

RAFI[®]

Cumprindo a Promessa de Smart Beta

Jeff Wilson

Sócio, Relacionamentos com Clientes Institucionais

Research Affiliates, LLC

» Missão

- › Research Affiliates se compromete a ser a preeminente fonte de insights e produtos que transformam a comunidade global de investimentos para o benefício de investidores.

» Líder global em

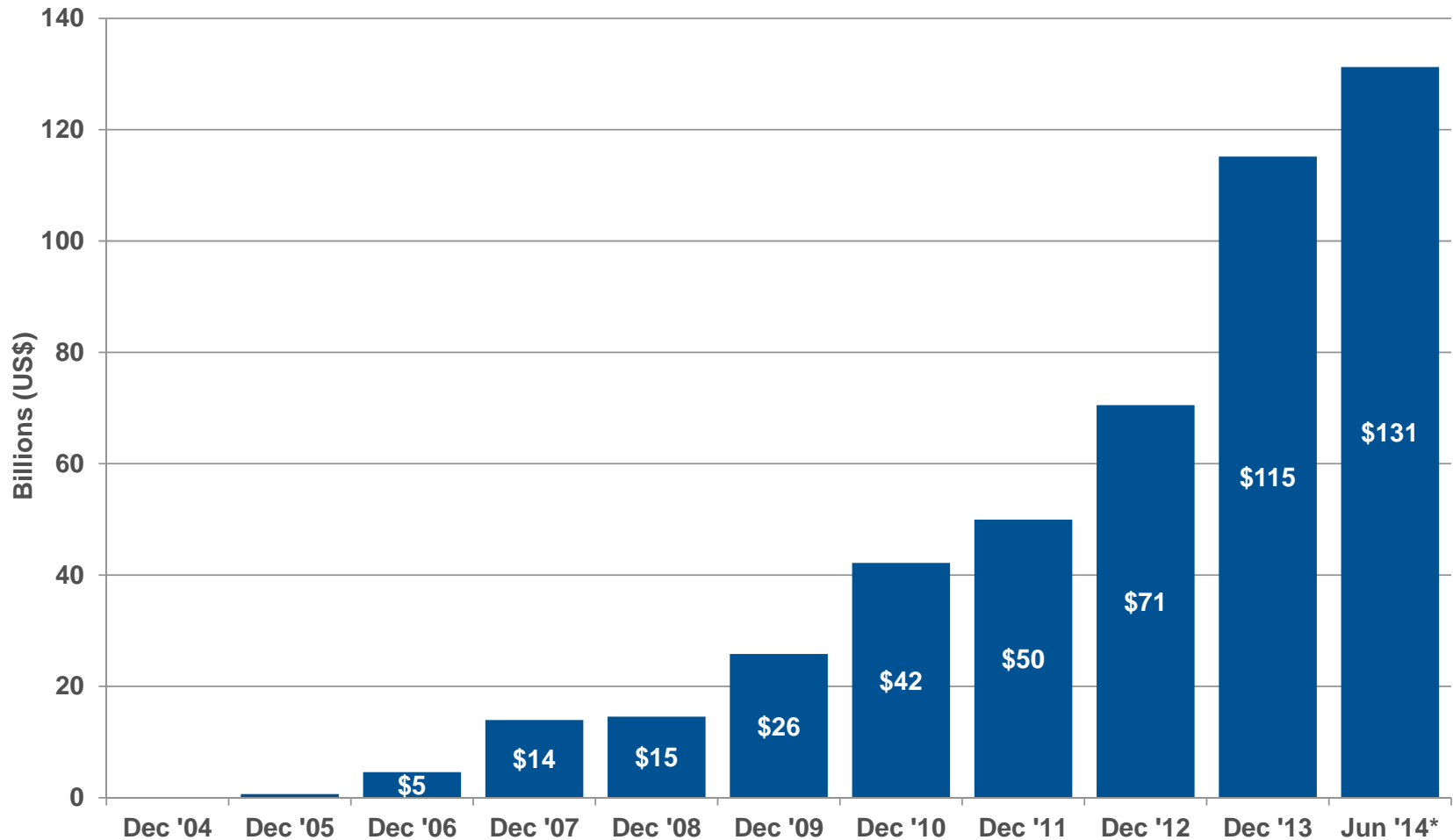
- › Asset Allocation
- › Smart Beta

» Perfil

- › Aproximadamente \$181 bilhões administrados usando estratégias desenvolvidas por RA (junho 2014¹)
- › Fundada em 2002 por Rob Arnott e Jason Hsu

¹As of 6/30/2014 based on estimates. Includes assets managed or sub-advised by Research Affiliates or licensees using RAFI, Enhanced RAFI, Research Affiliates Equity, and GTAA strategies. *Note: please refer to the important information slide at the end for all relevant disclaimers, disclosures, and information on our intellectual property.*

Fundos Administrados desde a Criação de RAFI



*As of June 2014. Data based on estimates.

Includes RAFI and Enhanced RAFI assets managed or sub-advised by Research Affiliates and RAFI licensees.



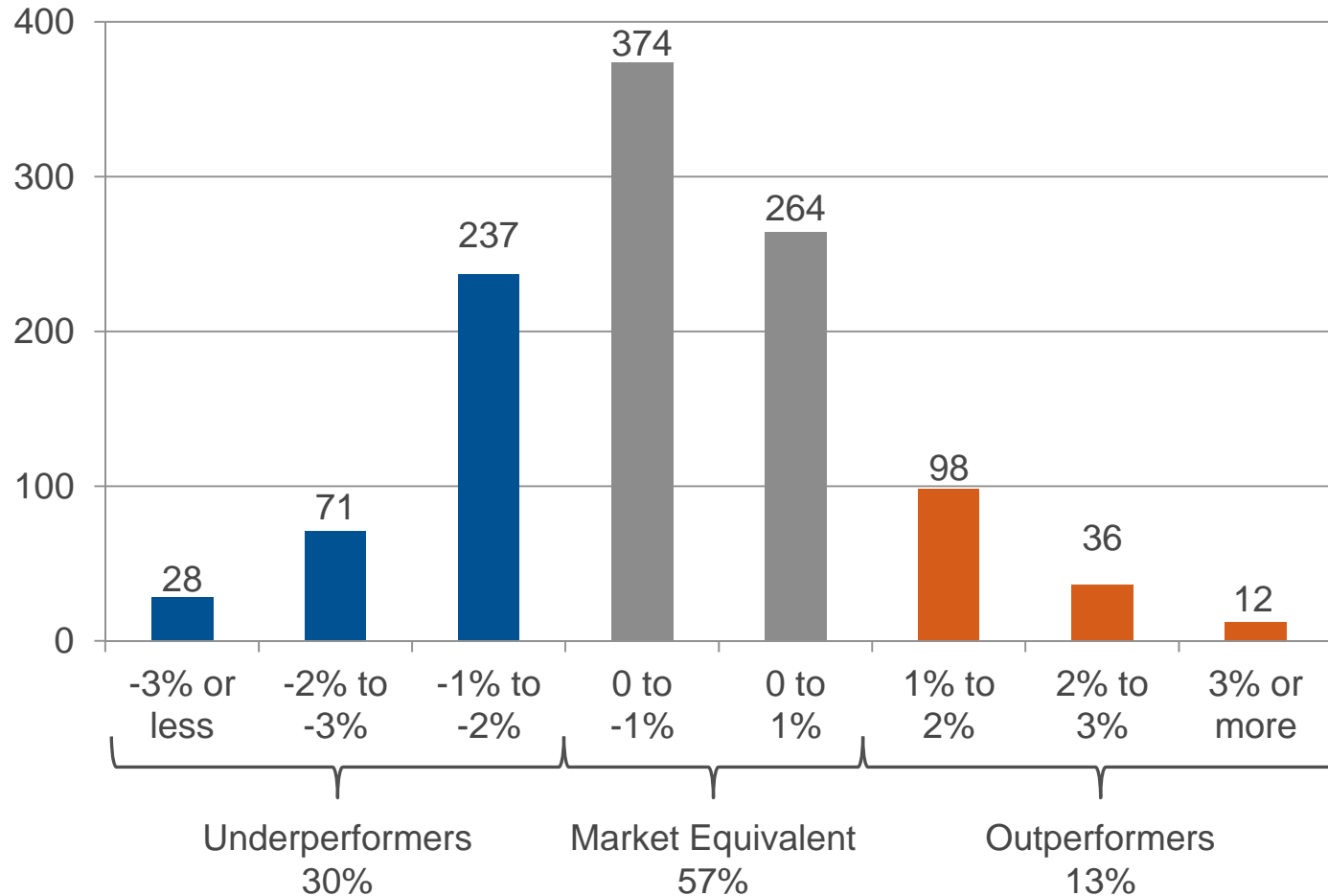
Examinando Smart Beta

Estratégias Smart Beta em Ações

- » **Múltiplas ofertas, múltiplas promessas de marketing, então...**
 - › Como medir a superioridade em relação ao “market cap”?
 - › Quais similaridades podem ser identificadas?
 - › Quais são as diferenças críticas?
 - › Como usar Smart Beta?

2% de Retornos em Excesso São Difíceis de Atingir

Retornos em Excesso de Fundos Sobreviventes (US Large Cap), 2004 – 2013



Source: Research Affiliates, LLC, based on Lipper data for U.S. large capitalization mutual funds. Mutual fund returns are net of fees. Chart has been recreated but based on Burton G. Malkiel, 2005, "Reflections on the Efficient Market Hypothesis: 30 Years Later", The Financial Review, 40.

As Vantagens de Investimentos Passivos

- » Fundos de Índices são uma escolha atraente para investidores
 - › Ampla exposição ao mercado
 - › Diversificação
 - › Enorme capacidade de investimento
 - › Baixas taxas e despesas
 - › Baixos custos de due diligence e monitoramento
 - › Performance superior em relação à maioria dos fundos ativos¹

¹Based on Vanguard Investment Counseling & Research, *The Case For Indexing*, April 2010

Smart Beta

Entregando fontes conhecidas de retornos superiores através de índices simples, transparentes e de baixo custo.

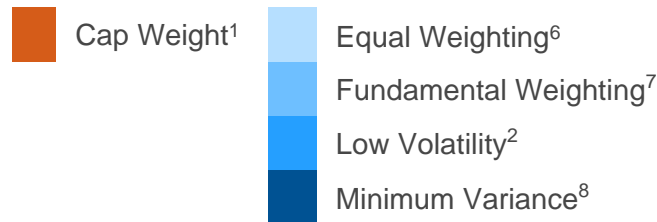
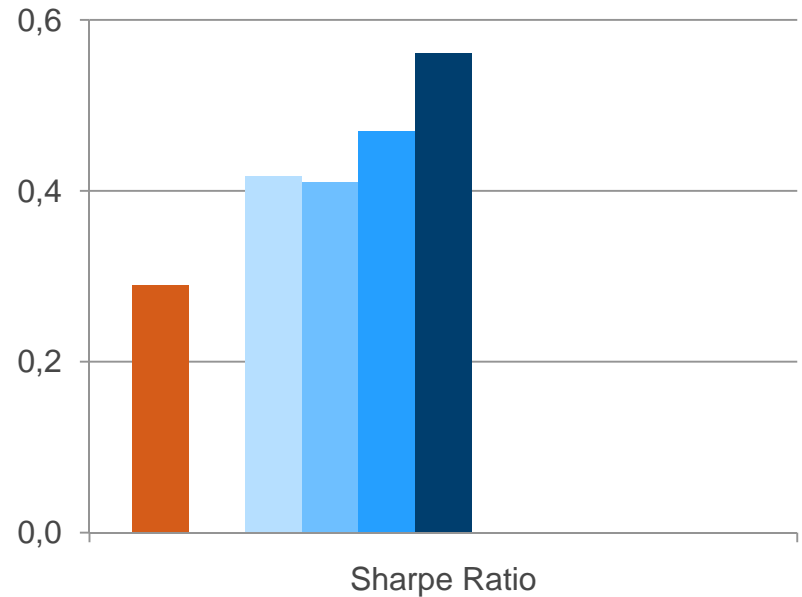
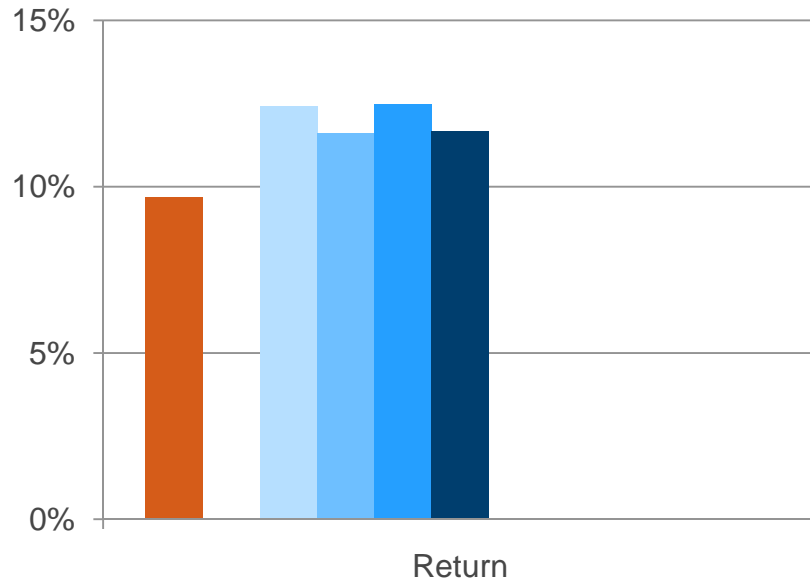
- » Estratégias Smart Beta combinam os benefícios de:
 - › Administração ativa – Oportunidade para performance superior
 - › Administração passiva – Transparência, baseado em regras, baixo custo

Alternativas Populares em Smart Beta

- » **Estratégias Smart Beta existem em diferentes versões**
 - › Equal Weighting—atribuem o mesmo peso a cada ação, (transparente, baseado em regras, heurística)
 - › Fundamentals Weighting—Seleção do universo e atribuição de peso baseados em medidas fundamentais de tamanho, (transparente, baseado em regras, heurística)
 - › Low Volatility—peso igual ao inverso da volatilidade, (transparente, baseado em regras, heurística)
 - › Minimum Variance—otimizada para minimizar volatilidade, (abordagem através de otimização com restrições)

Alternativas Populares em Smart Beta Atingem Performance Superior ao Cap-Weight

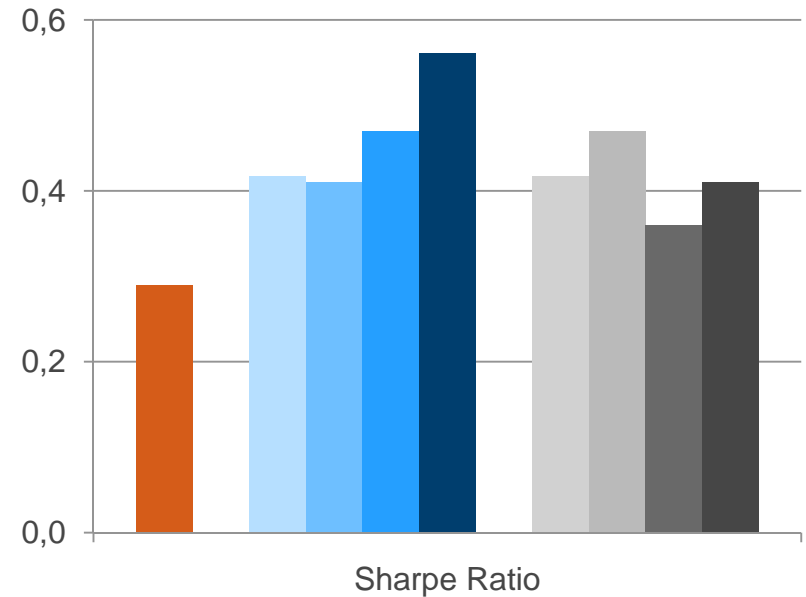
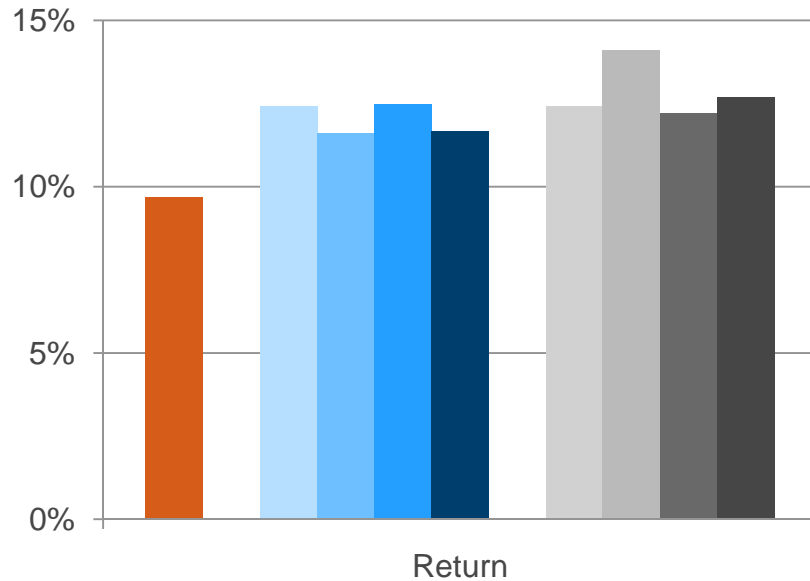
Estratégias Simuladas (EUA), 1964–2012



See notes slide for disclosures regarding individual strategies.
Source: Research Affiliates, LLC, based on Arnott, Hsu, Kalesnik and Tindall (2013)

Estratégias Inversas Também Atingem Performance Superior!

Estratégias Simuladas (EUA), 1964–2012



Cap Weight¹

Equal Weighting⁶

Fundamental Weighting⁷

Low Volatility²

Minimum Variance⁸

Inverse: Equal Weighting⁶

Inverse: Fundamental Weighting⁷

Inverse: Low Volatility²

Inverse: Minimum Variance⁸

See notes slide for disclosures regarding individual strategies.

Source: Research Affiliates, LLC, based on Arnott, Hsu, Kalesnik and Tindall (2013)

O Macaco de Malkiel



“A blindfolded monkey throwing darts at a newspaper’s financial pages could select a portfolio that would do just as well as one carefully selected by experts.”

-Burton G. Malkiel, *A Random Walk Down Wall Street*

“Um macaco vendado atirando dardos nas páginas financeiras de um jornal poderia criar um portfolio cuja performance seria igual à performance de um portfolio criado por especialistas.”

O Macaco de Malkiel Exibe Performance Superior ao Cap-Weight

Simulação de Seleção Randômica, repetida 100 vezes, 1964-2012

Strategy	Return	Standard Deviation	Sharpe Ratio
Average of 100 Monkey Portfolios ⁹	11.3%	18.3%	0.33
U.S. Cap Weight ¹	9.7%	15.3%	0.29

Somente 2 macacos (*extremamente azarados*) exibem performance inferior ao cap-weighted benchmark!

See notes slide for disclosures regarding individual strategies.
Source: Research Affiliates, LLC, based on Arnott, Hsu, Kalesnik and Tindall (2013)

Todas as Estratégias Independentes de Preços Atingem Performance Superior

Investment Strategy	Break the Link Between Price and Weight	Rebalance
Risk Weighted Strategies	✓	✓
Fundamental Strategies	✓	✓
Smart Beta Solutions	✓	✓
Random Monkey Portfolios	✓	✓
Cap-Weight		

Implementação É o Principal Diferenciador

» Várias estratégias de Smart Beta sofrem com altos custos de implementação.

› Investidores devem ter como objetivos:

Maximizar

Capacidade/Liquidez

Representatividade Econômica

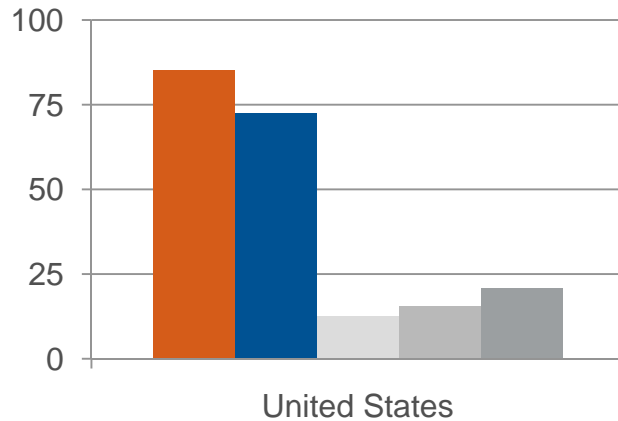
Minimizar

Volume/Turnover

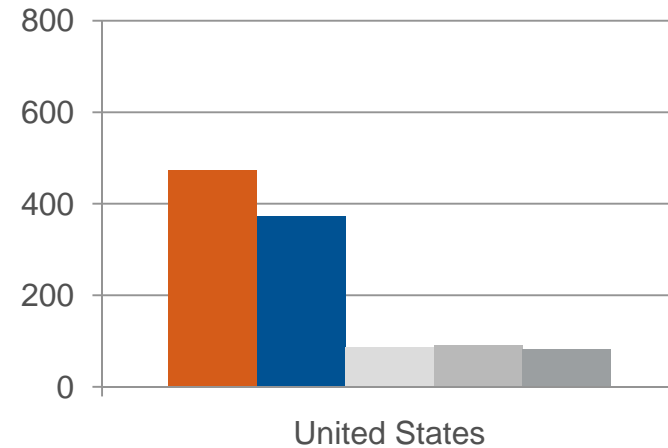
Custos de Trading

Fundamentals Weight Tem Implementação Simples

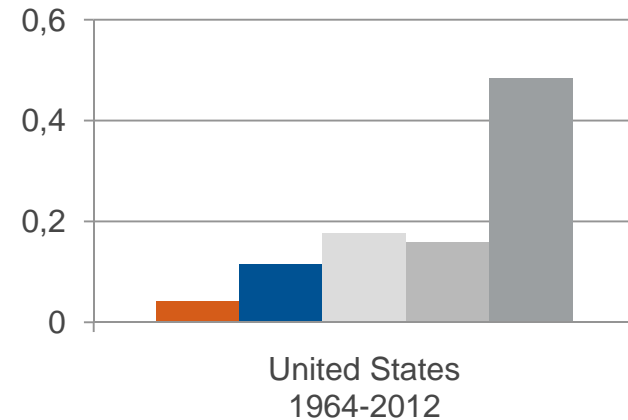
Market Cap in USD Billions – Jan 2012



Average Daily Volume in USD Millions – Jan 2012



Average Annual Turnover



Above figures all represent weighted averages.
See notes slide for disclosures regarding individual strategies.
Source: Research Affiliates, LLC.

Fundamentals Weight Tem

Representatividade Econômica

6/30/2014

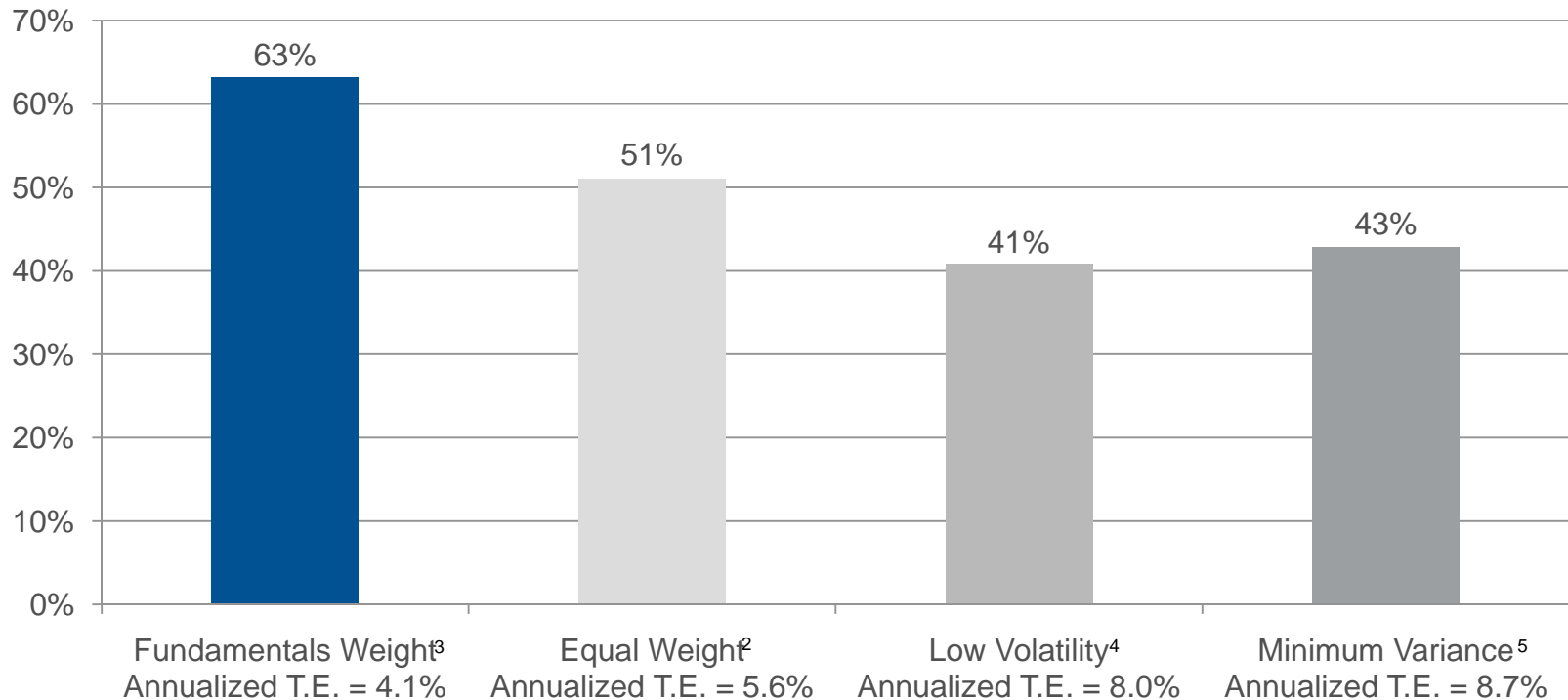
Russell 1000 Index Top Ten		FTSE RAFI US 1000 Top Ten	
Apple	2.78%	Exxon Mobil	3.04%
Exxon Mobil	2.15%	Chevron	2.22%
Microsoft	1.71%	AT&T	2.06%
Google	1.63%	General Electric	1.77%
Johnson & Johnson	1.47%	JPMorgan Chase	1.70%
General Electric	1.31%	Wells Fargo	1.57%
Wells Fargo	1.25%	Bank of America	1.55%
Chevron	1.23%	Berkshire Hathaway	1.29%
Berkshire Hathaway	1.15%	Verizon	1.28%
JPMorgan Chase	1.08%	ConocoPhillips	1.26%
Top 10 Total	15.76%	Top 10 Total	17.72%

Equal Weight Top Ten		Low Volatility Top Ten		Minimum Variance Top Ten	
Vertex Pharmaceuticals	0.25%	Sigma-Aldrich Corp.	1.20%	Johnson & Johnson	1.51%
Covidien	0.25%	McDonald's	1.17%	PepsiCo	1.51%
Williams Companies	0.24%	U.S. Bancorp	1.16%	Merck	1.50%
Integrus Energy Group	0.24%	Wal-Mart	1.16%	Verizon	1.46%
CarMax	0.23%	Duke Energy	1.15%	Ecolab	1.45%
Iron Mountain, Inc.	0.22%	UPS	1.13%	ADP	1.45%
First Solar, Inc.	0.22%	Southern Company	1.13%	Exxon Mobil	1.45%
Edwards Lifesciences	0.22%	ConocoPhillips	1.13%	AT&T	1.44%
AES	0.22%	PepsiCo	1.13%	Becton, Dickinson & Co.	1.44%
GameStop	0.22%	Clorox	1.12%	McDonald's	1.44%
Top 10 Total	2.30%	Top 10 Total	11.49%	Top 10 Total	14.66%

Source: Research Affiliates, LLC. based on data from Factset. Equal Weight Index data referenced in the above chart is the Guggenheim S&P 500 Equal Weight ETF. Low Volatility Index data uses the PowerShares S&P 500 Low Volatility ETF. Minimum Variance index data uses the iShares MSCI USA Minimum Volatility ETF.

Fundamentals Weights Tem Baixo Erro de Rastreamento

Fração de Retornos Anuais que se Situam a uma Distância menor do que 5% do Benchmark, 1967 - 2012



Resumo

- » Todas as estratégias Smart Beta agregam valor em relação ao cap-weighting
- » RAFI é uma estratégia Smart Beta de núcleo
 - › Maior capacidade
 - › Menor custo de implementação
 - › Representatividade econômica
 - › Baixo erro de rastreamento em relação ao cap-weight



Combinando Estratégias Smart Beta

Estratégias Smart Beta Têm Características Diferentes

Características de Performance (1967 – 2013)

	Return	Volatility	Tracking Error	Sharpe Ratio	Information Ratio
Fundamentals Weight	12.4%	15.6%	4.4%	0.46	0.49
Low Volatility Strategy	12.0%	12.5%	8.5%	0.55	0.21
Momentum Strategy	13.3%	17.2%	7.3%	0.47	0.42
S&P 500 Index	10.3%	15.3%		0.33	

Exposição a Fatores (1967 – 2013)

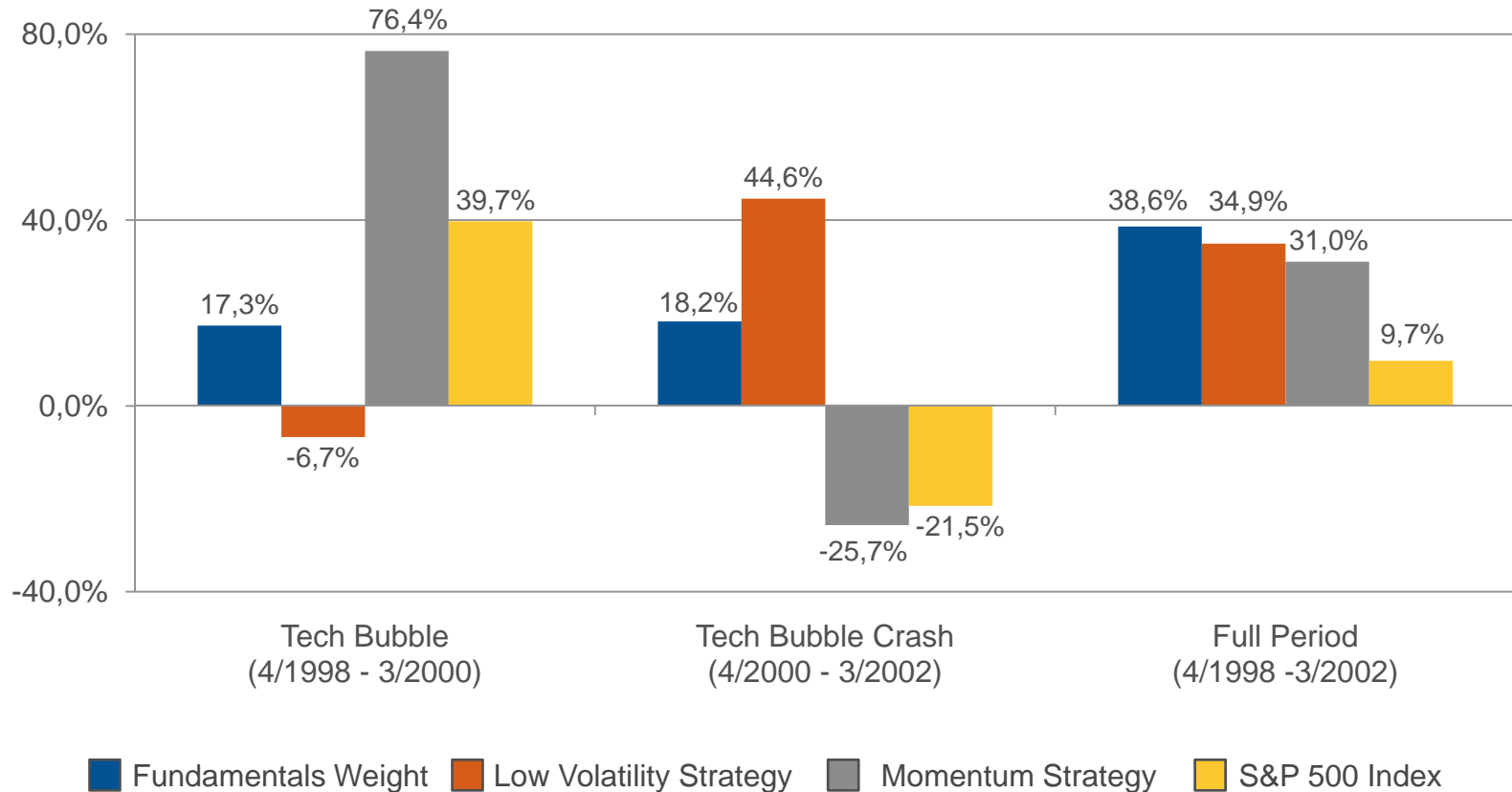
	Market Beta	Size	Value	Low Volatility	Momentum
Fundamentals Weight	1.01	-0.06	0.32	0.04	-0.10
Low Volatility Strategy	0.74	-0.03	0.16	0.41	-0.08
Momentum Strategy	1.06	-0.01	0.05	-0.05	0.39
S&P 500 Index	0.99	-0.18	0.02	0.00	-0.02

Source: Research Affiliates, LLC, based on data from Factset, CRSP, Compustat and Ken French's website.

Fundamentals Weighted strategy in this exhibit uses the returns of the FTSE RAFI US 1000 Index. Low Volatility strategy is a simulated portfolio that weights the 200 U.S. equities with the lowest volatility by 1/Volatility, selected from the 1000 largest companies by cap-weight. Momentum strategy is Ken French's Big, High momentum portfolio, http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html.

Smart Beta Durante a Tech Bubble

Retornos Cumulativos

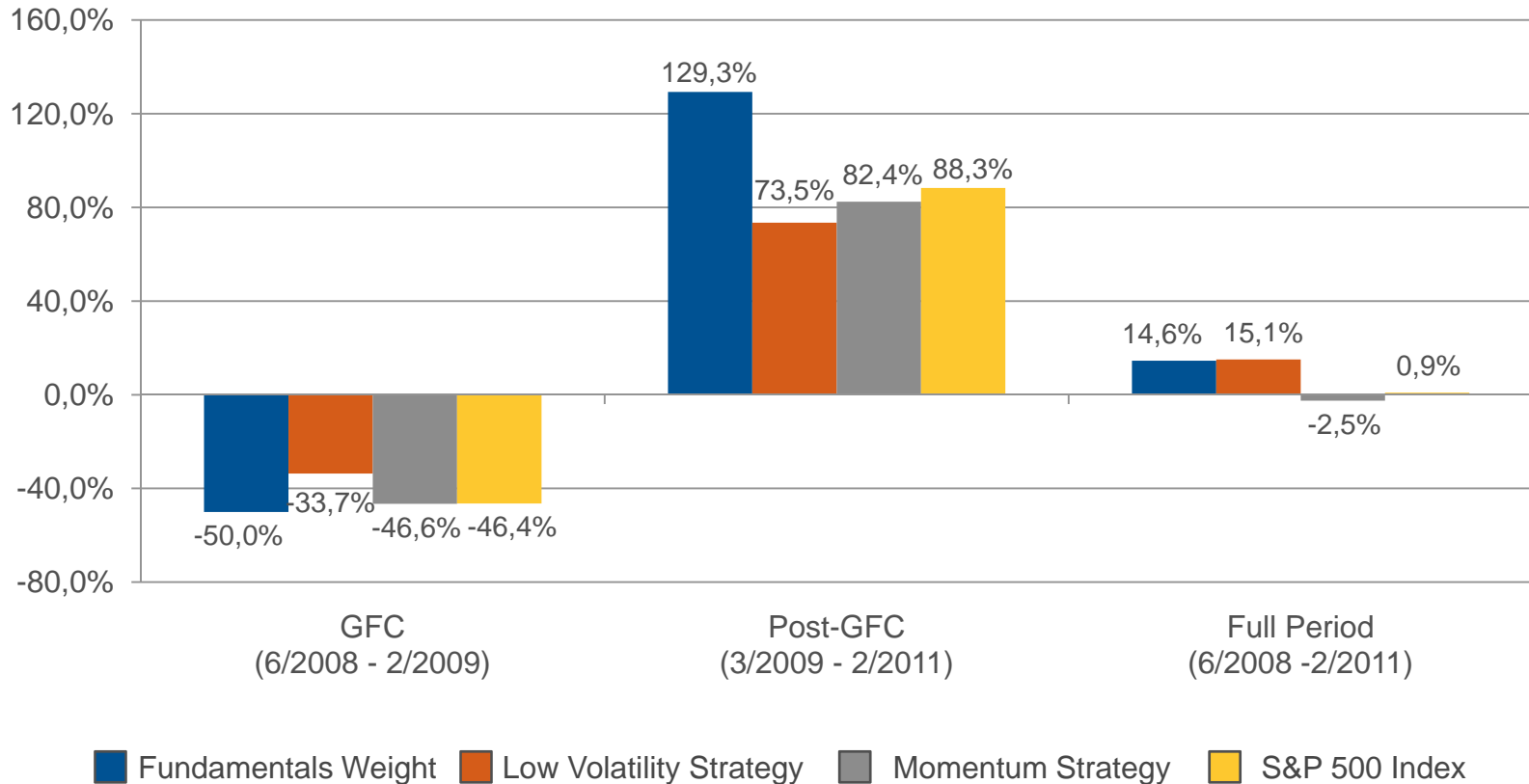


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Smart Beta Durante a Crise Financeira Global (GFC)

Retornos Cumulativos

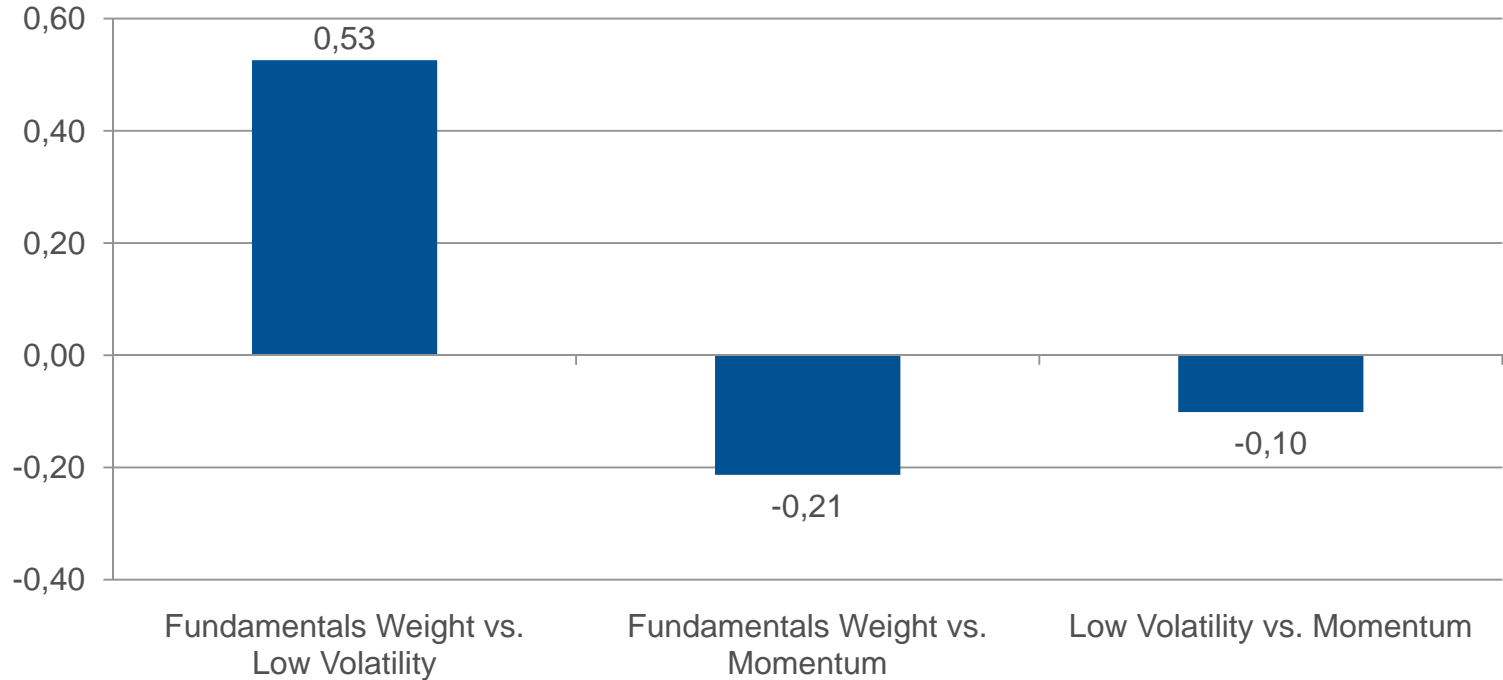


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Oportunidade para Diversificação

Correlação de Retornos em Excesso
(1967 – 2013)

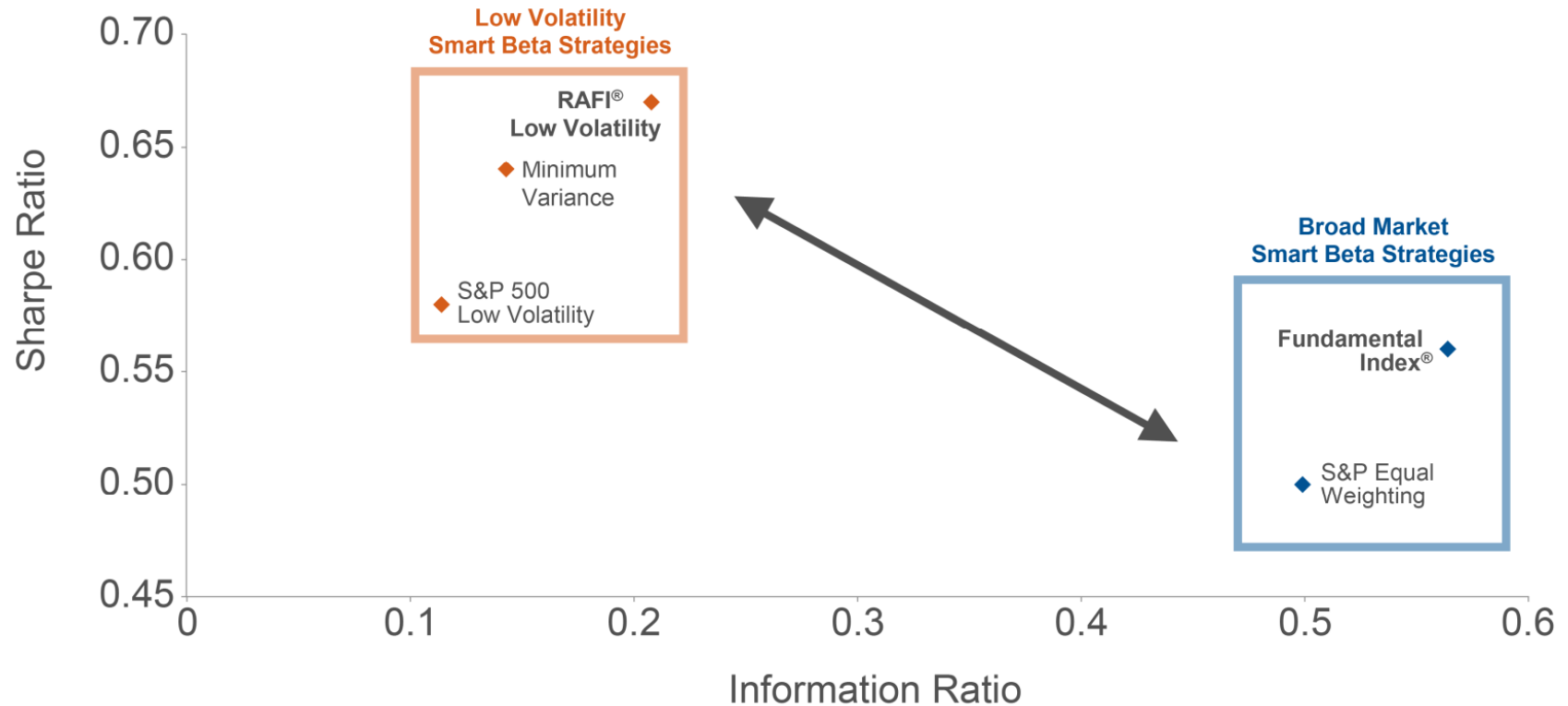


- » Padrões de performance de estratégias Smart Beta diferem
 - › Existem benefícios de diversificação ao se combinar as estratégias

Source: Research Affiliates, LLC, based on data from Factset, CRSP, Compustat and Ken French's website.

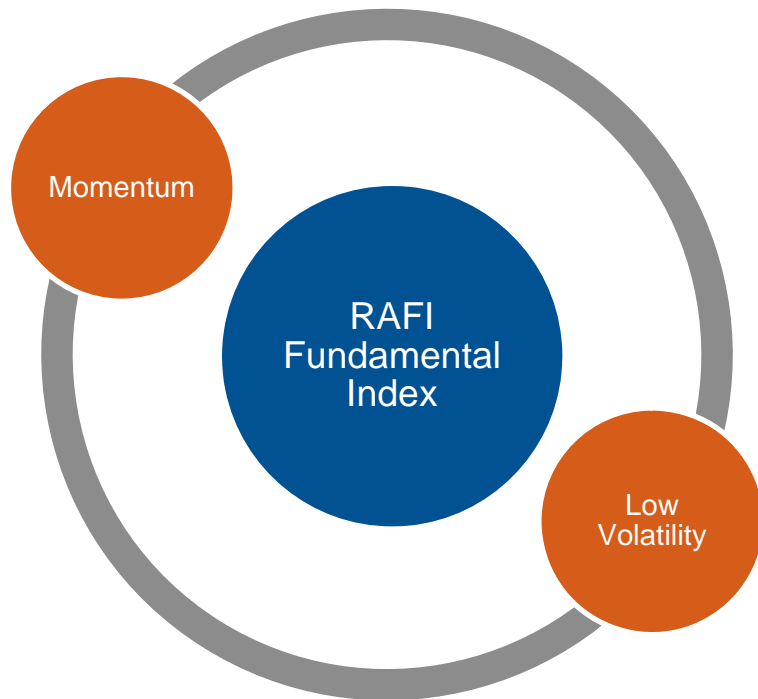
Fundamentals Weighted strategy in this exhibit uses the returns of the FTSE RAFI US 1000 Index. Low Volatility strategy is a simulated portfolio that weights the 200 U.S. equities with the lowest volatility by $1/\text{Volatility}$, selected from the 1000 largest companies by cap-weight. Momentum strategy is Ken French's Big, High momentum portfolio, http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html. Excess returns are versus the S&P 500 Index.

Investimentos de Baixa Volatilidade (Low Volatility) Requerem uma Mudança de Preferência ao Risco



Source: Research Affiliates, LLC, based on data from CRSP/Compustat and Standard & Poors. Turnover average from 1991-2010. Weighted average market cap as of December 31, 2010.

RAFI em uma Relação Núcleo-Satélite de Estratégias Smart Beta



- » **RAFI forma o núcleo**
 - › Maior capacidade/liquidez
 - › Representatividade econômica
 - › Baixo turnover em relação ao cap-weight
 - › Baixo erro de rastreamento em relação ao cap-weight
- » **Outras estratégias Smart Beta são excelentes complementos ao RAFI**
 - › Reduzem momentum negativo
 - › Reduzem volatilidade

Combinando RAFI, Low Volatility e Momentum

Características de Performance (1967 – 2013)

	Return	Volatility	Tracking Error	Sharpe Ratio	Information Ratio
Fundamentals Weight	12.4%	15.6%	4.4%	0.46	0.49
Low Volatility Strategy	12.0%	12.5%	8.5%	0.55	0.21
Momentum Strategy	13.3%	17.2%	7.3%	0.47	0.42
S&P 500 Index	10.3%	15.3%		0.33	
60% Fundamentals Weight 20% Low Volatility Strategy 20% Momentum	12.7%	14.7%	3.8%	0.51	0.63
70% Fundamentals Weight 30% Momentum Strategy	12.8%	15.6%	3.4%	0.49	0.74
70% Fundamentals Weight 30% Low Volatility Strategy	12.4%	14.4%	4.9%	0.50	0.43

Source: Research Affiliates, LLC, based on data from Factset, CRSP, Compustat and Ken French's website.

Fundamentals Weighted strategy in this exhibit uses the returns of the FTSE RAFI US 1000 Index. Low Volatility strategy is a simulated portfolio that weights the 200 U.S. equities with the lowest volatility by $1/\text{Volatility}$, selected from the 1000 largest companies by cap-weight. Momentum strategy is Ken French's Big, High momentum portfolio, http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html.

Core-satellite smart beta portfolio strategies are rebalanced annually on January 1.

Combinando RAFI, Low Volatility e Momentum

Exposição a Fatores
(1967 – 2013)

	Market Beta	Size	Value	Low Volatility	Momentum
Fundamentals Weight	1.01	-0.06	0.32	0.04	-0.10
Low Volatility Strategy	0.74	-0.03	0.16	0.41	-0.08
Momentum Strategy	1.06	-0.01	0.05	-0.05	0.39
S&P 500 Index	0.99	-0.18	0.02	0.00	-0.02
60% Fundamentals Weight 20% Low Volatility Strategy 20% Momentum	0.97	-0.04	0.24	0.10	0.00
70% Fundamentals Weight 30% Momentum Strategy	1.02	-0.05	0.24	0.02	0.05
70% Fundamentals Weight 30% Low Volatility Strategy	0.93	-0.05	0.27	0.15	-0.09

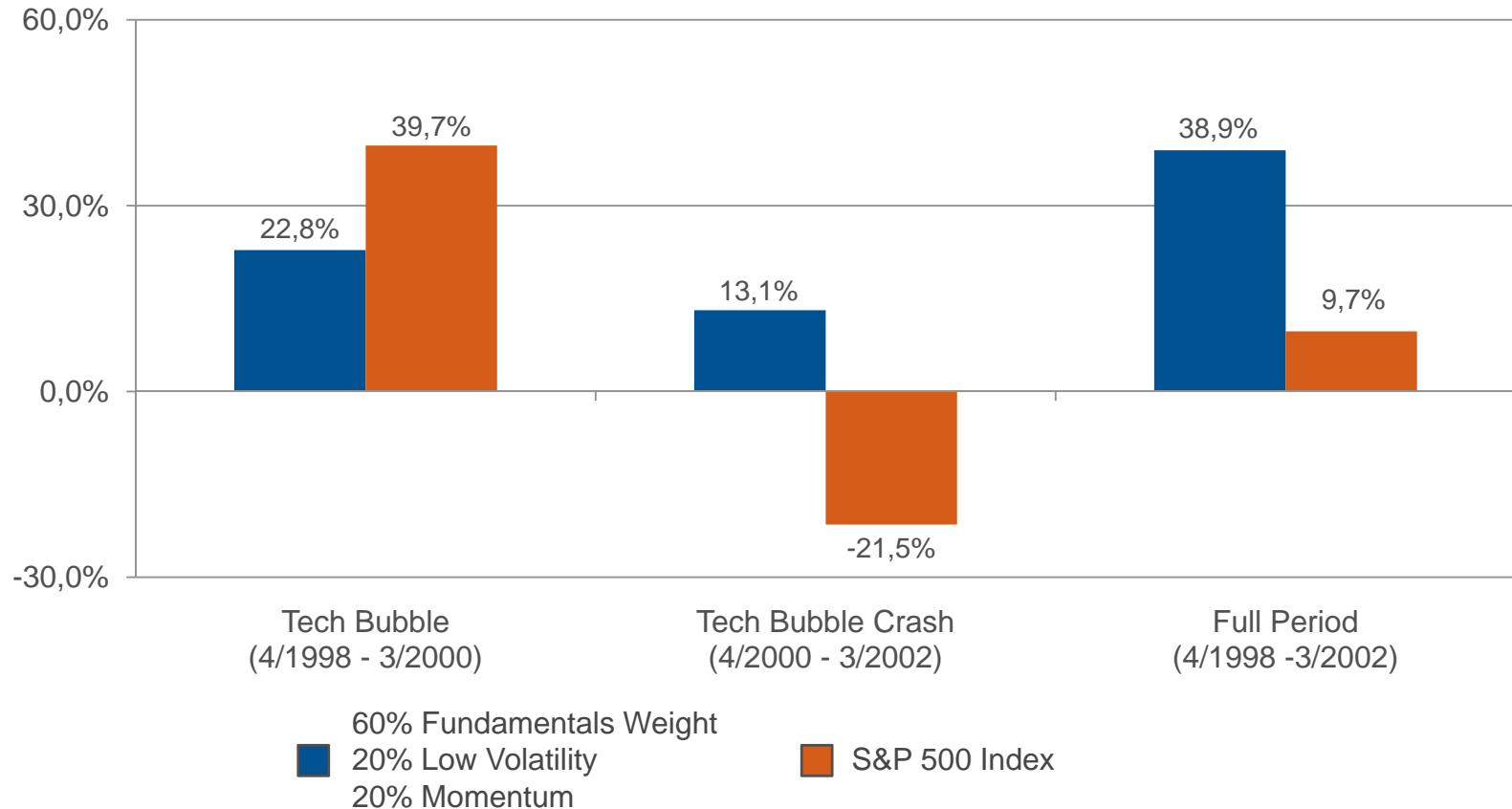
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Core-satellite smart beta portfolio strategies are rebalanced annually on January 1.

Estratégia Núcleo-Satélite Durante a Tech Bubble

Retorno Cumulativo



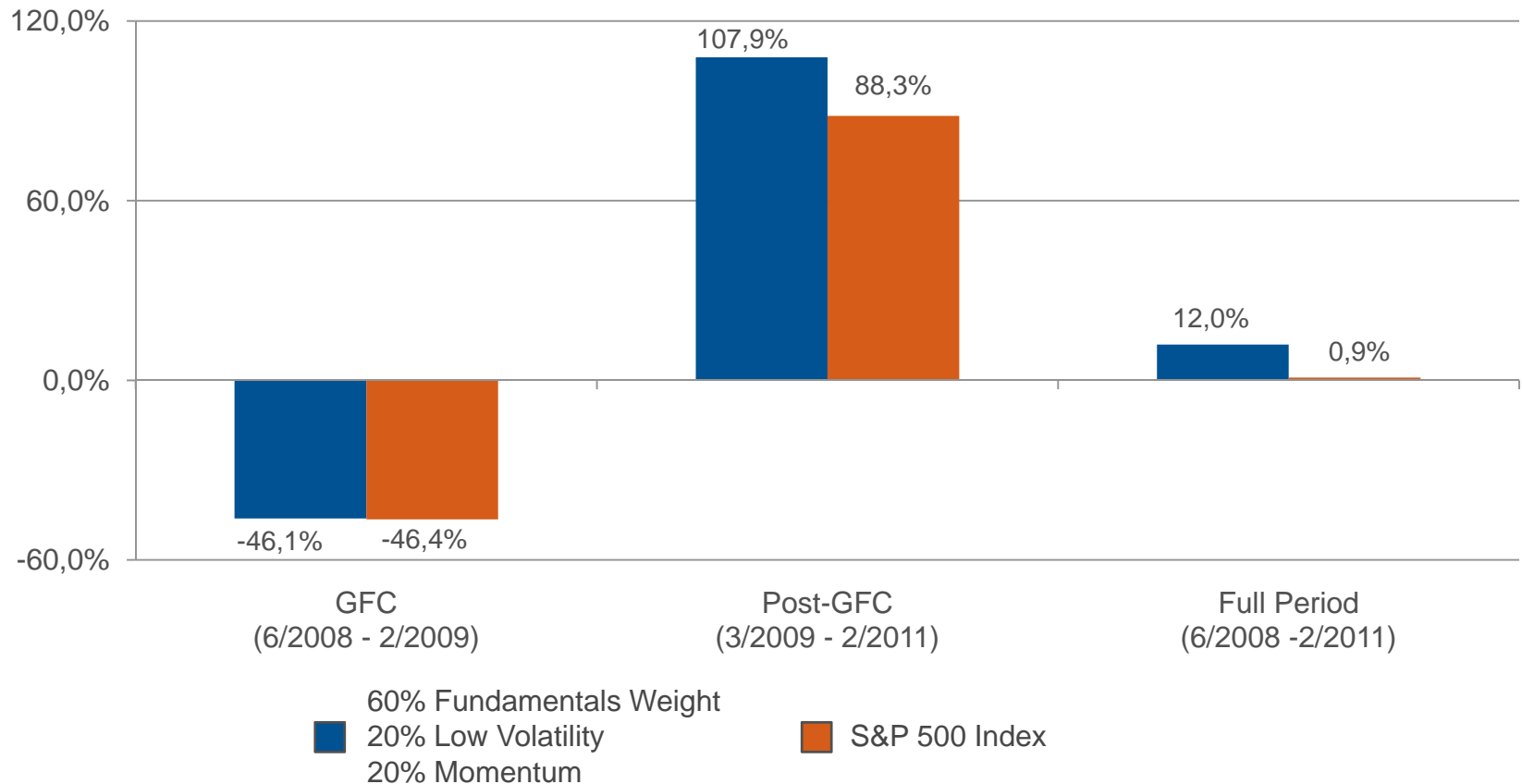
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Core-satellite smart beta portfolio strategies are rebalanced annually on January 1.

Estratégia Núcleo-Satélite Durante a Crise Financeira Global (GFC)

Retorno Cumulativo



Source: Research Affiliates, LLC, based on data from Factset, CRSP, Compustat and Ken French's website.

Fundamentals Weighted strategy in this exhibit uses the returns of the FTSE RAFI US 1000 Index. Low Volatility strategy is a simulated portfolio that weights the 200 U.S. equities with the lowest volatility by $1/\text{Volatility}$, selected from the 1000 largest companies by cap-weight. Momentum strategy is Ken French's Big, High momentum portfolio, http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html.

Core-satellite smart beta portfolio strategies are rebalanced annually on January 1.

Conclusão

- » **Todas as estratégias Smart Beta agregam valor vs. cap-weighting**
 - › Porém, diferentes metodologias levam a diferentes características de portfolio
- » **RAFI é uma estratégia Smart Beta de núcleo**
 - › Maior capacidade
 - › Baixo custo de implementação
 - › Representatividade econômica
 - › Baixo erro de rastreamento em relação ao cap-weight
- » **Baixa volatilidade (low volatility) e momentum são excelentes complementos ao RAFI**



Apêndice

Alternativas a Medidas de Peso Baseadas em Preço

» Medidas de peso

- › Não relacionadas a preço
- › Medidas de tamanho corporativo amplamente aceitas
- › Co-integradas com liquidez e capacidade
 - › Turnover
 - › Custos de trading
 - › Capacidade
 - › Representatividade Econômica

» Solução: Medidas fundamentais de tamanho corporativo

- › Sales, cash flow, dividends, and book value

Medidas Alternativas Exibem Performance Superior

Simulação, Índice RAFI Fundamental (US Large), 1962 – June 30, 2014

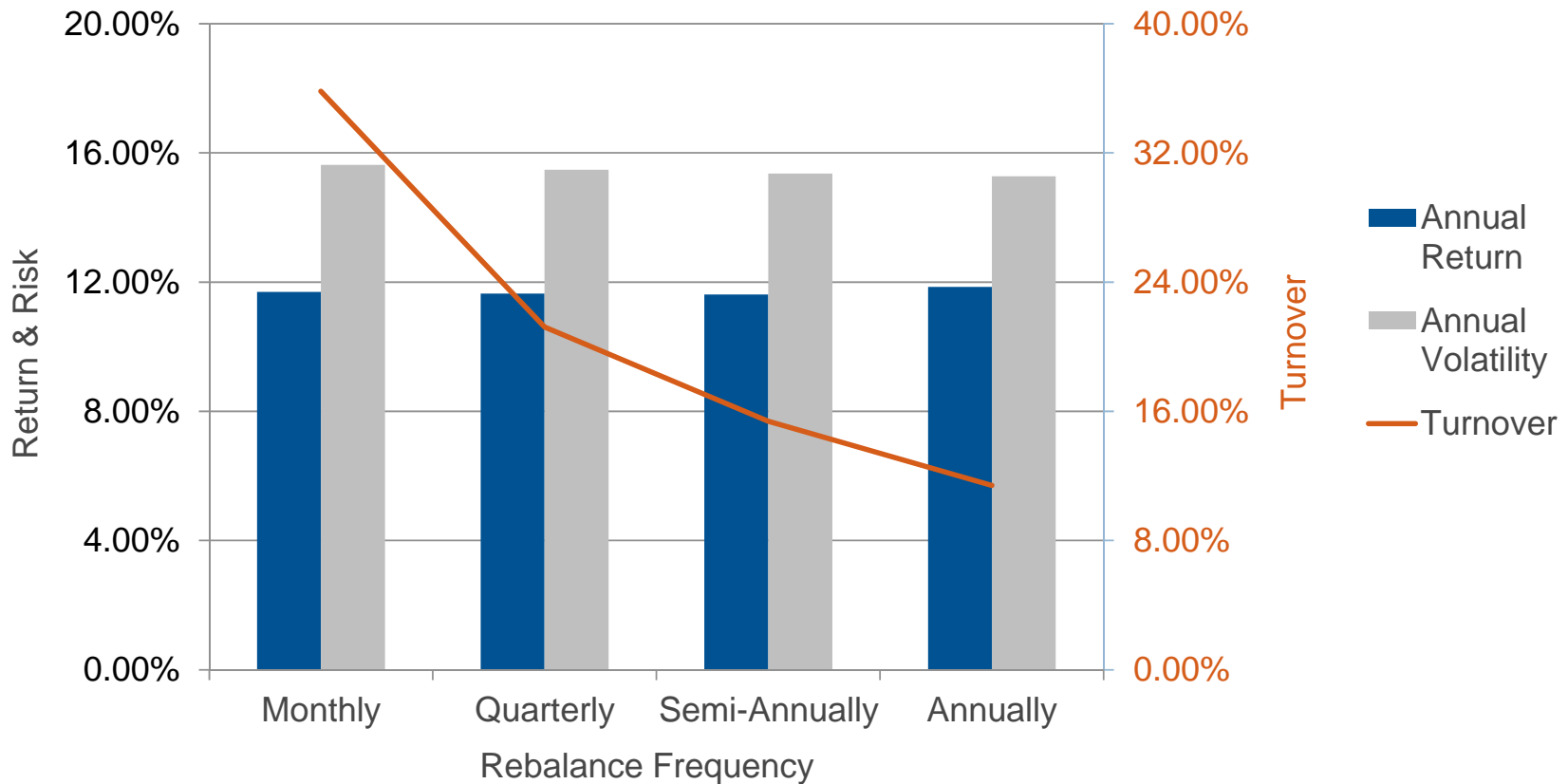
Index	Return (%)	Volatility (%)	Tracking Error (%)
S&P 500	9.9	15.0	--
Equal Weighted	11.6	17.2	6.0
Book Value	11.5	15.5	4.2
Cash Flow	11.8	15.5	4.3
Sales	12.5	16.3	5.2
Gross Dividends	11.6	14.1	5.0
RAFI Composite	11.9	15.3	4.3

Return, Volatility and Tracking Error figures are annualized.

Source: Research Affiliates based on data from Ibbotson, Bloomberg, CRSP, Compustat, and FactSet. Equal Weighted index is a simulated index that equal weights the top 1000 US equities and rebalances annually. Note: The index data published herein is simulated. Please see important disclosure information at end

Reconstituições Frequentes Aumentam Turnover

Simulated RAFI Fundamental Index US Large
1962 – June 30, 2014



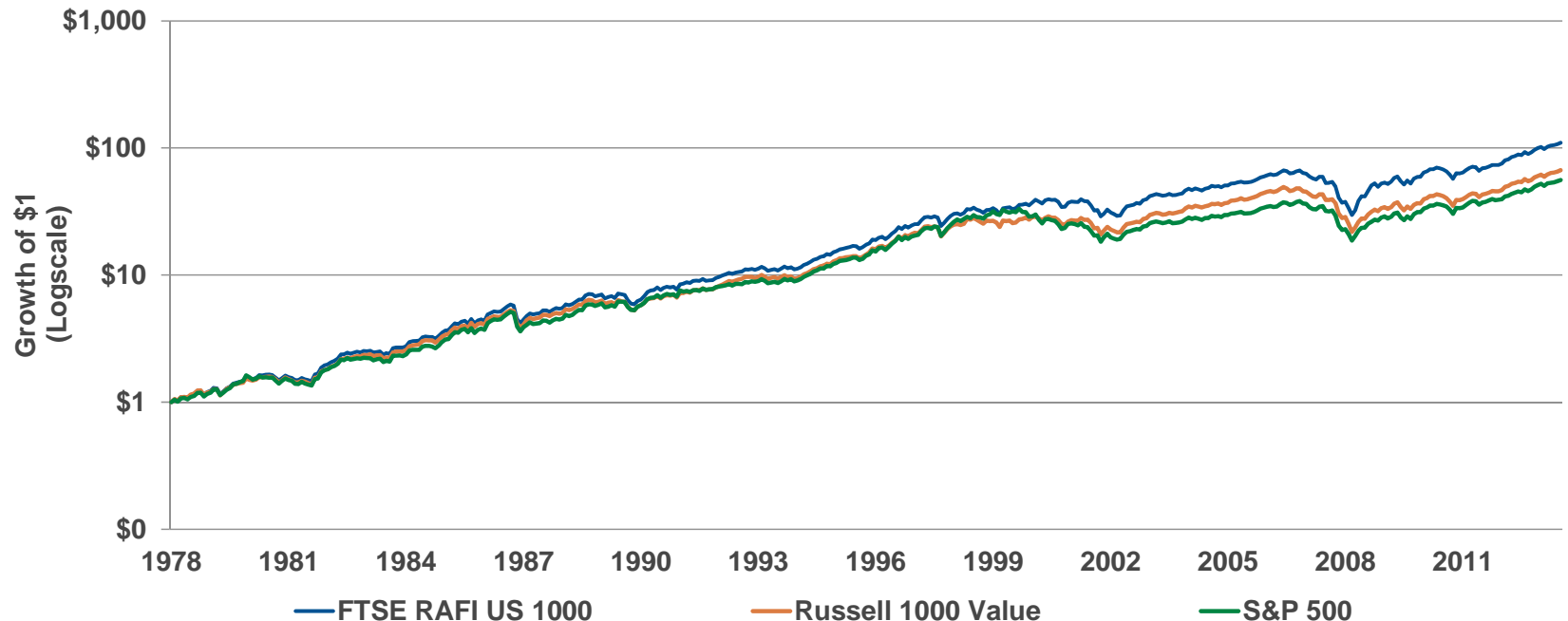
Return and Volatility figures are annualized. Turnover figures are one-way.

Source: Research Affiliates based on data from CRSP and Compustat.

Note: The index data published herein is simulated. Please see important disclosure information at end.

Performance Superior a Núcleo & Value

FTSE RAFI US 1000 vs. Russell 1000 Value and S&P 500
1979 – June 30, 2014

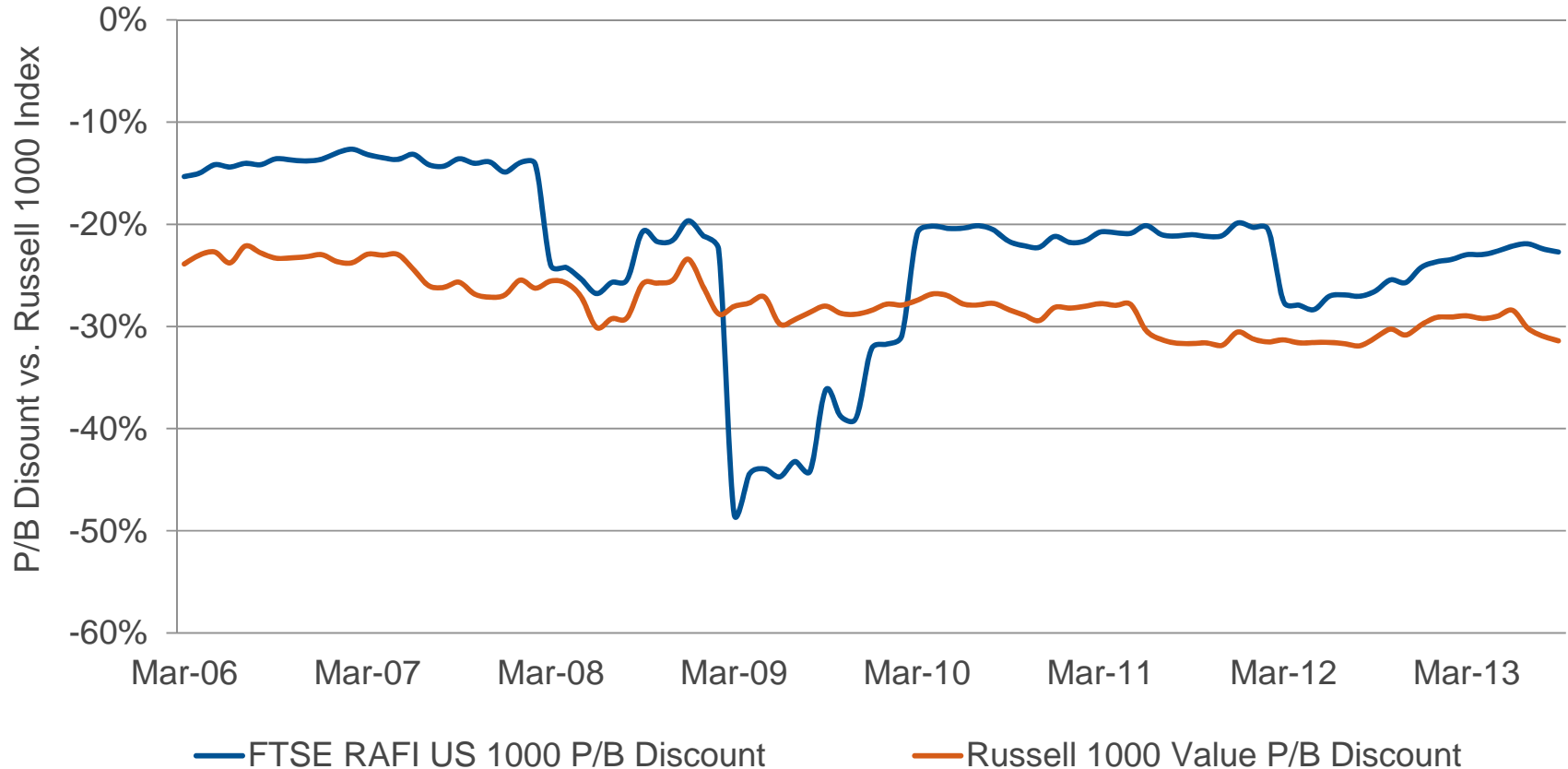


Index	Return	Volatility	Value Added	Tracking Error	Beta	Correl	R2
FTSE RAFI US 1000	14.15%	15.44%	2.15%	4.45%	0.97	0.96	0.92
Russell 1000 Value	12.56%	14.76%	0.56%	4.69%	0.92	0.95	0.91
S&P 500	12.00%	15.20%					

Source: Research Affiliates based on data from FactSet. The FTSE RAFI US 1000 Index launched on 11/28/2005. Index returns prior to launch are simulated.

Exposição ao Fator Value não é Estática

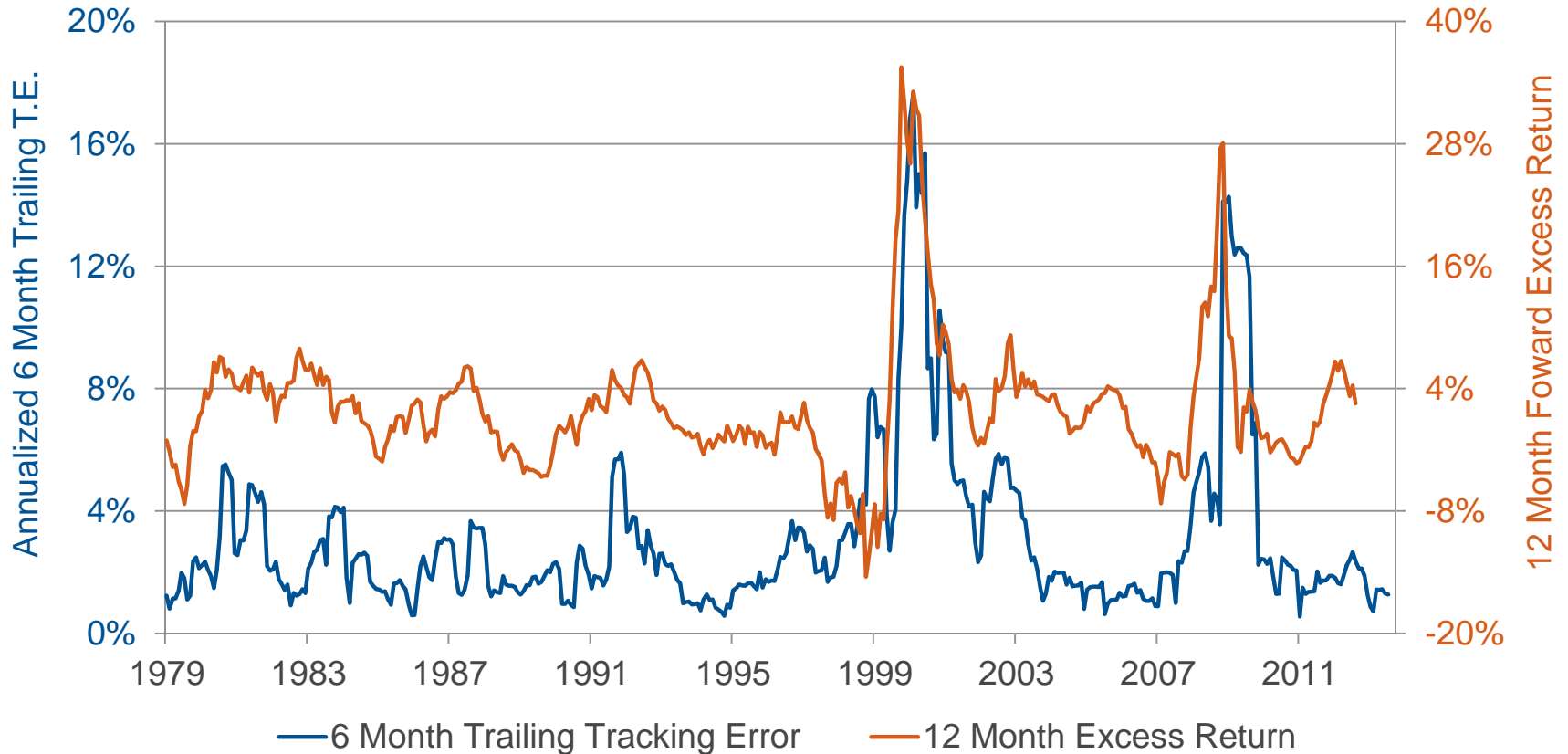
P/B Discount Relative to Cap
March 31, 2006 – March 31, 2013



Source: Research Affiliates based on data from FactSet.

Erro de Rastreamento e Retorno em Excesso

Erro de Rastreamento (Janela Móvel de 6 meses) e Subsequente Performance Anual
FTSE RAFI US 1000 vs. Russell 1000



Source: Research Affiliates, LLC. Based on data from Factset.

Índices FTSE RAFI

Fração de Performance Superior, Janelas Móveis

Válido em 30/4/2014

	1-Yr Rolling	3-Yr Rolling	5-Yr Rolling	Start Date
FTSE RAFI US 1000 Index vs. Russell 1000 Index	61.99%	75.84%	88.49%	1962
FTSE RAFI US 1000 Index vs. S&P 500 Index	64.42%	73.99%	87.29%	1962
FTSE RAFI US 1500 Index vs. Russell 2000 Index	80.87%	94.86%	99.45%	1979
FTSE RAFI Developed Ex US 1000 Index vs. MSCI EAFE Index	75.07%	83.59%	98.69%	1970
FTSE RAFI Dev. ex US Mid Small Index vs. MSCI EAFE Small Index	60.81%	68.55%	94.00%	1988
FTSE RAFI Emerging Markets Index vs. MSCI Emerging Markets Index	74.25%	87.56%	94.59%	1988
FTSE RAFI Dev. AP ex Japan Index vs. MSCI Asia Pacific ex Japan Index	71.80%	80.07%	93.39%	1988

Source: Research Affiliates, LLC based on data from Factset. Returns are total returns in USD.

Performance do Fundamental Index

	7/31/2014	3 Month	1 Year	3 Year	5 Year	Since Launch*	Launch Date
FTSE RAFI All World 3000		2.5%	18.4%	11.5%	13.0%	15.5%	10/6/2008
MSCI All World		2.9%	16.5%	11.0%	12.7%	13.8%	
Value Added		-0.4%	1.9%	0.5%	0.3%	1.7%	
FTSE RAFI US 1000		2.3%	16.6%	18.1%	18.6%	9.1%	11/28/2005
Russell 1000		2.9%	17.1%	16.8%	17.1%	7.6%	
Value Added		-0.6%	-0.5%	1.2%	1.4%	1.5%	
FTSE RAFI US MS 1500		-0.2%	11.5%	15.2%	19.3%	9.7%	5/4/2006
Russell 2000		-0.3%	8.6%	13.6%	16.6%	7.0%	
Value Added		0.1%	3.0%	1.6%	2.7%	2.7%	
FTSE RAFI Developed ex-US 1000		1.3%	19.5%	8.2%	9.4%	6.7%	11/28/2005
MSCI EAFE		0.8%	15.6%	8.5%	9.9%	5.6%	
Value Added		0.6%	3.9%	-0.2%	-0.5%	1.1%	
FTSE RAFI Dev. ex-US MS 1500		2.9%	20.0%	7.9%	12.7%	5.5%	8/6/2007
MSCI EAFE Small		0.6%	19.2%	9.7%	13.3%	3.4%	
Value Added		2.3%	0.8%	-1.8%	-0.6%	2.1%	
FTSE RAFI Emerging Markets		10.0%	15.9%	-1.1%	6.1%	2.7%	7/9/2007
MSCI Emerging Markets		8.5%	15.7%	0.7%	7.7%	2.1%	
Value Added		1.6%	0.2%	-1.8%	-1.5%	0.6%	

*Launch date returns are calculated using the first full month of returns following index inception.

Note: The index version of the RAFI methodology, or the FTSE RAFI Indexes, is licensed globally by our partner the FTSE Group. All returns are Total Returns in USD. This material relates only to a hypothetical model of past performance of the Fundamental Index strategy itself, and not to any asset management products based on this index. No allowance has been made for trading costs or management fees which would reduce investment performance. Actual results may differ. Indexes are not managed investment products, and, as such cannot be invested in directly. Returns represent performance based on rules used in the creation of the index, are not a guarantee of future performance and are not indicative of any specific investment. Returns listed prior to the individual indexes launch dates are simulated.

MSCI returns information provided under license through MSCI. All returns based calculations are calculated by Research Affiliates, LLC.

Source: Research Affiliates based on data from Bloomberg and FactSet.

Estratégias Fundamental Index

Atraentes Valuations

7/31/2014	Price / Sales	Price / Book	Dividend Yield	Weighted Average Market Cap
FTSE RAFI All World 3000	0.82	1.52	2.7%	\$70.8 billion
FTSE All World	1.27	1.99	2.3%	\$82.2 billion
RAFI Discount	-36%	-24%	16%	
FTSE RAFI US 1000	1.14	2.04	2.1%	\$100.6 billion
Russell 1000	1.71	2.60	1.8%	\$104.8 billion
RAFI Discount	-33%	-22%	17%	
FTSE RAFI US MS 1500	0.88	1.83	1.5%	\$2.1 billion
Russell 2000	1.23	2.06	1.3%	\$1.7 billion
RAFI Discount	-28%	-11%	16%	
FTSE RAFI Developed ex-US 1000	0.68	1.33	3.1%	\$56.9 billion
FTSE Developed ex-US	0.98	1.62	2.8%	\$57.9 billion
RAFI Discount	-31%	-18%	11%	
FTSE RAFI Dev. ex-US MS 1500	0.64	1.30	2.2%	\$3.0 billion
FTSE Developed Small ex-US 1500	0.76	1.50	2.3%	\$2.3 billion
RAFI Discount	-16%	-13%	-5%	
FTSE RAFI Emerging Markets	0.77	1.14	3.7%	\$38.4 billion
FTSE Emerging Markets	1.20	1.69	2.8%	\$32.6 billion
RAFI Discount	-36%	-33%	30%	

Note: The index version of the RAFI methodology, or the FTSE RAFI Indexes, is licensed globally by our partner the FTSE Group.

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Source: Research Affiliates based on data from FactSet.

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Notas: Descrições de Estratégias Simuladas

¹Cap-Weighted: Weighted using the market capitalization computed using December close of the year prior to index construction.

²Equal Weighting: Equally weighted portfolio of 1000 largest stocks by market capitalization

³Fundamentals Weighted: Weighted based on the five-year averages of cash flows, dividends, sales and the most recent book value of equity. We introduce two-year delay to avoid forward-looking bias. Following the original method, we select top stocks with the largest fundamental weight. For details see Arnott, Hsu, and Moore (2005).

⁴Volatility weighted: Weighted based on the standard deviation of monthly returns over the five year window prior to index construction.

⁵Minimum Variance: To construct the minimum variance strategy we use the method of Clarke, de Silva, and Thorley (2006).

⁶Malkiel's Monkey: Average of 100 portfolios, where each of the individual portfolios is rebalanced annually by randomly selecting 30 stocks out of the universe of the largest 1000 stocks by market capitalization.

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