

Idiosyncratic Risk Premium

CONNER DRAPER, JENNA HANCOCK, AND
MAXWELL SCHMULTZ

NARRATIVE OF IDIOSYNCRATIC RISK DIVERSIFICATION

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DOES IDIOSYNCRATIC RISK CARRY A POSITIVE PREMIUM?

Theoretical Context:

- Traditional view: Idiosyncratic risk should not be priced (CAPM)
- Behavioral/Merton view: Under-diversification requires compensation
- Recent evidence: Mixed results in empirical literature

This Study:

Tests Han & Xu (2022) finding of positive idiosyncratic risk premium using alternative methodology and extended sample period

A DIFFERENCE IN DEFINITIONS

Traditional definition of idiosyncratic risk:

Unsystematic risk, or risk that is specific to an asset rather than the market in general.

Definition in our model:

The variance of the residuals after accounting for Carhart 4 factors.

Since our factors may not entirely capture systematic risk, it is possible that our “idiosyncratic risk” is not entirely unsystematic.

METHODOLOGY

Data Sources:

- CRSP/Compustat (1970-2024)
- Standard Carhart-4 factor construction protocols

Idiosyncratic risk is measured by: $\sigma_{idiosyncratic} = std(\varepsilon)$

Where ε is the residual of our factor model in the equation:

$$r_i - r_f = \alpha + \beta_m (r_m - r_f) + \varepsilon$$

- Rolling 12-month estimation window

PORTFOLIO CONSTRUCTION

- Decile sorts on idiosyncratic volatility
- Value-weighted and equal-weighted implementations
- Long-short: Q10 - Q1
- Monthly rebalancing

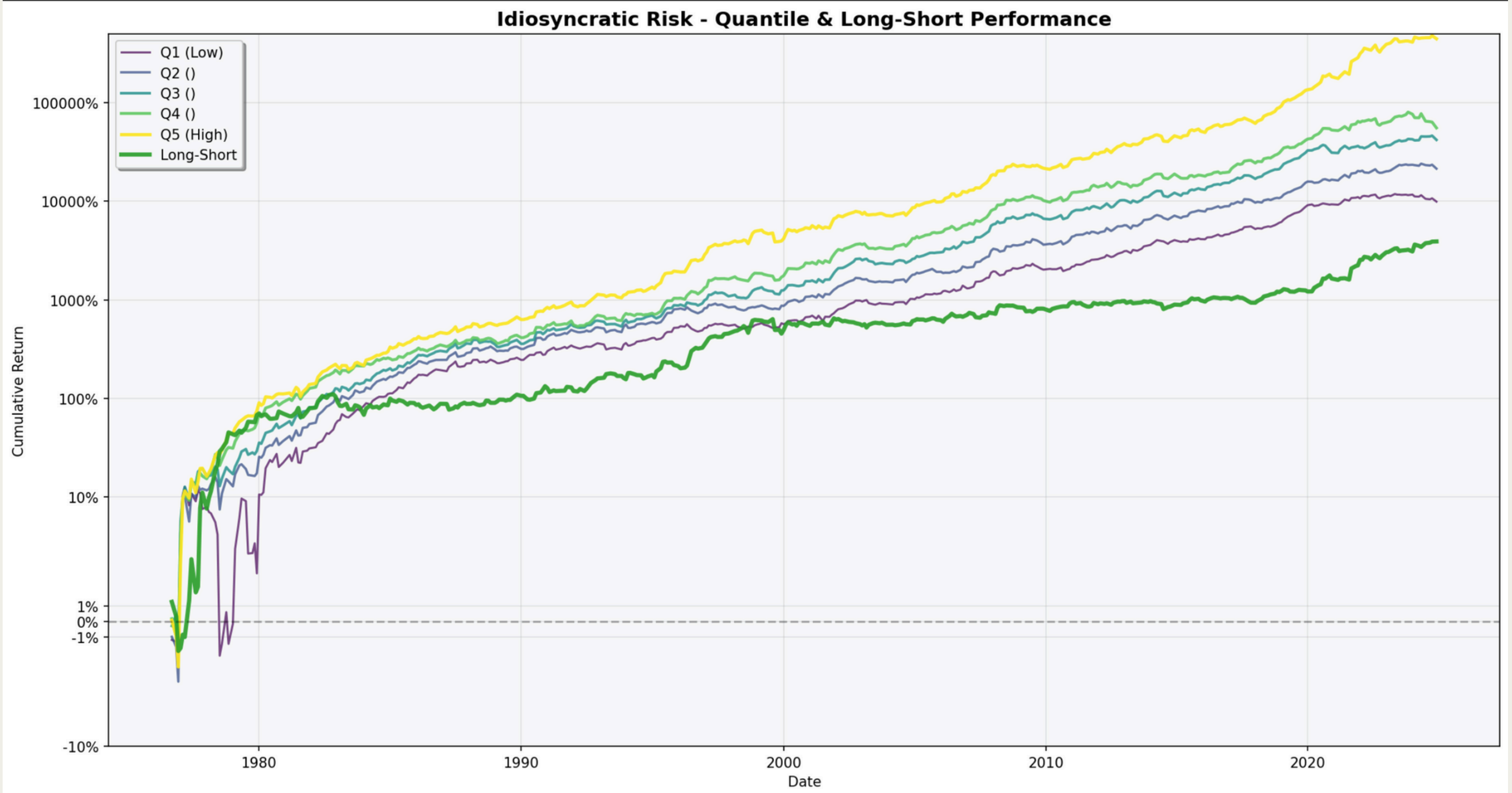
RESULTS - VALUE WEIGHTED PORTFOLIOS (CARHART-4)

| Factor | Return | Volatility | Sharpe Ratio | Alpha | Info Ratio | Avg Turnover |
|--------------------|--------|------------|--------------|--------|------------|--------------|
| Beta | 7.0% | 15.9% | 0.173 | 2.33% | 0.147 | 60.4% |
| Value | 3.6% | 10.4% | -0.059 | -0.60% | -0.057 | 46.2% |
| Size | 3.2% | 10.8% | -0.092 | -1.30% | -0.122 | 20.6% |
| Momentum | 10.7% | 10.9% | 0.589 | 7.05% | 0.648 | 80.6% |
| Idiosyncratic Risk | 12.0% | 15.4% | 0.505 | 7.41% | 0.480 | 57.0% |
| Combined Portfolio | 7.3% | 7.5% | 0.410 | 2.98% | 0.394 | 53.0% |

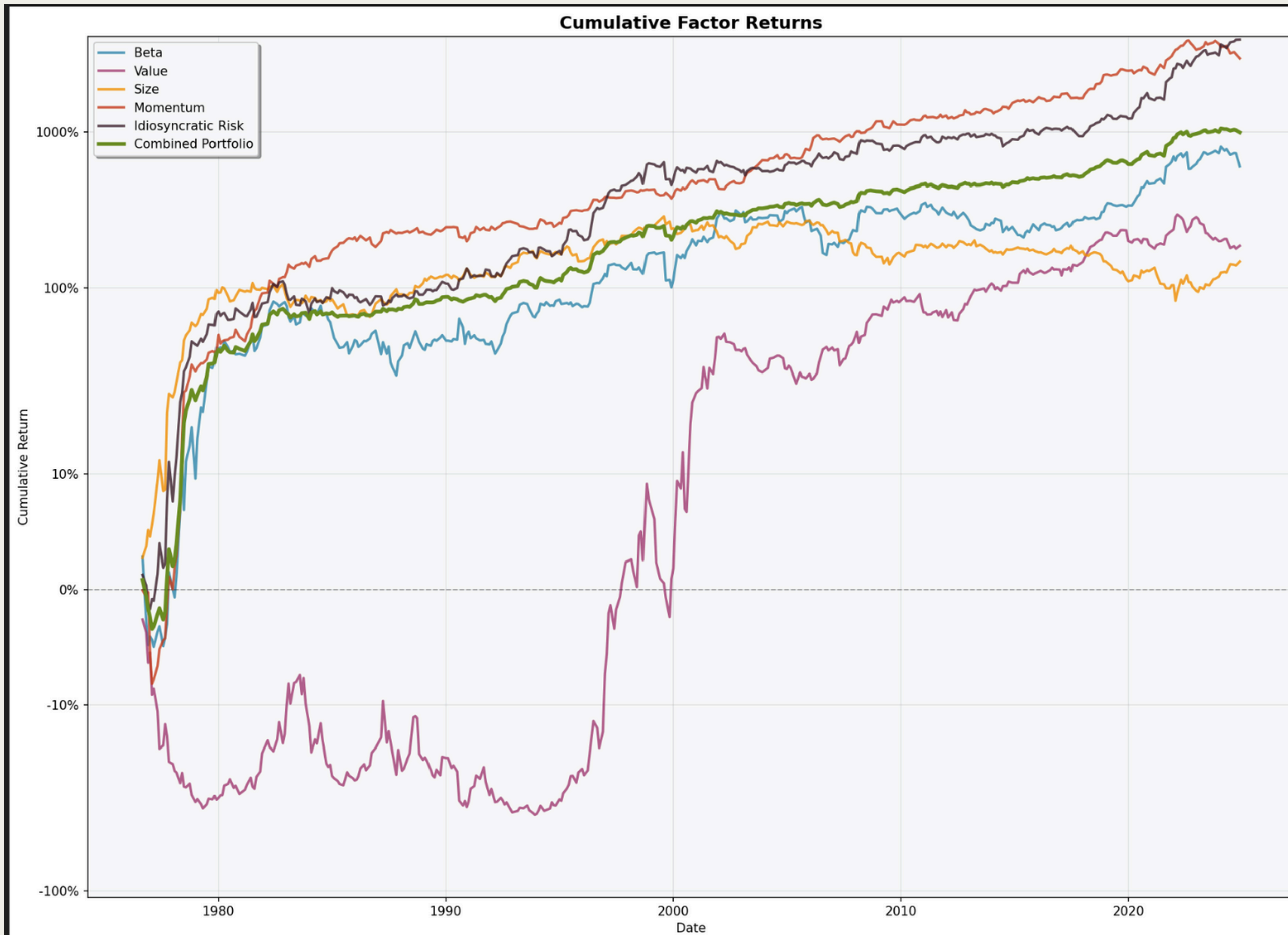
RESULTS - EQUAL WEIGHTED PORTFOLIOS (CARHART-4)

| Factor | Return | Volatility | Sharpe Ratio | Alpha | Info Ratio | Avg Turnover |
|--------------------|--------|------------|--------------|--------|------------|--------------|
| Beta | 7.9% | 12.2% | 0.299 | 4.34% | 0.359 | 51.5% |
| Value | 6.7% | 6.8% | 0.371 | 2.49% | 0.362 | 45.7% |
| Size | 4.1% | 9.5% | -0.014 | 0.06% | 0.006 | 22.9% |
| Momentum | 14.1% | 8.3% | 1.181 | 10.09% | 1.215 | 75.5% |
| Idiosyncratic Risk | 11.4% | 9.3% | 0.776 | 7.36% | 0.795 | 56.2% |
| Combined Portfolio | 8.8% | 5.2% | 0.882 | 4.87% | 0.932 | 50.4% |

VALUE-WEIGHTED QUANTILE RETURNS



VALUE-WEIGHTED FACTOR RETURNS



RESULTS - EQUAL WEIGHTED PORTFOLIOS

In Sample (1970-2010)

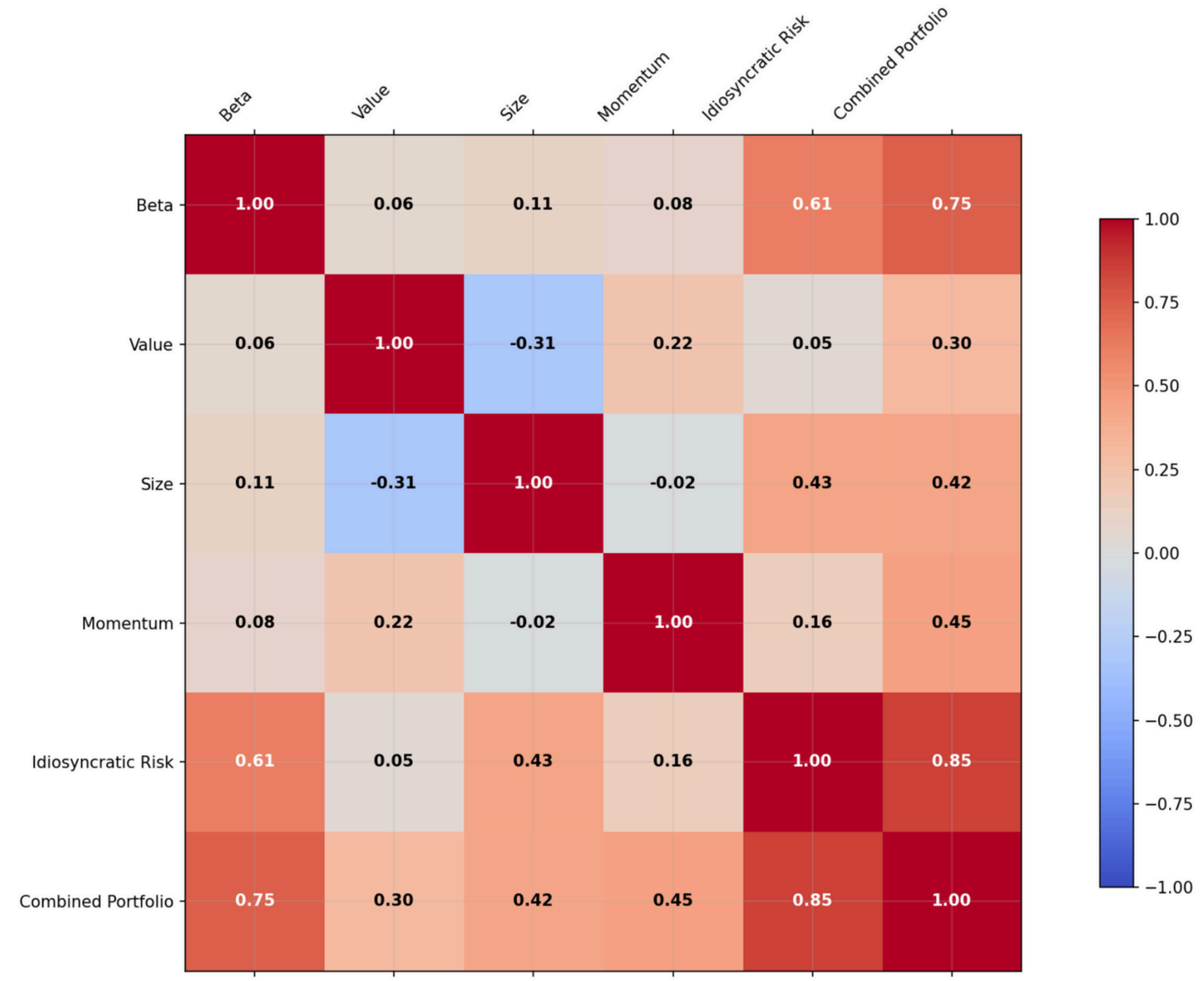
| Factor | Return | Volatility | Sharpe Ratio | Alpha | Info Ratio |
|--------------------|--------|------------|--------------|--------|------------|
| Beta | 8.0% | 15.7% | 0.162 | 2.90% | 0.185 |
| Value | 8.5% | 7.8% | 0.389 | 3.19% | 0.404 |
| Size | 3.0% | 11.7% | 1.042 | 11.72% | 1.028 |
| Momentum | 17.3% | 11.3% | 1.042 | 11.72% | 1.028 |
| Idiosyncratic Risk | 10.8% | 13.7% | 0.389 | 5.48% | 0.400 |
| Combined Portfolio | 9.3% | 13.6% | 0.284 | 4.13% | 0.303 |

RESULTS - EQUAL WEIGHTED PORTFOLIOS

Out of Sample (2011-2024)

| Factor | Return | Volatility | Sharpe Ratio | Alpha | Info Ratio |
|--------------------|--------|------------|--------------|--------|------------|
| Beta | 3.6% | 27.2% | 0.060 | 0.78% | 0.029 |
| Value | 10.8% | 10.8% | 0.820 | 8.74% | 0.805 |
| Size | -2.9% | 10.0% | -0.480 | -5.96% | -0.605 |
| Momentum | 31.4% | 14.8% | 1.986 | 31.98% | 2.233 |
| Idiosyncratic Risk | 8.8% | 15.7% | 0.434 | 4.90% | 0.318 |
| Combined Portfolio | 6.0% | 20.4% | 0.201 | 2.75% | 0.136 |

Factor Correlation Matrix



SOURCES

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Thank you

CONNER DRAPER, JENNA HANCOCK, AND MAXWELL SCHMULTZ