Asia Pacific Quantitative outlook and strategies

Quant outlook and merits of style selection model in EM Asia

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GLOBAL QUANTITATIVE RESEARCH

Asian Equity Quantitative Strategies

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- **2012 quant outlook:**

  - <u>We expected a mean reversion of factor valuations with a favorable view on value</u> (2012 Quantitative outlook, 8 Dec 2011).

  - *Rethinking the opportunity of value and revision* (15 Mar 2012) & *The unwinding of risk and the style shifts* (14 May 2012): As the value spreads are less extreme and risk appetite soured globally, the case for value in the near term may be muted while the revision factor will play a more important role. We prefer stocks with better FY2 revisions and also with inexpensive forecast P/E, as we believe such factor exposure provides a hedge against macro risks in the near term.

- **Merits of style selection strategy in emerging Asia:**

  - A systematic model to provide short-term views on style return in an emerging Asia universe, with the objective of securing consistent long-term performance. We show a practical portfolio optimisation simulation using the outputs from our style selection model and alpha scores, and demonstrate the efficacy of implementing the strategy in the region.

■ Year-to-date, we saw significant style shifts. We observed a risk-on value rally in January and February. But the unwinding of risk since late February has cancelled out part of the outperformance of value.

Factor	2011: APxJ			YTD: APxJ		YTD: APxJ DM		YTD: APxJ EM		Since April: APxJ		Since April: APxJ DM		Since April: APxJ EM	
	Return	R/R	Rank	Return	Rank	Return	Rank	Return	Rank	Return	Rank	Return	Rank	Return	Rank
Market cap *	(7.3)	(1.7)	18	2.9	8	3.1	6	2.9	8	(1.5)	17	(2.1)	17	(1.3)	17
Price momentum (1M)	(5.7)	(0.5)	14	(4.9)	21	(3.0)	19	(5.4)	21	1.3	5	3.2	4	0.8	9
Price momentum (12M -1M)	14.2	2.4	3	(3.3)	19	(4.6)	21	(2.9)	18	3.9	1	4.1	3	3.9	1
Volume turnover ratio	(4.7)	(0.6)	15	2.3	9	3.1	7	2.2	9	(1.5)	18	(1.6)	15	(1.5)	18
Dividend yield	7.2	2.0	5	4.3	4	1.2	11	5.1	4	1.9	4	4.7	2	1.2	6
Earnings yield	3.3	0.5	10	6.8	2	7.7	1	6.5	3	0.8	9	2.1	5	0.5	11
B/P	(10.0)	(2.2)	19	1.5	10	(0.0)	12	1.9	10	(1.6)	19	(0.7)	13	(1.9)	19
Cashflow yield	(6.5)	(1.3)	16	3.3	7	4.7	3	2.9	7	(0.7)	15	0.2	10	(0.9)	16
EBITDA/EV	(1.1)	(0.2)	12	4.0	5	1.6	9	4.7	5	0.4	11	(1.7)	16	0.9	7
Revision index	9.2	1.6	6	(1.0)	14	(1.7)	16	(0.8)	14	0.9	8	(0.3)	12	1.2	5
Change in earnings yield	10.4	1.3	7	7.2	1	4.2	5	8.0	1	1.1	7	1.5	7	0.9	8
StarMine predicted surprise	11.3	2.0	4	(1.8)	17	(0.1)	13	(2.2)	17	1.1	6	(0.8)	14	1.6	4
Normalised E/P	3.3	0.6	8	6.4	3	5.8	2	6.5	2	0.6	10	(0.0)	11	0.8	10
Sales growth (FY2)	(1.2)	(0.4)	13	0.7	12	1.3	10	0.5	13	(1.3)	16	(4.5)	20	(0.4)	15
EPS growth (FY2)	(4.3)	(2.7)	21	(1.6)	16	(2.6)	18	(1.3)	15	(0.6)	14	(3.7)	19	0.2	12
Return on equity	12.4	3.8	1	1.1	11	1.9	8	0.9	11	2.0	3	1.4	8	2.2	3
Shareholders' equity ratio	(0.4)	(0.1)	11	(1.4)	15	(1.4)	15	(1.4)	16	0.0	13	0.5	9	(0.1)	14
Pretax profit margin	10.4	2.5	2	(3.4)	20	(2.0)	17	(3.7)	20	0.3	12	1.8	6	(0.1)	13
Volatility	(13.8)	(1.6)	17	3.8	6	4.3	4	3.7	6	(3.0)	20	(3.3)	18	(2.9)	21
Estimate dispersion	(12.7)	(2.4)	20	0.4	13	(0.1)	14	0.6	12	(3.3)	21	(5.8)	21	(2.7)	20
Default probability *	6.1	0.6	9	(3.3)	18	(3.7)	20	(3.1)	19	3.2	2	5.5	1	2.6	2

Note: 2011 return figures are annualised performance; R/R refers to the average return/standard deviation and rank is based on R/R. YTD performance runs to 11 May 2012. Factor returns are generated by calculating the subsequent performance of an equal-weighted portfolio that is long the highest one-third and short the one-third with the lowest scores (rebalanced monthly with country/sector diversified), except for the factors marked with *, which are reverse-based. See Appendix I for factor definition. Universe is based on constituents in the MSCI Index.
Source: Worldscope, I/B/E/S, StarMine, MSCI, Nomura Quantitative Strategies

Style rotation under way

- Since late February, high risk and value stocks (especially high B/P) were down as concerns over Eurozone risks persisted. But stocks with high dividend yields and forecast earnings yields fared comparatively better.
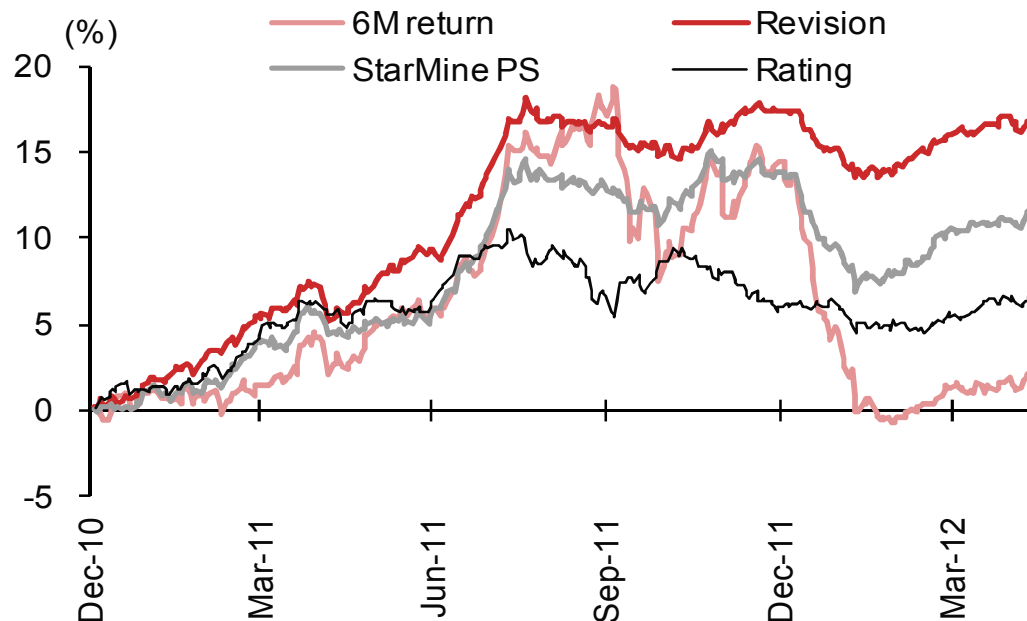
Performance of value and risk

Source: Worldscope, I/B/E/S, MSCI, Nomura Quantitative Strategies

Revision indicators have started to work
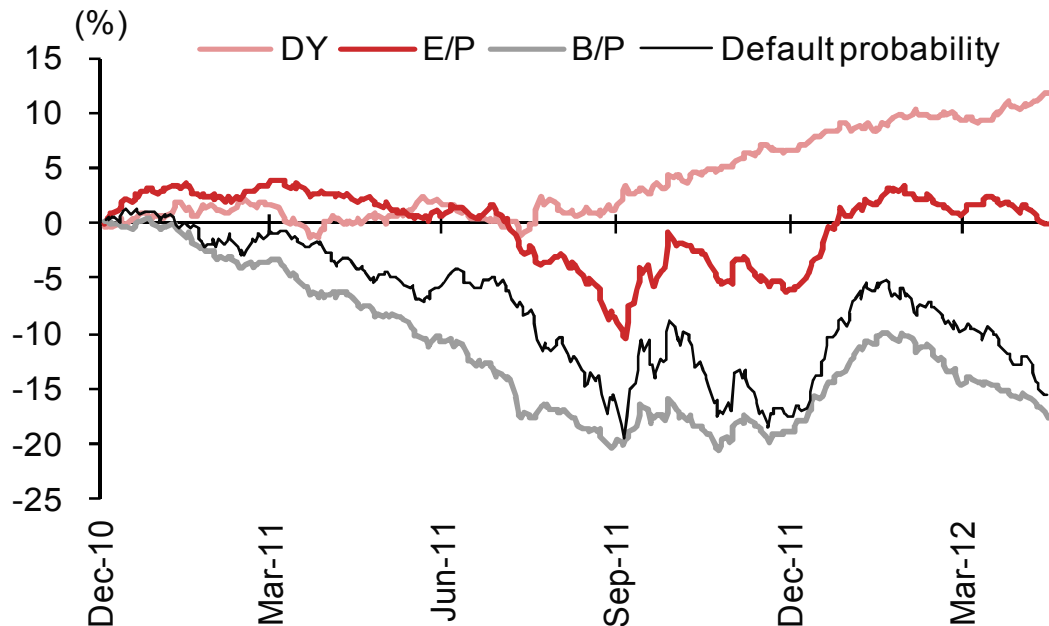
■ Contrary to the declining value performance, price momentum and earnings revision-related factors have delivered positive impact since late February.

Performance of price and earnings momentum

Source: Worldscope, I/B/E/S, StarMine, MSCI, Nomura Quantitative Strategies

Stock correlation dropped compared with last year

■ When correlation was high, this means investors were focusing less on underlying fundamentals and more on sentiment/risk, making it harder for stock pickers to add value.

■ Despite risk aversion signs in recent months, correlations between stock and factor returns are at low levels compared with last year.

Average pair-wise correlation — mean reversion of stock correlation
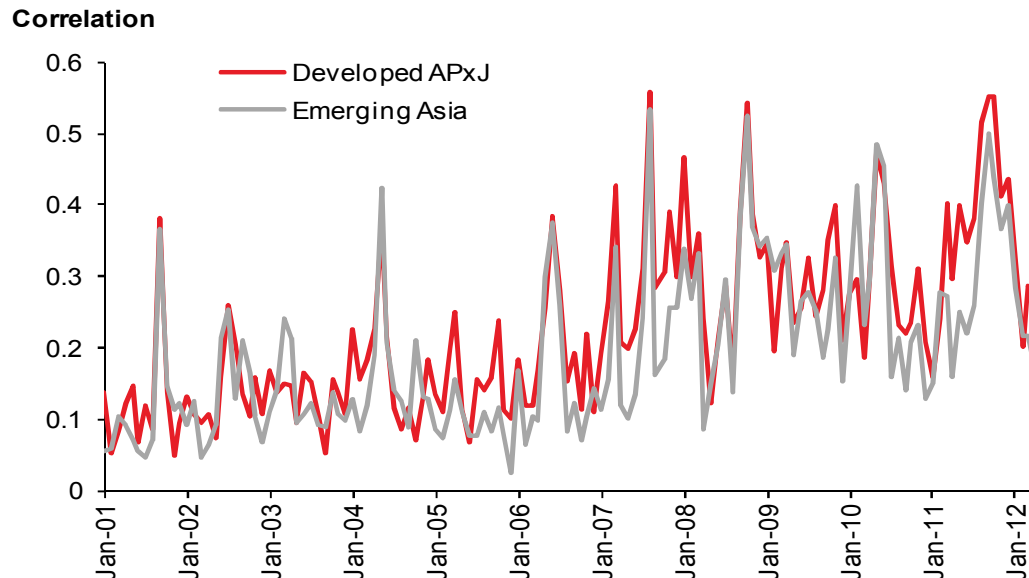
Note: Average pair-wise correlation between all the stocks in the MSCI AC Asia Pacific ex-Japan Index, based on daily prices over past one-month.
Source: Thomson Reuters Datastream, MSCI, Nomura Quantitative Strategies

Value spreads are less extreme now than at end-2011

■ But the unwinding of risk in recent months has brought the latest value spreads level still above the past 24-month average, near +1 standard deviation. With less extreme value spreads and rising risk aversion, the case for value in the near term may be muted. This is not to say that value factors will stop working completely in the rest of 2012, but we definitely need more catalysts.

E/P spread between Q1 and Q5 by E/P factor
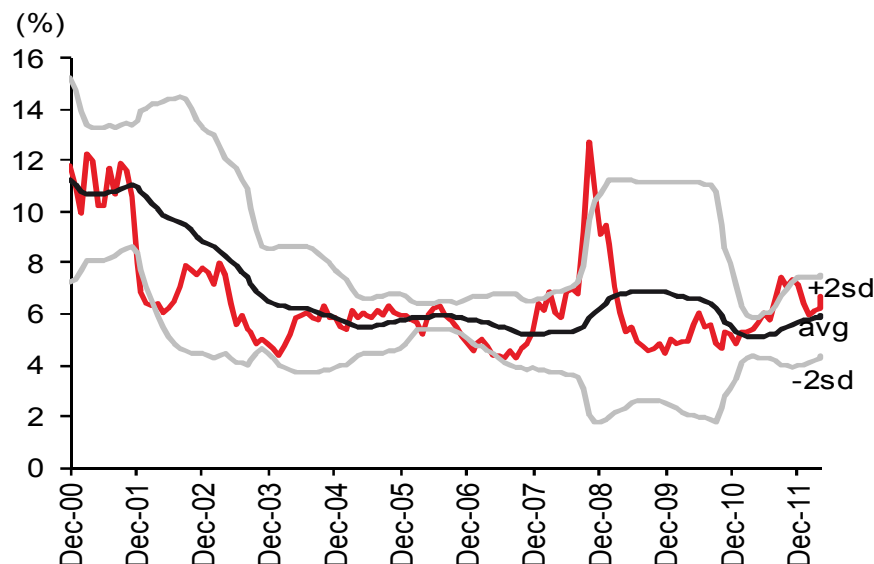
Notes: The spread is the median E/P difference between the top and bottom quintile portfolios by E/P. Moving averages and standard deviations are based on past 24-month data.
Source: Worldscope, I/B/E/S, MSCI, Nomura Quantitative Strategies

B/P spread between Q1 and Q5 by B/P factor
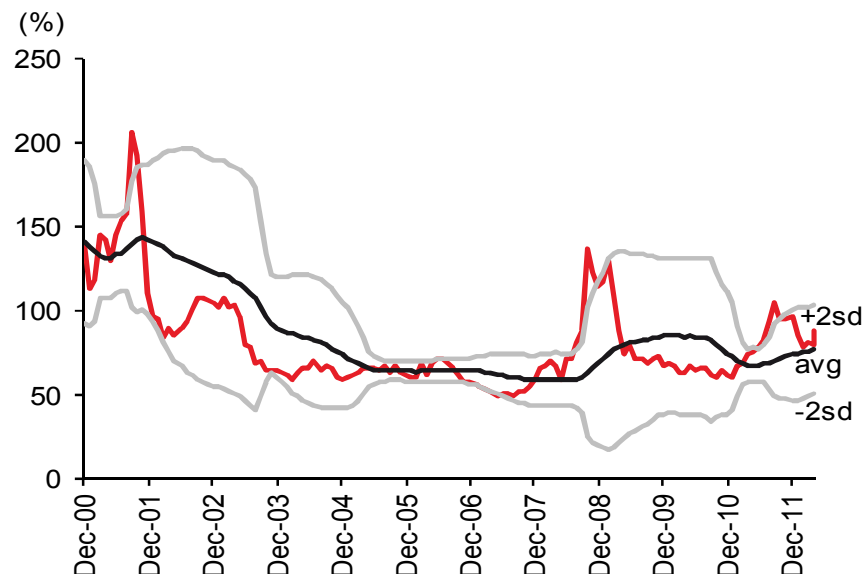
Notes: The spread is the median B/P difference between the top and bottom quintile portfolios by B/P. Moving averages and standard deviations are based on past 24-month data.
Source: Worldscope, I/B/E/S, MSCI, Nomura Quantitative Strategies

Price momentum tends to move the fastest

- At end-Dec 2011, valuation of price momentum was at an extreme – we thus expected mean reversion to take place in 2012. We saw a sell-off in momentum in Jan-Feb 2012. But price momentum has resumed its positive impact since late February and has begun to move back to the relative expensive zone.

E/P spread between Q1 and Q5 by momentum factor
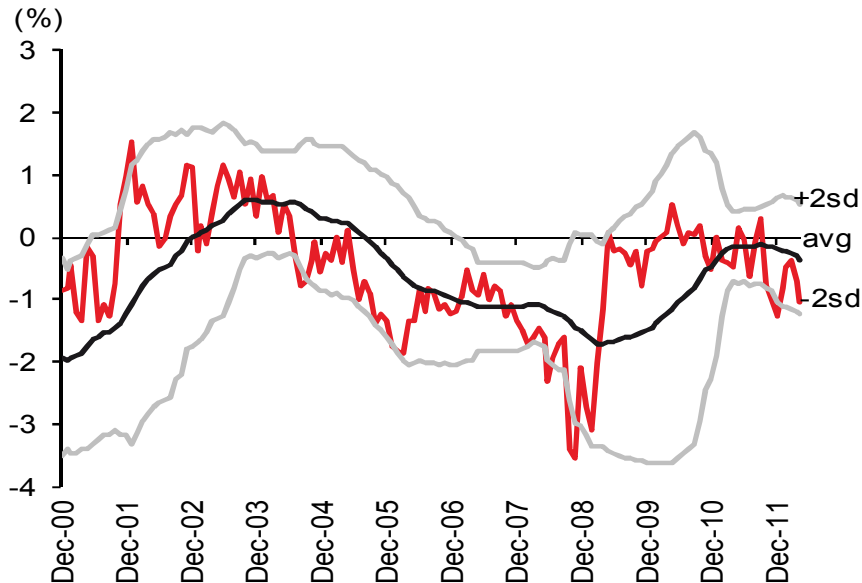
Notes: The spread is the median E/P difference between the top and bottom quintile portfolios by mid-term price momentum factor. Moving averages and standard deviations are based on past 24-month data.
Source: Worldscope, I/B/E/S, MSCI, Nomura Quantitative Strategies

B/P spread between Q1 and Q5 by momentum factor
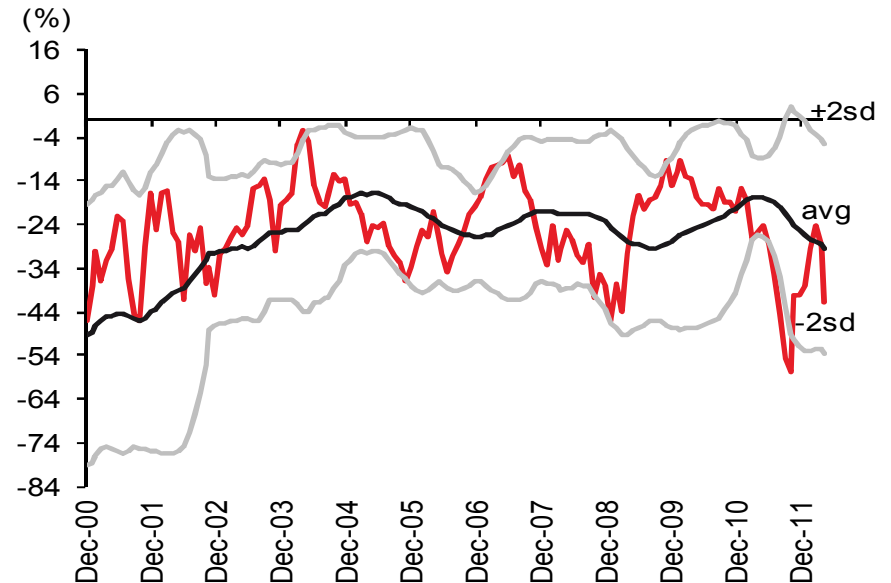
Notes: The spread is the median B/P difference between the top and bottom quintile portfolios by mid-term price momentum factor. Moving averages and standard deviations are based on past 24-month data.
Source: Worldscope, I/B/E/S, MSCI, Nomura Quantitative Strategies

Value factors are connected with earnings outlook and market risk

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- Value factors typically work when the earnings outlook is improving and when risk appetite is picking up.

- With macro uncertainties prevailing in Europe, risk appetite may remain subdued in the near term. But we are encouraged to see that our aggregate Asian earnings momentum index appears to have bottomed in late-2011 and has improved year-to-date.
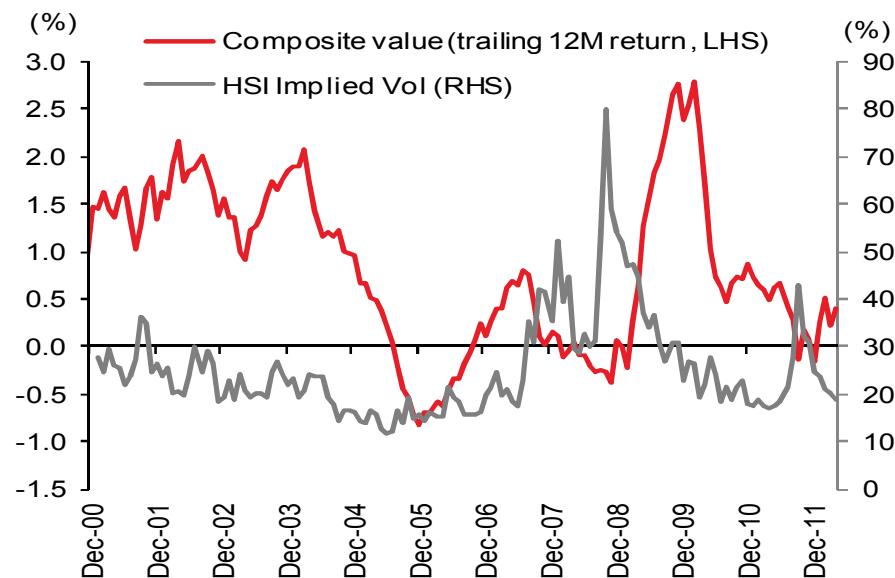
Relationship between value performance and EMI

Relationship between value performance and VHSI
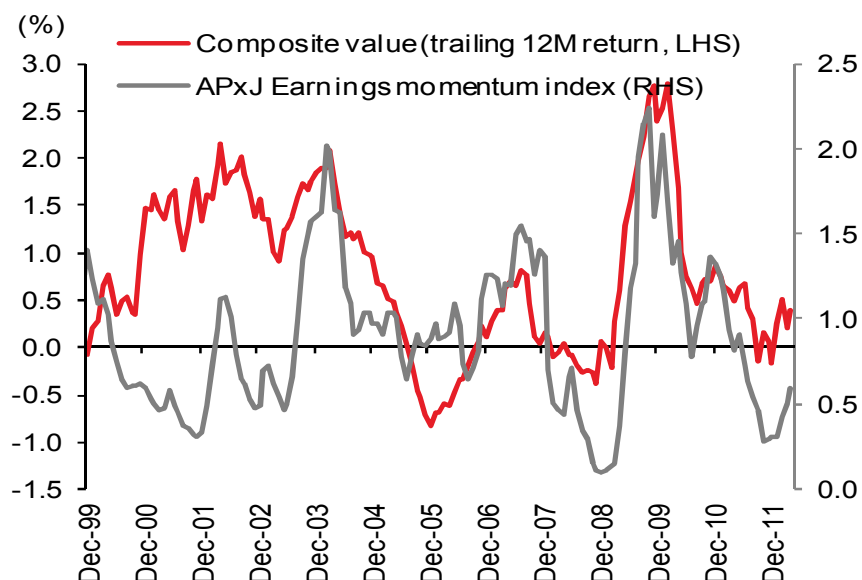
Note: Composite value factor is defined as the sum of the normalized scores of E/P and B/P. Earnings momentum index is defined as: % of companies with +ve Revi,t / % of companies with -ve Revi,t.
Source: Worldscope, I/B/E/S, MSCI, Nomura Quantitative Strategies

Note: Composite value factor is defined as the sum of the normalized scores of E/P and B/P. VHSI is HSI Volatility Index.
Source: Bloomberg, Worldscope, I/B/E/S, MSCI, Nomura Quantitative Strategies

■ The median StarMine-predicted surprise and EPS revision (forward 12-month) have also been improving since late-2011. The sustainability of Asian earnings growth is crucial for the case of value over the rest of 2012, in our view.

Median StarMIne-predicted surprise and StarMIne EPS revision
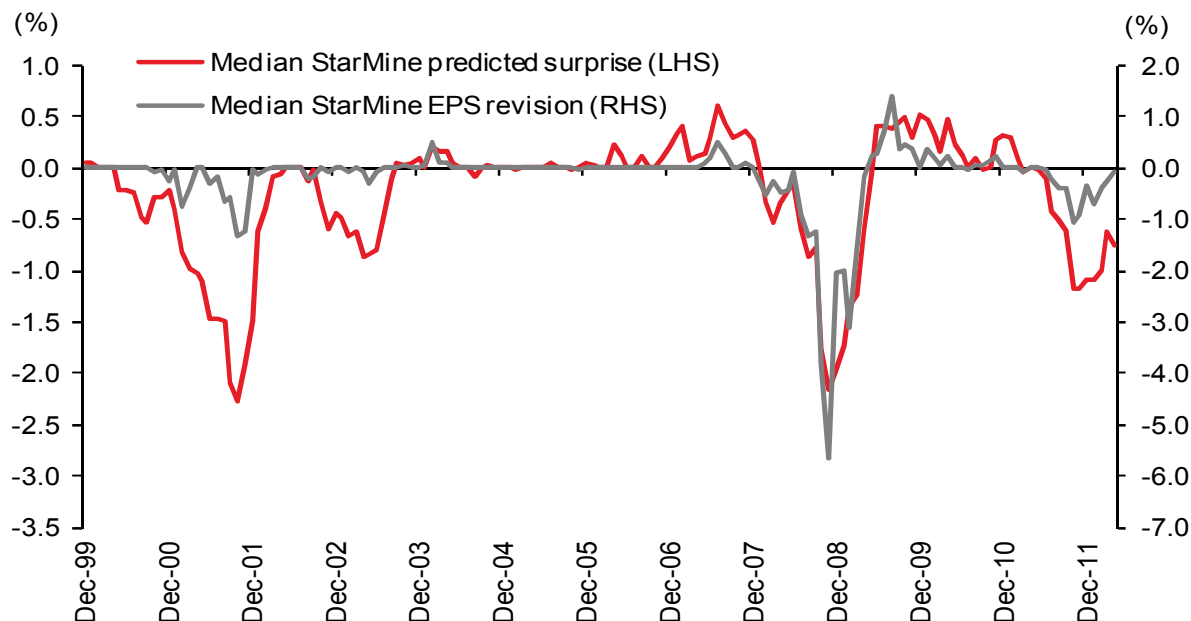
Source: StarMine, MSCI, Nomura Quantitative Strategies

Rethinking revision

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- Contrary to the value performance, revision factor delivered positive returns in March and April. It seems that investors monitor earnings revision trends more closely under the current risk-averse conditions. We believe stocks increasingly need catalysts and reality checks on the earnings outlook to perform.

Historical factor returns (rolling three-month average) of revision and value factors

Source: Worldscope, I/B/E/S, MSCI, Nomura Quantitative Strategies
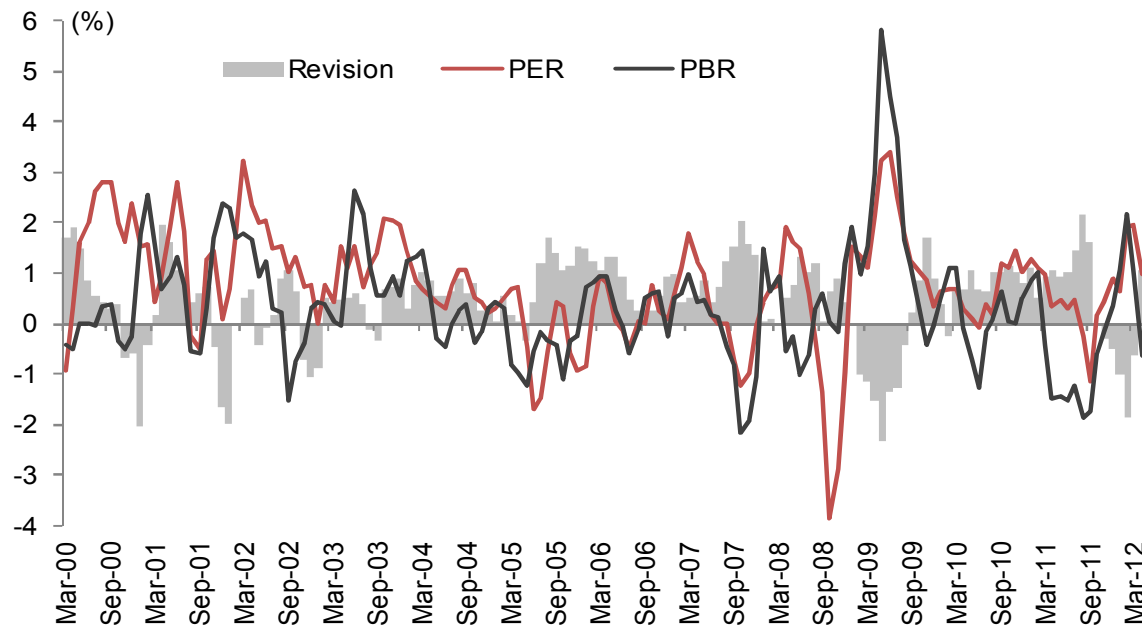
Revision performance and earnings downgrades/upgrades

■ In the previous 2009 cycle, revision factor did not work over the time when earnings expectations were picking up. Since March 2012, we have observed that revision factor started to work when the number of downward revisions was decreasing, albeit the number of upward revisions was dropping as well.

Historical factor returns of revision factor alongside the percentage of stocks with earnings upgrades and downgrades

Source: I/B/E/S, MSCI, Nomura Quantitative Strategies

Performance of revision appears to resume in more normal conditions
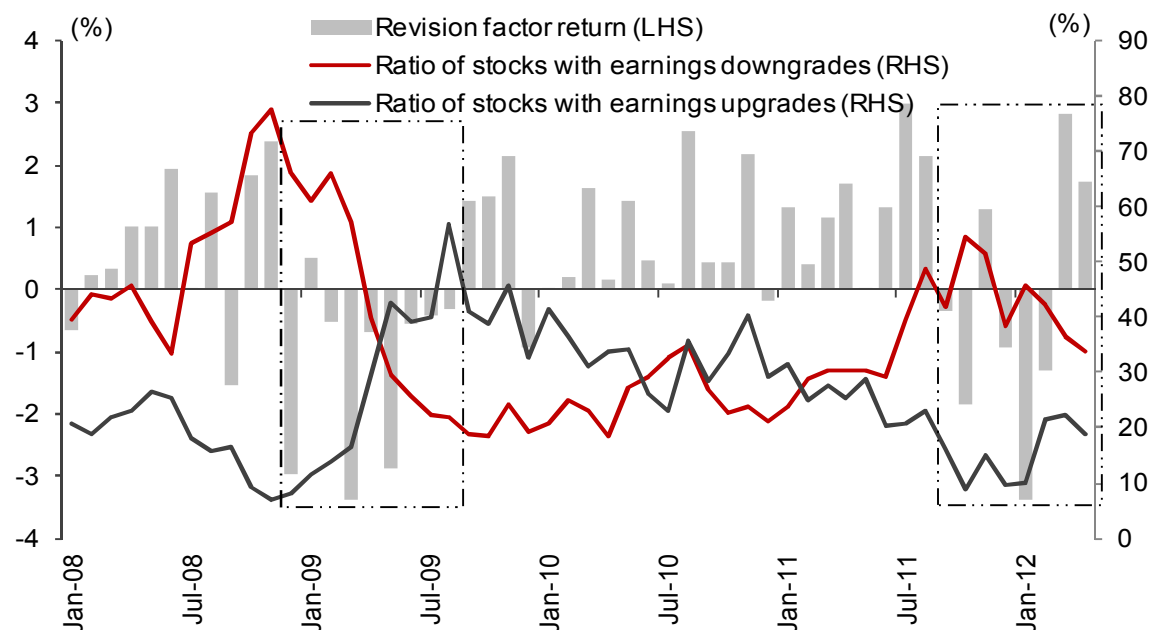
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■ Since mid-March, there has been a mean reversion in the short-term correlation (from -0.6 to circa -0.2 which is near the long-term correlation level) between revision factor returns and market returns (or P/E factor returns), suggesting that the recent pick-up in the revision factor returns was driven mainly by the impact of revision rather than the market direction.

Performance of the revision and its correlation with the MSCI index returns and P/E factor returns

Legend:
— Correlation between Revision and PER (LHS)
— Correlation between Revision and MSCI (LHS)
— Revision factor return (RHS)
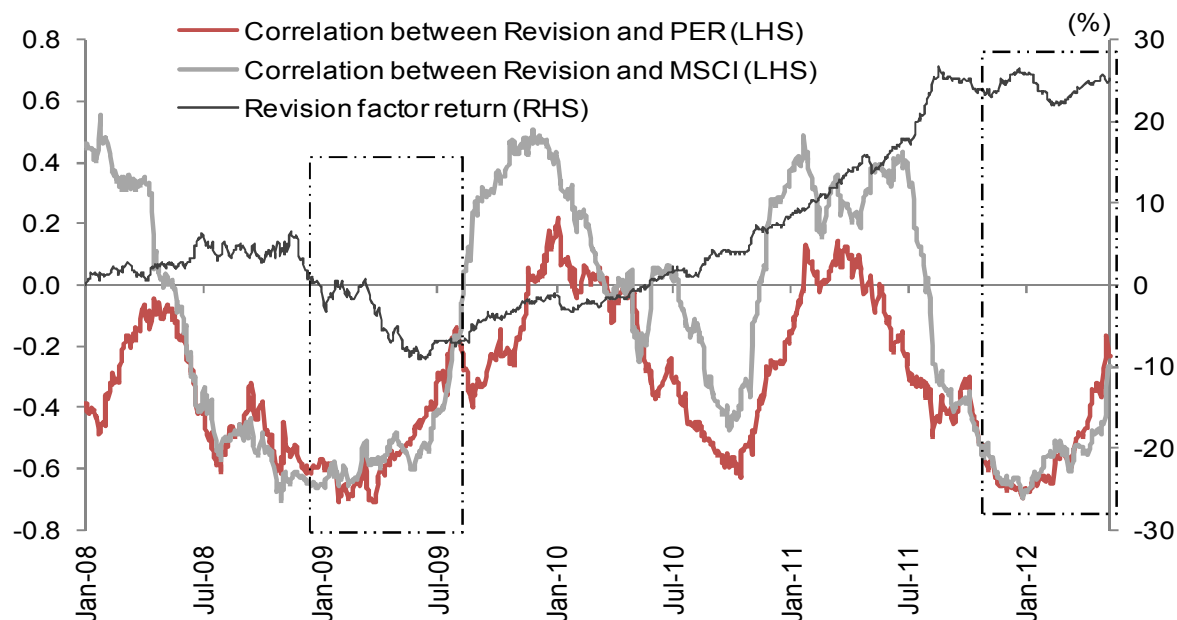
Note: Index is MSCI All-Country Asia-Pacific ex-Japan. Chart shows short-term (60-day) rolling correlation.
Source: I/B/E/S, MSCI, Nomura Quantitative Strategies

■ We like stocks with better revision trends and inexpensive forecast P/Es, as we believe such factor exposure provides a hedge against macro risks in the near term. Year-to-date, Asian investors appear to have become more discriminating with regard to their factor exposure and are preferring the more forward-looking FY3-based revision factor than FY1 or FY2.

2012 YTD performance of revision factors
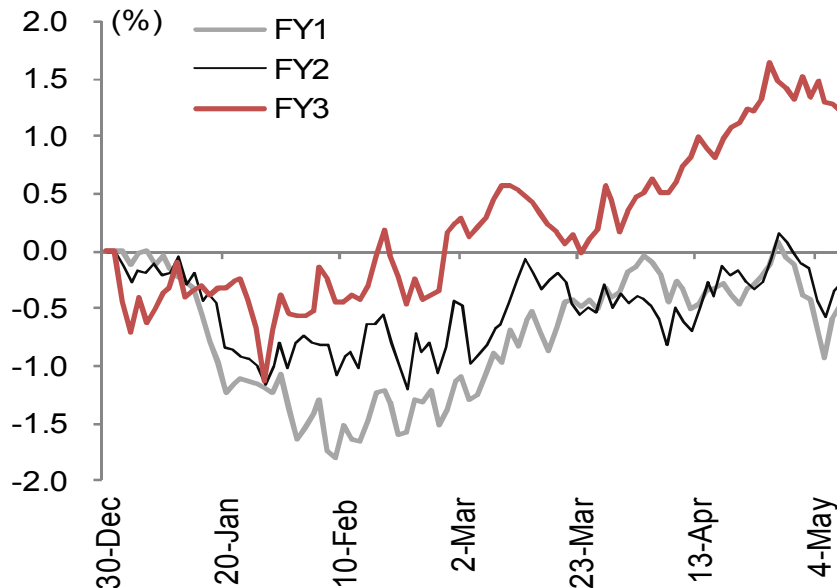
Source: I/B/E/S, MSCI, Nomura Quantitative Strategies

2012 YTD performance of value factors
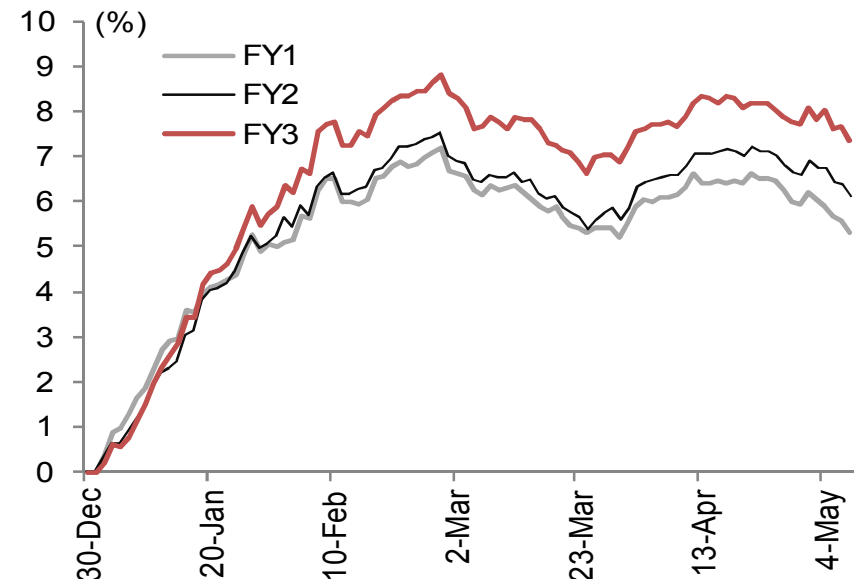
Source: I/B/E/S, MSCI, Nomura Quantitative Strategies

The same trend was observed in 2009

- We think such phenomenon looks interesting, as analysts usually care less about the FY3 EPS forecasts compared with those of FY1 and FY2. The same trend was observed in 2009.

Performance of revision factors in 2009
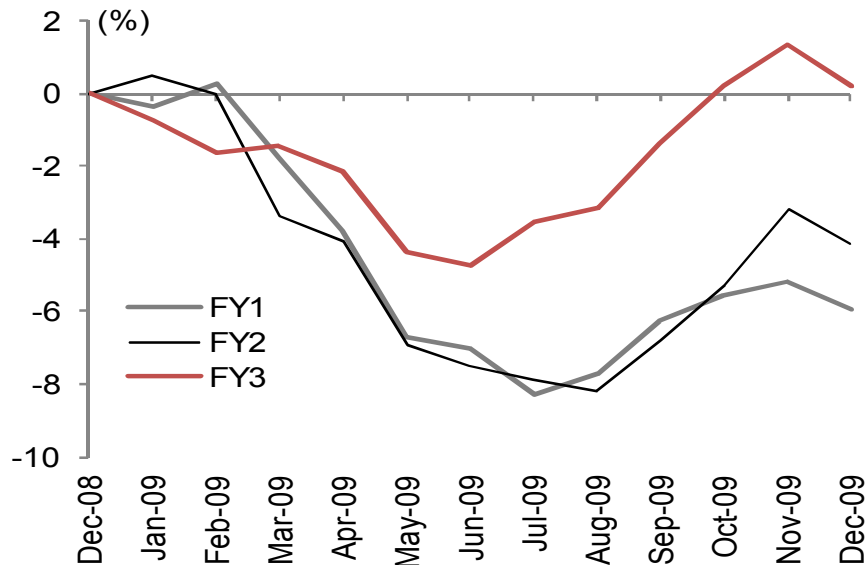
Source: I/B/E/S, MSCI, Nomura Quantitative Strategies

Performance of value factors in 2009

Source: I/B/E/S, MSCI, Nomura Quantitative Strategies

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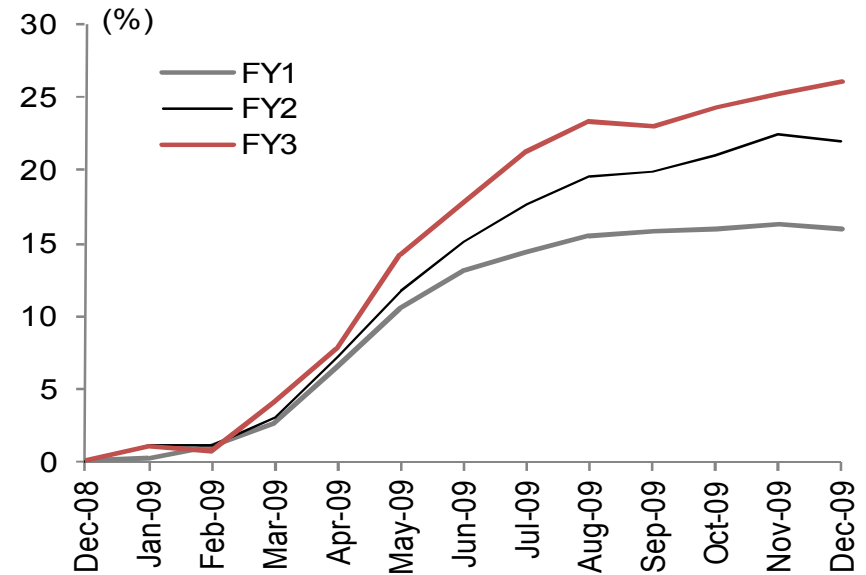
■ In both periods after the collapse of Lehman Brothers and since August 2011, the FY3 EPS growth did not follow the FY2 EPS growth. We believe the recent-year revisions in FY3 forecasts contain more information than in the normal periods. With previous FY3 earnings forecasts for stocks with December fiscal year shifted to become FY2 estimates, we now apply FY2-based factor in our screening process.

Median forecast EPS growth
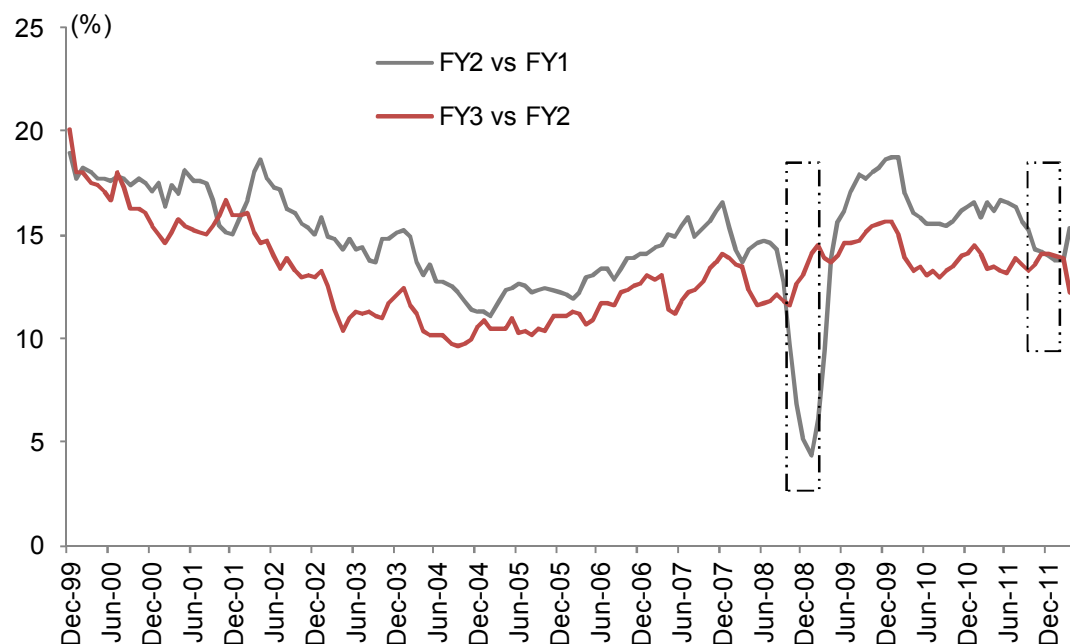
Source: I/B/E/S, MSCI, Nomura Quantitative Strategies

Value-revision screen basket

■ Companies with positive revision, inexpensive P/E, and avoid those that have strong price momentum.

Market	Ticker	Name	Sector	FY2 Revision	FY2 P/E	Past 3-month return (%)
Australia	WPL AU	Woodside Petroleum	Energy	0.39	11.41	-10.07
Australia	IAG AU	Insurance Australia Grp.	Financials	0.50	9.42	3.93
Australia	RHC AU	Ramsay Health Care	Health Care	0.14	15.74	11.99
China	2319 HK	China Mengniu Dairy Co	Consumer Staples	0.09	14.64	5.23
China	3383 HK	Agile Property Hldgs	Financials	0.03	4.85	-17.88
China	1288 HK	Agri Bank Of China H	Financials	0.16	5.25	-13.47
China	3328 HK	Bank Of Communications H	Financials	0.21	4.91	-14.51
China	998 HK	China Citic Bank H	Financials	0.03	4.78	-11.37
China	1800 HK	China Communic Constru-H	Industrials	0.08	5.89	-16.12
China	1186 HK	China Railway Const H	Industrials	0.06	6.71	-12.30
China	390 HK	China Railway Group H	Industrials	0.13	6.34	-16.83
China	1157 HK	Zoomlion Heavy Ind Sci H	Industrials	0.12	6.46	-15.78
China	1313 HK	China Resources Cement	Materials	0.08	6.10	-17.30
Hong Kong	683 HK	Kerry Properties	Financials	0.14	11.06	-9.78
Hong Kong	17 HK	New World Development	Financials	0.25	8.11	-14.61
Hong Kong	1038 HK	Cheung Kong Infrastruct.	Utilities	0.17	11.82	-1.10
India	MSIL IN	Maruti Suzuki India	Consumer Discretionary	0.08	11.45	-1.77
India	DRRD IN	Dr Reddy'S Laboratories	Health Care	0.04	16.27	1.40
India	ADE IN	Adani Enterprises	Industrials	0.11	7.06	-32.63
India	HCLT IN	Hcl Technologies	Information Technology	0.16	12.66	0.68
India	SESA IN	Sesa Goa	Materials	0.07	4.23	-16.49
India	RELI IN	Reliance Infrastructure	Utilities	0.11	6.60	-20.49
Indonesia	ANTM IJ	Aneka Tambang	Materials	0.27	8.78	-17.35
Indonesia	TLKM IJ	Telekomunikasi Indonesia	Telecommunication Services	0.24	12.07	16.31
Korea	012330 KS	Hyundai Mobis	Consumer Discretionary	0.29	6.99	-0.88
Korea	024110 KS	Industrial Bank Of Korea	Financials	0.21	5.11	-3.08
Korea	001740 KS	Sk Networks	Industrials	0.10	7.43	-14.51
Korea	005930 KS	Samsung Electronics Co	Information Technology	0.73	8.01	8.04
Korea	000880 KS	Hanwha Corp	Materials	0.11	5.11	-18.10
Korea	030200 KS	Kt Corp	Telecommunication Services	0.07	5.74	-9.05
Malaysia	RHBC MK	Rhb Capital	Financials	0.14	8.96	-7.67
Malaysia	GAM MK	Gamuda	Industrials	0.09	12.61	-2.19
Malaysia	DIGI MK	Digi.Com	Telecommunication Services	0.15	18.01	1.24
Singapore	JCNC SP	Jardine Cycle & Carriage	Consumer Discretionary	1.00	9.22	-4.75
Singapore	DBS SP	Dbs Group Holdings	Financials	0.38	10.05	-2.32
Singapore	UOL SP	United Overseas Land	Financials	0.25	9.66	-4.26
Singapore	NOBL SP	Noble Group	Industrials	0.05	7.54	-18.31
Taiwan	2392 TT	Cheng Uei Precision Ind	Information Technology	0.33	8.61	-19.01
Taiwan	2385 TT	Chicony Electronics Co	Information Technology	0.14	9.50	-7.10
Taiwan	2354 TT	Foxconn Technology Co	Information Technology	0.08	9.65	-28.04
Taiwan	2301 TT	Lite-On Technology Corp	Information Technology	0.57	9.49	-9.76
Thailand	PTTGC TB	Ptt Global Chemical	Materials	0.17	7.47	-12.08

Note: Data as of 11 May, 2012. Selection of stocks screened from the MSCI All-country Asia-Pacific ex-Japan. We focus on the FY2 forecast revision and P/E factors in this screen. Stocks that have positive revision and fall in the top one-third of each market and sector by revision and P/E factors, and those that are not in the top one-third on past three-month return factor are highlighted. Source: Worldscope, I/B/E/S, MSCI, Nomura Quantitative Strategies

Growing interest in emerging Asia

- Over the past 10 years, Asian markets have gained weightings steadily in the global equity market.

- Emerging markets in Asia have captured market weight at a faster pace than their developed peers, reflecting the faster development in economies and a growing investment preference in the region.

Weightings of emerging Asia and developed Pacific ex Japan in MSCI AC World
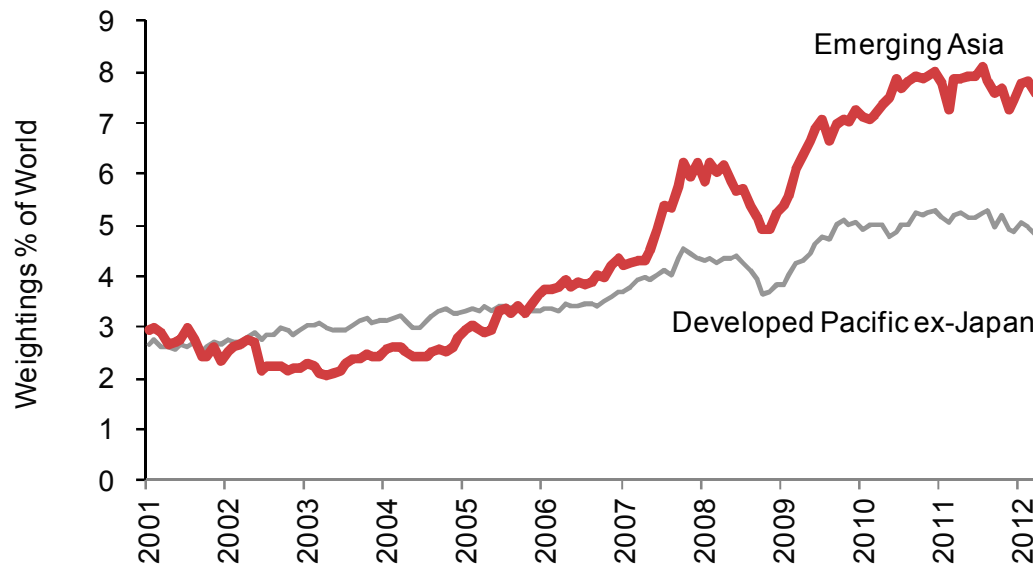
Note: Universe for calculating weightings is based on MSCI AC Asia Pacific ex Japan.
Source: MSCI, Nomura Quantitative Strategies

Increasing weights of emerging Asian countries

- The proportion of Asia emerging markets' weightings has increased consistently over the past decade, now accounting for roughly 61% of the regional total.

- The weightings of China, India, Indonesia, Korea, the Philippines and Thailand have gained on a relative basis. By country, China is the biggest weighting gainer, with its weighting in Asia Pacific ex Japan rising to circa 18.5% at end-April 2012 from just 5.4% at end-2001.

Weightings of developed and emerging markets in AP ex Japan
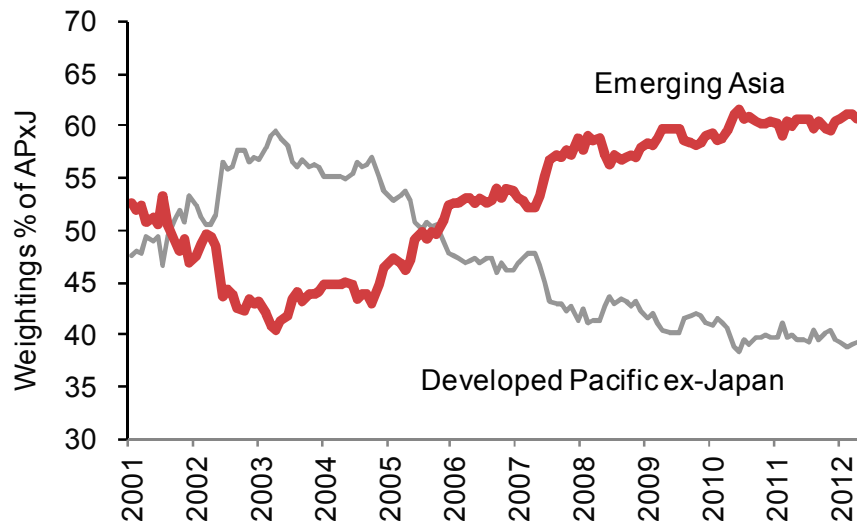
Note: Universe for calculating weightings is based on MSCI AC Asia Pacific ex Japan.
Source: MSCI, Nomura Quantitative Strategies

Asia Pacific ex Japan's weightings by country
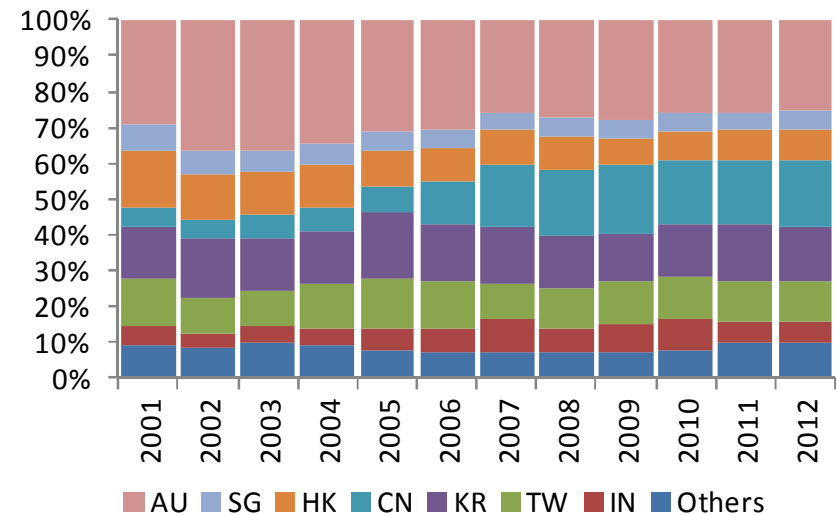
Note: Weightings are as at each calendar year end. 2012 figures are as of end April 2012. AU: Australia, SG: Singapore, HK: Hong Kong, CN: China, KR: Korea, TW: Taiwan, IN: India.
Source: MSCI, Nomura Quantitative Strategies

Asia emerging market funds have seen net outflows since March

■ Year-to-date, global equity mutual fund investors have invested a net USD19.8bn into all dedicated emerging market funds, while net outflows were seen in developed market funds. Asia emerging market funds saw net inflows in January and February, but net outflows since March.

Net equity flows (Global EM versus DM)
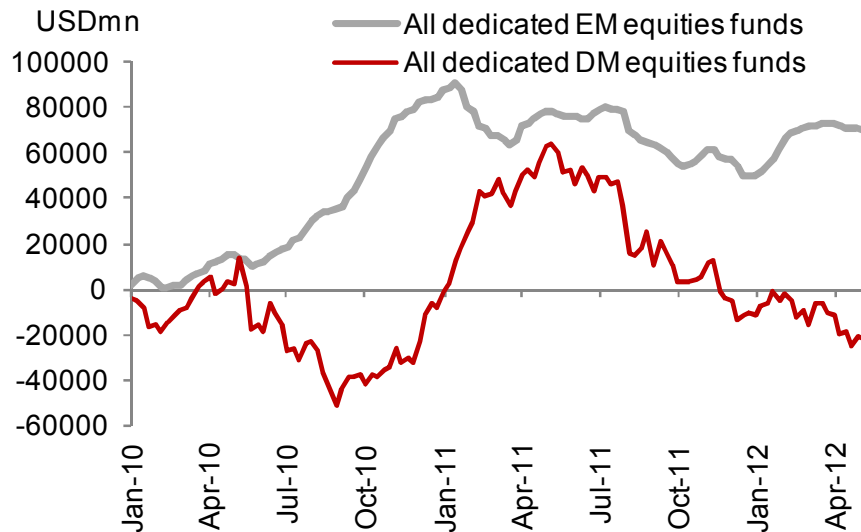
Note: Data run to 9 May. Source: EPFR Global, Nomura Quantitative Strategies

Net equity flows (regional EM versus DM)
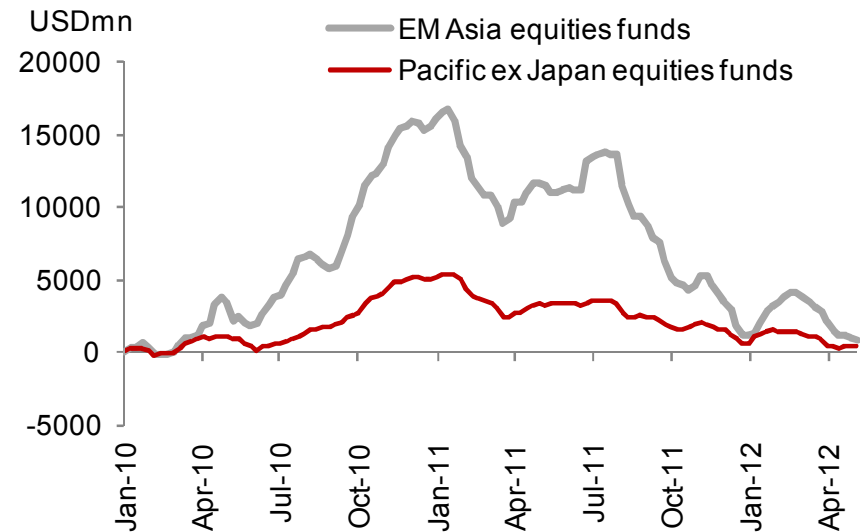
Note: Data run to 9 May. Source: EPFR Global, Nomura Quantitative Strategies

A look at return attribution: rising trend of the global factor effect

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- We observed a rising global factor effect in Asian markets amid a rising of global asset correlation.

- Emerging Asia markets such as Indonesia, India, Thailand, Malaysia, the Philippines, and Pakistan had the lowest global factor effect, whereas developed markets such as Australia and Singapore saw the opposite. This gives investors a means to diversify their global portfolio.

Global factor effect (1994 to 2011)
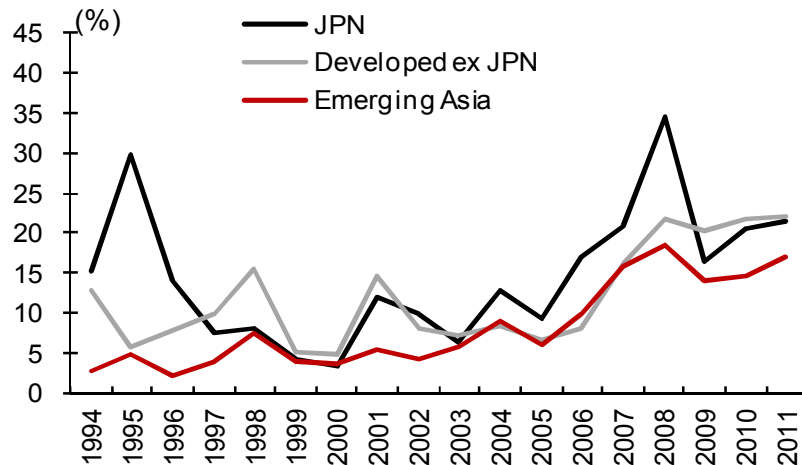
Source: FTSE, Nomura Quantitative Strategies

Global factor effect for Asia Pacific markets (2011)
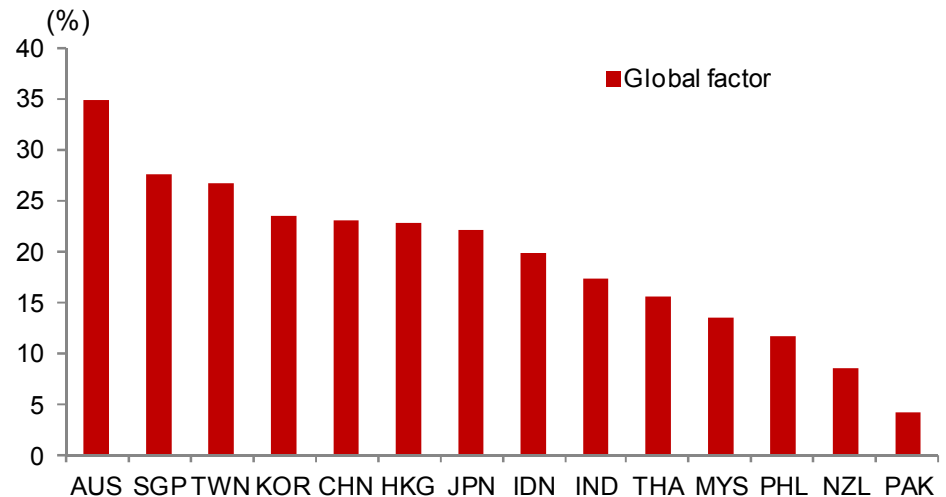
Note: AUS: Australia, SGP: Singapore, TWN: Taiwan, KOR: Korea, CHN: China, HKG: Hong Kong, JPN: Japan, IDN: Indonesia, IND: India, THA: Thailand, MYS: Malaysia, PHL: Philippines, NZL: New Zealand, PAK: Pakistan.
Source: FTSE, Nomura Quantitative Strategies

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Country factor effect still dominates

- The country factor effect is generally stronger than the sector effect in emerging Asia, especially in Pakistan, the Philippines, Indonesia, Thailand and China. However, the spread is getting narrower.

- Despite the increasing globalization of emerging Asia markets, country diversification seems to be more efficient than diversification across industries.

Spread between country and sector factor effects
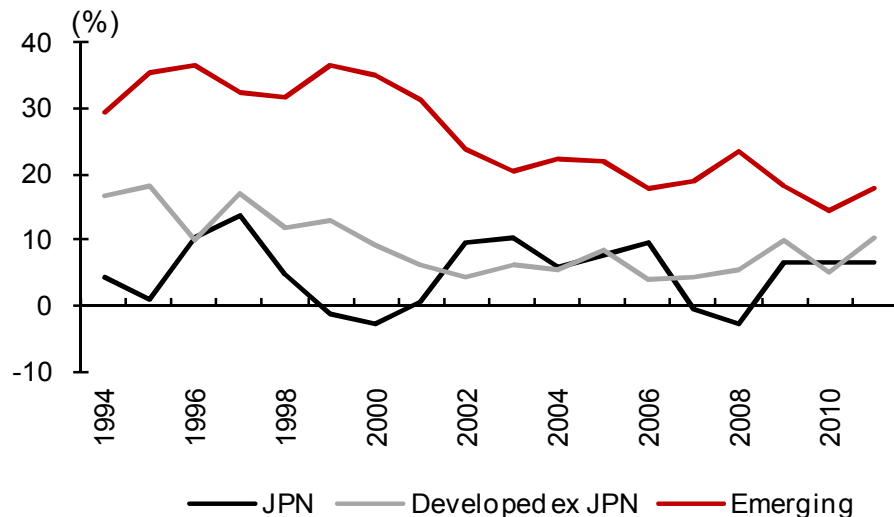
Source: FTSE, Nomura Quantitative Strategies

Country and sector factor effect (2011)

Source: FTSE, Nomura Quantitative Strategies

21
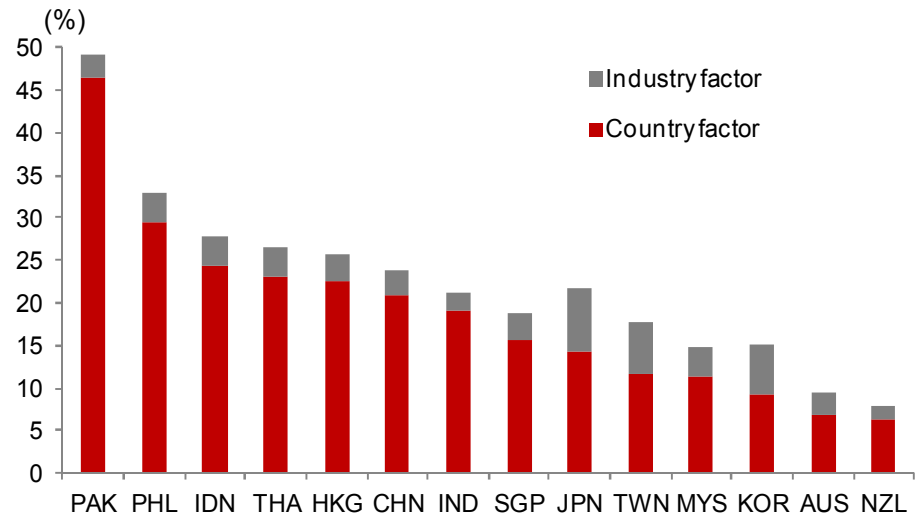
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- Different style strategies tend to cycle in and out of favour depending on the investment environment and macro circumstances. We investigate the style returns in the developed Pacific ex-Japan region and emerging Asia region. Our analysis starts from creating portfolios and calculating style indices.

Definition of eight investment styles

Style	Factors	Definition
Size *	Market cap	Log of US$ market cap
Momentum	Price momentum (12M -1M)	Last 12-month return less the last 1 month return in local currency
Yield	Dividend yield	F12-month DPS / stock price
Valuation	Earnings yield	F12-month EPS / stock price
	B/P	Actual BPS / stock price
Revision	Revision index	(Number of upward analyst revisions - number of downward analyst revisions) / total number of analysts' estimate
Growth	Sales growth (FY2)	FY2 sales / FY1 sales
	EPS growth (FY2)	FY2 EPS / FY1 EPS
Profitability	Return on equity	F12-month net profit /actual shareholders' equity
	Change in pretax profit margin	FY2 pretax profit margin - FY1 pretax profit margin
Risk *	Volatility	Past 36-month price return volatility
	Estimate dispersion	I/B/E/S FY1 consensus EPS standard deviation / absolute value for FY1 consensus EPS
	Default probability	Default probability estimated using Merton model

Note: The factors marked with * are reverse-based. Reported data are sourced from Worldscope, consensus estimate data from I/B/E/S, and price data from Exshare.
Source: Nomura Quantitative Strategies

Illustration of screening methodology
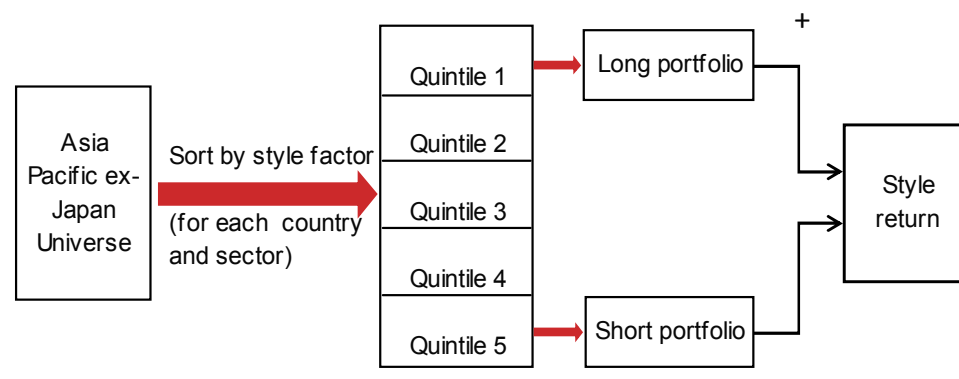
Source: Nomura Quantitative Strategies

Emerging Asia saw a higher alpha in general

- Despite closer tracking of emerging Asia stocks than ever in recent years by global investors, this doesn't stop them from delivering a better return than their developed peers in terms of quantitative factor alpha.

- Over the long run, yield, valuation and revision styles have consistently delivered a higher alpha in emerging Asia than that in developed Pacific ex-Japan. This was even more obvious after the credit crisis.

Valuation style
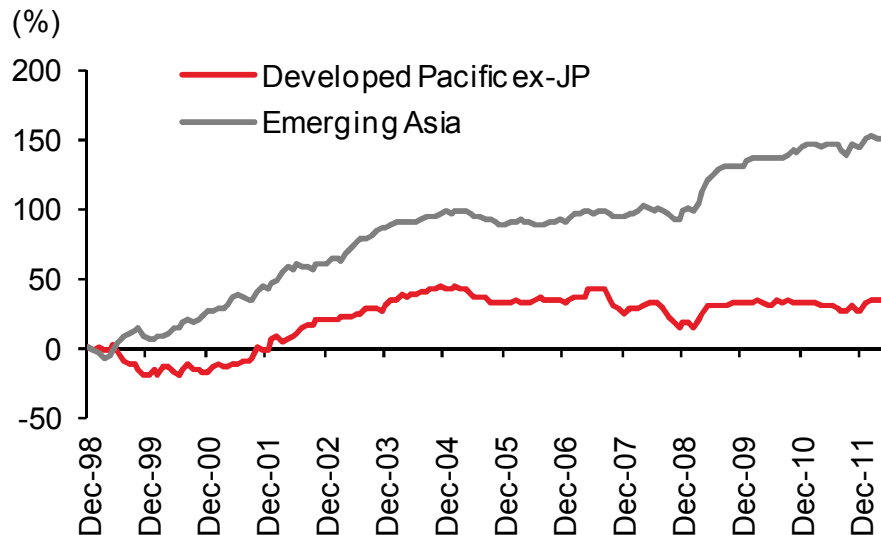
Source: Worldscope, I/B/E/S, MSCI, Nomura Quantitative Strategies

Revision style
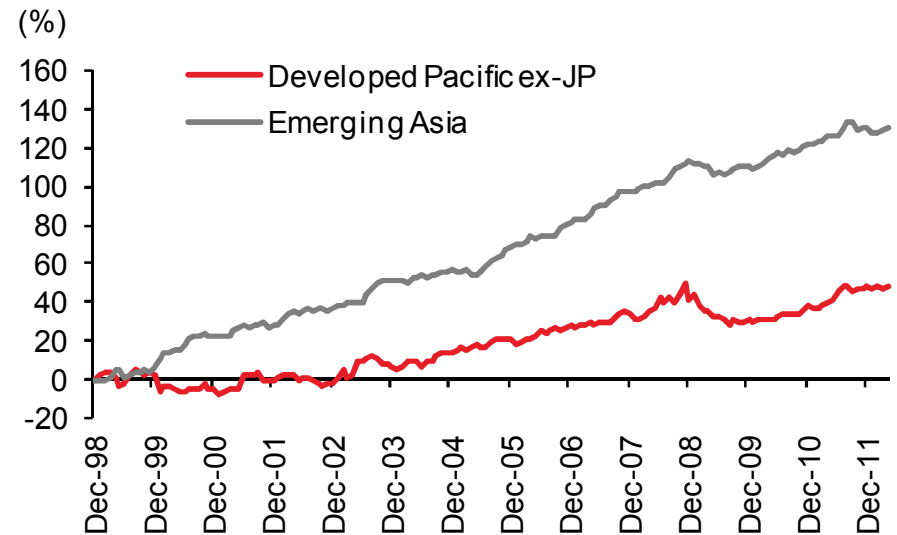
Source: Worldscope, I/B/E/S, MSCI, Nomura Quantitative Strategies

Profitability and risk measures saw a convergence in the returns

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- In contrast, there was a convergence in the performances of profitability and risk measures between emerging Asia and developed Pacific ex-Japan since 2009.

- Since 2009, the profitability style has worked in-line in both the emerging Asia and developed Pacific ex-Japan regions, suggesting investors are now focusing more on the operating quality of emerging Asia companies than before, and weight this measure similarly as that in developed markets.

Profitability style
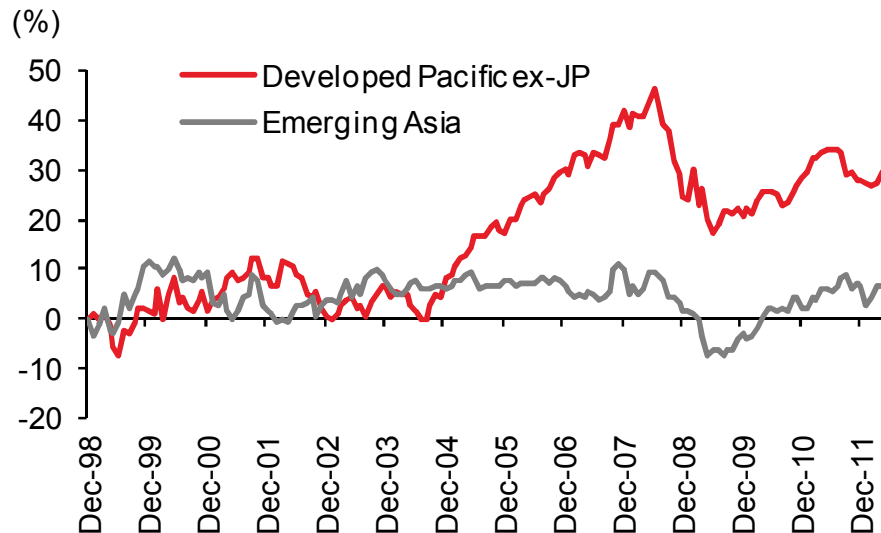
Source: Worldscope, I/B/E/S, MSCI, Nomura Quantitative Strategies

Risk* style
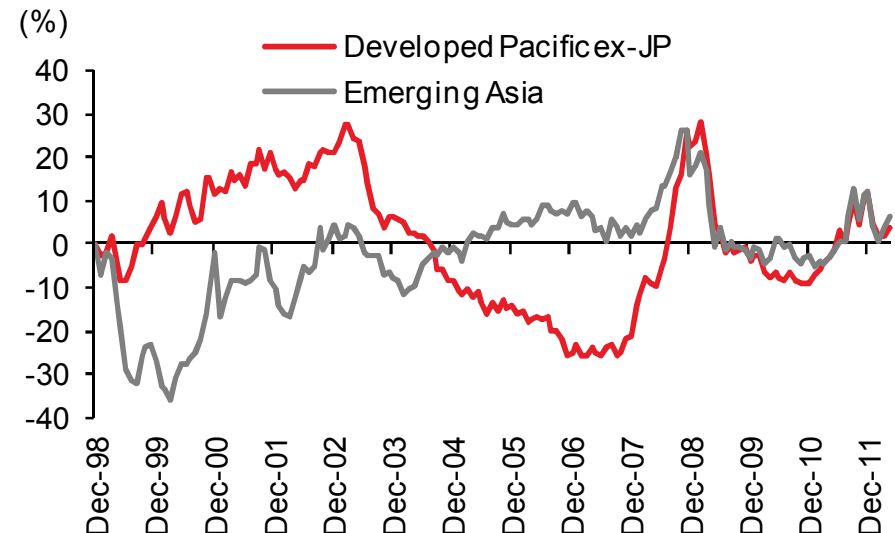
Note: Style marked with * is reverse-based.
Source: Worldscope, I/B/E/S, MSCI, Nomura Quantitative Strategies

Low correlations in style returns

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- ■ The style correlations are generally low (or negative) in Asia, reflecting that these styles offer diversification opportunities.

- ■ Notably, such low correlation appears to be more consistent in emerging Asia than that in developed Pacific ex-Japan.

Average correlation of quant styles
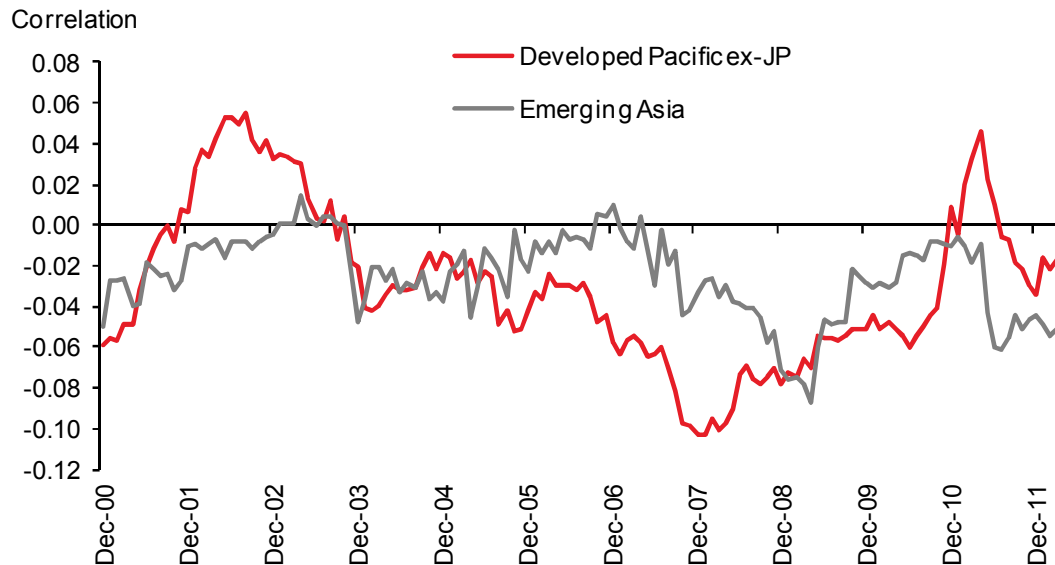
Note: Chart shows 24-month rolling average pair-wise correlation of return for the eight investment styles. Style performance is calculated by cumulating the return spread between top quintile and bottom quintile based on a composite style score. Style portfolios are rebalanced monthly with country and sector diversification.
Source: Nomura Quantitative Strategies

Our systematic style selection model in emerging Asia

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■ We exploit a systematic approach to select investment styles in emerging Asia, with the objective of securing consistent performance in the long run.

■ We compute the combined style ranking scores based on the respective long-term relative-valuation and short-term relative-strength rankings of styles. We also use market return as a risk-aversion proxy to improve style timing.

Long-term performance and correlation between style indices

Source: Nomura Quantitative Strategies
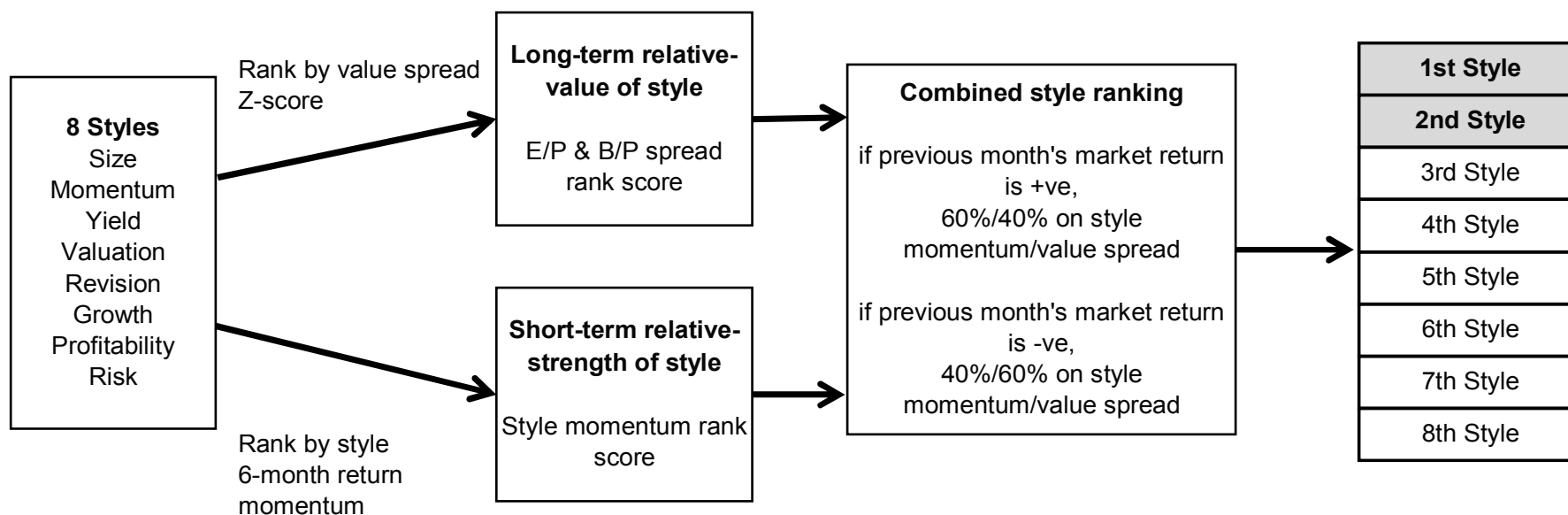
Performance of style selection model

■ Our style selection model has delivered fairly consistent performance in Asia over the cycle, with emerging Asian markets outperforming their developed peers.

■ Notably, the return spread between the two sub-regions is widening, especially since credit crisis.

Performance of style selection models for developed Pacific ex Japan and emerging Asia
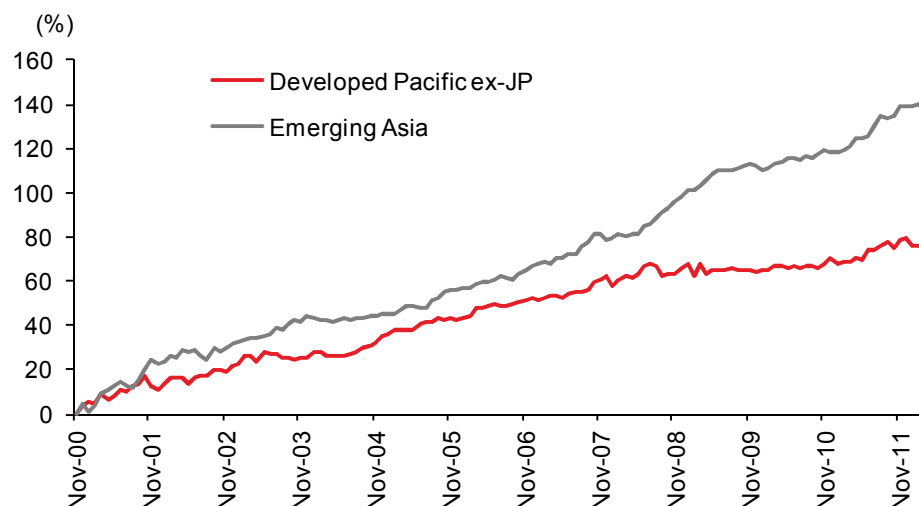
	Developed Pacific ex-JP	Emerging Asia
Annualised return (%)	6.64	12.19
Standard deviation (%)	6.43	5.82
Information ratio	1.03	2.09
Style turnover (%)	39.6	34.4

Note: The return of the model is calculated as the average long-short return of the two styles selected by the model, rebalancing monthly. The style turnover is defined as the average percentage of one-way style switch each month.
Source: Nomura Quantitative Strategies

Long-side alpha is effective in emerging Asia

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- Our emerging Asia style selection model is more effective on the long-side. This is crucial to us as individual stock liquidities may be low and short-selling facilities are limited in some emerging markets. The effective long-side alpha provides us the flexibility to implement the model as a long-only strategy with consistent outperformance over the benchmark.

Emerging Asia style selection model (long-side alpha versus short-side alpha)
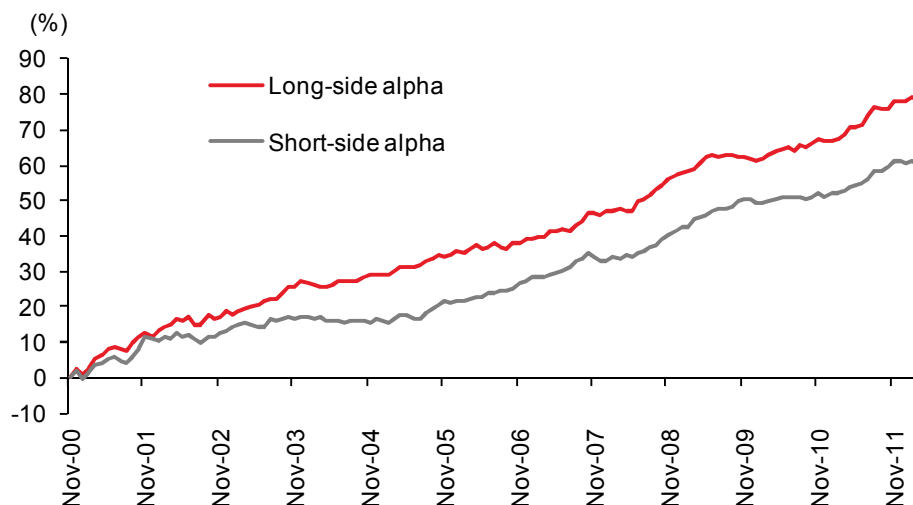
	Long-side alpha	Short-side alpha
Annualised return (%)	6.92	5.27
Standard deviation (%)	3.41	3.11
Information ratio	2.03	1.70

Note: Long-side alpha is the average of the long-only return of the two styles selected by the model, minus benchmark return. Short-side alpha is the benchmark return, minus the average of the short-only return of the two styles. We use MSCI EM Asia Index as the benchmark.
Source: Nomura Quantitative Strategies

Styles that were selected in emerging Asia

- We show the historical styles that were selected in our emerging Asia model.

Styles with the highest (attractive) ranking scores in emerging Asia
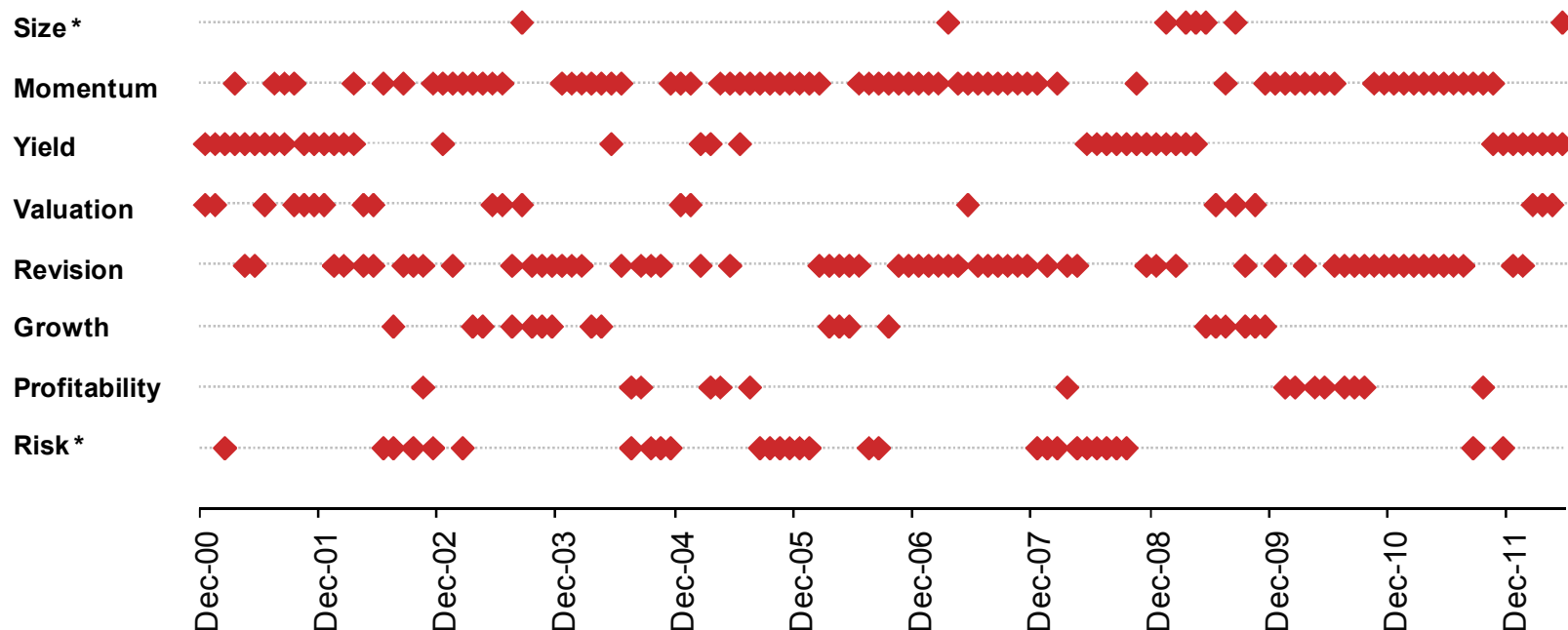
Source: Nomura Quantitative Strategies

■ We construct an optimised long-only portfolio in emerging Asia which utilises the alphas from the two chosen styles each month from our style selection model, with restricted turnover and risk control, and is able to be implemented practically.

Summary of portfolio optimization simulation

Universe	MSCI Emerging Market Asia universe
Sample period	January 2001 to April 2012 on a monthly basis
Benchmark	MSCI Emerging Market Asia Index (total return)
Method	Long stocks – short benchmark portfolio optimisation (Axioma Robust Optimisation)
Alpha factor (normalised)	Two style scores selected by our style selection model on EM Asia
Objective	Maximise alpha
Risk control (annualised)	Maximum 8% on active risk
Turnover control (1-way)	Maximum 20%
Portfolio size	Maximum 100 stocks on the long side
Country and sector neutral	Yes
Asset weight control	Maximum 10% and minimum 0.1% on each holding
Asset active weight control	Maximum +/- 2%
Rebalancing	End of every month
Performance	Subsequent one-month total return in USD

Source: Nomura Quantitative Strategies

Performance of optimised long-only portfolios

■ Our optimised long-only portfolios outperform the MSCI Emerging Asia Index after transaction costs.

Cumulative performance of optimised emerging Asia style selection portfolios

	Optimised long portfolio	MSCI EM Asia	Excess return	Excess return after transaction costs
Annualised return (%)	21.53	13.62	7.91	5.44
Standard derviation (%)	26.36	24.63	5.58	5.53
Information ratio	0.82	0.55	1.42	0.98
Average turnover (1-way; %)	20	-	20	20
Average holdings	98	-	98	98
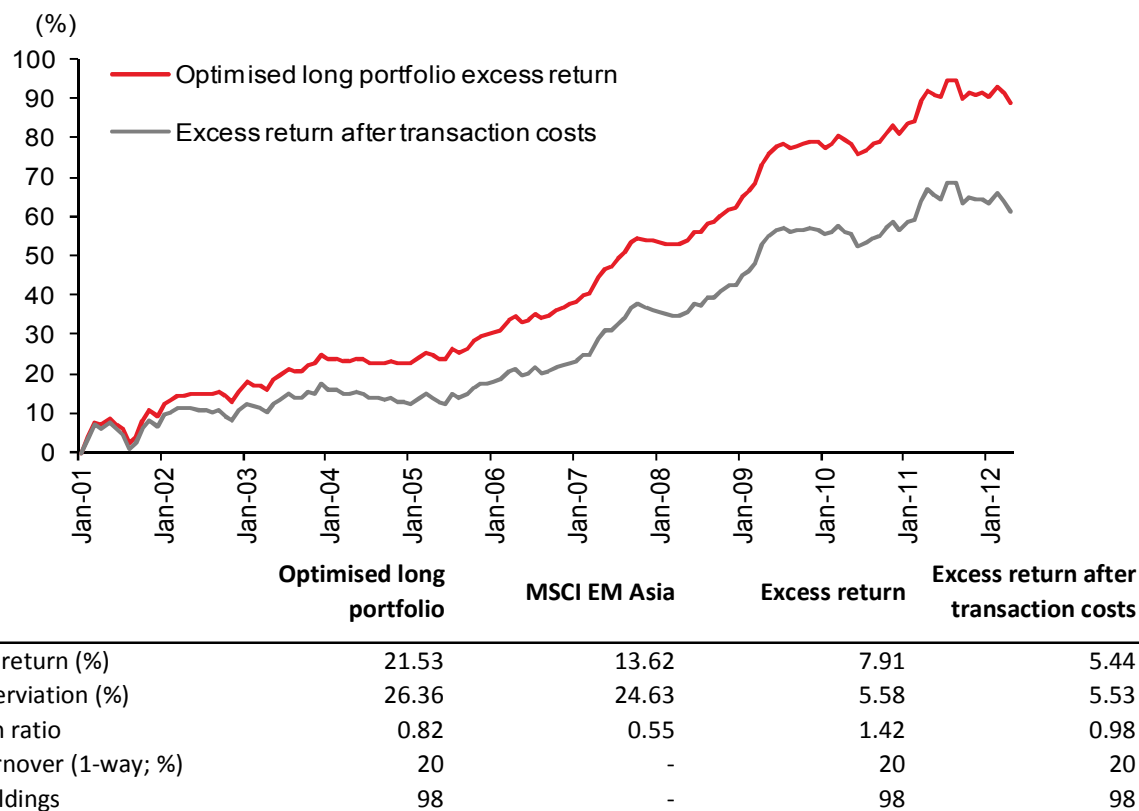
Note: Portfolio return is total return (with dividend re-invested) in USD. Benchmark is MSCI EM Asia Total Return USD Index. Returns after transaction costs are estimated using assumed one-way costs of 50bps.
Source: Axioma, Nomura Quantitative Strategies

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■ The country-neutral portfolios outperform the sector-neutral portfolios in terms of information ratio.

Optimised portfolio excess returns: country / sector effect
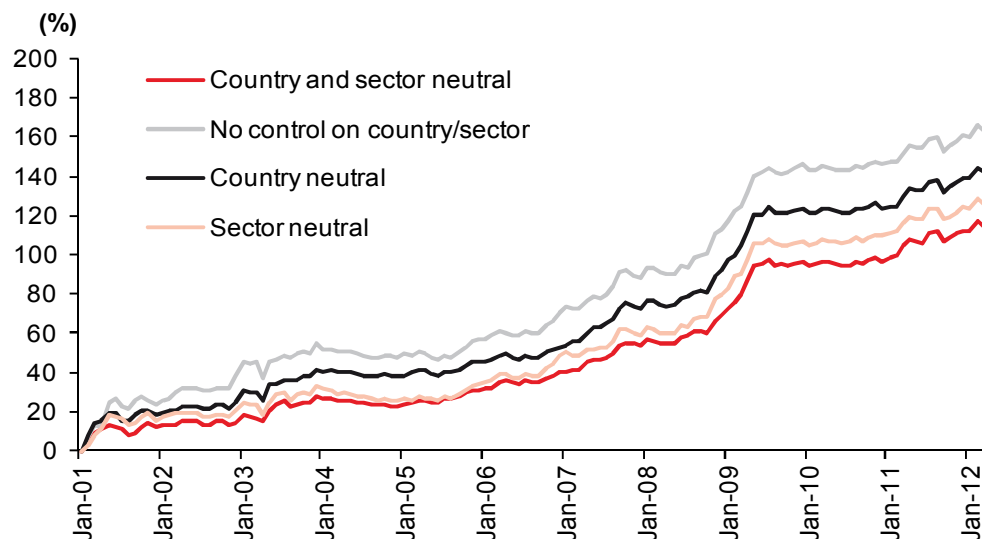
	Country and sector neutral	No control on country/sector	Country neutral	Sector neutral
Annualised return (%)	9.87	14.37	12.32	10.99
Standard derviation (%)	7.08	10.31	8.69	8.60
Information ratio	1.39	1.39	1.42	1.28
Average turnover (1-way; %)	53	56	55	55
Average holdings	91	79	85	86

Note: We relaxed turnover and risk control during this optimization. The return is excess return of the portfolio over benchmark with different settings of country/sector neutral constraints and excludes transaction costs.
Source: Axioma, Nomura Quantitative Strategies

Turnover rate matters

- By lowering the turnover rate, one may not only achieve lower transaction costs, but also reduce the power of alpha at the same time.

- Our simulation suggests the optimal one-way turnover control in our model is 20%.

Cumulative performance with different turnover controls

Turnover constraint	5%	10%	20%	30%	40%	No limits
Annualised return (%)	2.26	3.03	5.44	5.23	4.79	3.28
Standard derviation (%)	3.58	4.58	5.53	6.20	6.36	6.85
Information ratio	0.63	0.66	0.98	0.84	0.75	0.48
Average turnover (1-way; %)	9	12	20	30	38	53
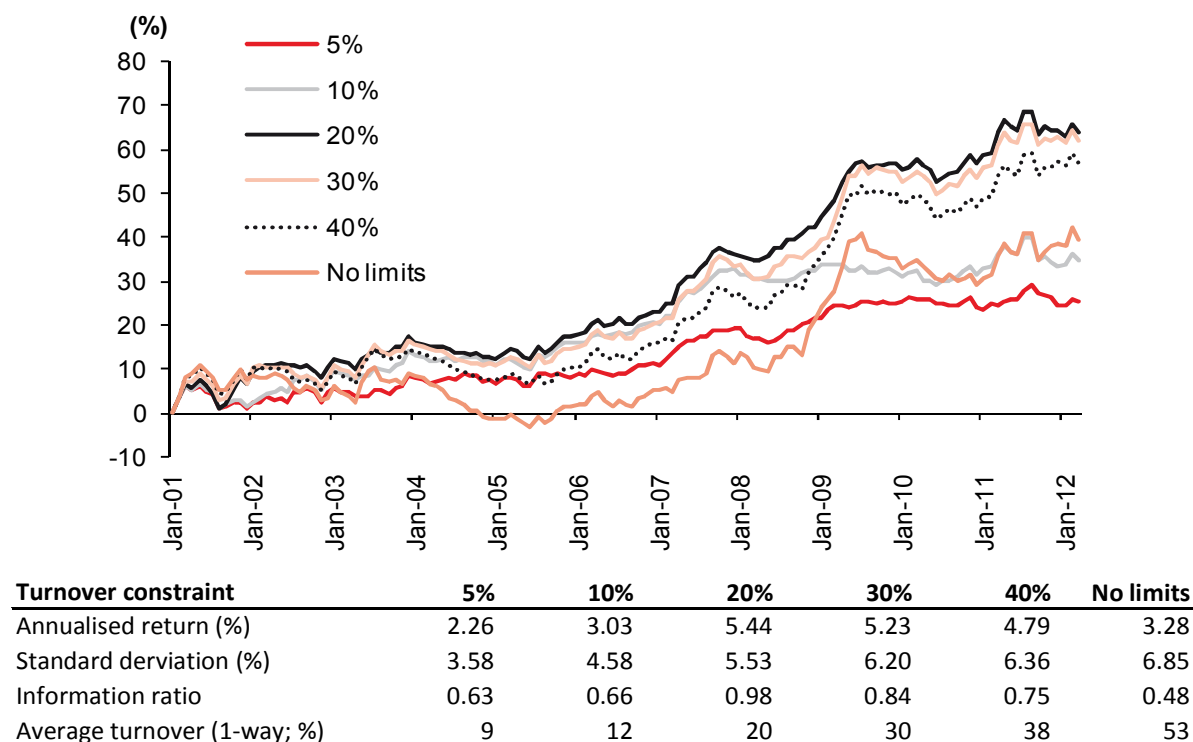
Note: Actual turnover may be higher than the limit when it violates other constraints. Excess returns after transaction costs are estimated using assumed one-way costs of 50bps.
Source: Axioma, Nomura Quantitative Strategies

Type	Factors	Definition
Size, price momentum & Liquidity	Market cap *	Log of US$ market cap
	Price momentum (1M)	Past 1-month local currency return
	Price momentum (12M -1M)	Last 12-month return less the last 1 month return in local currency
	Volume turnover ratio	Past 1-month trading volume / shares outstanding at month-end
Valuation	Dividend yield	F12-month DPS / stock price
	Earnings yield	F12-month EPS / stock price
	B/P	Actual BPS / stock price
	Cashflow yield	F12-month cashflow per share / stock price
	EBITDA/EV	(F12-month net profit + actual interest expense + actual depreciation) / (market cap + interest-bearing debt - cash - short-tern marketable securities)
Revision & earnings yield	Revision index	(Number of upward analyst revisions - number of downward analyst revisions) / total number of analysts' estimate
	Change in earnings yield	F12-month earnings yield - past 3-month average earnings yield
	StarMine predicted surprise	(SmartEstimate F12-month - consensus mean) / max(divisor, |mean|)
	Normalised E/P	(F12-month earnings yield - average earnings yield in past 36 months) / standard deviation of the earnings yields in the past 36 months
Growth	Sales growth (FY2)	FY2 sales / FY1 sales
	EPS growth (FY2)	FY2 EPS / FY1 EPS
Financial	Return on equity	F12-month net profit / actual shareholders' equity
	Shareholders' equity ratio	Actual shareholders' equity / actual total assets
	Pretax profit margin	F12-month pretax profit / F12-month sales
Risk	Volatility	Past 36-month price return volatility
	Estimate dispersion	I/B/ES FY1 consensus EPS standard deviation / absolute value for FY1 consensus EPS
	Default probability *	Default probability estimated using Merton model

Note: The factors marked with * are reverse-based. Source: Nomura Quantitative Strategies

Each beta coefficient is estimated according to the following procedure. Analyses are conducted every year using weekly returns.

1. Multifactor model for attribution analysis
We assume that returns of individual stocks are explained by the multifactor model below.

$$R_{it} = \alpha_i + \beta_i^M M_t + \beta_i^C C_{jt} + \beta_i^I I_{kt} + \varepsilon_{it}$$

Here, R_{it} stands for the return of stock i denominated in local currency at time t. M_t, refers to the return of the FTSE All-World Index, while C_{jt} and I_{kt} are the country and global industry factor returns at time t, respectively.

2. Pre-estimation of coefficient against global market, $\beta^M{}_i$
We first estimate $\beta^M{}_i$ using the regression method below.

$$R_{it} = \alpha_i + \beta_i^M M_t + u_{it}$$

3. Estimation of factor returns for country and sector factors
Using $\beta^M{}_i$ derived in above, we calculate the residual return, $r_{it.}$

$$r_{it} = R_{it} - \beta_i^M M_t = \alpha_i + u_{it}$$

Then, we estimate the weekly country factor, C_{jt} , and the industry factor, I_{kt} , by cross-sectional regression techniques.

$$r_{it} = \sum_{j=1}^{13} d_{ji}^C C_{jt} + \sum_{k=1}^{9} d_{ki}^I I_{kt} + \varepsilon_{it}$$

4. Estimation of coefficient (factor beta)
Finally, we consider the coefficient (factor beta) for each stock by applying the country and industry factors calculated using the formulae in 3 above.

$$R_{it} = \alpha_i + \beta_i^M M_t + \beta_i^C C_{jt} + \beta_i^I I_{kt} + \varepsilon_{it}$$

Note: Methodology from Quantitative Landscape (18 August 2010). Source: Nomura Quantitative Strategies

Appendix III: Long-term factor performance

Factor	Long-term: APxJ			Long-term: APxJ DM			Long-term: APxJ EM		
	Return	R/R	Rank	Return	R/R	Rank	Return	R/R	Rank
Market cap *	2.3	0.3	13	0.8	0.1	12	2.6	0.3	13
Price momentum (1M)	(6.0)	(0.7)	21	(4.1)	(0.5)	20	(6.5)	(0.7)	21
Price momentum (12M -1M)	3.6	0.4	11	4.5	0.5	7	3.4	0.3	12
Volume turnover ratio	2.6	0.4	12	2.0	0.3	10	2.7	0.3	11
Dividend yield	3.4	0.5	9	0.2	0.0	13	4.4	0.6	9
Earnings yield	8.7	1.4	2	3.4	0.4	8	10.2	1.4	2
B/P	4.3	0.6	8	(0.1)	(0.0)	14	5.6	0.7	8
Cashflow yield	6.3	1.1	7	3.9	0.5	5	7.0	1.1	6
EBITDA/EV	5.9	1.2	5	3.6	0.6	4	6.6	1.1	4
Revision index	6.7	1.8	1	3.0	0.5	6	8.0	1.8	1
Change in earnings yield	8.5	1.3	4	6.5	0.9	2	9.1	1.1	3
StarMine predicted surprise	5.9	1.3	3	6.2	1.0	1	5.9	1.0	7
Normalised E/P	6.5	1.1	6	4.3	0.6	3	7.2	1.1	5
Sales growth (FY2)	(0.1)	(0.0)	15	(1.3)	(0.2)	17	0.4	0.1	15
EPS growth (FY2)	1.8	0.4	10	2.0	0.3	9	1.8	0.3	10
Return on equity	1.8	0.2	14	1.9	0.2	11	1.7	0.2	14
Shareholders' equity ratio	(3.3)	(0.7)	20	(3.2)	(0.5)	21	(3.2)	(0.6)	20
Pretax profit margin	(1.5)	(0.3)	19	(3.5)	(0.5)	19	(0.7)	(0.1)	17
Volatility	(0.7)	(0.1)	16	(0.5)	(0.1)	15	(0.8)	(0.1)	16
Estimate dispersion	(0.7)	(0.1)	17	(0.9)	(0.1)	16	(0.9)	(0.1)	18
Default probability *	(2.2)	(0.2)	18	(3.1)	(0.3)	18	(1.6)	(0.2)	19

Note: Long-term factor performance from January 1999 to April 2012; R/R refers to the average return/standard deviation and rank is based on R/R. Factor returns are generated by calculating the subsequent performance of an equal-weighted portfolio that is long the highest one-third and short the one-third with the lowest scores (rebalanced monthly with country/sector diversified), except for the factors marked with *, which are reverse-based. See Appendix I for factor definition. Universe is based on constituents in the MSCI Index.
Source: Worldscope, I/B/E/S, StarMine, MSCI, Nomura Quantitative Strategies

Appendix IVa: Introducing enhanced earnings-revision strategy

- Reference reports: 1) *The long and the short of beating the herd: An enhanced earnings-revision strategy*, 25 September 2009; 2) *China Quantitative Strategy - Towards the futures*, 5 March 2010.

- Our earnings-revision indicator: $ERI_{i,t} = \dfrac{FY2EPS_{i,t}}{(FY2EPS_{i,t-1} + FY2EPS_{i,t-2} + FY2EPS_{i,t-3})/3} - 1$

- Concept: Investors can make better use of analysts' earnings-revision information by quantifying stock-specific signals and factors — such as valuations, predicted surprises and price/volume momentum — that reinforce the impact of earnings revisions in each market.

Image of enhanced earnings-revision strategy
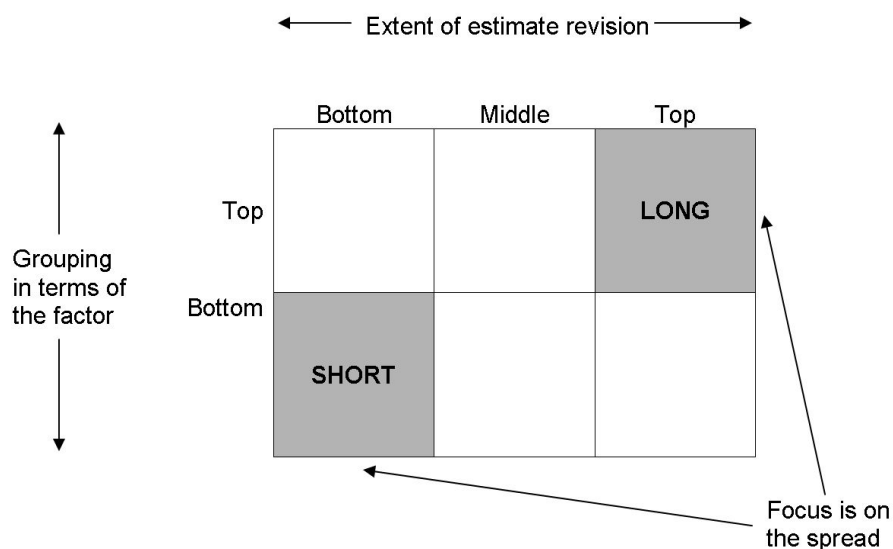
Note: Shaded five factors are selected to form a composite factor.
Source: Worldscope, I/B/E/S, StarMine, Nomura Quantitative Strategies

Grouping simulation results for factor (example: CSI300)

Factor	Hypothesis: Expected Impact	Bottom ER (Factor: Top-bottom) Mean (%)	t-stat	Top ER (Factor: Top-bottom) Mean (%)	t-stat	Top-bottom ER (Factor enhanced) Mean (%)	t-stat
Log of market cap in US$	Negative	-5.8	-1.38	-10.4	-2.39	15.5	4.47
Turnover	Positive	5.8	1.32	10.2	2.18	12.2	3.42
Book value to price ratio	Positive	13.7	3.53	6.1	1.33	16.3	4.52
Forecast earnings to price ratio	Positive	11.7	3.36	7.2	1.91	14.2	3.64
Dividend yield	Positive	-0.3	-0.09	5.3	1.64	6.4	1.67
Forecast dividend yield	Positive	3.9	1.27	0.1	0.03	5.7	1.26
Past one-month return	Negative	-15.9	-3.76	1.4	0.32	16.7	3.85
Past three-month return	Negative	-9.0	-2.11	1.6	0.33	11.9	2.76
Change in turnover	Positive	-9.0	-2.91	2.2	0.62	10.6	2.44
Liquidity impact	Negative	-7.9	-1.73	-14.8	-4.23	17.5	3.40
Price volatility	Positive	1.6	0.38	-2.0	-0.49	8.8	2.29
Analyst coverage (FY1)	Positive	1.0	0.29	7.2	1.34	11.2	1.80
Analyst coverage (FY2)	Positive	2.4	0.63	3.3	0.66	7.2	1.17
Earnings estimate dispersion (FY1)	Positive	-0.5	-0.14	4.1	1.16	4.0	0.85
Earnings estimate dispersion (FY2)	Positive	1.7	0.40	1.9	0.45	7.0	1.57
StarMine predicted surprise (FY1)	Positive	1.0	0.27	8.3	3.23	9.2	2.01
StarMine predicted surprise (F12M)	Positive	5.1	1.49	7.2	2.37	10.0	2.27
Analysts' recommendation revision	Positive	-3.9	-1.27	2.8	0.73	6.9	1.82
Consensus rating	Negative	0.7	0.23	-5.7	-1.82	10.1	2.25
Change in consensus rating	Negative	-10.4	-4.05	-5.9	-2.03	14.8	3.48

■ Results are mixed at the market level: typically for companies with more attractive valuations, turnover increases, positive consensus ratings, positive StarMine-predicted surprise, higher price volatility, higher earnings estimate dispersion, and for those that recently underperformed, our analysis suggests that they tended to react more strongly to earnings estimate upgrades, and vice versa.

Composite factor mix, by country

Country		Factor	Weighting	Country		Factor	Weighting
Australia	F1	Analysts' recommendation revision	1	China	F1	Change in consensus rating	-1
	F2	Analyst coverage (FY2)	1		F2	Book value to price ratio	1
	F3	Change in consensus rating	-1		F3	StarMine predicted surprise (FY1)	1
	F4	Liquidity impact	-1		F4	Log of market cap in USD	-1
	F5	Forecast earnings to price ratio	1		F5	Price volatility	1
Hong Kong	F1	Analysts' recommendation revision	1	India	F1	Analysts' recommendation revision	1
	F2	Change in turnover	1		F2	Dividend yield	1
	F3	Consensus rating	-1		F3	Past one-month return	-1
	F4	Past three-month return	-1		F4	Book value to price ratio	1
	F5	Forecast earnings to price ratio	1		F5	Consensus rating	-1
Korea	F1	Past one-month return	-1	Malaysia	F1	Analysts' recommendation revision	1
	F2	Past three-month return	-1		F2	Analyst coverage (FY2)	1
	F3	Book value to price ratio	1		F3	Forecast earnings to price ratio	1
	F4	StarMine predicted surprise (FY1)	1		F4	Change in consensus rating	-1
	F5	Analysts' recommendation revision	1		F5	Book value to price ratio	1
Singapore	F1	Turnover	1	Thailand	F1	Price volatility	1
	F2	Book value to price ratio	1		F2	Earnings estimate dispersion (FY1)	1
	F3	Analysts' recommendation revision	1		F3	Turnover	1
	F4	Price volatility	1		F4	Past one-month return	-1
	F5	Change in consensus rating	-1		F5	Change in turnover	1
Taiwan	F1	Past three-month return	-1	China	F1	Book value to price ratio	1
	F2	Past one-month return	-1	CSI 300	F2	Log of market cap in USD	-1
	F3	Book value to price ratio	1		F3	Forecast earnings to price ratio	1
	F4	Dividend yield	1		F4	Change in consensus rating	-1
	F5	Forecast earnings to price ratio	1		F5	Turnover	1

Note: Weighting with 1, or -1 refers to the factor has a positive, or a negative impact to earnings revision in our hypothesis. Source: Nomura Quantitative Strategies

Appendix IVc: Enhanced earnings revision strategy performance

■ Rigorous back-testing shows that the composite factor enables us to better isolate companies that display a positive (negative) impact owing to upward (downward) earnings revisions.

■ Long potential outperformers (high composite factor) in top earnings revision group; short potential underperformers (low composite factor) in bottom earnings revision group.

Results of Asia portfolio optimisation simulation
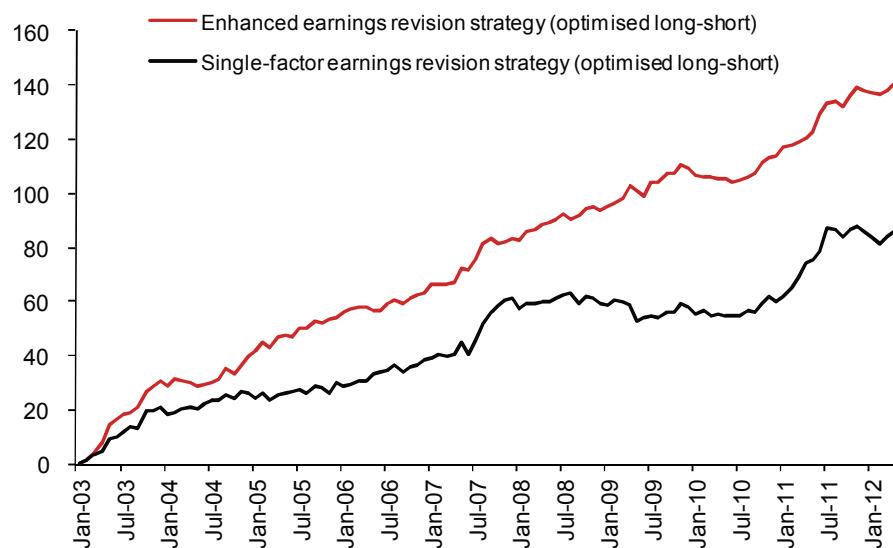
Note: Back test with 20% turnover and 8% risk control.
Source: Axioma, Nomura Quantitative Strategies

Performance of enhanced earnings-revision strategy
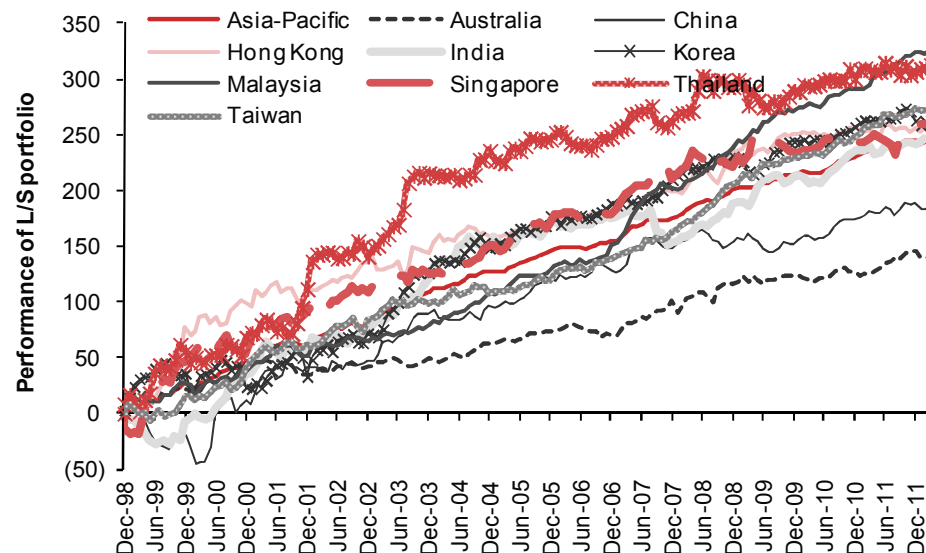
Note: Universe is based on the MSCI constituents.
Source: Nomura Quantitative Strategies

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- Reference reports: *Playing high yield: saving the score*, 24 June, 2010.

- Concept: Since investors look at high dividend yield as a form of 'safety net', factors that indicate the reliability and sustainability of the dividend yield are important in the high-yield universe. We create a composite score based on factors that are considered good indicators of dividend reliability: earnings capability, earnings quality, growth, recent forecast change, net upgrades, DPS revision backed by EPS revision, stable DPS and psychological resistance.

Image of high dividend yield strategy

High yield stocks - distribution of reliability score

Long only high yield stocks with reliability score >= 0
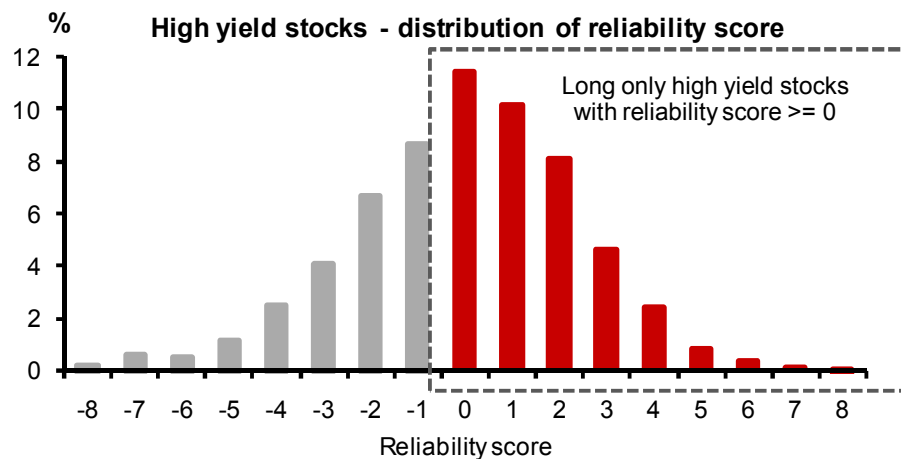
Dividend reliability composite score

Category	Factor name	Est. Sign	Score		
			Top 1/3	Middle 1/3	Bottom 1/3
Capability	Payout ratio	Negative	-1	0	+1
Earnings quality	Accruals	Negative	-1	0	+1
Growth	EPS growth	Positive	+1	0	-1
Forecast change	Forecast EPS change	Positive	+1	0	-1
Net upgrades	Net analyst upgrades for DPS	Positive	+1	0	-1
Unincorporated Revision	EPS revision – DPS revision	Positive	+1	0	-1
Stability of DPS	Volatility of DPS	Negative	-1	0	+1
Psychological resistance	Yield change	Positive	+1	0	-1

Note: Universe is based on MSCI All Country Asia-Pacific ex-Japan. Portfolios are rebalanced monthly and grouping simulation is conducted with country and sector diversification.
Source: Nomura Quantitative Strategies

■ The performance of high dividend yield strategy improves significantly, from 2pp to 7pp annual excess return, when the composite score is used for checking the reliability of the high-yield stocks. Even during times where dividend yield is not effective, consideration of the extra reliability check in a high dividend yield strategy delivers better performance.

Performance of high dividend yield strategy by setting a minimum criterion for the composite score
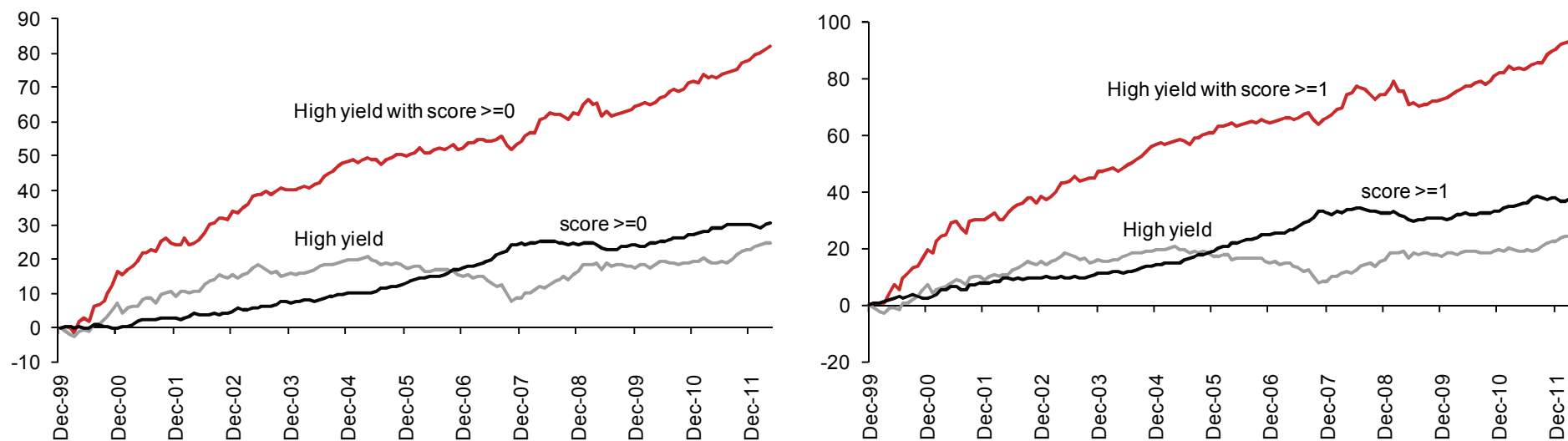
	High yield	Score >=0	Score >= 1	High yield with	
				Score >=0	Score >= 1
Annualized return over benchmark (%)	2.01	2.46	3.12	6.65	7.65
Risk (%)	3.17	1.42	2.03	4.09	5.05
IR	0.64	1.73	1.54	1.63	1.51

Note: Chart shows excess return over benchmark. Benchmark is the equally weighted return of the constituents in MSCI AC Asia Pacific ex Japan.
Source: Nomura Quantitative Strategies

■ Reference reports: 1) *Return reversal: catching the swing*, 7 December 2009; 2) *China Quantitative Strategy - Towards the futures*, 5 March 2010.

■ Concept: We look at two potential fine-tuners for a one-month return-reversal strategy. First, to identify stocks that are more likely to revert from overreactions, we focus on those with low analysts' earnings estimate dispersion. Second, we attempt to remove the proportion of raw price returns that can be explained by fundamental factors, to analyse residual return as a purer technical estimate of overreaction.

Image of low-dispersion return-reversal strategy

Low dispersion reversal

High dispersion reversal
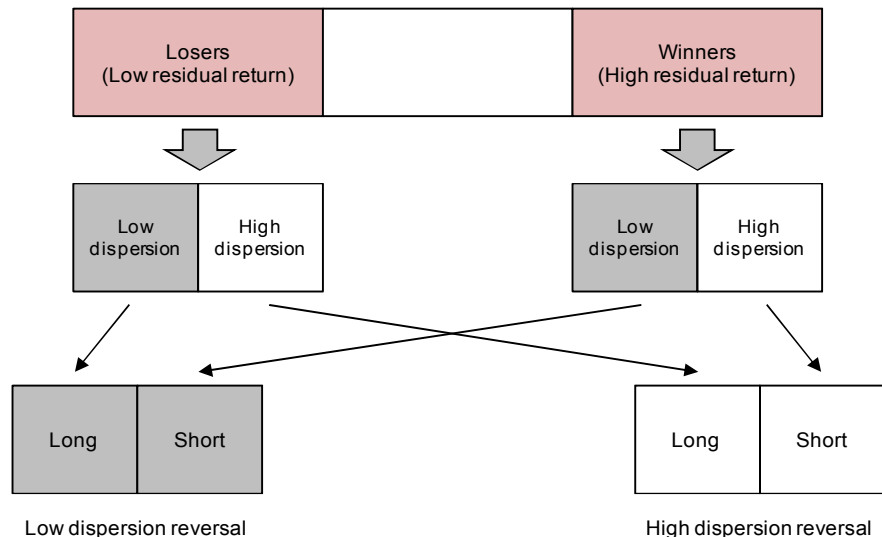
Calculation of the residual returns

■ Perform cross-sectional regression for each market with the following fundamental factors as independent variables and add a sector dummy to neutralise the sector effect.

- Market beta (36-month sensitivity against the index)
- Size (log of market cap)
- Value (forward 12-month E/P)
- Momentum (12-month return)
- Sector dummies (GICS 1)

$$r_s = a + \sum b_i X_i + \sum d_j I_j + \varepsilon$$

■ The residual return is calculated by the following equation:

$$r_r = r_s - \sum b_i X_i - \sum d_j I_j$$

Source: Nomura Quantitative Strategies

■ Our analysis indicates that stocks with low analyst estimate dispersion have a tendency to revert faster from investor overreaction than the high dispersion group, especially for undervalued (loser group) stocks. Using residual return (the excess return that is not explained by typical fundamental factors) can further enhance the return predictive power of a short-term return reversal strategy.

Performance of high- and low-dispersion reversal
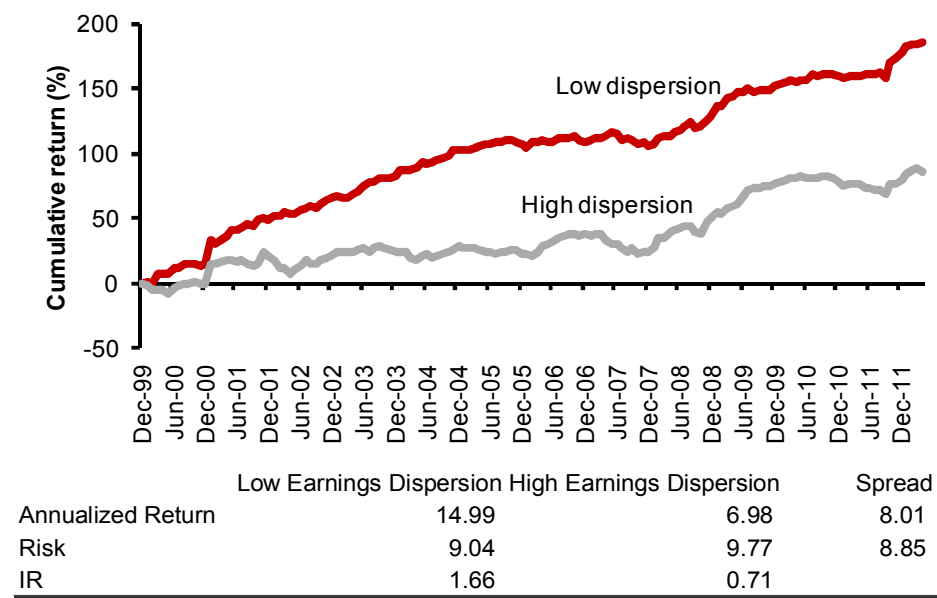
	Low Earnings Dispersion	High Earnings Dispersion	Spread
Annualized Return	14.99	6.98	8.01
Risk	9.04	9.77	8.85
IR	1.66	0.71	

Note: Universe is based on the constituents of MSCI Hong Kong, China (HK listed), Korea, Taiwan, Singapore, and Australia. Source: Nomura Quantitative Strategies

Performance of Low Dispersion Reversal Strategy
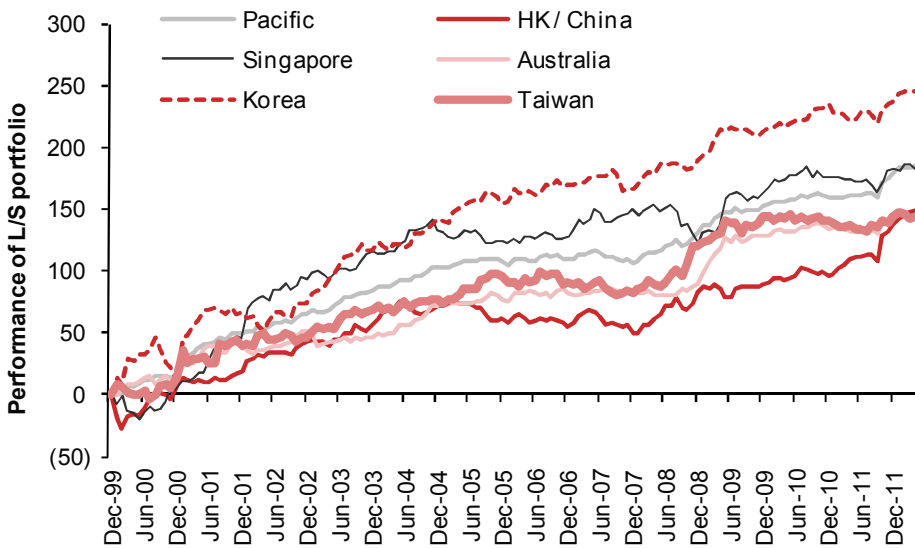
Note: Universe is based on the constituents of MSCI Hong Kong, China (HK listed), Korea, Taiwan, Singapore, and Australia. Source: Nomura Quantitative Strategies

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