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Discussion by
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Discussion Outline

• Clever empirical design to recover implementation costs of common factors

• Suggested areas for improvement
  • Adapt methods to institutional setting of mutual funds
    • Long-only
    • Characteristics- not covariances-based
  • Expand Motivation & Interpretation
First method (of two)

- Fama-Macbeth regression (returns on betas):

\[
r_{it}^e = \alpha_i + \beta_i^{MKT} MKT_t + \beta_i^{SMB} SMB_t + \beta_i^{HML} HML_t + \beta_i^{MOM} MOM_t + \epsilon_{it}
\]

\[
r_{it}^e = \hat{\beta}_i \hat{\lambda}_{stocks,t} \cdot 1_{\{i \in \text{stocks}\}} + \hat{\beta}_i \hat{\lambda}_{MFS,t} \cdot 1_{\{i \in \text{MFS}\}}
\]

- Implementation costs (e.g., for HML):

\[
IC^{HML} = \hat{\lambda}_{HML \, \text{stocks}} - \hat{\lambda}_{HML \, \text{MFS}}
\]
Institutional setting: Strategies

• Anecdote: In my retirement account, I hold a (Vanguard) 
  \textit{small-cap value} fund

  fund, not (explicitly) a 
  \textit{positive-}$$\beta^{SMB}$$/\textit{positive-}$$\beta^{HML}$$ fund

• Mutual funds do not try to mimic $HML$, but \textit{long-only} 
  \textit{characteristic-based} strategies

• Consider incorporating hedge funds and smart-beta ETFs 
  that do long-short strategies
Long-only effect: Small-value vs small-growth

- Two-fund example (SV and SG):

  \[ \beta_{SV}^{MKT} = \beta_{SG}^{MKT} = 1 \quad \text{and} \quad \beta_{SV}^{SMB} = \beta_{SG}^{SMB} = 0.5 \]

  \[ \beta_{SV}^{HML} = 0.5 \quad \text{and} \quad \beta_{SG}^{HML} = -0.5. \]

  \[ \lambda_{stocks}^{HML} = 8\%, \quad \text{and} \quad IC_{HML} = 6\% \quad \Rightarrow \quad \lambda_{MFS}^{HML} = 2\% \]

- \( E(r_i) = \beta_i \cdot \lambda^{MKT} + \beta_i^{SMB} \cdot \lambda_{MFS}^{SMB} + \beta_i^{HML} \cdot \lambda_{MFS}^{HML} \)

- Then:

  \[ \alpha_{SV}^{FF3} = (1 \cdot \lambda^{MKT} + 0.5 \cdot \lambda^{SMB} + 0.5 \cdot 2\%) \]

  \[-(1 \cdot \lambda^{MKT} + 0.5 \cdot \lambda^{SMB} + 0.5 \cdot 8\%) = -3\% \]

  \[ \alpha_{SG}^{FF3} = (1 \cdot \lambda^{MKT} + 0.5 \cdot \lambda^{SMB} - 0.5 \cdot 2\%) \]

  \[-(1 \cdot \lambda^{MKT} + 0.5 \cdot \lambda^{SMB} - 0.5 \cdot 8\%) = +3\% \]
Long-only effect: Small-value vs small-growth

- $\alpha_{SV}^{FF3} = (1 \cdot \lambda^{MKT} + 0.5 \cdot \lambda^{SMB} + 0.5 \cdot 2\%) - (1 \cdot \lambda^{MKT} + 0.5 \cdot \lambda^{SMB} + 0.5 \cdot 8\%) = -3\%$

- $\alpha_{SG}^{FF3} = (1 \cdot \lambda^{MKT} + 0.5 \cdot \lambda^{SMB} - 0.5 \cdot 2\%) - (1 \cdot \lambda^{MKT} + 0.5 \cdot \lambda^{SMB} - 0.5 \cdot 8\%) = +3\%$

- **Takeaway**: the “implementation costs” are actually benefits to long-only funds with negative betas
  - You could even be picking up skill of funds with negative betas
Long-only effect: cont’d

- Indeed, many funds with negative HML betas who WANT a lower HML premium!
Errors-in-variables problem

- Betas on RHS are estimated:
  \[ r_{it}^e = \hat{\beta}_i \hat{\lambda}_{stocks,t} \cdot 1_{i \in Stocks} + \hat{\beta}_i \hat{\lambda}_{MFS,t} \cdot 1_{i \in MFS} \]

- The EIV bias is likely greater for **funds** than characteristics sorted portfolios.
  - E.g. Style migration of mutual funds (e.g. Fama French, 2007)
Characteristics-vs-covariances adjustment

- Mutual funds follow characteristics strategies (e.g. small value)
- Even when beta models are DGP, characteristics still explain returns better than estimated $\beta$’s! (see, e.g., Lin et al, 2013)
  - Affects method 2---matching characteristic-sorted stocks with funds based on estimated $\beta$’s

- Characteristic-adjusting mutual fund returns yields different conclusions than risk-adjusting returns:

- Why not get holdings data and estimate a characteristics based model?
  
  \[
  r_{it}^e = a + b'_{stocks}x_{it}1_{\{i\in Stocks\}} + b'_{MFS}x_{it}1_{\{i\in MFS\}}
  \]
  
  \[
  x_{it} = (size, BM, r_{12,2})'
  \]
  
  \[
  IC = b_{stocks} - b_{MFS}
  \]

- Eliminates the EIV problem!
Motivation & interpretation

• “Is there a gap between the profitability of a trading strategy ‘on paper’ and that which can be achieved in practice?”

• Regression of DFA small-cap value excess return on Fama-French 3-factor model:

<table>
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<tr>
<th></th>
<th>(1) DFSVX</th>
<th>(2) HML</th>
</tr>
</thead>
<tbody>
<tr>
<td>MKT</td>
<td>0.97***</td>
<td>-0.32***</td>
</tr>
<tr>
<td></td>
<td>(21.73)</td>
<td>(-5.50)</td>
</tr>
<tr>
<td>SMB</td>
<td>0.81***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(13.53)</td>
<td></td>
</tr>
<tr>
<td>HML</td>
<td>0.61***</td>
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<tr>
<td></td>
<td>(9.61)</td>
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<tr>
<td>DFSVX</td>
<td></td>
<td>0.20***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(5.01)</td>
</tr>
<tr>
<td>alpha</td>
<td>0.42</td>
<td>2.71</td>
</tr>
<tr>
<td></td>
<td>(0.19)</td>
<td>(1.33)</td>
</tr>
<tr>
<td>N</td>
<td>297</td>
<td>297</td>
</tr>
<tr>
<td>adj. R-sq</td>
<td>0.73</td>
<td>0.09</td>
</tr>
</tbody>
</table>

• DFA can capture HML premium just fine.

• DFA=“typical” small-value fund
Motivation & interpretation

• “Is there a gap between the profitability of a trading strategy ‘on paper’ and that which can be achieved in practice?”
  • We know the answer is yes---even if your measure is better
  • Empirics address:
    • whether funds as a group do achieve this profitability
    • And by how much they fall short

• Average mutual fund earns negative alpha (e.g., Carhart, 1997)
  • Incorporate skill?
    • One of the largest novelties of the measure!
  • How do Active IC’s compare to passive IC’s?

• IC=(+)stock-level trading costs (-)skill
  • Do managers do (otherwise) poor job with low implementation costs?
  • …or a good job with high implementation costs?
  • Critically impacts the can
Long-only effect: Interpretation

- Momentum premium higher on SHORT leg
- Average fund has slightly positive MOM beta
  - MFs don’t seem to short extreme loser stocks
  - Is it *implementation costs* if they are not trying?

![MOM betas](image-url)
Motivation & Interpretation

• “Unlike existing approaches, these techniques deliver estimates of implementation costs without estimating parametric microstructure models from trading data or explicitly specifying factor trading strategies”

• Why are your ICs directly comparable to those from prior literature?
  • They take real-ish stock-level costs and apply them to “explicitly specified” trading strategies ($f_t$)
  • $f_t - c(f_t) \ vs \ f_t^{MF} - c(f_t^{MF})$
  • Others remove “skill”

• Consumers of transaction costs literature (like myself) need a way to correct their trading strategies for realistic trading costs
  • E.g. Detzel and Strauss ($RF$ forthcoming).
  • Is there a way to apply your IC’s to my trading strategies?
  • Two strategies with different turnover---but same betas---should not have same IC’s
Motivation & Interpretation

• Many of the transaction costs studies cited struggle with estimating price impact and strategy capacity
  • E.g. Novy-Marx and Velikov (2016) use TAQ data

• Interesting comparison between average and marginal costs by comparing funds of different size.
  • However, large funds can invest small amounts in a strategy
    • Need to incorporate size*beta
    • Moreover, if large funds have such large impact that they earn a negative momentum premium, why haven’t they eliminated the premium for other funds or even on paper?

• If we believe factor returns are compensation for risk, they should not be traded away
  • But if this is not this case, calls into question the use of a beta-model.
References


