

*Webinar*

# Multi-Factor Design

Part 1: Mixing vs. Integrating

*Presenter*



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*Host*



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# 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
3. Multifactor Design, Part 1 – Mixing vs. Integrating
4. Multifactor Design, Part 2 – Keep a Handle on Trading Costs
5. Issues in ESG Integration



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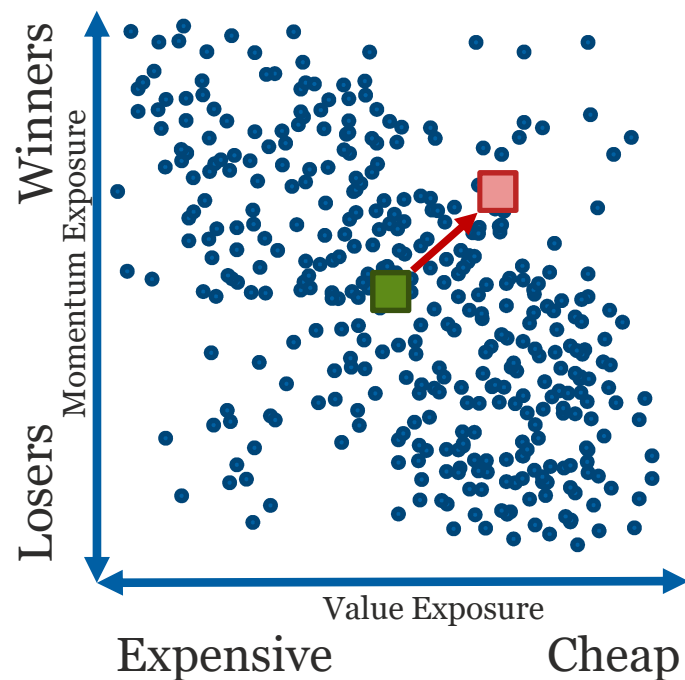
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# Multi-Factor Design

## 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)?

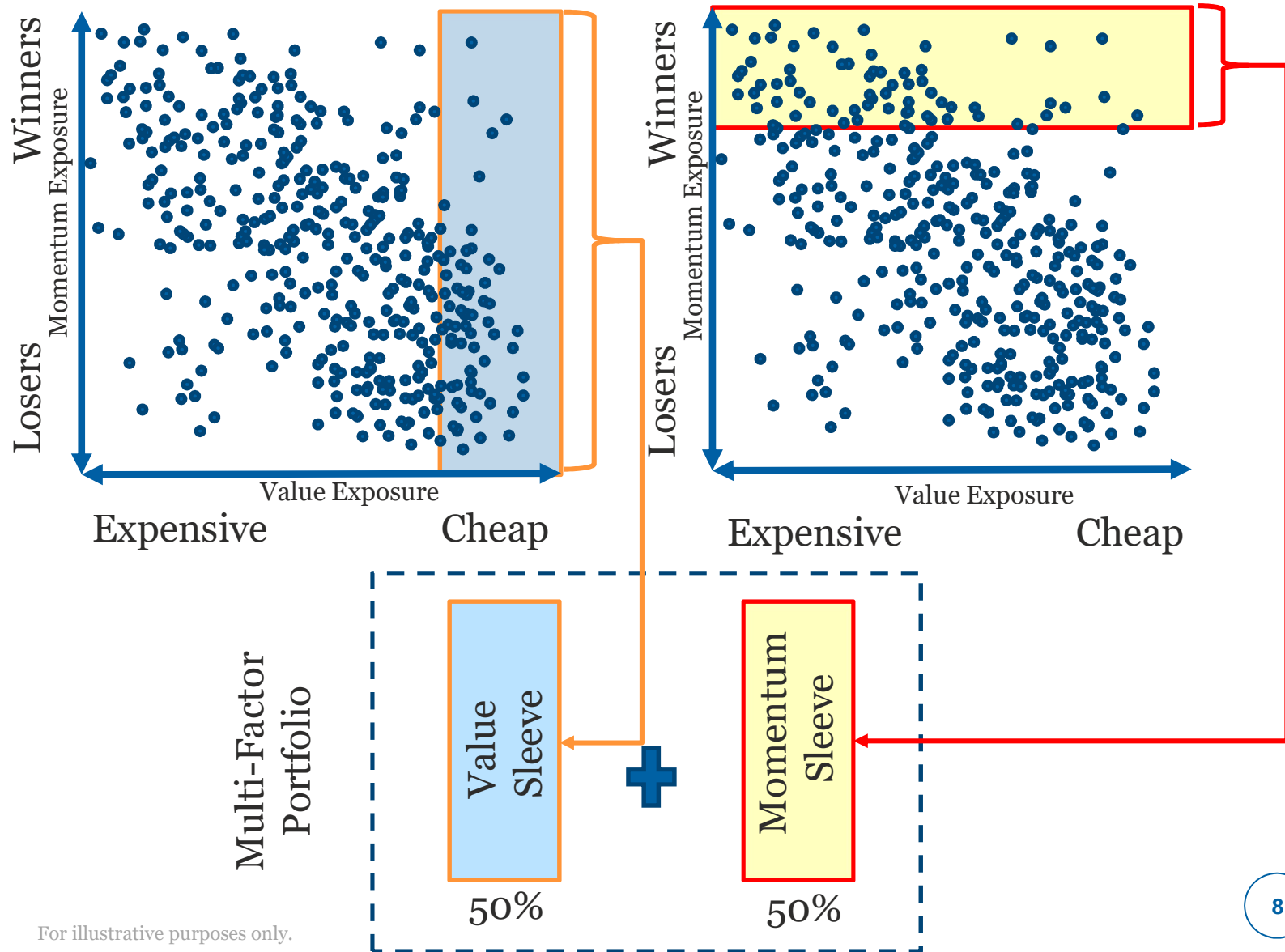
# Literature Is Full of Contradicting Statements:

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

1. Clarke, R., H. de Silva, and S. Thorley. 2016. “Fundamentals of Efficient Factor Investing.” *Financial Analysts Journal*, vol. 72, no. 6.
2. Fitzgibbons, S., J. Friedman, L. Pomorski, and L. Serban. 2016. “Long-Only Style Investing: Don't Just Mix, Integrate.” SSRN working paper.
3. Leippold, M., R. Rueegg. 2017. “The Mixed vs the Integrated Approach to Style Investing: Much Ado About Nothing?” SSRN Working paper.
4. Blitz, D., V. Roscovan, and M. Vidojevic. 2017. “Mixed versus Integrated Multi-Factor Portfolios.” Robeco.
5. Amenc, N., F. Ducoulombier, M. Esakia, F. Goltz, and S. Sivasubramanian. “Accounting for Cross-Factor Interactions in Multifactor Portfolios without Sacrificing Diversification and Risk Control.” *Journal of Portfolio Management*, Special QES Issue, vol. 43, no. 5.
6. Chow, T., F. Li, and J. Shim. 2018. “Smart Beta Multifactor Construction Methodology: Mixing versus Integrating.” *Journal of Index Investing*, vol. 8 no. 4.

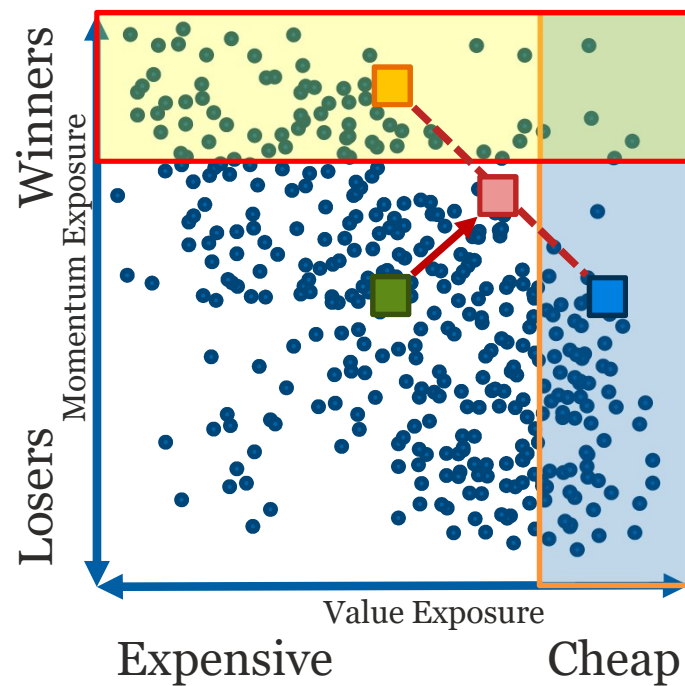


# Mixing (Sleeve or Top-Down) Approach to Multi-Factor



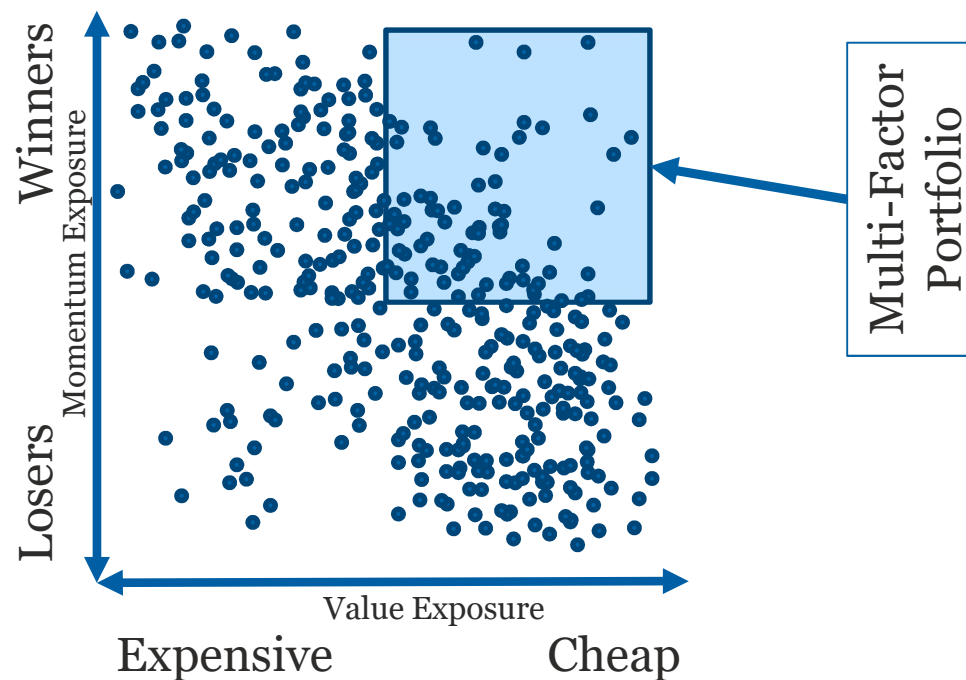


# Factor Exposure from Mixing Approach



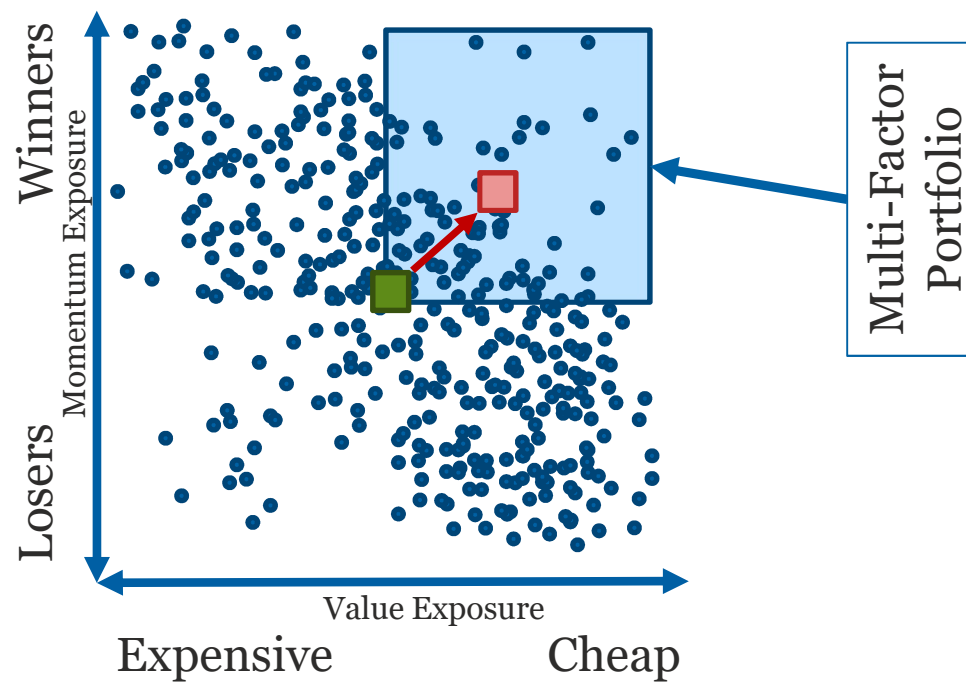
- » Mixing approach allows to gain some desired factor exposure with transparency into the factor construction and performance

# Integrating (Bottom-Up) Approach to Multi-Factor



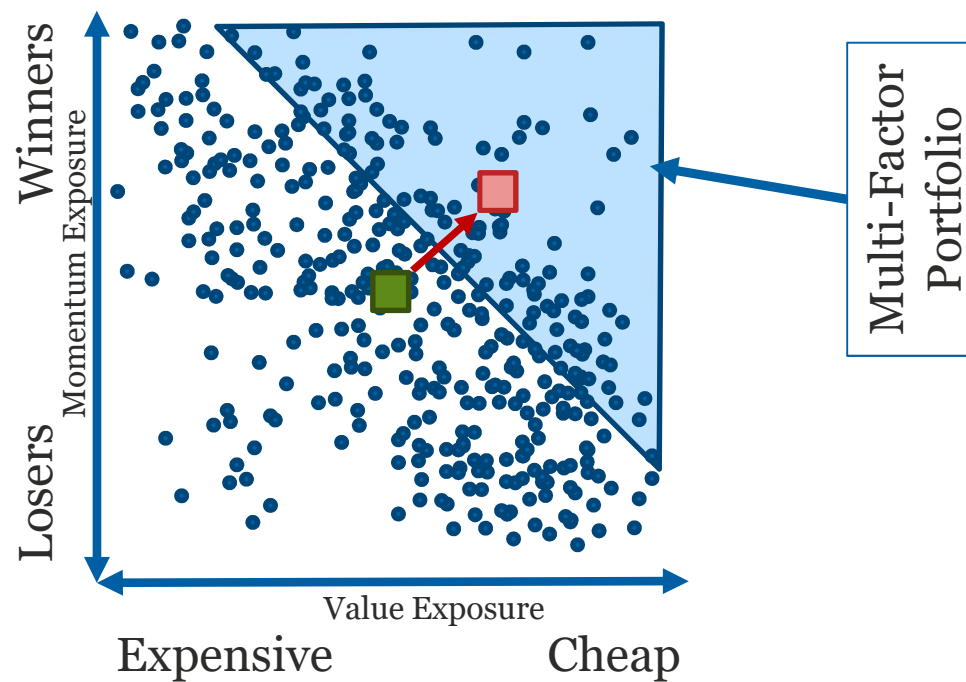
- » This is often implemented using an optimization approach, but there are also heuristic approaches to integrating factors

# Integrating (Bottom-Up) Approach to Multi-Factor



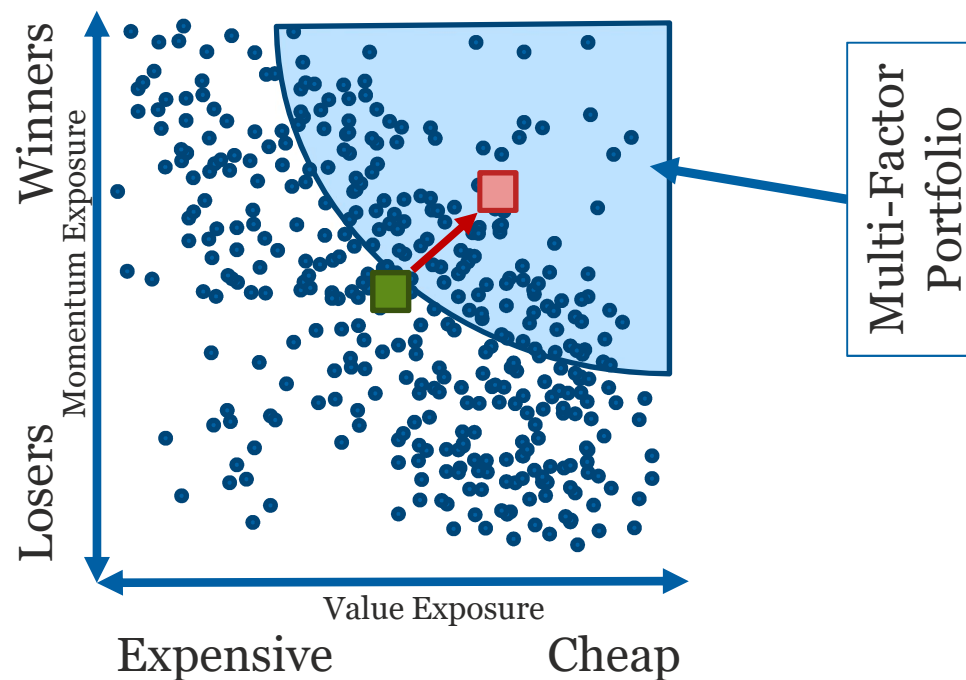
- » Integrated approach is also effective in gaining the desired factor exposure

# Integrating (Bottom-Up) Approach to Multi-Factor



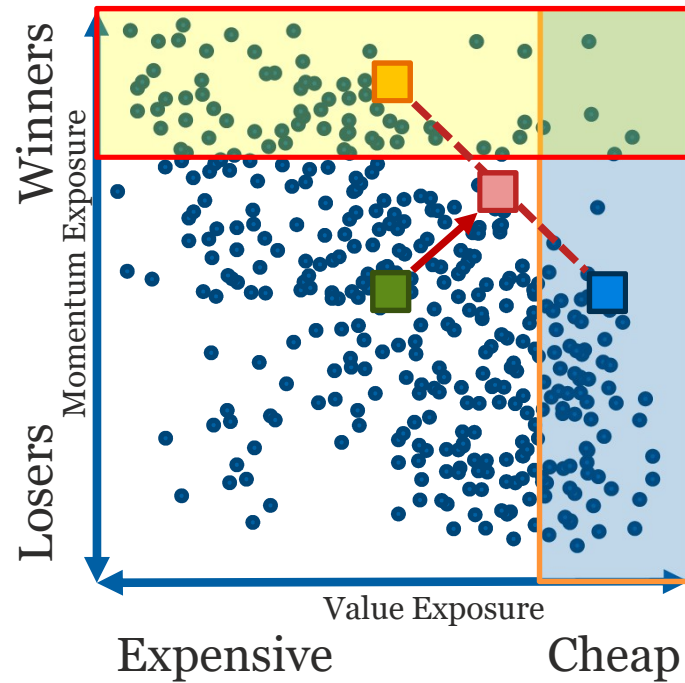
- » Many ways to do integrated approach – what matters in the end is factor exposure

# Integrating (Bottom-Up) Approach to Multi-Factor



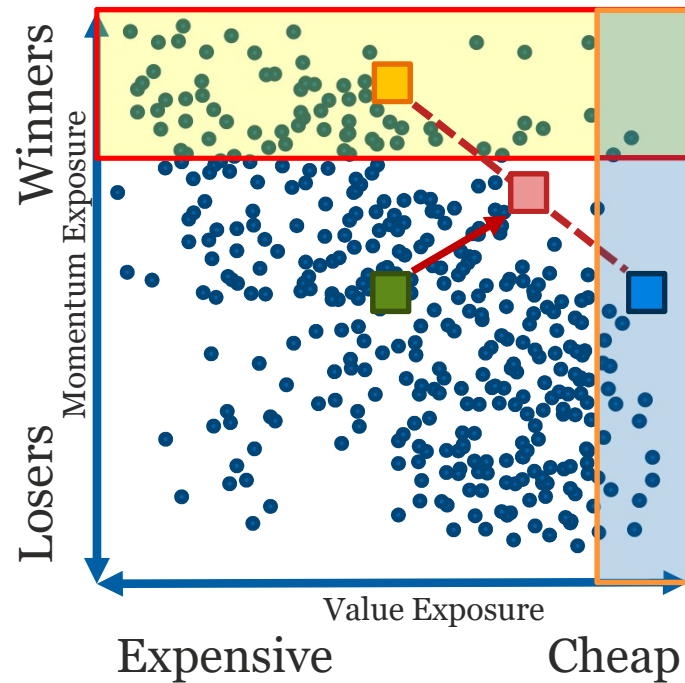
- » Many ways to do integrated approach – what matters in the end is factor exposure

# Mixing Approach Can Provide Similar Factor Exposure as Integrating

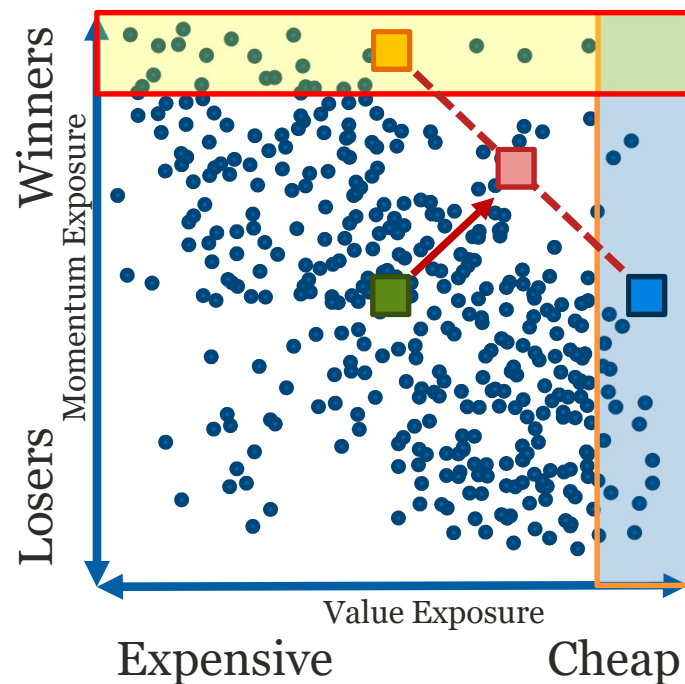


For illustrative purposes only.

# Mixing Approach Can Provide Similar Factor Exposure as Integrating



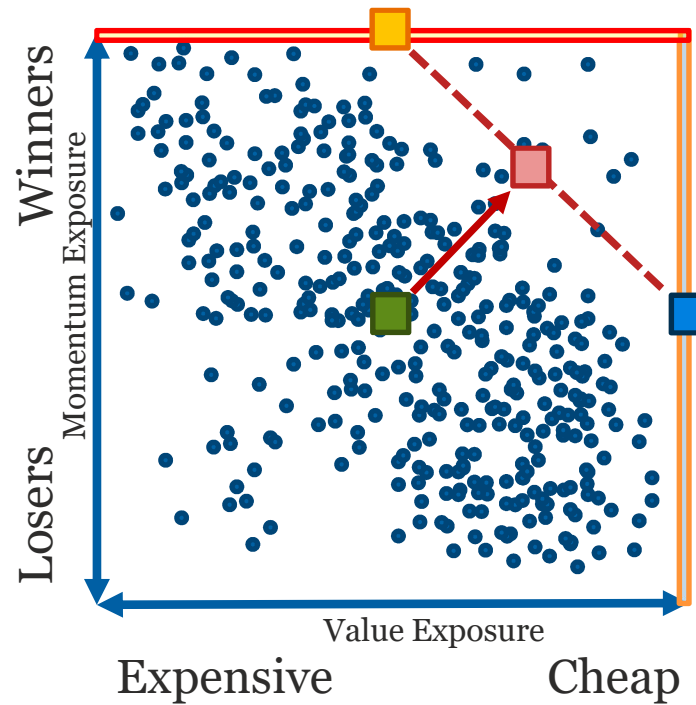
# Mixing Approach Has Limits



- » Mixing approach is limited in providing concentrated factor exposure, possibly gaining significant idiosyncratic noise at the limits

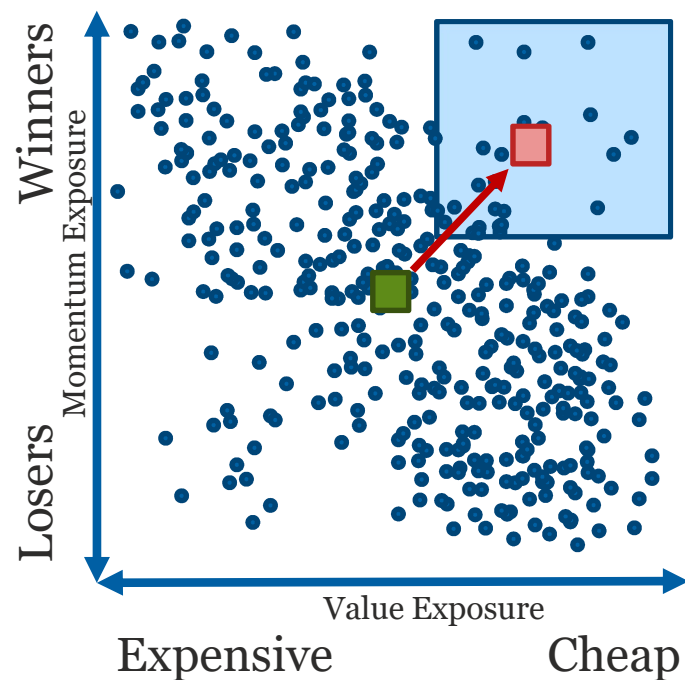


# Theoretical Limit to Mixing Approach



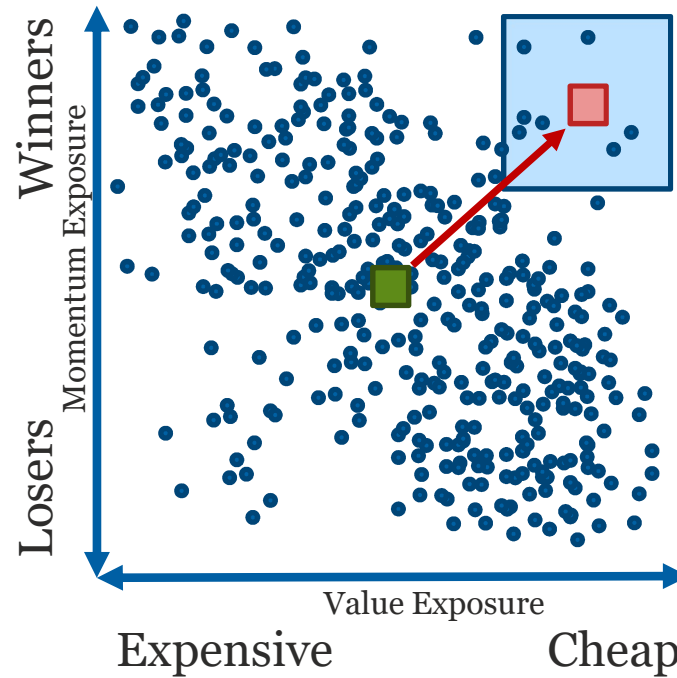
- » Combining a number of factors in mixing approach puts a limit on the desired factor exposure

# Integrating Approach Has Less Limits to Concentration

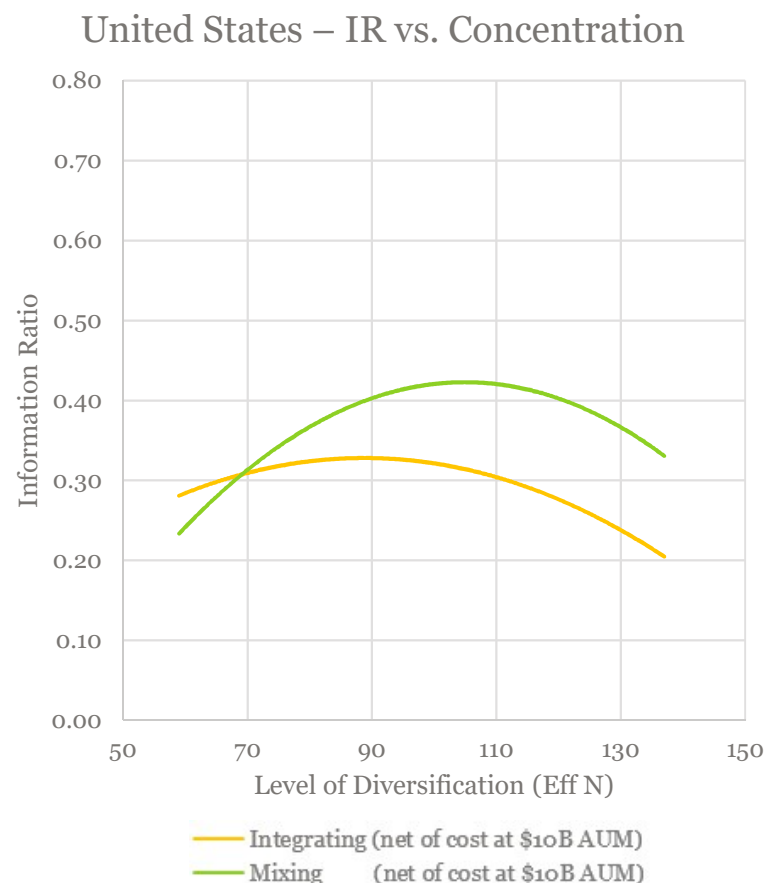
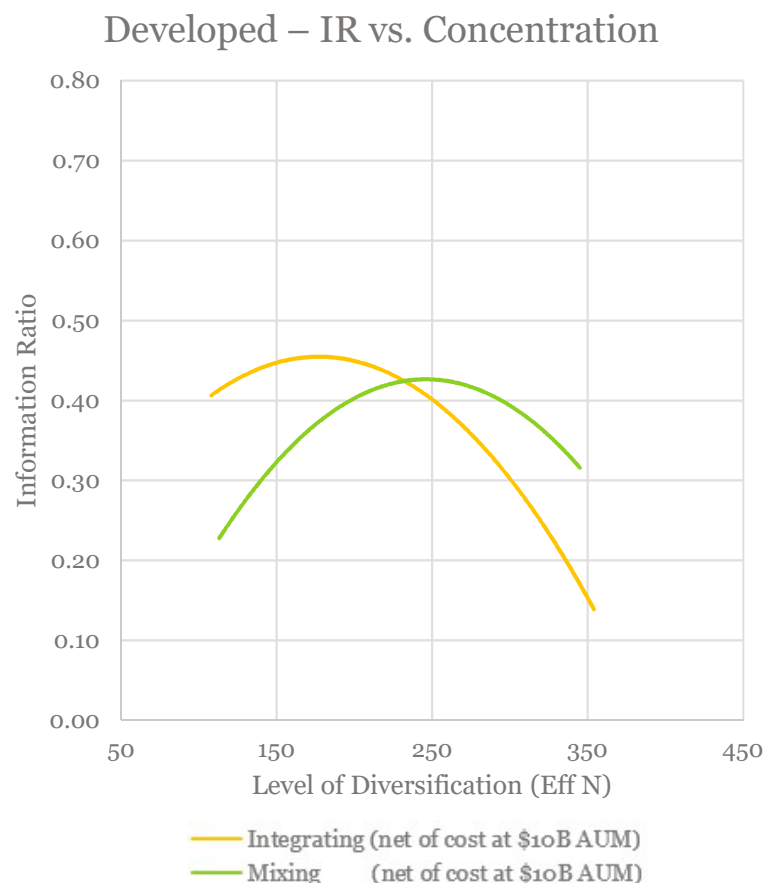


- » Integrated approach can easily match the factor exposure equivalent to the theoretical limit of the mixing approach with little idiosyncratic noise

# 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	<ul style="list-style-type: none"> <li>• Select the “super star” securities with decent rank in all dimensions.</li> <li>• Higher absolute return empirically (at high concentration levels only).</li> </ul>
Disadvantage	<ul style="list-style-type: none"> <li>• Stronger benefits come from less correlated factors, which results in highly concentrated portfolio.</li> <li>• Result in higher turnover and trading costs.</li> <li>• Higher risk of data snooping, higher idiosyncratic risk.</li> </ul>
Conclusion	<ul style="list-style-type: none"> <li>• Better suited to active multi-factor.</li> </ul>

## Mixing (Sleeve or Top-Down Approach)

Advantage	<ul style="list-style-type: none"> <li>• Transparency into portfolio holdings.</li> <li>• Transparency into factor performance.</li> <li>• Lower cost of governance.</li> <li>• Lower turnover and trading costs.</li> <li>• Flexibility in design choices.</li> </ul>
Disadvantage	<ul style="list-style-type: none"> <li>• Invest in securities that are good in only one or few dimensions.</li> <li>• Lower absolute return empirically at more concentrated levels.</li> </ul>
Conclusion	<ul style="list-style-type: none"> <li>• Smart beta index has much of the same benefits at half the cost.</li> </ul>



# 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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