The Factors That Matter

Presented to Democratize Quant / MARC

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Presented by:
Tammina Philippe, CFA
President
Bridgeway Capital Management

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The Conundrum - A Zoo of Factors

Literally hundreds of factors have been identified.

Which of these 100+ exhibits in the zoo matter?

John Cochrane in 2011 presidential address to American Finance Association: “zoo of factors”
Factor Criteria

Factors should help explain portfolio returns and have delivered a historical premium. Additionally, a factor should be:

- Persistent
- Pervasive
- Robust
- Investable
- Intuitive
Factors That Matter

So ... which factors matter and why?

Let’s apply our criteria to a couple of these factors: Value and Momentum
**Odds of outperformance (%), U.S. equities 1927-2015**

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>Momentum</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Year</td>
<td>63%</td>
<td>73%</td>
</tr>
<tr>
<td>3 Year</td>
<td>72%</td>
<td>86%</td>
</tr>
<tr>
<td>5 Year</td>
<td>78%</td>
<td>91%</td>
</tr>
<tr>
<td>10 Year</td>
<td>86%</td>
<td>97%</td>
</tr>
<tr>
<td>20 Year</td>
<td>94%</td>
<td>100%</td>
</tr>
</tbody>
</table>

A premium can be found for both across geographic regions

**Value has been found:**
- In broad international markets: a +5.2% premium
- In emerging markets: a +3.7% premium
- Across individual markets in Europe where premiums ranged from +1.2% to +7.3%

**Momentum has been found:**
- In 40 other countries
- Positive in different markets and asset classes, statistically significant in all but Japan
- Across different size ranges of stocks

*Sources of data provided in the presentation Appendix.*
**Value**

**Most common definition:**
- Classical academic definition is Book-to-Market (BtM) ratio

**Other definitions:**
- Cash Flow-to-Price ratio
- Earnings-to-Price ratio
- Sales-to-Price ratio
- Dividend Yield

**Momentum**

**Most common definition:**
- Return of the past 12 months, excluding the most recent month

**Other definitions:**
- Returns over other time periods, such as 6 and 9 months
- Residual or risk-adjusted returns (accounting for other factors)
- Measures other than returns
  - Earnings
  - Changes in profit margins
  - Changes in analyst forecasts
Some have questioned the usefulness of momentum in actual portfolios due to potentially higher turnover and trading costs.

However, momentum can be used to inform trading without an increase in turnover. Moreover, momentum is used by many investors in portfolios.
Intuitive: Risk + Behavior

Value

Behavioral Explanations:
- Extrapolating past growth leads to mispricing
- Confusing familiarity with safety

Risk-based Explanations:
- Distress factor
- Asymmetric risk
- Leverage effect
- Default premium

Momentum

Behavioral Explanations:
- Underreaction and overreaction
- Enhanced by limited attention of investors
- Disposition effect

Risk-based Explanations:
- Momentum stronger among stocks with large growth opportunities and risky cash flow
- Liquidity risk and institutional cash flows
Size Matters

QUESTION: When considering the premium a factor provides, is there an amplifier to returns? **Yes!**

```
Value × Size = 
```

```
Momentum × Size = 
```
Evidence shows that value and momentum factor exposure is stronger with the addition of *smaller* size.

### Historical Correlations, 1964-2015

<table>
<thead>
<tr>
<th>Factor</th>
<th>Market Beta</th>
<th>Size</th>
<th>Value</th>
<th>Momentum</th>
<th>Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market Beta</td>
<td>1.00</td>
<td>0.29</td>
<td>-0.27</td>
<td>-0.17</td>
<td>-0.52</td>
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<tr>
<td>Size</td>
<td>1.00</td>
<td>0.01</td>
<td>-0.12</td>
<td>-0.53</td>
<td></td>
</tr>
<tr>
<td>Value</td>
<td>1.00</td>
<td></td>
<td>-0.20</td>
<td></td>
<td>0.04</td>
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<tr>
<td>Momentum</td>
<td>1.00</td>
<td></td>
<td></td>
<td>0.30</td>
<td></td>
</tr>
<tr>
<td>Quality</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.00</td>
</tr>
</tbody>
</table>

- **Traditional way: Diversification by asset class**
  - An equity total market fund has exposure only to market beta

- **Modern financial theory suggests a new way to diversify**
  - Tilt to the factors that determine equity risk and return
  - These factors have low correlation: true diversification!
Contact Us

Please pick up a copy on your way out.

Tammira Philippe, CFA
tphilippe@bridgeway.com
(832) 204-8210

Chuck Bates
cbates@bridgeway.com
(832) 204-8212
Data Sources

1 1975-2015 Fama-French International Value Index minus Fama-French International Growth Index

2 1989-2015 Fama-French Emerging Markets Value Index minus Fama-French Emerging Markets Growth Index


Disclosure

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