

Webinar

Ignored Risks of Factor Investing

Presenter



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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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Ignored Risks of Factor Investing



Introduction

- » Factor investing is taking strong hold in investor portfolios
 - Transparency
 - Exposure to explored sources of return
 - Relatively low management fees
 - Relatively low transaction costs
- » Marketers are happy to advertise the benefits of factor investing
- » Investors often do not clearly understand the risks they are taking with factor investing
 - Factors have large drawdowns
 - Factors have long periods of underperformance
 - Factor return is not normally distributed which can make investment experience significantly worse
 - Diversification benefits within multi-factor are limited



Usual View at Factor Performance, United States, 1963–2017

	Factor	Return	Volatility	Sharpe Ratio	Value-Add	Information Ratio
Large Cap	Value/Large Cap	8.1%	16.1%	0.50	1.0%	0.21
	Momentum/Large Cap	8.8%	14.8%	0.59	1.7%**	0.34
	Low Beta/Large Cap	7.3%	12.6%	0.58	0.2%	0.04
	Investment/Large Cap	8.2%	14.6%	0.56	1.1%*	0.22
	Profitability/Large Cap	8.4%	14.4%	0.58	1.3%*	0.26
	Size	9.7%	19.6%	0.49	1.3%*	0.25
Small Cap	Value/Small Cap	12.4%	18.6%	0.67	2.6%***	0.53
	Momentum/Small Cap	13.5%	19.7%	0.68	3.7%***	0.74
	Low Beta/Small Cap	9.6%	16.1%	0.60	-0.2%	-0.04
	Investment/Small Cap	13.2%	19.4%	0.68	3.4%***	0.68
	Profitability/Small Cap	11.7%	19.2%	0.61	1.9%***	0.39
	Portfolio of Six Factors	12.3%	15.3%	0.80	3.9%***	0.77

Note: *** Significance at the 1% level, **Significance at the 5% level, * Significance at the 10% level. The portfolio of six factors is equally weighted. Factor returns are calibrated to the ex post long-run 5% tracking-error level.

Source: Research Affiliates, LLC, using data from Kenneth French website. Please see disclosures for important information relating to simulated data at the end.



Value-Add Correlations, United States, 1963–2017

	Value	Momentum	Low Beta	Size	Investment	Profitability	Average (off-diagonal)
Value	1	-0.19	0.39	-0.20	0.69	0.07	0.15
Momentum	-0.19	1	0.19	0.00	-0.02	0.11	0.02
Low Beta	0.39	0.19	1	-0.59	0.44	0.43	0.17
Size	-0.20	0.00	-0.59	1	-0.16	-0.41	-0.27
Investment	0.69	-0.02	0.44	-0.16	1	-0.04	0.18
Profitability	0.07	0.11	0.43	-0.41	-0.04	1	0.03
Average (off-diagonal)	0.15	0.02	0.17	-0.27	0.18	0.03	0.05



Source: Research Affiliates, LLC, using data from Kenneth French website. Please see disclosures for important information relating to simulated data at the end.

Many Phenomena Are Normally Distributed



Value Factor Assuming Normality, United States, 1963–2017

Factor	Drawdown	Return	Simulated Data		
			Years		
			Peak to Trough	Trough to Recovery	Peak to Recovery
Value/Large Cap	1	-25.1%	11.6	> 8.8	> 20.4
	2	-15.3%	4.5	> 4.2	> 8.7
	3	-11.2%	2.6	> 2.5	> 5.1
Value/Small Cap	1	-16.6%	4.4	> 4.2	> 8.6
	2	-12.4%	2.7	> 2.6	> 5.3
	3	-10.3%	2.0	> 2.0	> 4.0

- » Typical worst three drawdowns over a 55-year long simulated distribution assuming normality and similar mean and volatility as historical factor return



Note: The symbol “>” indicates a recovery is incomplete by the end of the sample.
 Source: Research Affiliates, LLC, using data from Kenneth French website. Please see disclosures for important information relating to simulated data at the end.

Momentum Factor Assuming Normality, United States, 1963–2017

Factor	Drawdown	Return	Simulated Data		
			Years		
			Peak to Trough	Trough to Recovery	Peak to Recovery
Momentum/Large Cap	1	–20.8%	7.4	> 6.5	> 13.9
	2	–14.4%	3.8	> 3.6	> 7.4
	3	–11.3%	2.5	> 2.4	> 4.9
Momentum/Small Cap	1	–13.5%	2.8	> 2.7	> 5.5
	2	–10.5%	1.9	> 1.9	> 3.8
	3	–9.0%	1.5	> 1.5	> 3.0

- » Typical worst three drawdowns over a 55-year long simulated distribution assuming normality and similar mean and volatility as historical factor return



Note: The symbol “>” indicates a recovery is incomplete by the end of the sample.
 Source: Research Affiliates, LLC, using data from Kenneth French website. Please see disclosures for important information relating to simulated data at the end.

Basketball Teams Are Outliers in the Crowd



Factor Returns Are Not Normally Distributed, United States, 1963–2017

Factor	Skewness	Worst Monthly Return	Frequency (in Years) of Expected Worst Realized Drawdown, Assuming Normal Return Distribution
Large Cap	Value	-6.4%	1 in 19,301
	Momentum	-9.9%	1 in 19 Billion (10 ⁹)
	Low Beta	-7.1%	1 in 222,251
	Investment	-6.0%	1 in 5,028
	Profitability	-5.2%	1 in 481
Size	0.51	-8.1%	1 in 8,655,171
Small Cap	Value	-6.9%	1 in 110,638
	Momentum	-12.9%	1 in 340 Quadrillion (10 ¹⁵)
	Low Beta	-6.1%	1 in 8,168
	Investment	-4.8%	1 in 199
	Profitability	-15.9%	1 in 622 Septillion (10 ²⁴)
Portfolio of Six Factors	0.09	-8.7%	1 in 117,434,364

Note: The portfolio of six factors is equally weighted.

Source: Research Affiliates, LLC, using data from Kenneth French website. Please see disclosures for important information relating to simulated data at the end.



Worst Drawdowns: Much Worse than Expected, United States, 1963–2017

Factor	Drawdown	United States		Europe		Developed		Asia Pacific ex Japan	
		Simulated	Realized	Simulated	Realized	Simulated	Realized	Simulated	Realized
Value/Large Cap	1	-25.1%	-21.3%	-19.7%	-25.1%	-22.6%	-23.8%	-16.6%	-13.3%
	2	-15.3%	-19.7%	-10.8%	-16.4%	-10.5%	-22.7%	-10.5%	-10.2%
	3	-11.2%	-15.3%	-7.4%	-6.8%	-6.6%	-6.0%	-7.8%	-8.5%
Value/Small Cap	1	-16.6%	-25.1%	-12.8%	-23.2%	-12.1%	-22.8%	-9.9%	-10.1%
	2	-12.4%	-17.4%	-9.1%	-15.2%	-8.8%	-7.7%	-7.4%	-8.6%
	3	-10.3%	-12.6%	-7.3%	-6.7%	-7.1%	-7.1%	-6.2%	-7.5%

Factor	Drawdown	Frequency Under Normality, Years	Simulated Data			Realized Data		
			Peak to Trough	Trough to Recovery	Peak to Recovery	Peak to Trough	Trough to Recovery	Peak to Recovery
Value/Large Cap	1	1 in 46	11.6	> 8.8	> 20.4	6.7	1.4	8.1
	2	1 in 317	4.5	> 4.2	> 8.7	9.0	> 2.3	> 11.3
	3	1 in 484	2.6	> 2.5	> 5.1	3.2	1.7	4.8
Value/Small Cap	1	1 in 875	4.4	> 4.2	> 8.6	1.6	1.2	2.8
	2	1 in 1,072	2.7	> 2.6	> 5.3	1.4	1.4	2.8
	3	1 in 414	2.0	> 2.0	> 4.0	5.3	> 2.9	> 8.3

- » Value factor tends to have long periods of underperformance followed by fast corrections
- » Drawdowns are worse and longer than expected

Note: A realized drawdown that exceeds the corresponding average simulated drawdown is noted in red. The symbol “>” indicates a recovery is incomplete by the end of the sample.

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Worst Drawdowns: Much Worse than Expected, United States, 1963–2017

Factor	Drawdown	United States		Europe		Developed		Asia Pacific ex Japan	
		Simulated	Realized	Simulated	Realized	Simulated	Realized	Simulated	Realized
Momentum/Large Cap	1	-20.8%	-18.2%	-16.4%	-18.2%	-17.2%	-20.7%	-18.2%	-18.6%
	2	-14.4%	-14.1%	-10.5%	-17.5%	-10.6%	-14.8%	-10.7%	-16.3%
	3	-11.3%	-12.5%	-7.8%	-8.3%	-7.7%	-6.2%	-7.6%	-8.7%
Momentum/Small Cap	1	-13.5%	-27.8%	-8.1%	-18.9%	-11.6%	-21.0%	-9.4%	-19.4%
	2	-10.5%	-10.9%	-6.3%	-11.3%	-8.5%	-13.7%	-7.1%	-18.1%
	3	-9.0%	-9.0%	-5.4%	-10.4%	-6.9%	-8.4%	-6.0%	-7.2%

Factor	Drawdown	Simulated Data				Realized Data		
		Frequency Under Normality, Years	Years			Years		
			Peak to Trough	Trough to Recovery	Peak to Recovery	Peak to Trough	Trough to Recovery	Peak to Recovery
Momentum/Large Cap	1	1 in 52	7.4	> 6.5	> 13.9	0.9	> 8.8	> 9.7
	2	1 in 80	3.8	> 3.6	> 7.4	8.3	1.8	10.1
	3	1 in 157	2.5	> 2.4	> 4.9	1.0	1.5	2.5
Momentum/Small Cap	1	1 in 16,835	2.8	> 2.7	> 5.5	1.3	> 8.4	> 9.7
	2	1 in 116	1.9	> 1.9	> 3.8	1.7	4.3	5.9
	3	1 in 94	1.5	> 1.5	> 3.0	0.2	0.8	0.9

- » Momentum factor tends to have sharp drawdowns followed by long periods of recovery
- » Drawdowns are worse and longer than expected

Note: A realized drawdown that exceeds the corresponding average simulated drawdown is noted in red. The symbol “>” indicates a recovery is incomplete by the end of the sample.
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Combination of Factors Assuming Normality, United States, 1963–2017

Factor	Drawdown	Return	Simulated Data		
			Years		
			Peak to Trough	Trough to Recovery	Peak to Recovery
	1	-13.2%	2.6	> 2.6	> 5.2
Portfolio of Six Factors	2	-10.3%	1.8	> 1.8	> 3.6
	3	-8.8%	1.4	> 1.4	> 2.8

- » Typical worst three drawdowns over a 55-year long simulated distribution assuming normality and similar mean and volatility as historical factor return



Note: The portfolio of six factors is equally weighted. The symbol “>” indicates a recovery is incomplete by the end of the sample. Source: Research Affiliates, LLC, using data from Kenneth French website. Please see disclosures for important information relating to simulated data at the end.

Worst Drawdowns: Much Worse than Expected, United States, 1963–2017

Factor	Drawdown	United States		Europe		Developed		Asia Pacific ex Japan	
		Simulated	Realized	Simulated	Realized	Simulated	Realized	Simulated	Realized
Portfolio of Six Factors	1	-13.2%	-18.7%	-10.9%	-13.8%	-12.7%	-12.2%	-11.8%	-17.8%
	2	-10.3%	-14.2%	-8.1%	-8.3%	-9.1%	-9.2%	-8.6%	-10.7%
	3	-8.8%	-10.3%	-6.7%	-7.7%	-7.3%	-7.7%	-7.0%	-7.2%

Factor	Drawdown	Simulated Data				Realized Data		
		Frequency Under Normality, Years	Years			Years		
			Peak to Trough	Trough to Recovery	Peak to Recovery	Peak to Trough	Trough to Recovery	Peak to Recovery
Portfolio of Six Factors	1	1 in 721	2.6	> 2.6	> 5.2	1.1	> 8.6	> 9.7
	2	1 in 1,186	1.8	> 1.8	> 3.6	1.4	1.0	2.4
	3	1 in 325	1.4	> 1.4	> 2.8	0.9	3.0	3.9

- » Drawdowns are worse and longer than expected
- » Quant crash-like events may happen where factors may be highly correlated at drawdowns

Note: The portfolio of six factors is equally weighted. A realized drawdown that exceeds the corresponding average simulated drawdown is noted in red. The symbol ">" indicates a recovery is incomplete by the end of the sample.
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Conclusion

- » Multi-Factor investing has tangible benefits
 - Exposure to factors with evidence of premium
 - Low transaction and management costs
 - Transparency
- » Factors have non-normal return distribution
 - Value tends to have long periods of underperformance followed by quick recoveries
 - Momentum is prone to crashes collecting pennies in front of a steam roller
 - Diversification benefits are limited
- » Investors should be expecting a bumpy ride to be able to benefit from factor investing!

Thank You



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