Every equity fund has a windfactor. What's yours?

Adventures in Factor Investing

Nathan Tidd, CFA
+1.646.837.8758
nathan.tidd@windfactor.com
www.windfactor.com
Expectations for Factor Investing

What are the best factor bets this year? Next 10 years?

1. Markets?
2. Industries?
3. “Risk premia”?
   - Value, Size, Quality, Momentum
4. Others?

<table>
<thead>
<tr>
<th>Risk</th>
<th>Expected Returns</th>
</tr>
</thead>
<tbody>
<tr>
<td>5%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10%</td>
</tr>
<tr>
<td></td>
<td>???</td>
</tr>
</tbody>
</table>

Annual Return
Last Ten Years: MSCI Factor Indexes

Source: Windfactor analysis of index data from msci.com
Risk Premia Barely Move The Needle

Primary US listings with $1b+ market cap. Source: Quandl
Standard Process

Use this formula every period...

Regressions:

\[ r_a = \sum_k X_{ak} r_k + r_i \]

Inputs:
- \( r_a \) = equity asset returns
- \( k \) = common factors
- \( X_{ak} \) = asset exposures to the factors

Outputs:
- \( r_k \) = returns from the common factors
- \( r_i \) = idiosyncratic returns for the assets

... to produce a time-series of factor returns
Factor Risk & Returns Expectations

Options for Higher Returns

1. Leverage
2. Discover new factors
3. Factor timing

Can factors get us here?

Source: Windfactor
Need More Information for Factor Timing

Components of Equity Return

\[ r_a = \frac{D + P_1 - P_0}{P_0} = \frac{D + P_1}{S_0} - \frac{P_0}{S_0} = \frac{V_1 - V_0}{V_0} \]

- Prices and dividends...
- ... divided by starting revenue ...
- ... equal starting & ending valuations

Stock returns are inversely related to starting valuations so factor returns must be also.
For any factor, the difference in average valuation between high exposure stocks and low exposure stocks.

Common Approach: Value Spreads

Big Spread = Expensive Factor

Small Spread = Cheap Factor

Source: Windfactor
Problems

Value spreads are an unrefined tool...

1. Arbitrary decile, quintile, tertile choice
2. Don’t control for other factors
3. Factors are designed to explain returns not valuations

... with unclear benefits

1. Return correlations appear weak without tech bubble
2. Limited ability to enhance tilt strategies (Asness)

Source: Cliff Asness, My Factor Philippic, May 2016
Alternative: Valuation Factor Models

Start of Period: \[ V_0 = \sum_k X_{ak} V_{k0} + V_{i0} \]

End of Period: \[ V_1 = \sum_k X_{ak} V_{k1} + V_{i1} \]

Variables:
- \( V_0 \) and \( V_1 \) = starting and ending* asset valuations
- \( k \) = the factors
- \( X_{ak} \) = start-of-period asset exposures to the factors
- \( V_{k0} \) and \( V_{k1} \) = starting and ending* factor valuations
- \( V_{i0} \) and \( V_{i1} \) = starting and ending* asset-specific valuations

*Includes dividends paid during the period
Valuation Factors vs. Returns Factors

Explain \( \Delta P/P \) (returns) using:

- E/P (Earnings Yield)
- D/P (Dividend Yield)
- BV/P (Value)

Explain P/S (valuations) using:

- E/S (Earnings), EBITDA/S (Cost Advantages)
- D/S (Dividends)
- BV/S (Book Value)

Independent variable structure should match dependent variable.
From Valuations to Returns

\[ r_a = \sum_k \left( \frac{X_{ak}}{V_0} \right) \times (V_{k1} - V_{k0}) + \frac{(V_{i1} - V_{i0})}{V_0} \]

Exposure to return = exposure to valuation scaled by \( 1/V_0 \).
Fact: Lower factor valuations have consistently meant higher factor returns.

Question: Does this help with forecasting?
Valuation-dependent Expected Factor Returns

Idea: Forecasts from “best-match” historical periods instead of recent past (half-life) or full history.

Source: Best-match Returns: The End of Half-life as We Know It
• Positive returns correlations for most factors.
• Directional accuracy weaker for some industry factors.
From Factors to Funds

Best-match Performance

- Average and volatility of active fund returns
- Shows **directional** risk for next 12-months assuming markets follow historical patterns.

<table>
<thead>
<tr>
<th>Factor Category</th>
<th>Active Weight</th>
<th>Best-match Returns Avg</th>
<th>Vol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Characteristics</td>
<td>8.2</td>
<td>1.4</td>
<td>1.9</td>
</tr>
<tr>
<td>Industries</td>
<td>-20.4</td>
<td>0</td>
<td>4.7</td>
</tr>
<tr>
<td>Firm-specific</td>
<td>10.9</td>
<td>0.3</td>
<td>-3.6</td>
</tr>
<tr>
<td>Cash</td>
<td>1.3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>0</td>
<td>1.7</td>
<td>3</td>
</tr>
</tbody>
</table>

Windfactor

- Normal distribution applied to best-match returns
- Shows probability of outperformance under best-match assumptions

**iShares MSCI USA Min Vol ETF vs US Market**

Source: Windfactor.com, 3/2018
Best-match Returns as a Forecast

March 2018 Best-match Performance: iShares US Equity ETFs

Source: Windfactor.com
Fund Picking Strategies

Holding high (low) windfactor ETFs for 6-12 months saw high (low) relative performance over the past decade.
Factor Picking Strategies

2007 - 2017 Performance: Factor Strategies

Varying tilts to factors with stable fundamentals using best-match returns would have worked even better.

Source: Rutgers MQF Internship, Aug 2017
Summary

More information may enable higher risk-return strategies...

... but good judgment is likely a key driver of success.
NOTICES AND DISCLAIMERS

This document and all information contained herein, including without limitation all text, data, graphs, charts (collectively the “Information”) is the property of Tidd Laboratories, Inc. (dba Windfactor Investment Research) and is provided for informational purposes only. The Information may not be reproduced or re-disseminated in whole or in part, used to create derivative works (e.g. indices, risk models, analytics, or software), to verify or correct other data or information, or in connection with offering or managing any securities, portfolios, or other investment vehicles without written authorization from Tidd Laboratories, Inc.

None of the Information constitutes an offer to buy or sell any security or investment product, nor does it advocate the use of any particular investment strategy. Information containing any historical information, data, or analysis should not be taken as an indication or guarantee of any future performance, analysis, forecasts, or results. The user of the Information assumes all risks associated with its use and Tidd Labs makes no warranties, express or implied, or representations with respect to the Information and to the extent possible by law disclaims all implied warranties regarding originality, accuracy, non-infringement, completeness, merchantability and fitness for a given purpose.

Portions of the materials have been granted Patent Pending status by the US Patent and Trademark Office and is protected under patent law in the United States and its jurisdictions and by treaty in other jurisdictions. Firms and individuals are prohibited from building, importing, selling, or using the methodology, or equally any product or apparatus implementing the methodology, without permission by written license. Any party interested in obtaining such license should contact: client_service@windfactors.com

©2014-2018 Tidd Laboratories, Inc. All Rights Reserved.
1350 Avenue of the Americas, 2nd Floor
New York, NY 10019