

RAFI Roadmap: A guide to better investor outcomes

RAFI™ Dynamic Multi-Factor Emerging Markets Index

BENCHMARK EM 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?

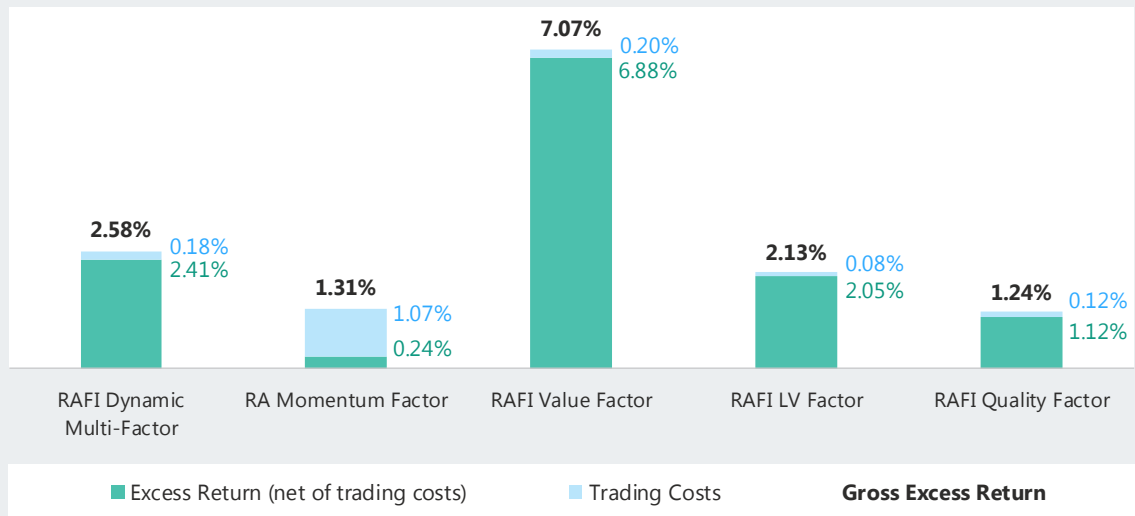
Why This Strategy Delivers

	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.	1.31%	5 of 5	3 of 3	1.07%
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.	7.07%	5 of 5	4 of 4	0.20%
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."	2.13%	5 of 5	1 of 4	0.08%
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.	1.24%	5 of 5	4 of 5	0.12%

SOURCE: CRSP/Compustat and Worldscope/Datastream | DATA: From 7/1/2002 to 06/30/2018 | *Gross of trading costs.

**Annualized trading costs are estimated as the market impact of transactions, assuming \$1B in AUM.

Historical Excess Return, by EM Factor Index



SOURCE: CRSP/Compustat and Worldscope/Datastream | DATA: From 7/1/2002 to 06/30/2018 | NOTE: Annualized trading costs are estimated as the market impact of transactions, assuming \$1B 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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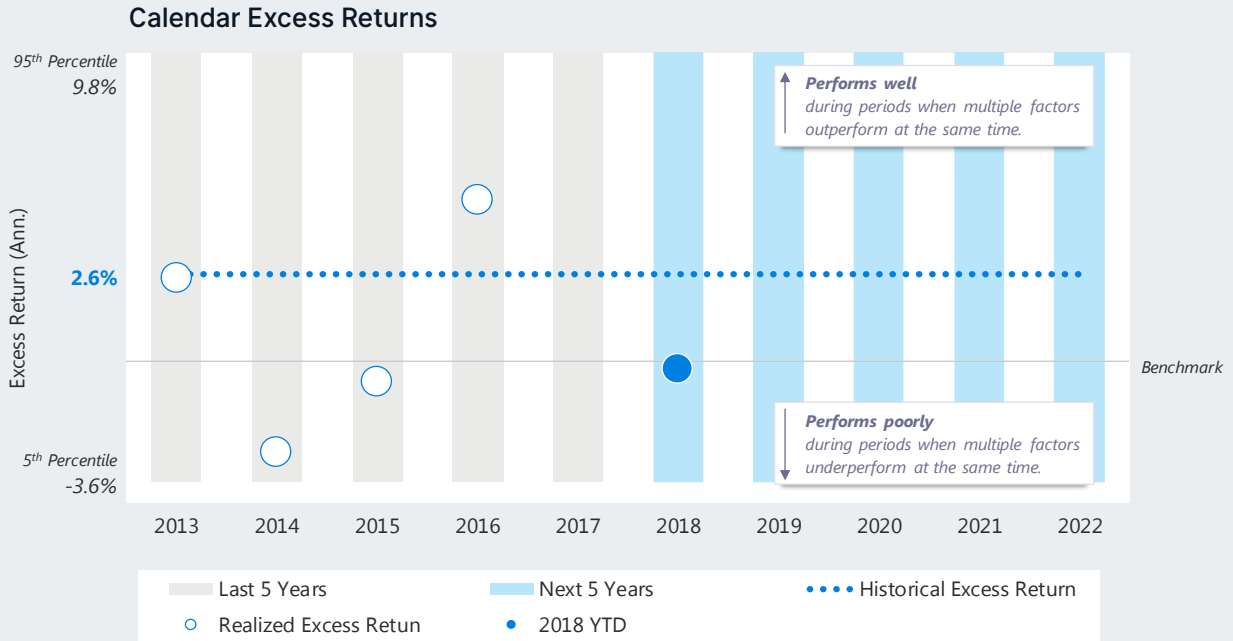
FEBRUARY 2017

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

ROB ARNOTT, NOAH BECK, AND VITALI KALESNIK

What to Expect?

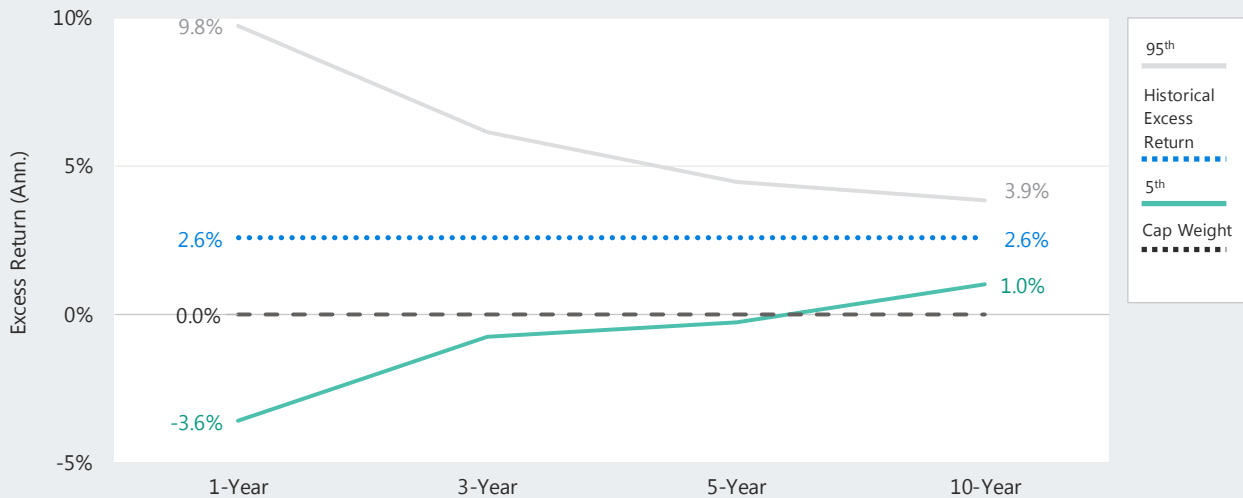
The RAFI Dynamic Multi-Factor Emerging Markets Index shows 2.6% in annualized excess returns since 2002. However, those results have come with a wide range of outcomes (+- 7% or more) in any given year.



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

Rolling Excess Returns

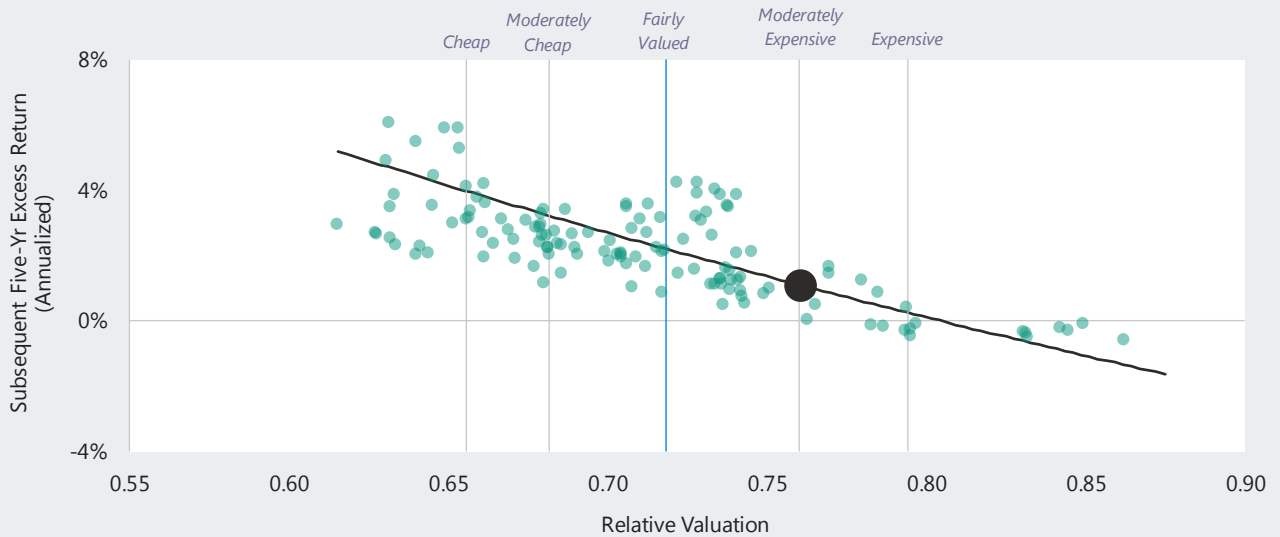
Longer investment horizons produce more predictable returns.



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 24% (0.76x)** to the relative valuation of its cap-weighted benchmark. This is **fairly valued** relative to its **median discount of 28% (0.72x)**. Given current valuations, our [Smart Beta Interactive](#) website forecasts an annualized excess return of **1.1%** over the next five years (gross of costs).

Valuations & Return Expectations



SOURCE: CRSP/Compustat and Worldscope/Datastream | DATA: From 7/1/2002 to 06/30/2018

The screenshot displays the Smart Beta Interactive website interface. It features a navigation menu on the left with categories like INCOME, LOW VOLATILITY, QUALITY, MOMENTUM, and MULTI-FACTOR. The main content area includes a 'Smart Beta INTERACTIVE' logo, a 'Historical Returns (Ann.)' table, and a 'Confidence Interval Expected Return' table. The 'Historical Returns (Ann.)' table shows an excess return over market benchmark of 0.85%. The 'Confidence Interval Expected Return' table shows a real return of 1.14% and a confidence interval for real return (gross) of 1.27%.

Category	Value
Excess Return Over Market Benchmark	0.85%
Real Return	1.14%
Confidence Interval: Real Return (Gross)	1.27%

Learn More

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 Emerging Markets Index outperformed the MSCI Emerging Markets Index by 315bps for the quarter ending September 2018. The RA Momentum Factor EM Index was the only single-factor index to underperform, while RAFI Low Volatility Factor EM Index and RAFI Value Factor EM Index outperformed by 519bps and 502bps, respectively. From a stock-level perspective, the five largest contributors to excess return were Tencent, Vale, Alibaba, China Petroleum & Chemical, and Lukoil. Taiwan Semiconductor was the single largest detractor to excess returns. A 2.1% underweight detracted 41bps as the stock rose 21% for the quarter.

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

Factor Sleeve Allocation

Momentum	19.2%
Quality	25.5%
Low Volatility	30.5%
Value	24.9%

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 Emerging Markets Index	2.2%	0.5%	13.3%	4.4%	7.4%	11.2%	20.8%	4.0%
RAFI Value Factor Emerging Markets Index	4.1%	5.4%	20.4%	6.9%	9.3%	13.2%	24.1%	8.4%
RAFI Low Volatility Factor Emerging Markets Index	4.2%	2.7%	10.0%	4.1%	8.3%	11.6%	18.0%	7.5%
RAFI Quality Factor Emerging Markets Index	2.7%	-1.3%	11.5%	2.3%	5.6%	6.7%	21.4%	5.2%
RA Momentum Factor Emerging Markets Index	-1.1%	-0.9%	12.3%	5.2%	7.3%	15.8%	20.4%	5.2%
MSCI EMF (Emerging Markets)	-0.9%	-0.4%	12.8%	4.0%	5.8%	14.9%	21.2%	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 Emerging Markets Index	660	11.52	1.20	0.74	3.15	40.41
RAFI Value Factor Emerging Markets Index	199	8.83	0.66	0.40	3.78	24.16
RAFI Low Volatility Factor Emerging Markets Index	310	11.88	1.01	0.70	3.17	15.00
RAFI Quality Factor Emerging Markets Index	310	12.68	1.99	0.88	3.76	35.45
RA Momentum Factor US Index	176	22.92	4.41	2.40	1.38	221.15

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

Emerging Markets (6/2007-9/2018)	RAFI Value Factor Emerging Markets Index	RAFI Low Volatility Factor Emerging Markets Index	RAFI Quality Factor Emerging Markets Index	RA Momentum Factor Emerging Markets Index	Tracking Error*
RAFI Value Factor Emerging Markets Index	1	0.09	0.39	-0.05	8.49%
RAFI Low Volatility Factor Emerging Markets Index	N/A	1	0.38	0.21	8.19%
RAFI Quality Factor Emerging Markets Index	N/A	N/A	1	0.04	5.31%
RA Momentum Factor Emerging Markets Index	N/A	N/A	N/A	1	5.06%
RAFI Dynamic Multi-Factor Emerging Markets					3.90%

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 Emerging Markets Index	Weights (%)	Value Factor	Low Vol. Factor	Quality Factor	Mom. Factor
1	Vale S.A. Sponsored ADR	2.83	3.39	-	3.09	3.34
2	Lukoil	2.44	6.99	-	-	2.01
3	China Petroleum & Chemical	2.33	6.68	-	-	1.35
4	PJSC Gazprom	2.19	5.91	-	-	1.63
5	Petrobras	1.96	4.48	-	-	2.24
6	Infosys Limited Sponsored ADR	1.78	-	2.30	2.49	1.84
7	Taiwan Semiconductor	1.72	-	-	6.24	-
8	CNOOC Limited	1.46	3.32	-	-	1.70
9	Naspers Limited Class N	1.41	-	-	-	4.73
10	Hyundai	1.38	3.42	3.86	-	-

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

Sectors

Sector	RAFI Dynamic Multi-Factor Emerging Markets Index	RAFI Value Factor Emerging Markets Index	RAFI Low Volatility Factor Emerging Markets Index	RAFI Quality Factor Emerging Markets Index	RA Momentum Factor Emerging Markets Index
1 Basic Materials	16.13%	19.63%	11.57%	16.80%	13.95%
2 Consumer, Cyclical	10.70%	8.18%	15.62%	7.90%	13.57%
3 Consumer, Non-Cyclical	7.66%	1.77%	8.90%	13.11%	6.96%
4 Energy	17.68%	35.45%	6.40%	11.05%	16.87%
5 Financial	15.69%	4.71%	21.10%	7.99%	24.83%
6 Health Care	1.10%	--	1.37%	1.35%	1.34%
7 Industrial	5.14%	5.21%	7.67%	4.81%	3.29%
8 Technology	15.39%	9.75%	10.41%	24.54%	16.65%
9 Telecommunications	6.00%	7.13%	9.44%	9.24%	1.02%
10 Utilities	4.50%	8.18%	7.52%	3.20%	1.54%

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

Regions

Sector	RAFI Dynamic Multi-Factor Emerging Markets Index	RAFI Value Factor Emerging Markets Index	RAFI Low Volatility Factor Emerging Markets Index	RAFI Quality Factor Emerging Markets Index	RA Momentum Factor Emerging Markets Index
1 Asia Pac ex China, India	22.02%	11.97%	33.71%	35.51%	14.28%
2 Brazil	10.17%	13.78%	1.25%	10.15%	10.66%
3 China	17.60%	17.29%	3.84%	10.69%	30.57%
4 Ctr & S America ex Brazil	3.54%	0.17%	7.44%	6.57%	2.28%
5 Europe ex Russia	1.01%	2.23%	2.19%	0.06%	0.54%
6 India	9.65%	0.77%	9.37%	10.60%	14.49%
7 Middle East & Africa	7.27%	7.10%	1.60%	6.04%	11.83%
8 Other	18.77%	27.13%	36.30%	10.94%	7.93%
9 Russia	9.97%	19.57%	4.31%	9.43%	7.42%

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

Disclosures (1/2)

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