



Ringling in the New Year with Alpha

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.

The traditional January Effect or Bounce

Traditionally, the term "The January Effect" was used to explain a seasonal anomaly where the stock market had a tendency to rally during the month of January. However, we find that this anomaly has long since been arbitrated away by market efficiencies.

But, the January Effect has evolved

In the quant space, the January Effect refers to a phenomenon where most conventional quant strategies tend to underperform in January. However, our results show that a one-month reversal strategy has the best performance over the month of January compared to any other month, with an average monthly return of approximately 3.6% and a hit rate of 74%. We find evidence that this outperformance in one-month reversal in January may be due to the reversal of investor window dressing in December.

Capitalizing on the January Effect

We see the January Effect as an alpha opportunity rather than a seasonal hindrance. With current market indices at all time highs, profit taking strategies such as reversal may be an opportune choice for investors looking for an early year head start in performance.

Miguel-A Alvarez

miguel-a.alvarez@db.com

Javed Jussa

javed.jussa@db.com

Zongye Chen

john.chen@db.com

Sheng Wang

sheng.wang@db.com

Allen Wang

allen-y.wang@db.com

Yin Luo, CFA

yin.luo@db.com

North America: +1 212 250 8983

Europe: +44 20 754 71684

Asia: +852 2203 6990



Deutsche Bank Securities Inc.

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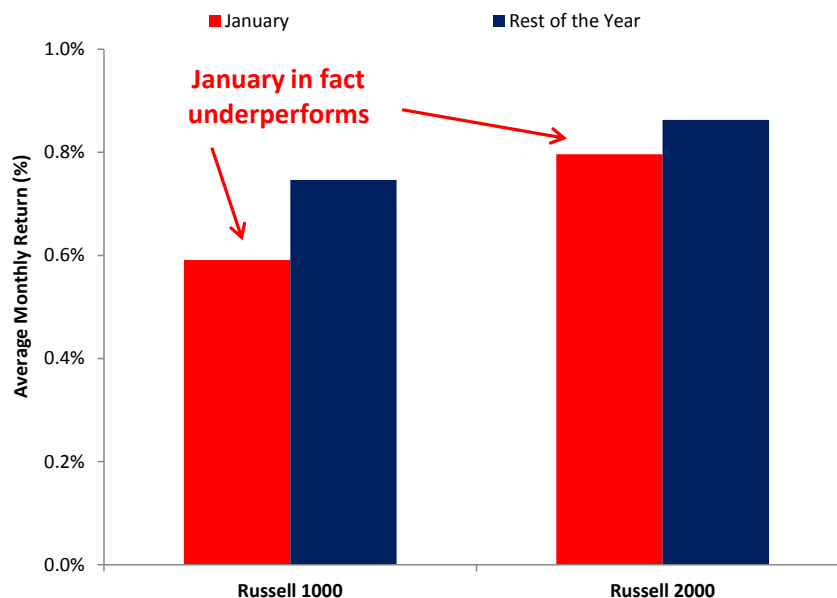
New Year Alpha

Traditionally, the term “The January Effect” was used to explain a seasonal anomaly where the stock market had a tendency to rally during the month of January.¹ There has been a multitude of academic journals, papers, and media commentary discussing potential reasons for the existence of the January Effect. In this month’s Quant View we take a practical viewpoint to determine whether this phenomenon still exists or whether it has been arbitrated away by market efficiency. We then analyze the strategy from a more quantitative perspective to explore any opportunities available to investors from this phenomenon.

The evolution of the January effect

The most common perception of the January Effect is that it refers to the tendency of the market to outperform during the beginning of year. A simple test is to analyze the average performance of the Russell 1000 and 2000 in January and compare it to the average return across all other months in the year (Figure 1). The average performance is computed using monthly market returns from 1988 onwards. Interestingly, we do not see any evidence of this notion of the January Effect. In fact, our results show that the market actually underperforms on average during the month of January.

Figure 1: Testing the presence of the January Effect from 1988 to 2013



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

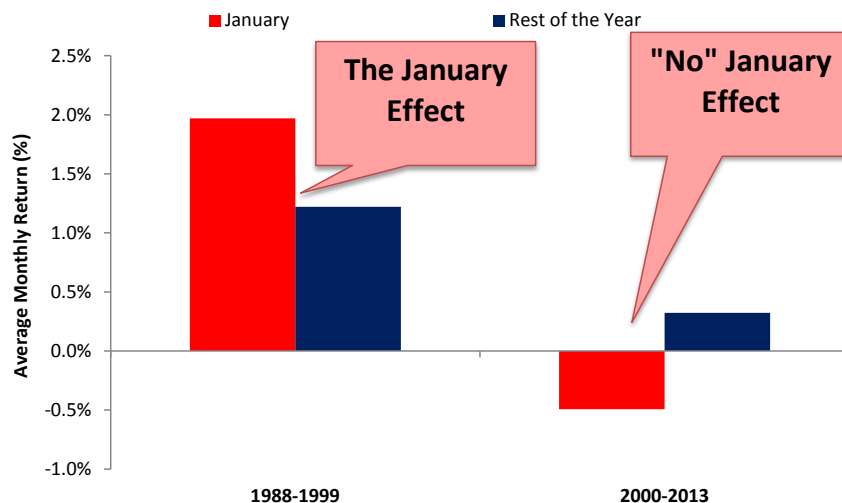
Perhaps the January Effect had persisted in the past, only to be arbitrated away more recently by market efficiency. To determine this, we test for the persistence of the January Effect in the past and during more recent times. Figure 2 compares the

¹ Note that there are several permutations and interpretations of the January Effect including the outperformance of small cap over large cap stocks in January as well as the January Barometer where the performance of the S&P 500 during January sets the stock market’s direction for the year.



performance of the January Effect within two distinct time periods (i.e. from 1988 to 1999 and from 2000 to 2013). The results show that the January effect persisted in the past, quite strongly in fact, but has likely been arbitrated away. These results suggest that, going forward, betting on the January seasonal anomaly may be futile for investors to pursue. Market efficiencies appear to have arbitrated away this seasonal anomaly to the extent where investors' participation is not worthwhile. However, a more quantitative perspective may uncover some additional insight into the January Effect.

Figure 2: Testing if the January Effect has been arbitrated away



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

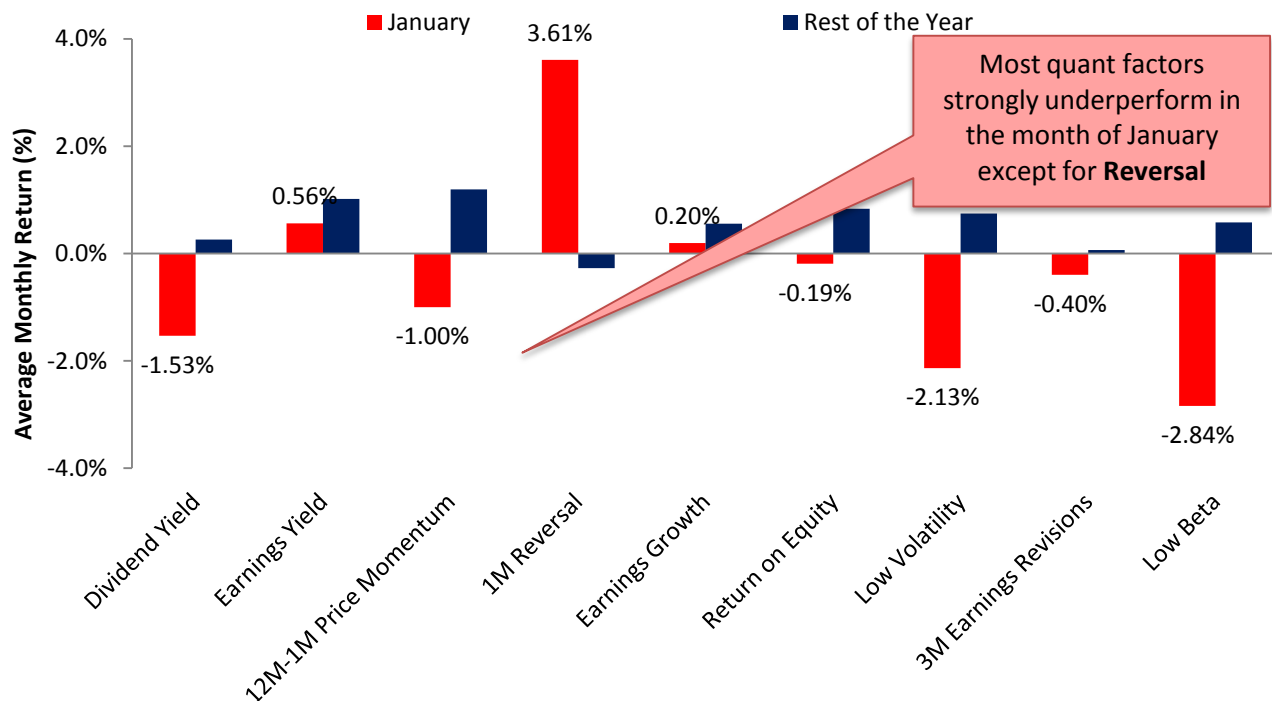
Adding quant to the equation

From the perspective of quants, the January Effect has a different connotation. Within the quant arena, the January Effect refers to a phenomenon where basic quant factors or strategies underperform in January. Essentially, most strategies that typical quant models employ, in fact, underperform in January. A simple test is to compare factor performance in January to other months (Figure 3) within the Russell 1000 universe. Interestingly, we do see a strong presence of the January Effect. Many of the quant factors such as value, quality, growth, momentum etc., underperform in January. Most notably, low volatility and low beta have historically underperformed.

Additionally, the results show that one-month reversal has superior performance in January, with an average monthly long/short return of approximately 3.6%. Recall that one-month reversal buys stocks with the worse performance last month and sells those with the best performance. In other words, it is a simple cross-sectional mean reversion strategy. Analyzing factor performance in January showed some interesting results. Next, we turn to a more rigorous analysis to better understand what is potentially causing the January rally in the reversal factor and the robustness of these results over different periods in time.



Figure 3: On average, quant factors underperform in the month of January from 1994 onwards



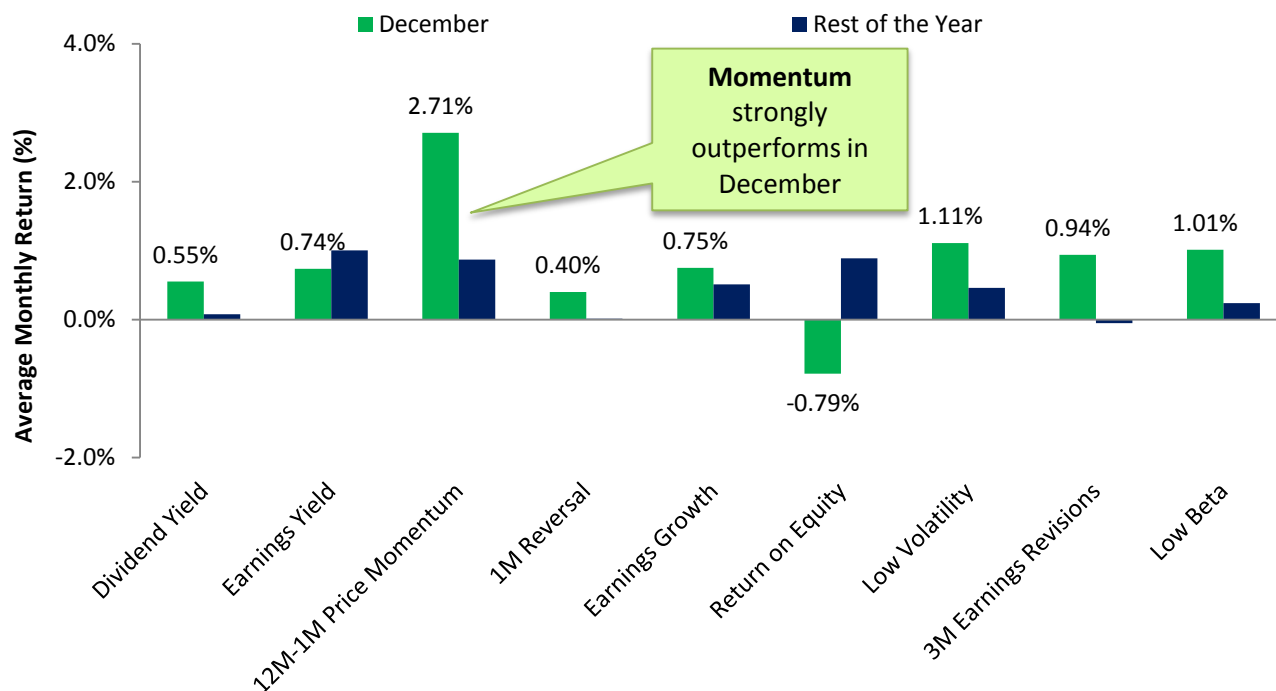
Source: Bloomberg Finance LP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank

There's been no shortage of explanations for the existence of the January Effect. Some of these explanations include investors' holiday psychology, the creation of tax losses, small cap effects and even raising capital for end of season shopping. However, there has not been much literature or explanations for the outperformance of reversal strategies during January. One sensible explanation is that it may be due to a correction or profit taking after "window dressing" by managers in December. Window dressing refers to the notion that managers tend to sell underperforming and buy outperforming stocks in December to improve the visual appearance of their portfolio at year end. The argument goes that window dressing causes mispricing because the decision to buy/sell stocks is not based on a stock's underlying valuation. Then in January the mispricing is reversed due to profit taking or as managers revert back towards their original convictions.

Let's assume for a moment that the window dressing explanation holds. This would imply that momentum strategies should outperform in December since window dressing entails investment managers are buying strong performing stocks and selling poorly performing ones. A simple test is to analyze the factor performance in December (Figure 4) and comparing it to the rest of the year. Interestingly, momentum is the best performing factor in December with a long/short average monthly return of approximately 2.7%. These results provide some empirical evidence substantiating the window dressing argument underlying the January Effect for reversal. In summary, we see a strong rally in momentum strategies in December potentially attributed to investor window dressing. This is followed by an unwinding the following month where reversal strategies rally strongly in January. Thus far we have seen some interesting insight surrounding the potential events leading the January rally in the reversal factor. Next, we look at the viability of building an alpha strategy to potentially capitalize on this effect.



Figure 4: Momentum strongly outperforms in the month of December from 1994 onwards



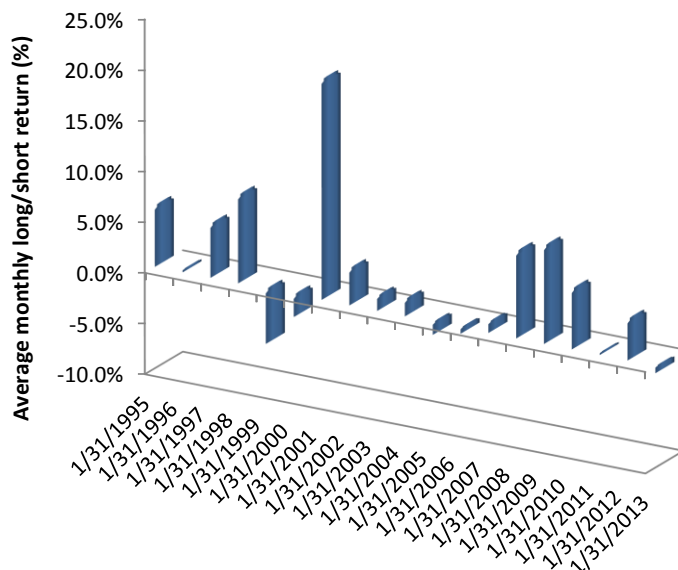
Source: Bloomberg Finance LP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank

Catching the January bounce

One-month reversal in the month of January appears to be a potentially promising strategy showing an average historical long/short monthly return of approximately 3.6%. However, aside from the overall strategy performance, it is pertinent to analyze that the performance is robust over time and not dominated by a few outlier periods. Figure 5 shows the time series of the long/short monthly performance of the one-month reversal strategy every January since 1995. The performance of the strategy is fairly stable overtime with only a few underperforming months. We do note one outlier on January 31st 2001. However, even after removing this outlier, the one-month reversal strategy every January has an approximate average long/short monthly return of 2.6%. Another method to assess the performance of the strategy is to analyze the hit rate.



Figure 5: Time series performance of 1 month reversal in January

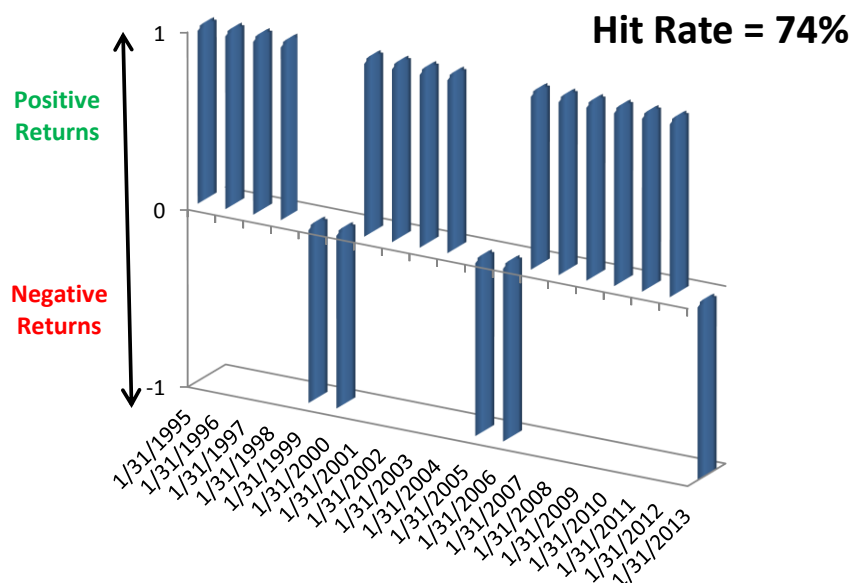


Source: Bloomberg Finance LP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank

We simply define the hit rate (Figure 6) as the proportion of times when implementing a one-month reversal strategy in January would have yielded a positive return over the backtesting period. We find the hit rate for the one-month reversal strategy within the Russell 1000 universe to be approximately 74%. This means that the one-month reversal long/short strategy showed positive returns fourteen out of the nineteen Januarys since 1995 (i.e. 74%). Next, we address the different avenues investors have to implement the one-month reversal strategies. Of course implementation will highly depend on the type of investment process.



Figure 6: Time series hit rate of 1 month reversal in January



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

How to capture the January Effect

Thus far, we have found promising empirical results based on a long/short reversal strategy in the month January. Understandably, business cycle events can override any seasonal patterns or anomalies. However, with current market indices at all time highs, profit taking strategies such as reversal may be an opportune choice for investors at this time. And as our research has shown, January may be the best month to put on reversal strategies. Below we show a few methods on how investors can capitalize on a one-month reversal strategy in January:

- Fundamental-based managers without quant resources can execute this strategy using a customized reversal basket or portfolio. Please contact us for the specific details.
- In multi-factor or multi-strategy portfolio, investors can increase the weight of the reversal factor or strategy in January. This in turn would decrease the weight to other factors or strategies. The most notable ramification of this would be to temporarily increase the model turnover since reversal is typically a higher turnover strategy.
- Quantitative investors can also neutralize seasonal effects within their alpha or stock selection models. We have written several research reports on how investors can implement such neutralization techniques. Please contact us for the specific details.
- Quantitative investors can also tune down their exposure to quant factors within the month of January since the results show that most quant factors underperform during this month. Another option is to simply turn-off the quantitative model or not rebalance the portfolio over January.

Please contact us DBEQS.Americas@db.com for more information on how to customize and trade such strategies.



Macro update

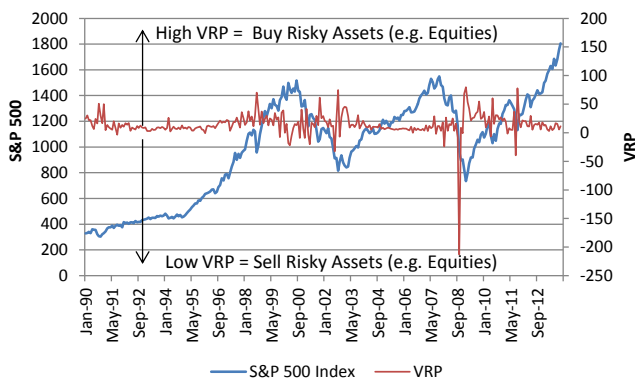
Turning our attention to the bigger picture, we also take the opportunity to update our favorite top-down market indicators.

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. 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.

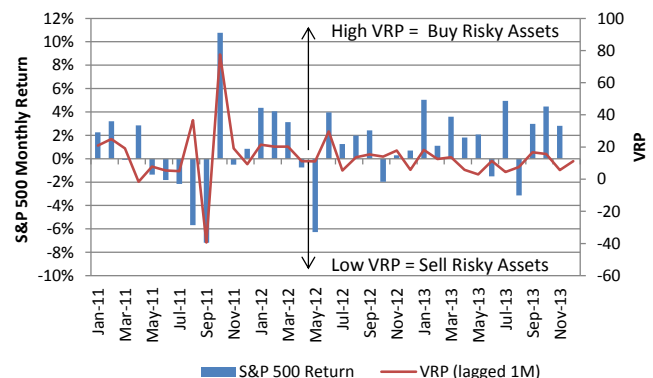
Our Variance Risk Premium (VRP) indicator is a contrarian indicator that measures market overreaction and underreaction to realized risk. Today our VRP indicator is reading 11, compared to a long-term average of 14.3. Generally we pay attention to the VRP when it hits extreme levels (like +/- 2 standard deviations).

Figure 7: Variance Risk Premium (VRP)



Source: Deutsche Bank

Figure 8: Recent VRP (lagged) and market returns



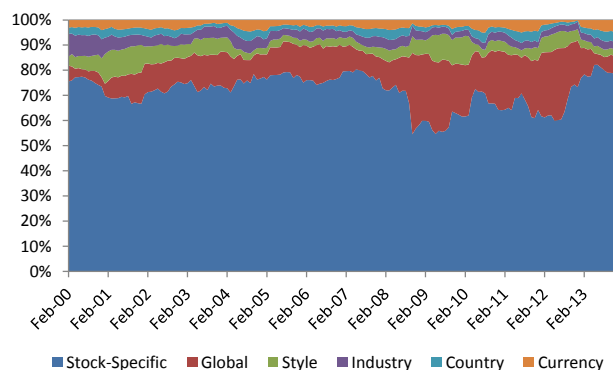
Source: Deutsche Bank

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 9 we show the opportunity set for global equity investors, and in Figure 10 we show the same thing for emerging market equity investors.

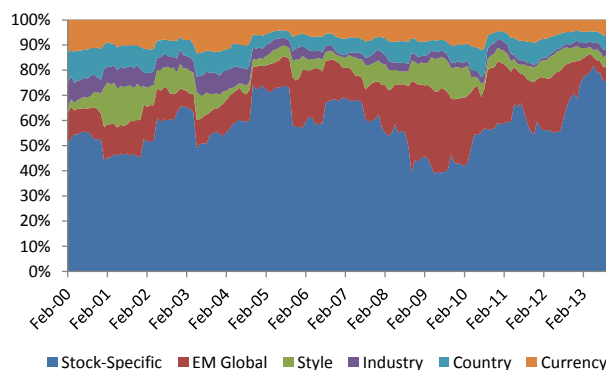


Figure 9: Global opportunity set



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

Figure 10: 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

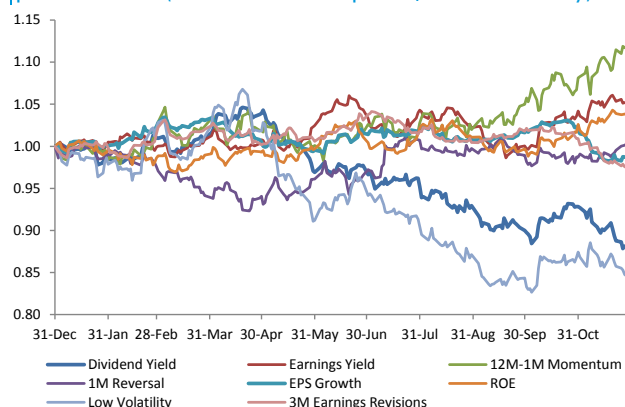
Which styles have been working around the world?

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

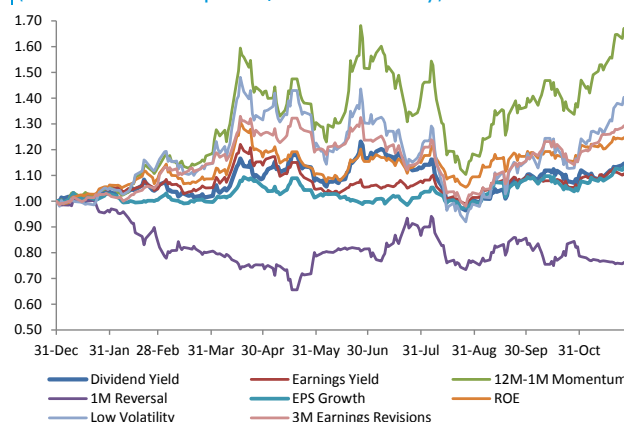
For the most recent daily factor performance, as well as factor performance delineated by different universes (e.g. large cap, small cap) and regions, please see our Global Quantitative Strategy website at <https://eqindex.db.com/gqs/>. Note that you need a username and password to log on to this website. 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 11: 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

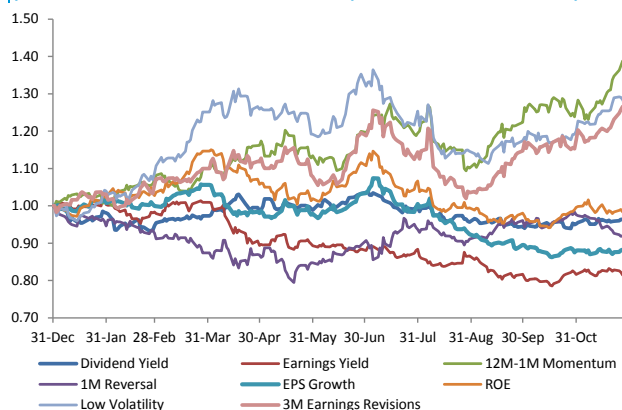
Figure 12: Canada: YTD cumulative factor performance (Q10-Q1 return spread, local currency)



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

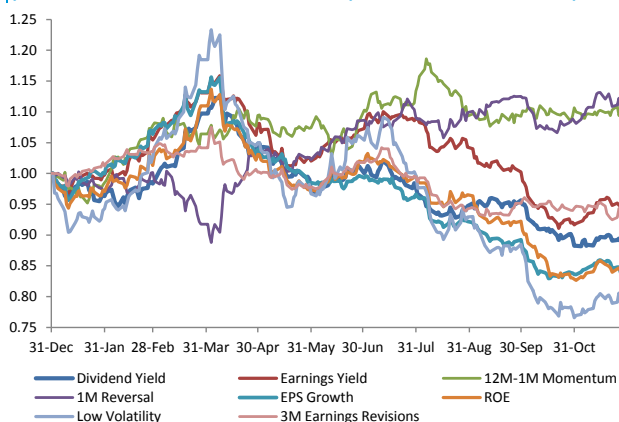


Figure 13: United Kingdom: YTD cumulative factor performance (Q10-Q1 return spread, local currency)



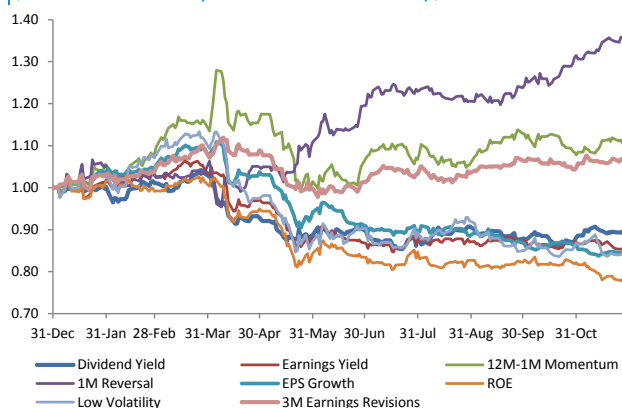
Source: Bloomberg Finance LP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank

Figure 14: Europe ex UK: YTD cumulative factor performance (Q10-Q1 return spread, local currency)



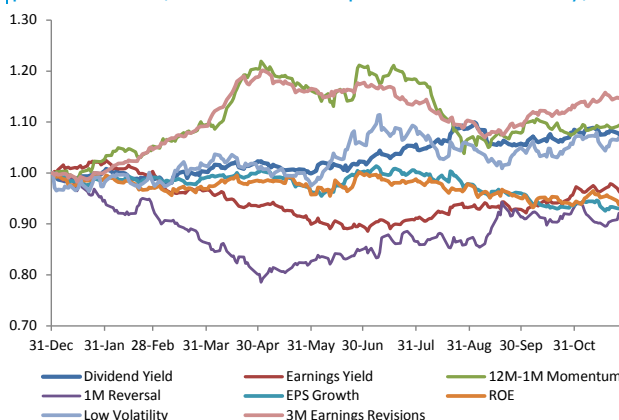
Source: Bloomberg Finance LP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank

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



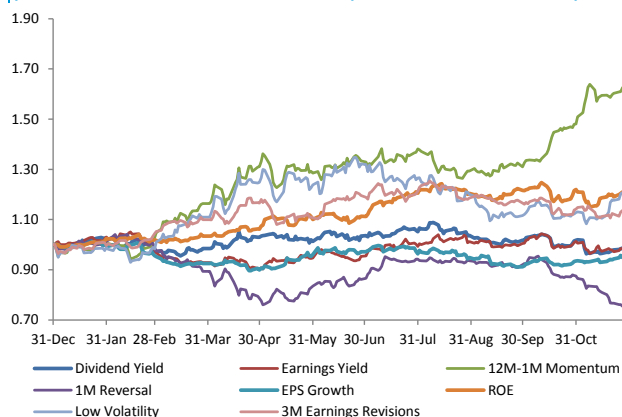
Source: Bloomberg Finance LP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank

Figure 16: Asia ex Japan: YTD cumulative factor performance (Q10-Q1 return spread, local currency)



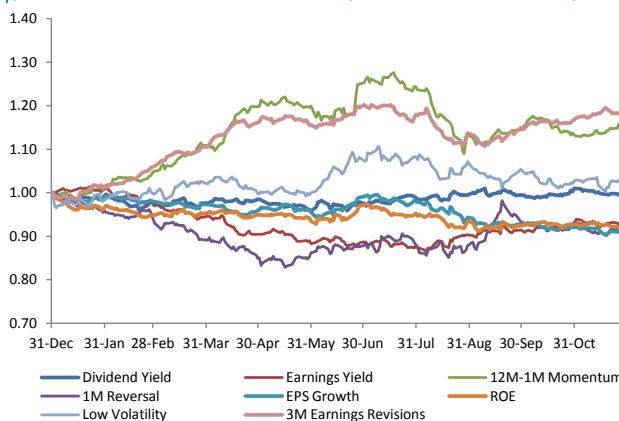
Source: Bloomberg Finance LP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank

Figure 17: 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 18: 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 19 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 19: 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)
EGL	ENLITY HOLDINGS INC	29285W104	Industrials	29.3%	AT	ATLANTIC POWER CORP	04878Q863	Utilities	-19.0%
HGG	HHGREGG INC	42833L108	Consumer Discretionary	27.9%	PCYO	PURECYCLE CORP	746228303	Utilities	-18.2%
ZLC	ZALE CORP	988858106	Consumer Discretionary	27.6%	KIOR	KIOR INC	497217109	Energy	-12.5%
MCK	MCKESSON CORP	58155Q103	Health Care	24.9%	ANV	ALLIED NEVADA GOLD CORP	019344100	Materials	-11.2%
BAH	BOOZ ALLEN HAMILTON HLDG CP	099502106	Information Technology	24.3%	GMO	GENERAL MOLY INC	370373102	Materials	-11.0%
QCOR	QUESTCOR PHARMACEUTICALS INC	74835Y101	Health Care	24.0%	AMRS	AMYRIS INC	03236M101	Energy	-10.6%
CACI	CACI INTL INC -CLA	127190304	Information Technology	23.8%	TWER	TOWERSTREAM CORP	892000100	Telecommunication Services	-8.3%
LLL	L-3 COMMUNICATIONS HLDGS INC	502424104	Industrials	23.0%	FCSC	FIBROCELL SCIENCE INC	315721209	Health Care	-8.1%
RAD	RITE AID CORP	767754104	Consumer Staples	22.6%	NIHD	NII HOLDINGS INC	62913F201	Telecommunication Services	-7.9%
COWN	COWEN GROUP INC	223622101	Financials	21.8%	UNXL	UNI-PIXEL INC	904572203	Information Technology	-7.4%
ANDE	ANDERSONS INC	034164103	Consumer Staples	21.8%	ARIA	ARIAD PHARMACEUTICALS INC	04033A100	Health Care	-7.3%
EIHI	EASTERN INSURANCE HLDGS INC	276534104	Financials	20.5%	ACFN	ACORN ENERGY INC	004848107	Industrials	-6.7%
SMG	SCOTTS MIRACLE-GRO CO	810186106	Materials	13.9%	TWGP	TOWER GROUP INTL LTD	G8988C105	Financials	-6.0%
FOE	FERRO CORP	315405100	Materials	12.7%	MOSY	MOSYS INC	619718109	Information Technology	-3.3%
VG	VONAGE HOLDINGS CORP	92886T201	Telecommunication Services	12.7%	SWSH	SWISHER HYGIENE INC	870808102	Industrials	-1.6%
WLB	WESTMORELAND COAL CO	960878106	Energy	11.3%	FSGI	FIRST SECURITY GROUP INC	336312202	Financials	-1.3%
LEAP	LEAP WIRELESS INTL INC	521863308	Telecommunication Services	11.1%	LWAY	LIFEWAY FOODS INC	531914109	Consumer Staples	-0.8%
MTRX	MATRIX SERVICE CO	576853105	Energy	9.6%	JCP	PENNEY (J C) CO	708160106	Consumer Discretionary	1.5%
NVE	NV ENERGY INC	67073Y106	Utilities	-5.7%	BODY	BODY CENTRAL CORP	09689U102	Consumer Discretionary	1.7%
GAS	AGL RESOURCES INC	001204106	Utilities	-6.8%	STSI	STAR SCIENTIFIC INC	85517P101	Consumer Staples	3.0%

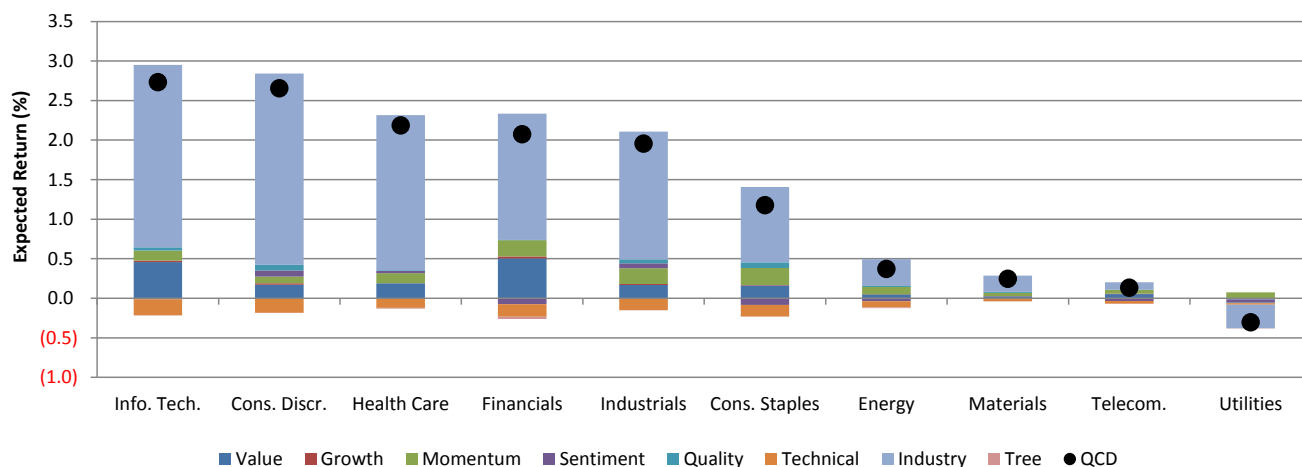
Source: Bloomberg Finance LP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank

Current sector recommendations

The QCD model also implicitly makes sector predictions. Figure 20 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 20: Current QCD sector recommendations

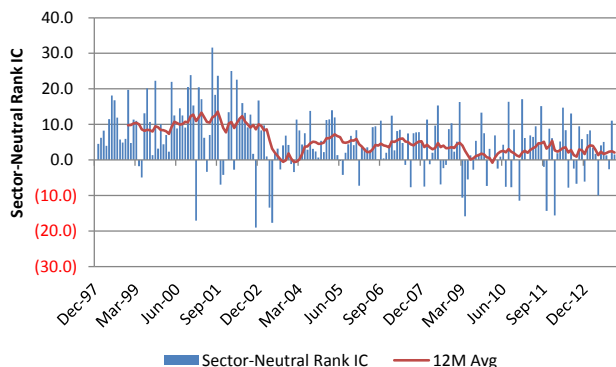


Source: Bloomberg Finance LP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank

Model performance

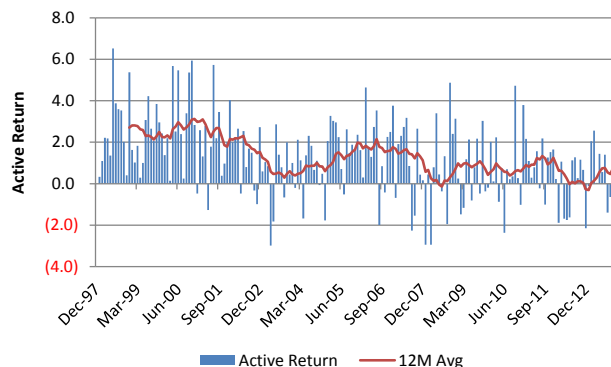
The QCD model has performed well since inception. Figure 21 shows the pure signal performance, measured as a monthly sector-neutral rank information coefficient (IC). Figure 22 shows the performance of an actual model portfolio, after costs, based on a realistically optimized market-neutral strategy.

Figure 21: Model performance, sector-neutral rank IC



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

Figure 22: Model portfolio active return, after costs

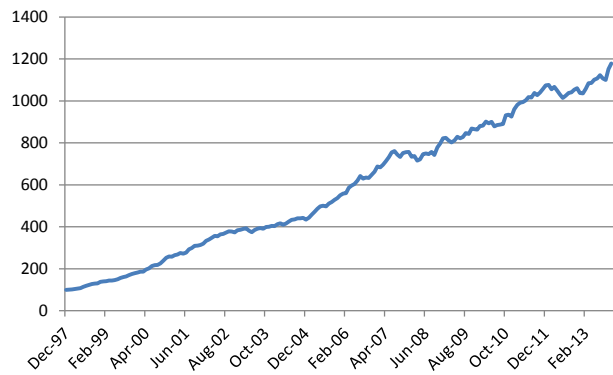


Source: Bloomberg Finance LP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank

Figure 23 shows the cumulative performance of the optimized strategy, and Figure 24 shows the annualized Sharpe ratio (after costs) by calendar year.

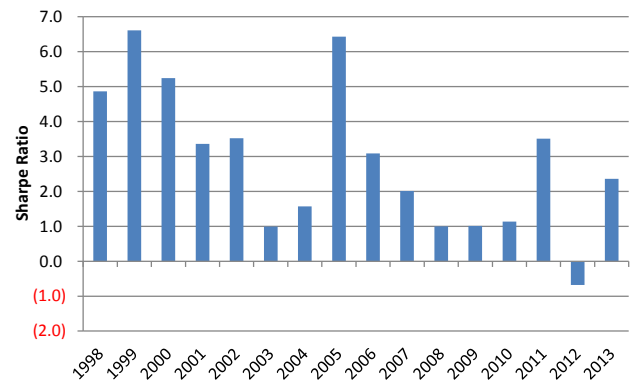


Figure 23: Model portfolio cumulative, after costs



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

Figure 24: 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 25 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 25: Current N-LASR model stock recommendations

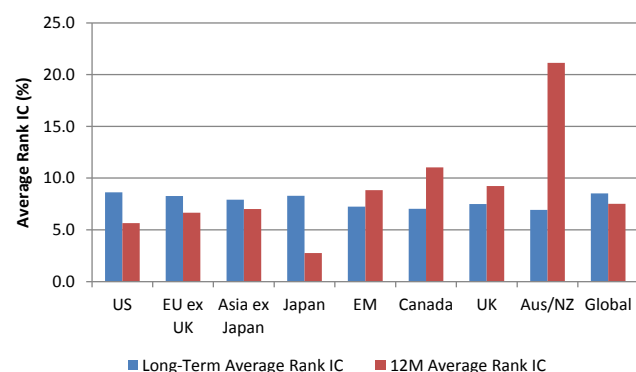
BEST BUY IDEAS					BEST SELL IDEAS				
Ticker	Name	SEDOL	Country	N-LASR Score (higher is better long)	Ticker	Name	SEDOL	Country	N-LASR Score (lower is better short)
CS FP	AXA	708842	France	2.90	MFRISCOA MM	Minera Frisco SAB de CV	B3QHKH	Mexico	-2.74
AIG	AMERICAN INTERNATIONAL GROUP	2027342	USA	2.87	068760 KS	Celltrion Pharm Inc	B0V3YP	Korea	-2.72
WTKH MK	WTK Holdings BHD	677142	Malaysia	2.82	ADANI IB	Adani Power Ltd	B3WQH4	India	-2.59
RBX SJ	Raubex	81TQ2V	South Africa	2.80	060310 KS	3s Korea Co Ltd	659946	Korea	-2.59
CBZ	CBIZ INC	2730781	USA	2.58	LCB PM	Lepanto Consolidated Mining B	651290	Philippines	-2.57
THG	HANOVER INSURANCE GROUP INC	2020415	USA	2.53	INVS IJ	Inovisi Infracom	B3LVVL	Indonesia	-2.56
UNM	UNUM GROUP	2433842	USA	2.51	1919 JT	Yamada SxL Home Co Ltd	649615	Japan	-2.53
SWM AU	Seven West Media Ltd	694943	Australia	2.51	041960 KS	Komipharm International Co Ltd	641900	Korea	-2.52
HIG	HARTFORD FINANCIAL SERVICES	2476193	USA	2.44	IMG LN	Imagination Tech Group PLC	093031	UK	-2.47
VSEC	VSE CORP	2926773	USA	2.41	PRC FP	Artprice.com	586924	France	-2.43
EGL	ENGLITY HOLDINGS INC	883M6H7	USA	2.37	082270 KS	Gemvax & Kael Co	B09CF3	Korea	-2.36
TPC	TUTOR PERINI CORP	2681760	USA	2.35	CGG	CHINA GOLD INTL RSRC CP LTD	2750488	Canada	-2.36
1531 TT	Kaulin Manufacturing Co Ltd	616161	Taiwan	2.34	HRT3 BS	HRT Participacoes em Petroleo S.A.	B4LW4N	Brazil	-2.36
ENERSIS CC	Enersis SA	229945	Chile	2.30	TRQ	TURQUOISE HILL RESOURCES LTD	B7WJF5	Canada	-2.35
6814 JT	Furuno Electric Co	635761	Japan	2.30	ARIA	ARIAD PHARMACEUTICALS INC	2066624	USA	-2.33
HMN	HORACE MANN EDUCATORS CORP	2437112	USA	2.29	276 HK	Mongolia Energy Corporation Ltd.	B02L83	Hong Kong	-2.30
HIL AU	Hills Holdings Limited	642819	Australia	2.28	078160 KS	Medipost Co	B0C5TJ	Korea	-2.30
MET	METLIFE INC	2573209	USA	2.23	AMRS	AMYRIS INC	B67TTN7	USA	-2.27
ADM	ARCHER-DANIELS-MIDLAND CO	2047317	USA	2.22	SRPT	SAREPTA THERAPEUTICS INC	B8DPDT7	USA	-2.25
2485 TT	Zinwell Corp	619973	Taiwan	2.21	EZCH IT	Ezchip Semiconduct	655499	Israel	-2.25

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

Model performance

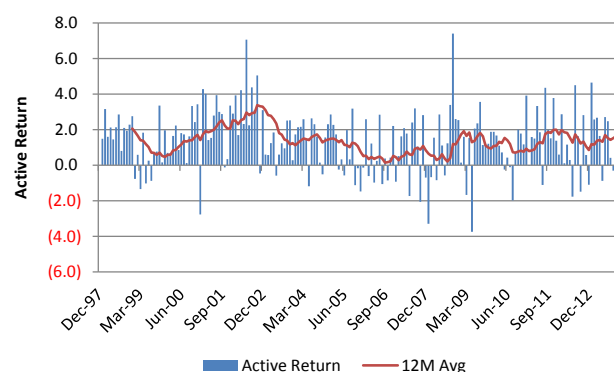
The N-LASR model has performed well since inception. Figure 26 shows the average pure signal performance, measured as a monthly rank information coefficient (IC), in different regions. Figure 27 shows the performance of a global model portfolio, after costs, based on a realistically optimized market-neutral strategy.

Figure 26: Regional model performance, average rank IC



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

Figure 27: Global portfolio active return, after costs

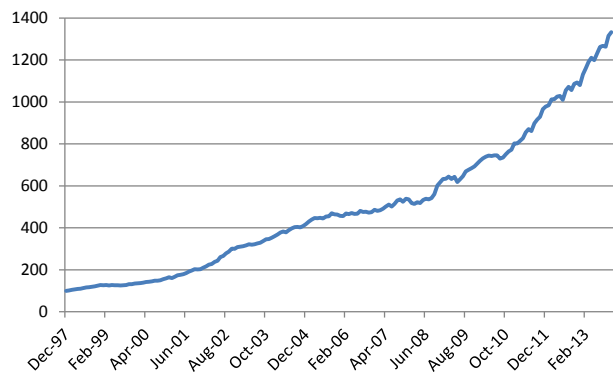


Source: Bloomberg Finance LP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank



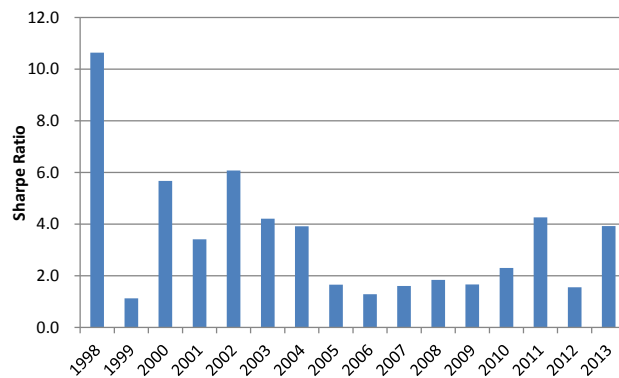
Figure 28 shows the cumulative performance of the optimized strategy, and Figure 29 shows the annualized Sharpe ratio (after costs) by calendar year.

Figure 28: Global portfolio cumulative, after costs



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

Figure 29: Annualized Sharpe ratio, after costs



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



Top-down country rotation

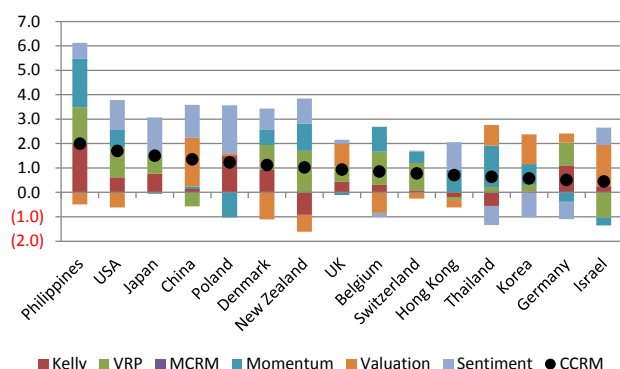
CCRM country rotation model

- 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

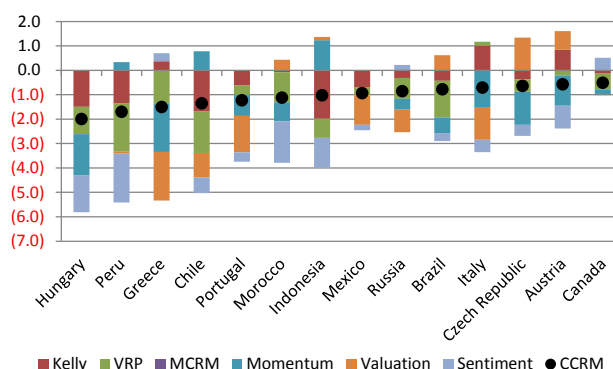
Figure 30 and Figure 31 show the top and bottom third of countries, as ranked currently by our CCRM model. The bars show what is driving these calls.

Figure 30: Top tercile countries



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

Figure 31: Bottom tercile countries



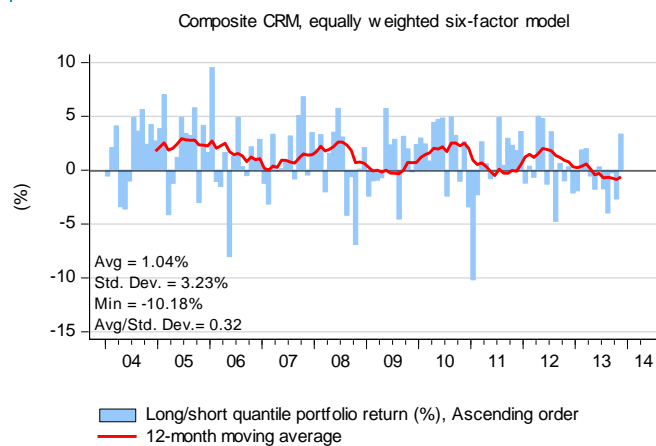
Source: Bloomberg Finance LP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank

Model performance

Figure 32 and Figure 33 show the performance of the model over time.

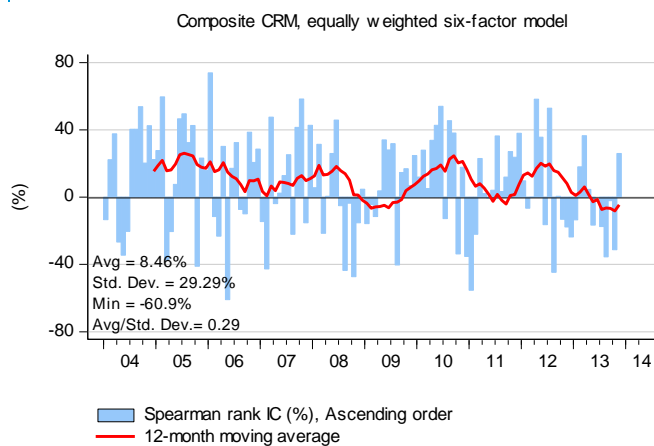


Figure 32: Long/short quantile portfolio return



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

Figure 33: Model performance with rank IC



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



Top-down asset allocation

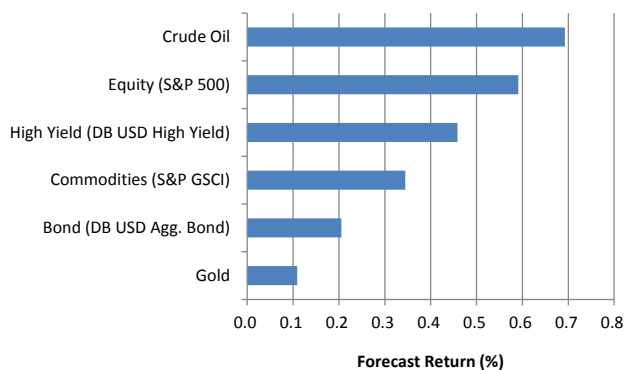
Quant Tactical Asset Allocation (QTAA) model

- 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

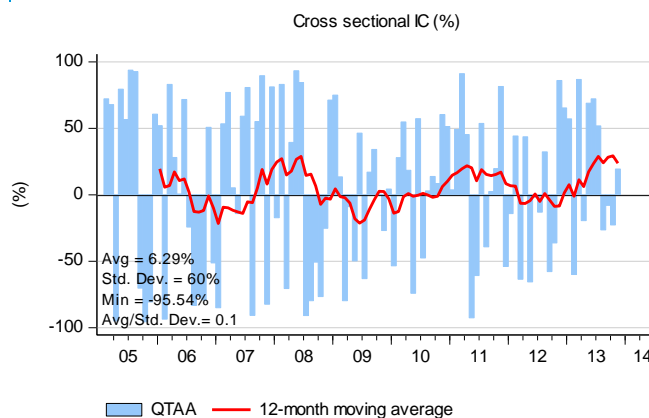
Figure 34 shows the current ranking of our six asset classes, ranked from best to worse in terms of month-ahead forecast returns. Figure 35 shows the monthly performance of the QTAA model over time.

Figure 34: Current QTAA forecasts



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

Figure 35: Performance of QTAA model



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



Top-down style rotation

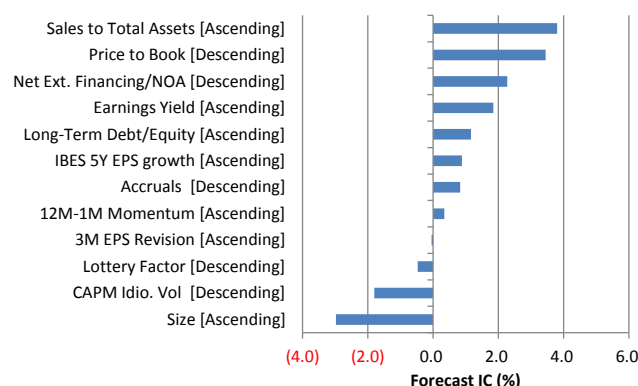
Style rotation model

- 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

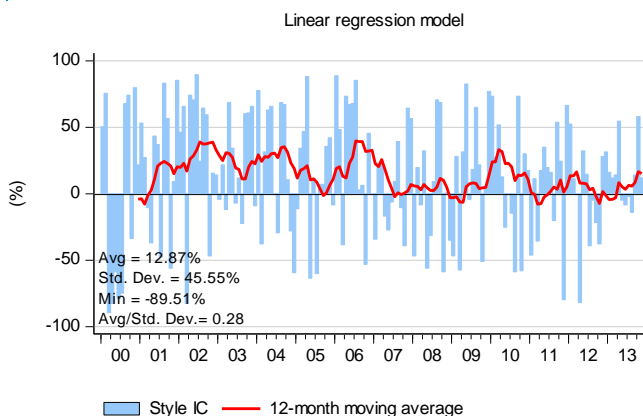
Figure 36 shows the current ranking of our 12 factors, ranked from best to worse in terms of month-ahead forecast performance. Figure 37 shows the monthly performance of the Style Rotation model over time.

Figure 36: Current style rotation forecasts



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

Figure 37: Performance of style rotation model



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



Appendix A: Factor performance

Figure 38: US factor performance, measured as rank IC (Russell 3000 universe)

Factor Name	Direction ¹	Current # of Stocks	Average IC (%)			Since Inception									# of Months	Avg # of Stocks	Hit Rate (%)	Serial Corr (%) ³
			Last M	12M Avg	3Y Avg	Avg	Std Dev	Avg / Std Dev	Max	Min	p-value ²							
1. Value																		
1 Dividend yield, trailing 12M	Ascending	2,942	(10.17)	(2.30)	1.49	2.83	14.39	0.20	42.59	(33.26)	0.00	311	2,874	54.66	99.14			
2 Expected dividend yield	Ascending	2,942	(9.78)	(2.01)	1.72	3.08	14.91	0.21	44.46	(33.89)	0.00	311	2,874	54.02	99.31			
3 Price-to-operating EPS, trailing 12M, Basic	Descending	2,295	15.81	4.10	1.71	2.85	10.34	0.28	30.82	(32.28)	0.00	235	2,354	60.00	95.24			
4 Operating earnings yield, trailing 12M, Basic	Ascending	2,915	9.47	4.76	4.20	4.90	12.89	0.38	47.24	(33.30)	0.00	235	2,873	62.55	96.44			
5 Earnings yield, forecast FY1 mean	Ascending	2,724	6.85	4.52	3.46	4.43	12.26	0.36	48.88	(34.61)	0.00	311	2,541	63.02	95.00			
6 Earnings yield, forecast FY2 mean	Ascending	2,714	10.17	5.19	2.84	3.91	11.87	0.33	47.02	(34.31)	0.00	311	2,442	63.67	94.38			
7 Earnings yield x IBES 5Y growth	Ascending	1,610	11.90	5.34	2.11	1.88	10.41	0.18	41.11	(26.63)	0.01	235	1,920	59.15	93.48			
8 Sector-rel Operating earnings yield, trailing 12M, Basic	Ascending	2,915	9.98	4.56	3.78	4.36	8.29	0.53	28.96	(14.90)	0.00	235	2,871	69.36	96.01			
9 Hist-rel Operating earnings yield, trailing 12M, Basic	Ascending	2,403	4.03	(0.17)	0.23	1.56	6.83	0.23	20.73	(18.74)	0.01	141	2,026	60.99	96.91			
10 Operating cash flow yield (income stmt def)	Ascending	2,942	3.65	4.15	3.21	4.12	10.80	0.38	47.14	(32.67)	0.00	311	2,874	65.27	96.03			
11 Cash flow yield, FY1 mean	Ascending	1,589	(0.48)	3.56	0.98	2.78	17.47	0.16	66.06	(54.29)	0.01	281	771	58.36	95.50			
12 Free cash flow yield	Ascending	2,838	10.80	5.72	4.36	4.94	7.86	0.63	31.93	(22.64)	0.00	274	2,515	75.55	94.62			
13 Price-to-sales, trailing 12M	Descending	2,879	10.04	5.60	1.97	1.87	10.89	0.17	30.02	(41.46)	0.00	311	2,799	56.91	99.11			
14 Price-to-book	Descending	2,827	4.47	(0.33)	(0.42)	0.80	10.63	0.08	26.28	(35.75)	0.18	311	2,764	49.20	97.65			
15 EBITDA/EV	Ascending	2,900	4.66	3.88	2.80	4.19	9.64	0.43	39.32	(27.15)	0.00	311	2,820	68.17	95.55			
16 Price-to-book adj for ROE, sector adj	Descending	2,640	10.57	2.28	(0.12)	0.50	8.70	0.06	22.50	(33.21)	0.31	311	2,435	49.52	95.63			
2. Growth																		
17 Hist 5Y operating EPS growth	Descending	2,847	5.53	1.95	2.38	1.11	8.62	0.13	30.58	(22.70)	0.06	223	2,734	53.36	97.29			
18 Hist 5Y operating EPS acceleration	Ascending	2,847	(1.90)	1.73	0.68	0.82	6.61	0.12	25.31	(16.13)	0.06	223	2,734	54.26	94.78			
19 IBES 5Y EPS growth	Ascending	2,379	5.30	2.04	1.93	0.97	8.07	0.12	21.65	(27.86)	0.04	311	2,299	54.66	98.25			
20 IBES 5Y EPS growth/stability	Ascending	2,379	4.05	2.31	2.14	1.39	7.68	0.18	20.64	(19.20)	0.00	311	2,299	57.23	98.59			
21 IBES LTG EPS mean	Descending	1,860	2.02	(2.80)	(0.86)	1.61	15.76	0.10	37.64	(52.38)	0.07	311	2,148	49.52	97.72			
22 IBES FY2 mean DPS growth	Ascending	2,137	1.22	(0.08)	1.34	0.91	8.52	0.11	24.12	(21.96)	0.21	138	1,506	50.72	87.80			
23 IBES FY1 mean EPS growth	Ascending	2,659	(1.39)	1.50	1.84	1.07	7.45	0.14	20.76	(24.42)	0.01	311	2,519	61.41	88.87			
24 Year-over-year quarterly EPS growth	Ascending	2,924	(0.33)	2.03	3.12	2.53	6.99	0.36	23.85	(21.12)	0.00	235	2,878	66.38	81.57			
25 IBES FY1 mean CPIS growth	Descending	1,364	3.14	(3.37)	(1.15)	0.37	11.11	0.03	38.08	(42.07)	0.61	238	540	50.42	92.76			
26 IBES SUE, amortized	Ascending	2,564	(2.51)	1.39	1.61	0.81	6.45	0.13	20.62	(16.30)	0.05	250	1,111	54.40	74.05			
3. Price Momentum and Reversal																		
27 Total return, 1D	Descending	2,942	4.23	2.92	2.59	4.97	7.16	0.69	15.52	(33.75)	0.00	311	2,875	77.81	1.57			
28 Total return, 21D (1M)	Descending	2,940	3.04	0.81	0.42	1.85	10.85	0.17	29.03	(43.69)	0.00	311	2,874	58.20	0.47			
29 Maximum daily return in last 1M (lottery factor)	Descending	2,935	(4.87)	0.22	3.04	5.04	14.88	0.34	39.13	(56.07)	0.00	311	2,747	63.99	54.12			
30 21D volatility of volume/price	Descending	2,942	(8.47)	1.11	1.68	0.24	6.59	0.04	24.16	(16.78)	0.52	311	2,864	51.13	56.27			
31 Total return, 252D (12M)	Ascending	2,828	2.62	2.03	3.04	3.26	14.01	0.23	39.62	(57.00)	0.00	311	2,793	64.95	89.95			
32 12M-1M total return	Ascending	2,828	4.26	2.34	3.41	4.10	13.12	0.31	37.65	(49.06)	0.00	311	2,793	65.59	88.46			
33 Price-to-52 week high	Ascending	2,844	(1.04)	0.56	3.37	3.16	17.67	0.18	49.63	(62.50)	0.00	311	1,955	62.06	83.24			
34 Total return, 1260D (60M)	Ascending	2,469	(4.43)	(0.73)	1.66	1.13	10.90	0.10	25.63	(35.41)	0.07	299	2,238	56.52	97.44			
4. Sentiment																		
35 IBES LTG Mean EPS Revision, 3M	Ascending	1,847	(1.82)	(0.03)	0.91	0.85	3.74	0.23	11.16	(12.06)	0.00	311	2,120	61.74	59.65			
36 IBES FY1 Mean EPS Revision, 3M	Ascending	2,680	0.21	(0.05)	1.77	2.90	8.40	0.35	29.96	(33.00)	0.00	311	2,479	66.88	75.23			
37 IBES FY1 EPS up/down ratio, 3M	Ascending	2,651	(0.54)	0.13	1.86	3.07	7.82	0.39	27.54	(24.41)	0.00	311	2,343	67.52	79.48			
38 Expectation gap, short-term - long-term	Descending	2,159	(6.44)	0.53	1.21	1.16	5.20	0.22	9.60	(19.91)	0.00	311	2,124	57.56	91.14			
39 IBES FY1 Mean CPIS Revision, 3M	Ascending	1,513	0.81	1.50	1.86	2.02	15.86	0.13	69.38	(75.04)	0.03	280	703	62.50	64.53			
40 IBES FY1 Mean SAL Revision, 3M	Ascending	2,661	0.18	0.64	1.92	1.11	7.79	0.14	27.43	(24.32)	0.04	210	2,179	60.48	71.41			
41 IBES FY1 Mean FFO Revision, 3M	Ascending	140	(20.86)	(2.29)	1.87	2.77	20.97	0.13	71.43	(80.00)	0.03	283	84	57.24	69.16			
42 IBES FY1 Mean DPS Revision, 3M	Ascending	1,274	(3.28)	2.14	1.47	0.76	5.19	0.15	14.91	(17.55)	0.09	135	1,006	58.52	62.78			
43 IBES FY1 Mean ROE Revision, 3M	Ascending	2,150	(0.27)	(0.20)	0.79	0.69	6.53	0.11	23.70	(22.19)	0.22	135	1,725	59.26	66.42			
44 Recommendation, mean	Descending	2,735	1.65	2.74	1.92	0.86	7.50	0.11	21.85	(19.41)	0.08	240	2,678	57.08	94.41			
45 Mean recommendation revision, 3M	Descending	2,732	(2.71)	(0.27)	0.36	1.21	4.07	0.30	19.86	(11.55)	0.00	237	2,665	62.87	59.99			
46 Target price implied return	Ascending	2,697	5.40	2.66	0.14	0.12	16.65	0.01	60.74	(39.59)	0.93	176	2,466	53.41	80.03			
47 Mean target price revision, 3M	Ascending	2,689	7.09	1.64	2.12	2.43	12.54	0.19	30.14	(41.94)	0.01	173	2,453	63.58	74.96			
5. Quality																		
48 ROE, trailing 12M	Ascending	2,815	4.45	3.61	3.42	3.91	10.00	0.39	33.42	(29.52)	0.00	235	2,863	65.11	96.49			
49 Return on invested capital (ROIC)	Ascending	2,901	4.64	3.65	3.78	4.24	10.15	0.42	33.02	(31.24)	0.00	235	2,856	69.36	98.10			
50 Sales to total assets (asset turnover)	Ascending	2,868	3.41	4.57	2.12	1.65	8.65	0.19	22.78	(22.02)	0.00	311	2,814	56.27	99.46			
51 Operating profit margin	Ascending	2,875	0.41	(1.28)	0.46	1.19	5.45	0.22	16.98	(14.17)	0.00	311	2,720	59.81	98.44			
52 Current ratio	Descending	2,249	(7.59)	0.65	1.09	1.82	10.18	0.18	31.95	(38.66)	0.00	311	2,239	54.02	97.89			
53 Long-term debt/equity	Ascending	2,815	(9.43)	0.73	1.67	0.77	9.58	0.08	35.65	(28.14)	0.16	311	2,748	48.23	98.51			
54 Altman's z-score	Ascending	2,190	5.12	0.90	1.76	0.34	9.14	0.04	31.74	(30.44)	0.51	311	2,159	49.52	98.35			
55 Merton's distance to default	Ascending	2,424	(3.43)	0.11	2.51	3.31	11.72	0.28	33.03	(41.45)	0.00	311	2,337	65.59	95.01			
56 Ohlson default model	Descending	2,195	(3.33)	0.14	1.54	2.31	6.33	0.36	16.95	(18.63)	0.00	274	2,126	68.25	98.28			
57 Accruals (Sloan 1996 def)	Descending	2,160	(6.19)	(0.78)	(0.38)	0.51	4.17	0.12	12.07	(15.48)	0.03	311	2,139	54.98	88.55			
58 Firm-specific discretionary accruals	Descending	1,191	(6.22)	(0.49)	(0.15)	0.48	3.23	0.15	7.82	(10.87)	0.02	251	2,112	55.78	79.10			
59 Hist 5Y operating EPS stability, coef of determination	Ascending	2,847	4.34	1.85	0.83	0.87	5.00	0.17	20.01	(12.27)	0.01	223	2,734	52.91	96.91			
60 IBES 5Y EPS stability	Descending	2,379	(0.94)	0.19	1.29	1.18	8.56	0.14	25.00	(34.33)	0.02	311	2,299	53.70	98.96			
61 IBES FY1 EPS dispersion	Descending	2,724	1.93	0.59	2.67	1.56	9.04	0.17	31.67	(25.17)	0.00	311	2,541	60.13	84.24			
62 Payout on trailing operating EPS	Ascending	2,194	(14.24)	(5.32)	(0.77)	0.67	13.50	0.05	38.55	(30.91)	0.38	311	2,211	49.20	99.10			
63 YoY change in # of shares outstanding	Descending	2,847	6.01	3.44	3.23	2.64	8.83	0.30	19.53	(46.21)	0.00	311	2,770	61.09	94.13			
64 YoY change in debt outstanding	Descending	2,150	5.18	(0.75)	(0.18)	0.25	4.08	0.06	13.07	(10.40)	0.27	311	2,220	55.63	89.95			
65 Net external financing/net operating assets	Ascending	2,921	(2.57)	2.36	2.69	2.47	8.41	0.29	44.61	(21.76)	0.00	311	2,837	61.41	94.72			
66 Piotroski's F-score	Ascending	2,942	1.21	2.61	3.13	2.95	8.05	0.37	29.20	(27.83)	0.00	311	2,876	67.85	88.28			
67 Mohanram's G-score	Ascending	533	(2.15)	(1.19)	1.23	2.60	10.50	0.25	35.27	(32.14)	0.00	223	387	56.50	95.49			
6. Technicals																		
68 # of days to cover short	Descending	2,941	(9.38)	0.84	1.44	2.14	7.31	0.29	33.80	(25.16)	0.00	311	2,032	58.20	91.41			
69 CAPM beta, 5Y monthly	Descending	2,938	(3.62)	(3.71)	(0.37)	0.93	13.68	0.07	40.19	(42.70)	0.28	252	2,909	50.79	97.71			
70 CAPM idiosyncratic vol, 1Y daily	Descending	2,937	(7.78)	0.76	4.62	5.13	18.03	0.28	42.60	(60.80)	0.00	299	2,881	61.87	99.18			
71 Realized vol, 1Y daily	Descending	2,849	(8.00)	0.25	4.28	4.98	18.65	0.27	42.69									



Figure 39: Global factor performance, measured as rank IC (S&P BMI World universe)

Factor Name		Direction ¹	Current # of Stocks	Average IC (%)			Since Inception							# 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	10,093	(9.24)	(0.08)	2.80	4.21	10.51	0.40	36.88	(23.89)	0.00	287	8,030	64.46	97.99		
2 Dividend yield, FY1	Ascending	7,848	(10.60)	(0.52)	2.16	4.24	10.84	0.39	32.17	(22.90)	0.00	230	5,274	63.48	98.18		
3 Dividend yield, FY2	Ascending	7,818	(11.35)	(0.56)	1.81	4.14	10.90	0.38	33.19	(24.39)	0.00	220	5,234	63.64	98.17		
4 Price/Earnings	Descending	8,387	(1.32)	0.14	0.00	3.99	13.05	0.31	39.66	(50.73)	0.00	280	6,320	61.79	96.32		
5 Price-to-FY0 EPS	Descending	7,861	(3.87)	0.60	(0.84)	2.88	10.24	0.28	28.98	(37.08)	0.00	287	6,044	62.37	96.41		
6 Earnings yield, FY0	Ascending	8,995	(2.59)	1.76	1.23	3.98	9.15	0.44	31.67	(18.68)	0.00	287	7,027	64.46	96.32		
7 Earnings yield, forecast FY1 mean	Ascending	8,493	(3.67)	1.93	1.55	4.70	10.83	0.43	35.35	(22.20)	0.00	287	6,477	63.76	95.68		
8 Earnings yield, forecast FY2 mean	Ascending	8,420	(3.64)	1.69	0.43	4.32	11.83	0.36	37.31	(31.50)	0.00	287	6,303	62.72	95.72		
9 Cash flow yield, FY0	Ascending	6,987	(3.22)	2.50	1.36	4.01	6.33	0.63	26.42	(11.80)	0.00	163	4,989	75.46	97.14		
10 Cash flow yield, FY1 mean	Ascending	6,013	(2.98)	2.02	(0.44)	2.05	9.67	0.21	31.42	(32.01)	0.00	219	4,495	58.45	96.02		
11 Price/Sales	Descending	9,578	2.14	3.43	0.78	1.51	9.53	0.16	26.48	(31.59)	0.01	287	7,508	56.10	99.23		
12 Price/Book	Descending	9,683	(6.29)	(0.74)	(1.04)	1.14	10.45	0.11	31.56	(37.54)	0.07	287	7,556	56.45	98.34		
13 Est Book-to-price, median	Ascending	7,451	(7.53)	(0.82)	(1.81)	1.11	9.81	0.11	30.37	(26.29)	0.14	171	5,436	52.63	98.08		
14 EBITDA to EV	Ascending	7,785	18.99	6.32	6.09	4.03	10.85	0.37	36.69	(26.20)	0.00	287	4,699	62.72	95.59		
15 Sales/EV	Ascending	9,490	4.89	4.46	2.14	2.00	7.86	0.25	24.81	(20.06)	0.00	287	7,473	61.32	98.99		
2. Growth																	
16 IBES SY EPS growth	Ascending	8,394	2.26	(0.36)	1.02	1.09	6.11	0.18	19.09	(21.86)	0.00	287	6,232	58.89	98.06		
17 EPS Growth	Ascending	9,124	1.18	0.97	1.68	2.04	6.84	0.30	29.72	(28.97)	0.00	271	6,907	64.21	88.43		
18 IBES LTG EPS mean	Descending	4,905	(4.55)	(1.48)	0.32	1.30	12.06	0.11	28.22	(40.36)	0.07	287	4,176	52.96	96.74		
19 IBES FY1 mean EPS growth	Ascending	7,970	0.93	0.77	0.48	0.39	6.04	0.06	14.44	(20.10)	0.27	287	6,382	55.05	88.58		
20 IBES FY1 mean CFPS growth	Descending	5,307	0.07	1.16	1.30	1.73	4.20	0.41	7.47	(11.39)	0.00	163	3,932	65.03	91.80		
21 IBES FY2 mean DPS growth	Ascending	7,799	(1.46)	0.03	(0.58)	2.44	10.94	0.22	38.85	(31.49)	0.00	229	5,116	59.39	88.11		
22 Asset growth	Descending	9,556	4.61	3.97	2.19	0.68	8.48	0.08	21.57	(27.36)	0.17	287	7,301	52.61	93.69		
3. Price Momentum and Reversal																	
23 Total return, 1D	Descending	10,102	0.73	2.08	4.30	3.60	7.41	0.49	21.94	(41.58)	0.00	287	8,142	71.08	2.00		
24 Weekly Total Return	Descending	10,101	(1.08)	1.20	3.02	2.97	8.69	0.34	30.60	(33.64)	0.00	287	8,141	64.46	1.41		
25 Total return, 21D (1M)	Ascending	10,100	4.25	1.49	0.78	0.13	11.39	0.01	27.69	(44.07)	0.85	287	8,136	52.96	4.11		
26 Total return, 252D (12M)	Ascending	9,854	13.65	6.17	5.42	4.45	14.47	0.31	41.64	(46.50)	0.00	287	7,943	66.90	90.67		
27 12M-1M total return	Ascending	9,854	13.80	6.06	5.76	5.06	13.94	0.36	40.96	(42.52)	0.00	287	7,943	68.99	88.78		
28 Total return, 1260D (60M)	Ascending	8,759	1.71	(0.53)	0.73	1.43	14.00	0.10	40.32	(44.84)	0.08	287	6,444	58.19	97.75		
4. Sentiment																	
29 IBES LTG Mean EPS Revision, 1M	Ascending	4,883	0.67	0.70	0.57	0.67	2.56	0.26	7.26	(8.59)	0.00	287	4,138	63.41	0.61		
30 IBES LTG Mean EPS Revision, 3M	Ascending	4,855	2.07	1.27	0.95	0.87	3.31	0.26	11.05	(10.26)	0.00	287	4,083	62.02	60.14		
31 IBES FY1 EPS up/down ratio, 1M	Ascending	4,889	2.19	2.96	3.58	3.68	5.40	0.68	17.76	(13.76)	0.00	287	4,360	76.66	34.70		
32 IBES FY1 EPS up/down ratio, 3M	Ascending	7,750	6.55	3.49	4.08	3.66	5.79	0.63	17.92	(12.36)	0.00	287	5,850	75.26	78.46		
33 IBES FY1 Mean EPS Revision, 1M	Ascending	8,332	1.57	2.53	2.89	2.89	5.05	0.57	16.50	(12.79)	0.00	287	6,329	72.47	24.10		
34 IBES FY1 Mean EPS Revision, 3M	Ascending	8,177	6.83	3.18	3.95	3.39	6.62	0.51	19.37	(20.12)	0.00	287	6,237	73.52	74.16		
35 IBES FY1 Mean CFPS Revision, 3M	Ascending	5,702	2.95	1.80	2.60	2.49	5.52	0.45	15.81	(23.83)	0.00	209	4,316	77.03	63.91		
36 IBES FY1 Mean DPS Revision, 1M	Ascending	6,223	0.70	1.84	2.57	1.75	4.36	0.40	12.65	(16.63)	0.00	228	4,362	71.93	10.94		
37 IBES FY1 Mean DPS Revision, 3M	Ascending	6,138	5.69	3.34	3.73	2.22	5.83	0.38	19.08	(24.51)	0.00	226	4,302	72.57	65.69		
38 IBES FY1 Mean FFO Revision, 1M	Ascending	7,608	3.50	2.80	3.33	2.27	4.04	0.56	11.73	(8.89)	0.00	155	4,109	77.42	13.57		
39 IBES FY1 Mean FFO Revision, 3M	Ascending	7,428	8.16	3.96	4.37	2.87	5.77	0.50	16.27	(14.53)	0.00	152	4,015	74.34	67.84		
40 IBES FY1 Mean ROE Revision, 1M	Ascending	8,329	2.14	1.80	2.04	1.78	4.06	0.44	13.70	(10.51)	0.00	207	5,411	69.57	14.40		
41 IBES FY1 Mean ROE Revision, 3M	Ascending	8,185	4.72	2.21	2.38	2.19	5.00	0.44	13.57	(13.58)	0.00	205	5,281	69.27	68.53		
42 Target price implied return	Descending	8,447	7.09	1.62	1.41	0.94	14.49	0.06	55.58	(36.25)	0.40	171	6,319	53.22	82.32		
43 Recommendation, mean	Descending	8,690	6.16	2.19	2.06	1.79	6.79	0.26	17.41	(16.84)	0.00	240	7,210	65.42	94.47		
44 Mean recommendation revision, 3M	Descending	8,651	1.61	1.45	1.49	1.89	2.91	0.65	10.01	(10.13)	0.00	237	7,188	75.53	60.12		
5. Quality																	
45 Return on Equity	Ascending	9,440	4.54	1.87	3.08	4.20	10.08	0.42	30.68	(34.69)	0.00	239	7,693	66.53	97.13		
46 return on capital	Ascending	9,443	2.39	1.00	2.62	4.43	12.23	0.36	49.47	(34.02)	0.00	287	6,988	64.81	97.96		
47 Return on Assets	Ascending	9,629	14.59	4.80	5.49	4.77	13.23	0.36	44.20	(30.31)	0.00	287	7,091	63.76	98.16		
48 Asset Turnover	Ascending	9,596	22.55	7.32	5.56	2.70	16.28	0.17	44.64	(51.55)	0.01	287	7,569	57.84	99.85		
49 Gross margin	Ascending	8,867	3.18	0.68	2.27	1.84	5.83	0.32	16.60	(13.45)	0.00	287	6,883	63.07	98.89		
50 EBITDA margin	Ascending	9,685	12.86	4.22	4.50	4.00	13.76	0.29	42.97	(41.30)	0.00	287	7,588	59.58	96.80		
51 Berry Ratio	Ascending	7,423	(7.48)	(2.07)	(0.34)	2.81	9.30	0.30	29.57	(20.79)	0.00	287	5,327	59.23	97.71		
52 IBES FY1 EPS dispersion	Descending	8,493	8.67	3.17	4.20	0.49	9.53	0.05	32.68	(25.37)	0.39	287	6,477	50.52	87.94		
53 IBES SY EPS growth/stability	Ascending	8,394	1.83	(0.06)	1.40	1.43	5.96	0.24	18.66	(20.47)	0.00	287	6,232	58.54	98.30		
54 YoY change in debt outstanding	Descending	7,914	2.45	1.03	0.73	0.26	3.90	0.07	11.51	(11.34)	0.26	287	6,302	53.66	91.52		
55 Current ratio	Descending	7,932	(4.88)	(0.33)	0.23	0.60	8.86	0.07	27.86	(27.01)	0.25	287	6,170	49.48	98.51		
56 Long-term debt/equity	Ascending	9,516	(0.27)	2.01	1.08	0.80	6.44	0.12	22.37	(18.17)	0.04	287	7,481	54.36	98.89		
57 Merton's distance to default	Ascending	8,273	4.77	1.42	3.79	2.62	11.10	0.24	31.19	(31.18)	0.00	287	6,482	59.93	93.26		
58 Capex to Dep	Descending	7,794	13.62	6.29	4.00	1.55	6.51	0.24	22.38	(19.93)	0.00	287	5,159	61.32	96.92		
6. Technicals																	
59 Realized vol, 1Y daily	Descending	9,858	7.60	3.17	5.07	5.09	15.29	0.33	29.45	(44.64)	0.00	287	7,951	61.32	98.97		
60 Skewness, 1Y daily	Descending	9,858	0.63	1.15	2.25	1.64	5.31	0.31	15.03	(32.98)	0.00	287	7,951	63.76	90.02		
61 Moving average crossover, 15W-36W	Ascending	9,608	18.64	4.14	2.55	3.03	14.53	0.21	37.15	(45.46)	0.00	287	6,953	62.72	91.36		
62 Normalized abnormal volume	Ascending	10,072	9.27	3.85	3.50	2.29	6.52	0.35	20.47	(14.71)	0.00	287	7,906	61.32	66.26		

Note:

- 1 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.
- 2 P-value indicates the statistical significance of the factor's performance. A smaller p-value suggests that it is more likely the factor's performance is different from zero.
- 3 This is the autocorrelation of the factor scores over time. Higher serial correlation indicates lower portfolio turnover based on the factor.

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



Appendix 1

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Group Chief Economist
Member of the Group Executive Committee

Guy Ashton
Global Chief Operating Officer
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Marcel Cassard
Global Head
FICC Research & Global Macro Economics

Richard Smith and Steve Pollard
Co-Global Heads
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Michael Spencer
Regional Head
Asia Pacific Research

Ralf Hoffmann
Regional Head
Deutsche Bank Research, Germany

Andreas Neubauer
Regional Head
Equity Research, Germany

Steve Pollard
Regional Head
Americas Research

International Locations

Deutsche Bank AG
Deutsche Bank Place
Level 16
Corner of Hunter & Phillip Streets
Sydney, NSW 2000
Australia
Tel: (61) 2 8258 1234

Deutsche Bank AG
Große Gallusstraße 10-14
60272 Frankfurt am Main
Germany
Tel: (49) 69 910 00

Deutsche Bank AG
Filiale Hongkong
International Commerce Centre,
1 Austin Road West, Kowloon,
Hong Kong
Tel: (852) 2203 8888

Deutsche Securities Inc.
2-11-1 Nagatacho
Sanno Park Tower
Chiyoda-ku, Tokyo 100-6171
Japan
Tel: (81) 3 5156 6770

Deutsche Bank AG London
1 Great Winchester Street
London EC2N 2EQ
United Kingdom
Tel: (44) 20 7545 8000

Deutsche Bank Securities Inc.
60 Wall Street
New York, NY 10005
United States of America
Tel: (1) 212 250 2500

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