Ai For Alpha

The Strategy Spotlight
# ML-Driven Decoding: A Path to Outperformance in Tactical Risk Parity

Introduction

- **Risk Parity / Risk-Balanced Strategies** allocate risk across multiple asset classes—most equities, credit derivatives, bonds, and commodities—in pursuit of more stable and consistent returns.

- By balancing these exposures, Risk Parity Strategies aim to perform well across various economic conditions:

  - **Equity and credit allocations** capture economic growth.

  - **Bonds** thrive during disinflationary periods or when government and central bank interventions stabilize financial markets.

  - **Commodities** help hedge inflationary risks, while **gold** acts as a store of value against currency debasement under fiscal or monetary stimulus.

- While the sharp rise in interest rates—approximately 300 basis points in 2022—negatively impacted risk parity strategies, such an extreme scenario is unlikely to recur in the near future.

- Many governments appear inclined toward **fiscal dominance**, fostering an environment more favorable to risk parity and risk-balanced approaches.

Ai For Alpha has pioneered a machine learning (ML) approach to replicate ("decode") and enhance Risk Parity portfolios solely based on their historical performance. This **Risk Parity Decoding** technique infers the evolving positions of prominent Risk Parity funds and indices (e.g., S&P Risk Parity, AQR Risk Parity, Invesco, AHL Target Risk) from the variation of their daily NAV without requiring additional inputs. **This results in a transparent and potentially outperforming alternative for investors.**

Methodological Underpinnings

- **Broad Asset Universe**: which encompasses equity indices, government bonds, short positions on credit derivatives, and commodities, covering 16 markets in total.

- **Target Volatility at 9%**: Aims to replicate the moderate risk profile typical of Risk Parity funds.

- **Graphical Models:** The Ai For Alpha method builds on Kalman filters and robust penalized regression to present a unified framework that optimizes the smoothing of regression betas over time while integrating interactions across factors. This approach extends simpler linear or Kalman-filter-based methods by dynamically capturing time-varying exposures and interdependencies among multiple markets or assets. Through targeted regularization, the model manages complexity and mitigates overfitting, carefully penalizing large or unstable exposures.

- **Enhancing Performance with Machine Learning:** Ai For Alpha leverages Machine Learning to refine risk parity strategies by transforming the traditional objective function into an utility function that balances both minimizing tracking error and improving excess returns relative to the benchmark. **By systematically identifying assets with the strongest risk–reward profiles while reducing exposure to those with heightened downside risks**, the model tactically adjusts asset weights in response to evolving market conditions and volatility regimes. This adaptive approach ensures that the portfolio maintains a **strong correlation with the risk parity benchmark** while **enhancing overall performance**, offering investors a more resilient and dynamic risk-balanced strategy. This unified framework of Graphical Model generalizes the notion of cointegration alpha introduced by Alexander and Dimitriu (2002, 2005), demonstrating that portfolios optimized with cointegration to an enhanced index can achieve superior index tracking and market-neutral alpha simultaneously.
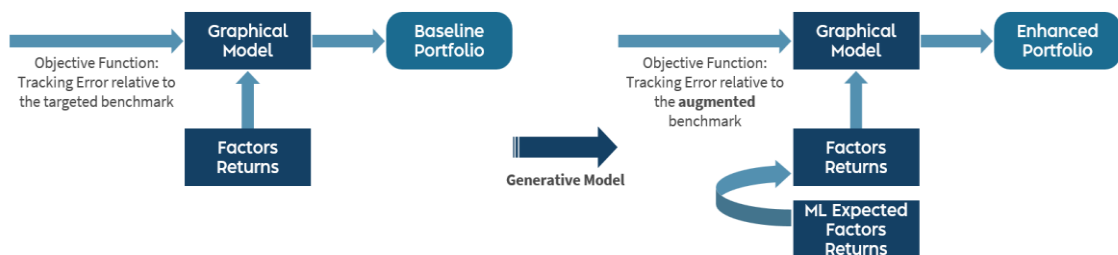
Ai For Alpha ML-driven Enhanced Decoding

Value Proposition

1. **Consistent Positive Information Ratio**

- An **alpha generation** that exceeds tracking error across various time horizons.

- Over shorter periods:

    o **1-year Information Ratio:** 1.38

    o **3-year Information Ratio:** 2.02

- Over longer periods (5–10 years), **Information Ratio always remains above 0.6**, indicating consistent risk-adjusted excess returns across all timeframes.

2. **Machine Learning-Driven Tactical Allocation**

- The model dynamically reallocates toward assets with **higher risk-adjusted return potential** while managing risk exposures.

3. **Strong Benchmark Correlation**

- Exceeds **90% across all time frames** (1–10 years), confirming the strategy's accuracy in tracking the target.

Period	Annual Return	Annual Volatility	Information Ratio relative to the Risk Parity Benchmark
1 Year	10.2%	7.8%	**1.38**
3 Years	5.6%	9.9%	**2.02**
5 Years	7.4%	10.7%	**0.8**
7 Years	7.6%	10.2%	**0.64**
10 Years	7.0%	9.1%	**0.62**

Performance statistics over all time frames in absolute and relative terms (source: Ai For Alpha)
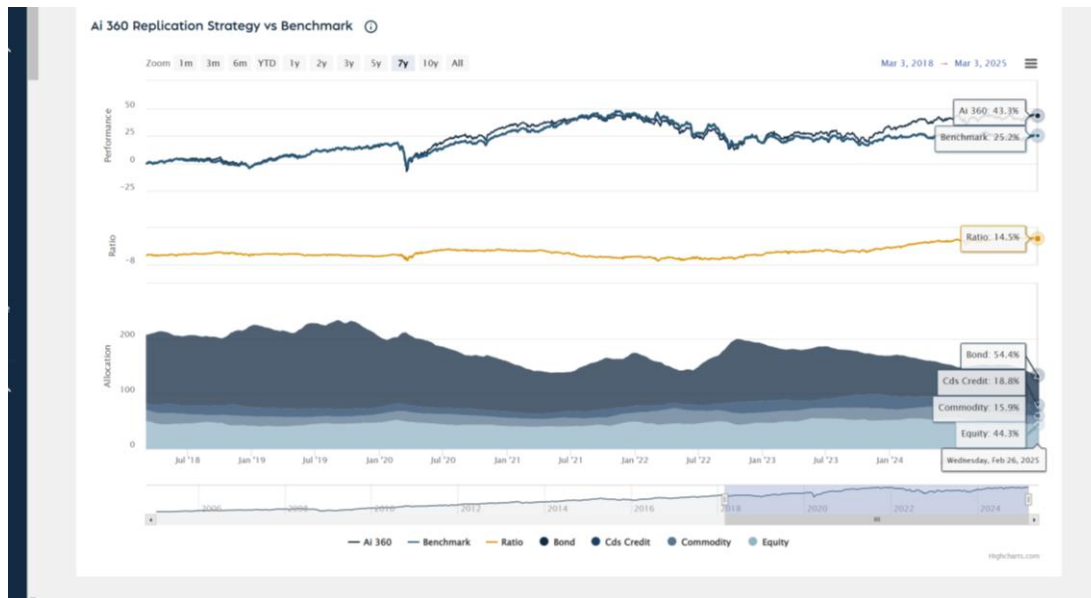
Comparison of performance between the Risk Parity Benchmark and Ai For Alpha Risk Parity Decoding Strategy (source: Ai For Alpha)

Conclusion

- **ML-Driven Outperformance:** Ai For Alpha's Risk Parity Decoding not only replicates established risk parity exposures but also seeks to enhance returns through machine learning-powered tactical asset allocation.
- **Adaptive Positioning:** The strategy dynamically reallocates toward higher risk-adjusted return assets, while managing downside risk.
- **Core Advantages:**

    o **Higher Return Potential** – Tactical allocation refines the allocation to maximize the chances of generating excess returns.

    o **Transparency & Liquidity** – Clear methodology and efficient tradability.

    o **Reliability** – Maintains high correlation with benchmarks while improving performance.

- **Robust in Uncertain Environments:** Built to navigate central bank policy shifts, global trade tensions, and volatility, providing a resilient alternative to conventional risk parity.