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"Don’t Judge the Book by its Cover: Market Maturity and Mispricing"
(forthcoming at the Journal of Financial Economics)

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Februar 2016

Beta and Biased Beliefs

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4th SUERF/UniCredit & Universities Foundation Workshop
The empirical record of the CAPM

Theory: \[ \mathbb{E}(R_i) = R_f + \beta_{iM} \times [\mathbb{E}(R) - R_f] \]

Empirical finding:

Effect even stronger in most recent 50 years: SML flat or slightly downward sloping!
Baker/Bradley/Wurgler (2011): Beta anomaly is “a particularly compelling” candidate for “the greatest anomaly in finance”
Selected existing explanations of the beta anomaly

- Frazzini and Pedersen (2014) (and others): leverage/funding constraints
- Baker et al. (2011) (and others): agency issues + other consequences of delegated portfolio management
- Schneider et al. (2016): Downside risk / Coskewness
- Bali et al. (2017): Preference for lottery-like stocks
- Antoniou et al. (2016): Investor sentiment
- Hong and Sraer (2016): Macro disagreement + short-selling constraints
- ...more!

This study:
- Most support for behavioral explanations
- Enhance understanding of the underlying mechanisms
State of the literature: Beta anomaly is major cross-sectional return puzzle

1. Many competing explanations

2. Blurry picture on underlying causes

U.S. stock market only, but global phenomenon

Generalizability of proposed return predictive mechanisms?

- Harvey/Liu/Zhu (2016): “We argue that most claimed research findings in financial economics are likely false.”

- Karolyi (2016): “large and persistent US (home) bias in academic research in Finance.”

This paper:

- Beta anomaly primarily represents mispricing driven by behavioral biases

- Synthesize information from 50 stock markets
Beta and Behavioral Biases

1. Overconfidence
   - Daniel/Hirshleifer (2015): „overconfidence provides a natural explanation for (...) betting-against-beta effects” due to overconfident disagreement + market frictions
   - Separately: High beta stocks natural habitat for overconfident investors

2. Representativeness heuristic
   - Ex post, many „successful stock picks“ will be high risk / high beta stocks
   - Asymmetric social communication (e.g., Hirshleifer/Han (2015))

3. Mental accounting (e.g., Shefrin/Statman (2000))

4. Attention-driven buying (e.g., Barber/Odean (2008))

Intuitive + well theorized
Data

- Stock market data
  - U.S.: CRSP, Compustat
  - International: Datastream (extensive screens), Worldscope
  - Exclude stocks < 10 Mio USD, countries <25 eligible firms or <60 eligible months
- (Baseline) Sample period: 1/1990-12/2013
- Baseline Sample:
  - 50 countries
  - ~ 50,000 firms
  - ~ 116,000,000 firm days
Empirical approach

- Beta computation (baseline):
  - Dimson (1979) betas
  - Daily data over previous 12 months
  - Quintile-based long/short portfolios

- Asset pricing approach
  - Local Fama and French (1993) three factor models

- Return weighting
  - Both equally weighted and value-weighted
Betting against beta across the globe: Baseline

Long/short quintiles, average monthly local three-factor alpha, equally weighted returns

Heiko Jacobs: Beta and Biased Beliefs
Betting against beta across the globe: Baseline

Average three-factor alpha (in bp per month)
Equally weighted returns
Value-weighted returns

Moreover: Return pattern is robust
Test 1: Beta and predictable market reaction to firm-level news

- Rational expectations vs. biased expectation framework:
  Random news vs predictable returns around firm-specific news days (e.g., Engelberg et al. (2016))
- 1.088 million earnings announcements: Cumulative abnormal return over days (-1,0,1)

![Graph showing abnormal returns for different beta quintiles](image-url)
Test 1: Beta and predictable market reaction to firm-level news

- 1.71 million further events in the U.S. stock market
  - 10-K filings, 8-K filings, newspaper articles, newswire stories

Further firm-level news in U.S. stock market

[Bar chart showing abnormal returns for different quintiles of beta]
Test 2: Beta and composite Stambaugh (2015, JF) local mispricing factor

- State-of-the-art approach to measure cross-sectional mispricing at the level of a firm month
- Bottom-up metric between 0 and

Financial Distress
O-Score
Net stock issues
Composity equity issues
Accruals
Net operating assets
Momentum
Gross profitability
Asset growth
Return on assets
Investment to assets
Composite score
Test 2: Beta and composite local mispricing factor

Alpha Fama/French local three-factor model

Mean: 54 bp***

Alpha Fama/French local three-factor model + local mispricing factor

Mean: 13 bp
Further tests: Market states

Time-series: Local market states (Past three year market return positive?)

Aforementioned biases should be much stronger following market gains

- Overconfidence + self-attribution bias rise (e.g., Gervais/Odean (2004), Cooper et al. (2004))
- High past market returns attract attention… (e.g., Kalsson et al. (2009), Yuan (2015), Sicherman (2016))
- …in particular among less sophisticated investors (e.g., Lamont/Thaler (2003), Grinblatt et al. (2011))
- Use of representativness heuristic more troublesome
- Procyclical risk-adjusted return expectations (e.g., Greenwood/Shleifer (2014), Amormin, Sharpe (2009))
Further tests: Market states

Time-series: Local market states (Past three year market return positive?)

Global results, three factor alpha, equally weighted returns, controlling for other determinants
Further tests: Sentiment and turnover

4. Time-series: Local consumer confidence

Global results,
three factor alpha,
equally weighted returns,
controlling for other determinants

5. Cross-section: Turnover

Global results,
three factor alpha,
equally weighted returns,
controlling for other determinants
Conclusion

1. Beta anomaly pervasive empirical puzzle, but drivers unclear
   - Low beta stocks outperform high beta stocks by 6% p.a. around the globe

2. New insights based on 50 stock markets + conceptually diverse tests
   - Beta anomaly can be traced back to behavioral biases

Beta anomaly may be mainly attributable to mispricing