

# Where Can Indexes—and Factors— Fall Short?

## Assessing Tradeoffs in Systematic Strategies

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**Jeromey Thornton, CFA**

Senior Investment Director

# Agenda

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Factors vs.  
Fundamentals

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Size and Style  
Indices

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Systematic  
Investing 2.0  
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Implementation  
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An Alternative  
Approach –  
Post-Factor  
Investing

# Factors vs. Fundamentals

# The Factor Craze – Evolution

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In what year was the first single-factor model developed?

- a. 1949
- b. 1964
- c. 1981
- d. 1993

# The Factor Craze – Evolution

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In what year was the first single-factor model developed?

- a. 1949
- b. 1964 – CAPM (Sharpe)**
- c. 1981
- d. 1993

# The Factor Craze – Evolution

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How many factors have been documented today?

- a. 100
- b. 200
- c. 400
- d. 1,000

# The Factor Craze – Evolution

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How many factors have been documented today?

- a. 100
- b. 200
- c. 400 – *A Census of the Factor Zoo* (Harvey/Liu, 2019)**
- d. 1,000

# 400 Factors...and Counting

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Data availability has allowed researchers and practitioners to “search” for patterns using historical data

- most of these patterns have no reason to exist – they happened randomly in the past
- Some factors provide benefits (but not increased expected returns), e.g. Low volatility
- Some factors may not be directly implementable but can enhance expected returns, e.g. momentum

**What should investors do to cut through the factor noise?**

See A Census of the Factor Zoo, Harvey/Liu (2019)



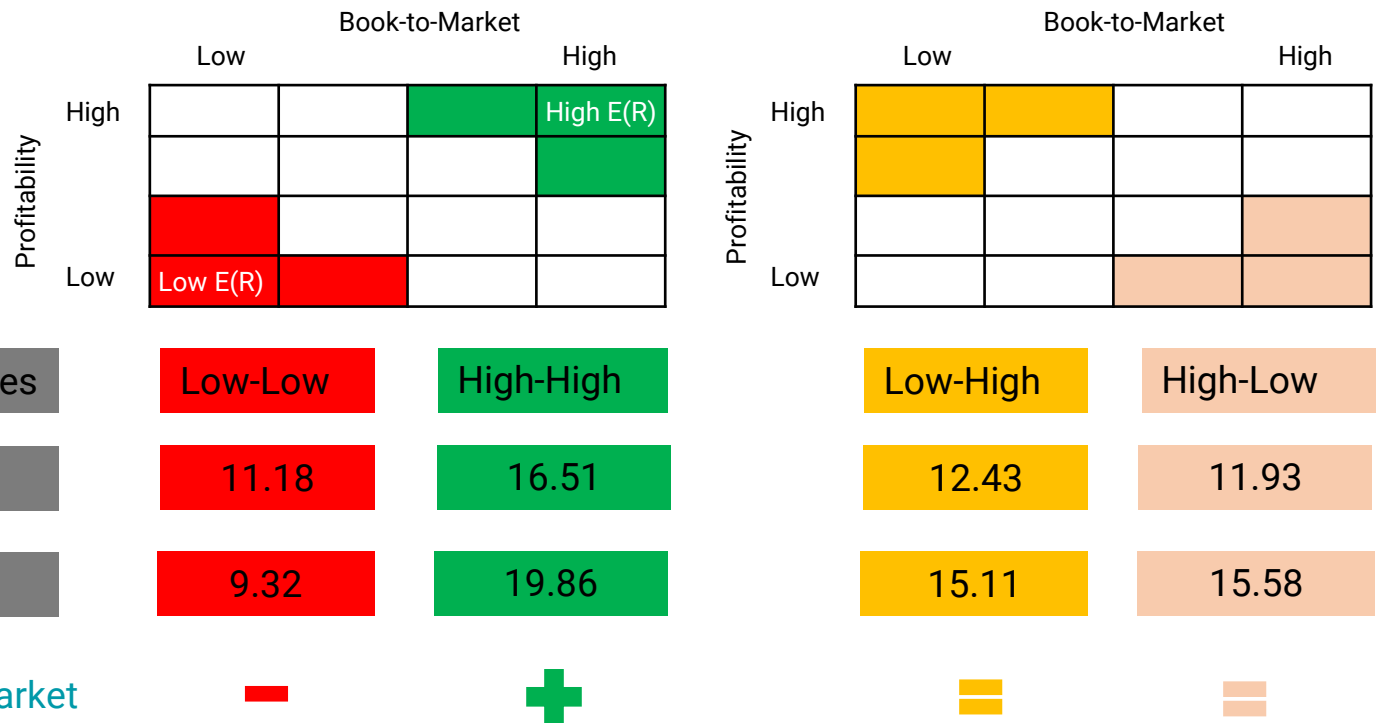
# We Should Consider Valuation

Use the learnings from asset pricing and factor research but within a valuation framework.

<b>Price = Equity + <math>\frac{\text{Profits}}{\text{Discount Rate}}</math></b>	<b><math>\frac{\text{Equity}}{\text{Price}}</math> AND <math>\frac{\text{Profits}}{\text{Equity}}</math></b>
<b>Expected returns (discount rates) are a function of:</b> Prices Current equity Expected profits	<b>Differences in expected returns across securities are captured in valuation ratios</b> <b>Need to define</b> Equity (modified B/M) Profits (cash-based operating profitability)

Goal is to find reliable proxies for equity and profits that incorporate enhancements to have a more robust approach.

# Implications for Expected Returns



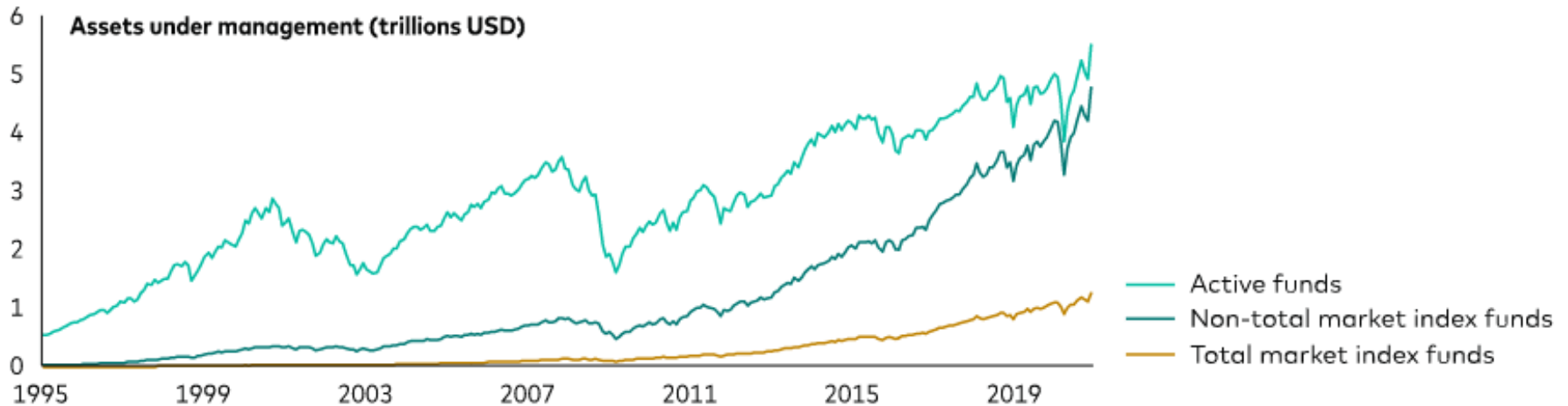
Source: Avantis Investors and Sunil Wahal, CRSP/Compustat, US Securities, 1973-2021

# Systematic Investing 1.0

## Size and Style Indices

# What's Driven the Growth in Indexing?

## Non-total market index funds capture the majority of index fund assets



**Notes:** The chart shows the development of assets under management in the categories of non-total market index funds, total market index funds, and active funds. Time period observed: January 1995 to December 2020.

**Sources:** Vanguard calculations, based on data from Morningstar, Inc.

Source: <https://corporate.vanguard.com/content/corporatesite/us/en/corp/articles/new-form-of-active-investing.html>

# Which Index has been the Winner?

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Which of these indexes has delivered the highest annualized return since their inception at the end of 1978?

- a. Russell 1000 Growth Index
- b. Russell 1000 Index
- c. Russell 2000 Index
- d. Russell 1000 Value Index

As of July 29, 2022. Source: Morningstar Direct

# Which Index has been the Winner?

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- a. Russell 1000 Growth Index
- b. Russell 1000 Index**
- c. Russell 2000 Index
- d. Russell 1000 Value Index

As of July 29, 2022. Source: Morningstar Direct

# Historical Performance of Value and Growth

Annualized Returns Since January 1979 (%)

Russell 1000 Index

11.95%

Russell 1000 Growth Index

11.79%

Russell 1000 Value Index

11.71%

Russell 2000 Index

11.10%

Source: Avantis Investors, data from Morningstar and Russell as of July 29, 2022. Inception date is 1/1/1979 for all indices.

# Value vs. Growth - Russell

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How many companies that are in the Russell 1000 Value Index are also in the Russell 1000 Growth Index?

- a. 0
- b. 57
- c. 206
- d. 351

As of July 29, 2022. Source: Morningstar Direct



# Value vs. Growth - Russell

---

How many companies that are in the Russell 1000 Value Index are also in the Russell 1000 Growth Index?

- a. 0
- b. 57
- c. 206
- d. 351**

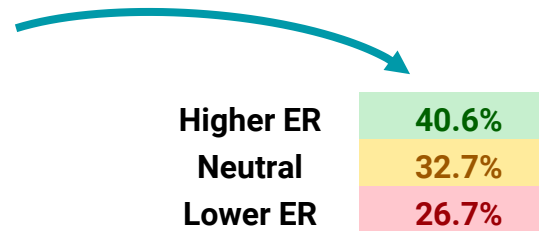
As of July 29, 2022. Source: Morningstar Direct

# What Exposure Do “Value” and “Growth” Indices Offer?

## Russell 1000 Index

**Adjusted Book-to-Market**

Cash-Based Operating Profitability		Adjusted Book-to-Market					
		Low				High	
High		7.7%	8.1%	2.6%	0.6%	0.7%	19.6%
		1.6%	4.2%	8.8%	3.5%	1.7%	19.8%
		4.5%	2.4%	9.4%	6.0%	2.1%	24.4%
		4.5%	1.7%	2.1%	4.7%	6.6%	19.6%
Low		1.5%	1.3%	2.9%	4.0%	6.7%	16.5%
		19.9%	17.7%	25.8%	18.9%	17.8%	100.0%



Source: Avantis Investors, data from Bloomberg as of June 30, 2022

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# What Exposure Do “Value” and “Growth” Indices Offer?

## Russell 1000 Index

### Adjusted Book-to-Market

		Adjusted Book-to-Market					
		Low				High	
Cash-Based Operating Profitability	High	7.7%	8.1%	2.6%	0.6%	0.7%	19.6%
		1.6%	4.2%	8.8%	3.5%	1.7%	19.8%
	Low	4.5%	2.4%	9.4%	6.0%	2.1%	24.4%
		4.5%	1.7%	2.1%	4.7%	6.6%	19.6%
		1.5%	1.3%	2.9%	4.0%	6.7%	16.5%
	19.9%	17.7%	25.8%	18.9%	17.8%	100.0%	



Higher ER	40.6%
Neutral	32.7%
Lower ER	26.7%

## Russell 1000 Growth Index

### Adjusted Book-to-Market

		Adjusted Book-to-Market				
		Low				High
Cash-Based Operating Profitability	High					
				?		
	Low					

## Russell 1000 Value Index

### Adjusted Book-to-Market

		Adjusted Book-to-Market				
		Low				High
Cash-Based Operating Profitability	High					
				?		
	Low					

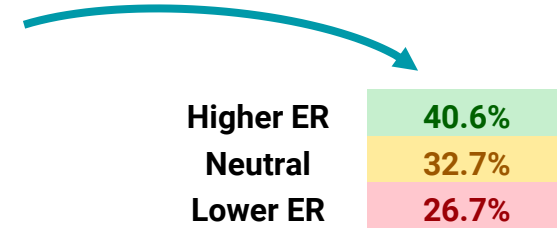
Source: Avantis Investors, data from Bloomberg as of June 30, 2022

# What Exposure Do “Value” and “Growth” Indices Offer?

## Russell 1000 Index

Adjusted Book-to-Market

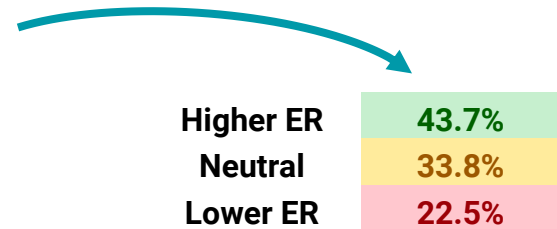
Cash-Based Operating Profitability		Adjusted Book-to-Market					
		Low				High	
High	High	7.7%	8.1%	2.6%	0.6%	0.7%	19.6%
	Neutral	1.6%	4.2%	8.8%	3.5%	1.7%	19.8%
	Lower ER	4.5%	2.4%	9.4%	6.0%	2.1%	24.4%
	Neutral	4.5%	1.7%	2.1%	4.7%	6.6%	19.6%
	High	1.5%	1.3%	2.9%	4.0%	6.7%	16.5%
Low	High	19.9%	17.7%	25.8%	18.9%	17.8%	100.0%
	Neutral						
	Lower ER						
	Neutral						
	High						



## Russell 1000 Growth Index

Adjusted Book-to-Market

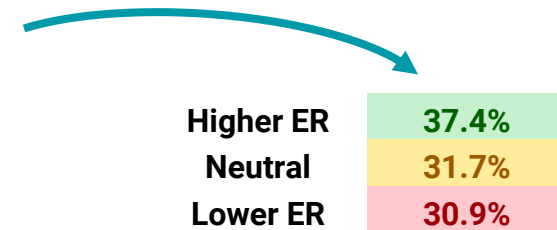
Cash-Based Operating Profitability		Adjusted Book-to-Market					
		Low				High	
High	High	12.7%	15.5%	3.2%	0.5%	0.2%	32.1%
	Neutral	2.3%	6.9%	14.5%	1.6%	0.4%	25.6%
	Lower ER	4.8%	4.5%	11.0%	7.3%	0.0%	27.7%
	Neutral	1.7%	1.5%	1.7%	2.5%	0.5%	8.0%
	High	1.2%	0.9%	1.3%	2.5%	0.7%	6.6%
Low	High	22.7%	29.3%	31.9%	14.4%	1.8%	100.0%
	Neutral						
	Lower ER						
	Neutral						
	High						



## Russell 1000 Value Index

Adjusted Book-to-Market

Cash-Based Operating Profitability		Adjusted Book-to-Market					
		Low				High	
High	High	2.7%	0.7%	1.9%	0.8%	1.1%	7.1%
	Neutral	1.0%	1.6%	3.0%	5.5%	3.0%	14.1%
	Lower ER	4.2%	0.4%	7.8%	4.6%	4.2%	21.2%
	Neutral	7.4%	1.8%	2.5%	6.8%	12.7%	31.2%
	High	1.8%	1.7%	4.5%	5.6%	12.8%	26.4%
Low	High	17.1%	6.1%	19.7%	23.3%	33.7%	100.0%
	Neutral						
	Lower ER						
	Neutral						
	High						



Source: Avantis Investors, data from Bloomberg as of June 30, 2022

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# Systematic Investing 1.0

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- Size and Style Indexes offered investors transparent, cheap building blocks to deviate from the market in order to pursue better returns
- Some of the most widely followed indexes have construction methodologies that were established more than 20, and in some cases more than 30, years ago
- Significant differences in asset class definitions and rebalancing schemes across index families contributes to performance dispersion and tracking differences, calling into question the merits of tracking any single index

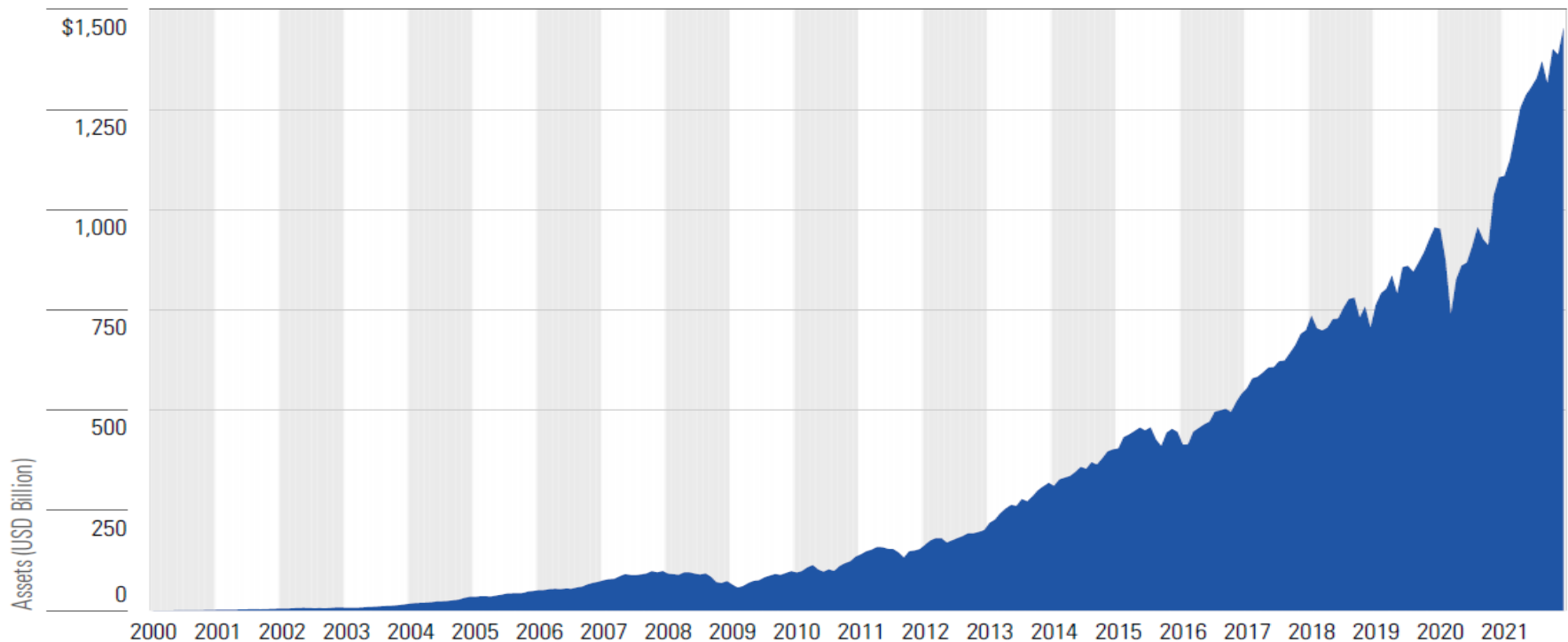
# Systematic Investing 2.0

## “Factor” Implementation Case Studies

# The Proliferation of “Strategic” Beta

As of the end of 2021, there were **622** Strategic-Beta ETPs in the US totaling almost **\$1.5 trillion** in AUM

## U.S. Strategic-Beta ETP Asset Growth



Source: Morningstar’s Global Guide to Strategic Beta Exchange-Traded Products, June 2022. Data as of 12/31/2021

# The Proliferation of “Strategic” Beta

As of the end of 2021, there were **622** Strategic-Beta ETPs in the US totaling almost **\$1.5 trillion** in AUM

- This definition includes many market-cap weighted index funds tracking indices like the Russell 1000 Growth and Value
- It also includes many single and multi “factor” indexes

## Different Types of Strategic Beta ETPs

Strategic Beta Group	No of ETPs	Assets (USD Bil)
Growth	39	398.3
Value	47	373.4
Dividend	140	327.2
Multifactor	165	84.7
Risk-Oriented	44	69.4
Other	41	52.2
Quality	20	51.6
Fundamentals	30	46.7
Momentum	31	26.6
Fixed Income	37	14.6
Commodity	28	7.8
<b>Total</b>	<b>622</b>	<b>1,452.5</b>

**Do these “factor” indexes solve the issues faced in style indexes?**

Source: Morningstar’s Global Guide to Strategic Beta Exchange-Traded Products, June 2022. Data as of 12/31/2021



# What Exposure Do “Value” and “Quality” Factor Indexes Offer?

## Russell 1000 Index

Adjusted Book-to-Market

		Adjusted Book-to-Market					
		Low		High			
Cash-Based Operating Profitability	High	7.7%	8.1%	2.6%	0.6%	0.7%	19.6%
		1.6%	4.2%	8.8%	3.5%	1.7%	19.8%
	Low	4.5%	2.4%	9.4%	6.0%	2.1%	24.4%
		4.5%	1.7%	2.1%	4.7%	6.6%	19.6%
		1.5%	1.3%	2.9%	4.0%	6.7%	16.5%
		19.9%	17.7%	25.8%	18.9%	17.8%	100.0%

Higher ER	40.6%
Neutral	32.7%
Lower ER	26.7%

## MSCI USA Enhanced Value Index

Adjusted Book-to-Market

		Adjusted Book-to-Market				
		Low		High		
Cash-Based Operating Profitability	High					
				?		
	Low					

## MSCI USA Sector Neutral Quality Index

Adjusted Book-to-Market

		Adjusted Book-to-Market				
		Low		High		
Cash-Based Operating Profitability	High					
				?		
	Low					

Source: Avantis Investors, data from Bloomberg as of June 30, 2022

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# What Exposure Do “Value” and “Quality” Factor Indexes Offer?

## Russell 1000 Index

Adjusted Book-to-Market

Cash-Based Operating Profitability		Adjusted Book-to-Market					
		Low				High	
High		7.7%	8.1%	2.6%	0.6%	0.7%	19.6%
		1.6%	4.2%	8.8%	3.5%	1.7%	19.8%
		4.5%	2.4%	9.4%	6.0%	2.1%	24.4%
		4.5%	1.7%	2.1%	4.7%	6.6%	19.6%
Low		1.5%	1.3%	2.9%	4.0%	6.7%	16.5%
		19.9%	17.7%	25.8%	18.9%	17.8%	100.0%

Higher ER 40.6%  
Neutral 32.7%  
Lower ER 26.7%

## MSCI USA Enhanced Value Index

Adjusted Book-to-Market

Cash-Based Operating Profitability		Adjusted Book-to-Market					
		Low				High	
High		4.6%	0.6%	2.8%	1.6%	2.4%	12.0%
		0.0%	0.4%	1.4%	4.9%	2.1%	8.8%
		6.9%	0.0%	3.3%	1.8%	4.2%	16.2%
		6.1%	0.7%	0.0%	6.1%	26.3%	39.2%
Low		4.2%	0.1%	0.5%	4.3%	14.7%	23.9%
		21.7%	1.9%	8.0%	18.7%	49.8%	100.0%

Higher ER 48.0%  
Neutral 29.2%  
Lower ER 22.8%

## MSCI USA Sector Neutral Quality Index

Adjusted Book-to-Market

Cash-Based Operating Profitability		Adjusted Book-to-Market					
		Low				High	
High		8.7%	10.1%	8.6%	3.6%	1.7%	32.7%
		2.6%	4.6%	15.7%	8.5%	1.3%	32.6%
		1.3%	6.4%	1.4%	6.0%	0.0%	15.1%
		0.0%	1.9%	2.1%	2.2%	3.0%	9.2%
Low		0.0%	0.5%	4.3%	1.6%	3.9%	10.3%
		12.7%	23.4%	32.1%	22.0%	9.9%	100.0%

Higher ER 58.5%  
Neutral 20.8%  
Lower ER 20.7%

Source: Avantis Investors, data from Bloomberg as of June 30, 2022

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# What Issues Do Factor Indexes Face?

Let's see the effects of deviating from the market

## U.S. Companies Sorted by Profitability and Book-to-Market

		Adjusted Book-to-Market					
		Low		High			
		High	Low	High	Low	High	
Cash-Based Operating Profitability	High	7.5%	7.7%	2.7%	0.8%	0.7%	<b>19.4%</b>
		1.8%	4.2%	8.4%	3.5%	1.8%	<b>19.7%</b>
	4.3%	2.5%	9.4%	5.9%	2.3%	<b>24.3%</b>	
	4.4%	1.8%	2.2%	4.7%	6.5%	<b>19.7%</b>	
	Low	1.7%	1.5%	3.0%	4.0%	6.6%	<b>16.8%</b>
		<b>19.7%</b>	<b>17.7%</b>	<b>25.7%</b>	<b>19.0%</b>	<b>17.9%</b>	<b>100.0%</b>

Source: Avantis, Bloomberg, U.S. Securities, June 30, 2022

# What Issues do Factor Indexes Face?

Shifting an allocation towards high BtM produces a shift to companies with low profitability.

## U.S. Companies Sorted by Profitability and Book-to-Market

		Adjusted Book-to-Market				
		Low				High
Cash-Based Operating Profitability	High	7.5%	7.7%	2.7%	0.8%	0.7%
		1.8%	4.2%	8.4%	3.5%	1.8%
		4.3%	2.5%	9.4%	5.9%	2.3%
		4.4%	1.8%	2.2%	4.7%	6.5%
	Low	1.7%	1.5%	3.0%	4.0%	6.6%

Companies with High BtM tend to have Low Profitability

High Prof	3.9%
	10.0%
	12.8%
	<b>36.4%</b>
Low Prof	<b>36.9%</b>

Searching for a BtM premium, as suggested by the factor, produces a negative profitability premium.

Source: Avantis, Bloomberg, U.S. Securities, June 30, 2022

# But We Have Complications to Deal With

Shifting an allocation towards high profitability produces a shift to companies with low BtM.

Companies with High Prof tend to have Low BtM

Low BtM			High BtM	
38.8%	39.7%	13.7%	4.2%	3.6%

U.S. Companies Sorted by Profitability and Book-to-Market

		Adjusted Book-to-Market				
		Low				High
Cash-Based Operating Profitability	High	7.5%	7.7%	2.7%	0.8%	0.7%
		1.8%	4.2%	8.4%	3.5%	1.8%
		4.3%	2.5%	9.4%	5.9%	2.3%
		4.4%	1.8%	2.2%	4.7%	6.5%
	Low	1.7%	1.5%	3.0%	4.0%	6.6%

Searching for a profitability premium, as suggested by the factor, produces a negative BtM premium.

Source: Avantis, Bloomberg, U.S. Securities, June 30, 2022

# Systematic Investing 2.0

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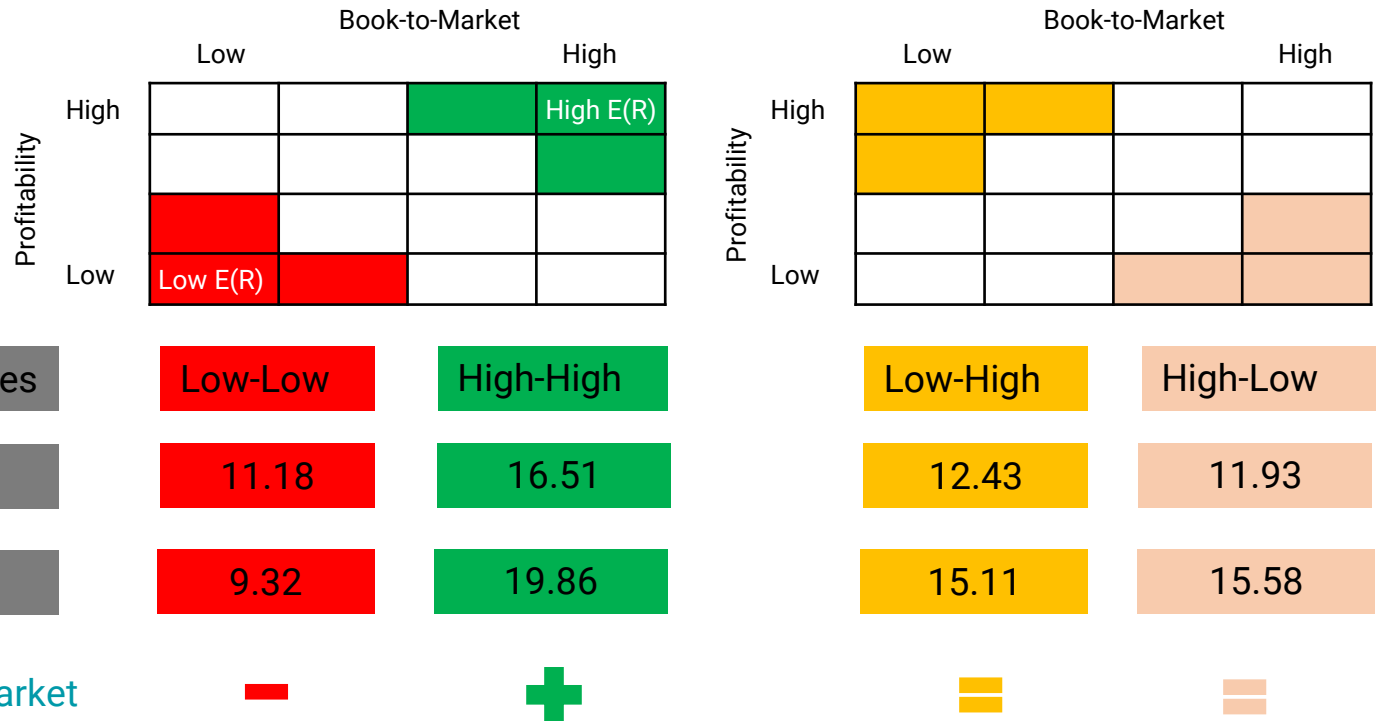
- The creation of factor indexes and smart/strategic beta strategies tracking factor indexes increased the number of tools available to implement systematic factor tilts into asset allocations
- Many single factor indexes can run into similar challenges of style-based indexes
- Single and multi-factor strategies can become too “factor focused”, ignoring interaction effects and sacrificing diversification and other risk management principles unnecessarily

# **An Alternative Approach**

## **Post-Factor Investing**

**Going Back to Fundamentals With Our  
New Lenses**

# Implications for Expected Returns

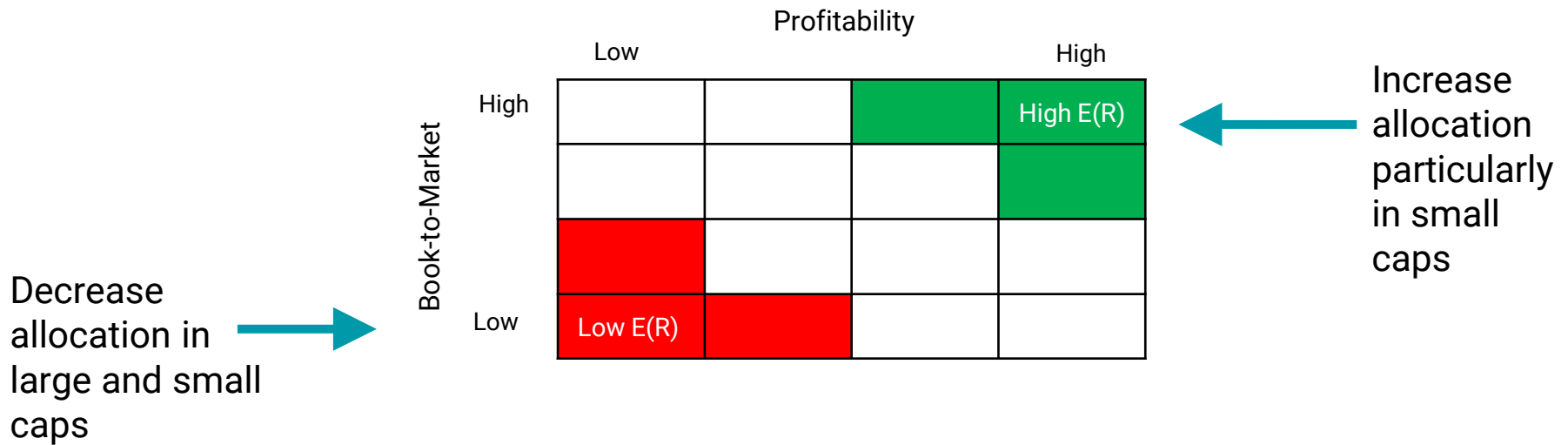


Source: Avantis Investors and Sunil Wahal, CRSP/Compustat, US Securities, 1973-2021



# Implementing Portfolios

Goal: create an efficient portfolio with increased expected returns while minimizing deviations from the market and tracking error

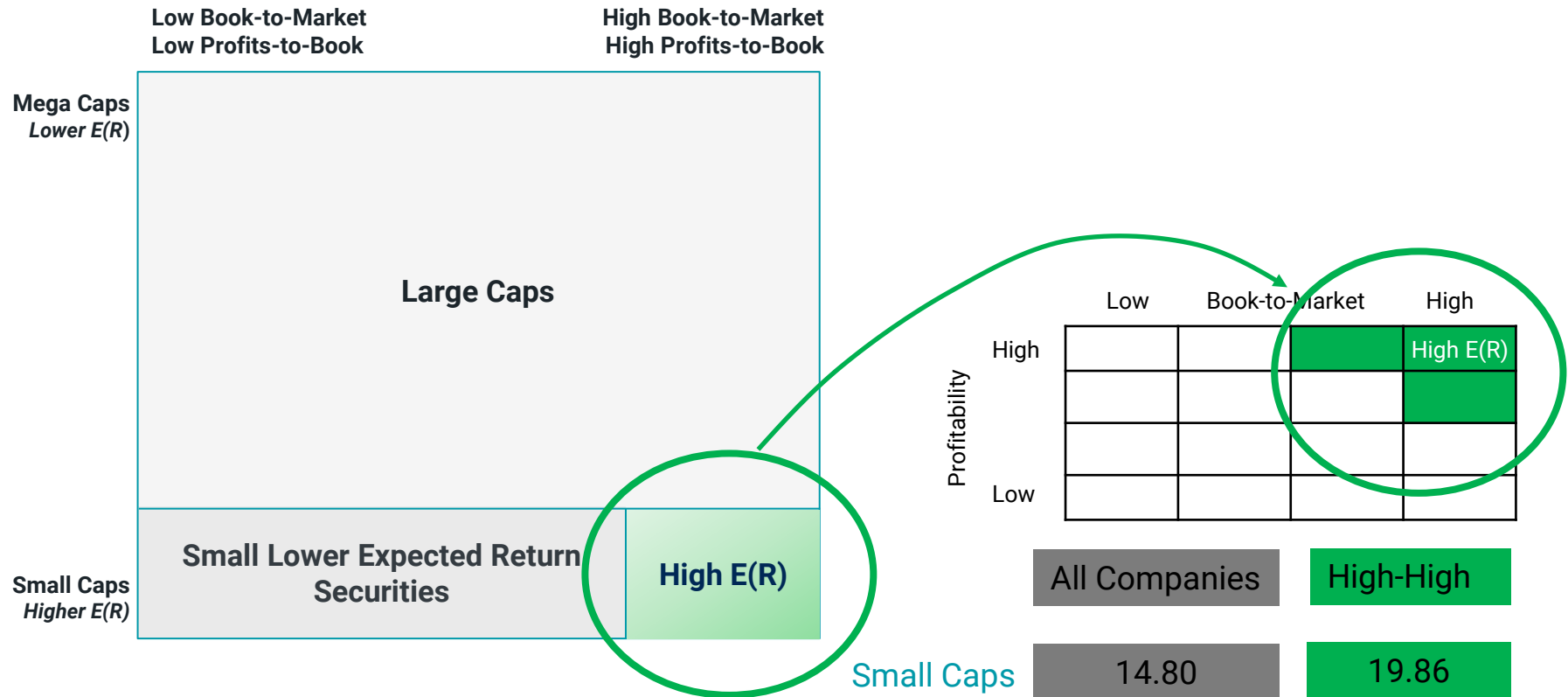


# Small Value Strategy Design and Execution

A more holistic approach:

Continuous focus on small cap companies with high profitability and high book-to-market

Broad diversification and low turnover effected when necessary



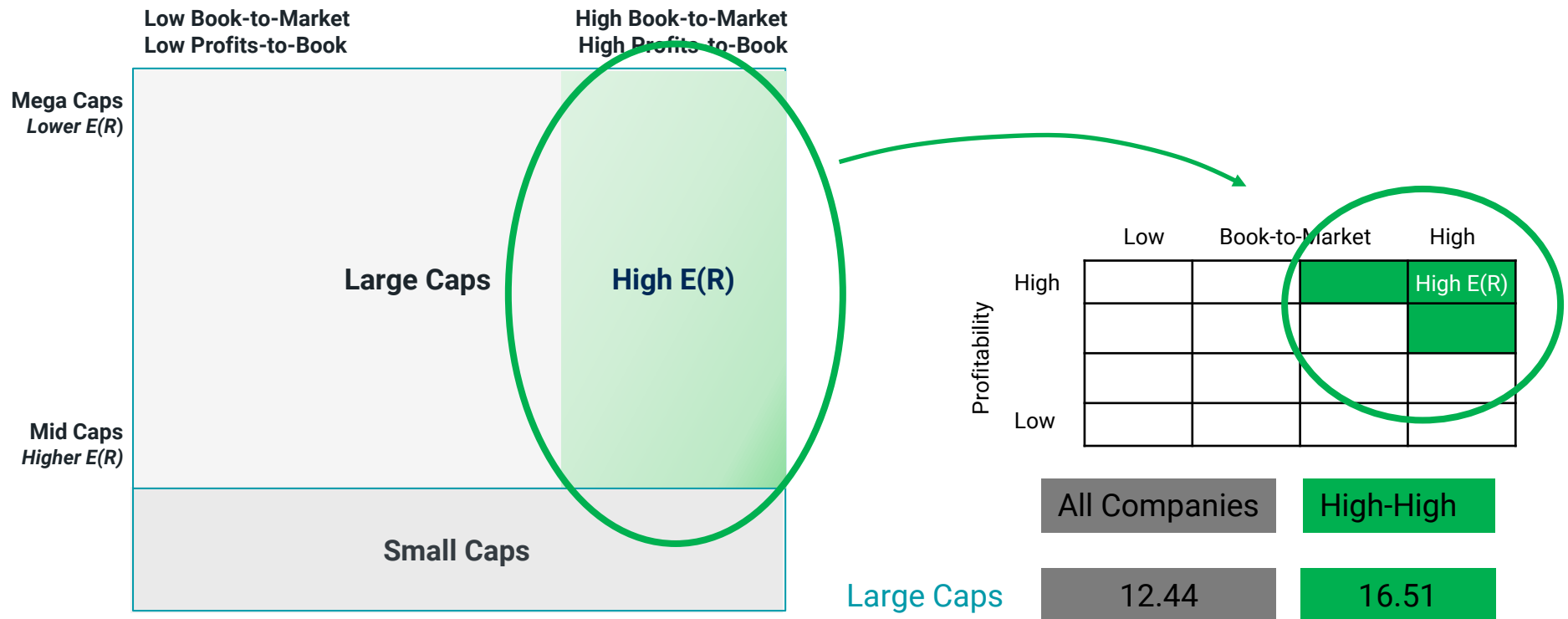
Source: Avantis Investors and Sunil Wahal, CRSP/Compustat, US Securities, 1973-2021

# Large Value Strategy Design and Execution

A more holistic approach:

Continuous focus on large cap companies with high profitability and high book-to-market

Broad diversification and low turnover effected when necessary



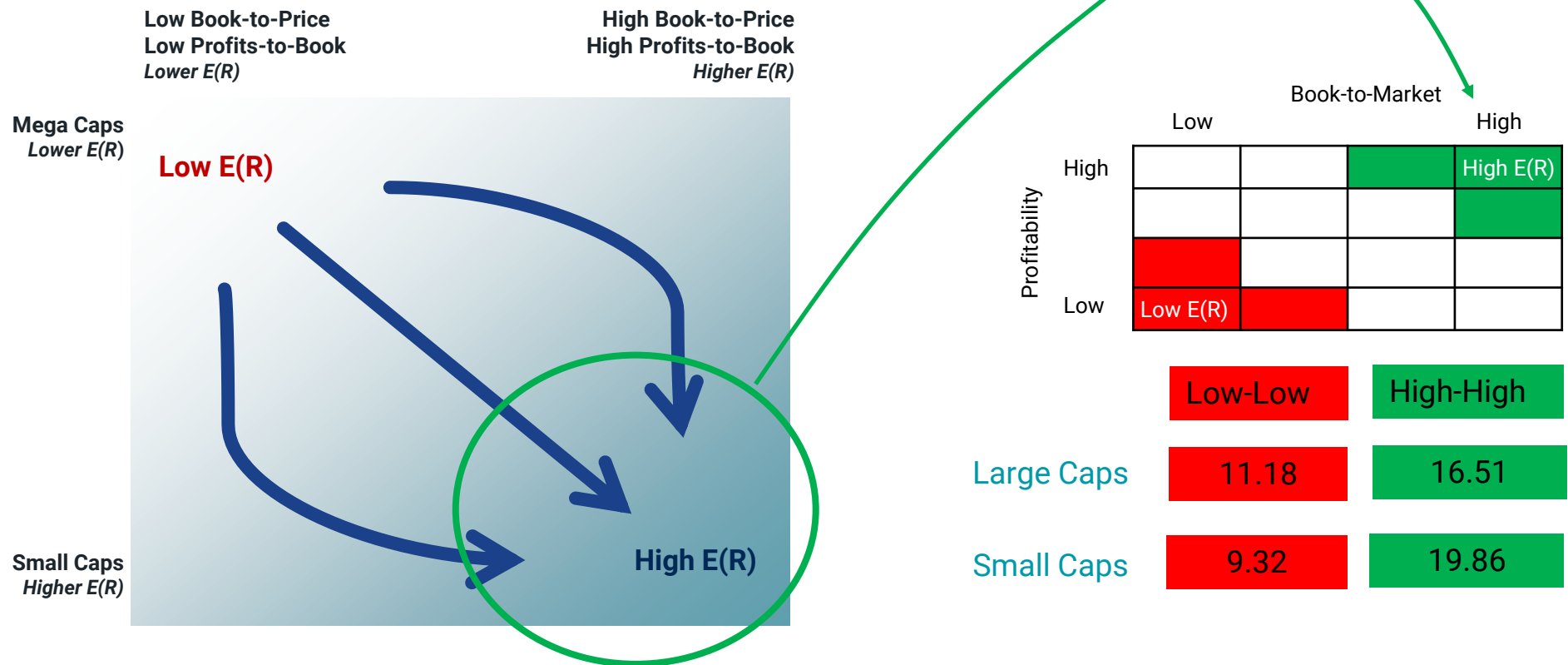
Source: Avantis Investors and Sunil Wahal, CRSP/Compustat, US Securities, 1973-2021

# All Cap Strategy Design and Execution

A more holistic approach:

Emphasize large and small cap companies with high profitability and high book-to-market

Broad diversification and low turnover effected when necessary



Source: Avantis Investors and Sunil Wahal, CRSP/Compustat, US Securities, 1973-2021

# Post-Factor Investing

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Financial Science and Research on Asset Pricing and Factors taught us:

Certain stock characteristics are associated with premiums

Premiums can be linked to valuations

To create better portfolios:

We do not need the factors

*factors are just one possible implementation of a concept*

We need the underlying concepts we learned from research  
and their interactions

Bassu (1977), Stattman (1980), Banz (1981), Rosenberg (1985), Bhandari (1988)

# Questions?

# Appendix

# What About Multi-Factor Indexes?

## Russell 1000 Index

Adjusted Book-to-Market

Cash-Based Operating Profitability		Adjusted Book-to-Market					
		Low				High	
High		7.7%	8.1%	2.6%	0.6%	0.7%	19.6%
		1.6%	4.2%	8.8%	3.5%	1.7%	19.8%
		4.5%	2.4%	9.4%	6.0%	2.1%	24.4%
		4.5%	1.7%	2.1%	4.7%	6.6%	19.6%
Low		1.5%	1.3%	2.9%	4.0%	6.7%	16.5%
		19.9%	17.7%	25.8%	18.9%	17.8%	100.0%

Higher ER

Higher ER	40.6%
Neutral	32.7%
Lower ER	26.7%

## GS ActiveBeta U.S. Large Cap Equity Index

Adjusted Book-to-Market

Cash-Based Operating Profitability		Adjusted Book-to-Market					
		Low				High	
High		9.3%	7.8%	3.3%	1.2%	0.8%	22.4%
		1.8%	4.0%	8.9%	3.2%	1.3%	19.2%
		4.5%	2.3%	10.6%	6.6%	2.5%	26.5%
		4.6%	1.6%	2.3%	4.4%	5.6%	18.6%
Low		1.3%	1.2%	1.8%	3.0%	6.0%	13.3%
		21.6%	16.9%	26.9%	18.5%	16.2%	100.0%

Higher ER

Higher ER	41.2%
Neutral	34.3%
Lower ER	24.4%

## JP Morgan Diversified US Factor Equity Index

Adjusted Book-to-Market

Cash-Based Operating Profitability		Adjusted Book-to-Market					
		Low				High	
High		11.1%	3.1%	4.4%	2.4%	2.5%	23.5%
		1.5%	3.1%	3.2%	3.1%	3.3%	14.2%
		3.8%	1.4%	7.7%	4.7%	2.7%	20.4%
		5.0%	1.0%	4.1%	6.1%	8.6%	24.8%
Low		0.9%	1.4%	1.5%	3.7%	9.6%	17.1%
		22.4%	10.1%	20.9%	19.9%	26.7%	100.0%

Higher ER

Higher ER	37.9%
Neutral	37.6%
Lower ER	24.5%

Source: Avantis Investors, data from Bloomberg as of June 30, 2022

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# Disclosures

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Expected Returns: Valuation theory shows that the expected return of a stock is a function of its current price, its book equity (assets minus liabilities) and expected future profits, and that the expected return of a bond is a function of its current yield and its expected capital appreciation (depreciation). We use information in current market prices and company financials to identify differences in expected returns among securities, seeking to overweight securities with higher expected returns based on this current market information. Actual returns may be different than expected returns, and there is no guarantee that the strategy will be successful.

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