



FOR INSTITUTIONAL DISCUSSION ONLY

QUAD
DURATION CAPITAL

Alpha Specialist

- Provides Overlay Solutions that are highly customizable, risk-managed strategies designed to capture excess returns over a benchmark asset portfolio
- Use liquid derivative instruments that can be notionally funded offering cash-efficient structures that are tax-efficient and extremely customizable
- QuAD model driver of multiple 5 Star Morningstar-ranked fixed income 40 Act Funds
- 12-year track record generating excess returns through active duration strategies

Investment Philosophy

- Alpha can be derived from directional trading of interest rate markets
- Interest rates reflect underlying economic fundamentals
- A short-term horizon is effective for predicting market movements
- Integrating macro, valuation and technical indicators can increase forecast accuracy
- Disciplined implementation necessary to avoid human bias and emotional decisions

Exploiting an Inefficient Market

QuAD attempts to achieve alpha through tactical long/short duration positioning

- Interest rate markets are inefficient with many large participants (treasurers, pension funds, central banks) who are not profit maximizers
- Fed Policy creates profitable trading opportunities
- Tactical positioning exploits pricing discrepancies that are mis-aligned with the current economic, inflation and technical price dynamics

Balanced Movements ... Even During Secular Trends



Full Sample (1962-2025)

Declining Rate Months	49%
Rising Rate Months	51%

Secular Rise (1962-1982)

Declining Rate Months	42%
Rising Rate Months	57%

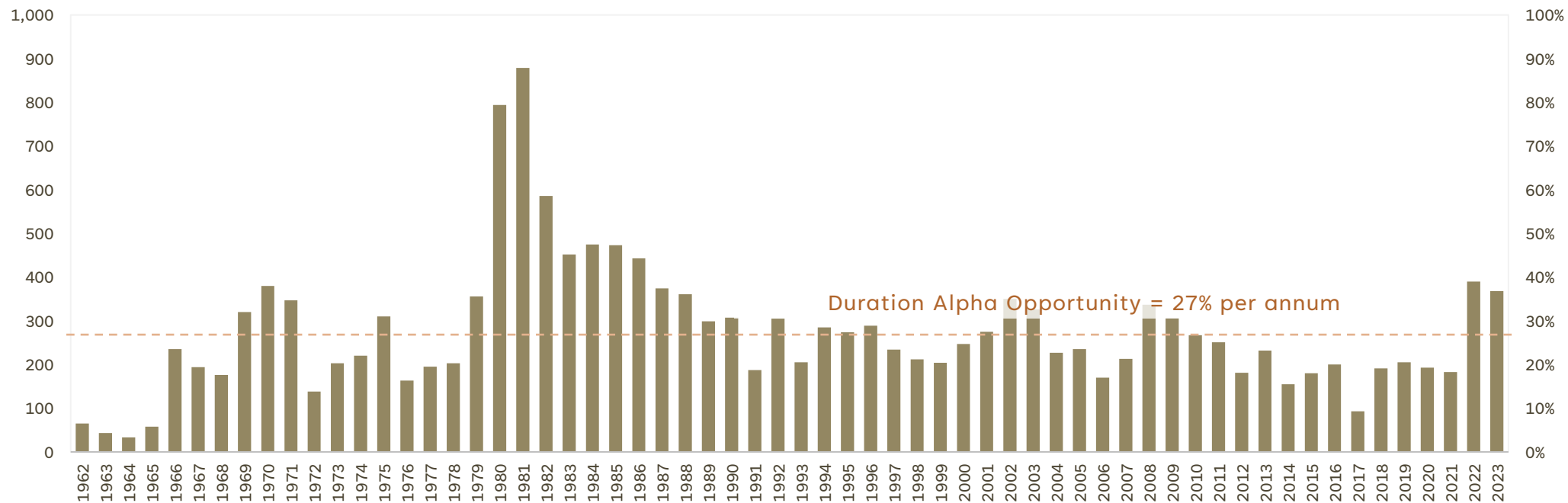
Secular Decline (1982-2020)

Declining Rate Months	53%
Rising Rate Months	47%

Monthly analysis of US market. 10-year Constant Maturity US Treasury yields based on yields published in Federal Reserve Statistical Release H.15.

Duration Alpha Opportunity Set

Alpha Opportunity of ± 10 Year Active Duration Overlay



This chart highlights the cumulative monthly yield change in the 10 Year Treasury yield per calendar year, and the estimated resulting return opportunity of a tactical long/short futures overlay strategy with perfect foresight (100% accuracy). Trade position (long or short) assumes static duration exposure of 10 years. See Disclosures for additional information.



Investment Framework

Quantitative Active Duration (QuAD)

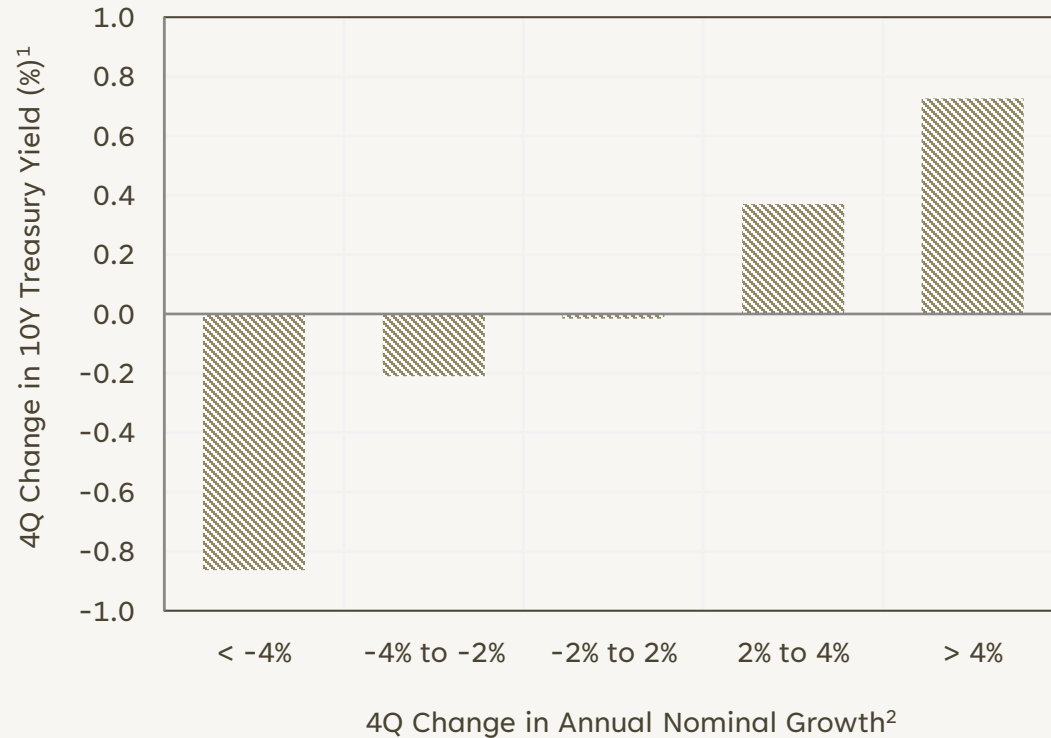
QuAD monitors various macro-economic and market-based factors that influence interest rate movements:

- Framework grounded in 80 years of research data
- Independently verified trading record spanning more than a decade
- Opportunity to generate liquid, scalable and uncorrelated alpha
- Implementation flexibly and tax efficient execution through futures

Evidence-based Framework

- Market environments are fraught with a constant state of noise
- Our model-based approach moves beyond reacting to coincident and lagging indicators offering an evidenced-based framework that prioritizes indicators based on their predictive power and proven position in the **business cycle sequence**
- Our goal is to find proxies for economic activity, inflation, monetary policy and sentiment that show robust, consistent, **stable predictive relationships** with long-term yields

Economic Activity and Interest Rates (1962 – Present)



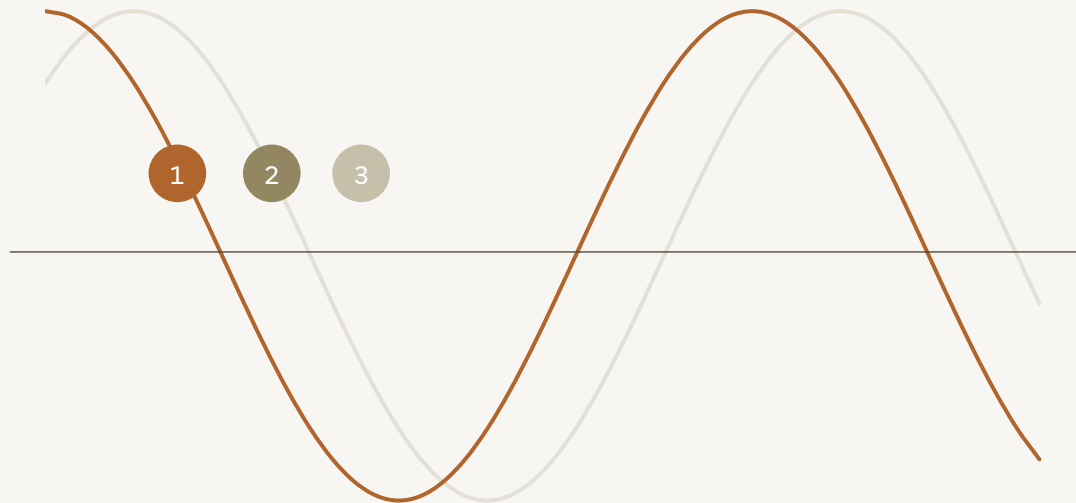
Economic activity is the primary driver to movements in long-term U.S. Treasury yields.

Active duration management attempts to exploit instances when yield levels diverge from underlying economic activity and inflation dynamics.

¹ Quarterly average constant maturity 10-yr Treasury yield, four-quarter change.

² Rolling annual nominal GDP growth, four-quarter change. Sources: Federal Reserve, Bureau of Economic Analysis

The Economic Sequence



★ Focused on Leading Variables of Economic Sequence

1. Leading Economy ———

Provides critical foresight into the foundational drivers to economic growth showing the earliest signals of economic change.

2. Aggregate Economy ———

Broad measure of economic health. Coincident indicators that describe the current state of the economy, not its future direction.

3. Lagging Economy ———

Represents service-oriented sectors that are the least sensitive to cyclical shifts (healthcare, non-residential construction).

Multi-step Mechanical Sequence

- Leading indicators do not "cause" recessions but sit at the front of a chain reaction
- Our macro composite monitors a syndrome of economic conditions based on financial market indicators like credit spreads, yield curve behavior, coupled with measures of employment and business activity
- In diagnostic terms, indicators mean less by themselves, but when observed together we can draw more meaningful conclusions of events from "possible" to "probable"

Evidence-based Forecasts

- The strongest evidence is obtained by combining data points into a single gestalt
- We monitor a broad set of leading indicators to develop the combined evidence of economic activity
- Most indicators are highly sensitive to credit conditions and interest rates (permits, new orders, construction, durable goods and labor growth)
- Proven to be predictive of the economic cycle over pre and post WW2 periods

Framework Objectives

- **Profitability** - Target information ratio of 0.5; represents the top quartile performance
- **Reliability** - Signals should prove correct at least half the time
- **Symmetry** - The trading rules should be profitable and reliable in bull and bear markets
- **Independence** - Signals should convey unique information (uncorrelated)
- **Simplicity** - Complicated specifications may yield higher in-sample results but run the risk of parameter drift

Unique Approach

- Unique framework based on anticipating reactions to economic and market variables:
 - ★ **Short-term** (avoid long and variable time horizon forecasts)
 - ★ **Hard data** (avoid “soft”, consensus-based data)
 - ★ **Comprehensive** including a variety of data sets (macro, technical, value)
- Eliminate emotions and human biases that can lead to sub-optimal investment decisions

Logical Framework

- What are logical, fundamental drivers of interest rates?
 - ★ **Macro-economic indicators:** *Is the economy expanding or contracting?*
 - ★ **Valuation indicators:** *Is the bond market rich or cheap?*
 - ★ **Technical indicators:** *Are there momentum or sentiment effects?*
- Can these drivers be precisely measured throughout history?
- Does history prove them to be robust, consistent, stable relationships?

Quantitative Active Duration (QuAD)

QuAD monitors various macro-economic and market-based factors that influence near-term interest rate movements

- ★ Framework grounded in **80 years of research data**
- ★ Independently **audited record** spanning more than a decade
- ★ Opportunity to generate liquid, scalable and **uncorrelated alpha**
- ★ Implementation flexibly and **tax efficient** execution through futures

Variable Attributes

QuAD model variables must possess certain attributes:

LOGICAL

Variables must have economic rationale behind predictive relationship.

MEASURABLE

Avoid survey variables that are not numerical. Data must be “hard-data” (i.e. quantifiable)

LONG STANDING

Variable histories that can be analyzed over various environments to gauge stability of predictive relationship.

ORTHOGANAL

Variables must add unique information (uncorrelated).

Variable Composites

Our model assesses a broad set of uncorrelated predictive factors:

ECONOMIC	INFLATION	FED POLICY	VALUATION	TECHNICALS
Are real-time measures of the economy expanding or contracting ?	Are price levels accelerating or decelerating ?	Is current policy restrictive or accommodative ?	Are current levels higher or lower than long-term value thresholds ?	Are current bond market technicals negative or positive ?

Exploiting Market Inefficiencies

- Economic information is not immediately discounted in the bond markets
- Traditional long-term outlook not aligned with short-term cycle of economic data flow
- Tendency for human bias and emotions around the investment decision
- Participants may fail to integrate macroeconomic, valuation and technical constructs

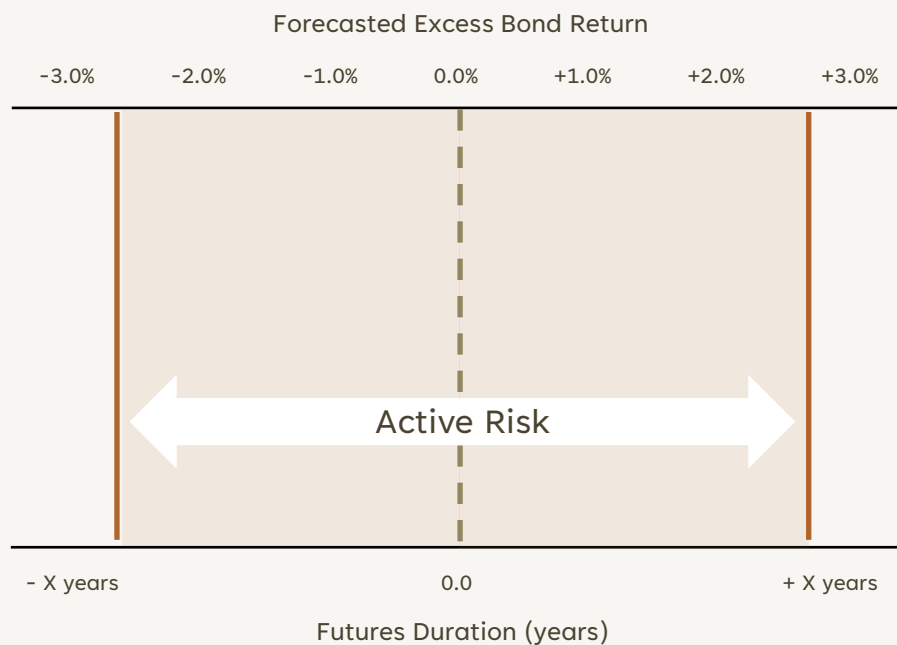
Confidence in Framework's Sustainability

- Framework grounded in 80 years of research data
- Indicators founded on essential economic principles demonstrating stable predictive correlations across different economic and market conditions
- A disciplined and uniformly implemented investment strategy
- Portfolio manager with 20 years of extensive and pertinent interest rate trading expertise spanning various interest rate cycles and economic environments

Strategy Benefits

- ★ **Excess Return:** Substantial excess return opportunity
- ★ **Cash Efficiency:** Futures allow for small portfolio cash allocation
- ★ **Scalability & Capacity:** Deep and liquid futures markets allow for substantial capital
- ★ **Non-correlation:** Portfolio diversifier leading to higher risk-adjusted returns
- ★ **Tax Efficiency:** Section 1256 allows for gains taxed @ long-term tax rates

Construction of Futures Overlay



Overlay Parameters

Unbiased alpha opportunity with pre-determined bounded active risk, no portfolio leverage and daily monitoring of through highly liquid exchange-traded futures

Based on \$50M	Max Duration	10Y Contracts	Margin-Equity
U.S. Directional	± 5 years	± 367	1.51%
U.S. Directional	± 10 years	± 734	3.03%
U.S. Directional	± 20 years	± 1,468	6.05%

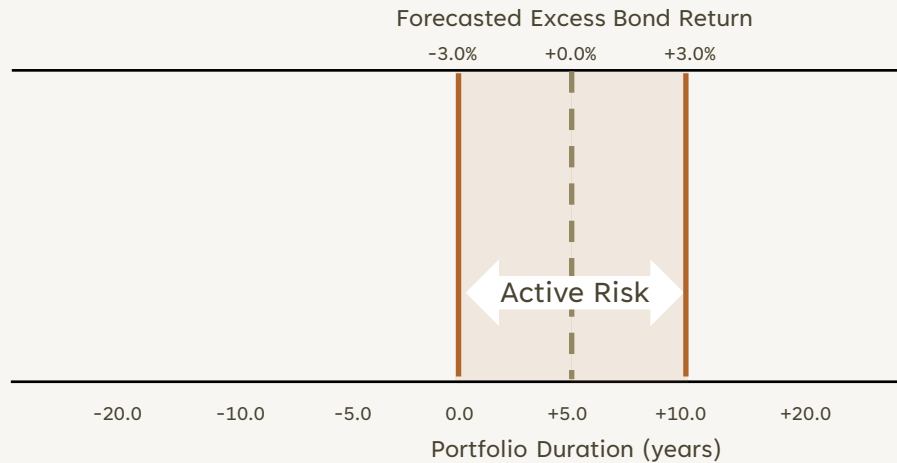
Customized Applications

Fixed Income Strategy

Long-biased portfolio exposure structured to generate excess returns relative to a fixed income benchmark.

Core Portfolio Duration = +5 years (bonds)

Active Duration Risk = ± 5 years



Absolute Return Strategy

Unbiased portfolio structured with ability to generate profits in up or down markets (absolute returns).

Core Portfolio Duration = 0 years (cash)

Active Duration Risk = ± 20 years

