Webinar

Multi-Factor Design

Part 1: Mixing vs. Integrating
Webinar Series Outline

1. What Matters in Multi-Factor Investing?
   – Business case for multi-factor investing – academic framework
   – Critical review of evidence for popular factors

2. Ignored Risks of Factor Investing


4. Multifactor Design, Part 2 – Keep a Handle on Trading Costs

5. Issues in ESG Integration
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Multi-Factor Design
Part 1: Mixing vs. Integrating
Debate on Optimal Ways of Gaining Factor Exposure: Mixing vs. Integrating

What is the optimal way to move from the neutral factor exposure point (green) to the point of desired factor exposure (red)?
Literature Is Full of Contradicting Statements:

- **Clarke, de Silva, and Thorley** – Integrating approach is superior\(^1\)
- **Fitzgibbons, Friedman, Pomorski, and Serban** – Integrating approach is superior\(^2\)
- **Leippold and Rueegg** – Controlling for factor exposure, both mixing and integrating approaches yield the same outcomes\(^3\)
- **Blitz, Roscovon, and Vidojevic** – “Integrating approach is not intrinsically superior to mixed approach, nor the other way around.”\(^4\)
- **Amenc, Ducoulombier, Esakia, Goltz and Sivasubramanian** – Mixing approach adjusted for cross-factor interactions is a preferred approach\(^5\)
- **Chow, Li, and Shim** – Mixing is preferred to passive investors and integrating is preferred to active investors\(^6\)

Mixing (Sleeve or Top-Down) Approach to Multi-Factor Portfolio

For illustrative purposes only.
Factor Exposure from Mixing Approach

» Mixing approach allows to gain some desired factor exposure with transparency into the factor construction and performance
Integrating (Bottom-Up) Approach to Multi-Factor

This is often implemented using an optimization approach, but there are also heuristic approaches to integrating factors.
Integrating (Bottom-Up) Approach to Multi-Factor

» Integrated approach is also effective in gaining the desired factor exposure
Integrating (Bottom-Up) Approach to Multi-Factor

» Many ways to do integrated approach – what matters in the end is factor exposure
Integrating (Bottom-Up) Approach to Multi-Factor

» Many ways to do integrated approach – what matters in the end is factor exposure
Mixing Approach Can Provide Similar Factor Exposure as Integrating

For illustrative purposes only.
Mixing Approach Can Provide Similar Factor Exposure as Integrating

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Mixing Approach Has Limits

» Mixing approach is limited in providing concentrated factor exposure, possibly gaining significant idiosyncratic noise at the limits.
Theoretical Limit to Mixing Approach

» Combining a number of factors in mixing approach puts a limit on the desired factor exposure
Integrating Approach Has Less Limits to Concentration

» Integrated approach can easily match the factor exposure equivalent to the theoretical limit of the mixing approach with little idiosyncratic noise

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Integrating Approach Can Go Even More Concentrated
Mixing vs. Integrating: Empirical Evidence

Simulated long-only factor strategies in Developed (1990-2016) and the United States (1976-2016) with methodologies similar to Fama and French (2014), except that selection concentration varies. Please see disclosures for important information relating to simulated data at the end.

Integrating: A single portfolio of companies with high combined ranking in value, low beta, profitability, investment, and momentum.

Mixing: Value, low beta, profitability, investment, and momentum factors are combined at equal weights quarterly.

Source: Research Affiliates, LLC, based on data from Compustat and CRSP.
## Is Integrating Suitable for Smart Beta?

### Integrating (Bottom-Up Approach)

| Advantage | Select the “super star” securities with decent rank in all dimensions.  
Higher absolute return empirically (at high concentration levels only). |
|-----------|---------------------------------------------------------------------|
| Disadvantage | Stronger benefits come from less correlated factors, which results in highly concentrated portfolio.  
Result in higher turnover and trading costs.  
Higher risk of data snooping, higher idiosyncratic risk. |
| Conclusion | Better suited to active multi-factor. |

### Mixing (Sleeve or Top-Down Approach)

| Advantage | Transparency into portfolio holdings.  
Transparency into factor performance.  
Lower cost of governance.  
Lower turnover and trading costs.  
Flexibility in design choices. |
|-----------|--------------------------------------------------------------------------------|
| Disadvantage | Invest in securities that are good in only one or few dimensions.  
Lower absolute return empirically at more concentrated levels. |
| Conclusion | Smart beta index has much of the same benefits at half the cost. |

Conclusion

» At low concentration, both mixing and integrating approaches provide similar performance characteristics
  - Mixing approach provides additional transparency into construction – preferred approach for smart beta

» At high concentration, integrating approach provides superior performance characteristics
  - Integrating approach lacks on transparency – preferred approach for high conviction active implementation

» Additional selection criteria, alternative weighting schemes, and alternative rebalancing rules allow to achieve desired factor concentration while preserving the benefits of the mixing approach

» Examine desired factor exposure, level of transparency, and transaction costs before making a call!
Thank You

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