

Context-Aware Alpha Extraction (CAAE) Strategy

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Objective

To build a diversified portfolio of ten factor-based portfolios that focuses on specific characteristics such as value, momentum, or quality by integrating financial factors with alternative data sources and allocate investment weights based on a classified market regime.

Data Preparation and Cleaning Process

Datasets	Data Cleaning	End goal
<ul style="list-style-type: none">• CRSP• Compustat	<ul style="list-style-type: none">• Disaggregated Compustat Quarterly data into Monthly• Handled missing values• Merged datasets using Link tables on Permno and Gvkey	<ul style="list-style-type: none">• Dynamic factor-based investment strategy that aims to outperform traditional benchmarks.

Portfolio Definition and Construction

10 Factor Portfolios	Metric
Value Portfolio	Book-to-Market Ratio, EBITDA
Momentum Portfolio	6–12 Month Returns, 12–24 months
Size Portfolio	Market Capitalization
Quality Portfolio	Quality Minus Junk, Earnings-to-Price Ratio
Profitability Portfolio	Gross Profitability. Return on Assets (ROA). Return on Equity (ROE)
Earnings Quality Portfolio	Accruals, net operating assets
Investment & Growth Portfolio	Asset Growth, CAPX, Growth Rate
Liquidity Portfolio	Amihud's Illiquidity, High-Volume Premium
Inflation Sensitivity Portfolio	Inflation Sensitivity (correlation with inflation)
Past Returns Portfolio	1 month, 2-5 month lagged returns, and 6-12 month, 12-24 month returns

Rankings and Stock Selection

- **Ranked stocks for each portfolio per month**
 - Monthly stocks from early 2000s to end 2023
 - Based on their respective metrics
 - Example: Value portfolio ranks stocks based on book to market and EBITDA each month
- **Stock selection:**
 - Selected top 1% of ranked stocks each month
 - Example: From 1,000 stocks ranked by B/M, chose top 10 highest-ranking stocks.

Regime Classification

Bullish Market:

1. $VIX < 20$
2. Monthly Inflation Rate < 0.002
3. Monthly Interest Rate < 0.04

Bearish Market:

1. $VIX > 30$
2. Monthly Inflation Rate > 0.005
3. Monthly Interest Rate > 0.06

Neutral Market:

1. VIX between 20 and 30
2. Monthly Inflation Rate between 0.002 and 0.005
3. Monthly Interest Rate between 0.04 and 0.06

Volatile Market:

1. The VIX spikes, $VIX > 25$, regardless of the Interest Rate and Inflation Rate

Weight Allocation and Market Classification

- Allocation that we follow in order to allocate weights to each of the portfolios depending on what market we're on
- **For the rest of the portfolios we equally distribute the weights**

<u>Market</u>	<u>Portfolio 1</u>	<u>Portfolio 2</u>	<u>Portfolio 3</u>	<u>Portfolio 4</u>
Bullish	Value (20%)	Momentum (20%)	Size (15%)	Past Returns (10%)
Bearish	Quality (20%)	Profitability (20%)	Earnings Quality (15%)	Sensitivity (10%)
Volatile	Macro Sensitivity (20%)	Liquidity (20%)	Sensitivity (15%)	
Neutral	Equally across all portfolios			

Backtesting

Portfolio Construction:

- Stocks selected from factor portfolios based on macroeconomic regime classification (Bullish, Bearish, Neutral, Volatile).
- Weights dynamically allocated across portfolios and equally distributed within them.

Data Integration:

- Merged portfolio allocations with CRSP monthly returns for each stock.
- Handled missing returns by assigning zero to ensure continuity.

Performance Calculation:

- Weighted monthly returns computed for all stocks.
- Aggregated portfolio returns for each month.

Evaluation Metrics:

- Cumulative Return, Average Monthly Return, Standard Deviation, Sharpe Ratio, Average Yearly Return

Results

Cumulative Return: Portfolio achieved notable gains during bullish and volatile market regimes but underperformed in neutral phases.

Variability: Performance fluctuated significantly across months, driven by regime-specific weight allocations.

- 44% Cumulative Returns and Sharpe Ratio of 1.2 for 2005-2010 period, but -35% and -0.12 for 2000-2023 period

Challenges: Data gaps and missing Permno codes affected consistency, highlighting areas for improvement in data integration.

Thank you!

Fight on!


