Outsmarting Smart Beta – Exploiting Factor Cyclicality

Presentation to Boston QWAFAFEW: Tuesday March 19, 2019

Defining Smart Beta...

when the industry cannot agree on a definition

"Smart Beta is simply about trying to identify good investment ideas that can be structured better. Smart beta strategies should be simple, low cost, transparent and systematic."

- Arnott & Kose (2014)

What is Dumb Beta?

Dumb Beta = Market Cap-Weighted Index Portfolio

Is Dumb Beta actually dumb?

- Not according to SPIVA, especially for taxable investors
- Dumb Beta is the Standard to Beat

Style and Size Indexes Before Smart Beta

Large Cap Value	Large Cap Core	Large Cap Growth
Mid Cap Value	Mid Cap Core	Mid Cap Growth
Small Cap Value	Small Cap Core	Small Cap Growth

Cyclicality and Leadership
An Institutional Perspective

The Callan Periodic Table of Investment Returns (1998 - 2017)

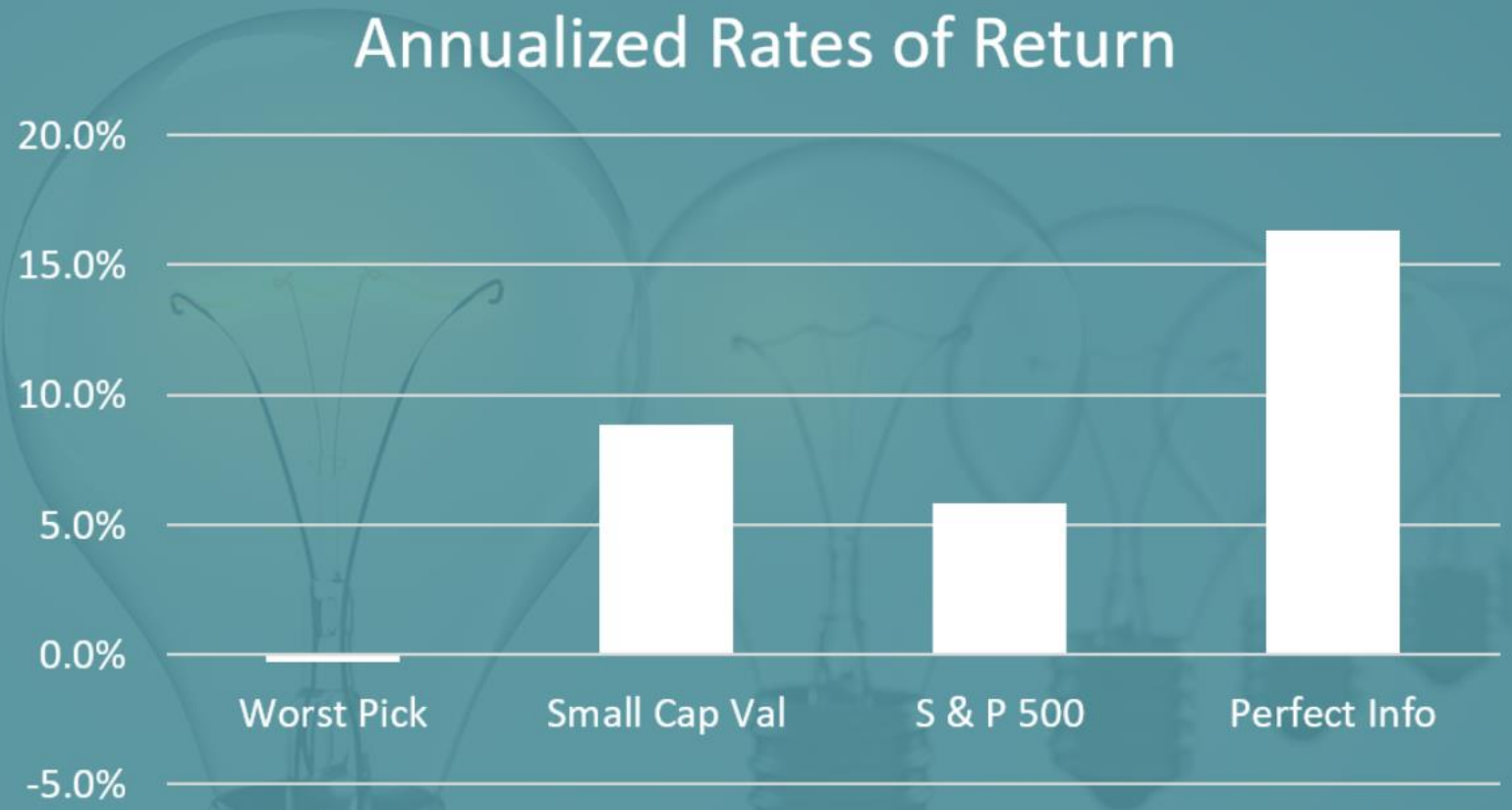
1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
S&P 500 Growth 42.16%	MSCI Emerging Markets 66.84%	Russell 2000 Value 22.83%	Russell 2000 Value 14.02%	Bloomberg Barclays Agg 10.26%	MSCI Emerging Markets 55.82%	MSCI Emerging Markets 25.55%	MSCI Emerging Markets 34.00%	MSCI Emerging Markets 32.17%	MSCI Emerging Markets 39.38%	Bloomberg Barclays Agg 5.24%	MSCI Emerging Markets 78.51%	Russell 2000 Growth 29.09%	Bloomberg Barclays Agg 7.84%	MSCI Emerging Markets 18.23%	Russell 2000 Growth 43.30%	S&P 500 Growth 14.89%	S&P 500 Growth 5.52%	Russell 2000 Value 31.74%	MSCI Emerging Markets 37.28%
S&P 500 28.58%	Russell 2000 Growth 43.09%	Bloomberg Barclays Agg 11.63%	Bloomberg Barclays Agg 8.43%	Bloomberg Barclays High Yield -1.37%	Russell 2000 Growth 48.54%	Russell 2000 Value 22.25%	MSCI World ex USA 14.47%	MSCI World ex USA 25.71%	MSCI World ex USA 12.44%	Bloomberg Barclays High Yield -26.16%	Bloomberg Barclays High Yield 58.21%	Russell 2000 26.85%	Bloomberg Barclays High Yield 4.98%	Russell 2000 Value 18.05%	Russell 2000 38.82%	S&P 500 13.69%	S&P 500 1.38%	Russell 2000 21.31%	S&P 500 Growth 27.44%
MSCI World ex USA 18.77%	S&P 500 Growth 28.24%	S&P 500 Value 6.08%	Bloomberg Barclays High Yield 5.28%	MSCI Emerging Markets -6.16%	Russell 2000 47.25%	MSCI World ex USA 20.38%	S&P 500 Value 5.82%	Russell 2000 Value 23.48%	S&P 500 Growth 9.13%	Russell 2000 Value -28.92%	Russell 2000 Growth 34.47%	Russell 2000 Value 24.50%	S&P 500 Growth 4.65%	S&P 500 Value 17.68%	Russell 2000 Value 34.52%	S&P 500 Value 12.36%	Bloomberg Barclays Agg 0.55%	S&P 500 Value 17.40%	MSCI World ex USA 24.21%
S&P 500 Value 14.68%	MSCI World ex USA 27.92%	Russell 2000 -3.02%	Russell 2000 2.49%	Russell 2000 Value -11.43%	Russell 2000 Value 46.03%	Russell 2000 18.33%	S&P 500 4.91%	S&P 500 Value 20.81%	Russell 2000 Growth 7.05%	Russell 2000 -33.79%	MSCI World ex USA 33.67%	MSCI Emerging Markets 18.88%	S&P 500 2.11%	MSCI World ex USA 16.41%	S&P 500 Growth 32.75%	Bloomberg Barclays Agg 5.97%	Russell 2000 Growth -1.38%	Bloomberg Barclays High Yield 17.13%	Russell 2000 Growth 22.17%
Bloomberg Barclays Agg 8.67%	Russell 2000 21.26%	Bloomberg Barclays High Yield -5.86%	MSCI Emerging Markets -2.61%	MSCI World ex USA -15.80%	MSCI World ex USA 39.42%	S&P 500 Value 15.71%	Russell 2000 Value 4.71%	Russell 2000 18.37%	Bloomberg Barclays Agg 6.97%	S&P 500 Growth -34.92%	S&P 500 Growth 31.57%	Bloomberg Barclays High Yield 15.12%	S&P 500 Value -0.48%	Russell 2000 16.35%	S&P 500 32.39%	Russell 2000 Growth 5.60%	MSCI World ex USA -3.04%	S&P 500 11.96%	S&P 500 21.83%
Bloomberg Barclays High Yield 1.87%	S&P 500 21.04%	S&P 500 -9.11%	Russell 2000 Growth -9.23%	Russell 2000 -20.48%	S&P 500 Value 31.79%	Russell 2000 Growth 14.31%	Russell 2000 4.55%	S&P 500 15.79%	S&P 500 5.49%	S&P 500 -37.00%	Russell 2000 27.17%	S&P 500 Value 15.10%	Russell 2000 Growth -2.91%	S&P 500 16.00%	S&P 500 Value 31.99%	Russell 2000 4.89%	S&P 500 Value -3.13%	Russell 2000 Growth 11.32%	S&P 500 Value 15.36%
Russell 2000 Growth 1.23%	S&P 500 Value 12.73%	MSCI World ex USA -13.37%	S&P 500 Value -11.71%	S&P 500 Value -20.85%	Bloomberg Barclays High Yield 28.97%	Bloomberg Barclays High Yield 11.13%	Russell 2000 Growth 4.15%	Russell 2000 Growth 13.35%	S&P 500 Value 1.99%	Russell 2000 Growth -38.54%	S&P 500 26.47%	S&P 500 15.06%	Russell 2000 -4.18%	Bloomberg Barclays High Yield 15.81%	MSCI World ex USA 21.02%	Russell 2000 Value 4.22%	Russell 2000 -4.41%	MSCI Emerging Markets 11.19%	Russell 2000 14.65%
Russell 2000 -2.55%	Bloomberg Barclays High Yield 2.39%	S&P 500 Growth -22.08%	S&P 500 -11.89%	S&P 500 -22.10%	S&P 500 28.68%	S&P 500 10.88%	S&P 500 Growth 4.00%	Bloomberg Barclays High Yield 11.85%	Bloomberg Barclays High Yield 1.87%	S&P 500 Value -39.22%	S&P 500 Value 21.17%	S&P 500 Growth 15.05%	Russell 2000 Value -5.50%	S&P 500 Growth 14.61%	Bloomberg Barclays High Yield 7.44%	Bloomberg Barclays High Yield 2.45%	Bloomberg Barclays High Yield -4.47%	S&P 500 Growth 6.89%	Russell 2000 Value 7.84%
Russell 2000 Value -6.45%	Bloomberg Barclays Agg -0.83%	Russell 2000 Growth -22.43%	S&P 500 Growth -12.73%	S&P 500 Growth -23.59%	S&P 500 Growth 25.66%	S&P 500 Growth 6.13%	Bloomberg Barclays High Yield 2.74%	S&P 500 Growth 11.01%	Russell 2000 -1.57%	MSCI World ex USA -43.56%	Russell 2000 Value 20.58%	MSCI World ex USA 8.95%	MSCI World ex USA -12.21%	Russell 2000 Growth 14.59%	Bloomberg Barclays Agg -2.02%	MSCI Emerging Markets -2.19%	Russell 2000 Value -7.47%	MSCI World ex USA 2.75%	Bloomberg Barclays High Yield 7.50%
MSCI Emerging Markets -25.34%	Russell 2000 Value -1.49%	MSCI Emerging Markets -30.71%	MSCI World ex USA -21.40%	Russell 2000 Growth -30.26%	Bloomberg Barclays Agg 4.10%	Bloomberg Barclays Agg 4.34%	Bloomberg Barclays Agg 2.43%	Bloomberg Barclays Agg 4.33%	Russell 2000 Value -9.78%	MSCI Emerging Markets -53.33%	Bloomberg Barclays Agg 5.93%	Bloomberg Barclays Agg 6.54%	MSCI Emerging Markets -18.42%	Bloomberg Barclays Agg 4.21%	MSCI Emerging Markets -2.60%	MSCI World ex USA -4.32%	MSCI Emerging Markets -14.92%	Bloomberg Barclays Agg 2.65%	Bloomberg Barclays Agg 3.54%

Style and Size: a 20-Year History

	Russell 2000 Value	Russell 2000 Growth	S&P 500 Value	S&P 500 Growth
Ann. Tot. Return	8.87%	5.45%	5.95%	5.52%
Std. Dev.	18.17%	23.54%	16.81%	19.86%
Sharpe Ratio	0.40	0.12	0.26	0.18
# Years Best	8	5	1	6
# Years Worst	8	4	2	6

Style and Size Cyclicality:

What if We Knew in Advance Which Would Perform Best on an Annual Basis?



Smart Beta?
Some Experts Cringe

"The industry and some academics have muddied the waters by using 'beta' for ... factor loadings,"

-Sharpe

"Multifactor models have additional factors (that) have their own regression slopes, which (are) additional betas. The additional betas are not alternative or smart."

-Fama

"I try to reserve the term 'beta' for sensitivity to the overall market. Using beta to mean other things can create confusion."

-French

Smart Beta
A Working Definition

"Smart beta is simply about trying to identify good investment ideas that can be structured better. Smart beta strategies should be simple, low cost, transparent and systematic."

– Arnott and Kose (2014)

Taming the Factor Zoo

Different Ways of Measuring Smart Beta Factors

Value

- Book-to-Price
- Earnings-to-Price
- Sales-to-Price
- Cash Flow -to-Price
- Dividend Growth-to-Price
- Earnings Growth-to-Price
- Industry Relative Pricing Change

Quality

- Return on Equity
- Earnings Stability
- Dividend Growth Stability
- Balance Sheet Strength
- Financial Leverage

Size

- Market Cap
- Revenues
- Total Assets
- Absolute vs. Relative

Low Volatility

- Std. Deviation of Price
- Beta
- Covariance Contribution

Dividend

- Yield
- Growth
- Quality

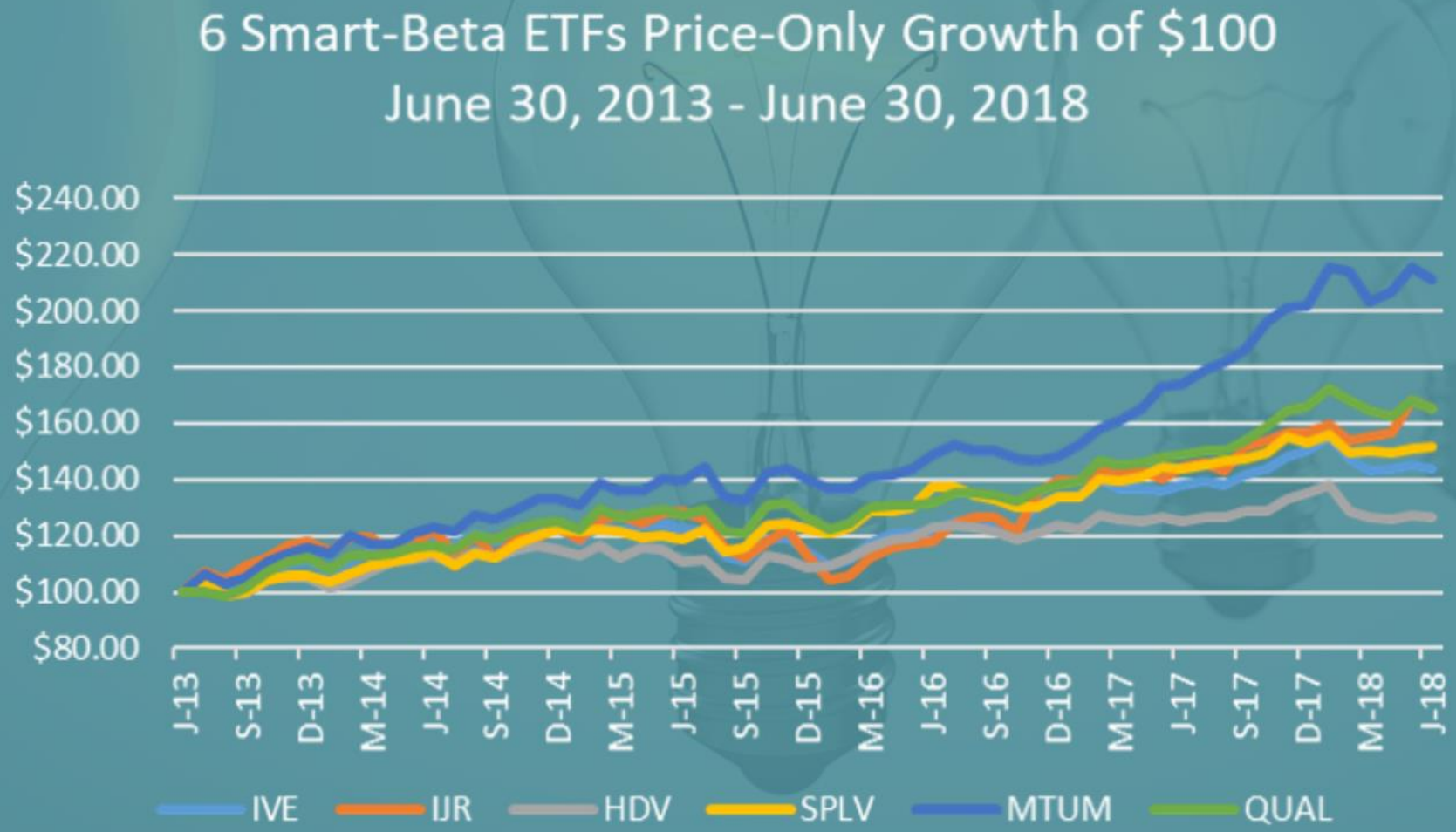
Momentum

- Price
- Combo. of different moving averages

Dominant Smart Beta Factors in the US-listed ETF Universe of 825

Dividend/Income	123
Growth	46
Low Volatility	65
Price Momentum	35
Quality	137
Size	144
Value	111
Multifactor	164

Single Factor ETFs – How Have They Performed



Smart Beta Factor Correlation Matrix

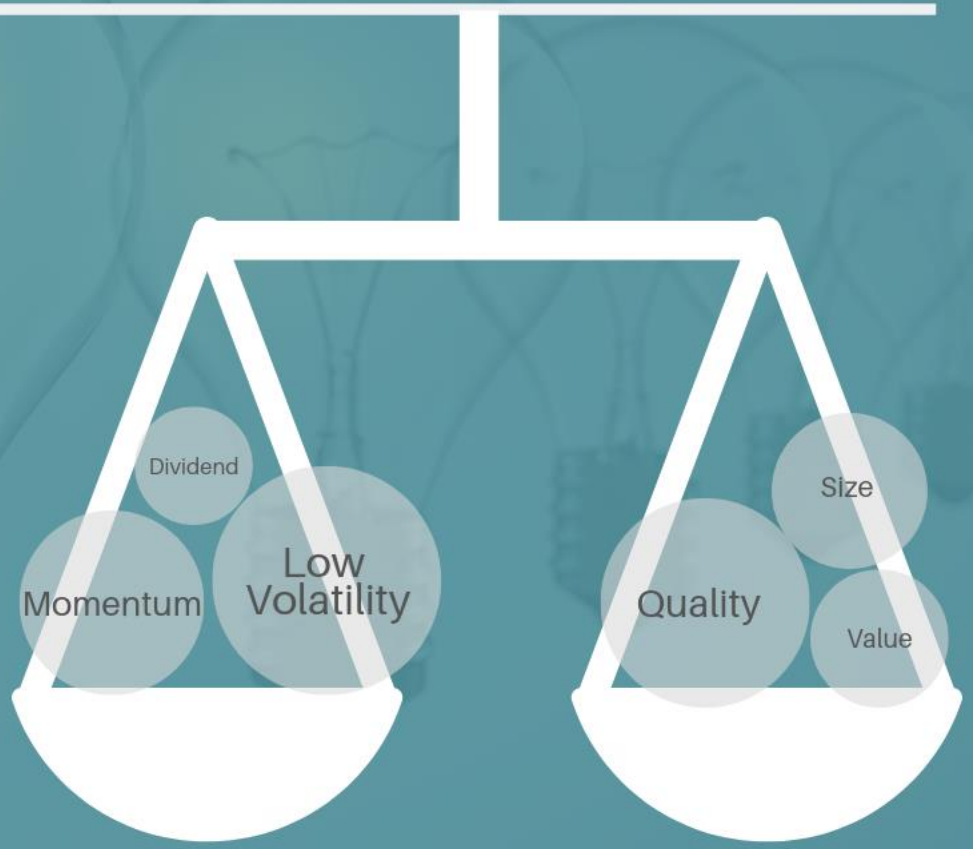
Factor	Quality	Value	Small Cap	Momentum	Low Vol	Div. Yield
Quality	1.00					
Value	0.52	1.00				
Small Cap	0.36	0.84	1.00			
Momentum	-0.09	-0.18	-0.21	1.00		
Low Vol	0.77	0.23	0.09	0.05	1.00	
Div. Yield	0.71	0.77	0.63	-0.22	0.62	1.00

- Momentum provides the most diversification with any other factor
- Small cap and value are the most highly correlated with each other

*January 1, 1991 – December 31, 2017 – Source: Invesco

How Should Factors Be Weighted in a Multifactor Portfolio?

- Equal Weighting
- Static Formulaic Weighting
- Dynamic Weighting



Timing Smart Beta Factors

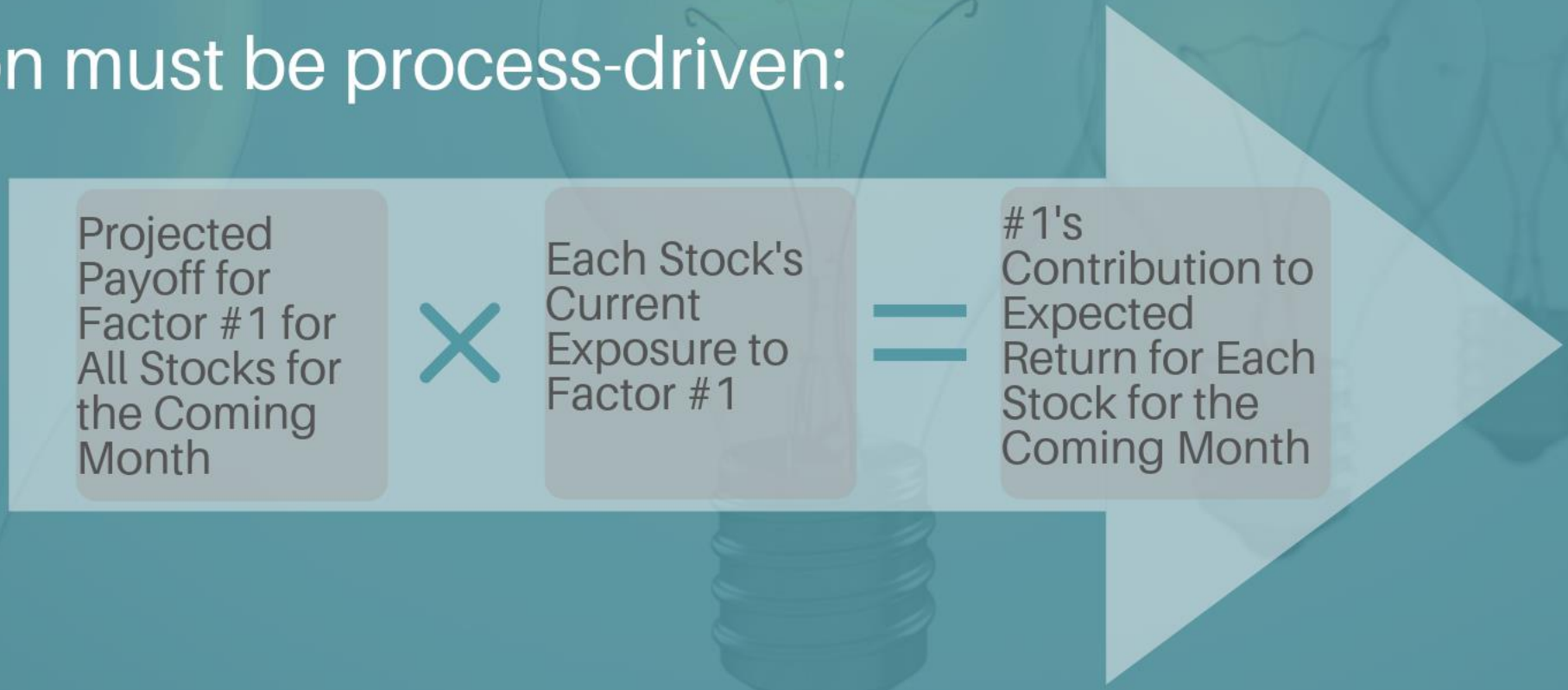
- Recent Studies: Smart Beta Factors CAN be timed
- Differences Between Timing Strategies
- Factor Categories vs. Factors (i.e., Variables)
- Simplicity vs. Accuracy – Sacrificing Alpha for Marketability

An Early Application of Machine Learning
Haugen 60-Factor Model Since 1996

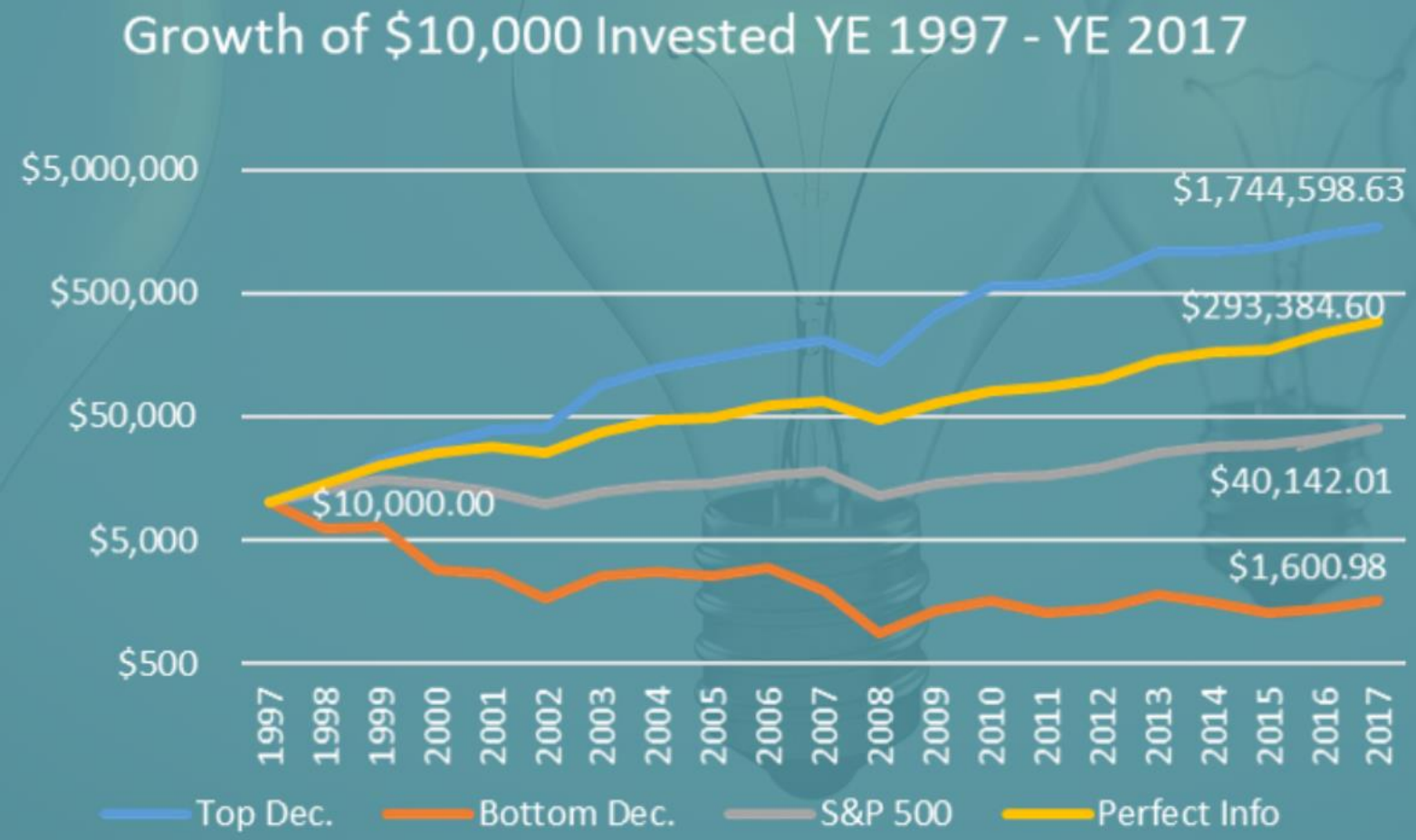
- Dynamic weighting algorithms calibrated on 14,000 securities in 43 Countries
- Factors categories include: Value; Quality; Size; Low volatility; Dividend; Momentum
- Historical sensitivities to multiple methods of measuring each of the above factors plus selected macroeconomic time series are recalculated monthly
- Ranks companies by expecting returns which have a 2-3 month time horizon
- Signal data used by clients for long and short positions

How Can Constituents Be Weighted to Optimize Expected Returns?

Solution must be process-driven:



Top Decile vs. Bottom Decile Haugen Portfolios without Volatility Constraints



Haugen Unconstrained Top vs. Bottom Deciles: 1998 - 2007

	Haugen Top Decile	Haugen Bottom Decile	Russell 3000
Annual Total Return	28.18%	-6.57%	7.72%
Standard Deviation	42.18%	31.90%	17.12%
Sharpe Ratio	0.63	-0.27	0.35

Low-Vol Smart Beta Portfolio Index Testing Methodology

The methodology for the index is as follows:

1. Start with the **top 2,000 stocks** by market cap
2. **Filter** out stocks with a market capitalization of **under $300M**
3. **Filter** out stocks with a closing price of **under $5**
4. Assign a smart beta / low vol rank as follows
   a. Sort the **expected returns** in **descending** order and assign a rank
   b. Sort the **volatility** numbers in **ascending** order and assign a rank
   c. Calculate the total rank:

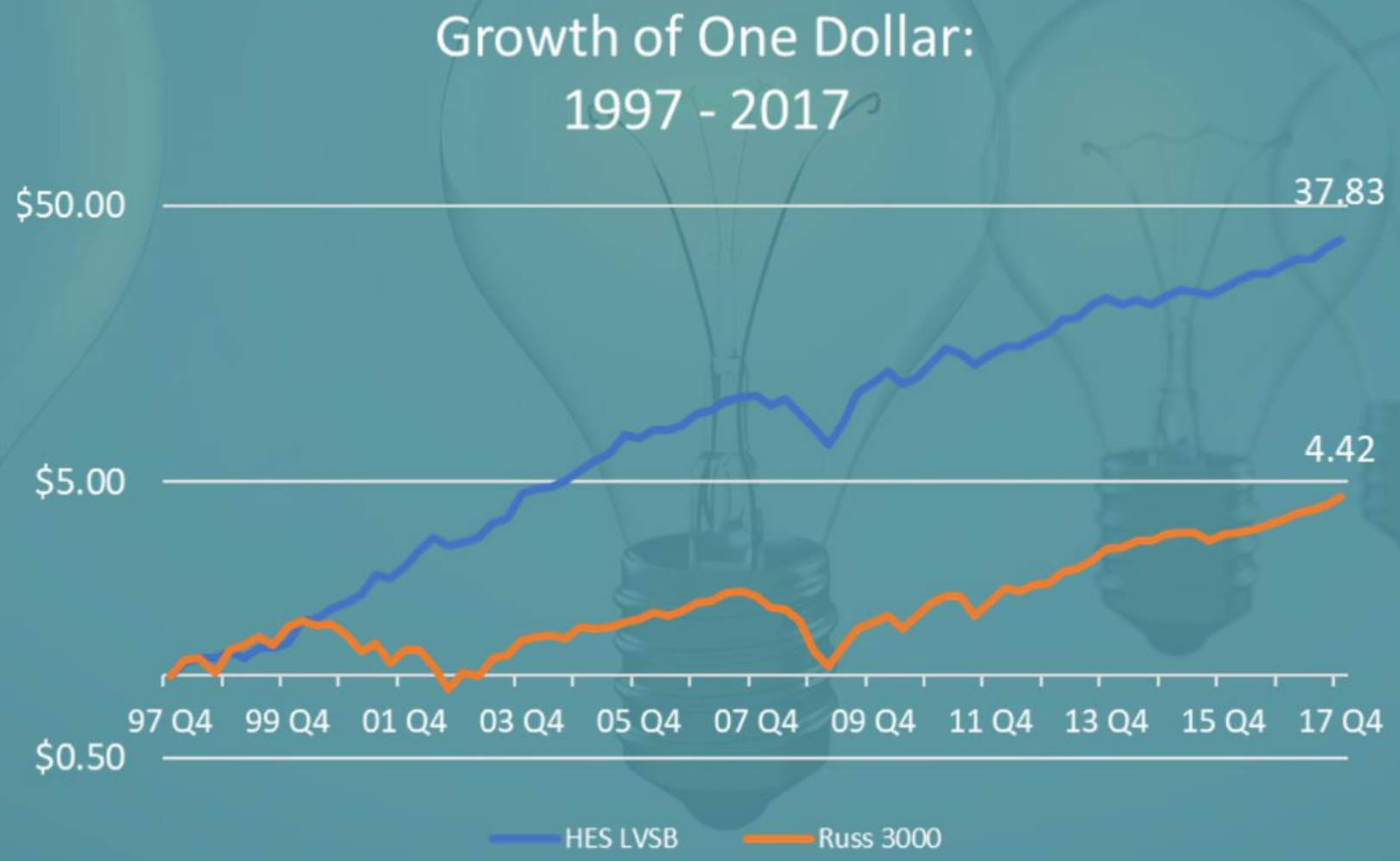
   SmartBetaLowVolRank = (**ERRank** ∗ **ERWeight**) + (**LowVolRank** ∗ **LowVolWeight**)

   with ERWeight = 100% and LowVolRank = 25%
5. Take the **top 50** (ie, lowest ranked) SmartBetaLowVolRanks to hold, equally weighted, in the portfolio.
   In the long portfolio, and the bottom 50 to hold equally weighted in the short portfolio.

Returns Table: 20-Year Comparison Dec. 31, 1997 – Dec. 31, 2017

	Haugen Low Vol Smart Beta Model	Russell 2000 Value	Russell 3000
Annualized Total Return	19.92%	8.87%	7.72%
Standard Deviation	15.42%	18.20%	17.12%
Sharpe Ratio	1.18	0.40	0.35

Haugen Equity Signals: Low Volatility Smart Beta Strategy



Key Research Findings

- "Dumb" Beta is far from dumb and provides the baseline
- Smart Beta factors are cyclical in nature
- There is both academic and empirical support that higher excess returns and Sharpe Ratios are attainable using dynamic factor weighting tied to detecting regime shifts in the stock markets
- The Haugen Model has applied this construct effectively since 1996

Thank You, Boston
QWAFAFEW!

I truly appreciate your hospitality!