



ELORA CAPITAL PARTNERS

SYSTEMATIC TRADING & QUANTITATIVE RESEARCH

QUANTITATIVE RESEARCH
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RESEARCH PUBLICATION · ISSUE 12

Global Cross-Asset Quantitative *Research*

*Systematic perspectives across equities, rates, currencies,
commodities and diversification*

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OVERVIEW · REGIME-DEPENDENT MARKETS

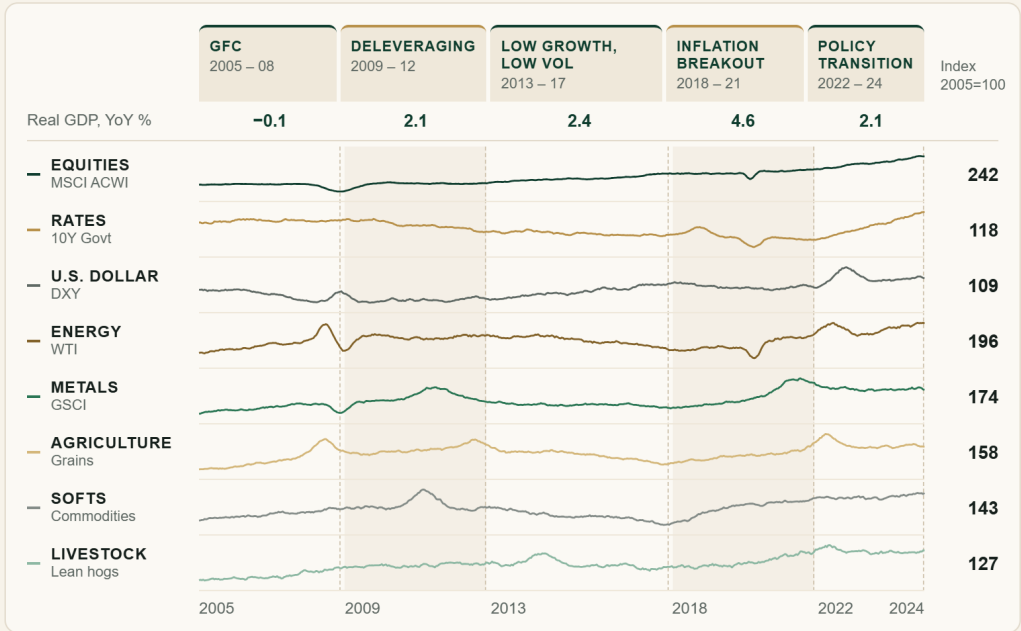
The Cross-Asset Lens

How assets interact across macro regimes

Markets are regime-dependent systems. Understanding how relationships strengthen, weaken or invert across regimes is the foundation of durable cross-asset alpha.

MULTI-ASSET REGIME TIMELINE 2005 – 2024

Weekly data, indexed to 100 at Jan 2005



Source: Elora Capital Partners, Bloomberg, Refinitiv, Haver Analytics.

STRONGEST CROSS-ASSET RELATIONSHIPS BY REGIME

Correlation, rolling 12M, averaged within regime

ASSET PAIR	GFC 2005 – 08	Deleveraging 2009 – 12	Low growth, low vol 2013 – 17	Inflation breakout 2018 – 21	Policy transition 2022 – 24
Equities – Rates	-0.62	-0.41	-0.28	0.36	0.18
Equities – U.S. Dollar	-0.48	-0.32	-0.12	0.41	0.29
Equities – Commodities	0.71	0.52	0.21	0.68	0.43
Equities – Metals	0.66	0.47	0.18	0.72	0.49
Rates – U.S. Dollar	0.58	0.43	0.30	0.56	0.41
Rates – Commodities	-0.44	-0.36	-0.20	0.46	0.22
U.S. Dollar – Commodities	-0.67	-0.51	-0.28	-0.62	-0.38
Energy – Metals	0.78	0.61	0.33	0.73	0.52
Agriculture – Energy	0.62	0.48	0.26	0.59	0.37
Softs – Commodity Index	0.55	0.41	0.19	0.51	0.34

Stronger negative -1.0 -0.5 0 +0.5 +1.0 Stronger positive

AVERAGE CROSS-ASSET CORRELATION

0.68

During risk-off observations, 2005 – 2024 — versus 0.31 in normal conditions.

THE CROSS-ASSET MECHANICS

Assets are linked to macro forces — growth, inflation, policy and risk appetite. As regimes shift, correlations and return drivers reshape.

Growth

Equities, cyclical energy and commodities tend to lead.

Inflation

Real assets, energy and metals tend to outperform.

Deleveraging

Duration extends, the dollar strengthens, commodities weaken.

Policy transition

Dispersion rises; currency and rate volatility shift.

RESEARCH CONCLUSIONS

- Regimes drive relationships**
Static correlations lead to model decay.
- Diversification is conditional**
Strongest when interactions are regime-aligned.
- Transitions matter**
Anticipation improves positioning and resilience.
- An integrated view adds value**
Captures feedback loops siloed analysis misses.

SECTION 01 · REGIME FRAMEWORK

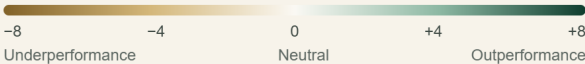
Macro Regimes

A multi-asset regime framework for systematic allocation and risk control

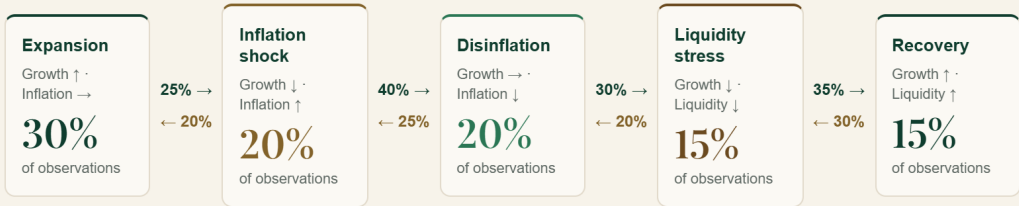
REGIME PAYOFF MATRIX NEXT 6 – 12 MONTHS

Excess return, %

ASSET CLASS	Expansion Growth ↑ · Inflation →	Post-crisis deleveraging Growth ↑ · Inflation ↓	Low growth, low vol Growth → · Inflation →	Inflation breakout Growth ↓ · Inflation ↑	Policy transition Growth mixed · Inflation →
Global Equities MSCI ACWI	8.2	4.1	5.6	-2.8	3.4
U.S. Equities S&P 500	9.1	4.8	6.2	-3.1	3.9
Developed ex-U.S. MSCI EAFE	6.7	3.9	5.4	-1.6	2.8
Emerging Markets MSCI EM	8.9	5.1	6.1	-2.4	4.3
Government Bonds Global Agg	-3.2	6.8	4.1	-5.6	2.8
U.S. Dollar DXY	1.1	3.6	0.8	4.9	2.1
Commodities BCOM	4.8	1.9	2.3	7.6	4.1
Energy WTI	6.1	2.4	1.9	9.7	4.8
Metals GSCI	5.4	1.8	2.6	8.1	4.2
Agriculture Grains	2.1	0.7	1.3	4.6	2.5
Softs Commodities	1.8	0.4	1.0	5.2	2.1
Livestock Lean hogs	1.5	0.3	0.8	3.9	1.7



REGIME TRANSITION DIAGRAM NEXT 6 – 12 MONTHS



Recovery → Expansion: 10% · closes the cycle

Arrows show estimated transition probabilities over 6 – 12 months.

RESEARCH NOTE

Market behaviour is regime-dependent. We classify five core macroeconomic regimes using growth, inflation, policy and liquidity dynamics.

The payoff matrix

Summarises historical relative performance across a broad multi-asset universe by regime over the next 6 – 12 months.

The transition diagram

Shows baseline probabilities of moving between regimes over the next 6 – 12 months.

Regime detection

Combines real-time indicators, Bayesian updating and trend filters to guide positioning, risk budgets and hedging.

Framework use

Underpins our systematic allocation engine and risk-control process.

PRINCIPLE

Regime awareness matters more than asset-class loyalty.

SECTION 02 · LEADERSHIP

Regime Map

What leads, what lags

Cross-asset regime scorecard across key macro conditions — z-score of 3-month change.

CROSS-ASSET REGIME SCORECARD

z-score, 3M change

ASSET CLASS	Growth Risk-on	Inflation Stagflation	Liquidity Risk-off	Volatility Stress	Trend Recovery
Global Equities MSCI ACWI	+1.8	-0.6	-1.1	-0.4	+1.1
U.S. Equities S&P 500	+2.1	-0.8	-1.3	-0.6	+1.4
Developed ex-U.S. MSCI EAFE	+1.5	-0.4	-1.0	-0.3	+1.0
Emerging Markets MSCI EM	+1.7	-0.3	-1.2	-0.5	+1.3
U.S. Government Bonds 10Y	-1.6	+0.8	+1.9	+1.2	-0.7
Investment Grade Credit IG	-0.9	+0.4	+1.4	+0.8	-0.4
High Yield Credit HY	+1.2	-0.5	-1.1	-0.3	+0.9
U.S. Dollar DXY	+0.6	+1.3	+1.5	+1.1	-0.8
Commodities BCOM	+0.9	+1.8	+0.4	+0.8	+0.6
Energy WTI	+1.1	+2.2	+0.1	+1.3	+0.7
Metals GSCI	+0.8	+2.0	+0.2	+1.1	+0.5
Agriculture Grains	+0.3	+1.1	-0.2	+0.4	+0.2
Softs Commodities	+0.4	+1.3	-0.1	+0.6	+0.4
Livestock Lean hogs	-0.1	+0.9	-0.3	+0.2	+0.1
Gold XAU	+0.2	+1.6	+1.2	+0.9	+0.3
Bitcoin BTC	+1.4	+0.7	-0.6	+0.8	+1.0
REITs Global	+1.3	-0.4	-1.1	-0.6	+0.9

Growth
↑ Growth · ↓ Inflation

Inflation
↓ Growth · ↑ Inflation

Liquidity
↓ Growth · ↓ Liquidity

Volatility
↑ Volatility · ↓ Risk appetite

Trend
↑ Growth · ↑ Liquidity

RESEARCH TAKEAWAYS

- 01

Growth leadership remains equity-centric
Developed-market equities show positive growth and trend scores, while rates lag on tighter liquidity.
- 02

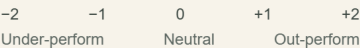
Disinflation in motion
Falling inflation momentum supports duration and high-quality credit; precious metals remain resilient.
- 03

Liquidity still a headwind for cyclicals
Global M2 contraction dampens cyclical and emerging-market sensitivity.
- 04

Volatility regime elevated
Risk remains two-sided; hedge demand supports Treasuries, gold and defensive sectors.
- 05

Commodities bifurcated
Energy and softs lead; grains and livestock lag on growth and trend dynamics.

LEGEND · Z-SCORE



LEADING ADVANTAGE

+1.36

Average regime lead of equities versus rates over the past three months.

SECTION 03 · SIGNALS

Asset Performance Ranking

Cross-asset trend, momentum and relative-strength signal

Assets are ranked on a composite of trend, momentum and relative strength across multiple time horizons. Rank 1 is strongest.

COMPOSITE RANKING · PRIOR MONTH TO CURRENT

15 assets

ASSET	PRIOR	Last month → now	CURRENT	CHANGE
MSCI ACWI ACWI	1		1	0
S&P 500 SPX	3		2	+1
NASDAQ-100 NDX	2		3	-1
STOXX Europe 600 SXXP	6		4	+2
MSCI Emerging Markets EEM	7		5	+2
U.S. Dollar Index DXY	4		6	-2
U.S. 10Y Government Bonds TNX	5		7	-2
Brent Crude Oil BZ=F	10		8	+2
Copper HG=F	8		9	-1
Corn · CBOT ZC=F	9		10	-1
Wheat · CBOT ZW=F	13		11	+2
Coffee · ICE KC=F	11		12	-1
Cotton · ICE CT=F	12		13	-1
Live Cattle · CME LE=F	14		14	0
Gold GC=F	15		15	0

Improved rank Declined rank Unchanged

RANKING SIGNAL

Leadership remains concentrated in developed-market equities, with rotation within regions and continued dispersion across rates, the dollar and commodities.

Equity leadership

Developed markets, especially U.S. equities, hold the top ranks across trend and momentum.

Stronger U.S. dollar

The dollar has strengthened on a shorter-term basis, pressuring commodities and emerging markets.

Mixed commodity picture

Energy momentum is improving, while agricultural and livestock assets remain under pressure.

Rates lag

Government bonds remain lower-ranked as higher yields and volatility persist.

RESEARCH CONCLUSION

Leadership remains narrow and concentrated in large-cap developed-market equities. Rates and the dollar have firmed near term; energy momentum is improving while agriculture and livestock stay under pressure.

SECTION 04 · RISK STRUCTURE

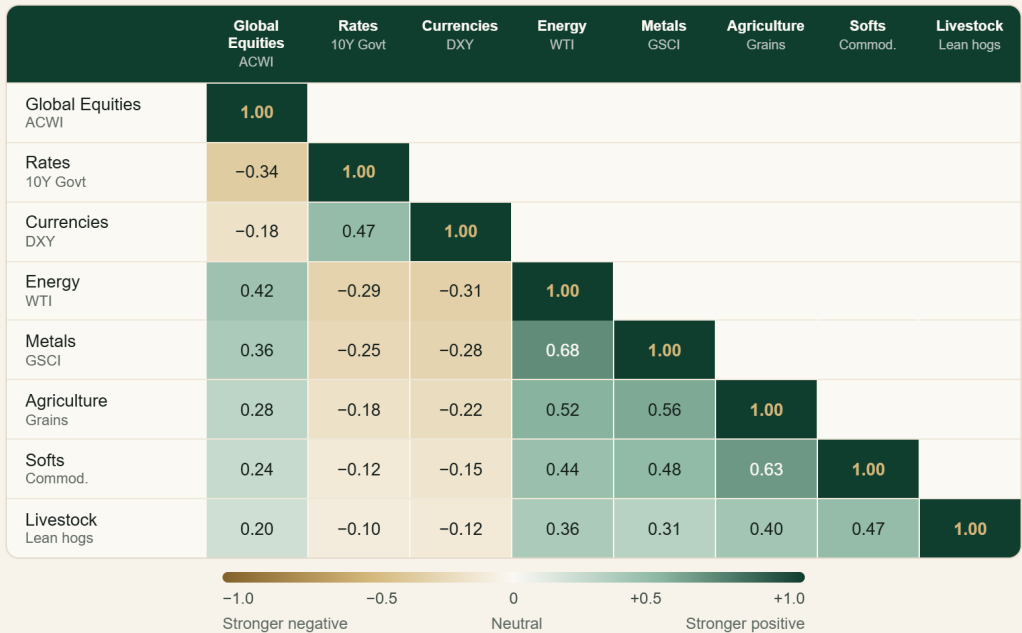
Risk is a Network

Volatility and correlation across global asset sleeves

Risk propagates through markets via persistent correlation structures and regime-dependent volatility. Understanding the network is a prerequisite for resilient, diversified portfolios.

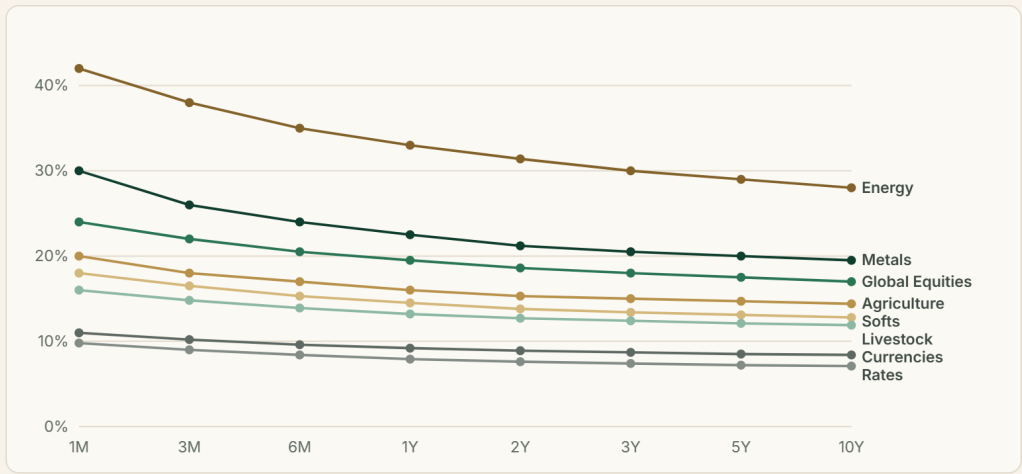
GLOBAL ASSET SLEEVE CORRELATION MATRIX

600-day rolling · Apr 2014 – Apr 2024



ANNUALISED VOLATILITY TERM STRUCTURE BY SLEEVE

Apr 2014 – Apr 2024



DIVERSIFICATION OBSERVATIONS

- 01 Rates provide portfolio ballast**
Government bonds are negatively correlated with equities and commodities.
- 02 Energy and metals cluster**
High positive correlation (0.68) reflects shared growth and dollar sensitivity.
- 03 Softs and livestock diversify**
Lower correlation to financial assets; driven by idiosyncratic supply and demand.
- 04 The dollar offsets commodities**
The USD is negatively correlated with every commodity sleeve and moves with rates.
- 05 Correlations are regime-dependent**
Links strengthen in stress and weaken in expansions.

MOST VOLATILE SLEEVES · 600-DAY

- 1 Energy 31.4%
- 2 Metals 21.2%
- 3 Global Equities 18.6%
- 4 Agriculture 15.3%
- 5 Softs 13.8%
- 6 Livestock 12.7%
- 7 Currencies 8.9%
- 8 Rates 7.6%

RESEARCH TAKEAWAY

Diversification is a function of *correlation*, not category.

SECTION 05 · VOLATILITY

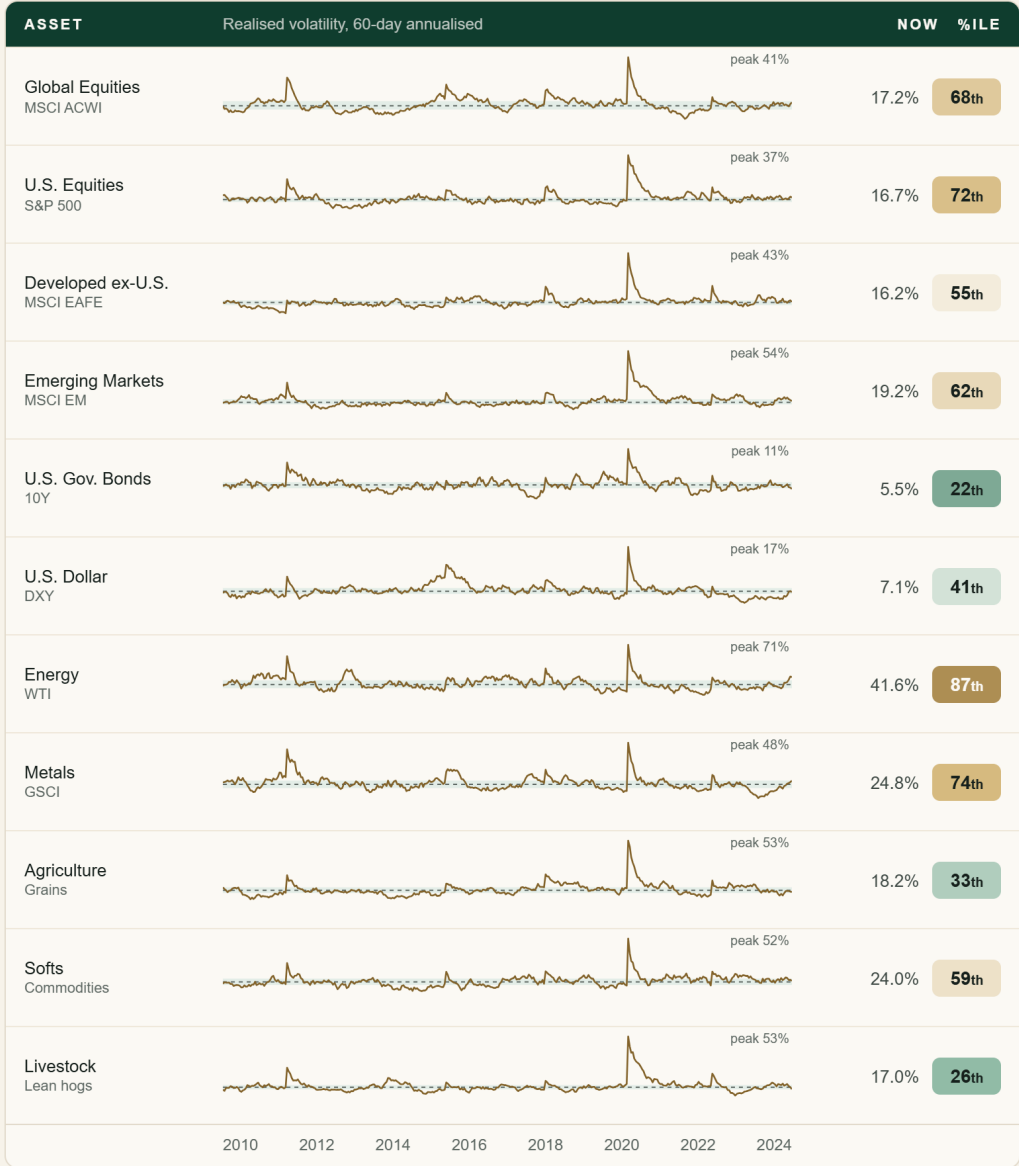
Volatility Intelligence

Understanding volatility regimes across global asset classes

Volatility is regime-dependent and persistent. We show where realised volatility sits within its own history — informing risk budgets, hedging priorities and opportunity sets.

CROSS-ASSET VOLATILITY REGIMES

Jan 2010 – Apr 2024



REGIME INSIGHTS

Energy · 87th percentile

Elevated on supply uncertainty and inventory sensitivity; options imply further near-term risk.

Metals · 74th percentile

Heightened amid growth cross-currents and variable Chinese demand.

Equities · 68th percentile

Above median, with persistent sector and regional dispersion.

Rates · 22nd percentile

Anchored policy expectations and deep liquidity suppress near-term rate volatility.

Agriculture & livestock

Ample supply keeps percentiles low; weather is the main upside catalyst.

METHODOLOGY

Realised volatility

Annualised standard deviation of daily log returns over 60 trading days.

Percentile ranking

Current level versus each asset's full history, Jan 2010 – Apr 2024.

Regime identification

State model combining level and slope thresholds.

Daily data · As of 30 April 2024
Source: Elora Capital Partners, Bloomberg

SECTION 06 · CALENDAR EFFECTS

Seasonality Lab

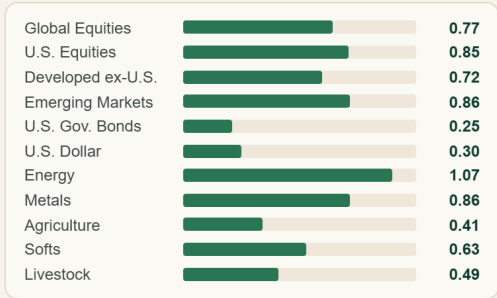
Historical calendar returns across major global markets

Seasonal patterns reflect persistent flows, policy cycles and behavioural tendencies. Median monthly returns and the probability of a positive month, January 2000 – April 2024.

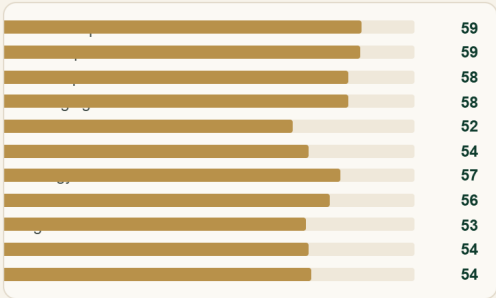
MEDIAN MONTHLY RETURN AND PROBABILITY OF A POSITIVE MONTH Jan 2000 – Apr 2024

ASSET	METRIC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
Global Equities ACWI	Median %	-0.2	0.8	1.1	1.5	0.9	0.3	1.9	-0.7	-1.2	1.6	1.8	1.4	+6.2
	% positive	56	62	68	64	58	55	61	49	45	60	67	66	
U.S. Equities S&P 500	Median %	-0.6	1.2	1.5	1.7	0.8	0.2	2.1	-0.9	-1.3	1.8	2.0	1.7	+7.4
	% positive	52	60	66	68	57	53	62	46	42	65	70	68	
Developed ex-U.S. EAFE	Median %	0.1	1.0	1.2	1.4	0.6	0.3	1.3	-0.6	-1.0	1.5	1.6	1.2	+5.2
	% positive	54	63	66	62	56	54	58	48	46	61	64	62	
Emerging Markets MSCI EM	Median %	1.1	1.4	1.3	1.0	0.5	0.1	1.5	-0.8	-1.6	1.9	2.1	1.8	+6.8
	% positive	60	64	62	58	54	51	60	45	40	65	69	67	
U.S. Gov. Bonds 10Y	Median %	0.8	0.6	0.3	-0.2	-0.5	-0.1	0.4	0.6	0.9	0.1	-0.4	0.5	+2.6
	% positive	62	58	52	48	44	46	50	54	58	51	46	54	
U.S. Dollar DXY	Median %	0.7	0.4	0.1	-0.3	-0.6	0.1	0.8	1.0	0.9	0.3	-0.2	0.4	+3.7
	% positive	60	56	50	48	42	51	58	62	59	53	48	56	
Energy WTI	Median %	2.8	2.1	1.4	0.6	-0.4	0.3	1.7	-0.5	-1.1	1.9	2.6	1.5	+11.9
	% positive	66	64	61	55	48	52	59	46	41	63	68	62	
Metals GSCI	Median %	1.9	1.3	1.2	0.8	-0.2	0.4	1.6	-0.6	-1.0	1.5	2.0	1.4	+9.3
	% positive	63	60	58	54	47	52	60	45	43	61	66	62	
Agriculture Grains	Median %	0.4	0.8	1.1	0.9	0.3	0.1	-0.2	-0.6	-0.8	0.7	1.2	1.0	+3.0
	% positive	55	58	61	59	51	50	46	44	42	56	60	58	
Softs Commodities	Median %	1.1	1.6	1.3	1.0	0.2	-0.1	-0.4	-0.7	-0.5	0.9	1.8	1.4	+5.6
	% positive	58	62	60	57	49	47	45	42	44	56	63	61	
Livestock Lean hogs	Median %	0.9	1.4	1.0	0.6	0.1	-0.3	-0.6	-0.2	-0.1	0.8	1.1	1.2	+4.9
	% positive	57	61	58	54	50	46	44	48	49	58	61	60	

AVERAGE OF MONTHLY MEDIANS, %



AVERAGE PROBABILITY POSITIVE, %



SEASONAL INSIGHTS

- 01 **Equities**

Positive seasonality in Q4 and July; September is historically weakest.
- 02 **Rates**

Modest strength in January and September; late spring softer.
- 03 **Currencies**

USD firms in Q1 and late summer; weaker from April to May.
- 04 **Energy**

Strongest in winter months (Nov – Feb); May and September soft.
- 05 **Metals**

Strength in January and November; September weakest.
- 06 **Agriculture**

Planting season supports March; late summer is weakest.
- 07 **Softs**

Strong late-year seasonality, led by November.

RESEARCH TAKEAWAY

Seasonality provides a *probabilistic edge*, not a guarantee.

Combine seasonal tendencies with macro regime, valuation and momentum signals.

SECTION 07 · DIVERSIFICATION

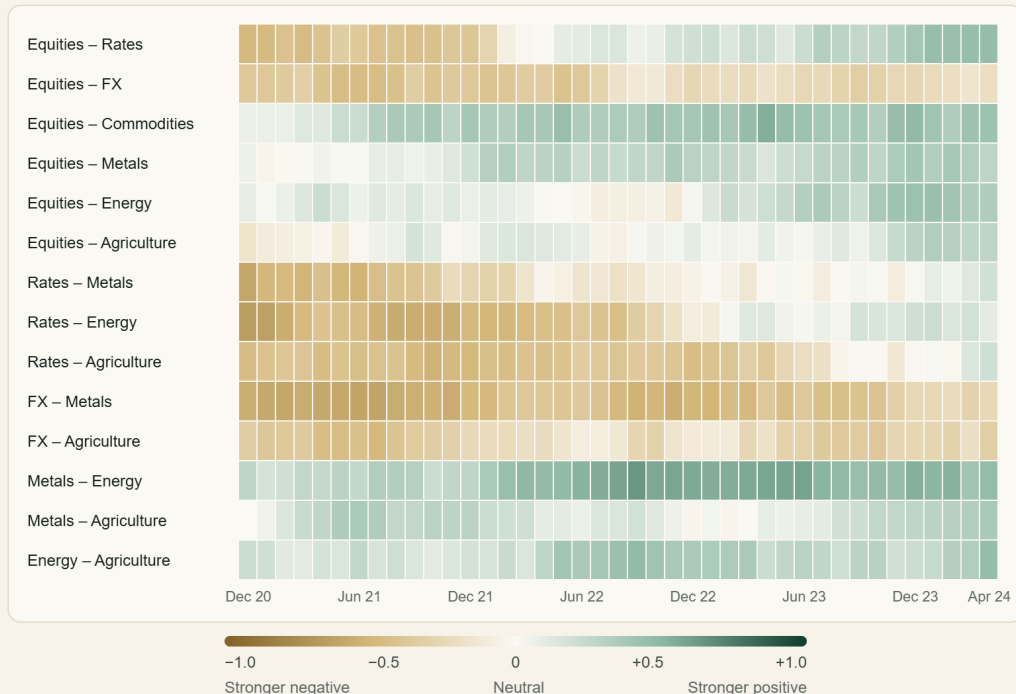
Correlation & Diversification

Dynamic correlation regimes shape diversification outcomes

Cross-asset correlations are time-varying and regime-dependent. Monitoring their evolution is essential for robust portfolio construction and risk management.

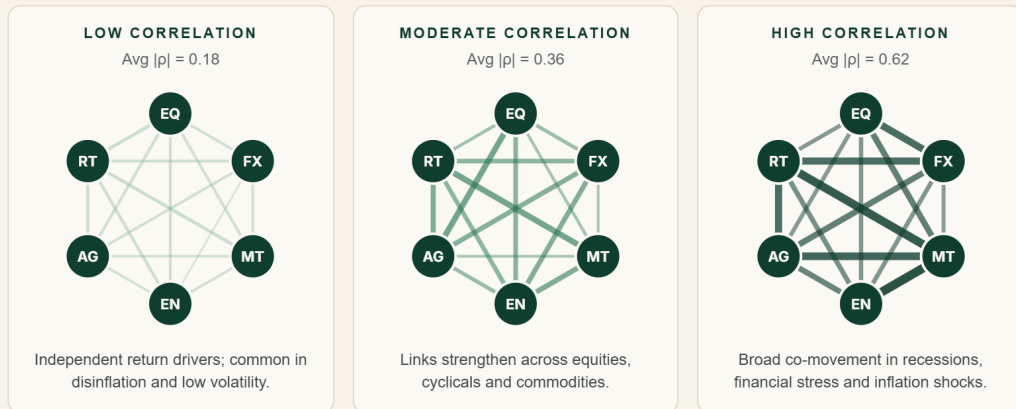
ROLLING 80-DAY CORRELATION HEATMAP

Dec 2020 – Apr 2024



CORRELATION NETWORKS BY REGIME

Line weight = average pairwise correlation



EQ Equities · FX Currencies · MT Metals · EN Energy · AG Agriculture · RT Rates

ANALYTICAL SUMMARY

- Low correlation regime**
Avg $|p| = 0.18$
Diversification is strong across most pairs, with independent return drivers.
- Moderate correlation regime**
Avg $|p| = 0.36$
Partial diversification; correlations rise in expansions and risk-on periods.
- High correlation regime**
Avg $|p| = 0.62$
Broad co-movement limits diversification and raises portfolio risk.

KEY TAKEAWAYS

- Correlations are regime-dependent**
Relationships shift meaningfully across macro environments.
- Diversification compresses in risk-off**
Equities, commodities and FX move together during stress.
- Monitoring improves resilience**
Allocation and hedging should reflect current regime conditions.

USE CASES

- Portfolio construction**
Size risk and improve diversification by regime.
- Risk management**
Add hedges when correlations rise in stress.
- Regime allocation**
Adapt weights as cross-asset relationships evolve.

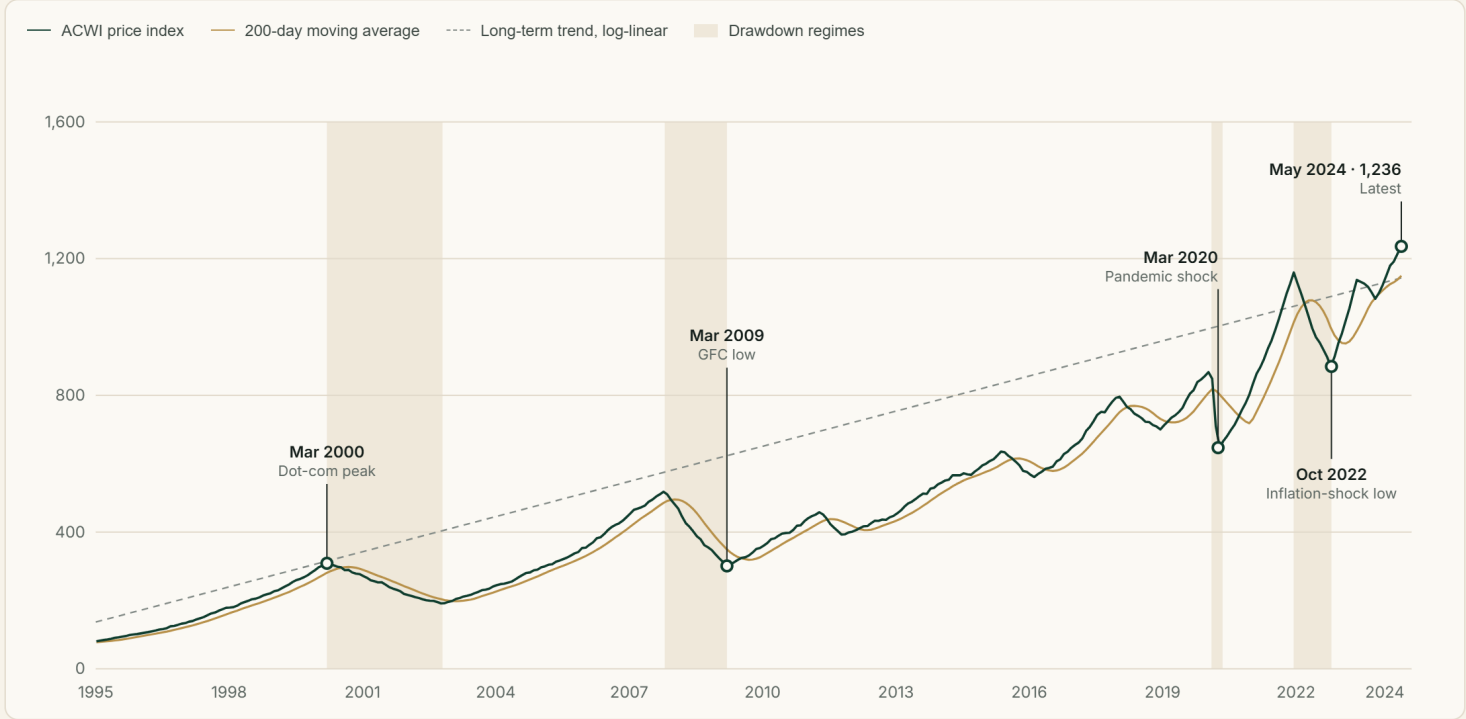
SECTION 08 · MARKET DEEP DIVE

Market Deep Dive

Global equities: long-term trend and regime context

MSCI ALL COUNTRY WORLD INDEX · PRICE, USD

Monthly · Jan 1995 – May 2024



MARKET CHARACTERISTICS

MOMENTUM · 12M

+8.6%

Price return

72nd percentile

TREND · VS 200-DAY MA

+12.4%

Above moving average

78th percentile

VOLATILITY · 36M

14.2%

Annualised

41st percentile

DRAWDOWN · 36M MAX

-24.1%

Peak to trough, 2022

Historical median -24.8%

INSTITUTIONAL COMMENTARY

**Structural uptrend,
managed risk.**

Global equities remain in a long-term structural uptrend, supported by earnings growth and innovation cycles. Price is extended above its 200-day average — historically associated with positive forward returns, but elevated volatility.

Momentum remains constructive and drawdown risk is moderate relative to history. We maintain broad exposure with active risk management and diversification across growth, value and quality factors.

GLOBAL MARKET COMPARISON

METRIC	Global Equities MSCI ACWI	U.S. Equities S&P 500	Developed ex-U.S. MSCI EAFE	Emerging Markets MSCI EM	U.S. Gov. Bonds 10Y	Commodities BCOM
12M return	+8.6%	+11.2%	+6.1%	+15.7%	+3.2%	+4.3%
Price vs 200-day MA	+12.4%	+14.8%	+6.3%	+20.1%	-1.8%	—
36M volatility	14.2%	15.6%	13.8%	16.9%	33.2%	21.4%
Max drawdown, 36M	-24.1%	-27.6%	-29.4%	-36.8%	-17.5%	-52.3%

SECTION 09 · RESEARCH LAB

Quantitative Research Lab

Does diversification actually reduce drawdown?

Diversification is a foundational principle of portfolio theory. Yet in stress episodes, diversified portfolios can still suffer deep and persistent drawdowns. This test examines how diversification affects drawdown magnitude, duration and recovery across asset classes, regimes and correlation structures.

01 · RESEARCH HYPOTHESIS

- H_0 Diversification does not reduce maximum drawdown.
- H_1 Diversification reduces maximum drawdown.

02 · METHODOLOGY

Factor-aware, correlation-sensitive framework

1

Define universe
Select asset classes, sources and proxies.

2

Estimate dependencies
Rolling correlations and regime dependencies.

3

Construct portfolios
Apply allocation rules and constraints.

4

Run simulations
1,000 block-bootstrap paths per scenario.

5

Evaluate and test
Compare drawdowns across portfolios.

03 · EXPERIMENTAL DESIGN

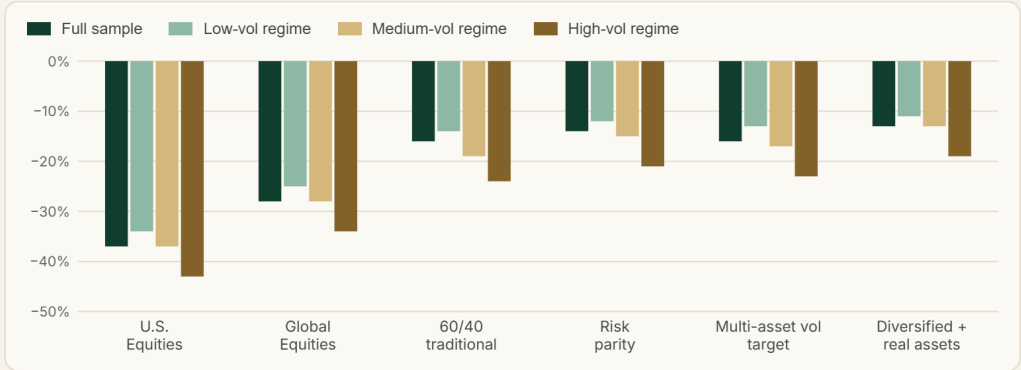
Sample period	Jan 2005 – Dec 2024
Frequency	Daily
Regime definition	Volatility tertiles: low, medium, high
Simulation engine	Block bootstrap with regime conditioning
Paths per scenario	1,000
Rebalancing	Monthly · long-only, fully invested
Cost assumption	5 bps per trade

04 · ASSET UNIVERSE

Global Equities	MSCI ACWI
U.S. Equities	S&P 500
Developed ex-U.S.	MSCI EAFE
Emerging Markets	MSCI EM
U.S. Treasuries	U.S. 10Y
Global High Yield	ICE BofA Global HY
Commodities	Bloomberg Commodity
Real Assets	FTSE EPRA Nareit Global

05 · MAXIMUM DRAWDOWN BY PORTFOLIO CONSTRUCTION

Illustrative results



KEY INSIGHTS

- 01 Drawdown reduction**
Diversification meaningfully reduces median and tail drawdowns across regimes.
- 02 Regime dependence**
Benefits are largest in expansions and more modest in high-volatility regimes.
- 03 Correlation structure**
Lower, more stable correlations improve drawdown mitigation.
- 04 Allocation matters**
Risk-parity and vol-targeted portfolios show shallower, shorter drawdowns than cap-weighted benchmarks.
- 05 Limits in extreme stress**
In systemic shocks correlations converge, reducing the benefit.

RESEARCH TAKEAWAY

Diversification reduces drawdown, but its effectiveness is *regime-dependent*.

Integrate diversification with regime detection, dynamic allocation and risk controls.

SECTION 09 · RESEARCH LAB

Research Lab: Results

Does diversification actually reduce drawdown?

We compare a concentrated single-asset strategy (global equities) with a broadly diversified multi-asset sleeve portfolio over the same 10-year sample.

TOTAL RETURN · 2015 – 2024

Diversified

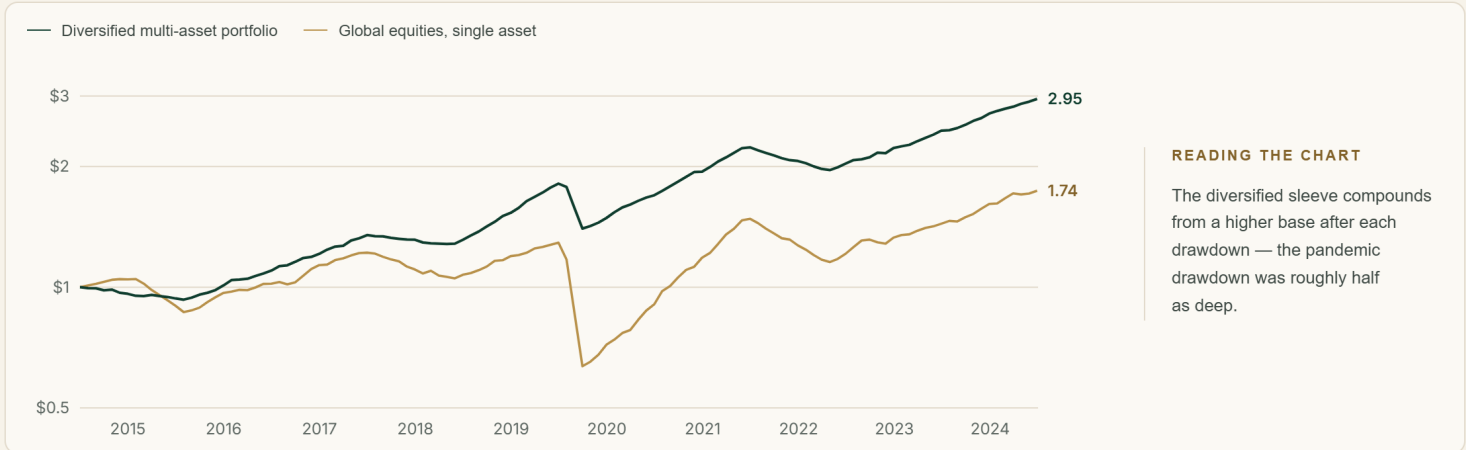
+195%

Global equities

+74%

CUMULATIVE GROWTH OF \$1, NET OF FEES

Log scale · Jan 2015 – Dec 2024

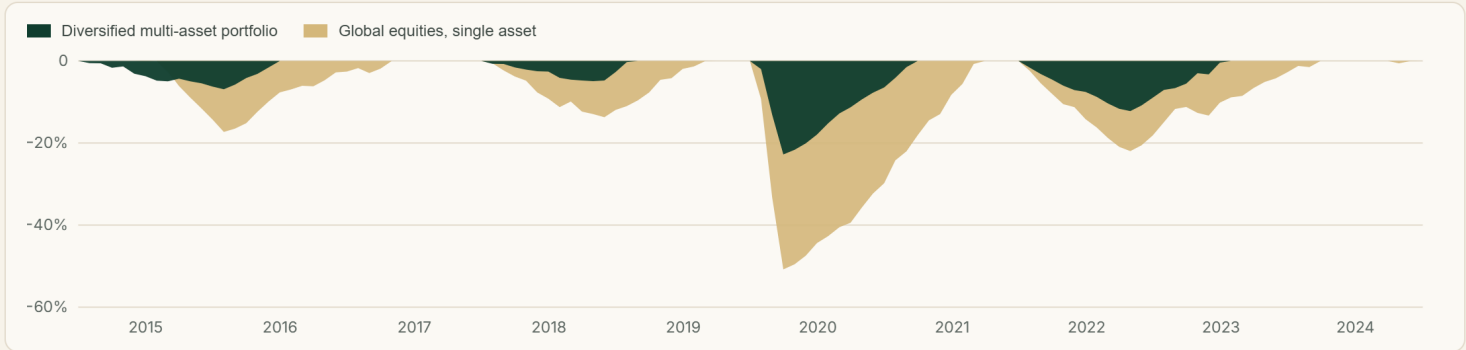


READING THE CHART

The diversified sleeve compounds from a higher base after each drawdown — the pandemic drawdown was roughly half as deep.

UNDERWATER DRAWDOWN, %

Decline from prior peak



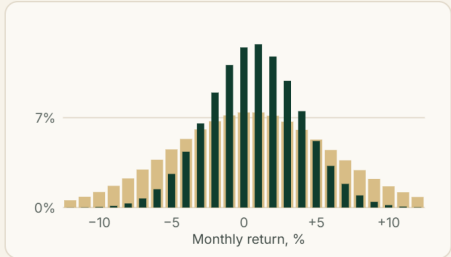
MONTHLY RETURN DISTRIBUTION

% of months

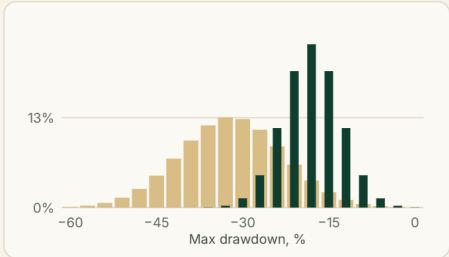
MAX DRAWDOWN DISTRIBUTION

1,000 paths

KEY STATISTICS · 10-YEAR



Diversified returns cluster tighter, with fewer extreme losses.



The distribution shifts right — smaller, less frequent extremes.

Metric	Diversified	Global Equities
Annualised return	8.7%	5.6%
Annualised volatility	11.2%	18.9%
Sharpe ratio	0.78	0.30
Max drawdown	-24.8%	-52.1%
Positive months	61%	54%
Avg. drawdown duration	6.2 mo	14.8 mo
Tail risk, 5th %ile	-4.1%	-8.9%