

Quantitative Strategy

Nomura Securities International, Inc., New York

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Wisdom of crowds / Madness of crowds

Quantitative Desk Commentary

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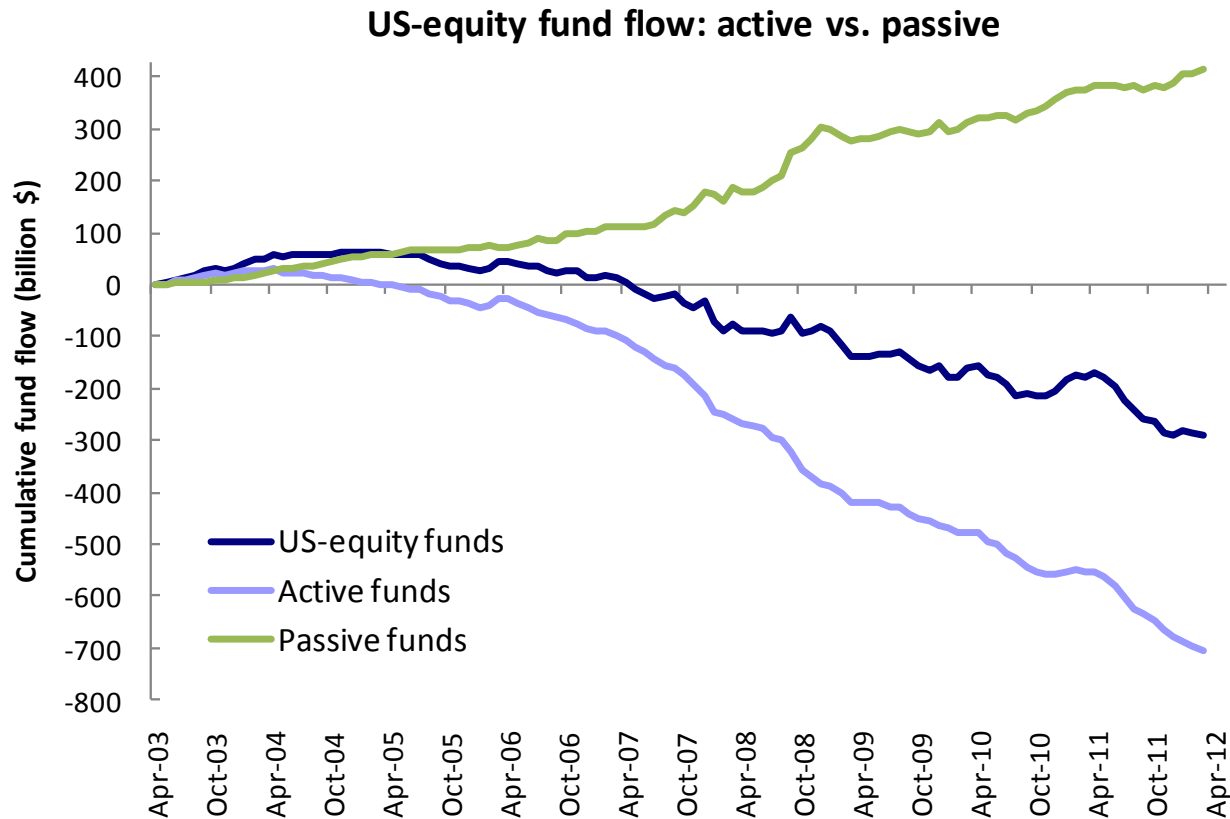
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The hunt for alpha: Paradigm in motion

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- Active management and the hunt for alpha**
- Correlation and growth of systemic risk**
- Changes over the past decade – a sampling**
- Wisdom of crowds or madness of crowds?**

Equity fund flow – passive funds grow, while active funds shrink



Note: Shows cumulative fund flow into US-equity funds, active funds, passive funds and ETFs. Period of analysis is from April 2003 through March 2012.
Source: Nomura Securities International, Inc, EPFR.

What's New? Why is this happening?

Cash equities

- Fundamental Indexation
- Min variance investing
- Risk parity investing
- Diversity weighting
- Etc...

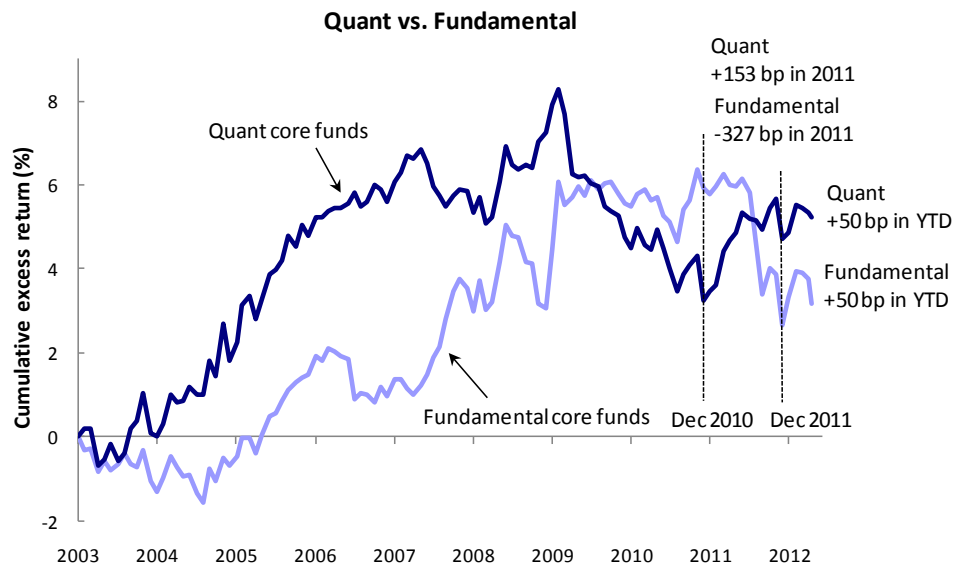
Many alternatives to traditional cap weighted benchmark

ETF's/ ETN's

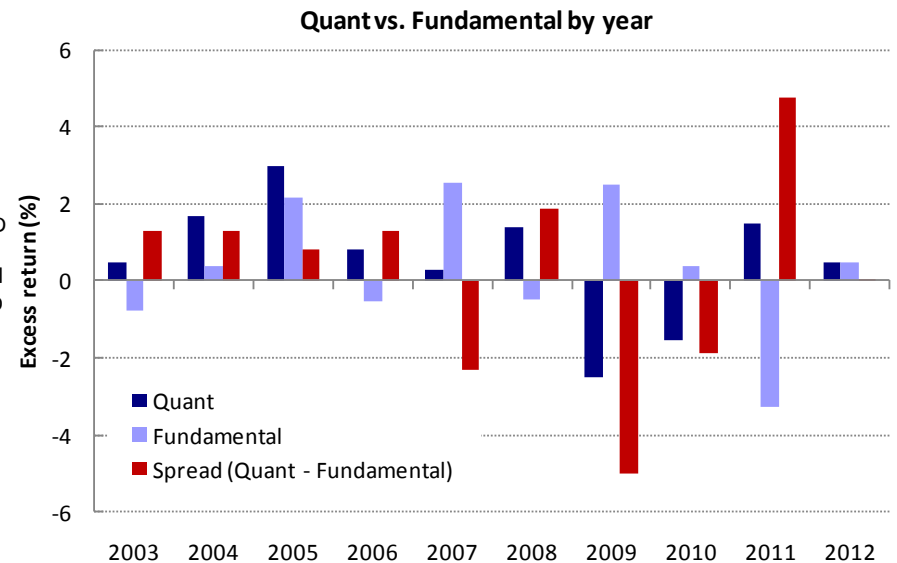
- SPLV (low vol)
- PBP (BuyWrite)
- IYR (real estate)
- SH (short S&P500)
- Risk on (ONN)/Risk off (OFF)
- Etc ...

Pick a theme or alternative beta to invest in

Quant vs. Fundamental



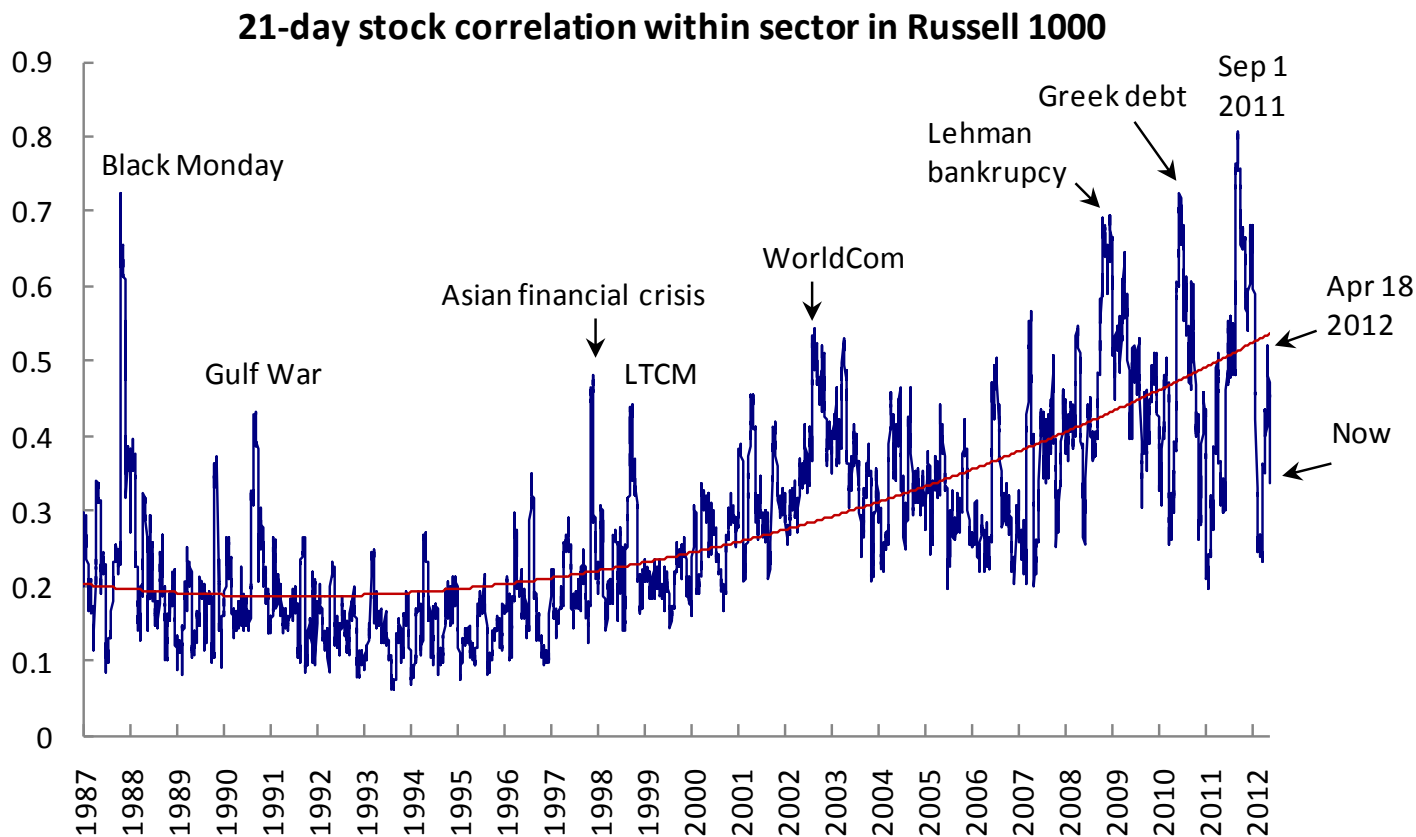
Quant vs. Fundamental by year



Note: Top chart shows cumulative average excess return (relative to the benchmark) in large-cap core funds based on quantitative methodologies (dark blue line) and large-cap core funds based on fundamental methodologies (light blue line). Bottom chart shows excess return by year (relative to the benchmark) in large-cap core funds based on quantitative methodologies (dark blue bar) and large-cap core funds based on fundamental methodologies (light blue bar). Red bar is the spread of excess returns between quant funds and fundamental funds. Currently, there are 20 funds in the quant core universe and 44 funds in the fundamental core universe. Period of analysis is from January 2003 through 14 May 2012.

Source: Nomura Securities International, Inc, Russell, S&P, Bloomberg.

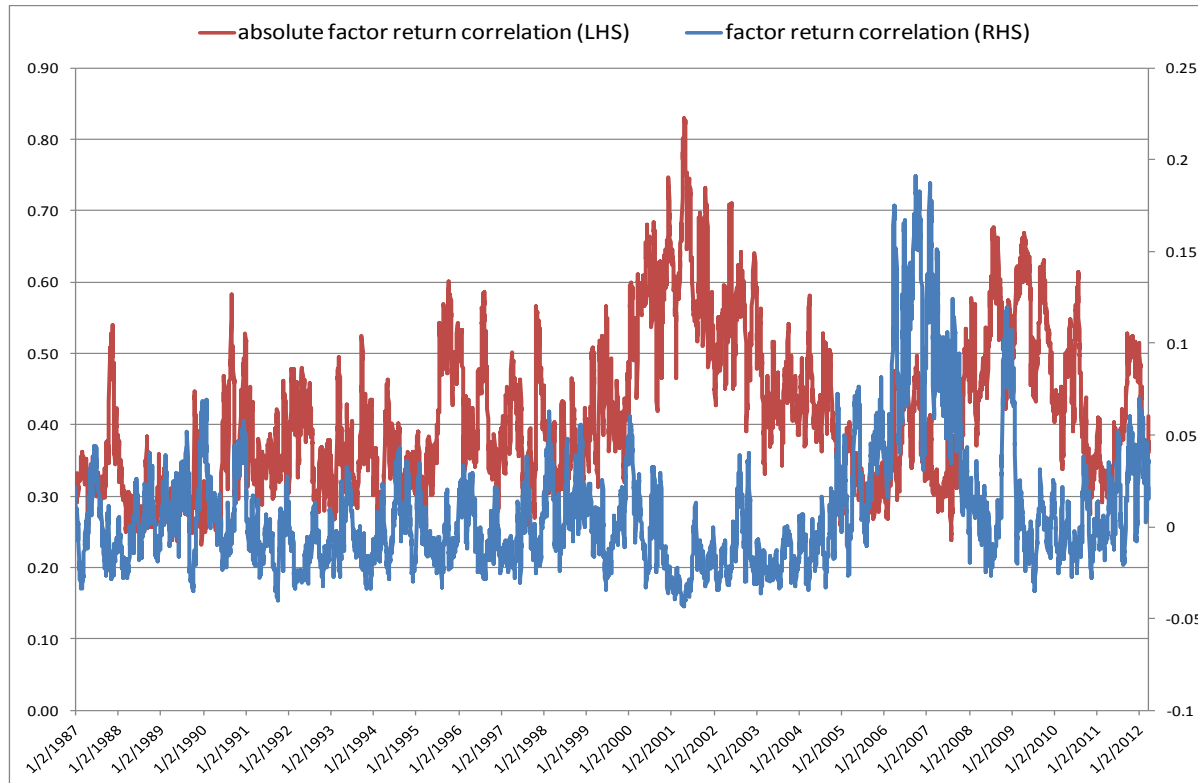
Stock correlation collapses from record high & bounces



Note: Shows 21-day stock correlation within sector, where the averages of all pair-wise stock correlations are calculated within GICS 10 sectors in Russell 1000 universe using 21-day total returns, and these correlations are averaged over all GICS 10 sectors. Period of analysis is from 5 January 1987 through 11 May 2012. Source: Nomura Securities International, Inc, Russell, IDC.

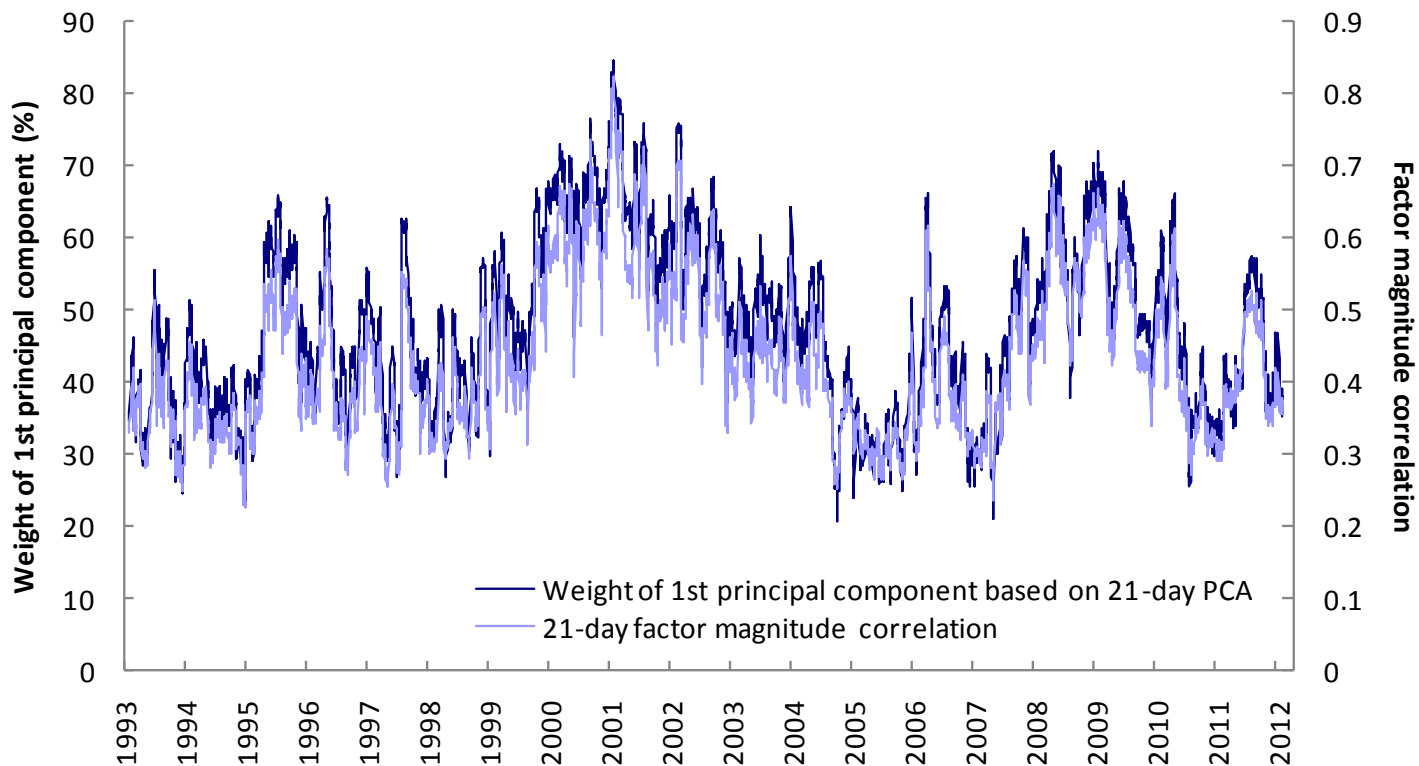
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Which correlation is more relevant for performance?



Note: Average pairwise 21-day correlation of factor returns using 22 representative factor returns shown in blue. Average pairwise 21-day correlation of factor return magnitudes shown in red. Period of analysis is from 2 January 1987 through 22 March 2012.
Source: Nomura Securities International, Inc., S&P, Russell, I/B/E/S, Compustat, IDC.

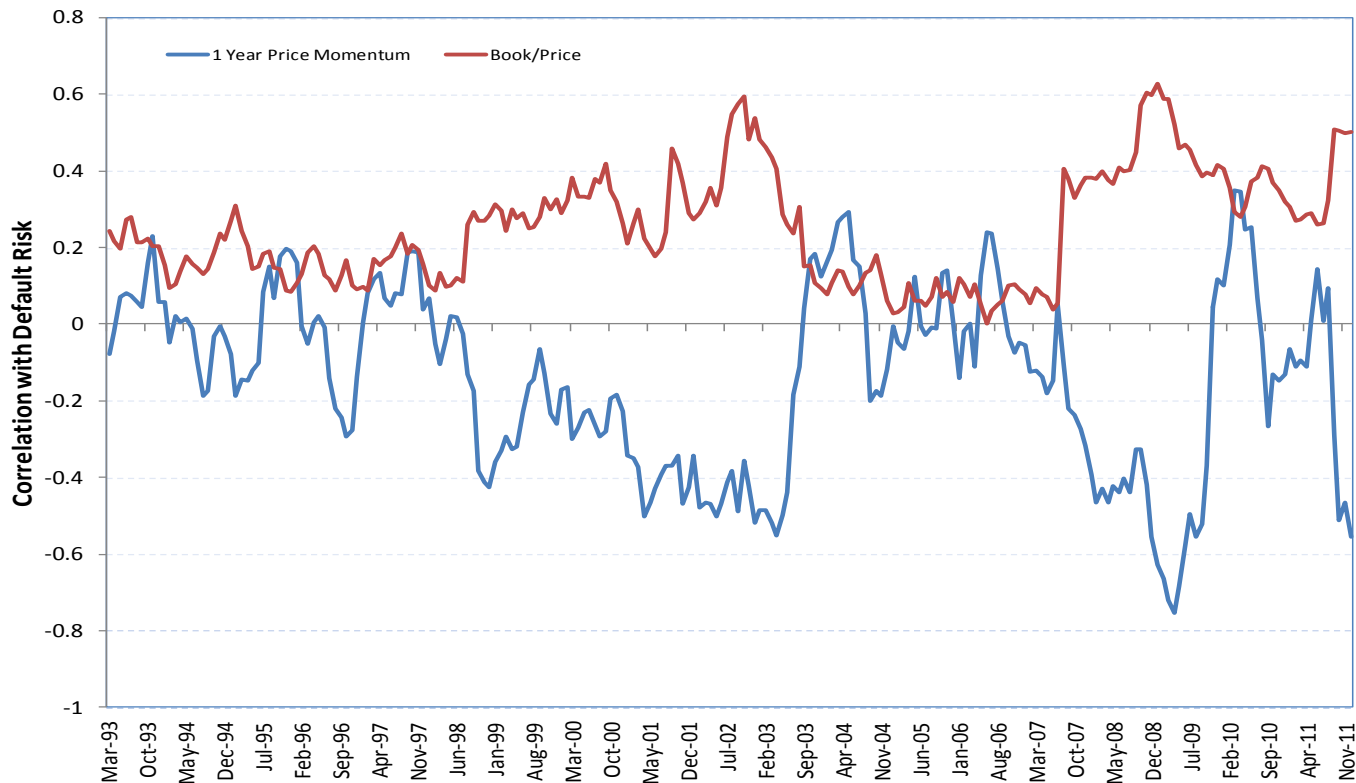
Factor magnitude correlation reflects diversity shown by PCA analysis



Note: Shows weight of first principal component based on 21-day PCA using 22 representative factor returns (dark blue line) together with 21-day pair-wise absolute factor correlation based on 22 representative factor returns in Russell 1000 universe (light blue line). Period of analysis is from 30 April 1993 through 11 May 2012.
Source: Nomura Securities International, Inc., S&P, Russell, I/B/E/S, Compustat, IDC.

Book/Price & 1-Year Price Momentum Correlation with Default Risk

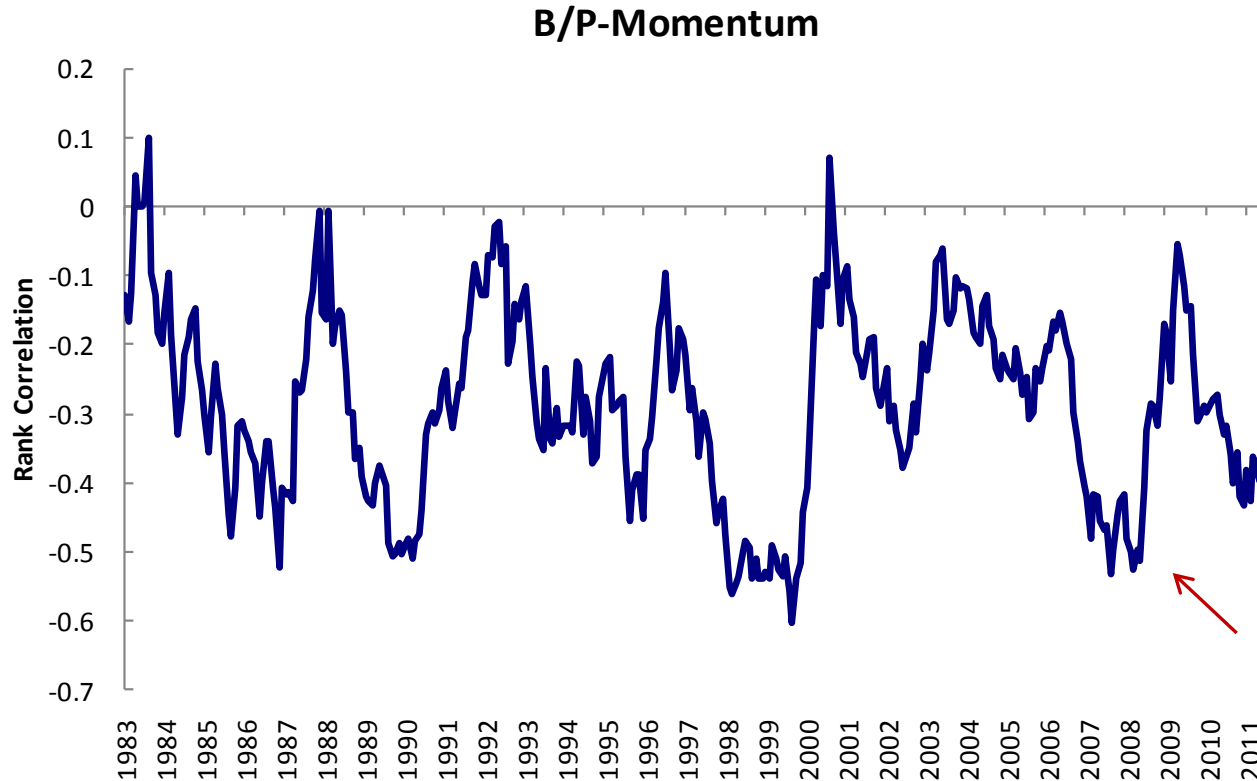
Is this a picture of diversification?



Note: Chart shows cross sectional correlation between default risk and 1-year price momentum and B/P. As of Dec 31 2011 Universe is Russell 1000.
Source: Nomura Securities International, Inc., Compustat, I/B/E/S, IDC, Russell.

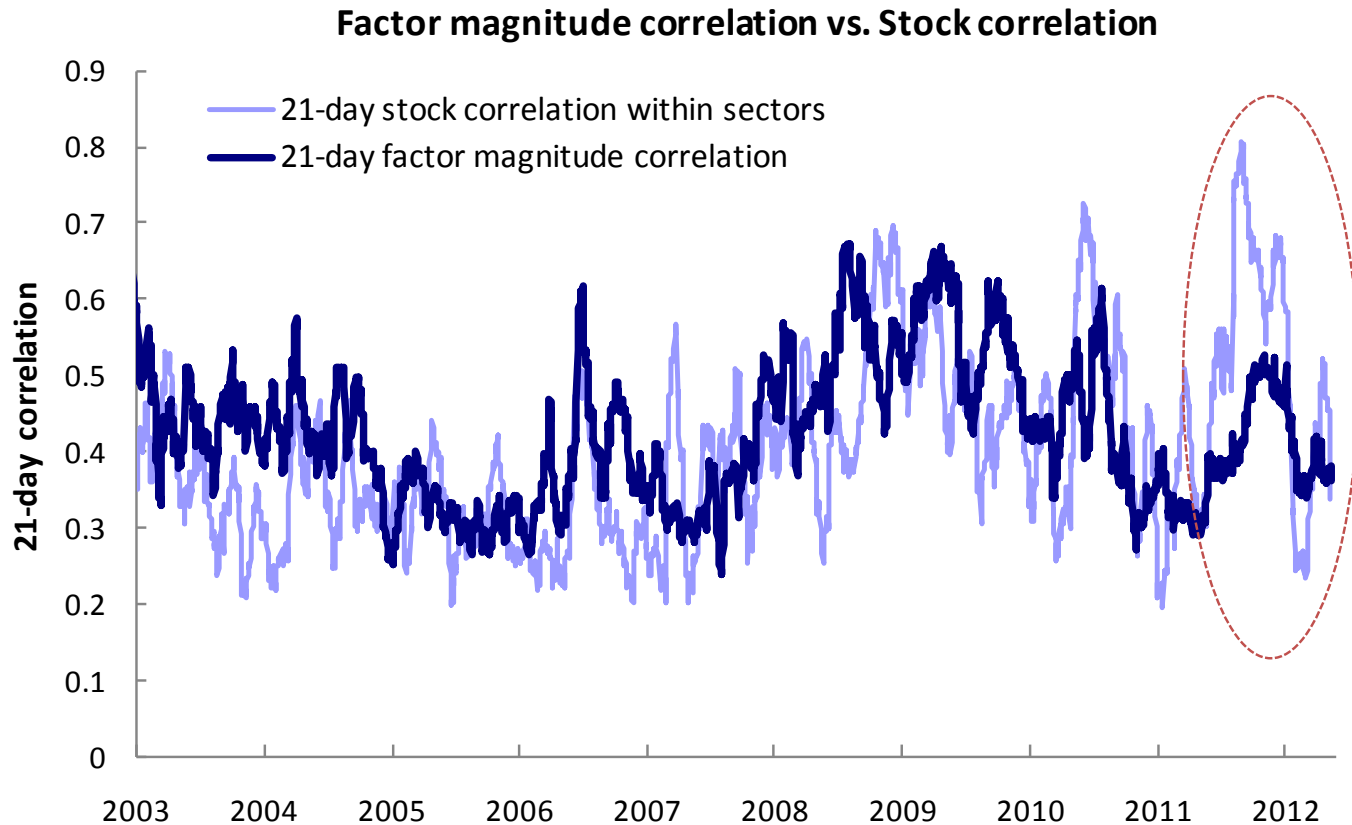
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Is this a picture of diversification?



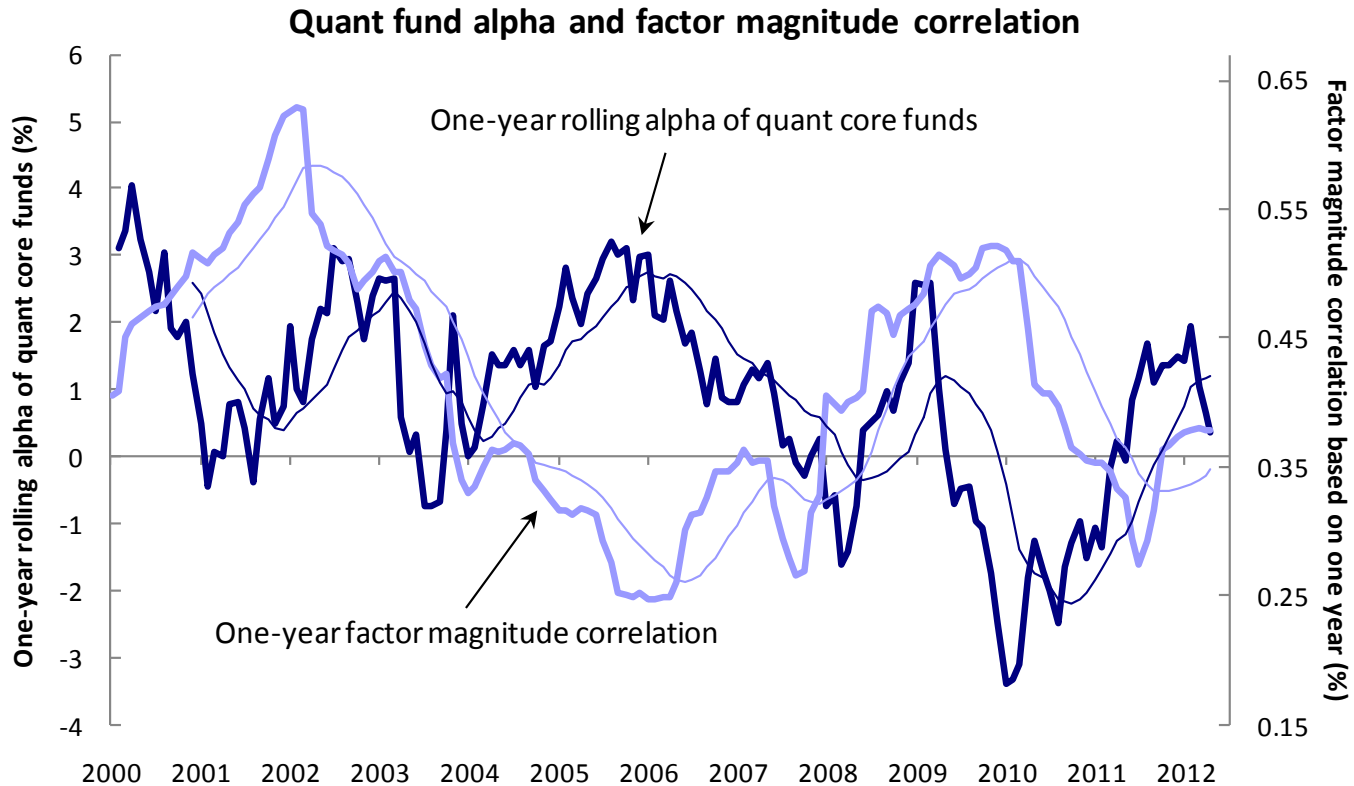
Note: Chart shows cross sectional correlation between B/P and 1-year price momentum and B/P. Universe is Russell 1000. The latest data is as of 30 April 2012.
Source: Nomura Securities International, Inc., Compustat, I/B/E/S, IDC, Russell.

Stock correlation and factor magnitude correlation – different paths



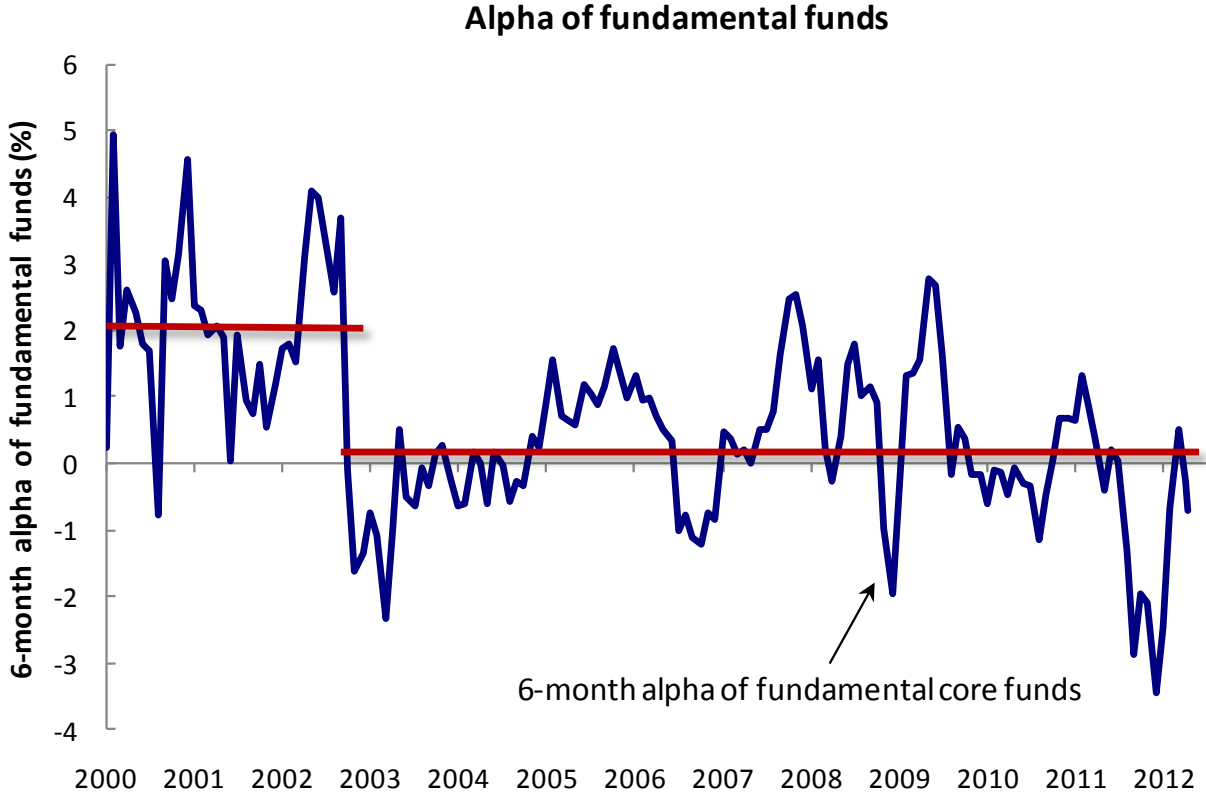
Note: Light blue line shows 21-day stock correlation within sector, where the averages of all pair-wise stock correlations are calculated within GICS 10 sectors in Russell 1000 universe using 21-day total returns and these correlations are averaged over all GICS 10 sectors. Dark blue line shows the average of 21-day pair-wise absolute factor correlation based on 22 representative factor returns in Russell 1000 universe. Period of analysis is from 30 April 1993 through 11 May 2012.

Source: Nomura Securities International, Inc, Russell, S&P, Bloomberg.

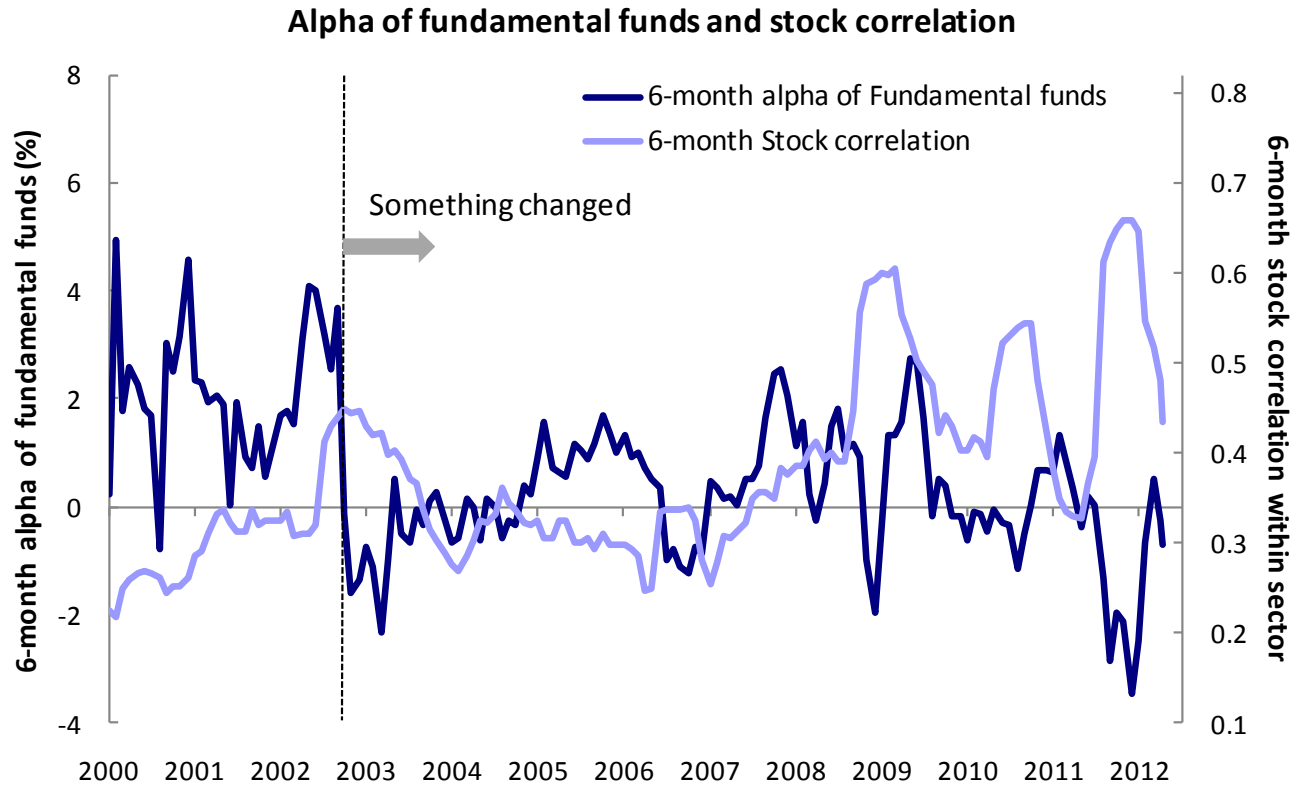


Note: Shows average 12-month rolling excess return of quant core funds relative to their benchmarks (dark blue line) together with the average of one-year (252-day) pair-wise absolute factor correlation based on 22 representative factor returns in Russell 1000 universe (light blue line). Thinner lines are 12-month moving average of each line. Currently, there are 20 funds in the quant core universe. Period of analysis is from January 2000 through 14 May 2012. Source: Nomura Securities International, Inc, Bloomberg, Compustat, I/B/E/S, Russell, S&P and IDC.

Fundamental performance was once much better



Note: Shows 6-month rolling excess return of fundamental core funds (dark blue line). Last data points are as of 14 May 2012.
Source: Nomura Securities International, Inc, Bloomberg, Compustat, IDC, Russell.



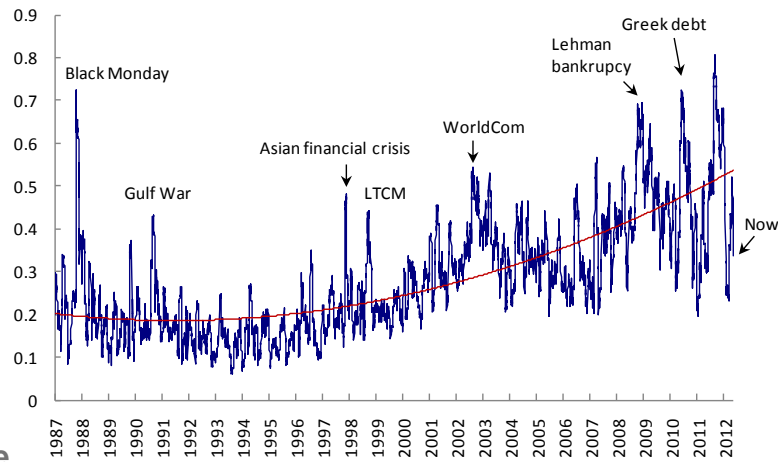
Note: Shows 6-month rolling excess return of fundamental core funds (dark blue line) and 126-day pair-wise stock correlation within sector in Russell 1000 (light blue line). Last data points are as of 14 May 2012.

Source: Nomura Securities International, Inc, Bloomberg, Compustat, IDC, Russell.

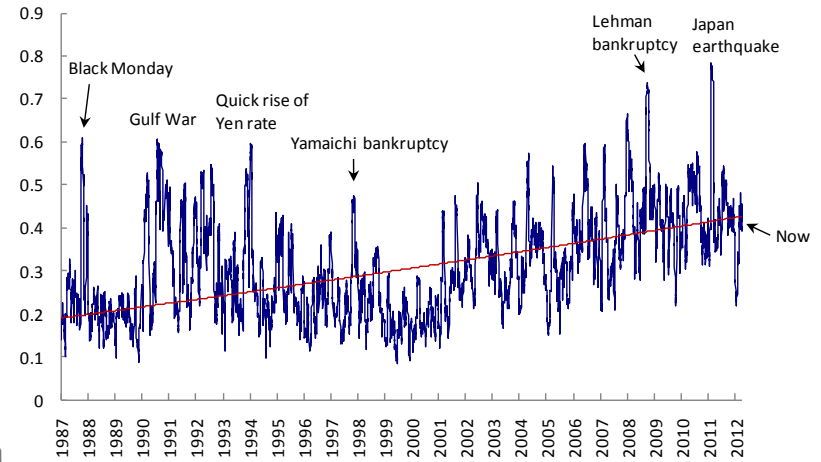
Stock correlation and the growth of systemic risk

Stock correlation around the globe and the trend of increasing stock correlation

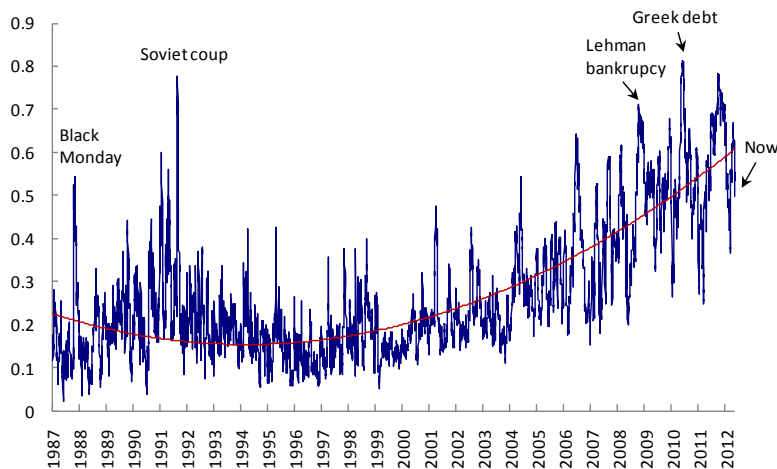
US



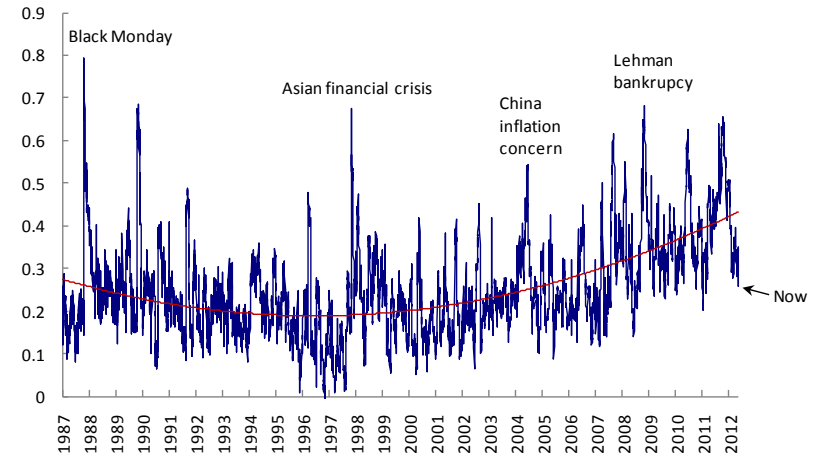
Japan



Europe



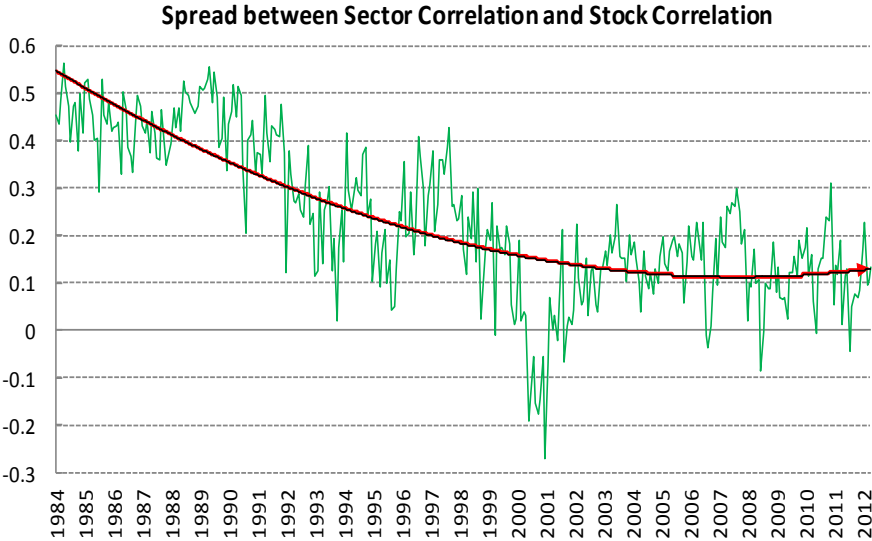
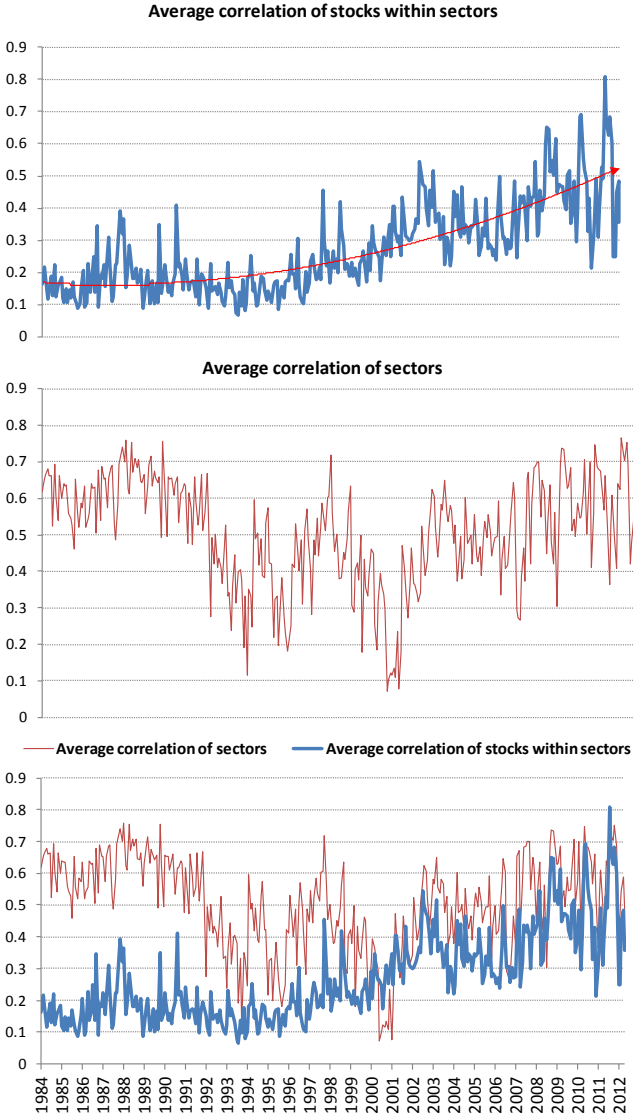
Asia



Note: Shows 21-day stock correlation within sector, where the averages of all pair-wise stock correlations are calculated using 21-day total returns within the 10 GICS sectors in the Russell 1000 (US), MSCI Europe (Europe) and MSCI Asia Pacific ex Japan (Asia) and within the 10 QUICK sectors in the TOPIX 500 (Japan), and these correlations are averaged over all 10 sectors. Period of analysis is from 2 January 1987 through 11 May 2012.
 Source: Nomura Securities International, Inc., Russell, MSCI, IDC, S&P, Exshare

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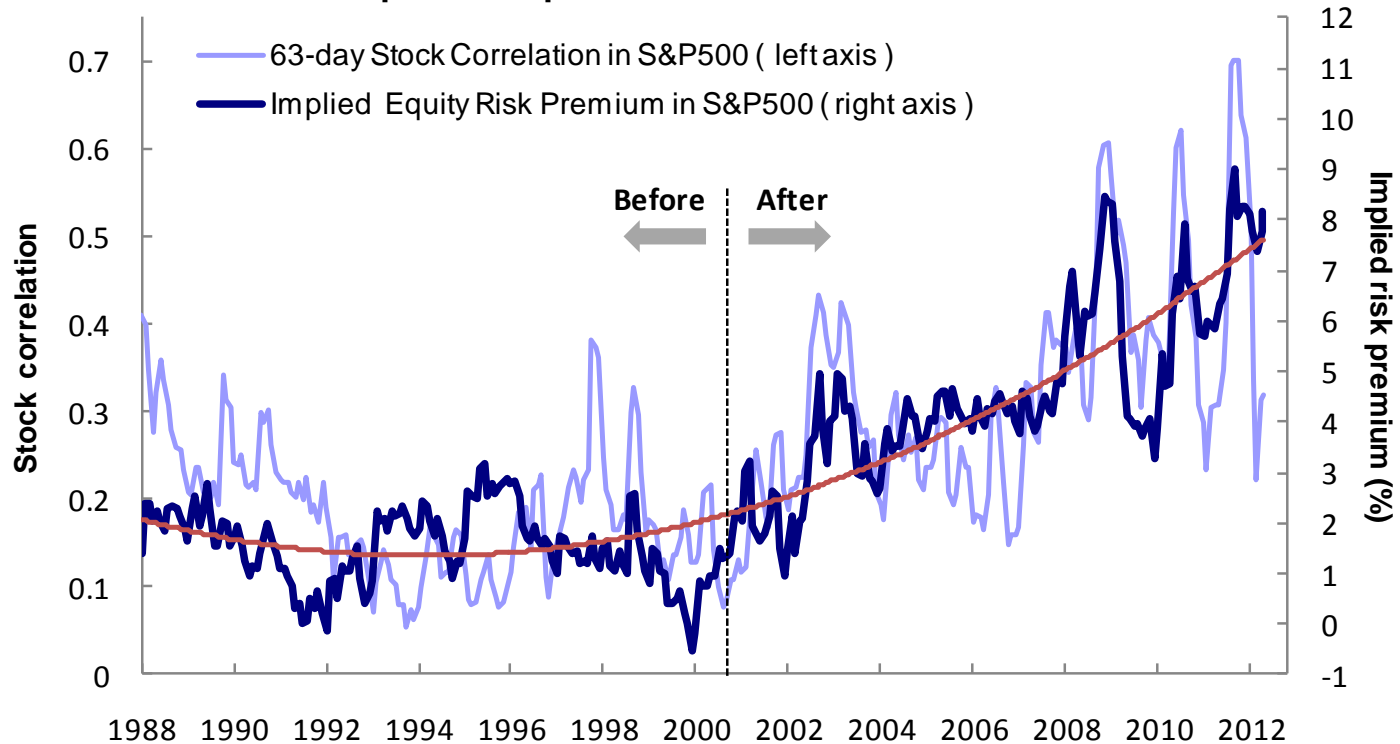
Stock Correlation, now a product of sector correlation?



Note: Shows the average of within-sector stock correlation (top panel) and the average correlation among 10 GICS sectors (middle panel). Bottom panel is the overlay of the top and bottom panels. The panel on the right shows the spread between sector correlation and stock correlation. Universe is Russell 1000.. Data from March 31, 1987 through May 15, 2012
 Source: Nomura Securities International, Inc., Compustat, I/B/E/S, IDC, Russell.

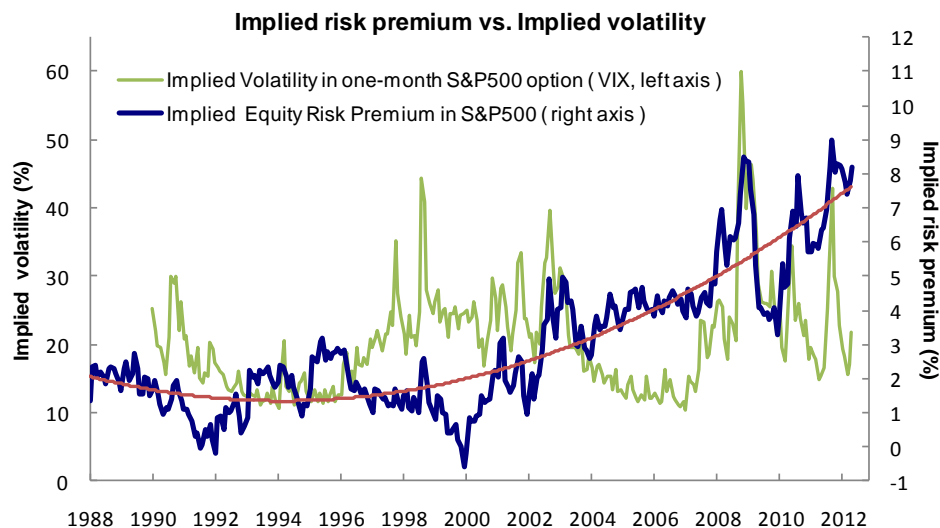
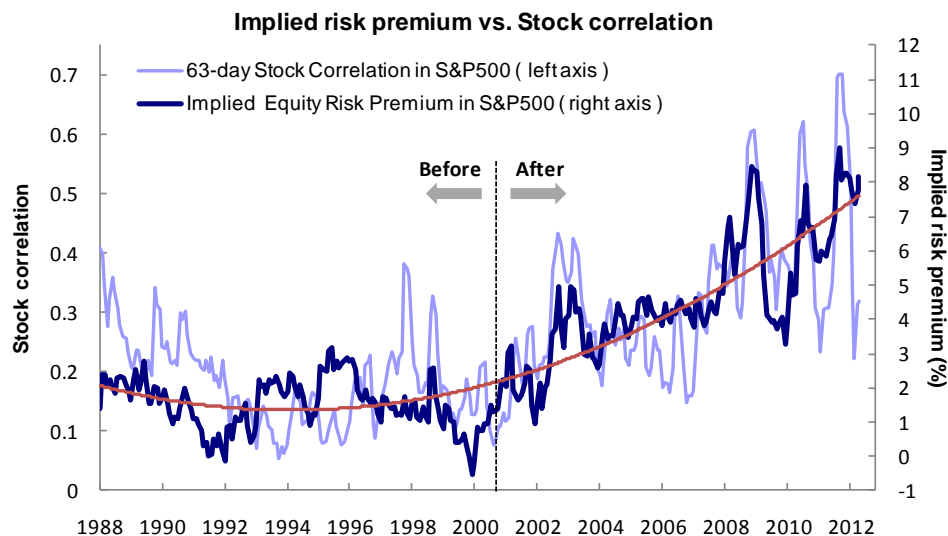
Equity market has priced growing systemic risk during past decade – impacting correlation

Implied risk premium vs. Stock correlation



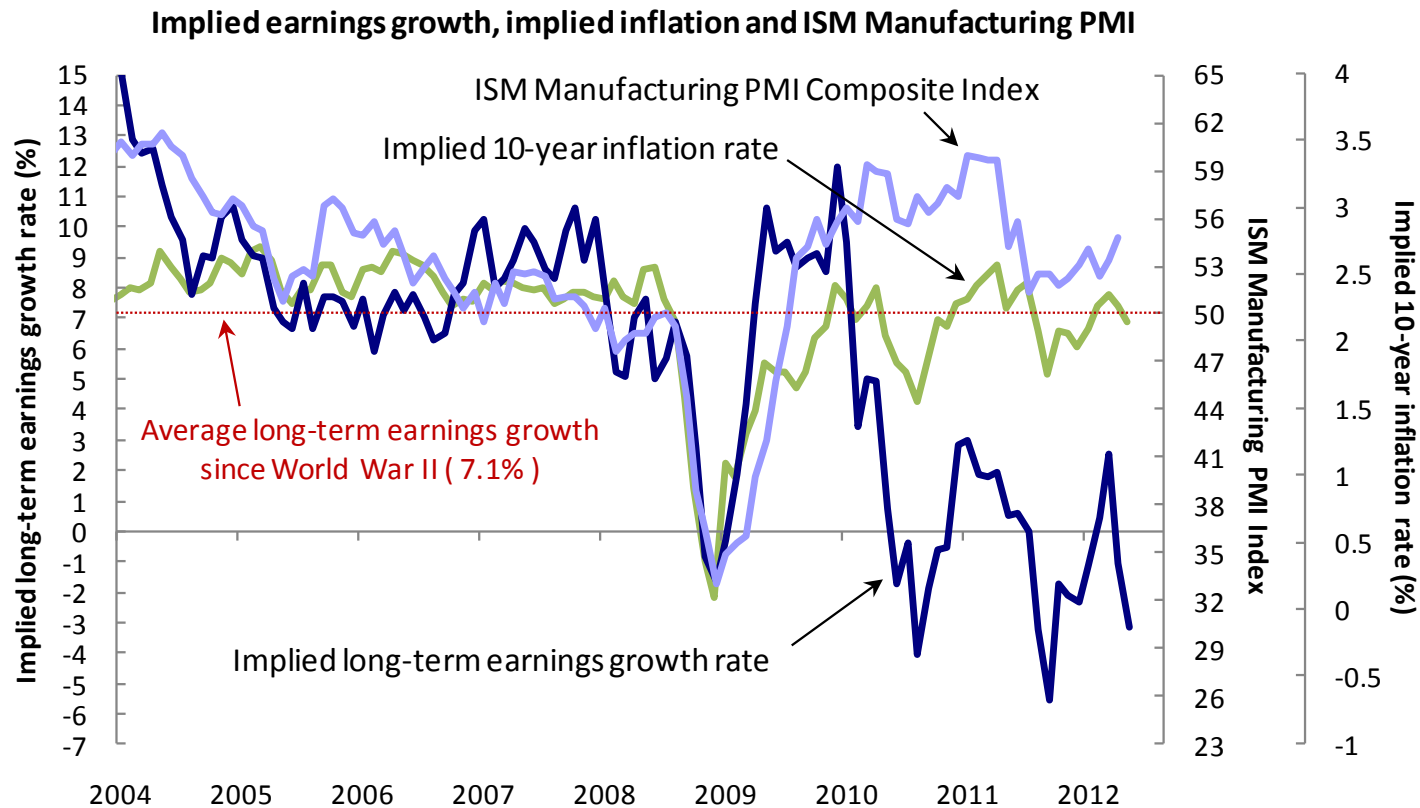
Note: Shows the implied equity risk premium in the S&P 500 (dark blue line) and 63-day pair-wise stock correlation in the S&P 500 (light blue line). Implied equity risk premium is based on a residual income model and I/B/E/S forecasted earnings. Last data points are as of 14 May 2012. Source: Nomura Securities International, Inc, I/B/E/S, Compustat, IDC, S&P.

Equity market has priced growing systemic risk during past decade – impacting correlation



Note: Top chart shows the implied equity risk premium in the S&P 500 (dark blue line) and 63-day pair-wise stock correlation in the S&P 500 (light blue line), while bottom chart shows the implied equity risk premium (dark blue line) and VIX (implied volatility in one-month S&P 500 options, light blue line). Implied equity risk premium is based on a residual income model and I/B/E/S forecasted earnings. Last data points are as of 14 May 2012.
 Source: Nomura Securities International, Inc, I/B/E/S, Compustat, IDC, S&P.

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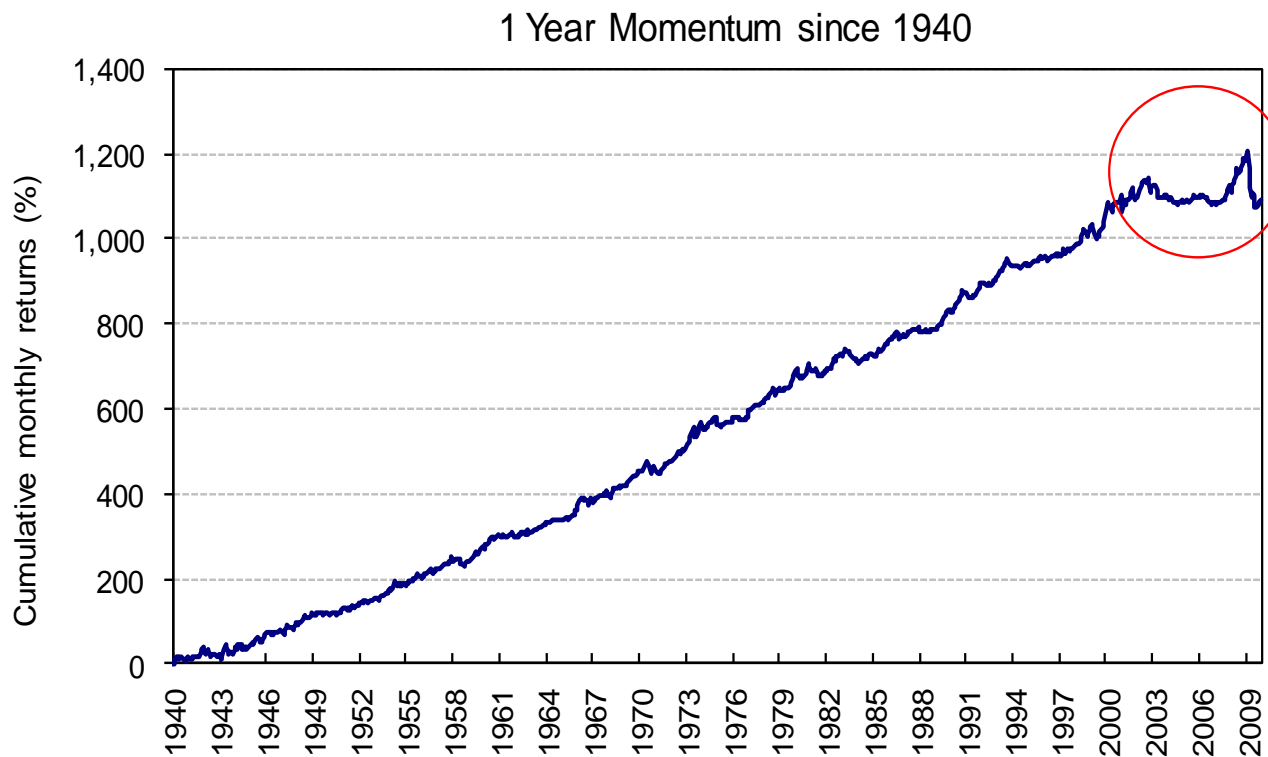
Note: Shows the implied long-term earnings growth (LTG) of S&P500 (dark blue line) and implied 10-year inflation rate (light blue line). Implied LTG (from FY1 to FY5) is derived by inputting expected equity risk premium in Duke University's CFO survey, based on a residual income model. Equity risk premium since March 2012 is estimated by linear model using VIX and previous month's risk premium. Implied inflation rate is calculated by subtracting the real yield of the inflation-linked maturity from the yield of the closest nominal Treasury maturity. Last data points are as of 14 May 2012.

Source: Nomura Securities International, Inc, Graham and Harvey (2012), I/B/E/S, S&P, Compustat, IDC, Bloomberg.

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Factor failure – Momentum & revisions meet reg FD

Momentum worked consistently for sixty years, and then ...

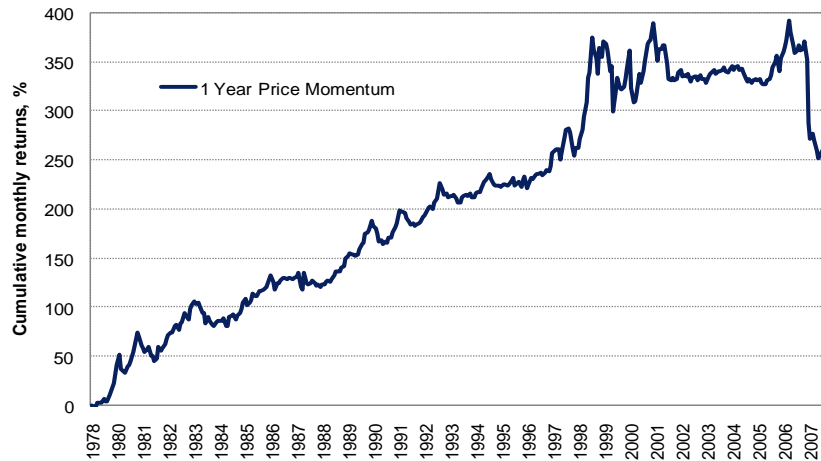


Note: Cumulative monthly factor returns to 12-month momentum (decile spreads) since 1940. The portfolios are constructed monthly using NYSE prior (2-12) return decile breakpoints. Universe is all NYSE, AMEX, and NASDAQ stocks. Analysis based on data from January 1940 to December 2009. Transaction costs not considered. Source: Kenneth R. French's website (http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html), Nomura Securities International Inc.

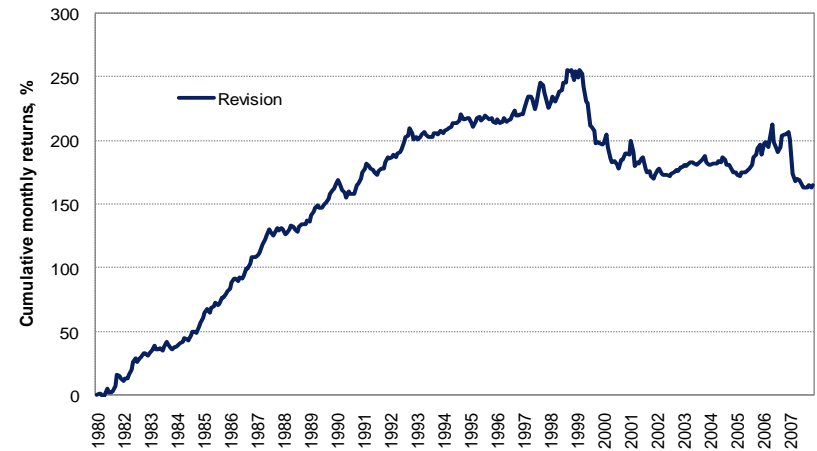
Is price momentum permanently damaged?

Impact of estimate revisions diminished due to Reg FD

1 year price momentum factor return

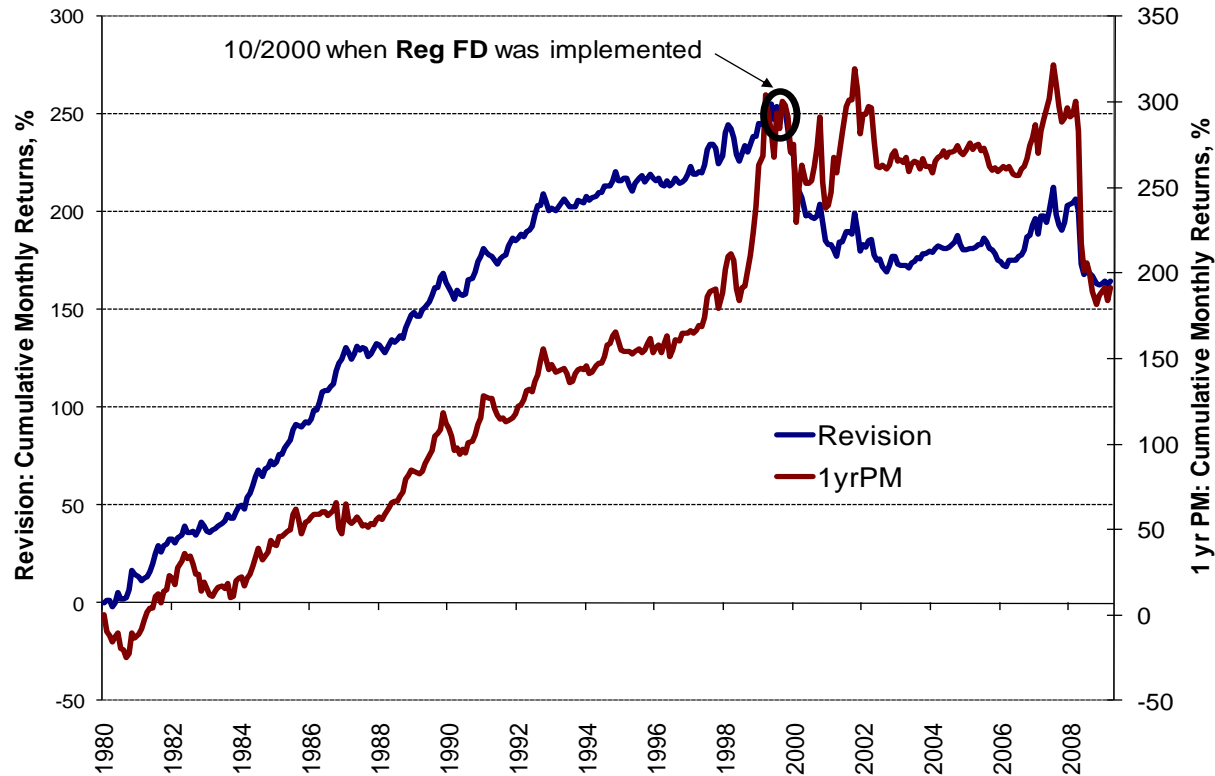


Estimate revisions factor return



Note: Based on analyst up down revisions (number of FY1 I/B/E/S up estimates minus number of down estimates divided by total number of estimates). Top panel shows long-side alpha (blue line, return of the highest-ranked decile minus the return of the market, Russell 1000) and short-side alpha (red line, market return minus the lowest-ranked decile return). Bottom panel shows the factor return of up down revisions (long-side alpha plus short alpha), excluding transaction costs. Universe is Russell 1000. Last data as of 2/28/2010.
Source: Nomura Securities International Inc., Compustat, I/B/E/S, Russell, and IDC.

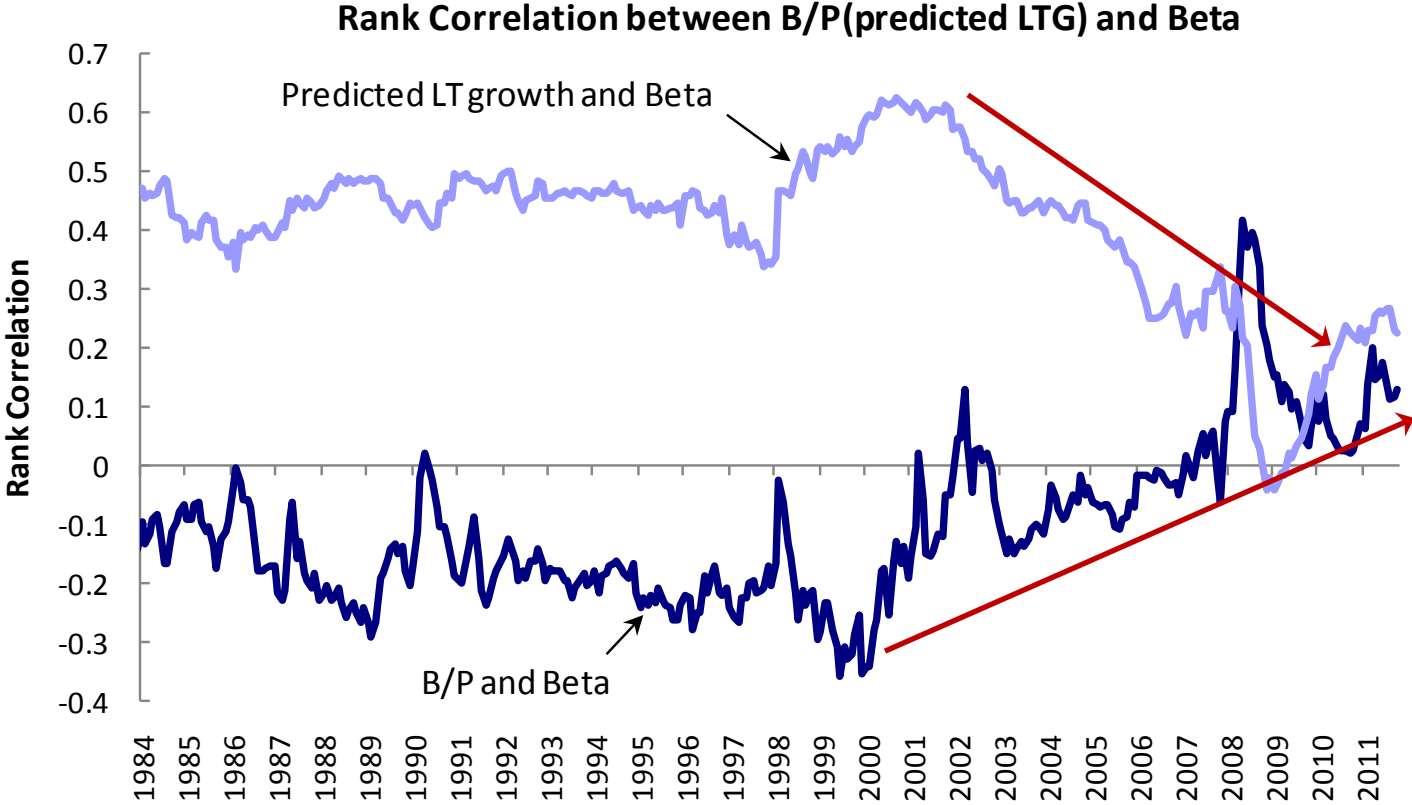
The momentum-revisions coupling conundrum



Note: Shows returns to analyst up down revisions (blue line, number of FY1 I/B/E/S up estimates minus down estimates divided by total number of estimates) and returns to one-year price momentum (red line, last twelve months' returns minus last month's), excluding transaction cost. Universe is Russell 1000. Last data as of 2/28/2010. Transaction costs are not considered.
 Source: Nomura Securities International Inc., Russell, IDC.

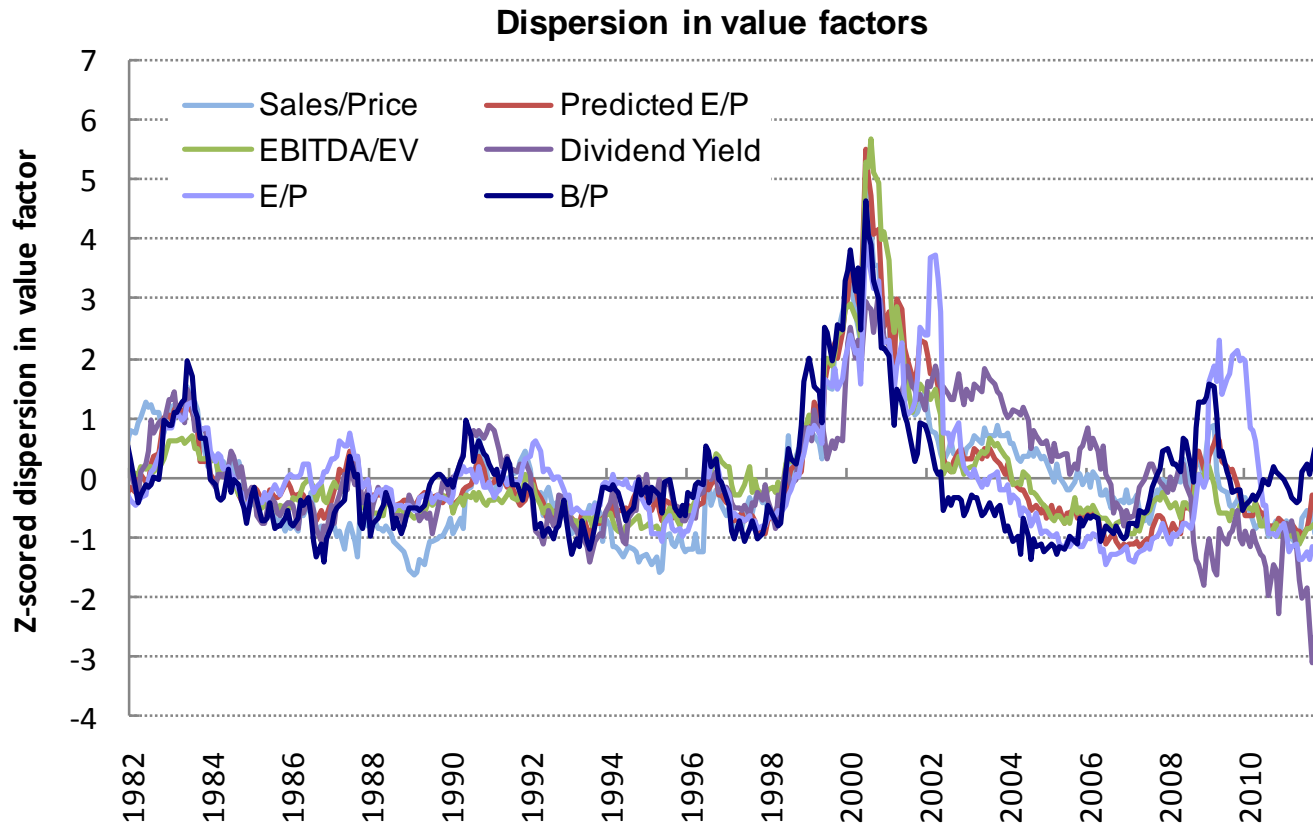
Is value still a category?

Regime shift in market risk of B/P and predicted LT growth



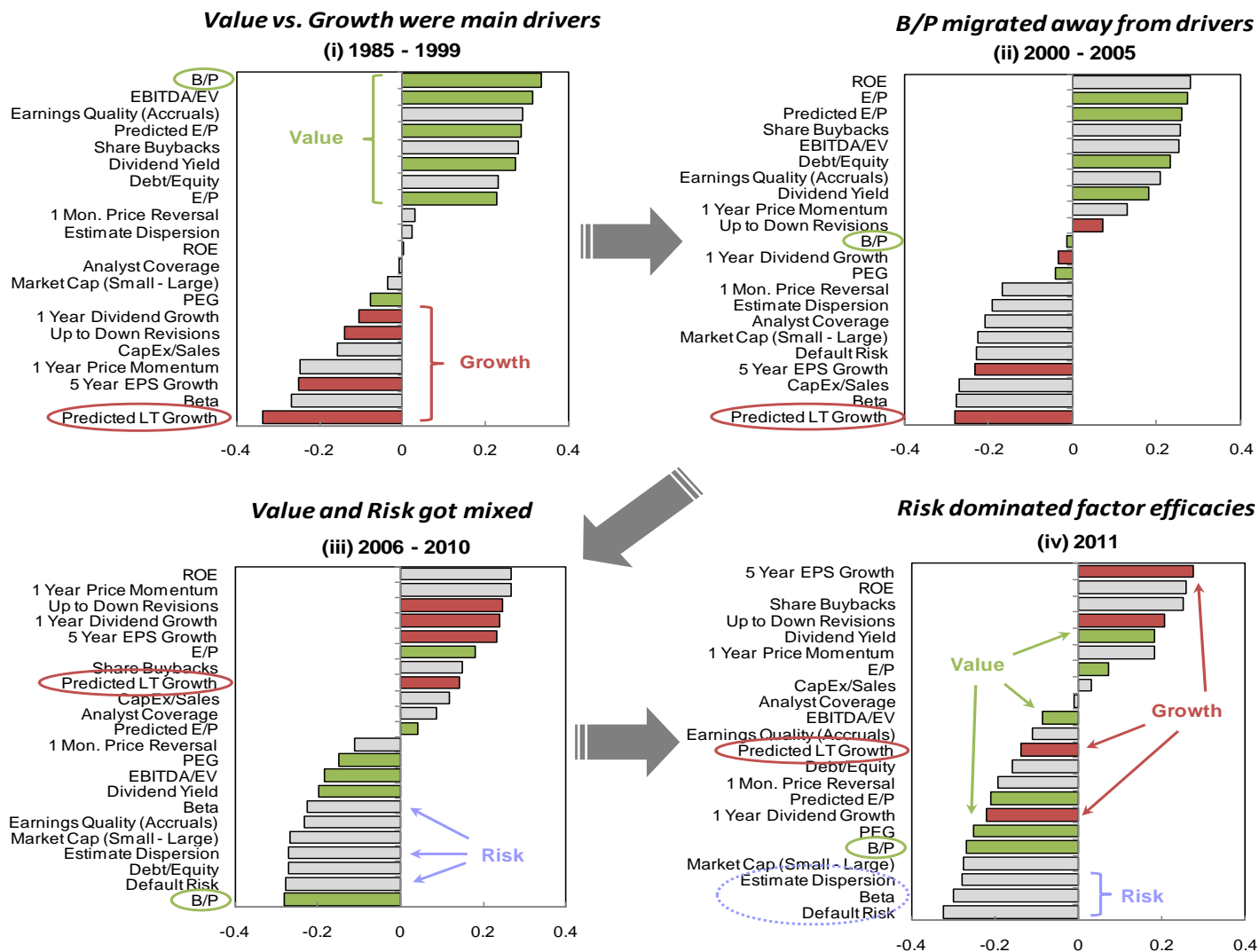
Note: Shows a history of rank correlation between B/P and beta (dark blue line) and rank correlation between predicted long-term earnings growth and beta (light blue line). Universe is Russell 1000. Period of analysis is from November 1983 through April 2012.
Source: Nomura Securities International Inc., Compustat, I/B/E/S, Russell, and IDC.

Spread in value factor dispersion – out of sync over the past decade



Note: Shows de-trended and normalized dispersion of value factors (predicted E/P, E/P, B/P, dividend yield, Sales/Price, and EBITDA/EV) across the Russell 1000 stocks. The dispersion of value factors is calculated by Median Absolute Deviation (MAD) / Median. Period of analysis is from January 1982 through December 2011. Source: Nomura Securities International, Inc, Russell, Compustat, I/B/E/S, IDC.

First principal component loadings: paradigm shift in “value vs. growth” over time



Note: Shows loadings of first principal component based on the performances of 22 representative factors for different periods: (i) January 1985 to December 1999, (ii) January 2000 to December 2005, (iii) January 2006 to December 2010, and (iv) January 2011 to December 2011. For reasons of long-term data availability, the analysis in the period (i) omits the default risk factor from our 22 representative factor (see Appendix B for factor definitions). Only period (iv), January 2011 to December 2011, is based on daily factor performances, while other periods are based on monthly factor performances. Universe is Russell 1000. Source: Nomura Securities International, Inc., Compustat, I/B/E/S, IDC, Russell.

**Unintended bets
Risk – Macro Investing**

Factor Correlation with beta and default risk

	Rank Correlation with Beta	Rank Correlation with Default Risk
	January 2012	January 2012
Beta		0.60
Default Risk	0.60	
B/P	0.18	0.50
EPS Variability	0.49	0.50
EBITDA/Price	0.15	0.48
Estimate Dispersion	0.22	0.45
Sales/Price	0.18	0.40
Predicted E/P	0.21	0.39
EBITDA/EV	0.19	0.39
PEG	0.43	0.37
PEGY	0.38	0.36

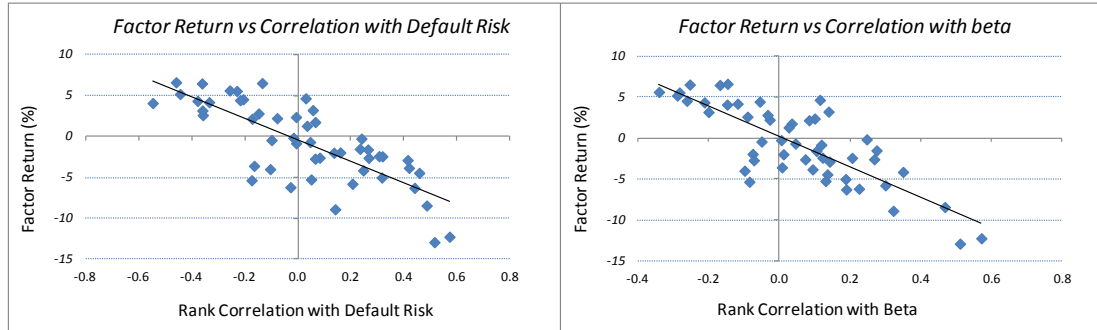


	Rank Correlation with Beta	Rank Correlation with Default Risk
	January 2012	January 2012
Gross Margin	-0.12	-0.28
Dividend Payout Ratio	-0.31	-0.30
5 Year EPS Growth	-0.18	-0.33
ROE	-0.08	-0.34
EBIT/WCPPE	-0.16	-0.34
5 Year Dividend Growth	-0.23	-0.35
Stable Growth	-0.29	-0.41
ROIC	-0.12	-0.41
ROA	-0.12	-0.49
1 Year Price Momentum	-0.31	-0.56

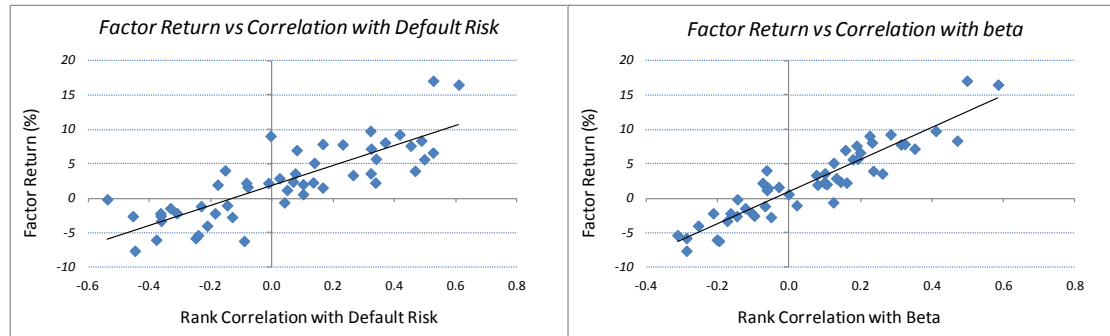
Note: Shows factor score rank correlations with beta and default risk, as of December 31 2011. Yellow highlights indicate ten factors with highest rank correlations, while blue highlights indicate ten factors with lowest rank correlations. Universe is Russell 1000.
 Source: Nomura Securities International, Inc., Compustat, I/B/E/S, IDC, Russell.

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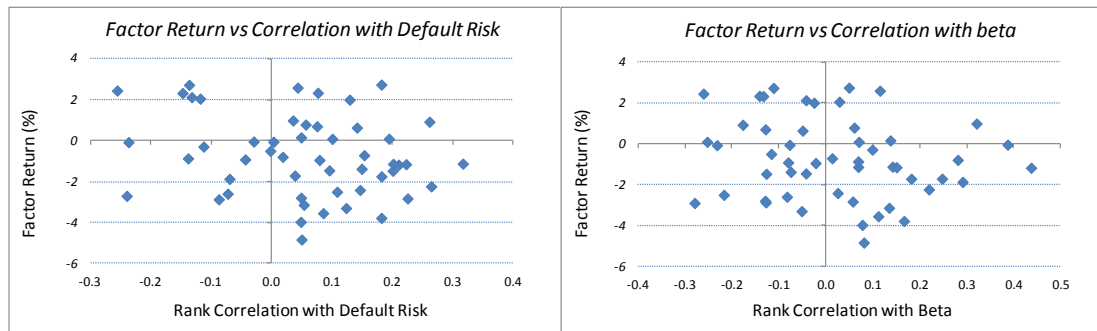
Risk –off (Sep 2011)



Risk –on (Oct 2011)

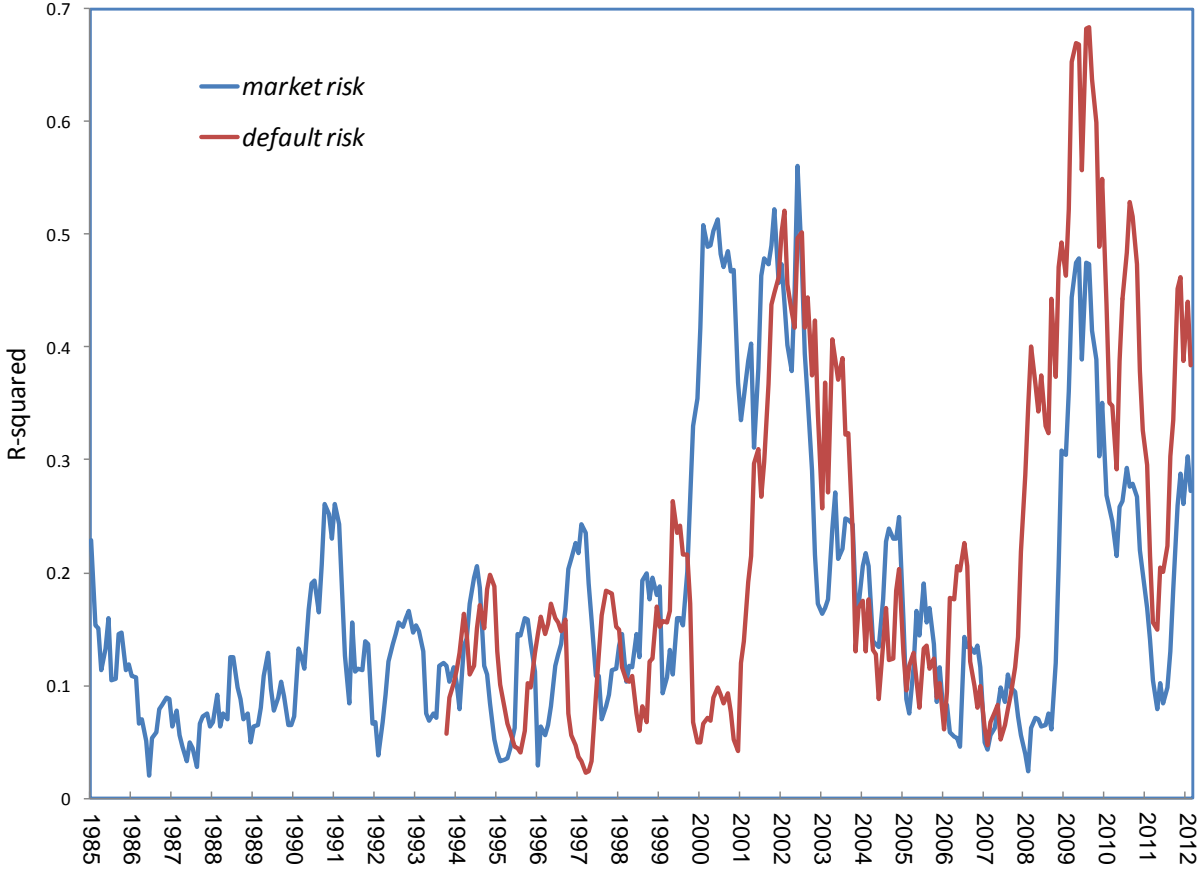


Risk – irrelevant(Oct 2005)



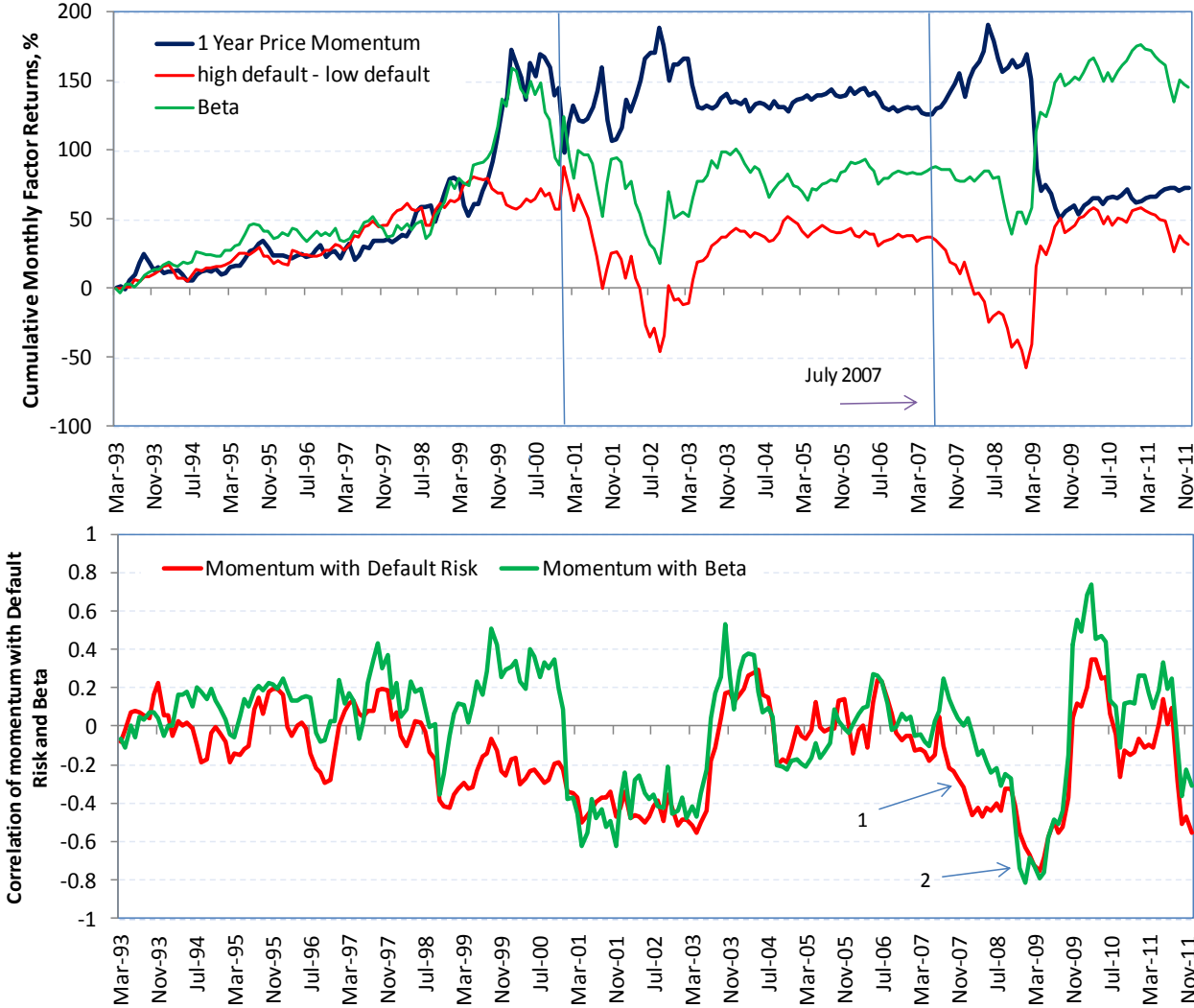
Note: Shows factor returns against factors' score rank correlation with default risk and beta. Universe is Russell 1000.
 Source: Nomura Securities International, Inc., Compustat, I/B/E/S, IDC, Russell.

Unintended bets - default (credit) risk has entered the room



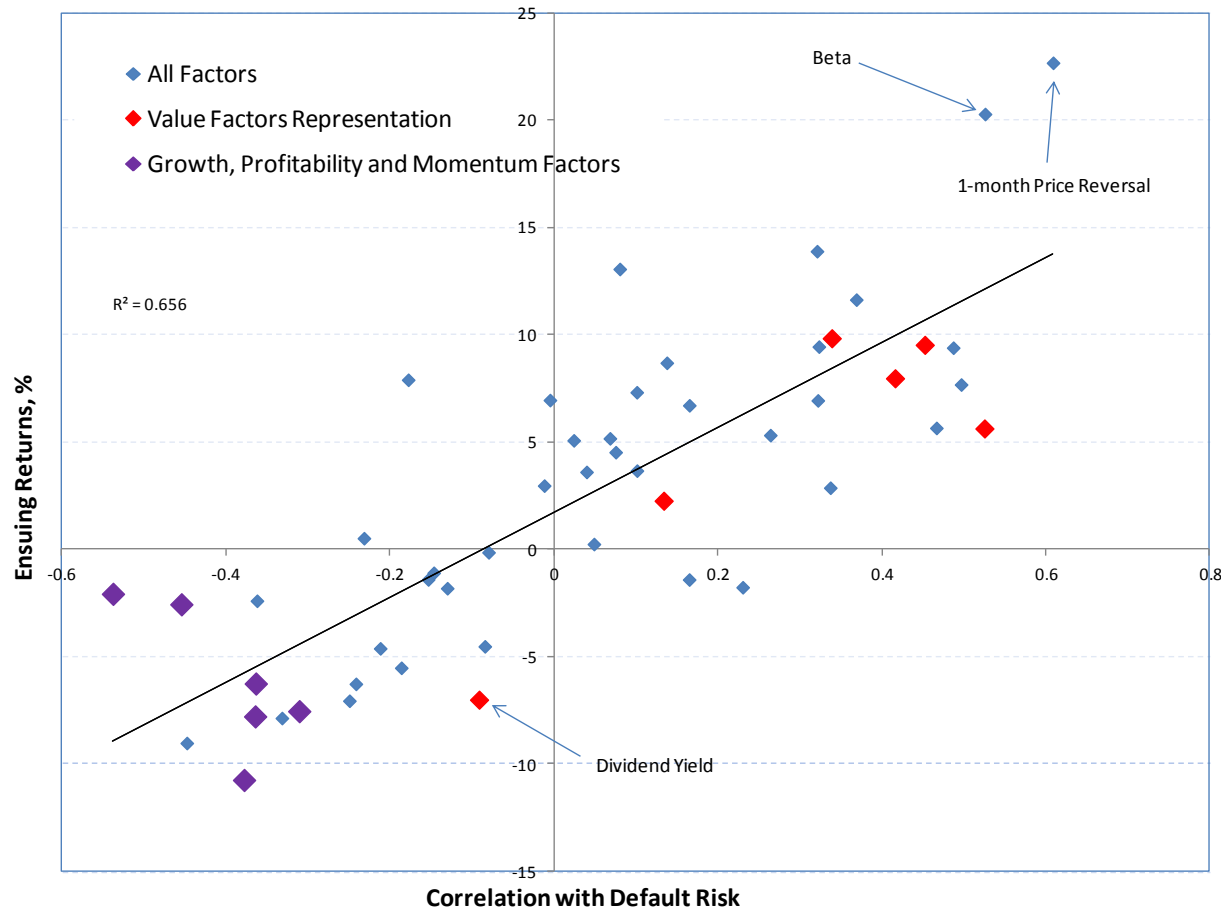
beta (blue line), and the default risk (red line) Period of analysis is January 1985 through February 2012. Universe is Russell 1000. Source: Nomura Securities International, Inc., Compustat, I/B/E/S, IDC, Russell.

Price momentum, default risk and beta



Note: Shows monthly cumulative returns of factors one-year price momentum (blue line), default risk (high-low, red line) and beta (high-low, green line). Universe is Russell 1000. Period of analysis is from March 1993 through December 2011. Transaction costs are not considered. Source: Nomura Securities International, Inc., Compustat, I/B/E/S, IDC, Russell.

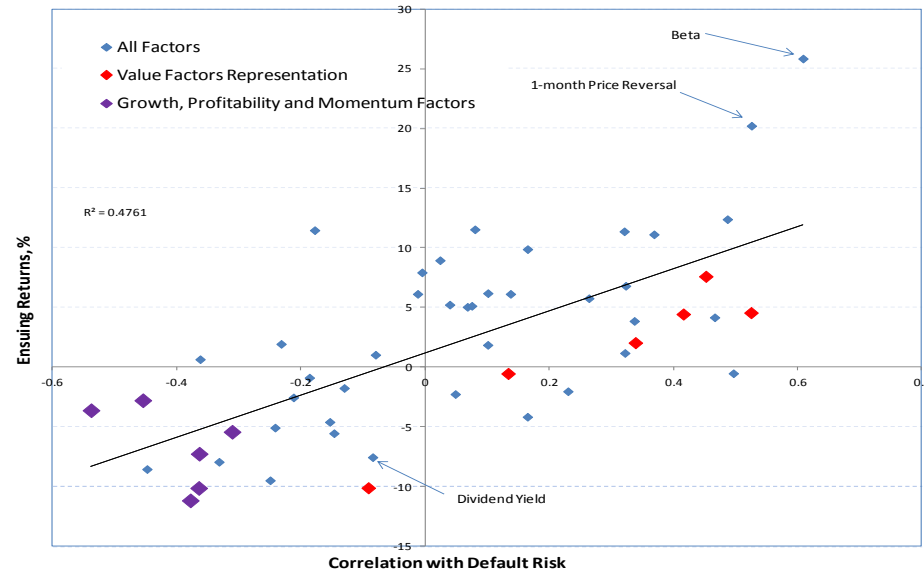
Value Mirage? – impact of default risk on factor returns since Oct 1, 2011 market bottom



Note: Top chart shows factor returns from Oct. 1 2011 to Jan. 31 2012 vs. correlations between default risk and other 51 factors in our database at Sep 30 2011; bottom panel is a table representation of the top chart for a few factors. Universe is Russell 1000. Source: Nomura Securities International, Inc., Compustat, I/B/E/S, IDC, Russell.

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Impact of default risk on factor returns between Oct 1, 2011 and March 31, 2012

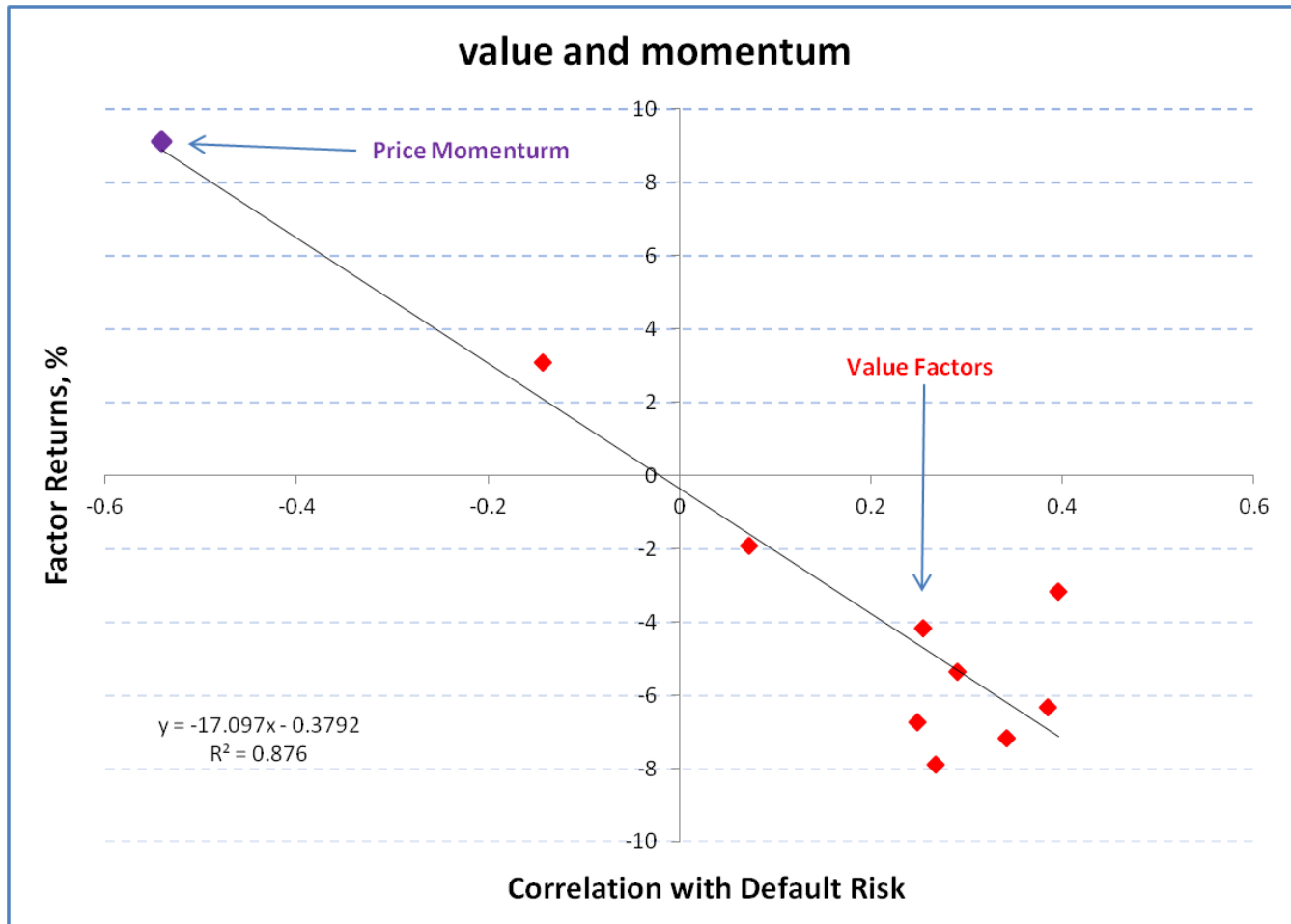


Value Factors		Correlation (9/30/2011)	Returns (10/1/2011 - 3/31/2012)
B/P		0.53	4.55
SALES/PRICE		0.45	7.60
PREDICTED E/P		0.42	4.44
EBITDA/EV		0.34	2.04
E/P		0.13	-0.54
DIVIDEND YIELD		-0.09	-10.12
Growth, Profitability and Momentum		Correlation (9/30/2011)	Returns (10/1/2011 - 1/19/2012)
5 Year EPS Growth		-0.38	-11.18
5 Year Dividend Growth		-0.36	-10.14
ROE		-0.36	-7.27
ROIC		-0.45	-2.79
ROA		-0.54	-3.63
1 Year Price Momentum		-0.31	-5.43

Note: Top chart shows factor returns from Oct. 1 2011 to March. 31 2012 vs. correlations between default risk and other 51 factors in our database at Sep 30 2011; bottom panel is a table representation of the top chart for a few factors. Universe is Russell 1000.

Source: Nomura Securities International, Inc., Compustat, I/B/E/S, IDC, Russell.

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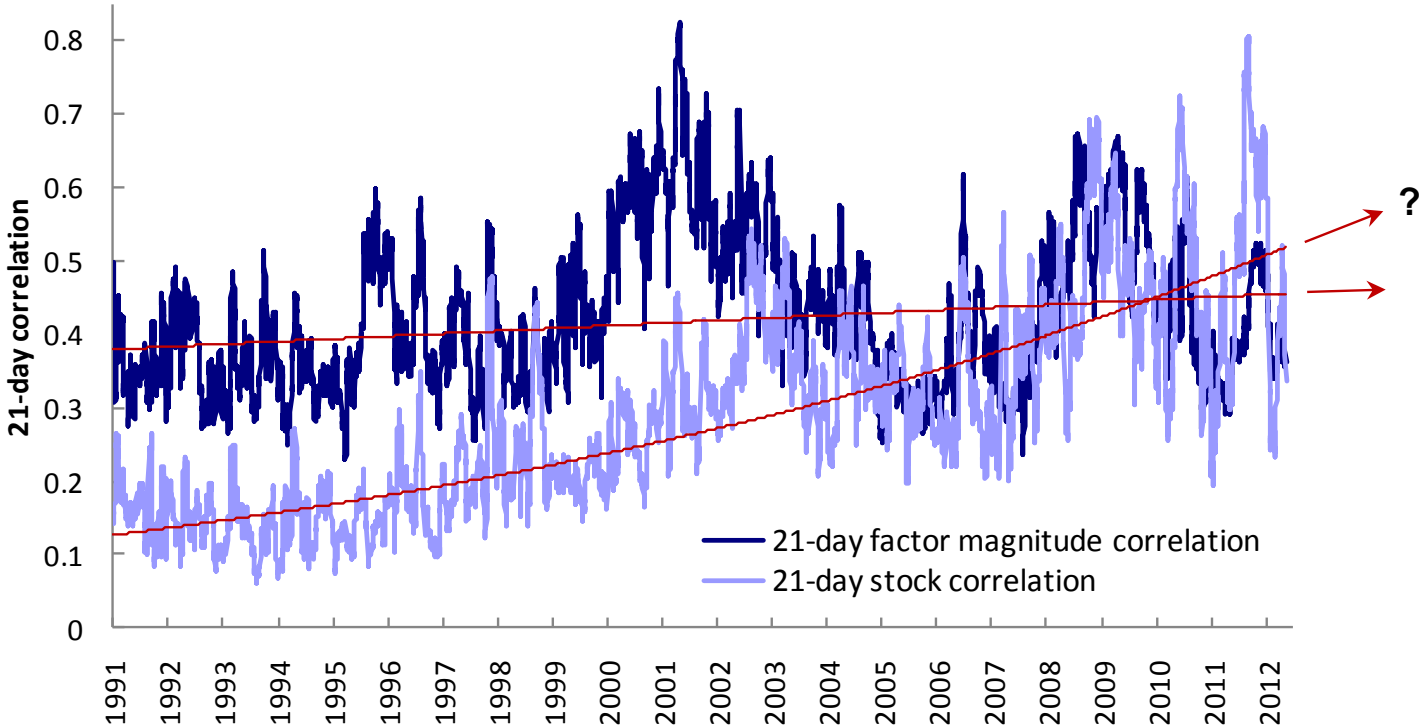
Note: Shows factor returns from April. 1 2012 to May 9 2012 vs. correlations with default risk on March 31 2012. Universe is Russell 1000.
 Source: Nomura Securities International, Inc., Compustat, I/B/E/S, IDC, Russell.

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Where do changes of the past decade leave investors?

Crossing correlation trends – rising for stocks, flat for factors

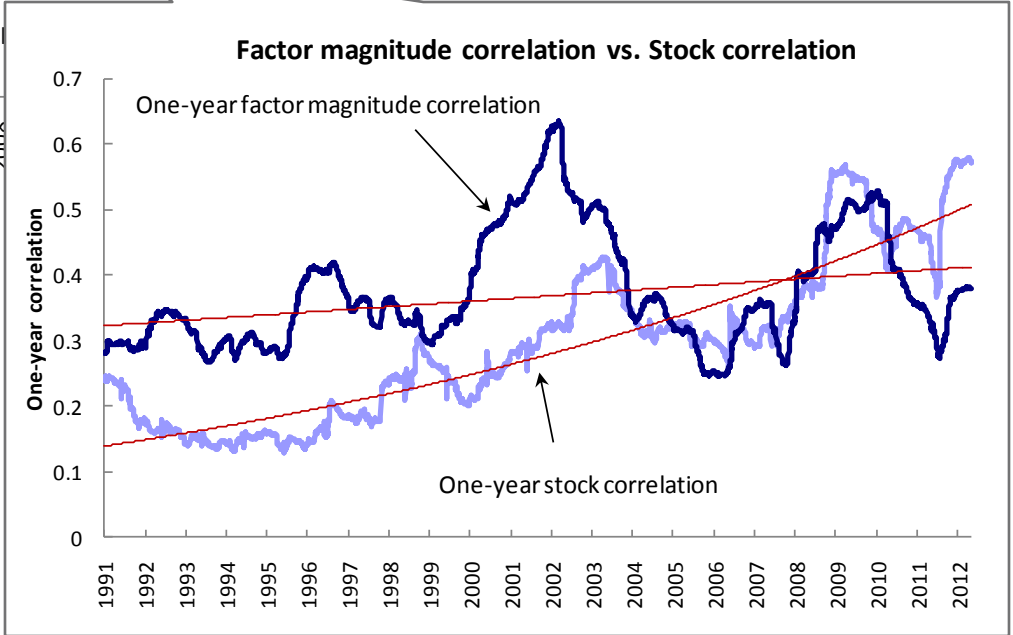
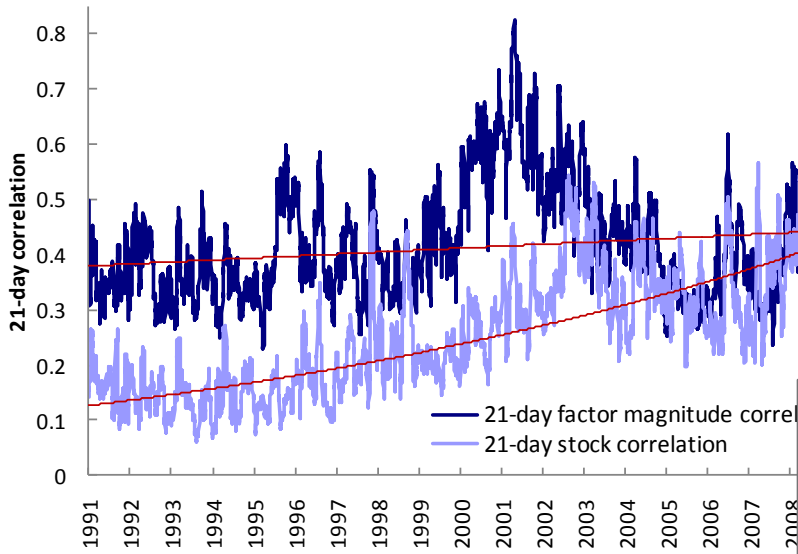
Factor magnitude correlation vs. Stock correlation



Note: Light blue line shows 21-day stock correlation within sector, where the averages of all pair-wise stock correlations are calculated within GICS 10 sectors in Russell 1000 universe using 21-day total returns and these correlations are averaged over all GICS 10 sectors. Dark blue line shows the average of all pair-wise absolute factor correlation among 22 representative factor returns in Russell 1000 universe. Period of analysis is from 2 January 1991 through 11 May 2012. Source: Nomura Securities International, Inc, Russell, S&P, Bloomberg.

Crossing correlation trends – rising for stocks, flat for factors

Factor magnitude correlation vs. Stock correlation

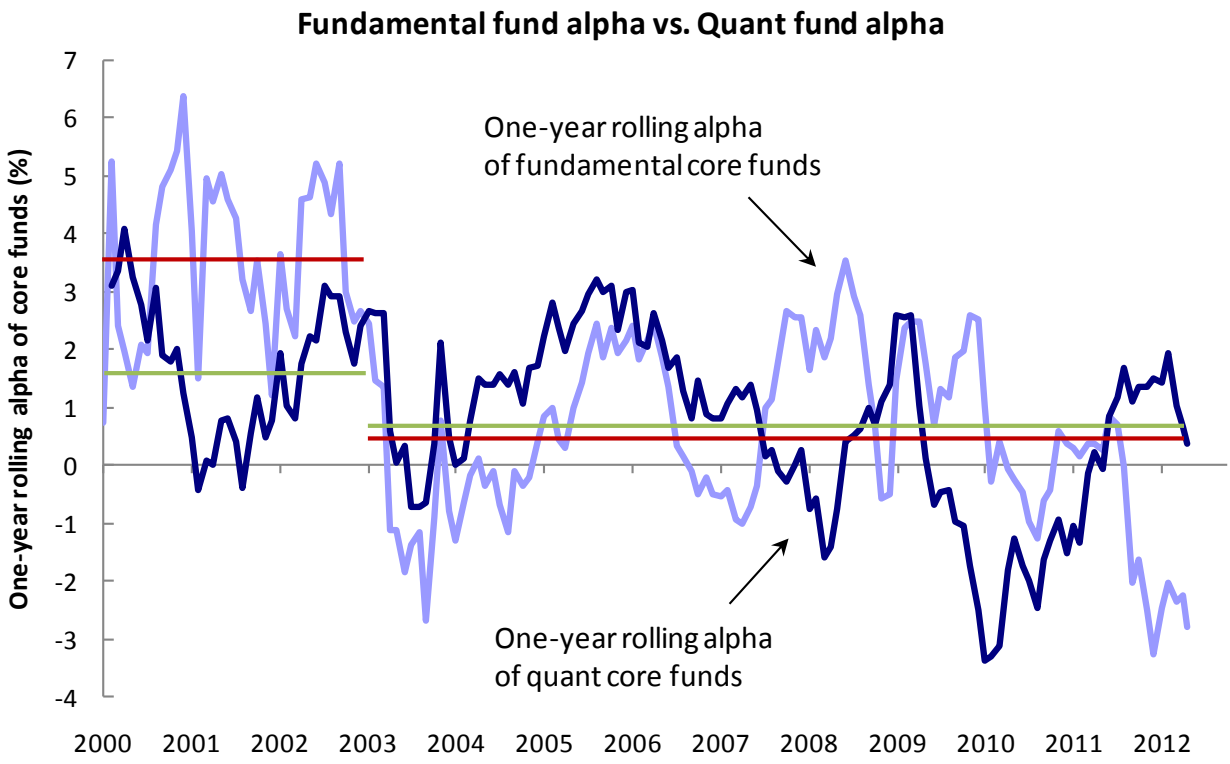


Note: Light blue line shows 252-day (one-year) stock correlation within sector, where the averages of all pair-wise stock correlations are calculated within GICS 10 sectors in Russell 1000 universe using 252-day total returns and these correlations are averaged over all GICS 10 sectors. Dark blue line shows the average of all pair-wise absolute factor correlation using 252-day factor returns of 22 representative factors in Russell 1000 universe. Period of analysis is from 2 January 1991 through 11 May 2012.
Source: Nomura Securities International, Inc., S&P, Russell, I/B/E/S, Compustat, IDC.

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Factor premium vs. stock alpha

A diversification opportunity?



Note: Shows one-year rolling excess return (relative to the benchmark) in large-cap core funds based on quantitative methodologies (dark blue line) and large-cap core funds based on fundamental methodologies (light blue line). Currently, there are 20 funds in the quant core universe and 44 funds in the fundamental core universe. Period of analysis is from January 2003 through 11 May 2012. Source: Nomura Securities International, Inc., Bloomberg, S&P, Russell.

Conclusion

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- **Wisdom of crowds or madness of crowds?**

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Quantitative Desk Strategies

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