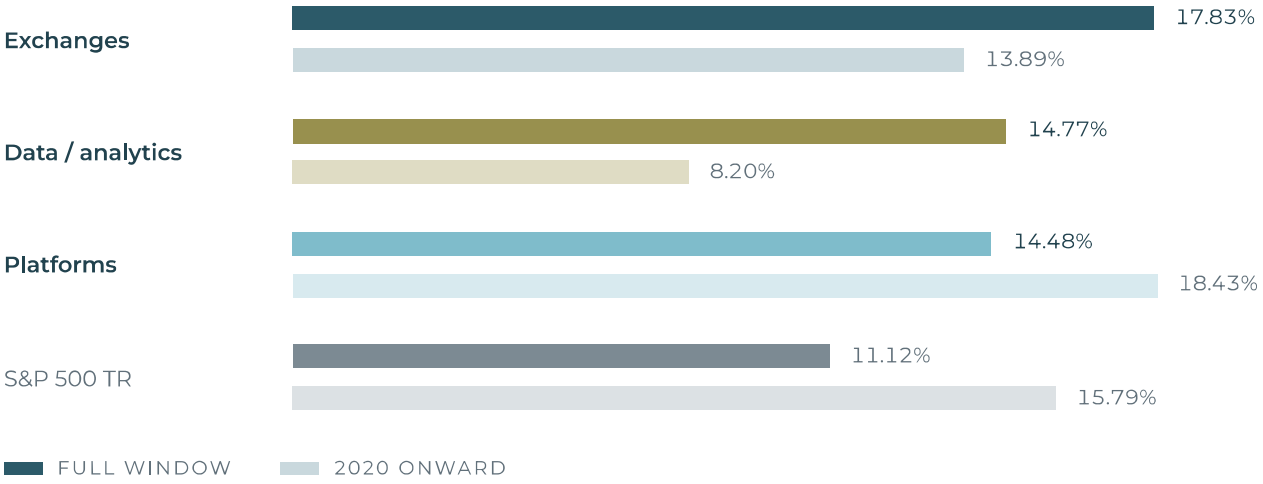

| SERIES | 3-YR MIN | 3-YR MEDIAN | 5-YR MIN | 5-YR % NEGATIVE |
|---|---|---|---|---|
| Exchanges | −20.13% | 16.13% | −11.44% | 11.25% |
| Data / analytics | −17.15% | 18.32% | −1.19% | 0.14% |
| Platforms | −26.26% | 20.68% | −8.57% | 7.48% |
| S&P 500 TR | −17.32% | 12.09% | −1.72% | 4.26% |
| Financials (XLF) | −40.66% | 10.82% | −18.32% | 21.03% |

The rolling medians rank differently from the CAGRs because the exchange bucket's return is concentrated in 2005–2007 and the post-2013 recovery, while its 2008–2013 stretch was deeply negative.

EXHIBIT 4

## The window test

Annualised return on the full window against the balanced panel from 2 January 2020 — the only period in which all fifteen constituents are live.




The ranking inverts. Platforms lead on both return and Sharpe (0.71), and data and analytics trails the market by 7.6 points a year. The window is 6.6 years and contains one drawdown event rather than two, but the direction is unambiguous: the data bucket's historical lead has not persisted into the period when the panel is complete.

EXHIBIT 5

## One exposure, or three

Correlation of daily returns, full window. Deeper cells are more correlated.

| | EXCHANGES | PLATFORMS | DATA | S&P 500 TR | FINANCIALS |
|---|---|---|---|---|---|
| Exchanges | 1.000 | 0.526 | 0.672 | 0.674 | 0.690 |
| Platforms | 0.526 | 1.000 | 0.524 | 0.575 | 0.577 |
| Data | 0.672 | 0.524 | 1.000 | 0.786 | 0.703 |
| S&P 500 TR | 0.674 | 0.575 | 0.786 | 1.000 | 0.846 |
| Financials | 0.690 | 0.577 | 0.703 | 0.846 | 1.000 |

These are not the correlations of one exposure sliced three ways. The data bucket alone posts 0.786 against the market — higher than any cross-bucket pair — and platforms are the least correlated with everything.

SECTION THREE

# Method, and the basket

**Weighting.** Equal weight within each bucket, re-set on the first US trading day of each year; fixed share counts between rebalances, so weights drift. Valuation is share-based and gapless — no overnight return is dropped.

**Eligibility.** A company is a member at a rebalance if it is listed on that date, per its primary-source first-trade date. Valuation uses the last known price.

**Classification.** By primary bucket — dominant revenue category — documented per name.

**Return basis and currency.** Total return via adjusted close, USD at the daily rate. Deutsche Börse from EUR, LSEG from pence; free FX history begins 1 December 2003.

**Metrics.** CAGR annualised on calendar years; volatility annualised at 252 days; Sharpe against ^IRX as a rate level converted to a daily rate, never a price series; beta against the S&P 500 total-return index; recovery in calendar days from trough to the first close at or above the prior peak.

**Standing constraint.** Cross-bucket statements are made only on the 2005-present window. The data bucket's 1974 history is single-bucket context and supports no comparison.

## THE BASKET, WITH PER-NAME STATISTICS

Measured from 3 January 2005 or the name's entry, whichever is later.

| COMPANY | TICKER | BUCKET | FIRST TRADE | CAGR | VOL | MAX DD | BETA |
|---|---|---|---|---|---|---|---|
| CME Group | CME | Exchanges | 6 Dec 2002 | 12.50% | 32.65% | −77.50% | 0.97 |
| Intercontinental Exchange | ICE | Exchanges | 16 Nov 2005 | 16.36% | 37.87% | −73.94% | 1.14 |
| Nasdaq, Inc. | NDAQ | Exchanges | 1 Jul 2002 | 18.03% | 35.25% | −68.48% | 1.16 |
| Cboe Global Markets | CBOE | Exchanges | 15 Jun 2010 | 16.28% | 25.21% | −43.23% | 0.51 |
| Deutsche Börse | DB1.DE | Exchanges | 5 Feb 2001 | 11.03% | 34.14% | −83.51% | 0.59 |
| MarketAxess | MKTX | Platforms | 5 Nov 2004 | 12.29% | 43.85% | −80.29% | 1.10 |
| Tradeweb Markets | TW | Platforms | 4 Apr 2019 | 16.46% | 30.42% | −48.64% | 0.63 |
| Virtu Financial | VIRT | Platforms | 16 Apr 2015 | 13.74% | 35.39% | −56.17% | 0.28 |
| Interactive Brokers | IBKR | Platforms | 4 May 2007 | 15.23% | 35.16% | −63.66% | 1.06 |
| S&P Global | SPGI | Data | 21 Feb 1973 | 13.08% | 30.12% | −74.67% | 1.11 |
| Moody's | MCO | Data | 3 Oct 2000 | 13.17% | 33.83% | −78.72% | 1.25 |
| MSCI | MSCI | Data | 15 Nov 2007 | 18.73% | 35.31% | −69.06% | 1.11 |
| FactSet | FDS | Data | 28 Jun 1996 | 10.93% | 29.16% | −61.13% | 0.91 |
| Morningstar | MORN | Data | 3 May 2005 | 12.26% | 30.24% | −67.92% | 0.81 |
| London Stock Exchange Group | LSEG.L | Data | 20 Jul 2001 | 11.89% | 34.65% | −87.01% | 0.61 |

### THE ONE CLASSIFICATION CALL THAT MATTERS

LSEG is an exchange by name and history and sits in the data bucket, because post-Refinitiv the majority of its revenue is data and analytics and the primary-bucket rule follows revenue rather than identity. The same rule keeps ICE and Nasdaq in exchanges despite large data arms. Nasdaq's 1 July 2002 date is the start of OTC bulletin-board trading; own-exchange listing followed 9 February 2005. S&P Global's 1973 date is the first clean data date under the McGraw-Hill lineage, not an IPO, and is exempt from listing truncation as a name change of the same issuer.

SECTION FOUR

# Results in full

### HEADLINE RESULTS, 3 JANUARY 2005 – 14 AUGUST 2026, USD TOTAL RETURN

| SERIES | CAGR | VOLATILITY | SHARPE | BETA | MAX DRAWDOWN | TROUGH | DAYS TO RECOVER |
|---|---|---|---|---|---|---|---|
| **Exchanges** | 17.83% | 26.00% | 0.68 | 0.93 | −71.62% | 20 Nov 2008 | 2,219 |
| **Data / analytics** | 14.77% | 23.12% | 0.62 | 0.97 | −63.52% | 20 Nov 2008 | 918 |
| **Platforms** | 14.48% | 32.55% | 0.51 | 1.00 | −75.31% | 20 Nov 2008 | 1,624 |
| S&P 500 TR | 11.12% | 18.77% | 0.55 | 1.00 | −55.25% | 9 Mar 2009 | 1,120 |
| Financials (XLF) | 6.13% | 28.50% | 0.28 | 1.29 | −82.69% | 6 Mar 2009 | 3,043 |

### CYCLICALITY

Sensitivity beyond market beta. Vol-shock beta is the response to a 1% move in the VIX.

| BUCKET | MKT BETA | VOL SHOCK | VOL, VIX>30 | DOWN CAPTURE |
|---|---|---|---|---|
| Exchanges | 1.05 | +0.024 | 61.80% | 0.79 |
| Platforms | 1.08 | +0.017 | 68.85% | 0.95 |
| Data / analytics | 0.98 | +0.003 | 51.83% | 0.93 |

Estimated by regressing daily bucket returns on the market return jointly with the daily log change in the VIX and the daily change in the 10-year Treasury yield. A reduced-form estimate of return sensitivity, not an attribution to revenue.

### DIVERSIFICATION

Daily-rebalanced blends with the S&P 500 total-return index.

| PORTFOLIO | CAGR | VOLATILITY | SHARPE |
|---|---|---|---|
| Market alone | 11.12% | 18.77% | 0.549 |
| 90 / 10 exchanges | 11.97% | 18.74% | 0.589 |
| 80 / 20 exchanges | 12.78% | 18.91% | **0.622** |
| 80 / 20 data | 12.03% | 18.86% | 0.589 |
| 80 / 20 platforms | 12.43% | 19.50% | 0.594 |

Every blend improved the Sharpe ratio; the exchange bucket most. The mechanism is imperfect correlation combined with a large return premium, not low volatility. Ten-percent blends improve less and are omitted here.

### CURRENCY BASIS

Currency cost the dollar investor 0.80 points a year on Deutsche Börse (11.03% USD against 11.83% EUR) and 1.80 on LSEG (11.89% against 13.68% GBP), adding two to three points of annualised volatility to each. At bucket level: exchanges 17.83% USD against 18.04% local; data 14.77% against 14.87%. No finding turns on the currency basis.

SECTION FIVE

# The correction, and the validation behind it

Bucket membership at each annual rebalance had been determined by whether a company had a price observation on that date, rather than by whether it was listed. On 2 January in years when the US market is closed but Frankfurt or London is open, the only member with a price that day is the foreign one — so the basket rebalanced onto a single company and held it for the year. This happened in five of twenty-one years for the exchange bucket (100% Deutsche Börse in 2006, 2007, 2012, 2017 and 2023) and in 2007 for the data bucket (100% London Stock Exchange Group). In four further years no member had a price on the rebalance date and the old rule skipped the rebalance entirely, which is why the platform bucket, with no foreign constituent, also moves.

| BUCKET | CAGR BEFORE → AFTER | SHARPE | MAX DRAWDOWN | DAYS TO RECOVER |
|---|---|---|---|---|
| Exchanges | 16.88% → **17.83%** | 0.62 → **0.68** | −76.77% → **−71.62%** | 2,527 → **2,219** |
| Data / analytics | 16.43% → **14.77%** | 0.66 → **0.62** | −60.60% → **−63.52%** | 859 → **918** |
| Platforms | 14.67% → **14.48%** | 0.52 → **0.51** | −75.31% → −75.31% | 1,552 → **1,624** |

### WITHDRAWN

The earlier headline that data and analytics led on a risk-adjusted basis despite trailing exchanges on raw return; it was an artifact of the defect. The earlier cross-bucket correlations of 0.45, 0.50 and 0.59 are superseded by 0.53, 0.52 and 0.67 — they rose because the single-name years had been injecting idiosyncratic variance that suppressed them.

### SURVIVED

The recovery-versus-depth finding, the common 20 November 2008 trough, and the conclusion that the three buckets are distinct exposures. The data bucket still recovers fastest. Eligibility now follows the primary-source listing date, with valuation carrying the last known price; two independent versions of the fix agree to within two basis points on every reported figure.

### REPRODUCIBILITY

All 66 published figures re-derive from the frozen snapshot at a tolerance of $1\times10^{-9}$ with zero mismatches. All twelve snapshot hashes verify; the correctness suite passes 10 of 10. A snapshot is never overwritten — corrections create a new version, which is why the correction produced v3.

### SANITY CHECKS

Eleven checks, each written to fail; all eleven pass. One defect caught elsewhere reaches this study: the risk-free rate had been computed as the percentage change of a yield level, implying roughly 340% a year. Corrected to level ÷ 100 ÷ 252. The Sharpe ratios are meaningful only after that fix.

### LISTING DATES

All fourteen verifiable dates were upgraded to primary sources; six were wrong in substance. Moody's carried six years of Dun & Bradstreet history under its own ticker — 1,496 rows removed. The data bucket's long-history CAGR moved from 18.17% to 19.00%: a defect that flattered the answer and was invisible without the date check.

## LONG HISTORY OF THE DATA BUCKET, 1974–2026

Carried from snapshot v2_2026-08-16 and not re-run under the corrected eligibility rule. Single-bucket context only; it supports no cross-bucket comparison, so the correction does not bear on any claim made from it.

| PERIOD | CAGR | VOLATILITY | MAX DRAWDOWN | NAMES LIVE AT PERIOD END |
|---|---|---|---|---|
| 1974–1979 | 25.21% | 34.91% | −38.89% | 1 |
| 1980–1989 | 16.91% | 30.44% | −42.53% | 1 |
| 1990–1999 | 23.93% | 21.04% | −29.96% | 2 |
| 2000–2004 | 19.00% | 29.04% | −30.06% | 4 |
| 2005–2014 | 18.27% | 26.70% | −60.60% | 6 |
| 2015–2026 | 14.87% | 21.60% | −35.49% | 6 |

Full-history CAGR 19.00%, volatility 26.77%, maximum drawdown −60.60% on 20 November 2008, 859 days to recover. The strongest sub-periods are the ones with the fewest names: the bucket is a single company — S&P Global — for 22.4 of its 52.6 years, until FactSet lists in June 1996. Statistics from that era describe one company, not an industry.

SECTION SIX

# Limitations, data and provenance

**Three of five sub-questions are answered.** Nothing here attributes performance to revenue, margin or multiple.

**The full-window ranking is not stable across windows.** The most important caveat in the study.

**Unbalanced panel.** In the early years the buckets rest on few names; the platform bucket is MarketAxess alone until Interactive Brokers joins in 2008.

**Survivorship.** Listed survivors only; businesses acquired, delisted or failed over the period are absent, biasing returns upward by an unquantified amount.

**Fifteen names, and a judgment per name.** Bucket statistics rest on four to six companies each, and primary-bucket classification is a judgment call — LSEG is where it changes the picture most.

**Total-return proxy.** Adjusted close does not model withholding tax on foreign dividends, transaction costs, or the spread paid at rebalance. Regime statistics are conditional means on subsets of days, and noisier than full-window statistics.

## DATA AND REPRODUCTION

| | |
|---|---|
| Source | Public Yahoo chart endpoint, adjusted close, acquired 17 August 2026 |
| Panel | 168,677 rows across 23 series; 14,462 dated rows in the merged equity calendar |
| Benchmarks | ^SP500TR, XLF, ^IRX, ^VIX, ^TNX |
| FX | EURUSD and GBPUSD daily, from 1 December 2003 |
| Snapshot | v3_2026-08-17 for every figure except the long history, carried from v2_2026-08-16 |
| Reproduction | python3 fetch.py && python3 final.py && python3 charts.py |

## SOURCES AND PROVENANCE

Listing dates and corporate facts come from primary sources only: SEC EDGAR filings (ICE FY2005 10-K; MarketAxess FY2004 10-K; Interactive Brokers FY2007 10-K Item 5; Moody's FY2000 10-K405; Morningstar FY2005 10-K; Nasdaq FY2002 10-K), issuer investor relations (Deutsche Börse, LSEG, CME Group, FactSet, MSCI, Tradeweb, S&P Global) and listing-exchange releases (Cboe, Virtu). No encyclopaedic source is cited for any date.

This edition compiles and supersedes the project charter, methods spec and addenda, milestone records two through five, the long-history appendix, the compiled findings report, and SECURITIES_EXCHANGE_STUDY_v1.0. The work is recorded in earlier documents as "Study 2 — Capital Markets Infrastructure" and was renamed on 17 August 2026; both names refer to the same work, basket and frozen series.

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