



Updating our best quant ideas

Quantitative macro and micro forecasts for the month

In this report we present our latest quantitative forecasts for the coming month. Our models are designed to generate both bottom-up stock selection ideas as well as top-down asset, country, and style allocation calls.

Reversal strategies are in favor while Momentum has faltered

July has seen a strong run up in the one-month reversal factor; while twelve month Momentum has given back much of its June performance. Analyzing the performance and direction of Momentum and Reversal in tandem can tell us something about the current state of the market.

Momentum, Reversal and Beta

We find that Momentum and Reversal performance has been heavily impacted by Beta exposure over the last three months. In the case of Reversal, this exposure has been favorable to the factor. In contrast, Momentum has seen its performance diminished by its Beta exposure – something we have noted consistently for Momentum in the past.

Knowing factor Beta exposure is important

Factors may pick up significant exposure and correlation to Beta over time and this exposure can have significant impact on factor performance when markets move sharply. Knowing factor Beta exposure is crucial to navigate volatile markets in our current risk-on/risk-off era.

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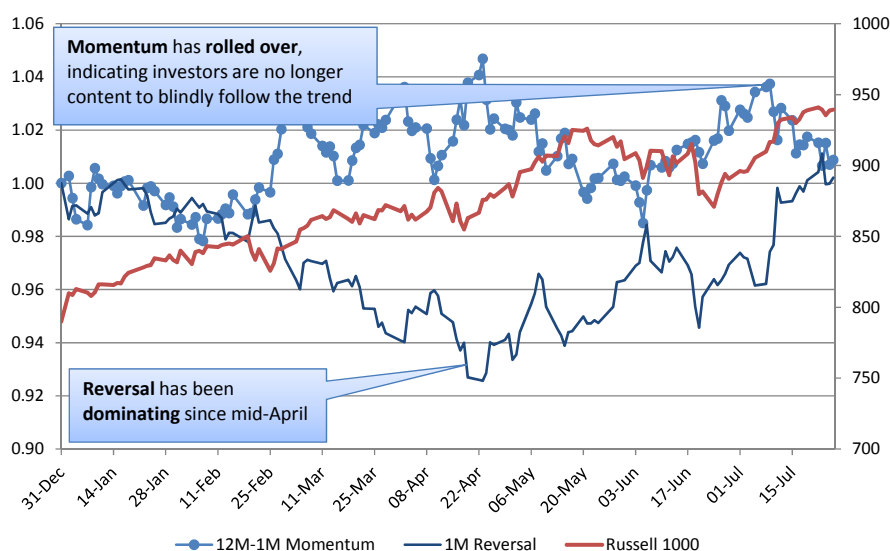
Quantifying markets

Two sides of the same coin?

Momentum has faltered and reversal is dominating: What does it mean?

Since late April, the one-month Reversal factor has been having a strong run in performance. At the same time, the 12-month price momentum strategy has faltered (Figure 1). These two strategies are the most basic in the entire quant playbook. Reversal just buys stocks with the worse performance last month and sells those with the best performance. In other words, it is a simple mean reversion play. Momentum, on the other hand, buys stocks that have been going up over the last year, and sells those that have been going down (after subtracting the most recent month, to avoid the aforementioned reversal effect).

Figure 1: Performance of Reversal and Momentum in Russell 1000 universe



Source: Bloomberg Finance LP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank

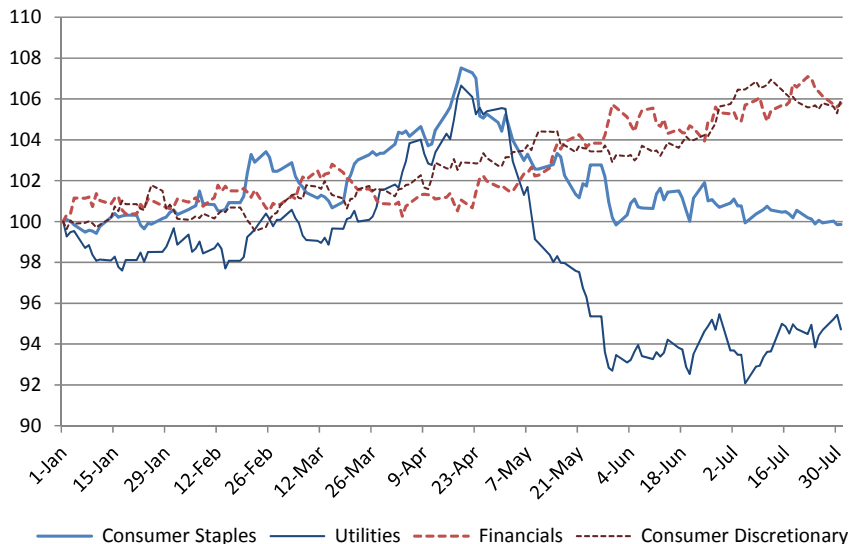
Therefore, watching these two strategies in action tells us something about the state of the market. The fact that Reversal is dominating right now suggest a more opportunistic market. Investors – perhaps unsure which way the next market move will be – are taking profits on short-term strength and buying in on short-term weakness. In contrast, the longer-term trend in stocks is being ignored. Perhaps the world has changed too much in the past few months for investors to put too much faith in past performance?

Sector rotation at work?

Or maybe this behavior is being driven by some short-term sector rotation trades? It's certainly true that the sharp rotation out of more defensive sectors – like Utilities and Consumer Staples – and into more cyclical sectors – like Consumer Discretionary and Financials – looks like it coincides with the change in fortune for Momentum and Reversal (Figure 2).



Figure 2: Market-relative performance of select sectors year-to-date

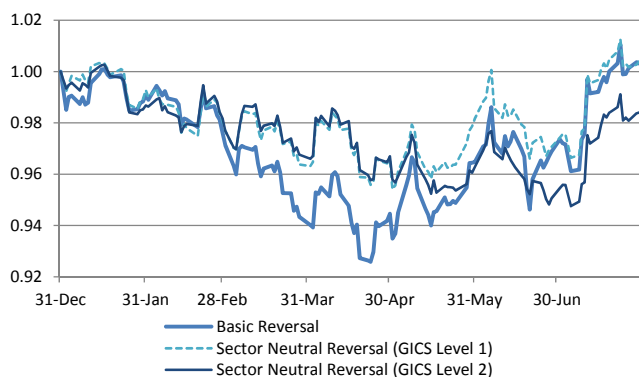


Source: Bloomberg Finance LP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank

To isolate the sector effect, we can re-run our backtests in a sector neutral setting. To do this, we just z-score our factor scores within (1) GICS Level 1 Sectors and (2) GICS Level 2 Industry Groups. The results for Reversal are shown in Figure 3 and Momentum in Figure 4.

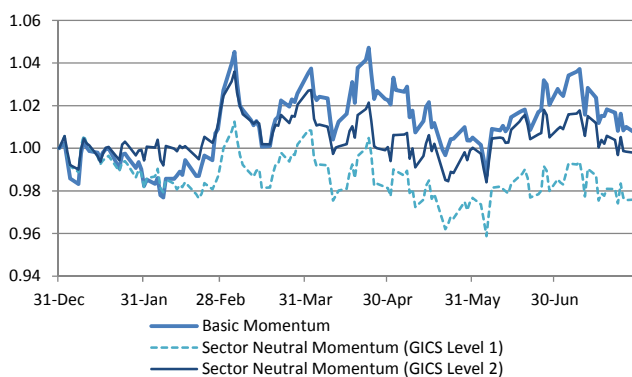
It turns out the sector effect can't completely explain the recent strength in Reversal, nor is it driving the slide in Momentum. In other words, even within Sectors and Industry Groups, stocks are mean reverting more than they are trending. Larger forces are at play here.

Figure 3: Performance of Reversal and sector neutral Reversal



Source: Bloomberg Finance LP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank

Figure 4: Performance of Momentum and sector neutral Momentum



Source: Bloomberg Finance LP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank

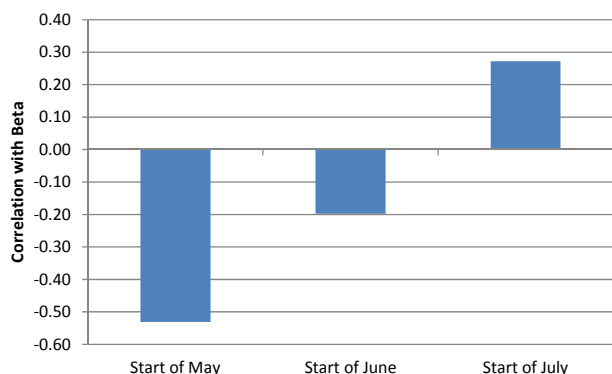


Bad beta!

In our paper “Reviving Momentum”, we showed that cross-sectional beta exposure can be a big driver of factor performance, particularly around turning points.¹ We saw two such turning points recently: QE tapering-related angst May 22nd and then a relief rally after June 19th when the Fed clarified some of the commentary. Perhaps Momentum has become tainted with beta once again?

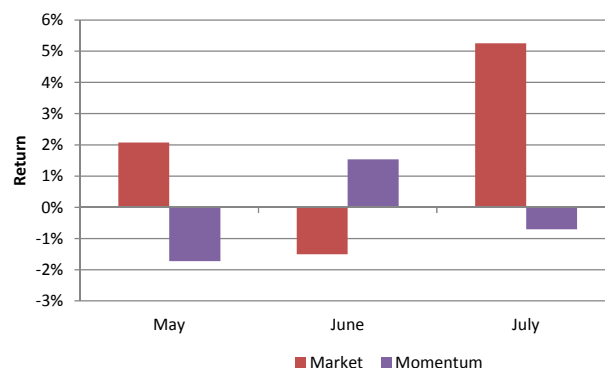
Let’s look at those beta exposures at the start of each month from May to June. What’s important to see is that over May the Momentum factor had a large tilt towards low Beta stocks, which was harmful to its performance given that May resulted in a risk rally that saw higher Beta stocks outperform lower Beta stocks. Subsequent to May, Figure 5 shows that Momentum has gradually increased its correlation/exposure to Beta and as of the beginning of last month the correlation has turned slightly positive.

Figure 5: Beta exposure of momentum at start of past three months



Source: Bloomberg Finance LP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank

Figure 6: Performance of market and momentum strategy over each month



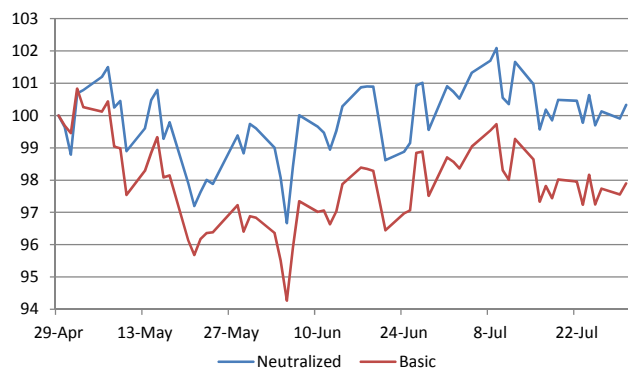
Source: Bloomberg Finance LP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank

So let’s neutralize and see what happens. As we have seen consistently in past research, neutralizing Momentum for its Beta exposure – i.e. isolating the stock-specific component of Momentum – tends to benefit its performance over time (Figure 7 and Figure 8).

¹ Alvarez et al., 2011, “Signal Processing: Reviving Momentum – Mission Impossible?”, *Deutsche Bank Quantitative Strategy*, 6 July 2011

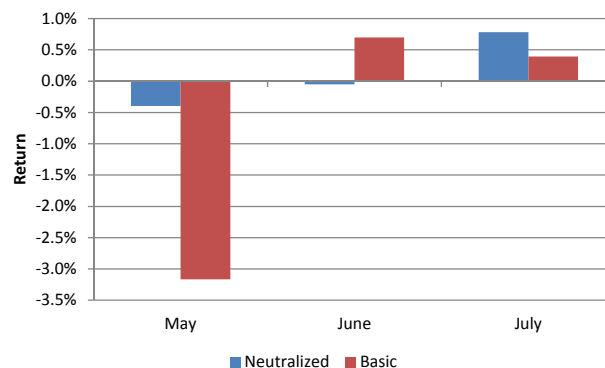


Figure 7: Cumulative daily performance of momentum and beta-neutralized momentum, factor-mimicking portfolios



Source: Bloomberg Finance LP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank

Figure 8: Monthly performance of momentum and neutralized momentum, factor-mimicking portfolios

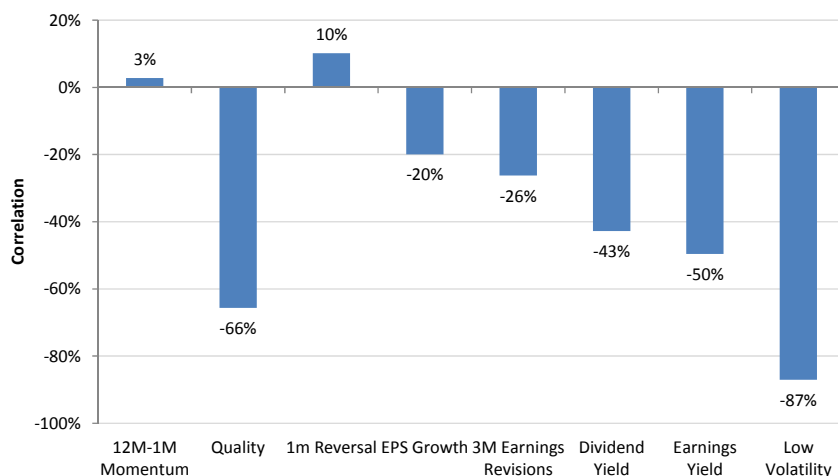


Source: Bloomberg Finance LP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank

We've made this point before, and but it's worth making again. Be cognizant of the beta exposures in your factors. Is it really the factor that is driving performance, or are you just playing beta in disguise?

As a reference, the chart below shows the current beta exposures of the eight factors we track in our "DB Quant Dashboard" (see pages 9-13). If you don't have a strong view on the future direction of the market, then we'd highly recommend neutralizing these exposures. If, on the other hand, you want to make an active call on market direction, this can help you position your factor exposures to do so. For example, a bearish call would involve tilts towards the factors with strong negative beta exposure, i.e. Quality, Earnings Yield and Low Volatility. In the case of Momentum, the Beta exposure is now neutral implying that it will not be impacted by strong moves in relative beta performance.

Figure 9: Factor correlation to beta portfolio as of the beginning of August



Source: Deutsche Bank



Macro update

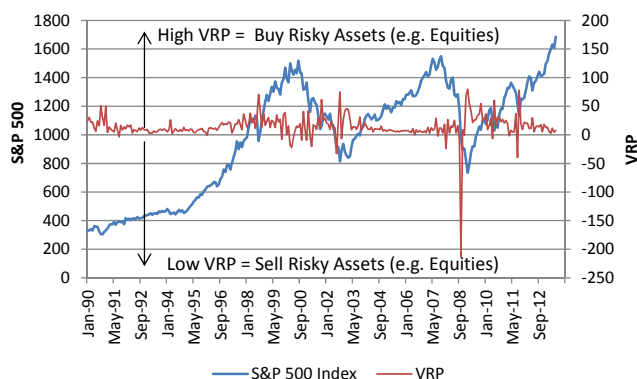
Turning our attention to the bigger picture, we also take the opportunity to update our favorite top-down market indicators.

Our favorite market timing indicator

Our Variance Risk Premium (VRP) indicator is a contrarian indicator that measures market overreaction and underreaction to realized risk. In simple terms, VRP is the difference between options-implied risk (i.e. the VIX index) and realized risk (i.e. the actual risk in the market measured historically over the last month). If VRP is high, we see this as a buying opportunity for risky assets, like equities and high yield bonds. Why? The intuition is as follows. When VRP is high, VIX has typically shot up dramatically (i.e. the market is in panic mode). At the same time, realized risk has probably also risen, but not to the same extent. In other words, the market has overreacted relative to what the actual, realized data is telling us. Our research shows that such episodes are good buying opportunities for risky assets on about a three month horizon.⁴ On the other hand, when VRP is low, it tends to be a complacency indicator: investors are failing to price in rising realized risk in the market, and as a result we should be selling risky assets like equities.

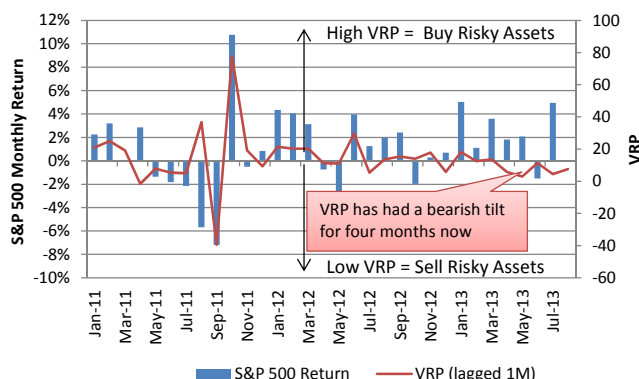
Our Variance Risk Premium (VRP) indicator is a contrarian indicator that measures market overreaction and underreaction to realized risk. Today our VRP indicator is reading 7, compared to a long-term average of 14.3. The VRP has edged upward since last month's reading of 4 suggesting a fairly neutral position. Generally we pay attention to the VRP when it hits extreme levels (like ± 2 standard deviations).

Figure 10: Variance Risk Premium (VRP)



Source: Deutsche Bank

Figure 11: Recent VRP (lagged) and market returns



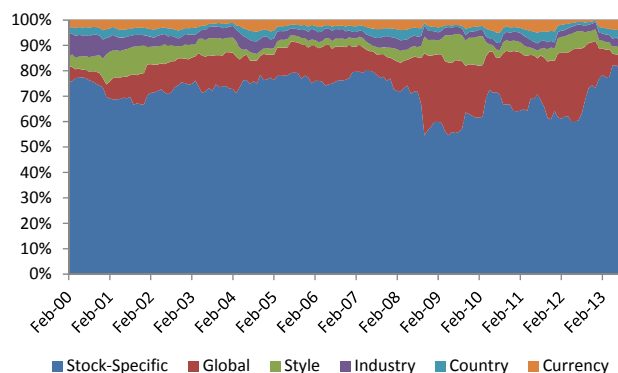
Source: Deutsche Bank

The opportunity set for investors

Another metric we keep a close eye on is the so-called "opportunity set" for investors. Think of this as the total alpha on the table. Our main interest is to understand what is driving that opportunity, because this can allow us to position our strategies to pick in the orchard with the juiciest fruit. In Figure 12 we show the opportunity set for global equity investors, and in Figure 13 we show the same thing for emerging market equity investors.

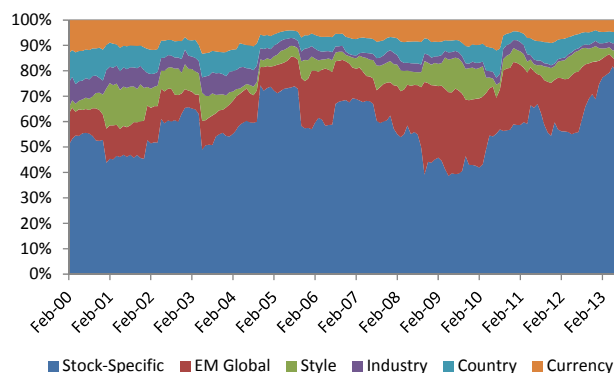


Figure 12: Global opportunity set



Source: Bloomberg Finance LP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank

Figure 13: Emerging markets opportunity set



Source: Bloomberg Finance LP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank

The key result is the size of the blue portion relative to the other colors. The blue represents the opportunity explained by stock selection, whereas we can think of the other colors as representing the opportunity from top-down calls like picking the right countries, industries, and styles. When the financial crisis exploded in 2008, we moved into a much more macro-dominated world. As a result, the portion of overall opportunity that could be explained by individual company characteristics (e.g. valuation, growth profile, earnings quality, etc.) shrunk sharply; no one cared if a stock looked good on fundamentals if it was exposed to Europe for example. Needless to say, such an environment was challenging for quants and non-quants alike, since both camps tend to use stock specific information to differentiate between stocks.



The DB Quant Dashboard

Which styles have been working around the world?

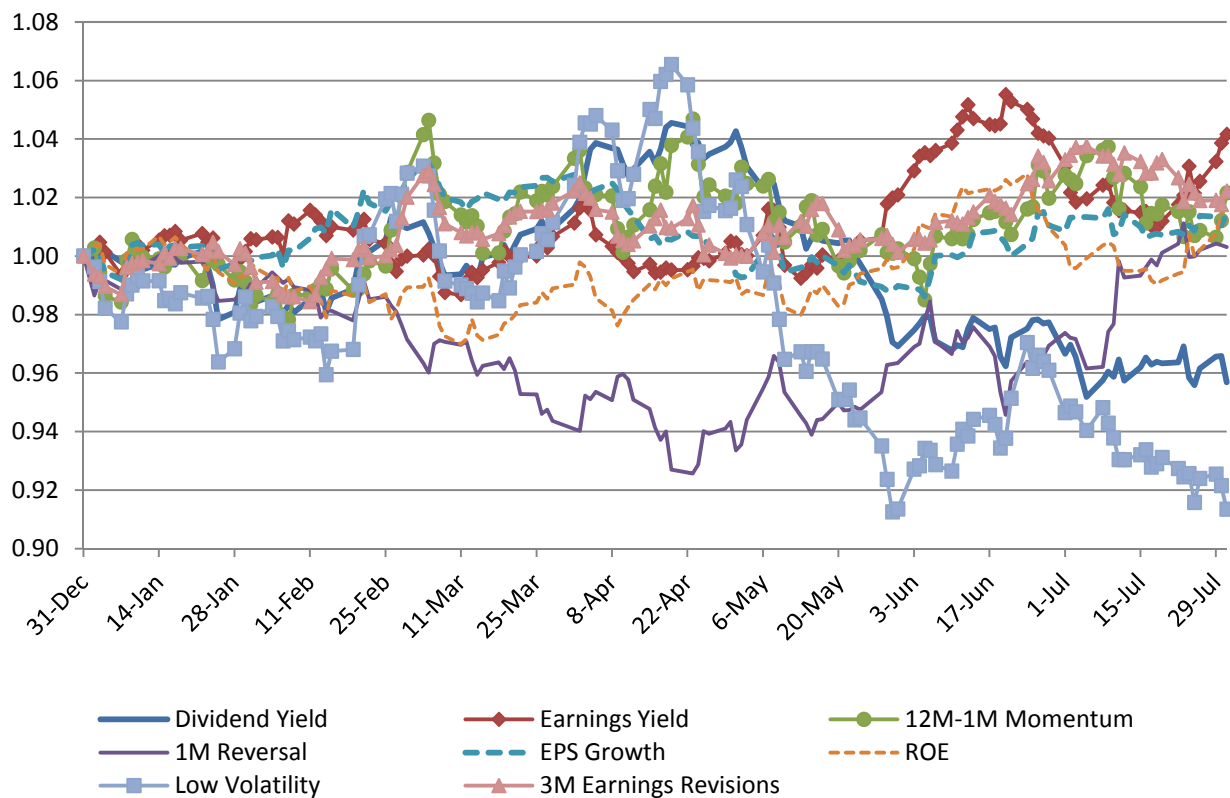
The DB Quant Dashboard is an easy-to-use cheat sheet that shows which styles have been working in key markets around the world. We track cumulative factor performance year-to-date, and highlight what we think are the noteworthy observations in each region. For those who prefer the previous tabular format (which includes more factors), you can find those results in the Appendix.

For more details see our website

For the most recent daily factor performance, as well as factor performance delineated by different universes (e.g. large cap, small cap) and regions, please see our Global Quantitative Strategy website at <https://eqindex.db.com/gqs/>. Note that you need a username and password to log on to this website. If you don't have login details, please contact us at DBEQS.Americas@db.com and we'd be happy to set you up.



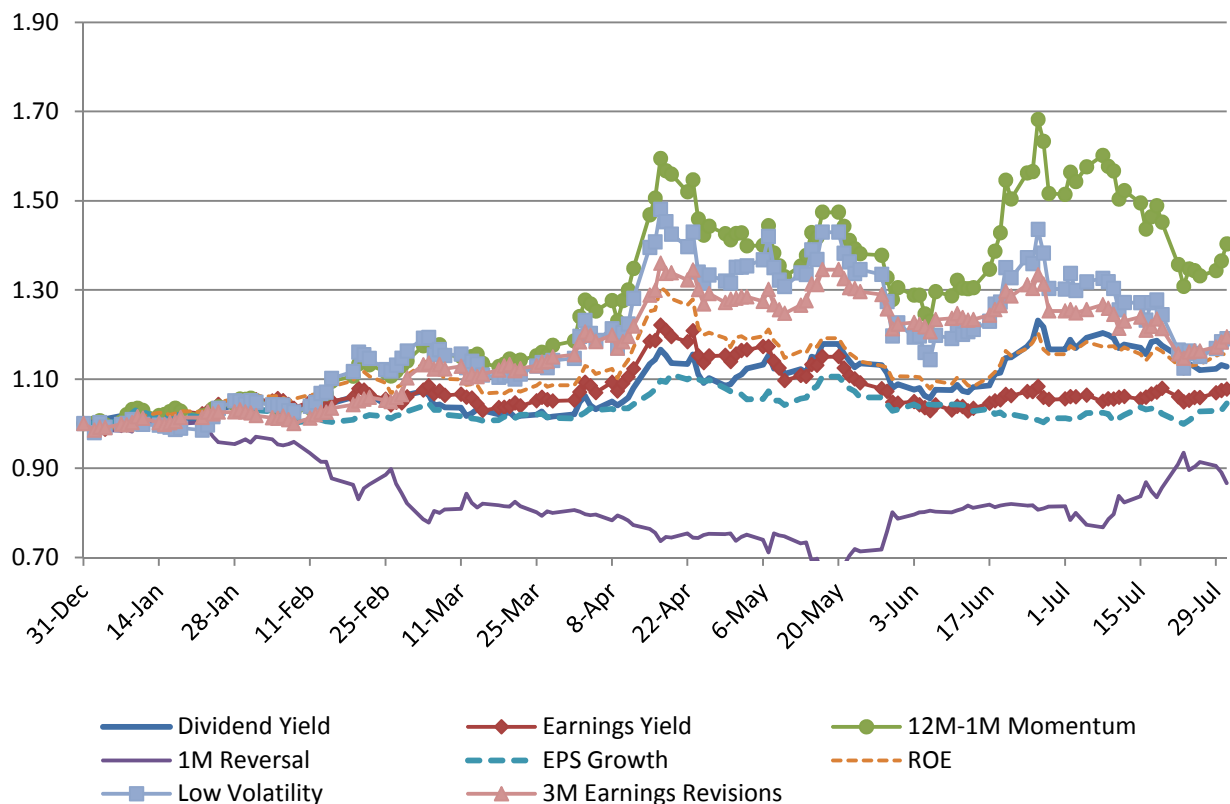
Figure 14: United States: YTD cumulative factor performance (Q10-Q1 return spread, local currency)



Source: Bloomberg Finance LP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank



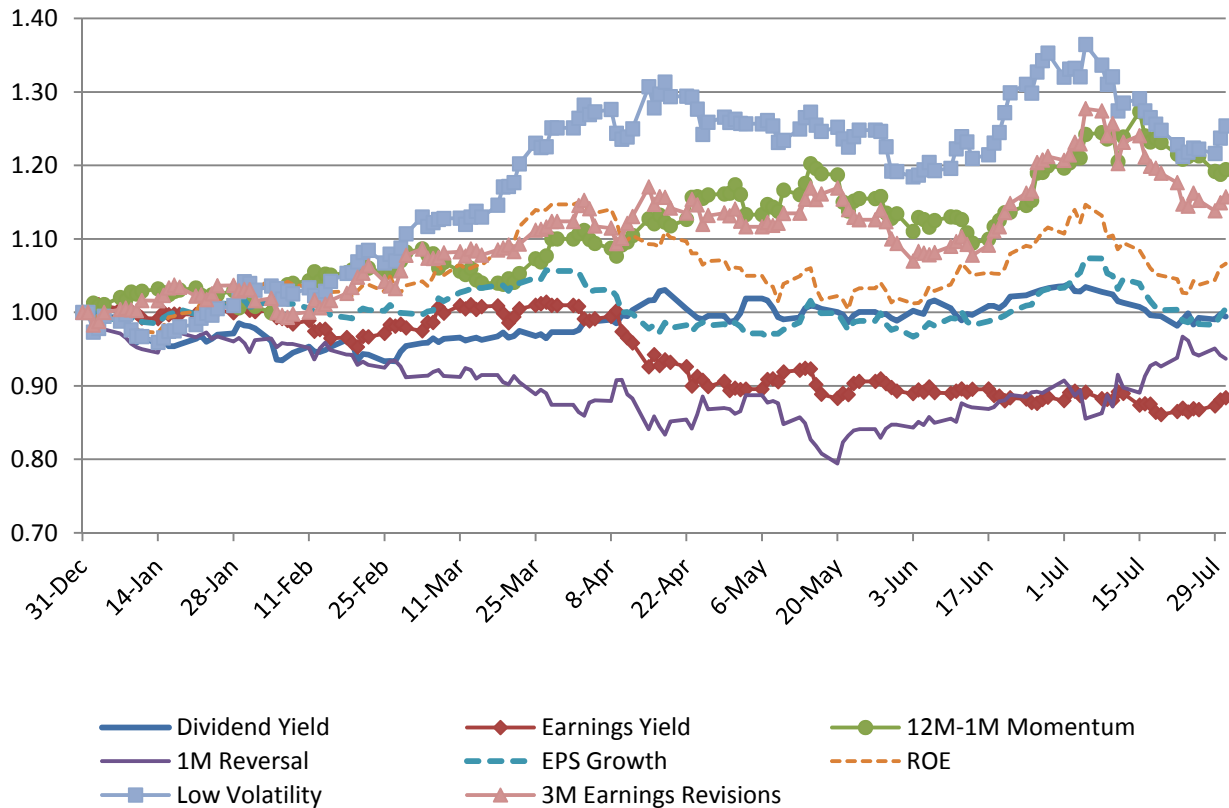
Figure 15: Canada: YTD cumulative factor performance (Q10-Q1 return spread, local currency)



Source: Bloomberg Finance LP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank



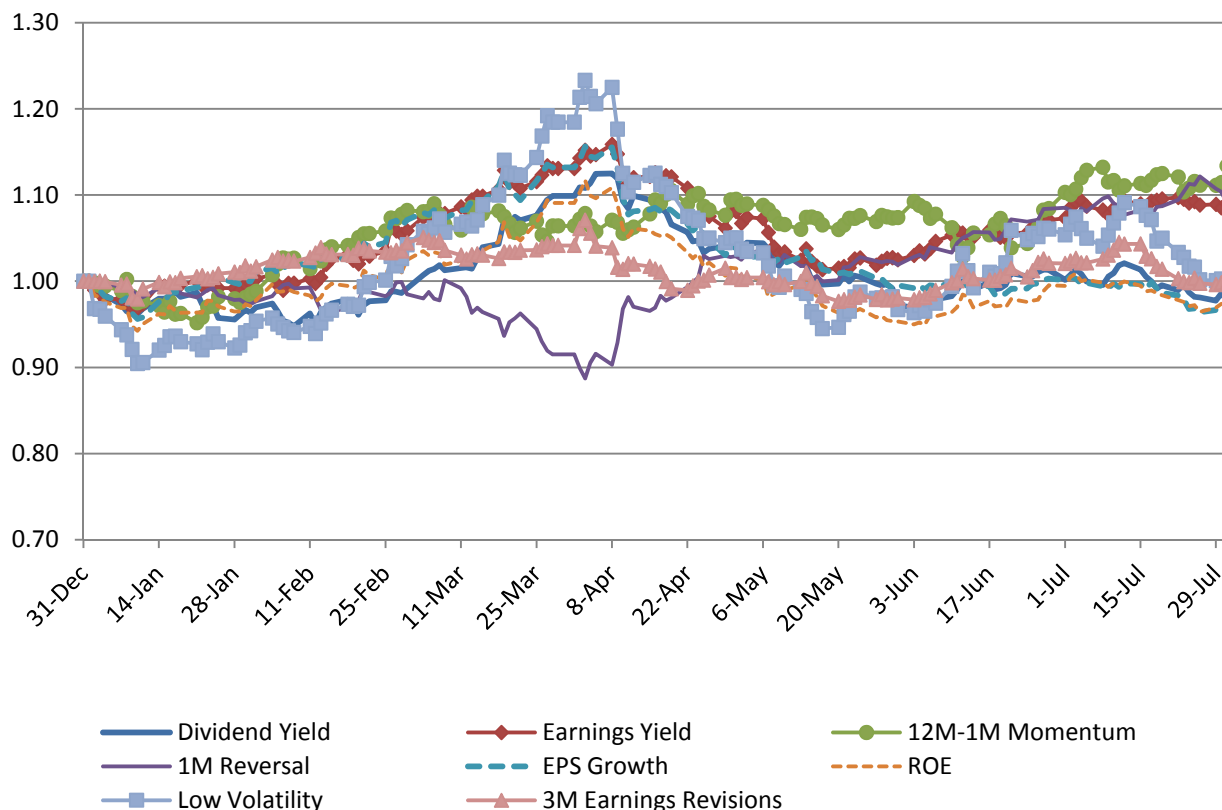
Figure 16: United Kingdom: YTD cumulative factor performance (Q10-Q1 return spread, local currency)



Source: Bloomberg Finance LP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank



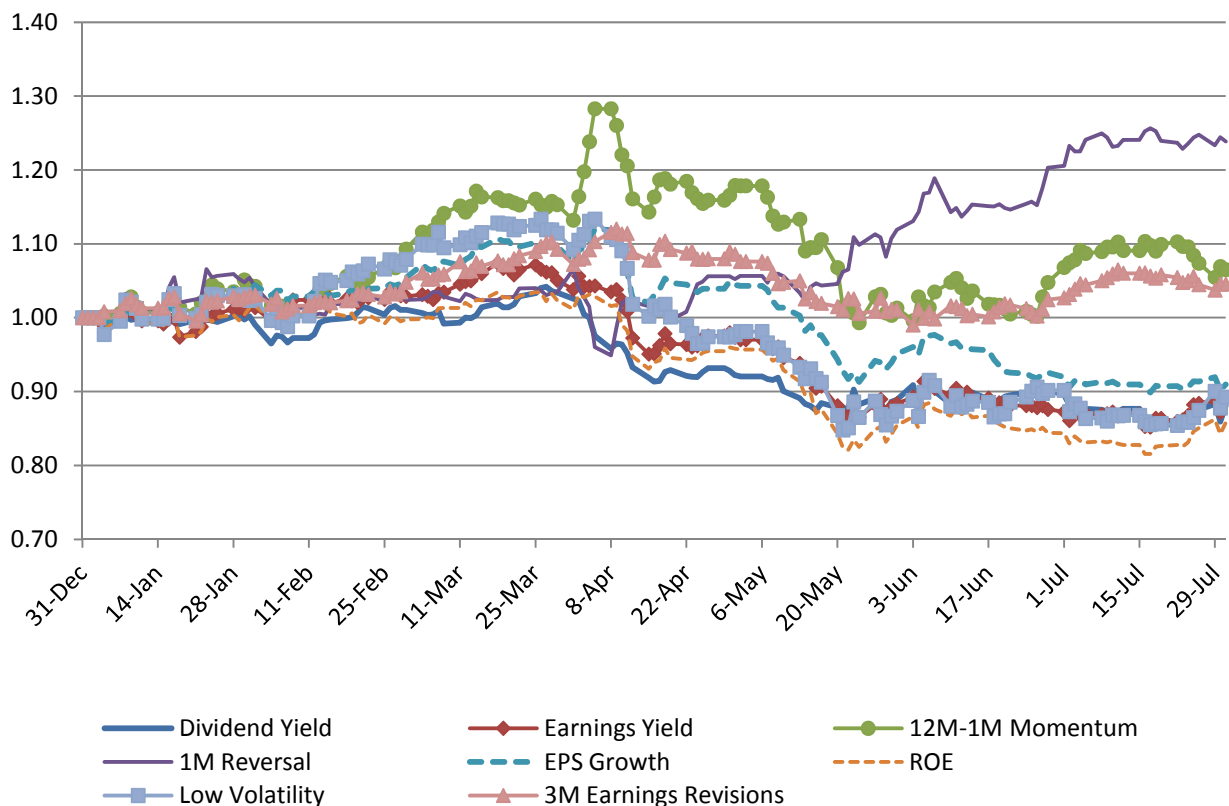
Figure 17: Europe ex UK: YTD cumulative factor performance (Q10-Q1 return spread, local currency)



Source: Bloomberg Finance LP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank



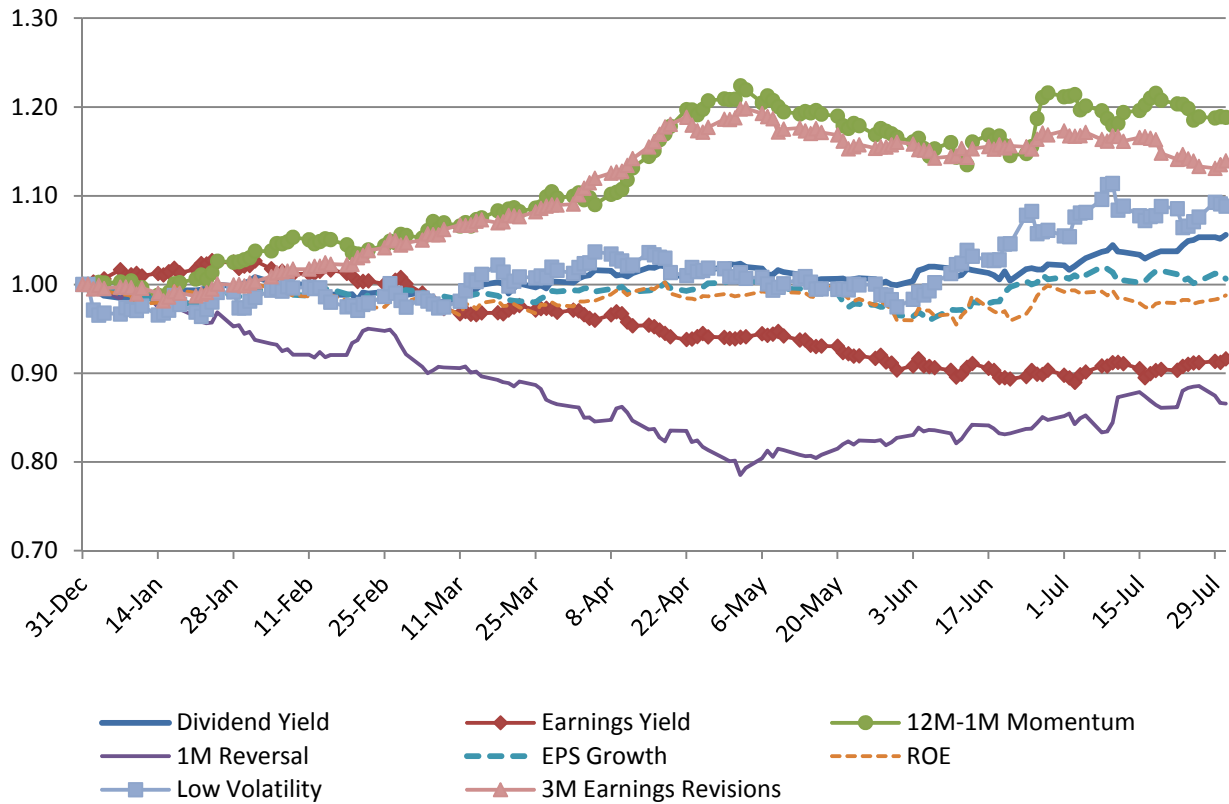
Figure 18: Japan: YTD cumulative factor performance (Q10-Q1 return spread, local currency)



Source: Bloomberg Finance LP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank



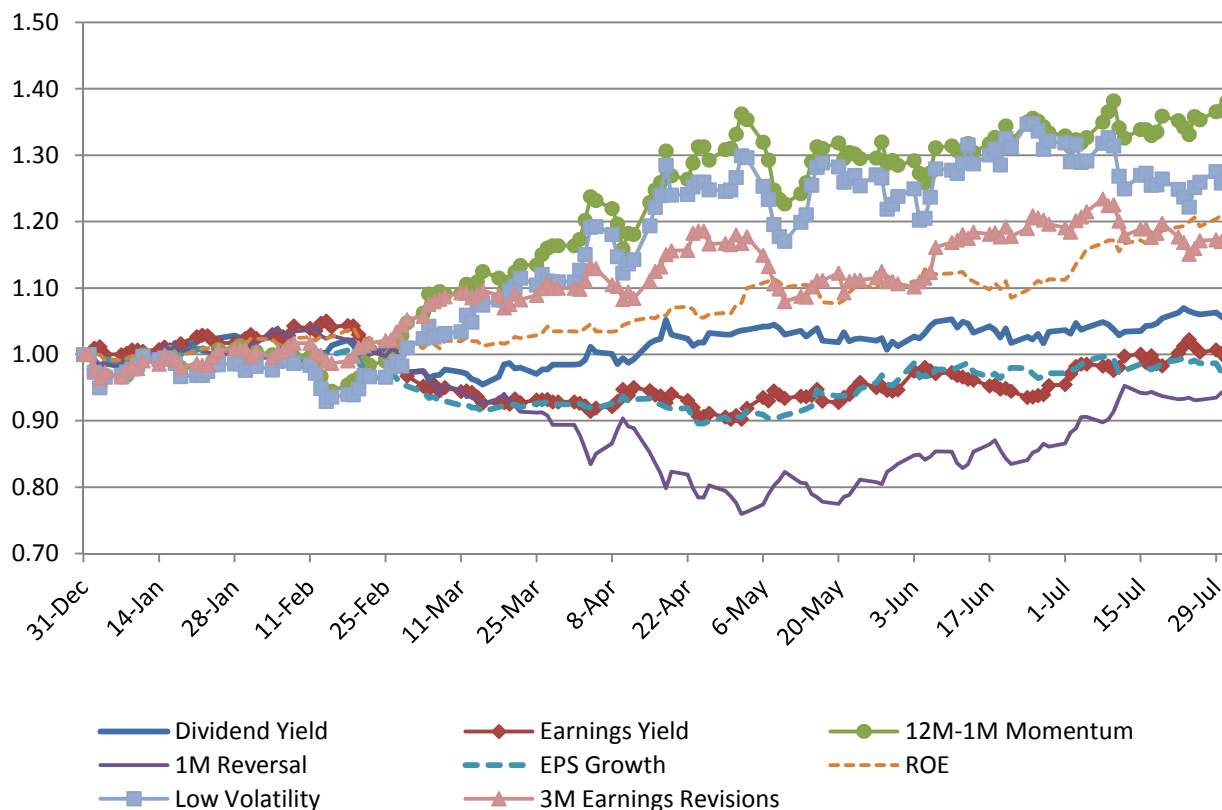
Figure 19: Asia ex Japan: YTD cumulative factor performance (Q10-Q1 return spread, local currency)



Source: Bloomberg Finance LP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank



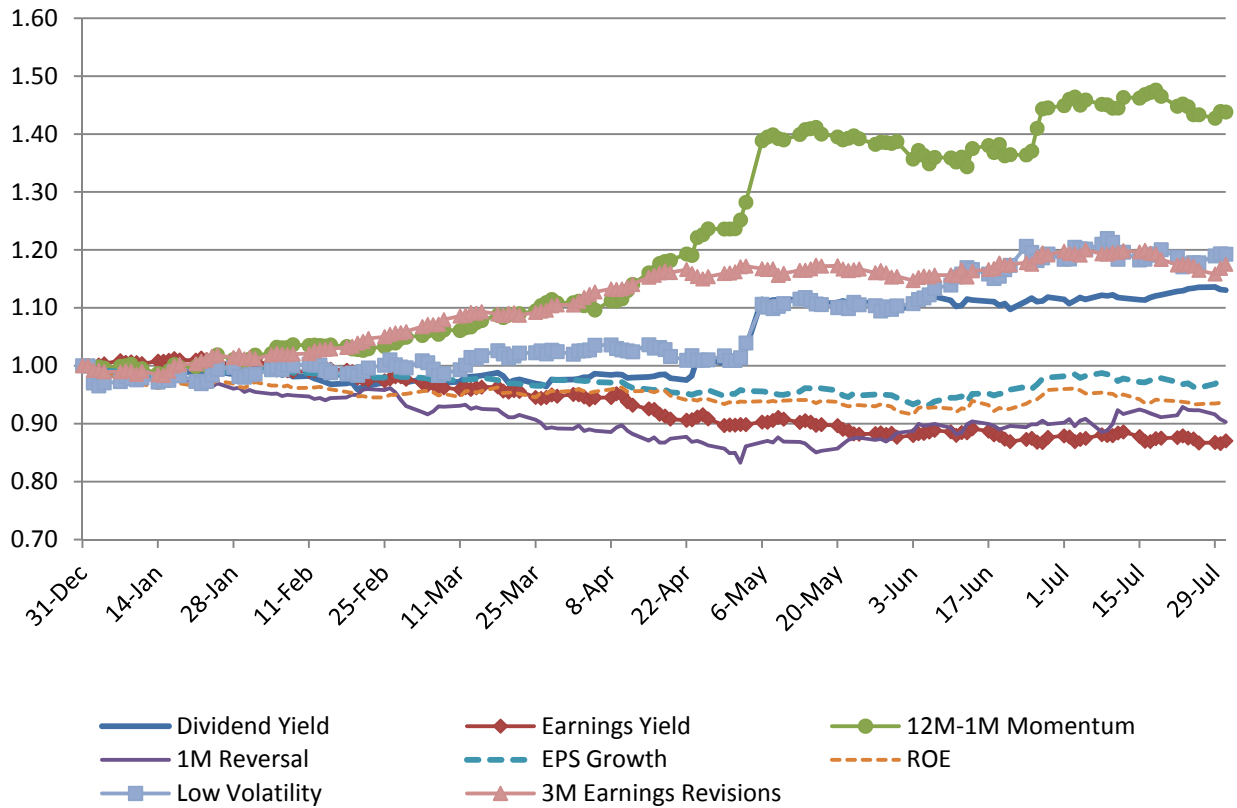
Figure 20: Australia/New Zealand: YTD cumulative factor performance (Q10-Q1 return spread, local currency)



Source: Bloomberg Finance LP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank



Figure 21: Emerging Markets: YTD cumulative factor performance (Q10-Q1 return spread, local currency)



Source: Bloomberg Finance LP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank



Bottom-up stock selection

QCD U.S. stock selection model

- The QCD model is our flagship stock selection model for U.S. equities.
- The model incorporates a number of unique features including dynamic factor selection, a non-linear TREE component, and active style and sector rotation.
- For complete details on the model, please see Luo et al., "QCD Model: DB Quant Handbook", 22 July 2010.

Current stock recommendations

Figure 22 shows the best 20 buy ideas and sell ideas from today's model. Note that a complete ranking for all Russell 3000 stocks is available in spreadsheet format. If you would like to get a copy of the spreadsheet, please contact us at DBEQS.Americas@db.com.

Figure 22: Current QCD model stock recommendations

BEST BUY IDEAS (SECTOR NEUTRAL)					BEST SELL IDEAS (SECTOR NEUTRAL)				
Ticker	Name	CUSIP	GICS Sector	QCD Score (higher is better long)	Ticker	Name	CUSIP	GICS Sector	QCD Score (lower is better short)
AVIV	AVIV REIT INC	05381L101	Financials	20.6%	MCP	MOLYCORP INC	608753109	Materials	-20.5%
SRI	STONERIDGE INC	86183P102	Consumer Discretionary	16.2%	LNG	CHENIERE ENERGY INC	16411R208	Energy	-19.3%
NILE	BLUE NILE INC	09578R103	Consumer Discretionary	15.5%	BPZ	BPZ RESOURCES INC	055639108	Energy	-18.7%
PDL	PDL BIOPHARMA INC	69329Y104	Health Care	15.0%	RBCN	RUBICON TECHNOLOGY INC	78112T107	Information Technology	-17.7%
PTRY	PANTRY INC	698657103	Consumer Staples	13.2%	RIGL	RIGEL PHARMACEUTICALS INC	766559603	Health Care	-17.3%
MN	MANNING & NAPIER INC	56382Q102	Financials	13.1%	MDW	MIDWAY GOLD CORP	598153104	Materials	-17.0%
ONE	HIGHER ONE HOLDINGS INC	42983D104	Information Technology	13.0%	IVAC	INTEVAC INC	461148108	Information Technology	-17.0%
ABC	AMERISOURCEBERGEN CORP	03073E105	Health Care	12.3%	MTG	MGIC INVESTMENT CORP/WI	552848103	Financials	-16.4%
SVU	SUPERVALU INC	868536103	Consumer Staples	11.6%	TWER	TOWERSTREAM CORP	892000100	Telecommunication Services	-14.4%
TTEC	TELETECH HOLDINGS INC	879939106	Information Technology	11.4%	UNIS	UNILIFE CORP	90478E103	Health Care	-13.7%
EDG	EDGEN GROUP INC	28014Q107	Industrials	10.9%	PCYO	PURECYCLE CORP	746228303	Utilities	-13.5%
RUSHA	RUSH ENTERPRISES INC	781846209	Industrials	9.9%	SWSH	SWISHER HYGIENE INC	870808102	Industrials	-13.5%
INT	WORLD FUEL SERVICES CORP	981475106	Energy	7.9%	AMSC	AMERICAN SUPERCONDUCTOR CP	030111108	Industrials	-13.4%
IDT	IDT CORP	448947507	Telecommunication Services	7.9%	SWS	SWS GROUP INC	78503N107	Financials	-13.1%
CALL	MAGICJACK VOCALTEC LTD	M6787E101	Telecommunication Services	7.4%	NIHD	NII HOLDINGS INC	62913F201	Telecommunication Services	-12.0%
ALJ	ALON USA ENERGY INC	020520102	Energy	7.1%	AT	ATLANTIC POWER CORP	04878Q863	Utilities	-9.9%
ADES	ADVANCED EMISSIONS SOLUTIONS	00770C101	Materials	6.3%	GRIF	GRIFFIN LAND & NURSERIES INC	398231100	Consumer Staples	-8.9%
ZEUS	OLYMPIC STEEL INC	68162K106	Materials	3.8%	ALCO	ALCO INC	016230104	Consumer Staples	-6.6%
UGI	UGI CORP	902681105	Utilities	3.4%	BYD	BOYD GAMING CORP	103304101	Consumer Discretionary	-5.8%
CNP	CENTERPOINT ENERGY INC	15189T107	Utilities	3.2%	BEBE	BEBE STORES INC	075571109	Consumer Discretionary	-4.5%

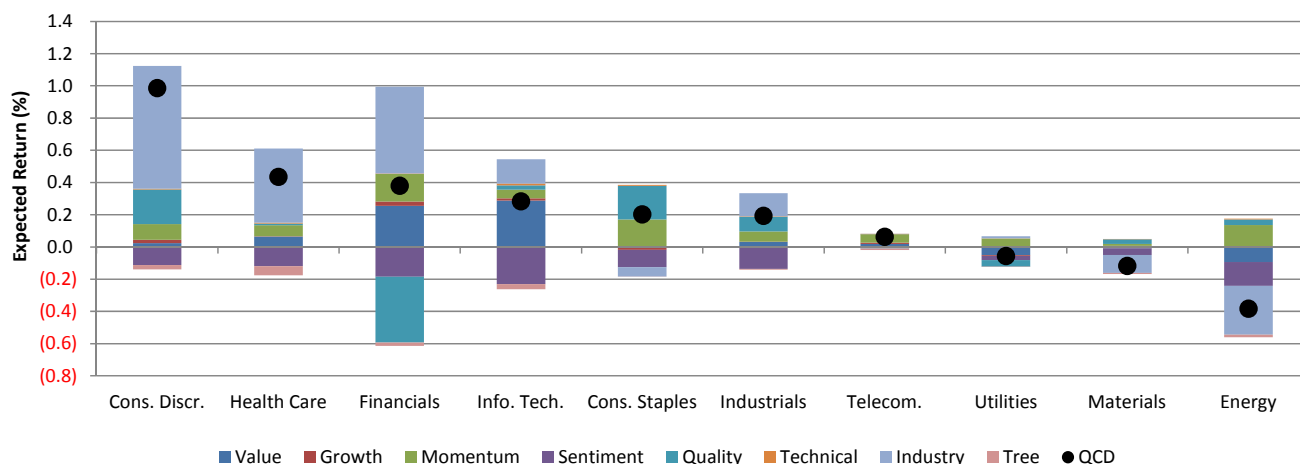
Source: Bloomberg Finance LP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank

Current sector recommendations

The QCD model also implicitly makes sector predictions. Figure 23 shows the current ranking of the 10 GICS Level 1 Sectors, ranked from best (most likely to outperform this month) to worse (least likely to outperform). The bars show the key drivers for each call.



Figure 23: Current QCD sector recommendations

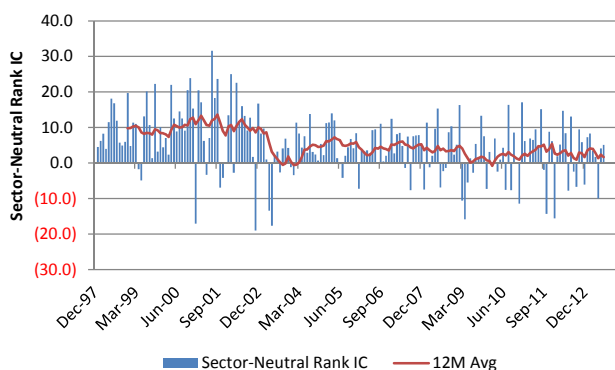


Source: Bloomberg Finance LP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank

Model performance

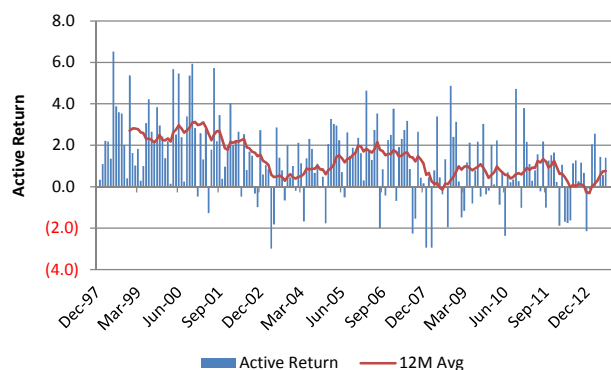
The QCD model has performed well since inception. Figure 24 shows the pure signal performance, measured as a monthly sector-neutral rank information coefficient (IC). Figure 25 shows the performance of an actual model portfolio, after costs, based on a realistically optimized market-neutral strategy.

Figure 24: Model performance, sector-neutral rank IC



Source: Bloomberg Finance LP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank

Figure 25: Model portfolio active return, after costs

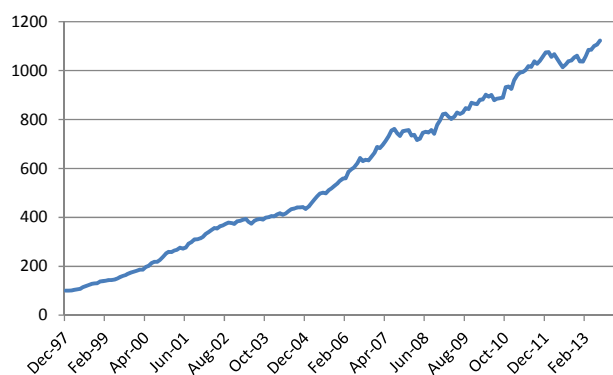


Source: Bloomberg Finance LP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank

Figure 26 shows the cumulative performance of the optimized strategy, and Figure 27 shows the annualized Sharpe ratio (after costs) by calendar year.

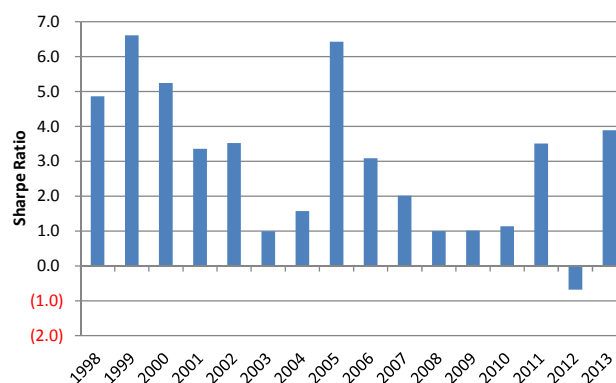


Figure 26: Model portfolio cumulative, after costs



Source: Bloomberg Finance LP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank

Figure 27: Annualized Sharpe ratio, after costs



Source: Bloomberg Finance LP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank



N-LASR global stock selection model

- The N-LASR model is our flagship stock selection model for global equities.
- The model is based on a machine learning algorithm called AdaBoost, and is designed to adaptively learn which factors to use, often in a non-linear way.
- For complete details on the model, please see Wang et al., "Signal Processing: The Rise of the Machines", 5 June 2012.

Current stock recommendations

Figure 28 shows the best 20 buy ideas and sell ideas from today's model. Note that a complete ranking for all global stocks is available in spreadsheet format. If you would like to get a copy of the spreadsheet, please contact us at DBEQS.Americas@db.com.

Figure 28: Current N-LASR model stock recommendations

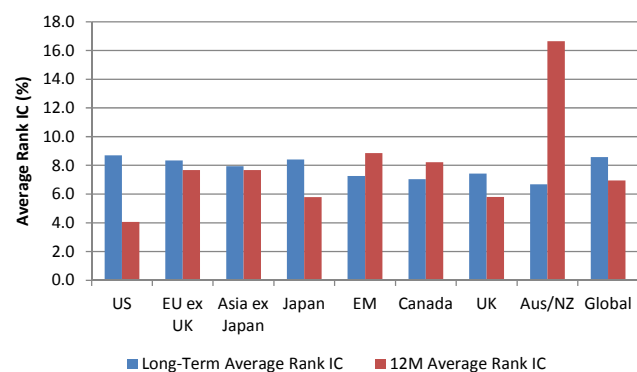
BEST BUY IDEAS					BEST SELL IDEAS				
Ticker	Name	SEDOL	Country	N-LASR Score (higher is better long)	Ticker	Name	SEDOL	Country	N-LASR Score (lower is better short)
DNB	DUN & BRADSTREET CORP	2636254	USA	2.06	CPL AU	Coalspur Mines Ltd	698499	Australia	-2.17
CR	CRANE CO	2231897	USA	1.87	KSK LN	KSK Power Ventur Plc	81G293	UK	-2.02
DV	DEVRY INC	2267609	USA	1.84	LLXL3 BS	LLX Logistica S.A.	83BXMS	Brazil	-1.93
OMV AV	OMV AG	465145	Austria	1.83	ISRL	ISRAMCO INC	2247571	USA	-1.91
TCLA	TRANSCONTINENTAL INC -CLA	2357953	Canada	1.81	MCP	MOLYCORP INC	8458HM7	USA	-1.91
SIP AU	Sigma Pharmaceuticals Limited	655259	Australia	1.81	NGD.	NEW GOLD INC	2826947	Canada	-1.88
LVD LN	Lavendon Group	050575	UK	1.75	MPXE3 BS	MPX Mineracao e Energia SA	829VWQ	Brazil	-1.85
BA	BOEING CO	2108601	USA	1.70	PGI AU	PanTerra Gold Ltd	84NX2K	Australia	-1.84
LYB	LYONDELLBASELL INDUSTRIES NV	835PXZ3	USA	1.69	SEVDR NO	Sevan Drilling ASA	864V15	Norway	-1.83
MDP	MEREDITH CORP	2578516	USA	1.67	TRQ.	TURQUOISE HILL RESOURCES LTD	87WJ1F5	Canada	-1.82
8219 JT	Aoyama Trading Co	604587	Japan	1.66	ENJOY CI	Enjoy SA	862KG9	Chile	-1.79
AUSS NO	Austevoll Seafood ASA	816MKT	Norway	1.62	DML AU	Discovery Metals Ltd	671178	Australia	-1.79
XRK	XEROX CORP	2985202	USA	1.62	AMRS	AMYRIS INC	867TTN7	USA	-1.77
UBP PM	Union Bank Of Philippines	691454	Philippines	1.61	IMAS IJ	Indomobil Sukses Internasional	88981L	Indonesia	-1.77
SVAV RX	Sollers OJSC	742530	Russia	1.60	WG	WILLBROS GROUP INC	84WX361	USA	-1.75
LNC	LINCOLN NATIONAL CORP	2516378	USA	1.60	DIA LN	Dialight Plc	330577	UK	-1.75
MET	METLIFE INC	2573209	USA	1.60	MRC MK	Malaysian Resources Corp Bhd	655786	Malaysia	-1.75
HAFC	HANMI FINANCIAL CORP	86TPXR5	USA	1.59	5981 JT	Tokyo Rope Mfg Co	689578	Japan	-1.71
HMN	HORACE MANN EDUCATORS CORP	2437112	USA	1.59	SF TB	Siam Future Development PCL	657817	Thailand	-1.71
BRC	BRADY CORP	2117726	USA	1.59	506 HK	China Foods Ltd.	610573	China	-1.69

Source: Bloomberg Finance LP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank

Model performance

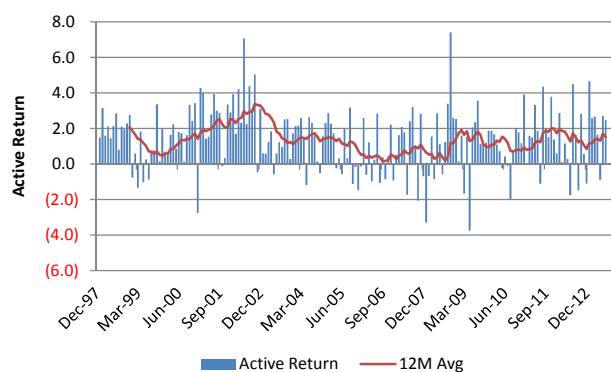
The N-LASR model has performed well since inception. Figure 29 shows the average pure signal performance, measured as a monthly rank information coefficient (IC), in different regions. Figure 30 shows the performance of a global model portfolio, after costs, based on a realistically optimized market-neutral strategy.

Figure 29: Regional model performance, average rank IC



Source: Bloomberg Finance LP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank

Figure 30: Global portfolio active return, after costs

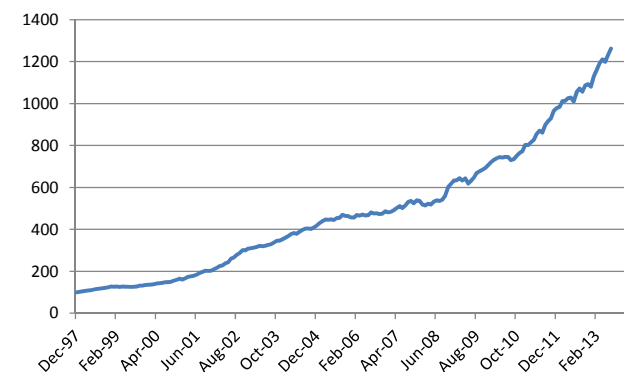


Source: Bloomberg Finance LP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank



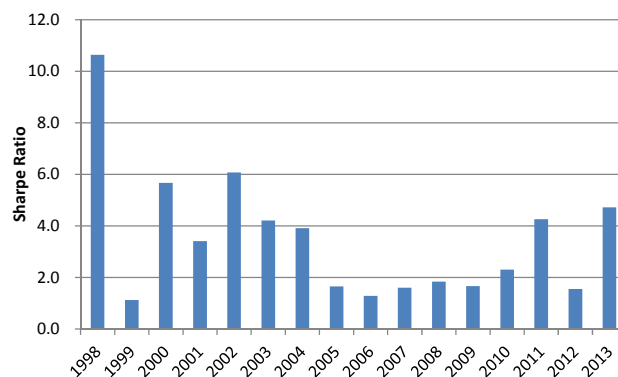
Figure 31 shows the cumulative performance of the optimized strategy, and Figure 32 shows the annualized Sharpe ratio (after costs) by calendar year.

Figure 31: Global portfolio cumulative, after costs



Source: Bloomberg Finance LP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank

Figure 32: Annualized Sharpe ratio, after costs



Source: Bloomberg Finance LP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank



Top-down country rotation

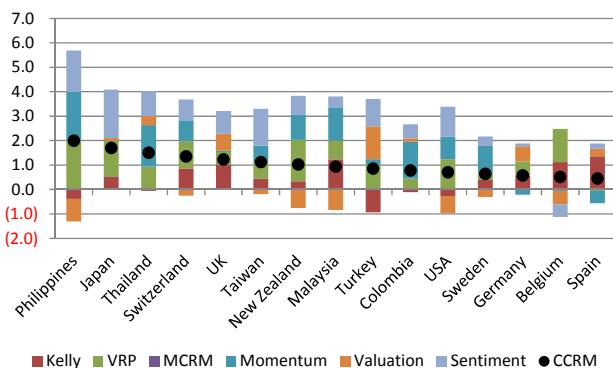
CCRM country rotation model

- Our Composite Country Rotation Model (CCRM) uses three sets of inputs to dynamically rotate between countries in the MSCI All Country World Index.
- The inputs include top-down macro signals (e.g. VRP, Kelly's Tail Risk), aggregate bottom-up fundamental signals (e.g. country-level valuation and momentum), and lead-lag signals based on economic trade linkages.
- For complete details on the model, please see Luo et al., "Signal Processing: New Insights in Country Rotation", 9 February 2012.

Current recommendations

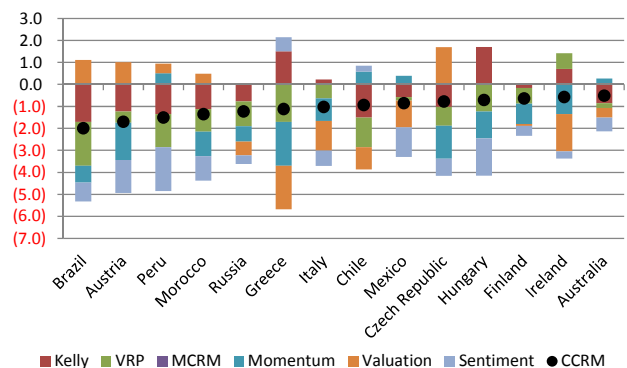
Figure 33 and Figure 34 show the top and bottom third of countries, as ranked currently by our CCRM model. The bars show what is driving these calls.

Figure 33: Top tercile countries



Source: Bloomberg Finance LP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank

Figure 34: Bottom tercile countries

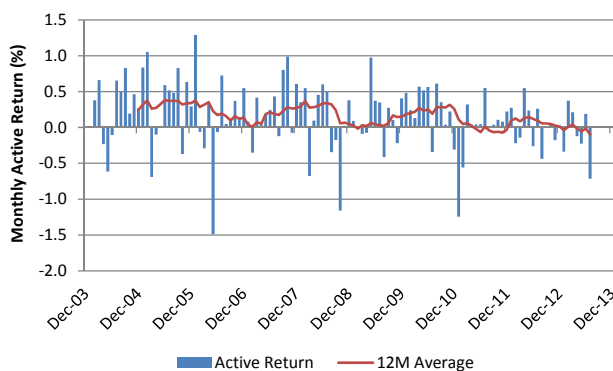


Source: Bloomberg Finance LP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank

Model performance

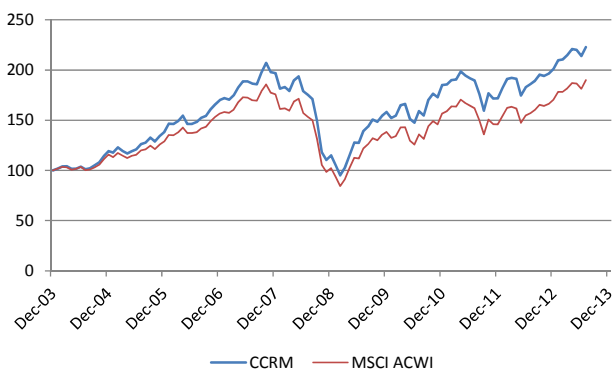
Figure 35 and Figure 36 show the performance of the model over time.

Figure 35: Monthly returns



Source: Bloomberg Finance LP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank

Figure 36: Cumulative performance



Source: Bloomberg Finance LP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank



Top-down asset allocation

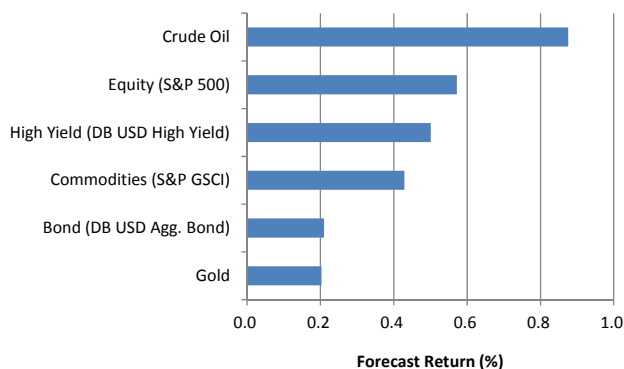
Quant Tactical Asset Allocation (QTAA) model

- Our Quantitative Tactical Asset Allocation (QTAA) model uses a model-of-models methodology to rotate between six asset classes.
- The model uses a wide range of fundamental and market-based factors as inputs, and dynamically selects a subset of those factors to use at each point in time.
- For complete details on the model, please see Luo et al., "Signal Processing: Quant Tactical Asset Allocation", 19 September 2011.

Current recommendations and performance

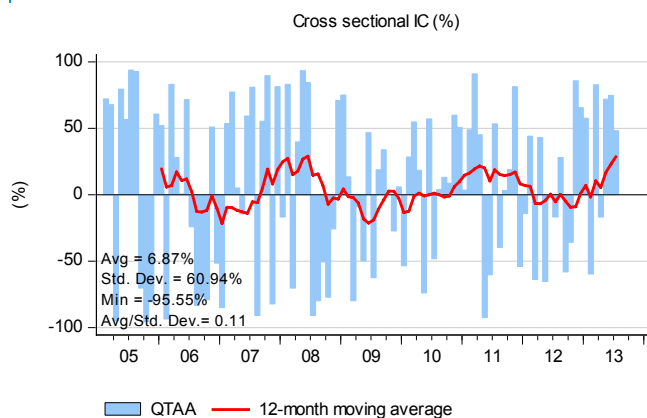
Figure 37 shows the current ranking of our six asset classes, ranked from best to worse in terms of month-ahead forecast returns. Figure 38 shows the monthly performance of the QTAA model over time.

Figure 37: Current QTAA forecasts



Source: Bloomberg Finance LP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank

Figure 38: Performance of QTAA model



Source: Bloomberg Finance LP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank



Top-down style rotation

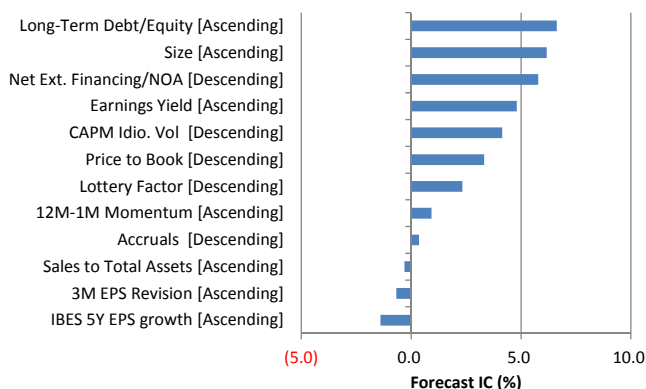
Style rotation model

- Our Style Rotation model dynamically rotates between 12 “typical” quant factors.
- The model uses market-based and macroeconomic inputs to predict month-ahead factor returns using a backwards stepwise linear regression model.
- For complete details on the model, please see Luo et al., “Signal Processing: Style Rotation”, 7 September 2010.

Current recommendations and performance

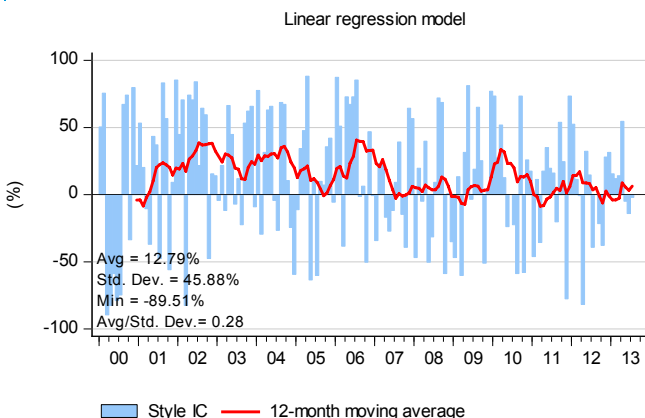
Figure 39 shows the current ranking of our 12 factors, ranked from best to worse in terms of month-ahead forecast performance. Figure 40 shows the monthly performance of the Style Rotation model over time.

Figure 39: Current style rotation forecasts



Source: Bloomberg Finance LP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank

Figure 40: Performance of style rotation model



Source: Bloomberg Finance LP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank



Appendix: Factor performance

Figure 41: US factor performance, measured as rank IC (Russell 3000 universe)

												Since Inception				
Factor Name	Direction ¹	Current # of Stocks	Average IC (%)			Avg /				# of Months	Avg # of Stocks	Hit Rate (%)	Serial Corr (%) ³			
			Last M	12M Avg	3Y Avg	Avg	Std Dev	Std Dev	Max					Min	p-value ²	
1. Value																
1 Dividend yield, trailing 12M	Ascending	2,948	(7.95)	0.24	1.90	2.90	14.41	0.20	42.59	(33.26)	0.00	307	2,873	55.05	99.24	
2 Expected dividend yield	Ascending	2,948	(7.91)	0.24	2.20	3.15	14.94	0.21	44.46	(33.89)	0.00	307	2,873	54.40	99.31	
3 Price-to-operating EPS, trailing 12M, Basic	Descending	2,338	9.64	4.06	1.63	2.86	10.37	0.28	30.82	(32.28)	0.00	231	2,354	60.17	95.23	
4 Operating earnings yield, trailing 12M, Basic	Ascending	2,928	5.15	3.87	4.23	4.88	12.98	0.38	47.24	(33.30)	0.00	231	2,872	61.90	96.44	
5 Earnings yield, forecast FY1 mean	Ascending	2,790	6.75	4.50	3.83	4.44	12.32	0.36	48.88	(34.61)	0.00	307	2,538	62.87	94.98	
6 Earnings yield, forecast FY2 mean	Ascending	2,773	7.00	4.47	3.04	3.89	11.93	0.33	47.02	(34.31)	0.00	307	2,437	63.52	94.36	
7 Earnings yield x IBES 5Y growth	Ascending	1,758	5.35	3.77	1.67	1.83	10.47	0.17	41.11	(26.63)	0.01	231	1,925	58.87	93.47	
8 Sector-rel Operating earnings yield, trailing 12M, Basic	Ascending	2,928	5.99	3.53	3.85	4.34	8.33	0.52	28.96	(14.90)	0.00	231	2,870	69.26	96.01	
9 Hist-rel Operating earnings yield, trailing 12M, Basic	Ascending	2,110	(2.86)	0.29	1.46	1.65	6.89	0.24	20.73	(18.74)	0.01	137	2,015	62.04	96.88	
10 Operating cash flow yield (income stmt def)	Ascending	2,948	3.33	3.79	3.25	4.11	10.85	0.38	47.14	(32.67)	0.00	307	2,873	64.82	96.03	
11 Cash flow yield, FY1 mean	Ascending	1,630	4.72	3.12	0.94	2.75	17.57	0.16	66.06	(54.29)	0.01	277	759	58.48	95.75	
12 Free cash flow yield	Ascending	2,869	7.36	4.75	3.52	4.94	7.89	0.63	31.93	(22.64)	0.00	270	2,510	75.56	94.65	
13 Price-to-sales, trailing 12M	Descending	2,894	7.00	4.83	1.05	1.86	10.95	0.17	30.02	(41.46)	0.00	307	2,798	57.00	99.11	
14 Price-to-book	Descending	2,855	(0.26)	1.88	(0.68)	0.85	10.64	0.08	26.28	(35.75)	0.16	307	2,763	49.19	97.65	
15 EBITDA/EV	Ascending	2,910	3.06	2.81	2.85	4.17	9.68	0.43	39.32	(27.15)	0.00	307	2,819	68.08	95.56	
16 Price-to-book adj for ROE, sector adj	Descending	2,672	4.61	2.70	(0.65)	0.49	8.73	0.06	22.50	(33.21)	0.33	307	2,433	49.51	95.61	
2. Growth																
17 Hist 5Y operating EPS growth	Descending	2,873	(0.29)	1.35	2.79	1.05	8.68	0.12	30.58	(22.70)	0.07	219	2,732	52.51	97.26	
18 Hist 5Y operating EPS acceleration	Ascending	2,873	(0.40)	1.82	0.32	0.83	6.67	0.12	25.31	(16.13)	0.07	219	2,732	53.88	94.75	
19 IBES 5Y EPS growth	Ascending	2,453	4.25	(0.26)	2.16	0.90	8.09	0.11	21.65	(27.86)	0.05	307	2,297	54.07	98.29	
20 IBES 5Y EPS growth/stability	Ascending	2,453	3.95	0.01	2.37	1.33	7.69	0.17	20.64	(19.20)	0.00	307	2,297	56.68	98.62	
21 IBES LTG EPS mean	Descending	2,017	(1.73)	(0.64)	(1.07)	1.68	15.82	0.11	37.64	(52.38)	0.06	307	2,151	49.51	97.76	
22 IBES FY2 mean DPS growth	Ascending	2,157	(2.18)	(0.03)	1.49	0.91	8.54	0.11	24.12	(21.96)	0.22	134	1,487	50.75	87.81	
23 IBES FY1 mean EPS growth	Ascending	2,765	1.01	2.17	1.64	1.07	7.49	0.14	20.76	(24.42)	0.01	307	2,517	61.24	88.80	
24 Year-over-year quarterly EPS growth	Ascending	2,937	1.60	2.94	2.98	2.54	7.04	0.36	23.85	(21.12)	0.00	231	2,876	66.67	81.60	
25 IBES FY1 mean CPFS growth	Descending	1,483	0.58	(3.15)	(1.35)	0.43	11.16	0.04	38.08	(42.07)	0.55	234	525	50.43	92.73	
26 IBES SUE, amortized	Ascending	2,617	3.77	0.60	2.01	0.80	6.49	0.12	20.62	(16.30)	0.05	246	1,087	54.07	73.94	
3. Price Momentum and Reversal																
27 Total return, 1D	Descending	2,948	8.55	2.07	2.80	4.99	7.17	0.70	15.52	(33.75)	0.00	307	2,873	77.85	1.66	
28 Total return, 21D (1M)	Descending	2,947	7.28	1.75	0.79	1.86	10.92	0.17	29.03	(43.69)	0.00	307	2,872	57.98	0.43	
29 Maximum daily return in last 1M (lottery factor)	Descending	2,941	(1.88)	0.88	3.41	5.10	14.94	0.34	39.13	(56.07)	0.00	307	2,744	64.17	54.27	
30 21D volatility of volume/price	Descending	2,947	(3.40)	0.85	1.93	0.22	6.57	0.03	24.16	(16.78)	0.56	307	2,863	51.14	56.43	
31 Total return, 252D (12M)	Ascending	2,878	1.83	1.11	2.55	3.25	14.09	0.23	39.62	(57.00)	0.00	307	2,792	64.50	89.94	
32 12M-1M total return	Ascending	2,878	3.39	1.56	3.03	4.09	13.20	0.31	37.65	(49.06)	0.00	307	2,792	65.15	88.42	
33 Price-to-52 week high	Ascending	2,878	(3.82)	(0.06)	3.00	3.15	17.78	0.18	49.63	(62.50)	0.00	307	1,943	61.89	83.32	
34 Total return, 1260D (60M)	Ascending	2,517	(4.34)	(2.32)	2.42	1.11	10.95	0.10	25.63	(35.41)	0.08	295	2,235	56.61	97.47	
4. Sentiment																
35 IBES LTG Mean EPS Revision, 3M	Ascending	1,985	0.11	0.29	1.05	0.87	3.75	0.23	11.16	(12.06)	0.00	307	2,123	61.89	59.76	
36 IBES FY1 Mean EPS Revision, 3M	Ascending	2,748	2.01	0.71	1.87	2.93	8.45	0.35	29.96	(33.00)	0.00	307	2,476	66.78	75.38	
37 IBES FY1 EPS up/down ratio, 3M	Ascending	2,742	1.63	0.41	1.84	3.09	7.86	0.39	27.54	(24.41)	0.00	307	2,339	67.75	79.61	
38 Expectation gap, short-term - long-term	Descending	2,185	(8.21)	0.89	1.63	1.19	5.18	0.23	9.60	(19.91)	0.00	307	2,124	57.65	91.14	
39 IBES FY1 Mean CPFS Revision, 3M	Ascending	1,559	(0.50)	1.07	2.02	2.02	15.98	0.13	69.38	(75.04)	0.04	276	691	62.32	64.51	
40 IBES FY1 Mean SAL Revision, 3M	Ascending	2,707	(2.06)	1.07	2.11	1.09	7.86	0.14	27.43	(24.32)	0.05	206	2,169	60.19	71.61	
41 IBES FY1 Mean FFO Revision, 3M	Ascending	138	7.37	(0.93)	2.80	2.91	21.06	0.14	71.43	(80.00)	0.02	279	84	57.71	69.56	
42 IBES FY1 Mean DPS Revision, 3M	Ascending	1,250	2.05	0.73	0.99	0.67	5.16	0.13	14.91	(17.55)	0.14	131	997	58.02	62.65	
43 IBES FY1 Mean ROE Revision, 3M	Ascending	2,115	2.01	(0.68)	0.83	0.67	6.63	0.10	23.70	(22.19)	0.25	131	1,728	58.78	65.91	
44 Recommendation, mean	Descending	2,796	2.30	2.27	2.11	0.81	7.53	0.11	21.85	(19.41)	0.10	236	2,666	56.78	94.39	
45 Mean recommendation revision, 3M	Descending	2,785	2.29	0.87	0.44	1.25	4.08	0.31	19.86	(11.55)	0.00	233	2,663	63.09	59.94	
46 Target price implied return	Ascending	2,738	6.42	2.85	0.52	0.08	16.83	0.00	60.74	(39.59)	0.95	172	2,460	52.91	80.06	
47 Mean target price revision, 3M	Ascending	2,726	(0.54)	0.83	1.42	2.39	12.67	0.19	30.14	(41.94)	0.02	169	2,446	63.31	74.99	
5. Quality																
48 ROE, trailing 12M	Ascending	2,925	2.02	1.19	3.34	3.86	10.06	0.38	33.42	(29.52)	0.00	231	2,863	64.50	96.46	
49 Return on invested capital (ROIC)	Ascending	2,918	2.06	0.88	3.78	4.18	10.22	0.41	33.02	(31.24)	0.00	231	2,855	68.83	98.21	
50 Sales to total assets (asset turnover)	Ascending	2,930	3.42	1.65	1.86	1.61	8.69	0.19	22.78	(22.02)	0.00	307	2,813	56.03	99.45	
51 Operating profit margin	Ascending	2,889	2.80	(1.39)	0.81	1.20	5.48	0.22	16.98	(14.17)	0.00	307	2,718	59.61	98.44	
52 Current ratio	Descending	2,283	(3.41)	1.69	1.08	1.85	10.20	0.18	31.95	(38.66)	0.00	307	2,238	54.40	97.92	
53 Long-term debt/equity	Ascending	2,843	(4.39)	2.52	1.63	0.80	9.60	0.08	35.65	(28.14)	0.15	307	2,747	48.53	98.52	
54 Altman's z-score	Ascending	2,267	(1.08)	(1.17)	1.42	0.29	9.17	0.03	31.74	(30.44)	0.58	307	2,158	49.19	98.35	
55 Merton's distance to default	Ascending	2,450	(4.28)	(1.34)	2.84	3.31	11.78	0.28	33.03	(41.45)	0.00	307	2,335	65.47	95.05	
56 Ohlson default model	Descending	2,259	(1.94)	(1.23)	1.65	2.29	6.35	0.36	16.95	(18.63)	0.00	270	2,124	68.15	98.29	
57 Accruals (Sloan 1996 def)	Descending	2,212	(2.91)	0.02	(0.24)	0.55	4.17	0.13	12.07	(15.48)	0.02	307	2,138	55.37	88.53	
58 Firm-specific discretionary accruals	Descending	2,182	(5.94)	(0.55)	(0.26)	0.48	3.18	0.15	7.82	(10.87)	0.02	247	2,120	55.87	80.36	
59 Hist 5Y operating EPS stability, coef of determination	Ascending	2,873	(2.10)	0.20	0.00	0.82	5.02	0.16	20.01	(12.27)	0.02	219	2,732	52.51	96.90	
60 IBES 5Y EPS stability	Descending	2,453	(1.13)	0.18	1.30	1.19	8.61	0.14	25.00	(34.33)	0.02	307	2,297	54.07	98.96	
61 IBES FY1 EPS dispersion	Descending	2,790	0.08	(0.21)	3.03	1.57	9.09	0.17	31.67	(25.17)	0.00	307	2,538	59.93	84.21	
62 Payout on trailing operating EPS	Ascending	2,235	(10.14)	(2.13)	(0.17)	0.76	13.50	0.06	38.55	(30.91)	0.32	307	2,211	49.51	99.23	
63 YoY change in # of shares outstanding	Descending	2,895	2.63	2.73	2.89	2.62	8.87	0.30	19.53	(46.21)	0.00	307	2,769	60.91	94.30	
64 YoY change in debt outstanding	Descending	2,263	4.40	0.58	(0.39)	0.30	4.06	0.07	13.07	(10.40)	0.20	307	2,220	56.03	89.90	
65 Net external financing/net operating assets	Ascending	2,938	(1.56)	2.15	2.20	2.46	8.44	0.29	44.61	(21.76)	0.00	307	2,835	61.24	94.69	
66 Piotroski's F-score	Ascending	2,948	3.59	2.54	3.11	2.94	8.08	0.36	29.20	(27.83)	0.00	307	2,875	67.75	88.23	
67 Mohanram's G-score	Ascending	549	(7.28)	(2.62)	1.41	2.61	10.58	0.25	35.27	(32.14)	0.00	219	384	56.62	95.48	
6. Technicals																
68 # of days to cover short	Descending	2,937	(7.48)	0.83	2.30	2.17	7.31	0.30	33.80	(25.16)	0.00	307	2,020	58.31	91.38	
69 CAPM beta, 5Y monthly	Descending	2,945	(6.13)	(2.55)	0.03	1.00	13.76	0.07	40.19	(42.70)	0.25	248	2,908	51.21	97.71	
70 CAPM idiosyncratic vol, 1Y daily	Descending	2,946	(8.57)	1.00	5.03	5.16	18.11	0.28	42.60	(60.80)	0.00	295	2,880	62.03	99.19	
71 Realized vol, 1Y daily	Descending	2,878	(11.06)	0.14	4.52	5.00	18.74	0.27	42.69	(59.63)	0.00	307	2,791	61.24	99.16	
72 Skewness, 1Y daily	Descending	2,878	(4.25)	(0.70)	0.2											



Figure 42: Global factor performance, measured as rank IC (S&P BMI World universe)

Since Inception															
Factor Name	Direction ¹	Current # of Stocks	Average IC (%)			Avg /					# of Months	Avg # of Stocks	Hit	Serial Corr (%) ³	
			Last M	12M Avg	3Y Avg	Avg	Std Dev	Std Dev	Max	Min					p-value ²
1. Value															
1 Dividend yield, trailing 12M	Ascending	9,840	(9.21)	1.44	3.51	4.26	10.55	0.40	36.88	(23.89)	0.00	283	8,003	64.66	97.99
2 Dividend yield, FY1	Ascending	7,616	(7.73)	1.11	3.19	4.32	10.88	0.40	32.17	(22.90)	0.00	226	5,231	63.72	98.17
3 Dividend yield, FY2	Ascending	7,554	(7.19)	1.07	2.94	4.20	10.94	0.38	33.19	(24.39)	0.00	216	5,189	63.43	98.16
4 Price/Earnings	Descending	8,090	(0.37)	0.13	0.23	4.03	13.14	0.31	39.66	(50.73)	0.00	276	6,293	61.59	96.29
5 Price-to-FY0 EPS	Descending	7,797	1.81	0.06	(0.73)	2.89	10.30	0.28	28.98	(37.08)	0.00	283	6,019	62.19	96.38
6 Earnings yield, FY0	Ascending	9,017	0.95	1.83	1.56	4.00	9.19	0.43	31.67	(18.68)	0.00	283	7,000	64.66	96.29
7 Earnings yield, forecast FY1 mean	Ascending	8,275	(0.90)	2.05	2.14	4.71	10.89	0.43	35.35	(22.20)	0.00	283	6,450	63.60	95.66
8 Earnings yield, forecast FY2 mean	Ascending	8,160	(0.19)	1.22	0.89	4.31	11.90	0.36	37.31	(31.50)	0.00	283	6,276	62.54	95.70
9 Cash flow yield, FY0	Ascending	6,861	3.31	1.27	0.73	4.06	6.38	0.64	26.42	(11.80)	0.00	159	4,939	75.47	97.09
10 Cash flow yield, FY1 mean	Ascending	5,838	3.77	0.28	(0.86)	2.01	9.73	0.21	31.42	(32.01)	0.00	215	4,468	58.14	96.01
11 Price/Sales	Descending	9,352	1.52	0.42	(0.37)	1.46	9.57	0.15	26.48	(31.59)	0.01	283	7,481	55.83	99.23
12 Price/Book	Descending	9,491	(5.16)	(1.51)	(1.81)	1.14	10.50	0.11	31.56	(37.54)	0.07	283	7,529	56.54	98.33
13 Est Book-to-price, median	Ascending	7,230	(3.18)	(1.19)	(2.52)	1.12	9.90	0.11	30.37	(26.29)	0.15	167	5,391	52.10	98.06
14 EBITDA to EV	Ascending	7,345	13.66	5.39	5.31	4.03	10.85	0.37	36.69	(26.20)	0.00	283	4,659	62.90	95.60
15 Sales/EV	Ascending	9,361	1.82	1.14	1.04	1.96	7.88	0.25	24.81	(20.06)	0.00	283	7,447	61.13	98.98
2. Growth															
16 IBES 5Y EPS growth	Ascending	8,285	(1.73)	0.19	1.78	1.11	6.15	0.18	19.09	(21.86)	0.00	283	6,203	59.01	98.06
17 EPS Growth	Ascending	8,862	0.88	2.34	1.35	2.08	6.86	0.30	29.72	(28.97)	0.00	267	6,876	64.04	88.41
18 IBES LTG EPS mean	Descending	5,198	2.77	(0.31)	0.19	1.34	12.13	0.11	28.22	(40.36)	0.06	283	4,164	53.00	96.76
19 IBES FY1 mean EPS growth	Ascending	7,976	(6.84)	0.15	0.34	0.39	6.07	0.06	14.44	(20.10)	0.28	283	6,360	54.77	88.50
20 IBES FY1 mean CFPS growth	Descending	5,161	6.08	1.45	1.02	1.76	4.23	0.42	7.47	(11.39)	0.00	159	3,898	65.41	91.73
21 IBES FY2 mean DPS growth	Ascending	7,540	(6.42)	0.21	0.08	2.43	11.03	0.22	38.85	(31.49)	0.00	225	5,071	59.11	88.05
22 Asset growth	Descending	9,278	8.47	2.56	1.63	0.65	8.54	0.08	21.57	(27.36)	0.20	283	7,272	52.30	93.65
3. Price Momentum and Reversal															
23 Total return, 1D	Descending	9,863	17.07	2.65	3.25	3.63	7.45	0.49	21.94	(41.58)	0.00	283	8,117	71.02	2.02
24 Weekly Total Return	Descending	9,863	6.67	1.02	3.39	2.98	8.73	0.34	30.60	(33.64)	0.00	283	8,115	64.66	1.39
25 Total return, 21D (1M)	Ascending	9,856	(1.25)	0.93	0.66	0.13	11.46	0.01	27.69	(44.07)	0.85	283	8,110	53.00	4.15
26 Total return, 252D (12M)	Ascending	9,675	5.44	6.80	5.76	4.45	14.54	0.31	41.64	(46.50)	0.00	283	7,918	66.78	90.64
27 12M-1M total return	Ascending	9,675	5.97	7.01	6.20	5.07	14.00	0.36	40.96	(42.52)	0.00	283	7,918	68.90	88.72
28 Total return, 1260D (60M)	Ascending	8,636	(1.62)	0.97	2.64	1.47	14.09	0.10	40.32	(44.84)	0.08	283	6,413	58.30	97.79
4. Sentiment															
29 IBES LTG Mean EPS Revision, 1M	Ascending	5,165	1.90	0.60	0.62	0.67	2.57	0.26	7.26	(8.59)	0.00	283	4,126	62.90	0.55
30 IBES LTG Mean EPS Revision, 3M	Ascending	5,129	(0.06)	0.91	0.91	0.86	3.33	0.26	11.05	(10.26)	0.00	283	4,071	61.48	60.12
31 IBES FY1 EPS up/down ratio, 1M	Ascending	5,494	3.32	3.46	3.63	3.71	5.43	0.68	17.76	(13.76)	0.00	283	4,345	76.68	34.74
32 IBES FY1 EPS up/down ratio, 3M	Ascending	7,676	1.73	4.36	4.04	3.68	5.80	0.63	17.92	(12.36)	0.00	283	5,825	75.27	78.51
33 IBES FY1 Mean EPS Revision, 1M	Ascending	8,060	2.99	3.06	2.91	2.91	5.07	0.57	16.50	(12.79)	0.00	283	6,303	72.44	24.14
34 IBES FY1 Mean EPS Revision, 3M	Ascending	7,952	0.15	4.03	3.99	3.41	6.63	0.51	19.37	(20.12)	0.00	283	6,212	73.50	74.18
35 IBES FY1 Mean CFPS Revision, 3M	Ascending	5,469	(2.95)	2.64	2.71	2.52	5.55	0.45	15.81	(23.83)	0.00	205	4,290	77.07	63.96
36 IBES FY1 Mean DPS Revision, 1M	Ascending	6,004	2.19	2.48	3.00	1.79	4.38	0.41	12.65	(16.63)	0.00	224	4,331	71.88	10.98
37 IBES FY1 Mean DPS Revision, 3M	Ascending	5,925	2.76	3.65	3.86	2.23	5.86	0.38	19.08	(24.51)	0.00	222	4,271	72.52	65.66
38 IBES FY1 Mean FFO Revision, 1M	Ascending	7,294	3.11	3.76	3.61	2.30	4.06	0.57	11.73	(8.89)	0.00	151	4,035	77.48	13.50
39 IBES FY1 Mean FFO Revision, 3M	Ascending	7,108	0.68	5.06	4.66	2.90	5.75	0.50	16.27	(14.53)	0.00	148	3,941	74.32	67.77
40 IBES FY1 Mean ROE Revision, 1M	Ascending	8,074	(2.28)	1.88	1.95	1.77	4.08	0.43	13.70	(10.51)	0.00	203	5,356	69.46	14.29
41 IBES FY1 Mean ROE Revision, 3M	Ascending	7,934	(4.60)	2.16	2.27	2.17	5.01	0.43	13.57	(13.58)	0.00	201	5,226	69.15	68.46
42 Target price implied return	Descending	8,332	0.84	1.29	1.51	0.95	14.65	0.06	55.58	(36.25)	0.40	167	6,271	53.29	82.33
43 Recommendation, mean	Descending	8,507	3.30	2.28	2.31	1.77	6.84	0.26	17.41	(16.84)	0.00	236	7,187	65.25	94.45
44 Mean recommendation revision, 3M	Descending	8,464	1.87	0.96	1.36	1.87	2.92	0.64	10.01	(10.13)	0.00	233	7,165	75.11	60.11
5. Quality															
45 Return on Equity	Ascending	9,100	0.88	2.69	3.69	4.22	10.14	0.42	30.68	(34.69)	0.00	235	7,666	66.81	97.09
46 Return on capital	Ascending	9,213	(1.23)	1.82	3.36	4.45	12.30	0.36	49.47	(34.02)	0.00	283	6,956	64.66	97.95
47 Return on Assets	Ascending	9,439	10.13	4.67	5.23	4.81	13.27	0.36	44.20	(30.31)	0.00	283	7,057	63.96	98.15
48 Asset Turnover	Ascending	9,397	18.45	5.00	3.97	2.71	16.33	0.17	44.64	(51.55)	0.01	283	7,543	58.30	99.84
49 Gross margin	Ascending	8,671	5.11	2.26	2.47	1.88	5.85	0.32	16.60	(13.45)	0.00	283	6,858	63.25	98.88
50 EBITDA margin	Ascending	9,385	7.72	4.37	3.96	4.06	13.80	0.29	42.97	(41.30)	0.00	283	7,562	59.72	96.82
51 Berry Ratio	Ascending	7,187	(2.77)	0.18	0.94	2.86	9.30	0.31	29.57	(20.79)	0.00	283	5,300	59.36	97.69
52 IBES FY1 EPS dispersion	Descending	8,275	1.76	2.59	3.66	0.51	9.57	0.05	32.68	(25.37)	0.37	283	6,450	50.88	87.91
53 IBES 5Y EPS growth/stability	Ascending	8,285	(1.81)	0.53	2.14	1.45	5.99	0.24	18.66	(20.47)	0.00	283	6,202	58.66	98.30
54 YoY change in debt outstanding	Descending	7,702	4.01	0.70	0.21	0.27	3.92	0.07	11.51	(11.34)	0.25	283	6,282	53.71	91.45
55 Current ratio	Descending	7,776	(4.06)	0.35	0.61	0.60	8.91	0.07	27.86	(27.01)	0.26	283	6,148	49.47	98.50
56 Long-term debt/equity	Ascending	9,327	(0.31)	2.97	1.23	0.79	6.46	0.12	22.37	(18.17)	0.04	283	7,455	54.42	98.88
57 Merton's distance to default	Ascending	8,171	5.25	1.89	4.10	2.65	11.16	0.24	31.19	(31.18)	0.00	283	6,459	60.07	93.26
58 Capex to Dep	Descending	7,243	9.61	4.85	2.65	1.54	6.50	0.24	22.38	(19.93)	0.00	283	5,124	61.48	96.90
6. Technicals															
59 Realized vol, 1Y daily	Descending	9,681	(2.44)	3.82	5.30	5.13	15.36	0.33	29.45	(44.64)	0.00	283	7,926	61.13	98.96
60 Skewness, 1Y daily	Descending	9,681	(0.22)	1.34	2.12	1.66	5.33	0.31	15.03	(32.98)	0.00	283	7,926	63.96	90.01
61 Moving average crossover, 15W-36W	Ascending	9,411	2.68	4.18	1.91	3.01	14.59	0.21	37.15	(45.46)	0.00	283	6,917	62.54	91.36
62 Normalized abnormal volume	Ascending	9,809	4.05	3.41	2.76	2.27	6.55	0.35	20.47	(14.71)	0.00	283	7,878	60.78	66.25

Note:

- Direction indicates how the factor scores are sorted. Ascending order means higher factor scores are likely to be associated with higher subsequent stock returns, and vice versa for descending order.
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- This is the autocorrelation of the factor scores over time. Higher serial correlation indicates lower portfolio turnover based on the factor.

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Appendix 1

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