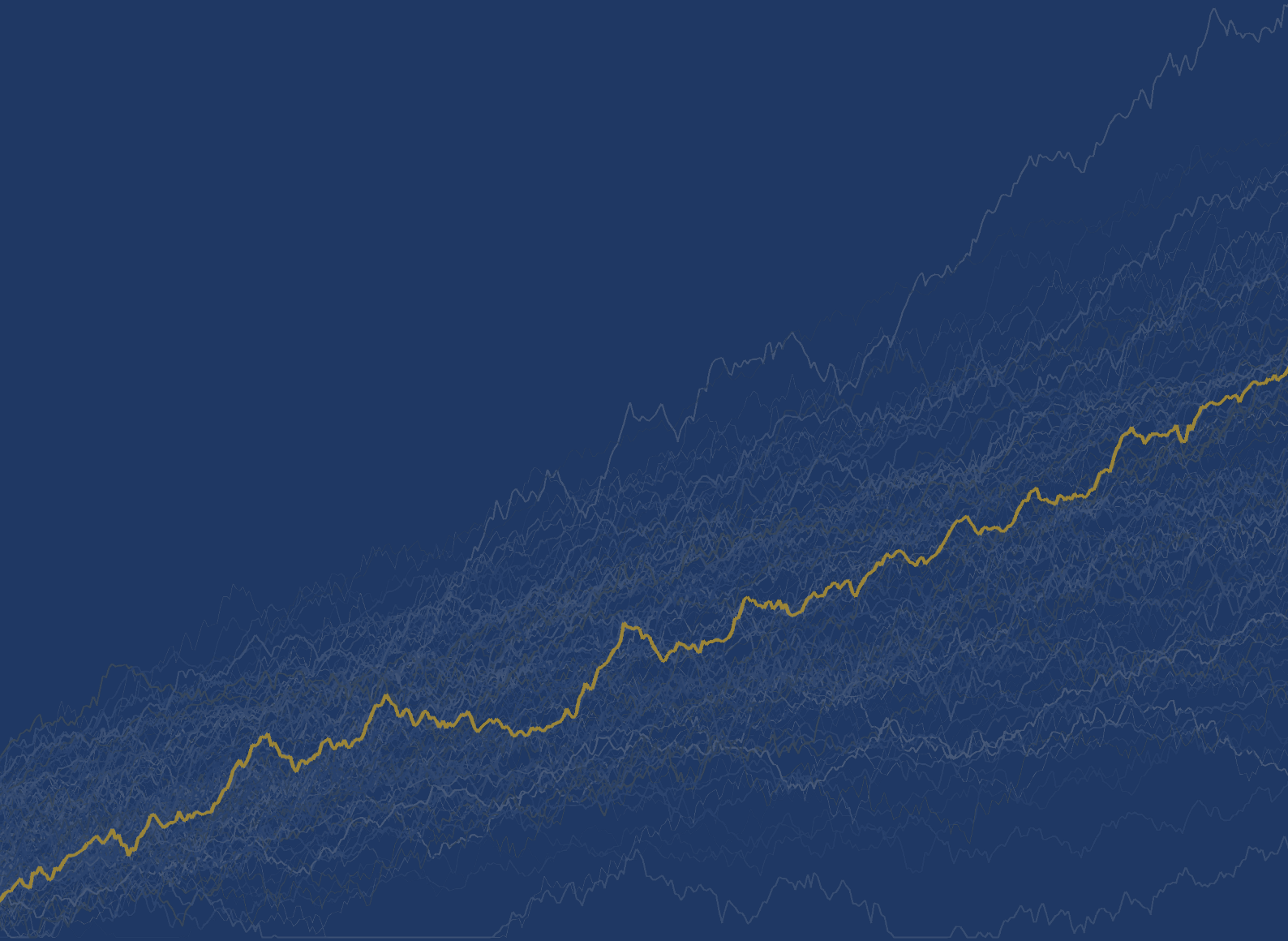

Public Markets

A Research Compendium on Global Listed Markets

LONG-RUN EVIDENCE · THE 2025 YEAR · FACTOR PREMIA · CONCENTRATION · FIXED INCOME · FORWARD RETURNS

MULTI-FAMILY OFFICE RESEARCH



■ Contents

This compendium synthesises data from primary institutional research sources including the UBS/Dimson-Marsh-Staunton Global Investment Returns Yearbook 2025, J.P. Morgan Asset Management Long-Term Capital Market Assumptions 2026, Vanguard Capital Markets Model (VCMM) December 2025 / March 2026, BlackRock Investment Institute Capital Market Assumptions (March 2026), Goldman Sachs Asset Management Investment Outlook 2026, Bloomberg Fixed Income Index data, and Dimensional Fund Advisors published research. All tables and exhibits are author-constructed from paraphrased and cited source data. This document contains no investment advice and is intended for professional and institutional readers. Document version 1.3, July 2026 — supersedes versions 1.0–1.2. Corrections and source revisions are recorded in the accompanying Erratum; version 1.3 added author-constructed exhibits with no changes to data or text; version 1.4 restores the Annex B gold cross-reference in §2.3, whose removal in v1.2 is corrected in the amended Erratum. Exhibits visualise the same author-paraphrased data presented in the adjacent tables, using indicative midpoints where sources provide ranges.

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■ Market snapshot

Global public markets at a glance, 2025–2026.

01	02	03
+22.3%	+17.9%	+31.9%
MSCI ACWI total return 2025Third consecutive year of double-digit gains [G]	S&P 500 total return 2025Despite spring tariff sell-off and shutdown [G]	MSCI World ex USA 2025Widest margin over S&P 500 since 1993 [G]
04	05	06
+33.6%	+7.3%	+12.2%
MSCI Emerging Markets 2025Best region globally for the year [G]	Bloomberg US Aggregate 2025Best bond return since 2020 [E]	EM Hard Currency debt 2025Best fixed income return since 2019 [E]

All figures total returns, calendar year 2025 unless noted. [E] Bloomberg Fixed Income indices; [G] Dimensional / MSCI / S&P sources. Sources cited in full in Appendix A.

Executive Summary

Public markets delivered extraordinary returns in 2025. Global equities advanced 22.3% on the MSCI All Country World Index, making it one of the strongest annual performances in recent memory. International and emerging markets materially outperformed the United States — in developed markets' case by the widest margin since 1993. Fixed income recovered robustly, with the Bloomberg US Aggregate returning 7.3% — its best year since 2020. Gold surged more than 50% to above \$4,000 per ounce for the first time.

Beneath these headline numbers, the data reveals a market of unusual structural tensions. The S&P 500's top ten stocks represent approximately 40% of the index by market capitalisation — up from roughly 20% a decade ago — while the top five technology companies command a collective market capitalisation of approximately \$17.6 trillion, exceeding the combined GDP of Japan, India, the United Kingdom, France, and Italy. US equity valuations are at their highest in decades, with the S&P 500 trading at 22x forward earnings as of end-2025 — matching the peak multiple of 2021 and approaching the record 24x of 2000. The Magnificent Seven's aggregate price-to-book ratio stands materially above the US market's 30-year average.

Against this, 125 years of global market data from the Dimson-Marsh-Staunton database establishes an unambiguous long-run hierarchy: equities have outperformed bonds, bills, and inflation in every country with a sufficiently long return history. Global equities delivered an annualised real return of 3.5% in the 21st century to date and 5.2% across the full 125-year record, with an equity risk premium over bills of 4.3%. These long-run premia are the empirical bedrock against which current valuations and forward return expectations must be assessed.

The consensus from institutional long-horizon models in early 2026 is notably more cautious on US equity growth than the recent past might suggest. Vanguard's Capital Markets Model projects US equity returns of just 3.9%–5.9% annualised over the next decade, explicitly citing stretched valuations. BlackRock's 10-year US equity forecast sits at approximately 5%, down from 6.2% a year prior. JP Morgan's Long-Term Capital Market Assumptions (30th anniversary edition) project 60/40 returns of 6.4% over 10–15 years, rising to 6.9% with a diversified alternatives allocation. The model-consensus across leading institutions is that bonds have re-emerged as a credible competitor to equities on a risk-adjusted basis for the first time since before the GFC.

The factor evidence from the Dimensional Matrix Book and the academic work of Fama and French — data extending to 1926 — shows that the size premium, value premium, and profitability premium have each been positive over long time periods and across multiple geographies, though each has experienced extended negative episodes. In 2025, US value lagged growth, large caps outperformed small caps, and profitability provided inconsistent signals across regions. The current environment of elevated large-cap growth valuations relative to value and small-cap segments is historically associated with prospective outperformance of the cheaper segments, though timing is inherently uncertain.

The structural tension in 2026

The same economy that is producing AI-driven earnings growth exceptional enough to partly justify elevated US equity valuations is also producing interest rate conditions that make high-quality bonds more competitive than at any time since 2007–2008. The forward return frameworks from Vanguard, BlackRock, and JP Morgan agree on the direction: lower expected US equity returns than the recent past, more attractive bonds, and better relative value outside US large-cap growth. The data supports diversification — geographically, across asset classes, and across the market-cap spectrum.

SECTION 01

The Long Run: 125 Years of Asset Class Evidence

1.1 The Dms Database

The most authoritative source of long-run public market return data is the Dimson-Marsh-Staunton (DMS) database, maintained by Professor Elroy Dimson (Cambridge), Professor Paul Marsh and Dr Mike Staunton (both London Business School). Since 2000 it has been published annually — originally with ABN AMRO, from 2009 with Credit Suisse, and since 2023 with UBS — as the Global Investment Returns Yearbook. The 2025 edition, published in March 2025, spans 125 years from 1900 to 2024 across 35 national markets, with 23 markets having complete 125-year histories and a further 12 markets with records of close to or more than 50 years. The database covers annual returns on equities, bonds, bills, inflation, and currencies, covering over 98% of global equity market capitalisation at inception.

No comparable dataset exists. The breadth, consistency, and independence of the DMS database makes it the reference standard for any serious assessment of long-run asset class behaviour. All long-run return statistics cited in this section are drawn from this source unless otherwise noted. A 2026 edition, extending the dataset to 1900–2025, was published in March 2026; the 2025 edition is used here as its 25th-anniversary century comparison is the analytical focus of this section.

1.2 Equities: The 125-Year Picture

The central finding of 125 years of data is unequivocal: equities have outperformed bonds, bills, and inflation in every country with sufficient return history. This finding is not market-specific or period-specific — it holds globally and across the full sample.

ASSET CLASS	GLOBAL REAL RETURN P.A.(1900–2024)	EQUITY PREMIUMVS BILLS	EQUITY PREMIUMVS BONDS
Global equities	5.2%	+4.3%	+3.1%
Global bonds	1.7%	—	—
Global bills	0.5%	—	—
US equities	~6.5%	+4.7%	+3.5%
Global equities (21st C only, 2000–2024)	3.5%	+4.3%	Higher than 20th C

Table 1.1. Long-run real returns by asset class, global aggregates. Source: UBS/Dimson-Marsh-Staunton Global Investment Returns Yearbook 2025 [A]. All figures are author-paraphrased from the Yearbook. 20th century figures are 1900–2000; 21st century figures are 2000–2024.

125 years of evidence: the equity premium endures

Real annualised returns — DMS / UBS Global Investment Returns Yearbook 2025 [A]; 21st-century sub-period hatched

Annualised real return, USD, 1900–2024		
US equities		6.5%
Global equities		5.2%
Global equities, 2000–2024		3.5%
Global bonds		1.7%
Global bills (cash)		0.5%

Exhibit 1. Long-run real annualised returns, USD, 1900–2024, with the 21st-century global equity sub-period, corresponding to Table 1.1. Author-constructed from UBS/DMS Global Investment Returns Yearbook 2025 data [A].

The 2025 Yearbook edition marks the 25th anniversary of the series and provides the first opportunity to compare a full quarter-century of 21st century market performance with the 20th century record. Key observations from this comparison include: 21st century equity returns have been lower than in the 20th century, while bond returns have been higher, reflecting the multi-decade bond bull market from 1982 to 2021. Yet the equity risk premium — the excess return of equities over bills — remained positive at 4.3% in the 21st century, consistent with the long-run 20th century premium. The hierarchy of risk and return (equities > bonds > bills) has held.

The 2025 Yearbook's special focus is diversification, highlighted in the context of rising market concentration. With the US now representing approximately 64% of global equity market capitalisation and the ten largest companies globally — nearly all of them US — representing approximately a quarter of the entire global equity market, the principle of geographic and cap-range diversification to reduce portfolio risk is as relevant as at any point in the database's 125-year history.

1.3 The Equity Risk Premium: Definition And Long-Run Behaviour

The equity risk premium (ERP) is the excess return that equities deliver over a risk-free benchmark (typically government bills) as compensation for bearing equity market risk. It is the foundational variable in all asset pricing models and the primary justification for holding equities over the long term. The DMS database records a global ERP of 4.3% over bills and 3.1% over bonds across 125 years. The US premium has been higher (approximately 4.7% over bills) reflecting the particular growth trajectory of the US economy and market through the 20th century.

The ERP is not fixed. It is time-varying, estimated from current valuations and earnings expectations rather than observed directly. Current US equity valuations — with the S&P 500 at 22x forward earnings and the Shiller CAPE (Cyclically Adjusted Price Earnings ratio) at historically elevated levels — imply a compressed forward ERP relative to the long-run average, consistent with the subdued 10-year equity return forecasts from Vanguard, BlackRock, and JP Morgan discussed in Section 6.

The survivorship question

A critical methodological point raised explicitly in the DMS Yearbook is survivorship bias. Investors who restrict long-run return analysis to markets that ‘survived’ will systematically overstate the ERP. The DMS database includes all major markets, including those that experienced significant losses (Russia 1917, China 1949, Germany post-WWII). The 4.3% global ERP is calculated on a broad, survivorship-adjusted basis. Estimates restricted to the US or to markets that continuously thrived throughout the 20th century will produce materially higher historical ERP estimates.

1.4 Bonds And Bills: The Long-Run Fixed Income Picture

Government bonds have delivered an annualised real return of 1.7% globally since 1900, and cash (bills) 0.5% — both positive in real terms but substantially below equities. The 21st century has, however, been kinder to bonds than the 20th: the long secular bond bull market from 1982 to 2021 produced exceptional bond returns by historical standards, followed by the sharp reversal in 2022 (the worst year for the Bloomberg US Aggregate in its history at -13.0%). The subsequent recovery in 2023–2025 — with the US Aggregate returning 7.3% in 2025 — has restored bonds to a position where, for the first time since the pre-GFC era, they offer competitive risk-adjusted returns relative to equities.

The concept of ‘bonds are back’ rests on the observation that bond yields today (approximately 4.1–4.5% for US investment-grade) exceed projected equity earnings yields for US large-cap growth stocks on some forward scenarios. This is a structural development of the first importance: for the four decades to 2022, equities dominated bonds so heavily that a 60/40 portfolio was widely regarded as sub-optimal. The current rate environment has changed that calculus.

PERIOD	10-YR US TREASURY YIELD	US AGG REAL RETURN	S&P 500 ERP VS 10YR	KEY CONTEXT
2000–2008	~6% → ~2.2%	Positive	Positive, declining	Dot-com bust; GFC
2009–2021	0.5–3.0% range	Low but positive	High (rates suppressed)	QE era; ZIRP
2022	~1.5% → 3.9%	-13.0%	Compressed sharply	Rate shock
2023	~3.9% → 3.9%	+5.5%	Moderate	Disinflation begins
2024	~3.9% → 4.6%	+1.25%	Elevated US equity val.	Sticky yields
2025	~4.6% → 4.18%	+7.30%	Compressed (high PE)	Bonds rebound

Table 1.2. US bond market context across market regimes. Sources: Bloomberg [E]; DMS Yearbook 2025 [A]; author-constructed.

SECTION 02

The 2025 Market in Detail

2.1 Global Equities: A Year Of International Rebound

2025 was the third consecutive year of double-digit gains for global equities, but its most significant structural feature was the reversal of the dominant trend of the prior decade: international markets materially outperformed the United States. The MSCI World ex USA Index gained 31.9% — outpacing the S&P 500 by the widest margin since 1993 and serving as a powerful reminder of the empirical case for geographic diversification. Emerging markets outperformed developed markets, with the MSCI Emerging Markets Index rising 33.6%.

The US market’s spring 2025 trajectory illustrates the risk of narrow concentration. Following global tariff announcements from the US administration in April, stocks fell sharply — April 2025 was one of the most volatile months in recent history. International markets, less dependent on US policy sentiment, demonstrated their diversifying properties. The S&P 500 recovered to close the year up 17.9%, but the path was considerably more volatile than the headline return suggests.

INDEX	2025 TOTAL RETURN	10-YR ANNUALISED (TO DEC 2025)	NOTES
MSCI All Country World (ACWI)	+22.3%	~11.3% (EUR)	Best year in recent memory [G, H]
S&P 500	+17.9%	+14.8% p.a.	Third consecutive double-digit year [G]
Nasdaq 100	+20.9%	Strong	Tech-heavy; ended below its autumn record highs [G]
MSCI World ex USA	+31.9%	Lagged US significantly	Widest margin over S&P 500 since 1993 [G]
MSCI Emerging Markets	+33.6%	Subdued vs DM	Best-performing broad region in 2025 [G]
MSCI World ex USA Value	+42.2%	—	Value rewarded ex-US [G]
MSCI World ex USA Small Value	+38.6%	—	Among the best-performing sub-asset classes of 2025 [G]
Russell 3000 Value	+15.7%	—	Value lagged growth in US [G]
Russell 3000 Growth	+18.2%	—	Growth marginally led in US [G]
Russell 2000 (US Small Cap)	+12.8%	More in line with LT avg	Small caps lagged US large caps [G]

Table 2.1. Equity index returns, 2025 and 10-year context. Sources: Dimensional Fund Advisors Market Review 2025 [G]; MSCI data; S&P data. Past performance is no guarantee of future results.

2025: the year leadership rotated

Developed ex-US equities beat the S&P 500 by the widest margin since 1993 — Dimensional [G]; Bloomberg [E]

Total return, USD, 2025		
International small value		+38.6%
MSCI Emerging Markets		+33.6%
MSCI World ex USA		+31.9%
MSCI ACWI		+22.3%
S&P 500		+17.9%
Bloomberg US Aggregate		+7.3%

Exhibit 2. Total returns in USD, 2025, corresponding to Table 2.1. Author-constructed from Dimensional [G] and Bloomberg [E] data.

The fact that international small value — often considered a peripheral sub-asset class — was among the best-performing segments of 2025 at +38.6% is a data point of practical significance. It validates the long-run academic evidence on the value and size premia (discussed in Section 3) and demonstrates that those premia, while unreliable in any given year, can deliver meaningfully when conditions align. It also reinforces the case for geographic diversification: US value lagged US growth in the same year that international value dramatically outperformed.

2.2 The S&P 500: A Century Of Annual Returns

2025 marks a milestone: with reliable S&P 500 data now extending back to January 1926, investors have access to a full 100-year return history of the US equity market. The long-term view reveals consistent compounding wealth creation despite extraordinary short-term volatility — the Great Depression, World War II, the Oil Shock, the dot-com crash, the GFC, COVID-19 — each was devastating in the short run and irrelevant to long-run outcomes for investors who stayed the course.

Annual returns from this century-long record include the following distribution characteristics: the S&P 500 has produced positive calendar-year returns in approximately 73–74% of all years. Negative years cluster around major economic shocks rather than being uniformly distributed. The worst calendar year was 1931 at approximately -43% during the Great Depression; 2008 was -37%. Positive extremes include +54% in 1933 and, more recently, +31% in 2019.

In real terms, the 10-year rolling return since 1926 has been negative in approximately 10–12% of all rolling windows (on a nominal total-return basis the figure is closer to 5%), confirming that equity market risk does not disappear even over a decade — but is substantially diminished relative to single-year risk. The 20-year rolling return has been negative in less than 2% of all windows in real terms — and never on a nominal total-return basis.

2.3 Gold: A Noteworthy 2025

Gold surged more than 50% in 2025, reaching above \$4,000 per ounce for the first time. The magnitude of the move — the largest annual price gain in approximately 46 years (a record also noted independently in Annex B, Quantitative Portfolio Analysis, of the European Family Offices research suite) — attracted considerable attention and reinforced gold's narrative as a portfolio hedge. However, the DMS Yearbook and a century of evidence caution against uncritical acceptance of this narrative. Since 1970, gold has experienced large price swings relative to annual inflation, and gold prices have shown little consistent relation to fluctuations in GDP. In both up and down markets, gold's behaviour has been unpredictable enough

that it cannot be reliably characterised as an inflation hedge, a recession hedge, or a safe haven in any mechanically reliable sense.

The 2025 gold move appears primarily driven by USD weakness (the dollar depreciated materially against major currencies), geopolitical risk premia, and central bank buying — particularly from emerging market central banks diversifying away from USD reserves. These are legitimate cyclical and structural drivers, but they do not constitute the same evidence base as the 125-year equity and bond return record.

SECTION 03

Factor Premia: Size, Value, and Profitability

3.1 The Academic Foundation

The most consequential development in empirical asset pricing since the Capital Asset Pricing Model is the identification of systematic return premia that persist across markets and time periods beyond what exposure to the broad equity market (beta) can explain. The foundational work is that of Eugene Fama (University of Chicago, Nobel laureate 2013) and Kenneth French, whose data extending to July 1926 for US equities and available on the Ken French Data Library constitutes the most widely used long-run factor dataset in academic finance.

Three premia have the strongest and most robust empirical support:

FACTOR PREMIUM	DEFINITION	HISTORICAL MAGNITUDE (US, LONG-RUN)	SOURCE DATA FROM
Market (equity) premium	Excess return of equities over risk-free rate	~4–5% p.a. (real)	DMS 1900–; Fama/French 1926–
Size premium (SMB)	Small-cap stocks vs large-cap stocks	~2% p.a. (gross, long-run)	Fama/French July 1926–
Value premium (HML)	Low-price/book vs high-price/book stocks	~3–4% p.a. (gross, long-run)	Fama/French July 1926–
Profitability premium (RMW)	High operating profitability vs low	~3% p.a. (gross, long-run)	Fama/French 1963– (profitability)

Table 3.1. Factor premia: definition and long-run magnitude. Gross figures are before fees, costs, and implementation drag. Source: Fama/French Data Library as referenced in Dimensional Fund Advisors published research [G, H]; DMS Yearbook 2025 [A].

These premia are grounded in valuation theory: a stock’s price reflects the present value of its expected future cash flows discounted at the investor’s required return. Stocks with lower prices relative to fundamental measures of value (lower price-to-book, higher book-to-market) imply higher discount rates and therefore higher expected returns. Stocks with higher operating profitability, all else equal, generate higher cash flows at any given price, implying higher expected returns. Smaller stocks carry additional risks — lower liquidity, greater sensitivity to economic cycles, higher idiosyncratic volatility — for which investors are expected to receive compensation.

3.2 The Premia In 2025: A Mixed Year

2025 provided a differentiated picture across factors and geographies that is instructive precisely because it defies any single narrative.

In the United States, value lagged growth: the Russell 3000 Value returned 15.7% versus 18.2% for Growth. Small caps also lagged large caps, with the Russell 2000 returning 12.8% against the Russell 1000’s 17.4%. The profitability premium was negative in global developed markets — the Fama/French Developed High Profitability Index rose 19.3% versus 30.0% for its low-profitability counterpart. These are short-term factor outcomes and represent a year in which the mega-cap AI-growth complex dominated US market returns, mechanically compressing the relative performance of everything else.

Outside the United States, the picture reversed. Value strongly outperformed growth internationally: the MSCI World ex USA Value Index gained 42.2% against 21.9% for its growth counterpart — a 20-percentage-point spread. International small value (+38.6%) was among the best-performing major sub-asset classes of the year. The profitability premium held in emerging markets, with the Fama/French EM High Profitability Index rising 32.6% versus 20.8% for low profitability.

Why factor premia are period-dependent but not illusory

The value and small-cap premia went through an extended period of underperformance from approximately 2007 to 2021 that tested the conviction of systematic investors. Yet the data shows that after negative 10-year periods for the value premium, the subsequent 10-year period has historically been strongly positive. The long-run persistence of these premia is not contingent on them working in every year or every decade; it is grounded in valuation theory and the rational pricing of risks that vary systematically across stocks. The data point that US small caps' 10-year returns to 2025 were 'more in line with long-term historical averages' while large-cap S&P 500 returns of 14.8% annually over the same period represented 'a notable deviation from large caps' long-term average' [G] encapsulates this dynamic precisely.

3.3 The Size Premium: Long-Run Context

The size premium — the tendency of smaller companies to generate higher returns than larger companies over long periods — has a controversial recent history. In the three years to June 2025, US large caps beat small caps by more than 8 percentage points annualised (19.7% vs 11.6%). The gap over the full decade was smaller but still historically wide: the S&P 500's 14.8% annualised return over the ten years to end-2025 represents a notable deviation above large caps' long-term average, while small caps' returns over the same period were more in line with their own long-term history [G]. This extended period of large-cap dominance was driven primarily by a small number of mega-cap technology companies whose market capitalisations grew to a scale unprecedented in financial history.

The valuation data makes the prospective case: as of December 2025, the aggregate price-to-trailing-earnings multiple for US large caps had grown to more than 30x — nearly double the average since 1963 of 17.6x — while the ratio for US small-cap stocks stood at just 16.4x. Historical analysis extending to 1975 shows that a US small-cap index screened for profitability (excluding the bottom quartile by operating profits as a percentage of book equity) delivered 15.17% annualised against 13.95% for unscreened small caps — a 122 basis point improvement from simple quality filtering within the small-cap universe.

3.4 The Value Premium: Structural Context For 2026

Value's underperformance in the US during 2025 must be read in the context of the extraordinary valuation spread that has opened between US large-cap growth and the rest of the market. As of December 2025, the Magnificent Seven traded at a price-to-book ratio materially above the US market's 30-year average, while the broader S&P 500 — at approximately 22x forward earnings — already sits well above its own 10-year average of 18.9x.

The academic evidence is clear that valuation spreads of this magnitude are historically followed by outperformance of the cheaper segments, though timing is inherently unreliable. The same evidence shows that value's long-run premium is pervasive — documented across US markets since 1926, international developed markets, and emerging markets. International value's 42% return in 2025, in a year when US value was flat relative to growth, demonstrates that the premium can express itself powerfully when conditions permit.

SECTION 04

Market Concentration: The Magnificent Seven and the S&P 500

4.1 The Scale Of Concentration

The concentration of US equity market capitalisation in a small number of companies has reached levels with no close precedent in the available data. As of December 2025:

The top 10 stocks in the S&P 500 represent approximately 40% of the index by market capitalisation, up from roughly 20% ten years ago.

The top 20 stocks represent close to 50% of the index.

The Magnificent Seven (Nvidia, Microsoft, Apple, Alphabet, Amazon, Meta, Tesla) account for more than 35% of the S&P 500's weight.

The top five AI hyperscalers (Amazon, Google, Meta, Microsoft, Oracle) are responsible for approximately 27% of total S&P 500 capital expenditure.

The top five US technology firms have a collective market capitalisation of approximately \$17.6 trillion — exceeding the combined GDP of Japan, India, the United Kingdom, France, and Italy (\$17.1 trillion).

The top 10 US stocks account for approximately 25% of the entire global equity market capitalisation.

These statistics are not simply descriptive: they have direct implications for portfolio construction, risk management, and performance attribution. An investor holding a standard global equity index fund — whether MSCI World or MSCI ACWI — now has an exposure to US large-cap technology that would have been considered dangerously concentrated even by aggressive single-stock investors a decade ago. Passive 'diversification' at the global level, in the current environment, does not deliver the geographic and sector diversification that the term traditionally implies.

4.2 Concentration And Valuations

The concentration itself is partially justified by earnings. The top 10 S&P 500 companies account for approximately 30% of total index earnings, not just 40% of market capitalisation — implying a valuation premium but not pure speculation. The ten largest companies trade at an aggregate price-to-earnings multiple of approximately 31x against 21x for the remainder of the index. This represents a premium but is not as extreme as the dot-com era, when the top 10 traded at 43x against 21x for the rest — and when their earnings share was below 20% rather than today's 30%.

Concentration is higher than 2000 — but so is earnings power

Ten largest S&P 500 companies vs the remainder — Goldman Sachs data via Columbia Threadneedle [I]

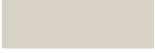
	Tech-bubble peak (2000)		Today (Aug 2025)
Top-10 share of index value		27%	 39%
Top-10 P/E multiple		43x	 31x
Rest-of-index P/E		21x	 21x
Top-10 share of earnings		<20%	 30%

Exhibit 3. Concentration metrics for the ten largest S&P 500 companies versus the remainder, tech-bubble peak versus August 2025, corresponding to Table 4.1. Author-constructed from Goldman Sachs data as presented by Columbia Threadneedle [I]; earnings share at the 2000 peak shown at an indicative 18% (source states below 20%).

The critical distinction is earnings quality and growth rate. In 2025, the technology sector accounted for approximately 53% of the S&P 500's total return, driven by AI-related earnings growth. Goldman Sachs estimates that the top technology companies' earnings contribution to the S&P 500 was approximately \$70 per share in 2025, forecast to rise to \$92 in 2026 and \$109 in 2027. This earnings momentum is structural if AI monetisation continues to scale; it becomes speculative if the earnings growth disappoints or the multiple applied to those earnings reverts toward historical norms.

METRIC	MEGA-CAP COHORT	REST OF S&P 500	FULL S&P 500	HISTORICAL S&P 500 AVG
Forward P/E (approx.)	~31x	~21x	~22x	~18.9x (10-yr avg)
Weight in S&P 500	>35%	<65%	100%	—
Share of S&P 500 earnings	~30%	~70%	100%	—
Share of 2025 index return	~53%	~47%	100%	—
Share of S&P 500 capex (top 5)	~27%	~73%	100%	—

Table 4.1. Market concentration metrics. The P/E and earnings-share rows describe the ten largest S&P 500 companies versus the remainder of the index (Goldman Sachs data as of 31 August 2025, via Columbia Threadneedle [I]); the index-weight row describes the Magnificent Seven; the return-share row describes the technology sector; the capex row describes the five largest hyperscalers. Sources: Goldman Sachs Asset Management [F]; Dimensional Fund Advisors Q1 2026 Portfolio Consulting [H]; Columbia Threadneedle [I].

4.3 Concentration Risk: What History Says

The DMS Yearbook's 2025 edition addresses concentration explicitly as its thematic focus, reappraising the importance of diversification in the context of rising market concentration. The historical evidence provides two relevant data points. First, market concentration has been a precursor to below-average long-run returns for the concentrated segment in most historical episodes — not because companies fail, but because expectations embedded in high multiples are difficult to exceed. Second, the specific industries that dominate markets change dramatically over time: of the US firms listed in 1900, approximately 80% of their value was in industries that are small or extinct today; the equivalent figure for the UK is 65%. Conversely, 63% of the value of today's listed US companies — and 44% in the UK — is in industries that were small or non-existent in 1900, including the technology sector, which barely existed as a category at that time.

This industrial rotation — the creative destruction of capitalism operating through public equity markets — is the mechanism through which the long-run equity premium is generated and sustained. It also means that concentrated bets

on today's dominant industries carry the risk of being caught in the transition to tomorrow's. Geographic diversification and sector diversification serve as structural protections against this risk.

SECTION 05

Fixed Income in Depth: Sectors, Duration, and Credit

5.1 The 2025 Fixed Income Recovery

The Bloomberg US Aggregate Bond Index returned 7.30% in 2025 — its strongest annual return since 2020 and a continuation of the recovery from the historic -13.01% drawdown in 2022. The cumulative gain since that trough now stands at 14.65%. Bloomberg's comprehensive year-in-review, covering the full universe of global fixed income indices, provides the most complete publicly available picture of 2025 bond market performance.

INDEX / SECTOR	2025 TOTAL RETURN	NOTES
Bloomberg US Aggregate Bond Index	+7.30%	Best since 2020; recovery from 2022 historic loss [E]
US Mortgage-Backed Securities (MBS)	+8.58%	Best MBS return since 2002; best MBS year in index [E]
US Government-Related Debt	+7.91%	Led by duration rally as yields fell [E]
US Corporate Investment Grade	+7.77%	Positive across all subsectors [E]
US CMBS (Commercial MBS)	+7.75%	Strong despite office sector headwinds [E]
US Treasuries	+6.32%	10-yr yield fell from ~4.6% to 4.18% [E, G]
US Asset-Backed Securities	+5.93%	Lagged; shorter duration weighed on results [E]
US High Yield	+8.62%	Third consecutive strong year: 13.44% (2023), 8.19% (2024) [E]
US Leveraged Loans	+5.51%	Underperformed HY; floating rate disadvantaged as yields fell [E]
Bloomberg Global Aggregate (USD unhedged)	+8.17%	Best annual return since 2020; USD weakness a factor [E]
EM Hard Currency (USD Aggregate)	+12.16%	Best since 2019; strongest fixed income class of the year [E]
EM Americas (hard currency)	+13.59%	Led EM; macro improvement and spread compression [E]
EM EMEA (hard currency)	+12.69%	Strong despite geopolitical backdrop [E]
EM Asia (hard currency)	+9.09%	Solid; softer credit environment relatively [E]

Table 5.1. Fixed income performance by sector, 2025. Source: Bloomberg, 'Looking Back at 2025: Fixed Income', January 2026 [E]. Author-paraphrased.

Bonds are back

Bloomberg index total returns [E] — best Aggregate year since 2020; cumulative recovery since the 2022 trough: 14.65%

Total return, USD

US Aggregate, 2022		-13.0%
US Treasuries, 2025		+6.3%
US Aggregate, 2025		+7.3%
US investment grade, 2025		+7.8%
US mortgage-backed, 2025		+8.6%
US high yield, 2025		+8.6%
EM hard currency, 2025		+12.2%

Exhibit 4. Bloomberg fixed income index total returns, 2025, with 2022 shown for contrast, corresponding to Table 5.1. Author-constructed from Bloomberg data [E].

The performance hierarchy of 2025 tells a coherent structural story. Longer-duration assets outperformed short-duration: the fall in US Treasury yields (from approximately 4.6% to 4.18% on the 10-year) mechanically benefited longer-duration bond holdings, while floating-rate instruments (leveraged loans, FRNs) lagged because their coupons reset downward as the Fed cut rates. Credit spreads tightened in most markets, adding excess return above the Treasury base across investment-grade and high-yield sectors.

5.2 The Structural Case For Investment-Grade Bonds

Vanguard's VCMM, as of March 2026, identifies high-quality US fixed income as offering the strongest risk-return profile across public asset classes over the coming 5–10 years — placing it above both US value equities and non-US developed markets equities in risk-adjusted terms. This is a historically unusual conclusion, reflecting the combination of current nominal yields (approximately 4.1–4.5% for US investment-grade) and the forward valuation compression expected in US equities.

The JP Morgan LTCMA 2026 edition supports a similar view from a portfolio construction perspective: the forecast annual return for a traditional USD 60/40 stock-bond portfolio is 6.4% over 10–15 years, while a 60/40+ portfolio with 30% in diversified alternatives generates a projected 6.9% with a 25% improvement in Sharpe ratio. The improvement from a diversified alternatives sleeve is largely attributable to the Sharpe-ratio contribution of alternative asset classes, but the fixed income component's attractive risk-adjusted return at current yield levels underpins the 60/40's revival as a credible institutional framework.

5.3 High Yield And Credit Risk

US high yield has delivered three consecutive years of strong performance: 13.44% in 2023, 8.19% in 2024, and 8.62% in 2025. The asset class has benefited from a combination of elevated absolute yields, falling default rates, and spread compression in the US economic soft-landing environment. This performance has attracted increased investor attention to public high-yield bonds as an alternative to private credit.

Dimensional Fund Advisors' research (May 2025), based on a 42-year MSCI dataset from 1980 to 2022, challenges the popular claim that private credit systematically outperforms public high-yield bonds. Using a RECTA framework (risk-

adjusted, excess, correlation, timing and alpha), Dimensional's Co-CIO Savina Rizova found that high-yield public bond benchmarks outperformed private credit over the 42-year period on a risk-adjusted basis. Private credit's IRR of approximately 10% over that period appeared attractive, but when adjusted for risk, correlation, and timing, public high-yield bonds performed comparably or better.

The public vs private credit evidence

Dimensional's 42-year analysis finding no risk-adjusted outperformance of private credit over public high-yield bonds is directly relevant to the finding of Annex B (Quantitative Portfolio Analysis) of the companion European Family Offices research suite, whose 21-year backtest shows negative alpha (-1.20% p.a.) for the consensus family office portfolio including private credit. The two analyses, conducted from different methodological approaches using different datasets, arrive at a consistent conclusion: the complexity premium for private credit is less well-established than its proponents claim, and the liquidity premium captured in public high-yield bonds is meaningful on a risk-adjusted basis.

5.4 Global Bond Diversification

Non-US bonds represent approximately 60% of the global bond universe by market value. Dimensional's Q1 2026 Portfolio Consulting analysis found that across 25 years of data (September 2000 to December 2025), global fixed income benchmarks with similar average durations to their US counterparts consistently offered lower standard deviations while producing higher annualised returns — in each case. This finding reflects the imperfect correlation of interest rate cycles across different monetary policy regimes: the ECB, the Bank of England, and the Federal Reserve do not tighten and ease simultaneously, providing natural diversification within multi-currency fixed income portfolios.

SECTION 06

Forward Return Frameworks: What Institutions Expect

6.1 The Capital Market Assumptions Landscape

Every major institutional asset manager publishes annual long-horizon return forecasts — Capital Market Assumptions (CMAs) — providing a proprietary forward-looking framework for strategic asset allocation. These CMAs are built from current market valuations, earnings growth expectations, yield levels, and macroeconomic forecasts. They are directional indicators rather than point predictions: Dimensional's own 'Reality Check' analysis of CMA accuracy found that equity forecast errors ranged from 1.7 to 6.8 percentage points across regions, with an average error of just over 4 percentage points. CMAs are most useful as a disciplined framework for comparing the relative attractiveness of asset classes, not as precise return forecasts.

The most rigorous institutional CMAs in the public domain are those of JP Morgan Asset Management (30th anniversary edition for 2026), Vanguard (VCMM, updated quarterly), and BlackRock Investment Institute (updated semi-annually). These three models differ in methodology and inputs but converge on several directional conclusions.

ASSET CLASS	JP MORGAN LTCMA 2026(10–15YR)	VANGUARD VCMM(10YR, DEC 2025)	BLACKROCK BII(10YR, MAR 2026)	KEY OBSERVATION
US equities (large cap)	6.7%	3.9%–5.9%	~5%	Vanguard most cautious; all below hist. avg
Non-US developed equities	7.4% (EAFE)	Higher than US	~7.1%	Consistent relative preference vs US
Emerging market equities	~7.7%	Higher than US	~7–8%	Highest return expectation; highest risk
US aggregate bonds	~4.5%	~4%	~4.1%	Near current yield levels; attractive vs history
US value equities	—	6.3%–8.3%	—	Vanguard explicit on value advantage vs growth
US growth equities	—	~2%–3%	—	Muted; stretched valuations
Global HY credit	~6–7%	—	~5.7%	Income-driven; above IG, below EM equity
60/40 portfolio (USD)	6.4%	~4–5% (w/ 40/60)	~5.5%	JPM highest; reflects more optimistic equity outlook
60/40 + alternatives (30%)	6.9%	—	—	JPM LTCMA flagship portfolio recommendation

Table 6.1. Institutional capital market assumptions comparison, early 2026. Sources: JP Morgan LTCMA 2026 [B]; Vanguard VCMM December 2025 [C]; BlackRock BII CMAs March 2026 [D]; Morningstar CMA compilation January 2026. Author-paraphrased; figures are indicative midpoints of published ranges.

The consensus next decade looks nothing like the last

10–15yr expected returns for US equities (Oct–Dec 2025 vintages) vs the realised decade — [B][C][D][G]
10-year annualised return, forecast vs realised

Realised: S&P 500, 2016–2025		14.8%
J.P. Morgan, US large cap		6.7%
BlackRock, US equities		just over 5%
Vanguard, US equities		3.9–5.9%

Exhibit 5. Ten-year forward return expectations for US equities (October–December 2025 vintages; Vanguard bar drawn at the 4.9% midpoint of its published 3.9–5.9% range) versus the realised ten-year S&P 500 return to end-2025, corresponding to Table 6.1. Author-constructed from J.P. Morgan [B], Vanguard [C], BlackRock via Morningstar [D], and Dimensional [G] data.

Three findings from this cross-institutional comparison are worth emphasis. First, there is near-unanimous agreement that non-US equities offer better prospective risk-adjusted returns than US equities over a 10-year horizon — a direct consequence of valuation differentials. Emerging market equities trade at approximately 40% discount to US equities on a forward P/E basis (Goldman Sachs AM), below their long-term average discount. Non-US developed markets trade at deep discounts to US equity on most valuation metrics.

Second, high-quality bonds now compete more credibly with equities on a risk-adjusted basis than at any time since the pre-GFC era. With nominal yields at approximately 4.1–4.5% for US investment-grade and real yields in clearly positive territory, bonds offer returns close to their historical inflation-adjusted norms while carrying significantly lower volatility than equities. Vanguard goes further, placing high-quality US fixed income as their top-ranked public asset class for the coming decade on a risk-return basis.

Third, the level of US equity valuations at end-2025 — 22x forward earnings, approaching the 2021 peak of 22x and the 2000 record of 24x — is embedded as a starting valuation headwind in all three models. The implication is not that US equities will fall, but that the margin above bonds and international markets must come entirely from earnings growth exceeding expectations, rather than from multiple expansion, which has already been harvested.

6.2 The Ai Variable

All three major forward-looking frameworks acknowledge AI-driven productivity as the primary upside scenario capable of lifting US equity returns above model forecasts. Goldman Sachs’ equity strategists project S&P 500 earnings of approximately \$340 per share in 2026, representing 24% annual growth, with AI infrastructure beneficiaries expected to account for roughly half of that growth. On this earnings trajectory, Goldman raised its year-end 2026 S&P 500 target from 7,600 to 8,000 in May 2026 [K]. The scale of the underlying investment is without precedent: hyperscaler capital expenditure reached approximately \$400 billion in 2025 (roughly 70% above 2024), with consensus estimates of \$754 billion for 2026 and \$905 billion for 2027 [K].

Vanguard is more sceptical at the index level, identifying a scenario where AI transforms the economy but where the investment returns accrue primarily to companies outside the current AI investment cycle — to consumers of AI technology who achieve productivity gains, rather than to producers of AI infrastructure whose elevated valuations already price in substantial growth. Vanguard’s explicit language is that ‘the best investment opportunities will emerge outside [the hyperscaler] sector.’

J.P. Morgan Asset Management's December 2025 return decomposition provides a structural data point that contextualises both views: multiple expansion drove 73% of the S&P 500's +24% return in 2023, with earnings growth contributing just 27%; by 2025, earnings growth drove 79% of the index's return, with the forward multiple essentially flat (22.1x at end-2024 to 22.2x in December 2025) [J]. This transition from multiple expansion to earnings-driven returns is typically considered healthier and more sustainable, but it also means that sustaining double-digit index returns requires double-digit earnings growth year after year — a high bar.

SECTION 07

Regional Equity Markets

7.1 United States

The US equity market remains the largest and most liquid in the world, representing approximately 70% of the MSCI World index and approximately 64% of global equity market capitalisation [A]. The S&P 500's 17.9% return in 2025 marked its third consecutive year of double-digit gains, driven overwhelmingly by the technology sector and by AI-related earnings growth. The Nasdaq 100 returned 20.9%.

The structural concern is not 2025's return but the starting point for 2026 and beyond. With the S&P 500 at 22x forward earnings (above the 10-year average of 18.9x), the index trades at a significant premium to all other major developed markets. The maximum drawdown risk embedded in a portfolio concentrated in US large-cap growth is material: in calendar year 2008 the MSCI World fell 40.3% — with a peak-to-trough drawdown deeper still — and did not recover its prior peak for several years. In the dot-com bust (2000–2002), the tech-heavy Nasdaq fell approximately 78% peak to trough.

7.2 Europe

European equity markets experienced two phases in 2025. Early in the year, European markets outperformed the US as economic recovery hopes and USD uncertainty created relative advantage. Following the US tariff regime announced in April 2025, the US market reasserted leadership through an AI-driven surge — but both the S&P 500 and MSCI Europe achieved double-digit returns in local currency terms over the full year.

The most significant structural development for European equities is fiscal and geopolitical rather than cyclical. Germany's easing of its constitutional debt brake for defence and infrastructure investment, the EU's Clean Industrial Deal and European Defence Industry Programme, and the continent-wide rearmament cycle represent a structural increase in European investment activity not seen since the post-war reconstruction era. Goldman Sachs AM notes that European equities broadly remain at a deep discount to US stocks, even adjusted for sector composition and different growth expectations, and that European bank valuations remain below long-term averages despite strong 2025 performance.

For European value-oriented investors, the data is compelling: the MSCI World ex USA Value Index returned 42.2% in 2025, the MSCI World ex USA Small Value Index returned 38.6%, and value stocks led by financials, defence, and utilities outperformed growth and quality sectors. European equity valuation spreads relative to US equities, on almost every conventional metric, are at multi-decade extremes in favour of Europe.

7.3 Japan

Japanese equities entered 2026 with structural tailwinds: ongoing corporate governance reforms driving increased dividends and share buybacks, robust corporate capex, wage growth supporting consumer spending, and potential fiscal support from the Takaichi administration. The expanded Nippon Individual Savings Account (NISA) programme is creating a structural shift in Japanese household asset allocation from cash toward equities — a development with long-run implications for domestic demand for Japanese stocks.

Japan's stock market also exhibits unique informational characteristics: fewer research analysts cover each listed company relative to other developed markets, language differences limit non-domestic analytical coverage, and proprietary data is difficult to access. These characteristics, per Goldman Sachs AM, create conditions favourable to systematic and fundamental active investors.

7.4 Emerging Markets

Emerging market equities were the best-performing broad regional category in 2025 at +33.6% on the MSCI EM Index. The supportive backdrop included a softening US dollar, declining oil prices, easing inflation, and a more dovish Federal Reserve. On a one-year forward P/E basis, EM equities trade at approximately 40% discount to US equities, below the long-term average discount. The long-run institutional consensus (JP Morgan LTCMA, BlackRock, Goldman Sachs AM) identifies EM equities as offering the highest return potential of any major equity region at the expense of the highest volatility.

Within EM, the most debated sub-region is China. Domestic stimulus measures, focus on technology innovation (AI, robotics, EVs, clean energy, biotech), and a growing domestic consumption orientation are enhancing China’s investment appeal, but geopolitical risk and earnings quality concerns mandate careful stock selection. India offers sustained GDP growth and strong corporate earnings driven by demographics, digital adoption, and domestic consumption. The digital payment volume in India has surged approximately threefold since 2021.

REGION	2025 EQUITY RETURN	KEY DRIVER	10-YR FORWARD VIEW	KEY RISK
United States (S&P 500)	+17.9%	AI earnings; large-cap tech	Subdued (val. headwind)	Multiple compression; concentration
Developed ex-US (MSCI World ex USA)	+31.9%	Value rotation; fiscal stimulus	Better than US (consensus)	Growth shortfall; geopolitics
Japan	Positive, double-digit	Governance reform; wages	Moderate positive	Yen volatility; policy reversal
Emerging Markets (MSCI EM)	+33.6%	USD weakness; China stimulus	Highest (with highest risk)	Geopolitics; China regulatory
International small value (World ex USA)	+38.6%	Value + small-cap + intl premia	Strong factor tailwinds	Factor timing uncertainty

Table 7.1. Regional equity markets: 2025 returns and 10-year forward context. Sources: Dimensional Fund Advisors [G, H]; Goldman Sachs AM [F]; JP Morgan LTCMA 2026 [B].

SECTION 08

The Public-Private Return Interface

8.1 Why The Comparison Matters

Public and private markets are not separate asset allocation universes: they are alternative expressions of ownership in the same companies, industries, and economic activities. The pricing and return relationship between listed and unlisted equities is one of the most actively debated questions in institutional portfolio construction. The companion SMP Financial Private Equity Markets Compendium provides a rigorous treatment of private equity returns, and Annex B (Quantitative Portfolio Analysis) of the European Family Offices research suite provides the quantitative backtest referenced below; this section draws the relevant connections to the public market data compiled here.

8.2 The Listed Proxy Problem

The Annex B quantitative analysis notes a fundamental methodological constraint: private equity holdings are valued using lagged appraisal-based methods that smooth returns, while listed equity proxies (used in the backtest) are mark-to-market. Applying an AR(1) smoothing filter (parameter $\phi=0.4$) to the PE, private credit, and real estate series in the consensus family office portfolio produces a Sharpe ratio approximately 0.15–0.20 higher and volatility approximately 3–4 percentage points lower than the true mark-to-market picture.

This smoothing gap is structurally important: when investors compare private equity returns to public market benchmarks, they are comparing appraisal-smoothed PE returns to volatile daily-priced public equity returns. The comparison systematically flatters PE. The appropriate comparison — PE on a PME (Public Market Equivalent) basis, matching cash flow timing — generally shows that PE has outperformed public markets over long periods at the top-quartile manager level, but that median PE performs more modestly and that the alpha is concentrated in manager selection rather than asset class exposure.

8.3 Correlation And Beta

Annex B reports that the listed PE proxy (LPX Major Market Index) shows a correlation of 0.95 with the MSCI World on annual returns, and that real estate (EPRA Nareit Developed) shows a correlation of 0.80. These figures confirm that the diversification case for listed PE proxies is weak: they behave as leveraged equity rather than as genuinely uncorrelated alternatives. The consensus family office portfolio's beta to the 60/40 benchmark is 1.29 — it amplifies market moves rather than dampening them.

The public market data in this report contextualises why this matters: in 2022, the 60/40 portfolio fell -15.8% and the consensus PE proxy fell -30%. In the GFC, the consensus portfolio — the Analysis Base Portfolio (ABP), as the backtest designates it — fell -33.7% against the 60/40's -22.1%. The claim that private markets provide genuine downside protection requires that unlisted assets' appraisal-based valuations genuinely diverge from underlying economic value during downturns — a claim the smoothing analysis explicitly flags as methodologically suspicious.

I The public-market lens on private allocations

Annex B (Quantitative Portfolio Analysis): 21-year backtest of the consensus European family office portfolio

-1.20%

Annualised alpha vs Global 60/40

Consensus portfolio, 2005–2025, listed proxies

0.95

PE proxy correlation to MSCI World

LPX Major Market Index, annual returns

135%

Down-capture vs the 60/40

Drawdowns amplified, not dampened

Exhibit 6. Headline statistics of the Annex B 21-year backtest of the consensus European family office portfolio, as cross-referenced in Sections 8.2–8.4. Author-constructed from Annex B (Quantitative Portfolio Analysis).

8.4 The High-Yield Vs Private Credit Evidence

Dimensional's 42-year MSCI analysis — the most rigorous long-run public comparison of private credit and public high yield — finds no risk-adjusted outperformance of private credit over the Bloomberg high-yield benchmark across 1980–2022. Three consecutive years of strong US high-yield performance (13.44%, 8.19%, 8.62%) and a 2025 EM hard-currency return of 12.16% — all in liquid, daily-priced instruments — make the opportunity cost of private credit's illiquidity premium increasingly difficult to justify on return grounds alone. The case for private credit must rest on diversification benefits, access to specific borrower types unavailable in public markets, or portfolio-level risk management considerations rather than on return enhancement per se.

The honest accounting

The public market evidence, taken together with the private market analysis in the companion compendium, points to a consistent conclusion: private markets have historically offered a genuine illiquidity premium in skilled hands, but that premium is increasingly concentrated in top-quartile manager selection, is partially illusory due to smoothing, and is less obvious on a risk-adjusted basis than is commonly presented. For a European family office holding 22% in private equity and private credit (36% including real estate and infrastructure) and 34% in listed equities, the public market data in this report is the more important input for understanding the portfolio's true risk profile — because the public markets establish the beta against which private market alpha must be measured.

SECTION 09

Research Gaps and Forward Agenda

9.1 Key Analytical Gaps

GAP	WHY IT MATTERS
Long-run factor premia outside the US	DMS database covers equities as a class; systematic factor data (size, value, profitability) of DMS quality does not yet exist for all 35 markets
European factor premia: domestic vs export	European equities' sector composition makes factor attribution more complex than US; value in Europe includes significant banking and energy exposure
Inflation-adjusted bond returns by regime	The DMS long-run bond return of 2% real includes the great bond bull market (1982–2021); the forward return environment for bonds in a structurally higher-inflation regime is not established
Currency effects on international equity returns	The 2025 experience (non-US materially outperforming in USD terms partly due to USD weakness) highlights how currency returns conflate with underlying equity market performance for non-USD investors
AI productivity premium: distribution across sectors	All three CMA models acknowledge AI as the primary upside scenario; none have reliable models for how the productivity gain distributes across sectors and geographies
Factor interactions in concentrated markets	The interaction of size, value, and profitability premia in markets with extreme concentration (eg S&P 500 top-10 at 40%+) has not been fully characterised

Table 9.1. Identified research gaps in public market analysis. Author-constructed.

9.2 Primary Research Questions

Does the long-run equity risk premium compress structurally when market concentration is at historical extremes, or does it normalise via price adjustment of the concentrated segment?

What is the historical precedent for the transition from PE multiple expansion-driven returns to earnings-driven returns at comparable valuation starting points, and what is the distribution of subsequent 5-year returns?

How do factor premia (size, value, profitability) interact with geographic diversification: is international small value a genuinely distinct premium, or a compound expression of three independent premia?

Given Dimensional's finding that 42 years of data shows no risk-adjusted outperformance of private credit over public high yield, what specific conditions (market segment, vintage, GP type) are necessary for private credit to justify its illiquidity premium?

What is the appropriate benchmark for European family office equity portfolios, given the near-equal split between North American and Western European exposures documented in the companion compendium?

APPENDIX A

Sources and Methodology

A.1 Primary Sources

REF	PUBLISHER & REPORT	DATE	URL	KEY DATA
[A]	UBS / Dimson, Marsh & Staunton — Global Investment Returns Yearbook 2025	Mar 2025	ubs.com/global/en/investment-bank/insights-and-data/2025/global-investment-returns-yearbook-2025.html	125-yr real returns; equity risk premium; 35 markets; diversification focus
[B]	J.P. Morgan Asset Management — Long-Term Capital Market Assumptions 2026 (30th edition)	Oct 2025	am.jpmorgan.com/us/en/asset-management/institutional/insights/portfolio-insights/lcma/	10–15yr return forecasts; 60/40 = 6.4%; 60/40+ = 6.9%; portfolio construction framework
[C]	Vanguard — 2026 Economic and Market Outlook / VCMM	Dec 2025 (updated Mar 2026)	corporate.vanguard.com/content/corporatesite/us/en/corp/vemo/	US equity 3.9–5.9% (10yr); bonds ~4%; value preferred over growth; AI scenario analysis
[D]	BlackRock Investment Institute — Capital Market Assumptions	Mar 2026 update	blackrock.com/institutions/en-us/insights/thought-leadership/capital-market-assumptions	10yr US equity ~5%; non-US 7.1%; US bonds 4.1%; new investment playbook
[E]	Bloomberg Professional — Looking Back at 2025: Fixed Income	Jan 2026	bloomberg.com/professional/insights/markets/looking-back-at-2025-fixed-income/	Full FI universe; US Agg 7.30%; EM HC 12.16%; US HY 8.62%; MBS 8.58%
[F]	Goldman Sachs Asset Management — Investment Outlook: Public Markets 2026	Nov 2025	am.gs.com/en-us/advisors/insights/article/investment-outlook/public-markets-2026	Market concentration data; EPS forecasts; regional equity analysis; EM valuations
[G]	Dimensional Fund Advisors — Market Review 2025	Jan 2026	dimensional.com/insights/market-review-2025-us-stocks-ride-rocky-road	Full 2025 returns matrix; factor outcomes; bond market; 100-yr S&P 500 context
[H]	Dimensional Fund Advisors — Q1 2026 Portfolio Consulting Market Themes	Apr 2026	dimensional.com/us-en/insights/insights-from-dimensionals-portfolio-consulting-group-q1-2026-market-themes	Concentration data (top 10 = 40%+); valuation exhibit; global bond diversification data
[I]	Columbia Threadneedle — The Rise of the Magnificent 7	Sep 2025	columbiathreadneedle.com/en/insights/the-rise-of-the-magnificent-7	Mag 7 vs rest: P/E 31x vs 21x; earnings share 30%; historical comparison to dot-com
[J]	J.P. Morgan Asset Management — What's Driving Stock Market Returns?	Dec 2025	am.jpmorgan.com/us/en/asset-management/institutional/insights/market-insights/market-updates/on-the-minds-of-investors/whats-driving-stock-market-returns/	Return composition: 73% of 2023 return from multiple expansion; 79% of 2025 return from earnings growth; forward multiple 22.1x → 22.2x
[K]	Goldman Sachs — The S&P 500 Is Forecast to Climb as Earnings Growth Powers Stocks Higher	May 2026	goldmansachs.com/insights/articles/s-and-p-500-forecast-to-climb-as-earnings-growth-powers-stocks-higher	Year-end 2026 target raised to 8,000 (from 7,600, May 2026); EPS \$340 (2026) / \$385 (2027); ~half of growth from AI beneficiaries
[L]	Investment News — Junk Bond Returns Beat Private Debt, Dimensional Says	May 2025	investmentnews.com/alternatives/junk-bond-returns-beat-private-debt-dimensional-says/260728	42-yr MSCI analysis; no HY outperformance by private credit on RECTA basis

Table A.1. Primary source summary. All figures author-paraphrased from cited sources. All sources publicly available as of July 2026. Supplementary primary data sources: Ken French Data Library, Dartmouth (factor series underlying Section 3); Robert Shiller, Yale University, US stock market and CAPE

dataset (Section 1.3); World Gold Council, Gold Demand Trends (central-bank demand context, Section 2.3); Morningstar, Experts Forecast Stock and Bond Returns: 2026 Edition, January 2026 (cross-provider CMA figures, Table 6.1).

A.2 On The Dimensional Matrix Book

The Dimensional Matrix Book is an annual publication covering returns across global equity and fixed income markets from 1926, tracking more than 13,000 stocks across 40+ countries. It is a password-protected, proprietary document distributed exclusively to Dimensional-affiliated financial professionals and cannot be reproduced, cited as a public URL, or incorporated into third-party publications without Dimensional's express written consent (per its distribution terms).

This compendium references the underlying data and intellectual framework of the Matrix Book through Dimensional's public research outputs — specifically the annual Market Review (reference [G]) and the quarterly Portfolio Consulting Market Themes (reference [H]) — both of which draw on the same underlying Fama/French and MSCI datasets that inform the Matrix Book. The factor data referenced in Section 3 is sourced from the Ken French Data Library, which is publicly available and constitutes the academic bedrock of both Dimensional's and the broader factor investing literature.

A.3 Methodological Notes

Return data: All equity returns cited are total returns (including dividends) unless stated otherwise. All returns are in US dollars unless stated otherwise. European investors should note that USD/EUR currency movements can significantly affect returns in EUR terms: in 2025, USD depreciation meant that EUR-based investors in US equities received materially lower EUR returns than USD returns, while EUR-based international equity investors benefited from USD weakness.

Long-run data: The DMS database uses the most complete country-level return histories available, including periods of hyperinflation, war, and market closure. Returns during such periods are included in the long-run averages. Where markets were closed or data unavailable, standard academic procedures for gap-filling are used as documented in the Yearbook methodology section.

Forward return frameworks: CMA figures cited are indicative medians or midpoints of published ranges. All three major CMA providers (JP Morgan, Vanguard, BlackRock) publish probability distributions of returns rather than point estimates. The uncertainty bands around 10-year equity return forecasts are typically ± 5 –8 percentage points at 90% confidence. These should be treated as directional guidance, not precise targets.

Copyright: All source data is paraphrased from published sources in the author's own words. No tables, charts, or data outputs from any source publication have been reproduced. The use of individual published statistics for research commentary is consistent with fair dealing for research and private study.

APPENDIX B

Glossary

TERM	DEFINITION
Bloomberg US Aggregate	The broadest measure of the US investment-grade taxable bond market, including Treasuries, government-related, corporate, and mortgage-backed securities. The reference benchmark for US fixed income.
CAPE / Shiller P/E	Cyclically Adjusted Price-to-Earnings ratio. The current S&P 500 price divided by the average of 10 years of real (inflation-adjusted) earnings. Developed by Nobel laureate Robert Shiller as a long-run valuation indicator.
Capital Market Assumptions (CMAs)	Proprietary long-horizon forecasts of returns and risks for major asset classes, published annually by major institutional asset managers. Typically cover 10–15-year horizons.
DMS Database / Yearbook	The Dimson-Marsh-Staunton database of annual returns on equities, bonds, bills, inflation, and currencies across 35 national markets from 1900. Published annually as the UBS Global Investment Returns Yearbook.
Duration	A measure of a bond's sensitivity to interest rate changes, expressed in years. A bond with duration 5 will rise (or fall) approximately 5% in price for a 1% fall (or rise) in interest rates.
EM Hard Currency	Bonds issued by emerging market sovereigns or corporates denominated in USD or other major currencies, rather than local currency. Avoids local currency risk; carries sovereign credit risk.
Equity Risk Premium (ERP)	The excess return that equities have historically delivered over risk-free government bills. The DMS long-run global ERP is 4.3% over bills; approximately 3.1% over bonds.
Factor / Factor premium	A systematic characteristic of stocks (eg small size, low price relative to book value, high profitability) that has historically been associated with above-market returns. Also called a return dimension or smart beta factor.
HML (High Minus Low)	The Fama-French value factor. The return of a portfolio long stocks with high book-to-market ratios (value) minus stocks with low ratios (growth). Proxy for the value premium.
Magnificent Seven	Informal term for the seven largest US technology/technology-adjacent companies by market capitalisation as of 2025: Nvidia, Microsoft, Apple, Alphabet, Amazon, Meta, Tesla.
MSCI ACWI	MSCI All Country World Index. A market-cap-weighted index of large and mid-cap equities across 23 developed and 24 emerging markets. The broadest global equity benchmark.
MSCI World	Market-cap-weighted index of large and mid-cap equities in 23 developed markets. Excludes emerging markets. Currently approximately 70% US.
PME (Public Market Equivalent)	A methodology for comparing private market investment returns to public market benchmarks on a cash-flow-adjusted basis, replicating the timing and magnitude of private fund cash flows in a public index.
RMW (Robust Minus Weak)	The Fama-French profitability factor. The return of stocks with robust (high) operating profitability minus stocks with weak (low) operating profitability.
SMB (Small Minus Big)	The Fama-French size factor. The return of a portfolio long small-cap stocks minus large-cap stocks. Proxy for the size premium.
Sharpe Ratio	Risk-adjusted return metric: $(\text{portfolio return} - \text{risk-free rate}) \div \text{portfolio standard deviation}$. Higher is better. A Sharpe of 0.5 or above is generally considered reasonable; 0.6+ strong.
VCMM	Vanguard Capital Markets Model. Vanguard's proprietary 10,000-simulation stochastic model for projecting 10- and 30-year return distributions across asset classes. Updated quarterly.

Glossary of key terms used in this compendium. Author-constructed.

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SMP Financial is an independent financial planning firm established in Dublin in 2006 and regulated by the Central Bank of Ireland. The firm advises business people, professionals, families, and retirees requiring expert guidance on financial planning, pensions, investment, and succession. SMP offers a dedicated multi-family office solution for clients seeking an institutional-grade, fully integrated wealth management and planning service.

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This compendium synthesises data from primary institutional research sources including the UBS/Dimson-Marsh-Staunton Global Investment Returns Yearbook 2025, J.P. Morgan Asset Management Long-Term Capital Market Assumptions 2026, Vanguard Capital Markets Model (VCMM) December 2025 / March 2026, BlackRock Investment Institute Capital Market Assumptions (March 2026), Goldman Sachs Asset Management Investment Outlook 2026, Bloomberg Fixed Income Index data, and Dimensional Fund Advisors published research. All tables and exhibits are author-constructed from paraphrased and cited source data. This document contains no investment advice and is intended for professional and institutional readers. Document version 1.3, July 2026 — supersedes versions 1.0–1.2. Corrections and source revisions are recorded in the accompanying Erratum; version 1.3 added author-constructed exhibits with no changes to data or text; version 1.4 restores the Annex B gold cross-reference in §2.3, whose removal in v1.2 is corrected in the amended Erratum. Exhibits visualise the same author-paraphrased data presented in the adjacent tables, using indicative midpoints where sources provide ranges.