North America
United States

Quantitative Strategy

The Quant View

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Updating our best quant ideas

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Quantitative macro and micro forecasts for this 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.

Stock selection makes a comeback

Our decomposition of the global opportunity set for equity investors suggests that stock selection is making a comeback, after a long post-crisis period dominated by big macro themes. In other words, stocks are being priced more on individual company fundamentals rather than exposure to macro risk. This should be positive for bottom-up investors.

Despite equity rally, complacency has not set in yet

Our top-down VRP indicator is currently indicating that complacency towards market risk has not yet set in, despite the strong rally in equities. However, if the market continues to rally it will be worth watching this indicator closely, as it can often give an early warning signal when markets are getting overheated.

Technology and Consumer Staples favored domestically

Our flagship QCD model for U.S. equities is pointing towards Technology and Consumer Staples names in the domestic market. Meanwhile, our CCRM country rotation model is favorable towards emerging markets like Turkey and Thailand. At the asset allocation level, commodities dominate.

Deutsche Bank Securities Inc.

A letter to our readers

A one stop shop for all our quant models

Since we launched our quantitative research here at Deutsche Bank in 2010, we have deliberately steered away from the mundane monthly model updates that clog up the inboxes of quantitative investors around the world. We have always believed we can add more value by focusing on innovative new ideas rather than updating the same old models month after month. As quants, it's too easy to fall into the trap of becoming "quant reporters", mindlessly regurgitating last month's value or momentum performance *ad infinitum*, as if that somehow gives us a crystal ball to the future.

Introducing "The Quant View"

Having said that, over the past three years we have written a lot of research – over 80 reports, not including model updates – and as a result keeping track of all our models has become a challenge.[1] Therefore, to simplify things we are launching a new report: "The Quant View". In this monthly report we will present the latest forecasts from six key models:

- **Variance Risk Premium** – The VRP is a top-down signal that we use extensively in our research to forecast upcoming risk regimes. A high reading of VRP indicates we should be buying risky assets like equities, high yield, etc.

- **QCD model** – Our flagship stock selection model for U.S. equities. This model uses a unique blend of linear and non-linear factors to forecast month-ahead performance for U.S. stocks.

- **N-LASR model** – Our flagship global stock selection model. The model uses a novel machine learning algorithm to dynamically adapt to changing market conditions. We use it to forecast month-ahead performance for global stocks.

- **CCRM country rotation model** – This model uses a combination of top-down signals, aggregate country-level fundamentals, and trade-linkages to rotate among MSCI All Country World equity markets.

- **QTAA asset allocation model** – This tactical asset allocation model uses a model-of-models approach to forecast month-ahead performance for six asset classes.

- **Style rotation model** – This model reflects our view that style performance is time-varying, which means picking the right factors at the right time can boost performance. Our model uses point-in-time macroeconomic and market data to forecast month-ahead style performance.

On the following pages investors can find a succinct summary of the current recommendations from each model. Each model also has a much more detailed white paper – see the reference in each section.

Regards,

Yin, Rocky, Miguel, Javed, John, and Sheng
Deutsche Bank Quantitative Strategy

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[1] For a complete library of all our past research, see the DB Quant Website at https://eqindex.db.com/gqs/. If you do not have a login, please contact us at DBEQS.Americas@db.com and we can get you set up.
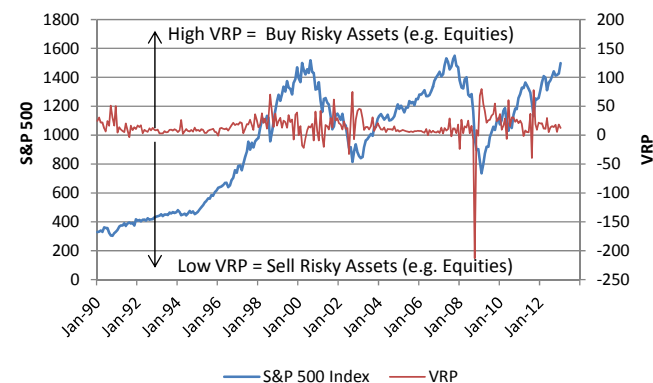
Quantifying markets

Macro update

Variance Risk Premium

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.[2] 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.

So where do we sit today? Interestingly, the current reading of VRP is very close to its long-run average (see last point on the red line in Figure 2). This suggests that, despite the rapid market rally, market expectations for risk are largely in-line with realized risk. In other words, strong market returns have not yet translated into complacency among investors, and therefore based on this model we would not yet suggest selling equities.

Figure 1: Variance Risk Premium (VRP)	Figure 2: Recent VRP (lagged) and market returns
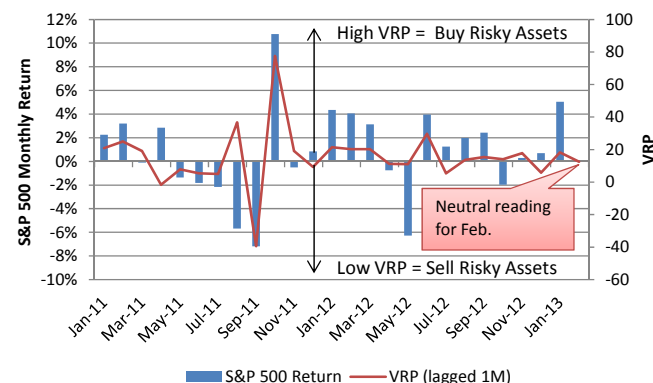
Source: Bloomberg Finance LLP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank

Source: Bloomberg Finance LLP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, 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 3 we show the opportunity set for global equity investors, and in Figure 4 we show the same thing for emerging market equity investors.

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[2] For more details on the VRP, including our backtesting work, see: Luo et al., 2011, "Signal Processing: Quant Tactical Asset Allocation (QTAA)", *Deutsche Bank Quantitative Strategy*, 19 September 2011.
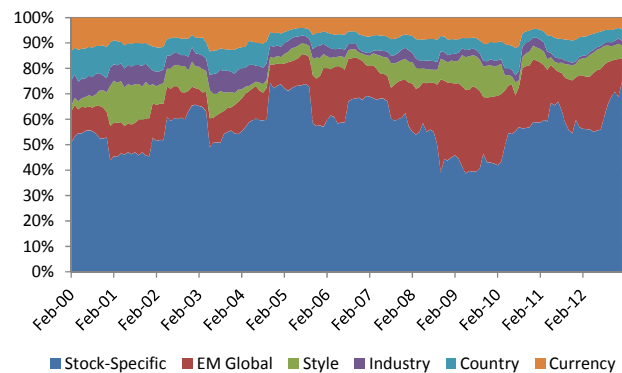
Figure 3: Global opportunity set
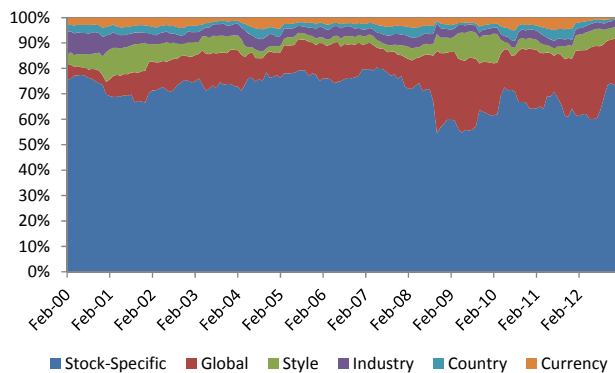
Source: Bloomberg Finance LLP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank

Figure 4: Emerging markets opportunity set

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

Both charts actually tell a similar story. 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.

However, in both charts note the recent uptick in the blue area. This tells us that with macro fears subsiding, there is a renewed opportunity in stock selection. In fact, the current portion of the opportunity set explained by stock selection is actually fairly close to what is was in the bull market from 2003-2007. This bodes well for investors looking to get back to stock picking instead of making macro calls.[3]

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[3] For technical details on our definition of the opportunity set, see: Alvarez et al., 2012, "Portfolios Under Construction: Correlation and Opportunity", *Deutsche Bank Quantitative Strategy*, 24 January 2012.

Factor performance

U.S. factor performance

Figure 5, on page 6 shows the recent and long-term performance for around 80 quantitative factors in the U.S. market (defined as the Russell 3000 universe). Last month we saw solid factor performance across the board, with strong performances from valuation and analyst sentiment factors particularly noteworthy. Earnings Yield and Cash Flow Yield did well as investors sought out undervalued names in the rush to get back in to equities. On the other hand, Dividend Yield suffered in the re-risking that saw more defensive yield names left behind a little. As would be expected in a market rally month, quality factor suffered; for example Merton's Model, Ohlson's Default Model, and Altman's Z-score – three factors that assess bankruptcy risk – all had a down month. In other words, investors were willing to buy into names at higher risk of bankruptcy.

Global factor performance

Figure 6, on page 7, shows the recent and long-term performance for quantitative factors in a global universe (defined as the S&P BMI World Index). Last month across all six style buckets we track, factor performance was strong on average. Similar to what we saw in the U.S. market, valuation factors like Earnings Yield and Cash Flow Yield had a strong month. This suggests a worldwide re-rating of deep value stocks as the market re-risked in January. Interestingly though, Dividend Yield – typically more of a defensive factor – also did well, unlike what we saw in the U.S. This is evidence that the strong rally last month was not solely a "junk" rally, i.e. it is not just lower quality, small cap names that are driving market performance.

12M price momentum also enjoyed strong returns in January, a sign that stocks that have been doing well over the last year continued to prosper in the latest rally. On the other hand, 1M reversal has suffered in a market that is trending in one direction right now. Another interesting story last month was the fact that almost all sell-side analyst sentiment signals worked, e.g. EPS Revisions, Sales Revisions, etc. In other words, the analyst community does appear to have done a good job of picking stocks; perhaps this ties back in to the more favorable stock picking environment we are seeing (see the opportunity set earlier in this report).

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

Factor Name	Direction[1]	Current # of Stocks	Average IC (%)			Since Inception									
			Last M	12M Avg	3Y Avg	Avg	Std Dev	Avg / Std Dev	Max	Min	p-value[2]	# of Months	Avg # of Stocks	Hit Rate (%)	Serial Corr (%)[3]
1. Value															
1 Dividend yield, trailing 12M	Ascending	2,967	(1.46)	1.75	2.69	2.98	14.47	0.21	42.59	(33.26)	0.00	301	2,872	54.82	99.41
2 Expected dividend yield	Ascending	2,967	(0.69)	1.62	2.90	3.24	15.00	0.22	44.46	(33.89)	0.00	301	2,872	54.15	99.32
3 Price-to-operating EPS, trailing 12M, Basic	Descending	2,388	6.15	1.23	0.70	2.80	10.49	0.27	30.82	(32.28)	0.00	225	2,355	59.11	95.34
4 Operating earnings yield, trailing 12M, Basic	Ascending	2,956	6.51	2.26	3.49	4.90	13.15	0.37	47.24	(33.30)	0.00	225	2,871	60.89	96.47
5 Earnings yield, forecast FY1 mean	Ascending	2,419	7.48	2.06	2.87	4.43	12.44	0.36	48.88	(34.61)	0.00	301	2,533	62.13	94.97
6 Earnings yield, forecast FY2 mean	Ascending	2,414	10.27	2.09	2.39	3.90	12.03	0.32	47.02	(34.31)	0.00	301	2,431	63.12	94.32
7 Earnings yield x IBES 5Y growth	Ascending	1,557	4.86	3.30	1.07	1.79	10.51	0.17	41.11	(26.63)	0.01	225	1,930	54.67	93.59
8 Sector-rel Operating earnings yield, trailing 12M, Basic	Ascending	2,956	6.93	1.71	3.06	4.36	8.43	0.52	28.96	(14.90)	0.00	225	2,869	68.89	96.03
9 Hist-rel Operating earnings yield, trailing 12M, Basic	Ascending	2,163	0.62	(0.53)	0.95	1.72	7.02	0.25	20.73	(18.74)	0.01	131	2,010	62.60	96.89
10 Operating cash flow yield (income stmt def)	Ascending	2,967	5.52	1.42	2.63	4.12	10.96	0.38	47.14	(32.67)	0.00	301	2,872	64.12	96.15
11 Cash flow yield, FY1 mean	Ascending	1,405	3.48	(1.36)	0.59	2.74	17.75	0.15	66.06	(54.29)	0.01	271	740	57.93	95.73
12 Free cash flow yield	Ascending	2,878	(0.13)	3.60	3.33	4.88	7.97	0.61	31.93	(22.64)	0.00	264	2,502	75.00	94.62
13 Price-to-sales, trailing 12M	Descending	2,922	3.54	2.36	1.14	1.80	11.01	0.16	30.02	(41.46)	0.00	301	2,796	56.48	99.15
14 Price-to-book	Descending	2,881	(1.32)	2.26	0.06	0.88	10.73	0.08	26.28	(35.75)	0.16	301	2,761	49.83	97.79
15 EBITDA/EV	Ascending	2,921	2.88	0.53	2.27	4.19	9.77	0.43	39.32	(27.15)	0.00	301	2,817	67.44	95.67
16 Price-to-book adj for ROE, sector adj	Descending	2,327	3.17	1.61	(0.43)	0.48	8.79	0.06	22.50	(33.21)	0.34	301	2,428	49.50	95.57
2. Growth															
17 Hist 5Y operating EPS growth	Descending	2,902	5.44	1.92	2.02	1.07	8.80	0.12	30.58	(22.70)	0.08	213	2,729	52.11	97.21
18 Hist 5Y operating EPS acceleration	Ascending	2,902	8.70	2.68	(0.12)	0.85	6.73	0.13	25.31	(16.13)	0.07	213	2,729	53.99	94.66
19 IBES 5Y EPS growth	Ascending	2,370	(3.53)	(0.13)	1.39	0.90	8.16	0.11	21.65	(27.86)	0.06	301	2,295	54.15	98.29
20 IBES 5Y EPS growth/stability	Ascending	2,370	(4.08)	(0.08)	1.40	1.32	7.76	0.17	20.64	(19.20)	0.00	301	2,295	54.15	98.63
21 IBES LTG EPS mean	Descending	1,733	3.15	(1.31)	(0.57)	1.75	15.93	0.11	37.64	(52.38)	0.06	301	2,155	49.83	97.88
22 IBES FY2 mean DPS growth	Ascending	1,864	(2.18)	0.80	1.18	0.92	8.61	0.11	24.12	(21.96)	0.23	128	1,457	50.00	88.34
23 IBES FY1 mean EPS growth	Ascending	2,375	2.99	3.62	1.16	1.04	7.56	0.14	20.76	(24.42)	0.02	301	2,513	60.80	88.92
24 Year-over-year quarterly EPS growth	Ascending	2,958	5.52	3.94	2.74	2.56	7.11	0.36	23.85	(21.12)	0.00	225	2,875	66.67	81.76
25 IBES FY1 mean CFPS growth	Descending	1,231	(3.17)	(2.02)	(0.93)	0.48	11.26	0.04	38.08	(42.07)	0.52	228	503	50.88	92.85
26 IBES SUE, amortized	Ascending	1,125	4.39	(0.08)	1.23	0.76	6.56	0.12	20.62	(16.30)	0.08	240	1,045	53.33	74.06
3. Price Momentum and Reversal															
27 Total return, 1D	Descending	2,967	7.78	0.41	2.83	5.07	7.19	0.70	15.52	(33.75)	0.00	301	2,872	78.41	1.63
28 Total return, 21D (1M)	Descending	2,967	4.33	2.18	1.63	1.92	10.97	0.17	29.03	(43.69)	0.00	301	2,871	58.47	0.36
29 Maximum daily return in last 1M (lottery factor)	Descending	2,963	2.60	2.52	3.64	5.19	15.02	0.35	39.13	(56.07)	0.00	301	2,741	64.45	54.56
30 21D volatility of volume/price	Descending	2,967	7.45	1.73	1.83	0.24	6.58	0.04	24.16	(16.78)	0.54	301	2,861	51.16	56.55
31 Total return, 252D (12M)	Descending	2,878	5.11	1.62	2.38	3.25	14.18	0.23	39.62	(57.00)	0.00	301	2,790	64.12	89.94
32 12M-1M total return	Ascending	2,878	6.70	2.35	3.00	4.12	13.28	0.31	37.65	(49.06)	0.00	301	2,790	65.12	88.41
33 Price-to-52 week high	Ascending	2,025	(2.48)	0.31	1.96	3.15	17.88	0.18	49.63	(62.50)	0.00	301	1,938	61.79	83.33
34 Total return, 1260D (60M)	Ascending	2,552	(4.12)	(2.51)	1.59	1.12	11.04	0.10	25.63	(35.41)	0.09	289	2,229	56.40	97.46
4. Sentiment															
35 IBES LTG Mean EPS Revision, 3M	Ascending	1,726	0.29	1.42	1.21	0.88	3.79	0.23	11.16	(12.06)	0.00	301	2,126	61.79	59.89
36 IBES FY1 Mean EPS Revision, 3M	Ascending	2,385	2.58	0.89	1.55	2.96	8.51	0.35	29.96	(33.00)	0.00	301	2,471	66.78	75.64
37 IBES FY1 EPS up/down ratio, 3M	Ascending	2,376	2.71	0.30	1.54	3.11	7.92	0.39	27.54	(24.41)	0.00	301	2,333	67.77	79.71
38 Expectation gap, short-term - long-term	Descending	2,141	3.35	1.51	1.96	1.23	5.20	0.24	9.60	(19.91)	0.00	301	2,123	58.14	91.17
39 IBES FY1 Mean CFPS Revision, 3M	Ascending	1,323	3.58	(0.06)	1.40	2.00	16.15	0.12	69.38	(75.04)	0.04	270	673	64.15	64.36
40 IBES FY1 Mean SAL Revision, 3M	Ascending	2,355	2.70	0.90	1.88	1.06	7.95	0.13	27.43	(24.32)	0.06	200	2,153	60.00	71.70
41 IBES FY1 Mean FFO Revision, 3M	Ascending	111	4.34	(0.65)	2.38	2.93	21.20	0.14	71.43	(80.00)	0.02	273	82	57.14	69.89
42 IBES FY1 Mean DPS Revision, 3M	Ascending	1,145	2.02	0.02	0.75	0.68	5.24	0.13	14.91	(17.55)	0.15	125	985	58.40	61.84
43 IBES FY1 Mean ROE Revision, 3M	Ascending	1,862	(1.18)	(0.66)	0.60	0.64	6.76	0.09	23.70	(22.19)	0.29	125	1,710	57.60	66.61
44 Recommendation, mean	Descending	2,426	6.35	1.41	1.33	0.79	7.60	0.10	21.85	(19.41)	0.12	230	2,674	56.09	94.33
45 Mean recommendation revision, 3M	Descending	2,425	3.29	(0.23)	0.29	1.24	4.12	0.30	19.86	(11.55)	0.00	227	2,660	62.56	59.81
46 Target price implied return	Ascending	2,364	7.46	2.57	0.76	0.11	17.03	0.01	60.74	(39.59)	0.94	166	2,450	53.61	80.07
47 Mean target price revision, 3M	Ascending	2,362	6.32	(1.26)	0.86	2.37	12.85	0.18	30.14	(41.94)	0.02	163	2,437	63.80	74.99
5. Quality															
48 ROE, trailing 12M	Ascending	2,953	4.61	0.97	2.83	3.91	10.18	0.38	33.42	(29.52)	0.00	225	2,862	64.00	97.04
49 Return on invested capital (ROIC)	Ascending	2,947	4.09	0.57	3.27	4.24	10.35	0.41	33.02	(31.24)	0.00	225	2,854	68.44	98.26
50 Sales to total assets (asset turnover)	Ascending	2,958	2.34	(0.04)	1.72	1.58	8.71	0.18	22.78	(22.02)	0.00	301	2,811	56.15	99.45
51 Operating profit margin	Ascending	2,917	(5.33)	(0.98)	0.94	1.21	5.44	0.22	16.98	(14.17)	0.00	301	2,715	60.13	98.43
52 Current ratio	Descending	2,296	2.83	0.77	0.78	1.84	10.28	0.18	31.95	(38.66)	0.00	301	2,238	54.15	97.94
53 Long-term debt/equity	Ascending	2,858	4.63	3.60	2.08	0.80	9.64	0.08	35.65	(28.14)	0.15	301	2,745	48.50	98.58
54 Altman's z-score	Ascending	2,262	(2.68)	0.04	1.44	0.28	9.25	0.03	31.74	(30.44)	0.60	301	2,157	49.17	98.36
55 Merton's distance to default	Ascending	2,246	(1.93)	(0.58)	2.43	3.35	11.84	0.28	33.03	(41.45)	0.00	301	2,336	65.78	95.11
56 Ohlson default model	Descending	2,246	(1.30)	0.18	1.85	2.39	6.36	0.37	16.95	(18.63)	0.00	264	2,122	68.56	98.29
57 Accruals (Sloan 1996 def)	Descending	2,177	0.20	(0.65)	(0.25)	0.54	4.21	0.13	12.07	(15.48)	0.03	301	2,137	54.82	88.51
58 Firm-specific discretionary accruals	Descending	1,541	(3.99)	0.50	0.03	0.52	3.15	0.17	7.82	(10.87)	0.01	241	2,133	55.60	81.66
59 Hist 5Y operating EPS stability, coef of determination	Ascending	2,902	0.46	0.06	(0.14)	0.81	5.07	0.16	20.01	(12.27)	0.02	213	2,729	52.58	96.87
60 IBES 5Y EPS stability	Descending	2,370	(1.60)	0.09	0.73	1.17	8.68	0.13	25.00	(34.33)	0.02	301	2,295	53.82	98.95
61 IBES FY1 EPS dispersion	Descending	2,419	1.16	(0.47)	2.76	1.54	9.15	0.17	31.67	(25.17)	0.00	301	2,533	59.80	84.36
62 Payout on trailing operating EPS	Descending	2,294	(5.38)	(0.27)	0.86	0.85	13.52	0.06	38.55	(30.91)	0.28	301	2,211	49.50	99.33
63 YoY change in # of shares outstanding	Descending	2,900	1.64	2.07	2.64	2.62	8.95	0.29	19.53	(46.21)	0.00	301	2,767	60.13	94.21
64 YoY change in debt outstanding	Descending	2,239	(1.87)	1.14	(0.29)	0.28	4.08	0.07	13.07	(10.40)	0.23	301	2,220	55.81	90.00
65 Net external financing/net operating assets	Ascending	2,958	2.74	2.66	2.81	2.49	8.51	0.29	44.61	(21.76)	0.00	301	2,833	61.13	94.73
66 Piotroski's F-score	Ascending	2,967	5.22	1.75	2.56	2.94	8.15	0.36	29.20	(27.83)	0.00	301	2,874	67.44	88.16
67 Mohanram's G-score	Ascending	535	(6.73)	(0.11)	1.35	2.70	10.69	0.25	35.27	(32.14)	0.00	213	380	57.28	95.45
6. Technicals															
68 # of days to cover short	Descending	2,959	15.20	2.20	1.82	2.25	7.31	0.31	33.80	(25.16)	0.00	301	2,002	58.80	91.29
69 CAPM beta, 5Y monthly	Descending	2,967	(6.68)	(2.25)	(0.50)	1.05	13.89	0.08	40.19	(42.70)	0.24	242	2,907	51.24	97.68
70 CAPM idiosyncratic vol, 1Y daily	Descending	2,967	3.29	3.47	4.90	5.27	18.19	0.29	42.60	(60.80)	0.00	289	2,880	61.94	99.20
71 Realized vol, 1Y daily	Descending	2,878	2.25	2.41	4.18	5.09	18.81	0.27	42.69	(59.63)	0.00	301	2,790	61.13	99.16
72 Skewness, 1Y daily	Descending	2,878	3.85	0.07	0.42	1.28	5.36	0.24	13.93	(22.86)	0.00	301	2,790	57.48	89.71
73 Kurtosis, 1Y daily	Descending	2,878	0.00	0.80	1.44	1.45	5.47	0.27	15.28	(15.82)	0.00	301	2,790	62.13	91.47
74 Idiosyncratic vol surprise	Descending	2,919	2.15	2.18	1.83	2.89	8.06	0.36	22.66	(33.71)	0.00	288	2,860	67.01	87.74
75 Normalized abnormal volume	Descending	2,966	6.04	2.49	2.86	2.29	6.40	0.36	23.10	(16.38)	0.00	301	2,865	65.78	64.13
76 Float turnover, 12M	Descending	2,918	(8.09)	(0.74)	(0.35)	0.24	10.78	0.02	23.53	(26.97)	0.71	290	2,785	48.28	99.77
77 Moving average crossover, 15W-36W	Ascending	2,911	4.74	(2.62)	(0.43)	2.19	13.30	0.16	46.29	(55.07)	0.00	301	2,521	59.80	90.74
78 Log float-adj capitalization	Ascending	2,956	10.07	2.69	3.56	3.53	11.00	0.32	29.53	(40.68)	0.00	301	2,868	61.46	99.40
79 # of month in the database	Ascending	2,967	0.80	1.41	1.75	2.25	8.87	0.25	35.61	(23.86)	0.00	301	2,872	57.81	99.99
80 DB composite options factor	Ascending	2,008	1.16	0.46	1.59	1.56	3.69	0.42	13.99	(13.88)	0.00	138	2,024	67.39	22.40

Note:
1 Direction indicates how the factor scores are sorted. Ascending order means higher factors 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 is it 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 LLP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank

Figure 6: Global factor performance, measured as rank IC (S&P BMI World universe)

Factor Name	Direction[1]	Current # of Stocks	Average IC (%) Last M	12M Avg	3Y Avg	Since Inception Avg	Std Dev	Avg / Std Dev	Max	Min	p-value[2]	# of Months	Avg # of Stocks	Hit Rate (%)	Serial Corr (%)[3]
1. Value															
1 Dividend yield, trailing 12M	Ascending	9,790	0.55	4.34	4.23	4.34	10.44	0.42	36.74	(23.63)	0.00	277	8,066	63.54	97.97
2 Dividend yield, FY1	Ascending	7,328	(0.29)	4.29	3.83	4.49	10.89	0.41	32.17	(22.90)	0.00	220	5,168	64.55	98.18
3 Dividend yield, FY2	Ascending	7,273	1.55	4.51	3.45	4.41	10.94	0.40	33.19	(24.39)	0.00	210	5,124	64.29	98.16
4 Price/Earnings	Descending	8,303	4.58	1.86	0.97	4.21	13.20	0.32	39.66	(50.73)	0.00	270	6,254	62.59	96.33
5 Price-to-FY0 EPS	Descending	7,495	4.82	1.56	(0.22)	3.05	10.32	0.30	28.98	(37.08)	0.00	277	5,984	62.82	96.41
6 Earnings yield, FY0	Ascending	8,477	3.85	3.40	1.86	4.12	9.24	0.45	31.67	(18.68)	0.00	277	6,961	65.34	96.32
7 Earnings yield, forecast FY1 mean	Ascending	7,795	5.64	4.02	2.22	4.84	10.96	0.44	35.35	(22.20)	0.00	277	6,414	64.62	95.69
8 Earnings yield, forecast FY2 mean	Ascending	7,757	6.58	3.44	1.22	4.48	11.94	0.38	37.31	(31.50)	0.00	277	6,238	63.54	95.71
9 Cash flow yield, FY0	Ascending	6,577	3.48	(0.77)	0.63	4.13	6.48	0.64	26.42	(11.80)	0.00	153	4,875	75.16	97.11
10 Cash flow yield, FY1 mean	Ascending	5,600	3.94	(1.32)	(0.75)	2.10	9.83	0.21	31.42	(32.01)	0.00	209	4,431	58.37	96.04
11 Price/Sales	Descending	9,336	2.24	(0.62)	0.04	1.50	9.66	0.15	26.48	(31.59)	0.01	277	7,445	55.96	99.22
12 Price/Book	Descending	9,511	0.61	(0.30)	(0.79)	1.29	10.56	0.12	31.56	(37.54)	0.04	277	7,490	57.40	98.33
13 Est Book-to-price, median	Ascending	6,830	2.50	(0.43)	(1.70)	1.37	9.96	0.14	30.37	(26.29)	0.08	161	5,328	53.42	98.05
14 EBITDA to EV	Ascending	7,320	10.76	1.38	4.41	3.87	10.81	0.36	36.69	(26.20)	0.00	277	4,604	62.45	95.62
15 Sales/EV	Ascending	9,355	0.19	(0.64)	1.07	1.93	7.96	0.24	24.81	(20.06)	0.00	277	7,410	60.29	98.98
2. Growth															
16 IBES 5Y EPS growth	Ascending	8,019	(3.29)	1.62	1.72	1.12	6.20	0.18	19.09	(21.86)	0.00	277	6,162	58.84	98.07
17 EPS Growth	Ascending	9,071	3.56	2.92	1.51	2.08	6.91	0.30	29.72	(28.97)	0.00	261	6,832	63.98	88.56
18 IBES LTG EPS mean	Descending	4,972	(0.47)	(0.51)	0.46	1.42	12.23	0.12	28.22	(40.36)	0.05	277	4,142	53.07	96.82
19 IBES FY1 mean EPS growth	Ascending	7,479	3.37	0.50	(0.02)	0.35	6.05	0.06	14.44	(20.10)	0.33	277	6,329	54.51	88.64
20 IBES FY1 mean CFPS growth	Descending	5,063	(0.17)	0.39	0.86	1.74	4.26	0.41	7.47	(11.39)	0.00	153	3,856	65.36	91.88
21 IBES FY2 mean DPS growth	Ascending	7,266	(1.34)	3.19	(0.12)	2.59	11.09	0.23	38.85	(31.49)	0.00	219	5,006	59.82	88.11
22 Asset growth	Descending	9,243	3.11	(0.44)	1.09	0.55	8.59	0.06	21.57	(27.36)	0.29	277	7,232	51.26	93.70
3. Price Momentum and Reversal															
23 Total return, 1D	Descending	9,811	0.12	2.90	3.98	3.65	7.46	0.49	21.94	(41.58)	0.00	277	8,080	71.48	2.06
24 Weekly Total Return	Descending	9,811	9.62	1.18	4.36	3.08	8.74	0.35	30.60	(33.64)	0.00	277	8,079	65.34	1.41
25 Total return, 21D (1M)	Ascending	9,807	(4.15)	(0.96)	(0.39)	0.03	11.49	0.00	27.69	(44.07)	0.97	277	8,074	51.99	4.05
26 Total return, 252D (12M)	Ascending	9,634	6.27	3.40	4.19	4.31	14.57	0.30	41.64	(46.50)	0.00	277	7,882	66.43	90.63
27 12M-1M total return	Ascending	9,634	6.96	4.23	4.80	4.96	14.05	0.35	40.96	(42.52)	0.00	277	7,882	68.59	88.68
28 Total return, 1260D (60M)	Ascending	8,590	(7.13)	1.54	1.48	1.41	14.19	0.10	40.32	(44.84)	0.10	277	6,366	58.12	97.81
4. Sentiment															
29 IBES LTG Mean EPS Revision, 1M	Ascending	4,951	1.43	(0.03)	0.68	0.65	2.59	0.25	7.26	(8.59)	0.00	277	4,104	62.45	0.51
30 IBES LTG Mean EPS Revision, 3M	Ascending	4,920	3.37	0.19	0.70	0.84	3.36	0.25	11.05	(10.26)	0.00	277	4,048	61.01	60.13
31 IBES FY1 EPS up/down ratio, 1M	Ascending	5,341	4.02	1.84	3.16	3.65	5.44	0.67	17.76	(13.76)	0.00	277	4,318	76.53	34.83
32 IBES FY1 EPS up/down ratio, 3M	Ascending	7,229	7.22	2.57	3.37	3.62	5.80	0.62	17.92	(12.36)	0.00	277	5,790	75.09	78.58
33 IBES FY1 Mean EPS Revision, 1M	Ascending	7,654	6.08	1.76	2.28	2.86	5.08	0.56	16.50	(12.79)	0.00	277	6,267	72.20	24.23
34 IBES FY1 Mean EPS Revision, 3M	Ascending	7,588	7.22	2.67	3.28	3.35	6.64	0.50	19.37	(20.12)	0.00	277	6,176	73.29	74.26
35 IBES FY1 Mean CFPS Revision, 3M	Ascending	5,351	5.10	1.81	2.21	2.48	5.58	0.44	15.81	(23.83)	0.00	199	4,255	77.39	64.07
36 IBES FY1 Mean DPS Revision, 1M	Ascending	5,854	3.93	2.25	2.70	1.73	4.40	0.39	12.65	(16.63)	0.00	218	4,287	71.56	10.97
37 IBES FY1 Mean DPS Revision, 3M	Ascending	5,811	6.13	2.11	3.08	2.13	5.87	0.36	19.08	(24.51)	0.00	216	4,226	72.22	65.65
38 IBES FY1 Mean FFO Revision, 1M	Ascending	5,031	3.37	2.46	3.15	2.14	3.99	0.54	11.09	(8.89)	0.00	145	3,948	77.24	13.40
39 IBES FY1 Mean FFO Revision, 3M	Ascending	4,942	6.35	3.26	3.90	2.69	5.64	0.48	16.27	(14.53)	0.00	142	3,854	73.94	67.77
40 IBES FY1 Mean ROE Revision, 1M	Ascending	7,153	3.33	1.58	1.61	1.74	4.09	0.43	13.70	(10.51)	0.00	197	5,287	69.54	14.22
41 IBES FY1 Mean ROE Revision, 3M	Ascending	7,058	4.05	1.34	1.93	2.14	5.02	0.43	13.57	(13.58)	0.00	195	5,155	69.23	68.44
42 Target price implied return	Descending	7,908	(5.72)	(1.11)	0.51	0.79	14.80	0.05	55.58	(36.25)	0.50	161	6,199	52.17	82.32
43 Recommendation, mean	Descending	8,134	5.47	2.07	1.93	1.75	6.88	0.25	17.41	(16.84)	0.00	230	7,155	65.22	94.43
44 Mean recommendation revision, 3M	Descending	8,111	4.86	0.46	1.24	1.90	2.94	0.65	10.01	(10.13)	0.00	227	7,133	75.33	60.09
5. Quality															
45 Return on Equity	Ascending	9,217	1.69	4.65	3.76	4.29	10.26	0.42	30.68	(34.69)	0.00	229	7,631	65.94	97.10
46 return on capital	Ascending	9,293	(0.24)	4.41	3.51	4.54	12.42	0.37	49.47	(34.02)	0.00	277	6,912	57.95	97.95
47 Return on Assets	Ascending	9,437	6.35	2.57	4.59	4.71	13.33	0.35	44.20	(30.31)	0.00	277	7,010	63.54	98.16
48 Asset Turnover	Ascending	9,454	7.93	(0.73)	3.28	2.45	16.28	0.15	44.64	(51.55)	0.01	277	7,506	57.76	99.84
49 Gross margin	Ascending	8,656	3.18	0.88	1.98	1.83	5.88	0.31	16.60	(13.45)	0.00	277	6,823	62.82	98.88
50 EBITDA margin	Ascending	9,410	8.41	0.56	3.17	3.93	13.86	0.28	42.97	(41.30)	0.00	277	7,525	59.21	96.84
51 Berry Ratio	Ascending	7,242	(4.33)	2.82	1.25	3.01	9.33	0.32	29.57	(20.79)	0.00	277	5,263	60.65	97.67
52 IBES FY1 EPS dispersion	Descending	7,795	(1.40)	(0.88)	2.87	0.30	9.45	0.03	32.68	(25.37)	0.60	277	6,414	50.18	87.91
53 IBES 5Y EPS growth/stability	Ascending	8,019	(3.29)	2.06	2.09	1.46	6.04	0.24	18.66	(20.47)	0.00	277	6,161	58.48	98.30
54 YoY change in debt outstanding	Descending	7,724	(0.12)	(0.33)	0.21	0.21	3.94	0.05	11.51	(11.34)	0.37	277	6,253	52.71	91.53
55 Current ratio	Descending	7,770	1.06	1.17	0.57	0.66	8.97	0.07	27.86	(27.01)	0.22	277	6,116	50.18	98.50
56 Long-term debt/equity	Ascending	9,312	8.76	2.24	0.92	0.79	6.50	0.12	22.37	(18.17)	0.04	277	7,419	54.87	98.88
57 Merton's distance to default	Ascending	7,900	(5.12)	2.13	3.54	2.57	11.23	0.23	31.19	(31.18)	0.00	277	6,429	59.57	93.25
58 Capex to Dep	Descending	7,056	8.24	1.38	1.99	1.35	6.38	0.21	22.38	(19.93)	0.00	277	5,085	60.65	96.89
6. Technicals															
59 Realized vol, 1Y daily	Descending	9,632	0.47	3.60	4.50	5.08	15.45	0.33	29.45	(44.64)	0.00	277	7,889	61.01	98.97
60 Skewness, 1Y daily	Descending	9,632	2.33	1.13	1.56	1.65	5.37	0.31	15.03	(32.98)	0.00	277	7,889	64.26	90.02
61 Moving average crossover, 15W-36W	Ascending	9,364	4.97	(0.73)	0.73	2.92	14.69	0.20	37.15	(45.46)	0.00	277	6,865	62.09	91.35
62 Normalized abnormal volume	Ascending	9,779	0.38	1.14	2.34	2.20	6.56	0.34	20.47	(14.71)	0.00	277	7,838	60.29	66.13

Note:

1 Direction indicates how the factor scores are sorted. Ascending order means higher factors 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 is it 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.

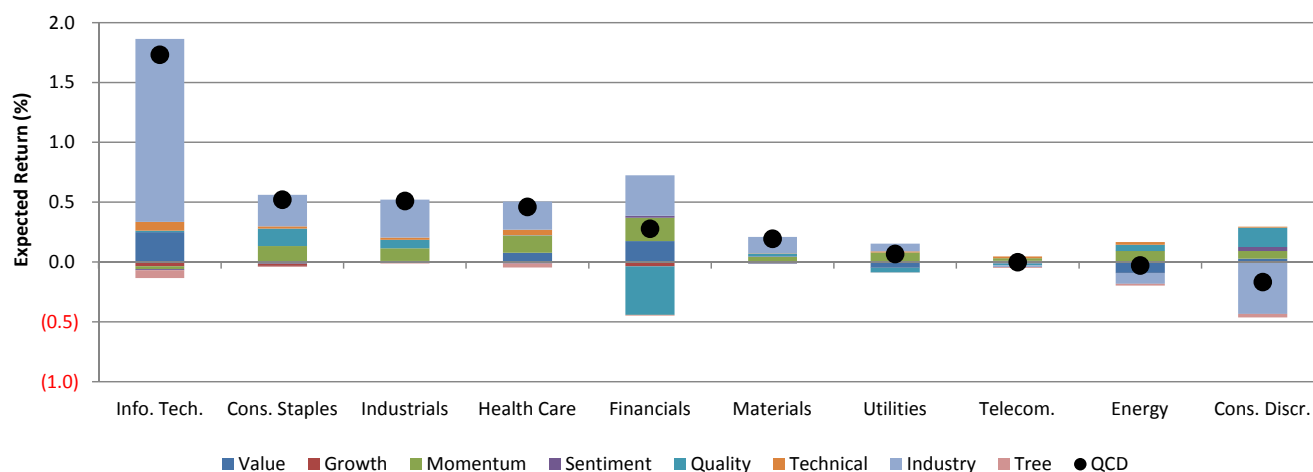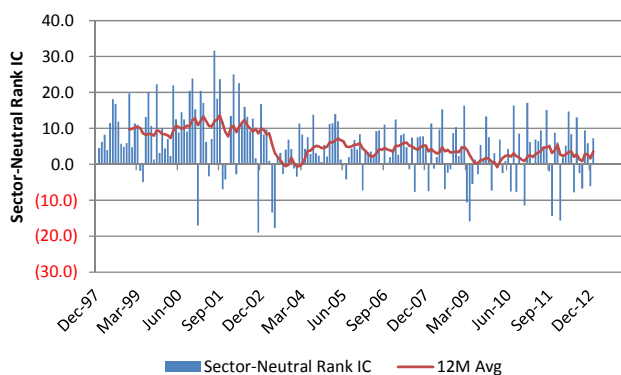*Source: Bloomberg Finance LLP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank*

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 7 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 7: Current QCD model stock recommendations

BEST BUY IDEAS (SECTOR NEUTRAL)

Ticker	Name	CUSIP	GICS Sector	QCD Score (higher is better long)
TNS	TNS INC	872960109	Information Technology	27.8%
LIOX	LIONBRIDGE TECHNOLOGIES INC	536252109	Information Technology	23.7%
FIZZ	NATIONAL BEVERAGE CORP	635017106	Consumer Staples	20.6%
SAFM	SANDERSON FARMS INC	800013104	Consumer Staples	18.5%
SMP	STANDARD MOTOR PRODS	853666105	Consumer Discretionary	18.0%
CTB	COOPER TIRE & RUBBER CO	216831107	Consumer Discretionary	16.9%
CASC	CASCADE CORP	147195101	Industrials	13.7%
NOC	NORTHROP GRUMMAN CORP	666807102	Industrials	12.3%
SCHN	SCHNITZER STEEL INDS -CL A	806882106	Materials	11.8%
CAH	CARDINAL HEALTH INC	14149Y108	Health Care	11.7%
KBW	KBW INC	482423100	Financials	11.4%
PSSI	PSS WORLD MEDICAL INC	69366A100	Health Care	11.3%
SCL	STEPAN CO	858586100	Materials	10.9%
HALL	HALLMARK FINANCIAL SERVICES	40624Q203	Financials	10.3%
IDT	IDT CORP	448947507	Telecommunication Services	8.7%
WNR	WESTERN REFINING INC	959319104	Energy	7.4%
CHG	CH ENERGY GROUP INC	12541M102	Utilities	7.1%
INT	WORLD FUEL SERVICES CORP	981475106	Energy	7.0%
UGI	UGI CORP	902681105	Utilities	5.4%
CBEY	CBEYOND INC	149847105	Telecommunication Services	4.6%

BEST SELL IDEAS (SECTOR NEUTRAL)

Ticker	Name	CUSIP	GICS Sector	QCD Score (lower is better short)
WMS	WMS INDUSTRIES INC	929297109	Consumer Discretionary	-27.3%
SVU	SUPERVALU INC	868536103	Consumer Staples	-27.3%
EDMC	EDUCATION MANAGEMENT CORP	28140M103	Consumer Discretionary	-26.3%
HNR	HARVEST NATURAL RESOURCES	41754V103	Energy	-25.3%
PRKR	PARKERVISION INC	701354102	Information Technology	-25.2%
VTUS	VENTRUS BIOSCIENCES INC	922822101	Health Care	-25.0%
KERX	KERYX BIOPHARMACEUTICALS INC	492515101	Health Care	-24.8%
GEVO	GEVO INC	374396109	Energy	-23.5%
STRI	STR HOLDINGS INC	78478V100	Information Technology	-22.5%
GRZ	GOLD RESERVE INC	38068N108	Materials	-21.9%
MCP	MOLYCORP INC	608753109	Materials	-19.8%
SVVC	FIRSTHAND TECHNOLOGY VALU FD	33766Y100	Financials	-19.7%
ZIP	ZIPCAR INC	98974X103	Industrials	-19.6%
NIHD	NII HOLDINGS INC	62913F201	Telecommunication Services	-19.5%
PCO	PENDRELL CORP	70686R104	Industrials	-19.2%
CLWR	CLEARWIRE CORP	18538Q105	Telecommunication Services	-18.9%
FMD	FIRST MARBLEHEAD CORP	320771108	Financials	-18.1%
STSI	STAR SCIENTIFIC INC	85517P101	Consumer Staples	-17.4%
CDZI	CADIZ INC	127537207	Utilities	-17.3%
ADGE	AMERICAN DG ENERGY INC	25398108	Utilities	-14.6%

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

Current sector recommendations

The QCD model also implicitly makes sector predictions. Figure 8 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 8: Current QCD sector recommendations

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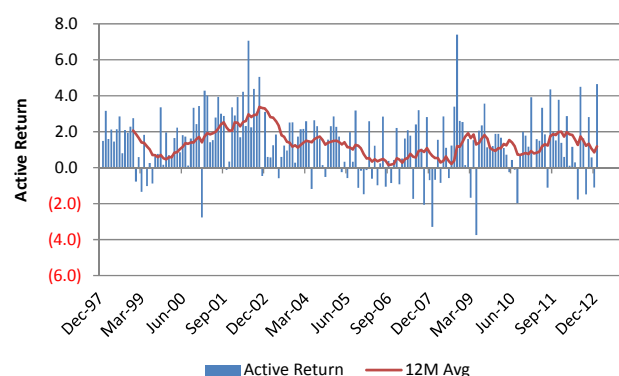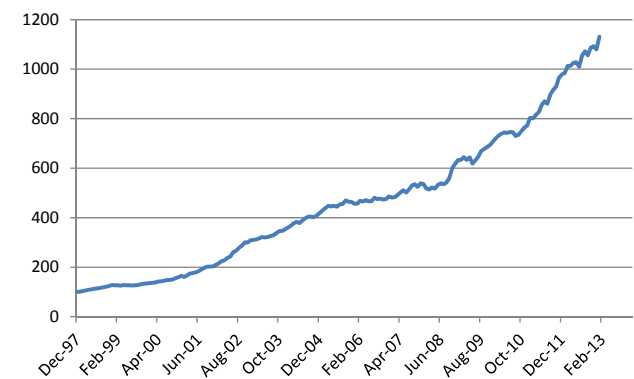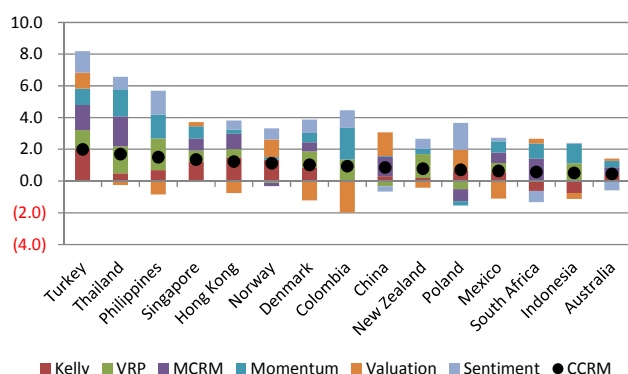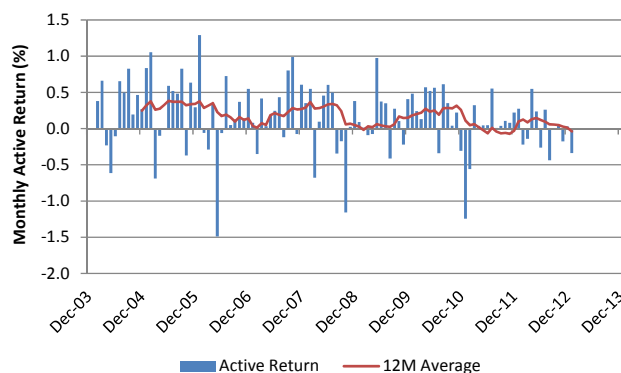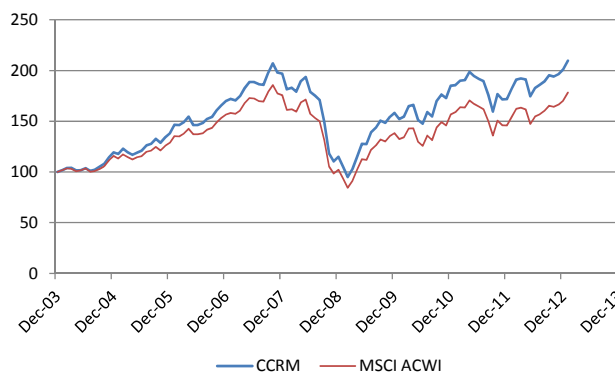
Model performance

The QCD model has performed well since inception. Figure 9 shows the pure signal performance, measured as a monthly sector-neutral rank information coefficient (IC). Figure 10 shows the performance of an actual model portfolio, after costs, based on a realistically optimized market-neutral strategy.

Figure 9: Model performance, sector-neutral rank IC

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

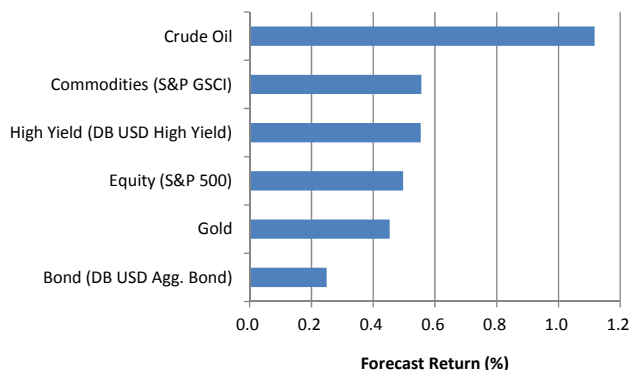## Figure 10: Model portfolio active return, after costs
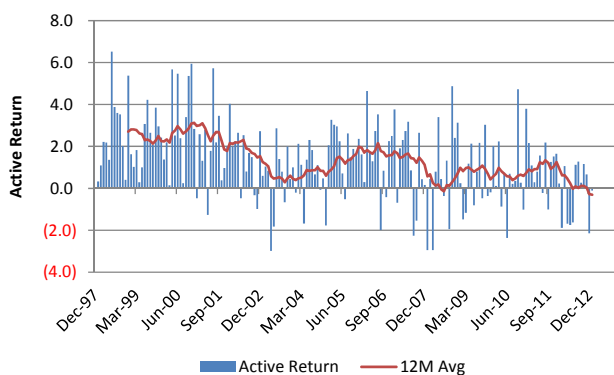
Source: Bloomberg Finance LLP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank

Figure 11 shows the cumulative performance of the optimized strategy, and Figure 12 shows the annualized Sharpe ratio (after costs) by calendar year.

Figure 11: Model portfolio cumulative, after costs
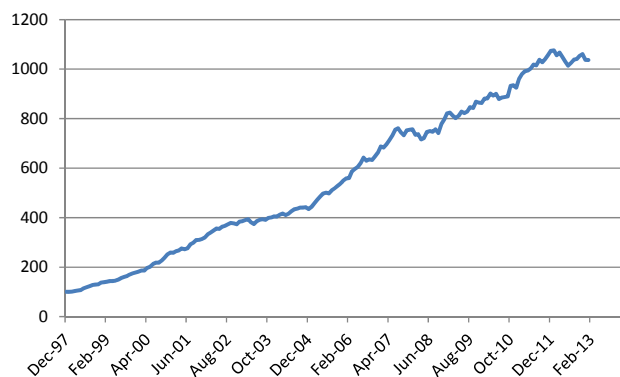
Source: Bloomberg Finance LLP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank

Figure 12: Annualized Sharpe ratio, after costs
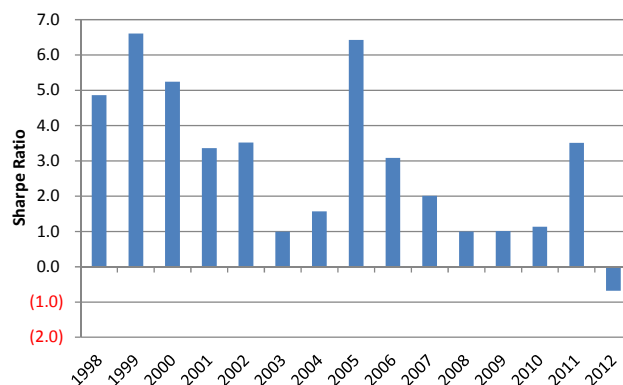
Source: Bloomberg Finance LLP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank

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.
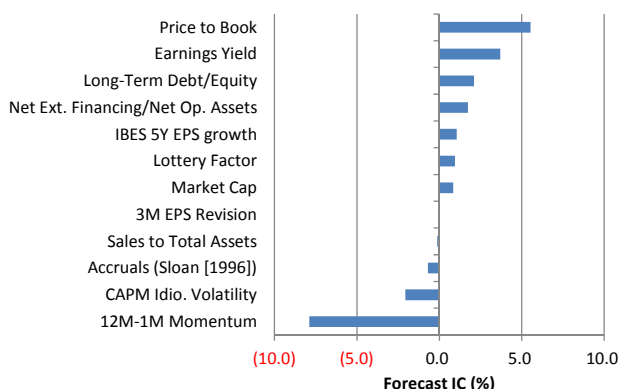
Current stock recommendations

Figure 13 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 13: Current N-LASR model stock recommendations

BEST BUY IDEAS				N-LASR Score	BEST SELL IDEAS				N-LASR Score
Ticker	Name	SEDOL	County	(higher is better long)	Ticker	Name	SEDOL	County	(higher is better long)
GCI	GANNETT CO	2360304	USA	2.83	538 HK	Ajisen (China) Holdings Ltd.	B1TNRD	China	-2.76
WIBC	WILSHIRE BANCORP INC	2537658	USA	2.56	BIOGB SS	BioGaia Biologics AB B	547312	Sweden	-2.59
HCC	HCC INSURANCE HOLDINGS INC	2400426	USA	2.44	6440 JT	Juki Corp	689582	Japan	-2.54
SREN VX	Swiss Re Reg	B545MG	Switzerland	2.38	APKT	ACME PACKET INC	B17WCB0	USA	-2.54
1973 JT	NEC Networks & System Integration Corp	661942	Japan	2.37	RBP SJ	Royal Bafokeng Platinum Ltd	B59KXT	South Africa	-2.53
C	CITIGROUP INC	2297907	USA	2.37	AIXA GY	Aixtron SE	546834	Germany	-2.46
HIG	HARTFORD FINANCIAL SERVICES	2476193	USA	2.37	2049 TT	Hiwin Technologies Corp	B1YMYT	Taiwan	-2.45
7606 JT	United Arrows Ltd	616659	Japan	2.35	NBPO LN	New Britain Palm Oil Ltd	B29868	UK	-2.43
AIG	AMERICAN INTERNATIONAL GROUP	2027342	USA	2.31	6905 JT	Cosel Co	619974	Japan	-2.41
FRME	FIRST MERCHANTS CORP	2342410	USA	2.30	AQUACHIL CC	Empresas AquaChile SA	B4R4YK	Chile	-2.41
FGEN PM	First Gen Corp	B0XNCB	Philippines	2.29	A3TV SM	Antena 3 Television SA	B07VZ9	Spain	-2.37
SUSQ	SUSQUEHANNA BANCSHARES INC	2858876	USA	2.25	ARCHER NO	Archer Ltd	B2850B	Norway	-2.31
FNF	FIDELITY NATIONAL FINANCIAL	B0LL8N0	USA	2.25	TFI IM	Trevi Finanziaria SpA	573144	Italy	-2.29
STC	STEWART INFORMATION SERVICES	2848736	USA	2.24	GRAMMY TB	GMM Grammy PCL	653981	Thailand	-2.26
BG	BUNGE LTD	2788713	USA	2.22	PEGA	PEGASYSTEMS INC	2675860	USA	-2.26
PFE	PFIZER INC	2684703	USA	2.20	6473 JT	JTEKT Corp	649708	Japan	-2.26
NWL	NEWELL RUBBERMAID INC	2635701	USA	2.18	5017 JT	AOC Holdings Inc	658136	Japan	-2.25
FPH PM	First Philippine Holdings Corp	620423	Philippines	2.16	INCO IJ	International Nickel Indonesia Tbk	B0217K	Indonesia	-2.25
MCK	MCKESSON CORP	2378534	USA	2.16	MULTIFOO CC	Multiexport Foods S.A.	B2369C	Chile	-2.25
RE	EVEREST RE GROUP LTD	2556868	USA	2.16	5310 JT	Toyo Tanso	B0ZV9X	Japan	-2.24

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

Model performance

The N-LASR model has performed well since inception. Figure 14 shows the average pure signal performance, measured as a monthly rank information coefficient (IC), in different regions. Figure 15 shows the performance of a global model portfolio, after costs, based on a realistically optimized market-neutral strategy.

Figure 14: Regional model performance, average rank IC
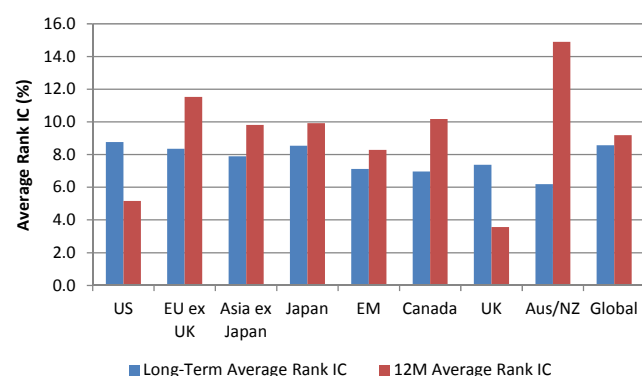
Source: Bloomberg Finance LLP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank

Figure 15: Global portfolio active return, after costs

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

Figure 16 shows the cumulative performance of the optimized strategy, and Figure 17 shows the annualized Sharpe ratio (after costs) by calendar year.

Figure 16: Global portfolio cumulative, after costs	Figure 17: Annualized Sharpe ratio, after costs
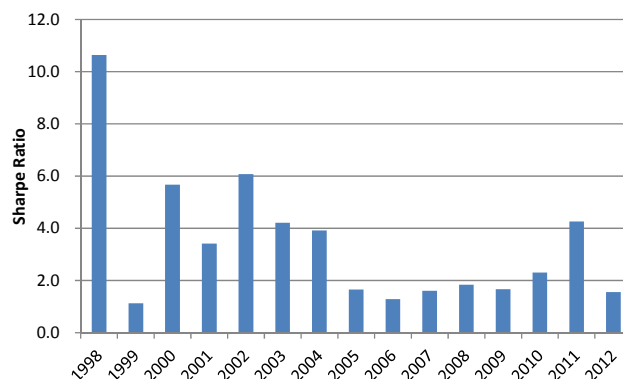
Source: Bloomberg Finance LLP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank

Source: Bloomberg Finance LLP, 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 18 and Figure 19 show the top and bottom third of countries, as ranked currently by our CCRM model. The bars show what is driving these calls.

Figure 18: Top tercile countries	Figure 19: Bottom tercile countries
Source: Bloomberg Finance LLP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank	Source: Bloomberg Finance LLP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank
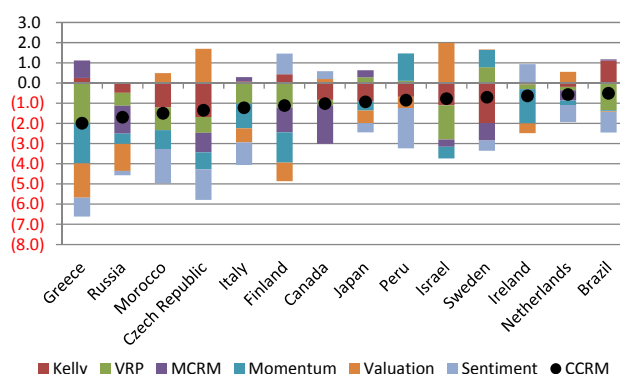
Model performance

Figure 20 and Figure 21 show the performance of the model over time.

Figure 20: Monthly returns	Figure 21: Cumulative performance
Source: Bloomberg Finance LLP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank	Source: Bloomberg Finance LLP, 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 22 shows the current ranking of our six asset classes, ranked from best to worse in terms of month-ahead forecast returns. Figure 23 shows the monthly performance of the QTAA model over time.

Figure 22: Current QTAA forecasts

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

Figure 23: Performance of QTAA model
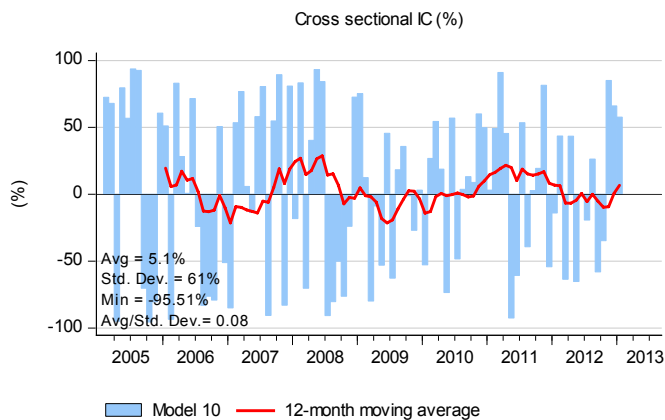
Source: Bloomberg Finance LLP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank

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 24 shows the current ranking of our 12 factors, ranked from best to worse in terms of month-ahead forecast performance. Figure 25 shows the monthly performance of the Style Rotation model over time.

Figure 24: Current style rotation forecasts	Figure 25: Performance of style rotation model
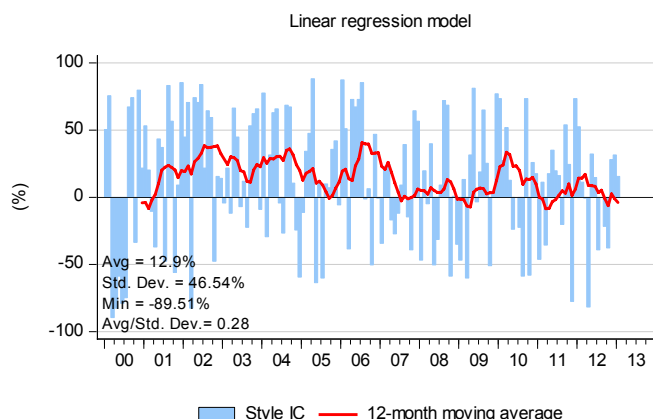
Source: Bloomberg Finance LLP, Compustat, IBES, MSCI, Russell, S&P, Thomson Reuters, Worldscope, Deutsche Bank

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

Appendix 1

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