

RAFI Roadmap: A guide to better investor outcomes

RAFI™ Dynamic Multi-Factor Developed ex US Index

BENCHMARK DevxUS Cap-Weight Large+Mid
ASSET CLASS Equity

What Is the Process?

1. Separate the universe into large companies and small companies.
2. Form individual factor sleeves:

RAFI Factor Index Construction

Factor	Measures	Select	Weighting	Rebalance
Momentum	Standard, Idiosyncratic, and Fresh Momentum	Top 50% by weight	Cap Weight	Full Quarterly
Value	RAFI / Cap	Top 25% by weight	RAFI Weight	Quarterly staggered
Low Volatility	Global, Industry, and Country Systematic Risk	Top 25% by weight	RAFI Weight	Quarterly staggered
Quality	Profitability and Investment	Top 25% by weight	RAFI Weight	Quarterly Staggered
Size	Average of four factor portfolios (value, quality, low volatility, momentum) built within small universe and rebalanced quarterly.		Due to lack of liquidity, size is excluded from the Emerging Markets Index.	

3. Implement trading controls to minimize turnover.
4. Use value and momentum measures to determine the weight to each factor.

Will the Strategy Deliver?

This strategy is expected to deliver excess returns in the future because it is theoretically and empirically robust. Every investor should ask five questions before investing:

1. Who is on the other side of the trade?
2. Has the strategy worked over long and varying time periods net of changes in valuation?
3. Does the strategy produce similar results across different regions?
4. Does the the strategy produce similar results across slightly different definitions (e.g., P/B vs. P/S)?
5. Is the strategy investable in the real world net of costs?

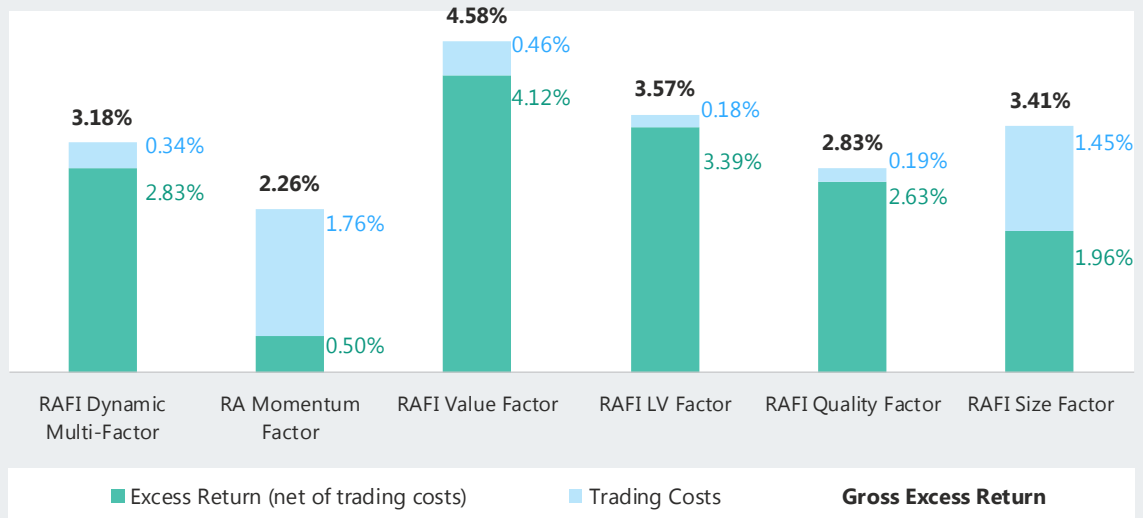
Why This Strategy Delivers

	Theory	Empirical Evidence			
Factor	1. Who's on the Other Side of the Trade?	2. Excess Return*	3. Regions That Worked	4. Definitions That Worked	5. Trading Costs**
RA Momentum Factor	The Patsy Momentum premium delivers because uninformed investors are slow to react to new information about a company.	2.26%	5 of 5	3 of 3	1.76%
RAFI Value Factor	The Performance Chaser Value premium delivers because <i>performance chasers</i> under-own value securities (preferring fast-growing glamour stocks), driving prices down, yields up, and future returns higher.	4.58%	5 of 5	4 of 4	0.46%
RAFI Low Volatility Factor	The Gambler Low volatility premium delivers because investors' preference for gambling leads them to over-own high volatility securities as "lottery tickets."	3.57%	5 of 5	4 of 4	0.18%
RAFI Quality Factor	The Empire Builder Quality premium delivers because investors are drawn to the glamour of <i>empire building</i> companies and underappreciate conservative capital allocators with wide economic moats.	2.83%	5 of 5	4 of 5	0.19%
RAFI Size Factor	All of the Above <i>All of the factor premiums above</i> tend to work better in small-capitalization markets because these markets tend to be less efficient and experience larger pricing errors.	3.41%	3 of 3	N/A	1.45%

SOURCE: CRSP/Compustat and Worldscope/Datastream | DATA: From 07/01/1989 to 06/30/2018 | *Gross of trading costs.

**Annualized trading costs are estimated as the market impact of transactions, assuming \$10B in AUM.

Historical Excess Return, by DEV ex US Factor Index



SOURCE: CRSP/Compustat and Worldscope/Datastream | DATA: From 07/01/1989 to 06/30/2018 | NOTE: Annualized trading costs are estimated as the market impact of transactions, assuming \$10B in AUM.

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SEPTEMBER 2016

[Will Your Factor Deliver? An Examination of Robustness and Implementation Costs](#)

JASON HSU, VITALI KALESNIK, NOAH BECK, AND HELGE KOSTKA

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FEBRUARY 2017

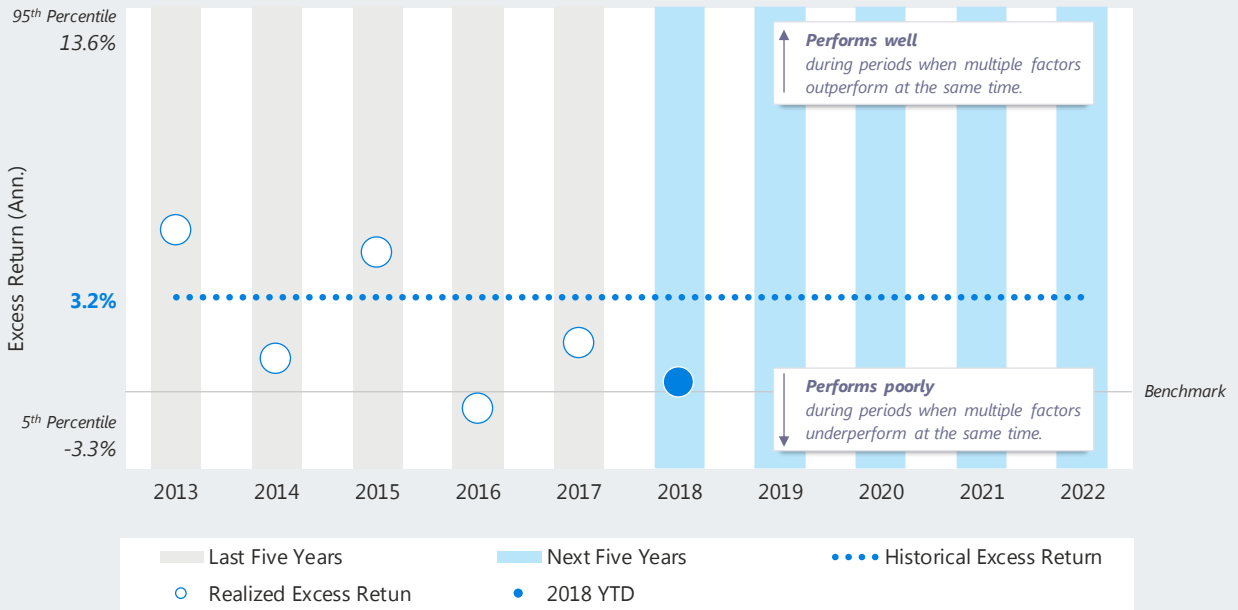
[Forecasting Factor and Smart Beta Returns \(Hint: History Is Worse than Useless\)](#)

ROB ARNOTT, NOAH BECK, AND VITALI KALESNIK

What to Expect?

The RAFI Dynamic Multi-Factor Developed ex US Index shows 3.2% in annualized excess returns since 1989. However, those results have come with a wide range of outcomes (+/- 10% or more) in any given year.

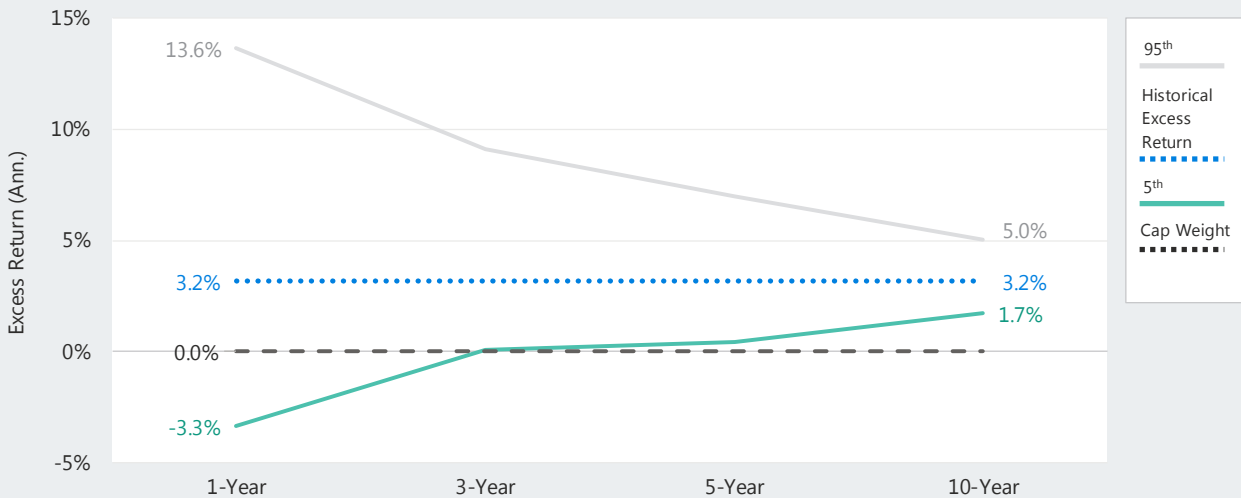
Calendar Excess Returns



NOTE: Based on rolling returns from simulated data | SOURCE: CRSP/Compustat and Worldscope/Datastream | DATA: As of 06/30/2018

Rolling Excess Returns

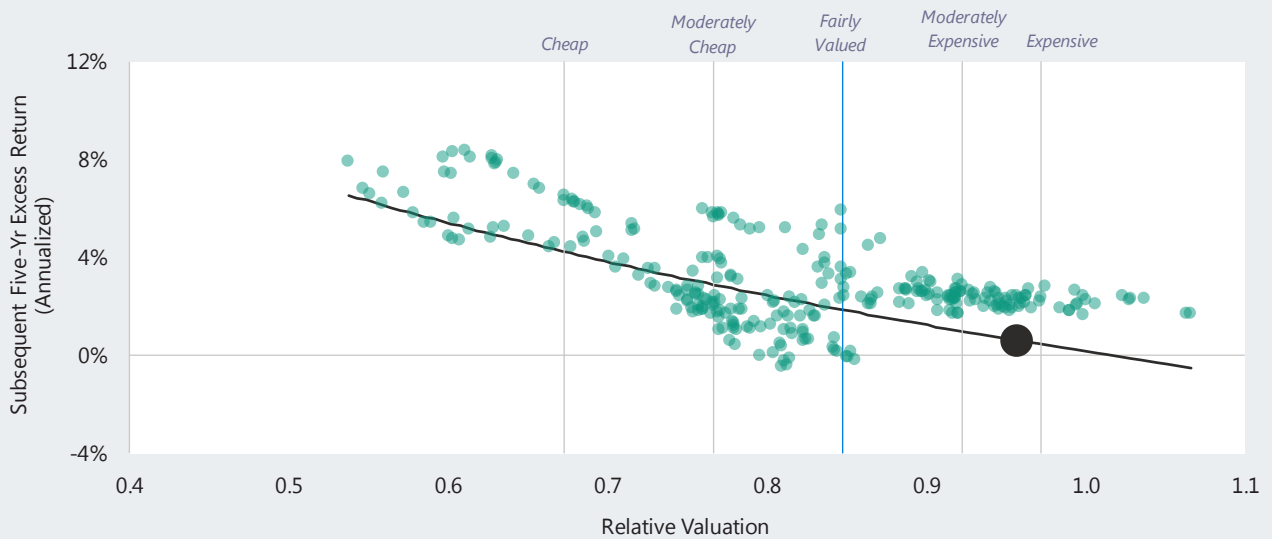
Longer investment horizons produce more predictable returns.



NOTE: Based on rolling returns from simulated data | SOURCE: CRSP/Compustat and Worldscope/Datastream | DATA: As of 06/30/2018

The Index trades at a **discount of 4% (0.96x)** to its cap-weighted benchmark. This is **expensive** relative to its **median discount of 15% (0.85x)**. Given current valuations, our [Smart Beta Interactive](#) website forecasts an annualized excess return of **0.6%** over the next five years (gross of costs).

Valuations & Return Expectations



SOURCE: CRSP/Compustat and Worldscope/Datastream | DATA: From 07/01/1989 to 06/30/2018

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JULY 2014

[Finding Smart Beta in the Factor Zoo](#)

JASON HSU AND VITALI KALESNIK

Past Performance & Characteristics

AS OF 09-30-2018

Quarterly Commentary

The RAFI Dynamic Multi-Factor Developed Index underperformed the MSCI World All Cap Index by 75bps for the quarter. All single-factor strategies underperformed their benchmarks for the quarter except for the RAFI Low Volatility Factor Developed Index which matched its benchmarks performance. From a stock-level perspective, the five biggest contributors to excess return were Facebook, CVS, Target, Express Scripts, and Bayer. When examining the bottom five contributors to excess return, as in past quarters, the list continues to be driven by technology companies. Many of these companies exhibit the traditional characteristics of growth-oriented tech companies: high investment, trading at lofty multiples, and having volatile price movements. These characteristics make for poor companies from the quality, value, and low volatility perspectives, and typically fail to make it into those indices, resulting in a low overall index weight.

Attributions and performance commentary: <https://www.rafi.com/investor-support/resources>

Factor Sleeve Allocation

Momentum	21.52%
Size	15.93%
Quality	20.04%
Low Volatility	22.55%
Value	19.96%

DATA: As of 09/30/2018 in USD
SOURCE: FactSet

Trailing Returns

Index	QTD	1 Yr	3 Yr	5 Yr	10 Yr	ITD*	10-Yr Volatility	10-Yr TE**
RAFI Dynamic Multi-Factor Developed ex US Index	1.2%	3.8%	11.3%	6.9%	8.4%	13.6%	15.9%	2.9%
RAFI Value Factor Developed ex US Index	1.7%	5.2%	13.4%	7.0%	8.7%	13.9%	18.7%	4.8%
RAFI Low Volatility Factor Developed ex US Index	2.0%	6.2%	10.2%	7.9%	8.2%	13.5%	13.3%	6.6%
RAFI Quality Factor Developed ex US Index	1.4%	2.4%	10.4%	6.2%	7.9%	12.4%	15.8%	3.2%
RA Momentum Factor Developed ex US Index	1.4%	2.8%	10.2%	5.6%	7.1%	13.6%	15.9%	3.7%
MSCI World ex USA	1.4%	3.2%	9.9%	4.8%	5.7%	12.8%	17.4%	N/A
RAFI Size Factor Developed ex US Index	-0.3%	2.8%	12.2%	7.7%	10.4%	14.8%	17.7%	2.2%
MSCI World ex USA Small Cap	-0.8%	3.8%	12.7%	7.5%	9.4%	15.7%	18.3%	N/A

SOURCE: FactSet | Data: As of 09/30/2018 in USD | INCEPTION DATE: 01/31/2017

* Inception to Date (ITD) uses the first full month of returns after inception date. All returns prior to inception are simulated. Please see disclosures for important information regarding simulated performance.

** Annualized Tracking Error calculated against each index's appropriate benchmark using the first full month of returns following index inception. Index returns prior to inception are simulated.

Characteristics

Index	Number of Holdings	P/E	P/B	P/S	Dividend Yield	Market Cap / \$B
RAFI Dynamic Multi-Factor Developed ex US Index	2174	14.32	1.58	0.85	3.04	37.34
RAFI Value Factor Developed ex US Index	406	11.51	1.00	0.47	3.39	32.46
RAFI Low Volatility Factor Developed ex US Index	539	15.19	1.72	1.02	3.29	37.16
RAFI Quality Factor Developed ex US Index	498	14.30	2.12	1.09	3.20	45.96
RA Momentum Factor Developed ex US Index	505	14.99	1.89	1.15	2.71	53.74
RAFI Size Factor Developed ex US Index	1211	15.83	1.80	0.97	2.62	4.40

SOURCE: FactSet | Data: As of 09/30/2018 in USD | INCEPTION DATE: 01/31/2017

NOTE: Portfolio characteristics derived from FactSet. Data prior to launch are simulated. One-way turnover data are historical averages based on simulated history. Capacity is estimated at 50-basis-point market-impact level.

Correlation of Excess Returns

Developed ex-U.S. (6/1992-9/2018)	RAFI Value Factor Dev ex US	RAFI Low Vol Factor Dev ex US	RAFI Quality Factor Dev ex US	RA Momentum Factor Dev ex US	RAFI Size Factor Dev ex US	Tracking Error*
RAFI Value Factor Dev ex US	1	0.36	0.48	0.16	0.49	5.58%
RAFI Low Vol Factor Dev ex US	N/A	1	0.74	0.39	0.36	6.58%
RAFI Quality Factor Dev ex US	N/A	N/A	1	0.53	0.39	4.02%
RA Momentum Factor Dev ex US	N/A	N/A	N/A	1	0.28	4.07%
RAFI Size Factor Dev ex US	N/A	N/A	N/A	N/A	1	6.37%
RAFI Dynamic Multi-Factor Developed ex-U.S.						3.83%

SOURCE: FactSet | DATA: As of 09/30/2018 in USD | *Annualized Tracking Error calculated against each index's appropriate benchmark using the first full month of returns following index inception. Index returns prior to inception are simulated.

Top 10 Holdings

RAFI Dynamic Multi-Factor Developed ex US Index	Weights (%)	Value Factor	Low Vol. Factor	Quality Factor	Mom. Factor	Size Factor
1 BP	1.48	2.81	-	-	2.45	-
2 Royal Dutch Shell	1.43	2.66	-	-	2.50	-
3 BHP Billiton	0.82	-	-	2.19	1.67	-
4 Ericsson	0.82	1.79	0.36	1.31	0.35	-
5 Nestle	0.80	-	1.98	2.08	-	-
6 Total	0.80	1.19	-	-	2.10	-
7 Zurich Insurance Grp.	0.74	-	1.62	1.36	0.61	-
8 Glencore plc	0.73	1.60	-	-	0.85	-
9 ENI	0.68	2.29	-	-	0.61	-
10 Swiss Re AG	0.68	0.42	1.35	1.14	0.37	-

SOURCE: FactSet | DATA: As of 09/30/2018 in USD

Sectors

Sector	RAFI Dynamic Multi-Factor Developed ex US Index	RAFI Value Factor Developed ex US Index	RAFI Low Volatility Factor Developed ex US Index	RAFI Quality Factor Developed ex US Index	RA Momentum Factor Developed ex US Index	RAFI Size Factor Developed ex US Index
1 Basic Materials	9.94%	11.06%	4.32%	11.82%	10.00%	11.22%
2 Consumer, Cyclical	14.75%	13.62%	10.45%	16.51%	16.37%	16.25%
3 Consumer, Non-Cyclical	14.63%	9.42%	22.03%	19.11%	12.12%	14.68%
4 Energy	9.37%	21.46%	2.45%	0.86%	11.67%	4.81%
5 Financial	14.69%	9.49%	18.17%	11.22%	15.17%	20.37%
6 Health Care	7.00%	1.16%	8.90%	10.02%	8.34%	8.33%
7 Industrial	12.31%	10.84%	10.54%	15.04%	13.25%	13.15%
8 Technology	5.21%	1.93%	5.36%	3.43%	7.44%	7.17%
9 Telecommunications	6.08%	8.22%	8.19%	8.56%	2.47%	1.73%
10 Utilities	6.01%	12.79%	9.59%	3.42%	3.16%	2.28%

SOURCE: FactSet | DATA: As of 09/30/2018 in USD

Regions

Sector	RAFI Dynamic Multi-Factor Developed ex US Index	RAFI Value Factor Developed ex US Index	RAFI Low Volatility Factor Developed ex US Index	RAFI Quality Factor Developed ex US Index	RA Momentum Factor Developed ex US Index	RAFI Size Factor Developed ex US Index
1 Asia ex Japan	4.29%	3.61%	6.86%	3.83%	5.29%	3.56%
2 Australia & New Zealand	5.74%	6.70%	2.39%	7.54%	5.71%	5.79%
3 Canada	5.73%	5.34%	7.52%	4.61%	5.44%	6.51%
4 Denmark, Norway, Sweden	6.27%	5.89%	4.09%	8.19%	4.50%	9.02%
5 Eurobloc	26.65%	32.08%	24.12%	20.87%	28.01%	21.82%
6 Japan	25.85%	27.31%	26.04%	26.54%	26.58%	25.50%
7 Other	0.48%	0.87%	1.15%	0.18%	0.16%	0.92%
8 Switzerland	6.16%	41.58%	7.95%	10.23%	5.62%	7.01%
9 United Kingdom	16.29%	16.06%	16.42%	16.48%	16.35%	16.92%
10 United States	2.54%	1.72%	3.45%	1.53%	2.34%	2.94%

SOURCE: FactSet | DATA: As of 09/30/2018 in USD

Disclosures (1/2)

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