The Dimensions of Popularity in the Stock Market

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• The Standard Risk Premium Paradigm
  • Higher Risk = Higher Return
  • RPs in stock markets, bond markets, and across markets

• Are the Stock Market Premiums RPs?
  • A look at US, UK, and JP

• Or are the Premiums “Popularity” Premiums?
  • Popularity & Liquidity
  • Explains Premiums & Mispricings

• Conclusions
Premiums in Asset Pricing

Excess Returns

persistent

Premiums

Risk

Markowitz 1952
Sharpe 1964, Lintner 1965
Ross 1976
Fama & French 1993

Other?

Basu 1975, Banz 1981
Ibbotson, Diermeier, & Siegel 1984
Daniel & Titman 1997
Baker & Wurgler, 2006
Green, Hand & Zhang 2013

Tversky & Kahneman 1974
Grossman & Stiglitz 1980
Shiller 1984
de Bondt & Thaler 1985

Mispricing

temporary
Higher Risk = Higher Return

- The Capital Market Line illustrates the payoff from the Equity Risk Premium and the U.S. Treasury Bill riskless rate.
Ibbotson® SBBI®
Stocks, Bonds, Bills, and Inflation 1926–2014

• Past performance is no guarantee of future results. Hypothetical value of $1 invested at the beginning of 1926. Assumes reinvestment of income and no transaction costs or taxes. This is for illustrative purposes only and not indicative of any investment. An investment cannot be made directly in an index. ©2015 Morningstar. All Rights Reserved.
# Comparing the Periods

## Compound Annual (Geometric Mean) Returns

<table>
<thead>
<tr>
<th>U.S.</th>
<th>1926-2014*</th>
<th>1996-2014*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large Company Stocks</td>
<td>10.1%</td>
<td>8.6%</td>
</tr>
<tr>
<td>LT Government Bonds</td>
<td>5.7</td>
<td>7.5</td>
</tr>
<tr>
<td>U.S. Treasury Bills</td>
<td>3.5</td>
<td>2.5</td>
</tr>
<tr>
<td>Inflation</td>
<td>2.9</td>
<td>2.3</td>
</tr>
</tbody>
</table>

- We examine the period 1996-2014 in which we have complete int’l data.
- Returns similar to period starting in 1926, with positive but lower risk premiums.

Are Stock Market Premiums RPs?

• Across markets and within the bond market, higher risk = higher return

• We examine the global stock market premiums in US, UK, and Japan

• In theory, high beta, small stocks, and value stocks have both higher returns and higher risk
**Study Methodology**

- Equally weighted **quartile** portfolios at the end of the selection year
- Report portfolio mean returns (arithmetic & geometric), std. dev.
- All returns in local currencies

Broad US/UK/JP universe ranked by 21 metrics:

- Beta, Volatility (3)
- Value (3)
- Liquidity (2)
- Size (4)
- Momentum (2)
- Fama-French Betas (3)
- Single Beta Factors (4)

## Overall Performance

<table>
<thead>
<tr>
<th></th>
<th>USA</th>
<th>UK</th>
<th>Japan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Universe Count</td>
<td>3,000</td>
<td>500</td>
<td>1,500</td>
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</table>

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<thead>
<tr>
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<tbody>
<tr>
<td><strong>1996-2014</strong></td>
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</tr>
<tr>
<td>Equal-Weighted Universe</td>
<td><strong>11.23%</strong></td>
<td>13.27%</td>
<td>20.93%</td>
<td><strong>8.34%</strong></td>
<td>10.84%</td>
<td>22.52%</td>
<td><strong>2.21%</strong></td>
<td>5.53%</td>
<td>27.11%</td>
</tr>
<tr>
<td>Cap-Weighted Universe</td>
<td><strong>9.08</strong></td>
<td>10.77%</td>
<td>18.49</td>
<td><strong>7.34</strong></td>
<td>8.59%</td>
<td>17.42</td>
<td><strong>1.07</strong></td>
<td>4.07%</td>
<td>26.50</td>
</tr>
<tr>
<td>Local Risk-Free Rate</td>
<td><strong>2.50</strong></td>
<td>2.53</td>
<td>2.28</td>
<td><strong>3.92</strong></td>
<td>3.94</td>
<td>2.50</td>
<td><strong>0.17</strong></td>
<td>0.17</td>
<td>0.17</td>
</tr>
</tbody>
</table>

Display the capital market line with the equally weighted index (arithmetic mean) and the risk free rate in local currency.
Risk & Return Within Markets
1996 – 2014

84 portfolios per country:
21 metrics X 4 quartiles

Beta, Volatility
Value
Liquidity
Size
Momentum
Fama-French Betas
Single Beta Factors
Risk & Return Within Markets
1996 – 2014

Risk is an Incomplete Explanation of Returns

The univariate view of risk and return is a gross oversimplification.

• What’s missing here?
  – Should be a broad, universal concept
  – Should affect pricing
  – A behavioral finance perspective

• Our proposal: **Popularity** *
  – Popular: prices ↑, returns ↓
  – Unpopular: prices ↓, returns ↑

What is Popularity?

• Popularity is how much anything is liked or recognized
  • Not a new concept, similar to contrarian, sentiment, affect, crowding, herding, admired/spurned, hot/cold, etc.

• More popular stocks have higher valuations relative to their fundamentals, but lower expected returns

• Popularity (or unpopularity) can be permanent (premiums) or temporary (mispricing)
Behavioral Finance

• Why do these payoffs exist / persist?
• Are they “risk” premiums or “popularity” premiums?

Systematic Behavioral Biases

- Overconfidence
- Availability
- Herding / Group Think

Stock Popularity

- Overly popular
- Less popular

Popularity Premium

- Low Beta / Volatility
- Value
- Liquidity
Can Popularity Explain Return with Less Risk?
Small caps (US) have outperformed.

- **Small stocks are unpopular:**
  - Institutions prefer large stocks
    - Gompers & Metrick (2001)
  - Capacity constrained
  - Costly to trade (price impact)
  - Less information, less recognized

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- Value has *outperformed* with *lower risk*.
- Value stocks are unpopular:
  - Not because of higher risk
    - Lakonishok, Shleifer & Vishny 1994
  - No exciting growth story –
    - Barberis, Shleifer & Vishny 1998
  - May have management issues

Popularity of Beta and Volatility
All Quartiles: 1972 – 2014

High beta and volatility have underperformed.

• Leverage aversion
  – Identified *high* beta & vol as popular
  – Beta: Frazzini & Pedersen, 2011

• Future outlook
  – Low beta & vol have become popular with institutions in recent years
  – Beta is only an indirect measure of popularity
  – *Popularity can change* over time

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<tbody>
<tr>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>Low</td>
<td>15.2%</td>
</tr>
<tr>
<td></td>
<td>16.2%</td>
</tr>
<tr>
<td></td>
<td>13.4%</td>
</tr>
<tr>
<td>High</td>
<td>11.5%</td>
</tr>
</tbody>
</table>

Valuations and Popularity
1972 – 2014, U.S.

Large changes in trading activity are associated with higher returns.

- 0.74% Migrate to Quartile 4
  +110.80% Return
- 2.80% Migrate to Quartile 3
  +61.75% Return
- 18.26% Migrate to Quartile 2
  +26.18% Return
- 78.20% Stay in Quartile 1
  +10.66% Return

Global Popularity Premiums
2000 – 2014 (USD)

Source: Zebra Capital Research.
Conclusions

• The relationship between risk and return has been the primary paradigm in finance
  – CAPM, APT, Fama-French
  – Empirical results (1996-2014, US/UK/JP) suggest that risk cannot be the only explanation

• Popularity is a possible framework for thinking beyond risk
  – Popularity can explain other long-term premiums
  – Popularity can also explain temporary mispricings
Appendix
### Popularity Premiums

<table>
<thead>
<tr>
<th>Morningstar Style Box®</th>
<th>Value / Growth</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Value</td>
<td>Blend</td>
</tr>
<tr>
<td><strong>Size</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Large</td>
<td>7.35%</td>
<td>6.86%</td>
</tr>
<tr>
<td></td>
<td>+2.33%</td>
<td>+1.65%</td>
</tr>
<tr>
<td>Mid</td>
<td>9.73%</td>
<td>9.61%</td>
</tr>
<tr>
<td></td>
<td>+3.25%</td>
<td>+3.19%</td>
</tr>
<tr>
<td>Small</td>
<td>9.91%</td>
<td>9.29%</td>
</tr>
<tr>
<td></td>
<td>+2.77%</td>
<td>+3.32%</td>
</tr>
</tbody>
</table>

Popularity Regressions on Factors
1972 – 2014, U.S.

Popularity can be expressed as a long/short or a long only factor.

<table>
<thead>
<tr>
<th>Factor</th>
<th>Annualized Alpha</th>
<th>Market M-RF</th>
<th>Size SMB</th>
<th>Value VMG</th>
<th>Momentum HML</th>
<th>( R^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long Unpopular, Short Popular Factor</td>
<td>4.44%*</td>
<td>-0.45</td>
<td>-0.39</td>
<td>+0.58</td>
<td>+0.14</td>
<td>72.2%</td>
</tr>
<tr>
<td>Unpopular Long Portfolio</td>
<td>2.40%*</td>
<td>+0.74</td>
<td>+0.56</td>
<td>+0.44</td>
<td>0.00</td>
<td>88.3%</td>
</tr>
</tbody>
</table>

*\( t \)-stats = 3.40 and 3.00 (both statistically significant at 5% level.)

Source: Ibbotson & Kim, "Liquidity as an Investment Style: 2015 Update" [Ibbotson, Chen, Kim & Hu, FAJ 2013], available at research.zebracapital.com
Market Beta & Volatility
1996 – 2014

- Low Beta and Volatility had *higher* returns
Small size premium (small minus big) is inconsistent across markets and metrics.
• Last year’s winners continued to outperform only in the U.K.

• However, losers exhibit higher volatility.
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