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Deutsche Bank

Quantitative Strategy

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Team overview

Andy Moniz joined Deutsche Bank in 2016. Andy was previously a long-short quantitative equity portfolio manager at UBS O'Connor. Prior to UBS, Andy was a senior portfolio manager at APG Asset Management responsible for global long-only systematic equity strategies. Andy began his career in 2000 at the Bank of England. He holds a BA and MA in Economics from the University of Cambridge, a MSc in Statistics from the University of London, and a PhD in Natural Language Processing from Erasmus University, The Netherlands.

Ganchi Zhang joined Deutsche Bank in July 2018 as a Quantitative Equity Researcher. He specializes in risk analytics, machine learning and signal processing. Prior to Deutsche Bank, he worked as an equity market risk manager at Goldman Sachs International. Ganchi received an M.Phil. degree in industrial engineering and a Ph.D. degree in information engineering from the University of Cambridge.

Gianpaolo Tomasi joined Deutsche Bank in November 2018. He spent the past 5 years working in hedge funds in London and Oxford first as a Quantitative Equity Researcher (Oxford Asset Management, MAN AHL) and then as a portfolio manager (Segantii Capital) focusing on alpha signal and portfolio optimization. He received his Ph.D in BioEngineering from the University of Padova and worked at Yale University and Imperial College London as Research Associate in the field of medical imaging.

Rong Leng joined Deutsche Bank Quantitative Equity Strategy Research team in 2018. She specialises in fundamental and statistical signal processing. Prior to Deutsche Bank she spent ten years holding various roles in different buy side firms and sell side banks including Barclays, AHL (Man Group) and Old Mutual Global Investors. She worked in quantitative strategies for cash equity, cash bond and equity index futures. Rong holds a Ph.D. in Finance from London Business School, and also holds the Financial Risk Manager (FRM) certification.

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Research process

Quant development team

Data capture and management
- All analysts

Signal Research
- Andreas Farmakas (accounting)
- Jose Gonzalez (fixed income)
- Rong Leng (macro)
- Andy Moniz (accounting, NLP, ESG)
- Caio Natividade (options)
- Gianpaolo Tomasi (accounting, stat arb)
- Blaz Zlicar (intraday CTA, machine learning)

Portfolio construction and risk
- Vivek Anand (FX, cross-asset)
- Ganchi Zhang (equities, cross-asset)

Vetting and publishing
- All analysts

Monitoring and analytics
- Monitoring: all analysts
- Analytics: Andreas Farmakas

Source: Deutsche Bank

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Inferring the value of company intangible assets

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Quantifying company intangible assets

- The conservative nature of accounting standards limits firms from valuing and recording most types of intangible assets in their financial statements (IAS 38).

  - Brand value (Madden et al. 2006)
  - Innovative efficiency (Hirshleifer et al. 2013; Chan et al. 2001)
  - Human capital (Edmans 2011)

Illustration of the sources of a firm's intangible value

Source: Adapted from Kaplan and Norton (2004), Deutsche Bank

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Methodology

- Dow Jones Newswires contains daily financial media news and company press releases (corporate awards, product news, and patents).
- Whilst the Dow Jones dataset contains metadata to identify particular news topics, our analysis suggests that precision and recall are low.
- Rather than using the Dow Jones metadata, we created our own gold-standard of >65,000 manually classified news stories and employed proprietary language modelling techniques.

Precision and recall for Dow Jones metadata

	Dow Jones tags		
Topics	Precision	Recall	F1-measure
Accounting/earnings	0.42	0.18	0.25
Acquisition	0.30	0.18	0.23
Climate Change	0.55	0.31	0.39
Contract Win	0.47	0.17	0.25
Corporate Award	0.00	0.00	0.00
Corporate Governance	0.10	0.00	0.01
Corporate Governance Problems	0.00	0.00	0.00
Cybersecurity	0.00	0.00	0.00
Environmental Contamination	0.58	0.66	0.62
Environmental News	0.00	0.00	0.00
Fraud Bribery	0.52	0.36	0.42
Insider Trading	0.58	0.42	0.49
Labor Discrimination	0.58	0.41	0.48
Labor Strike	0.40	0.21	0.27
Labor Unions	0.40	0.25	0.31
Licensing Agreement	0.61	0.42	0.50
Outage Delays	0.75	0.21	0.33
Patent Grant	0.67	0.69	0.68
Patent Infringement	0.55	0.46	0.50
Philantrophy	0.36	0.35	0.36
Product Approval	0.73	0.40	0.51
Product News Project News	0.57	0.14	0.22
Product Recall Defect	0.63	0.51	0.56
Reorganization	0.43	0.16	0.23
Equality	0.43	0.42	0.43
Wrongdoing	0.00	0.00	0.00
Average	**0.41**	**0.27**	**0.31**

Source: Dow Jones Newswires, Deutsche Bank

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Model Evaluation (1/2)

- To evaluate the topic models we created a benchmark of traditional machine learning classifiers.

Average Precision and Recall across topics

Classifier	Description
Ensemble Hard	Majority Voting - each sample is assigned to the class receiving the higher number of votes (i.e. predictions) by the individual classifiers forming the ensemble.
Ensemble Soft	For each sample, the probability estimate provided by the individual classifiers forming the ensemble is averaged. The Ensemble then assigns the sample to the class with the highest probability.
Naïve Bayes Classifier	Application of Bayes' theorem to features with a strong (naive) assumption on independence between the features, conditional on the class: given any class the features are assumed to be independent random variables. A given data point is assigned to the class for which the conditional probability P(Class| Features) is the highest.
Passive Aggressive Classifier	'Online' algorithm (i.e. samples are analysed serially, one at each time) based upon Crammer et al. (Journal Of Machine Learning Research, 2006). If for the current estimate of the parameters the current sample is correctly classified the algorithm does not update the weights ('passive'). If that is not the case the algorithm changes the weights in order to ensure that the current sample is correctly classified ('aggressive').
Ridge Classifier	Handles the multiclass problem in a 'one-versus-all' fashion where for each class one hyperplane is computed based on the well-known Ridge Regression method, with shrinkage coefficient set to the default value of 1.
SVC	Penalized Linear Support Vector Classifier using the L2 norm as penalty and C=1 (the default) as weight to the penalty term. A 'one-versus-all' approach is used to create one hyperplane per class in our multiclass problem. The standard hinge loss is used as loss function.

Source: Dow Jones Newswires, Deutsche Bank

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Model Evaluation (2/2)

- The topic models exhibit relatively high precision and recall based upon an evaluation of an out-of-sample news dataset.

	Dow Jones tags			Traditional machine learning			Traditional Deep Learning approaches				α-DIG model			
Topics	Precision	Recall	F1-measure	Precision	Recall	F1-measure	Precision	Recall	F1-measure	% difference	Precision	Recall	F1-measure	% difference
Accounting/earnings	0.42	0.18	0.25	0.81	0.81	0.81	0.80	0.80	0.80	-1%	0.88	0.94	0.91	13%
Acquisition	0.30	0.18	0.23	0.83	0.87	0.85	0.81	0.89	0.85	0%	0.91	0.94	0.93	9%
Climate Change	0.55	0.31	0.39	0.69	0.87	0.77	0.70	0.76	0.73	-5%	0.74	0.96	0.83	8%
Contract Win	0.47	0.17	0.25	0.82	0.84	0.83	0.85	0.85	0.85	2%	0.92	0.96	0.94	13%
Corporate Award	0.00	0.00	0.00	0.78	0.80	0.79	0.78	0.78	0.78	-1%	0.82	0.91	0.87	10%
Corporate Governance	0.10	0.00	0.01	0.84	0.86	0.85	0.85	0.83	0.84	-1%	0.85	0.89	0.87	2%
Corporate Governance Problems	0.00	0.00	0.00	0.93	0.96	0.95	0.97	0.96	0.96	2%	0.96	0.95	0.95	1%
Cybersecurity	0.00	0.00	0.00	0.71	0.68	0.69	0.66	0.64	0.65	-6%	0.82	0.79	0.80	16%
Environmental Contamination	0.58	0.66	0.62	0.94	0.99	0.96	0.96	0.98	0.97	1%	0.97	0.98	0.97	1%
Environmental News	0.00	0.00	0.00	0.47	0.13	0.21	0.49	0.14	0.21	3%	1.00	0.40	0.57	175%
Fraud Bribery	0.52	0.36	0.42	0.88	0.77	0.82	0.89	0.74	0.80	-2%	0.94	0.85	0.89	9%
Insider Trading	0.58	0.42	0.49	0.97	1.00	0.98	0.98	0.99	0.99	0%	0.98	1.00	0.99	1%
Labor Discrimination	0.58	0.41	0.48	0.93	0.96	0.94	0.94	0.96	0.95	0%	1.00	0.93	0.96	2%
Labor Strike	0.40	0.21	0.27	0.65	0.54	0.59	0.68	0.53	0.60	1%	0.92	0.72	0.80	37%
Labor Unions	0.40	0.25	0.31	0.75	0.88	0.81	0.74	0.87	0.80	-1%	0.88	0.93	0.90	12%
Licensing Agreement	0.61	0.42	0.50	0.81	0.94	0.87	0.86	0.90	0.88	1%	0.87	0.95	0.91	4%
Outage Delays	0.75	0.21	0.33	0.76	0.59	0.67	0.82	0.63	0.71	7%	0.96	0.81	0.88	32%
Patent Grant	0.67	0.69	0.68	0.92	0.97	0.95	0.95	0.97	0.96	1%	0.98	0.98	0.98	4%
Patent Infringement	0.55	0.46	0.50	0.85	0.82	0.84	0.84	0.85	0.84	0%	0.88	0.86	0.87	4%
Philantrophy	0.36	0.35	0.36	0.90	0.90	0.90	0.89	0.92	0.91	0%	0.94	0.92	0.93	3%
Product Approval	0.73	0.40	0.51	0.63	0.59	0.61	0.63	0.70	0.66	9%	1.00	0.88	0.94	54%
Product News Project News	0.57	0.14	0.22	0.65	0.60	0.62	0.60	0.63	0.61	-2%	0.85	0.78	0.81	30%
Product Recall Defect	0.63	0.51	0.56	0.87	0.96	0.91	0.91	0.96	0.93	2%	0.96	0.96	0.96	5%
Reorganization	0.43	0.16	0.23	0.73	0.77	0.75	0.70	0.71	0.71	-5%	0.83	0.92	0.87	17%
Equality	0.43	0.42	0.43	0.90	0.90	0.90	0.90	0.88	0.89	-1%	0.93	0.90	0.92	2%
Wrongdoing	0.00	0.00	0.00	0.60	0.61	0.61	0.63	0.72	0.67	10%	0.75	0.84	0.79	30%
Average	**0.41**	**0.27**	**0.31**	**0.79**	**0.79**	**0.79**	**0.80**	**0.79**	**0.80**	**1%**	**0.91**	**0.88**	**0.89**	**13%**

Source: Dow Jones Newswires, Deutsche Bank

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Example signals (1/2)

Illustrative example of news stories

Topic	Example text
Accidents/health & safety	At least 120 people died after a fire swept through an eight-story garment factory near Bangladesh's capital, Dhaka, police and fire department officials said.
Acquisitions	General Mills Inc. said Wednesday that it has acquired meat snacks company EPIC Provisions, which it will operate under its Annie's foods business.
Anti-trust	Robert Bosch GmbH has agreed to pay a fine of $57.8 million after pleading guilty in an investigation conducted by the U.S. Department of Justice regarding its anti-competitive conduct in the auto parts market. In a statement Wednesday, the German auto parts maker admitted to having had unlawful
Contract wins	Stuart Olson Industrial Group Awarded $80 Million in New Contracts Canada NewsWire CALGARY, Aug. 9, 2016 CALGARY, Aug. 9, 2016 /CNW/ - Stuart Olson Inc. (TSX: SOX, SOX.DB.A) ("Stuart Olson" or the "Company") today announced that its Industrial Group has been awarded approximately $80 million
Corporate award	Report highlights Mindtree's leadership in artificial intelligence and intelligent automation Mindtree, a global technology services and digital transformation company, today announced it has been recognized as an 'Innovator' in Avasant's Intelligent Automation Services RadarView 2018 report.
Corporate culture awards	Chairman and CEO Benno Dorer of The Clorox Company (NYSE: CLX) ranked No. 1 on Glassdoor's list of Highest Rated CEOs for 2017 based on anonymous and voluntary employee reviews posted on the jobs site during the past year.
Corruption/fraud	Kim Woo Choong, founder of the defunct Daewoo Group, was convicted of fraud and embezzlement, sentenced to 10 years in prison and ordered to forfeit more than $22 billion, after contributing to the biggest business failure in South Korean history. The trial, which began last August and concluded three
Cybersecurity	Limelight Networks Adds Web Application Firewall Service to Security Solutions Portfolio Content Delivery Network Protects Websites to Ensure Accessibility and Top Performance Globally Limelight Networks, Inc. (Nasdaq: LLNW), a global leader in digital content delivery, today announced the
Environmental Contamination	BP PLC agreed to pay $18.7 billion to settle all federal and state claims arising from the 2010 Deepwater Horizon oil spill, including the biggest pollution penalty in U.S. history. If approved by a federal judge, Thursday's deal would conclude a monumental legal showdown over the Deepwater Horizon disaster,
Environmental News	ExxonMobil subsidiary XTO Energy Inc. today said it has reduced methane emissions from its operations by 9 percent since 2016, demonstrating significant progress in its methane emissions reduction program and other initiatives. Of that amount, a reduction of close to 4 percent, or more than 7,200 metric tons
Insider Trading	The Spanish prosecutor who tried Telefonica SA's (TEF) chairman Cesar Alierta for alleged insider trading in a Madrid Court in April said Tuesday his office is preparing to appeal a recent ruling that dismissed the charges. "The idea is to appeal (the sentence) to the Supreme Court.
Labor Strike	Thousands of South Korean auto and shipbuilding workers are set to launch partial strikes this week, adding extra headwinds for the country's export-dependent economy. Unionized workers at Hyundai Motor (005380.SE) plan to down tools for at least four hours a day from Tuesday to Friday to demand
Patent Grant	Rexahn Pharmaceuticals, Inc. (NYSE MKT:RNN) a clinical stage biopharmaceutical company developing best-in-class therapeutics for the treatment of cancer, today announced that it has been issued a U.S. patent from the United States Patent and Trademark Office (USPTO) for claims related to the
Philantrophy	Kohl's Donates More than $1 Million to the American Cancer Society Grant funds new pilot programs to support healthcare service assistance and nutrition education Kohl's (NYSE: KSS) today announced the donation of more than $1 million to the American Cancer Society, over 1.5 years, to implement
Product approvals	Allergan Receives FDA Approval For Use of VRAYLAR(TM) (cariprazine) in the Maintenance Treatment of Schizophrenia -- Label Expansion Includes New Data Showing Long-Term VRAYLAR Therapy Delayed Time to Relapse Compared to Placebo Over the Course of up to 72 Weeks -- PR Newswire DUBLIN,
Product news	Aerohive Announces Security Solution to Protect Networks from IoT Attacks Software Defined LAN Helps Stop Attacks at First Point of Contact Aerohive Networks(R) (NYSE:HIVE) today detailed its Internet of Things (IoT) security solution for Wi-Fi and wired networks. Built on Aerohive's Software Defined LAN

Source: Dow Jones Newswires, Deutsche Bank

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Example signals (2/2)

Indicative Sharpe ratios (monthly rebalanced L/S strategies)

Source: Dow Jones Newswires, Deutsche Bank

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Example: Corporate Culture Awards

Illustrative example of news stories

Headline	Text
Office Depot, Inc. Earns Perfect Score in Corporate Equality Index for Fifth Consecutive Year	Office Depot, Inc. Earns Perfect Score in Corporate Equality Index for Fifth Consecutive Year Company Earns 100 Percent on Human Rights Campaign Foundation's Fourteenth Annual Scorecard on LGBT Workplace Equality Office Depot, Inc. (NASDAQ: ODP), a leading global provider of office products, services, and solutions, and parent company of Office Depot and OfficeMax, today announced that it received...
Citrix Systems Honored as One of the Top 50 Best Places to Work in 2012, a Glassdoor Employees' Choice Award	When it comes to great employers, the employees know best. Glassdoor, a jobs and career community where people share workplace insights, has announced its fourth annual Employees' Choice Awards, revealing this year's top 50 "Best Places to Work," based on surveys collected from U.S.-based employees in 2011. Citrix Systems has been recognized as one of the top 50 Best Places to Work...
Disability Equality Index Names ManpowerGroup One Of The Best Places To Work In The U.S. for Commitment To Creating Integrated And Inclusive Workplaces	ManpowerGroup Recognized as Best Workplace for Disability Inclusion Four Years in a Row MILWAUKEE, July 11, 2018 /PRNewswire/ -- ManpowerGroup (NYSE: MAN) has been recognized as one of the Disability Equality Index(R) (DEI) Best Places to Work, receiving the perfect score for its commitment to inclusion in the workplace...

Top words associated with the signal

Source: Dow Jones Newswires, Deutsche Bank

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Corporate Culture Awards: Data Coverage (1/2)

Unique number of companies over different look-back windows

Average number of news stories per month

Source: Dow Jones Newswires, Deutsche Bank

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Corporate Culture Awards: Data Coverage (2/2)

Distribution of companies with a signal by sector

Distribution of the count of companies by region

Source: Dow Jones Newswires, Deutsche Bank

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Corporate Culture Awards: Data Analysis

Fundamental characteristics

Signal quintile	Market cap	Debt to Equity	Earnings yield	Return on Equity	Gross margins	Sloan accruals	EPS growth FY0 to FY2	EPS growth (3 year historic)	Price momentum
Q5	19239.30	52.36	5.39	15.89	49.44	3.64	0.00	28.20	0.15
Q4	21302.00	52.55	5.05	15.10	43.01	3.99	0.00	25.80	0.15
Q3	18197.61	53.12	4.96	15.51	39.42	3.74	0.00	23.77	0.15
Q2	19612.57	53.03	4.99	14.65	43.29	3.74	0.00	21.64	0.16
Q1	19207.96	58.20	5.25	13.24	45.81	3.78	0.00	27.59	0.16
Q5-Q1 tstat.	-6.41	2.75	1.64	1.15	3.26	1.71	-1.20	-1.41	-0.39

News characteristics

Signal quintile	# Corporate culture awards	# Corporate awards	# Product news	# Patent grants	# Patent infringement	# Contract win	# Corporate governance concerns	# Allegations	# Restructuring concerns	# Violations	# Layoffs
Q5	5.00	6.00	12.00	0.00	0.00	2.00	0.00	1.00	0.00	0.00	0.00
Q4	3.00	4.00	8.00	0.00	0.00	2.00	0.00	1.00	1.00	0.00	0.00
Q3	2.00	2.00	8.00	0.00	0.00	2.00	0.00	1.00	0.00	0.00	0.00
Q2	1.00	3.00	10.00	0.00	0.00	2.00	0.00	1.00	1.00	0.00	0.00
Q1	1.00	3.00	8.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00
Q5-Q1 tstat.	66.67	11.36	-1.93	-4.58	-3.52	-0.19	-2.94	-9.22	-11.67	-6.35	-10.03

Note: Tables compare the average fundamental characteristics for each quintile of the signal (Q5 is the top basket, Q1 the bottom basket).

Source: Dow Jones Newswires, Deutsche Bank

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Corporate Culture Awards: Characteristic Regressions

Regression results of the signal on firm characteristics

To assess the factor exposures of our signal, we employ the following regression: $Signal_{i,t} = \beta_1 Momentum_{i,t} + \beta_2 Valuation_{i,t} + \beta_3 Quality_{i,t} + \beta_4 Size_{i,t} + \Sigma Controls_{i,t} + \varepsilon_{i,t}$.

The dependent variable in the regressions is our text-based signal. Topic proportion refers to the Z-scored signal versus other securities in the universe each month. Size-adjusted signal is the orthogonalised version of the text-based signal to market cap. Indicator variable equal to 1 if a security exhibits news for the topic, and 0 otherwise. Value is defined as an equal-weighted composite of sector-neutral earning yield, dividend yield and free cash flow yield. Price Momentum is defined as the first 11 of the past 12 months total return. Quality is defined as an equal-weighted composite of sector-neutral (Sloan accruals, Percent accruals), Return on Equity (ROE) and Debt to Equity. For each variable we report corresponding test statistic (in parentheses). Standard errors are clustered by firm following Petersen (2009). For each variable we report corresponding robust t-statistic (in parentheses). An absolute value greater than 2 implies that the variable is highly statistically significant, where *** indicates statistical significance at the 1% level, ** at the 5% level and * at the 10% level. Sample period: 2007-2018.

	Topic proportion		Size-adjusted signal		Indicator variable	
	Coefficient	T-statistic	Coefficient	T-statistic	Coefficient	T-statistic
Price Momentum	-0.0270	(-4.38) ***	-0.0270	(-4.34) ***	-0.0210	(-6.77) ***
Value	0.0220	(1.65)	0.0230	(1.71) *	0.0120	(1.81) *
Quality	0.1110	(8.67) ***	0.1110	(8.64) ***	0.0420	(7.26) ***
Market Cap	0.1830	(11.6) ***	-0.0600	(-3.78) ***	0.1120	(14.74) ***
Region effects	Yes		Yes		Yes	
Sector effects	Yes		Yes		Yes	
Adj. R sq	0.139		0.084		0.482	

Source: Dow Jones Newswires, Deutsche Bank

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Corporate Culture Awards: Return Regressions

Regression results for excess returns

To assess return predictability, we employ the following regression methodology: $R_{i,t+1} = \beta_1 Signal_{i,t} + \beta_2 PriceMomentum_{i,t} + \beta_3 Valuation_{i,t} + \beta_4 Quality_{i,t} + \beta_4 Size_{i,t} + \Sigma Controls_{i,t} + \varepsilon_{i,t}$

The dependent variable in the regressions is each stock's one-month ahead excess return. Returns are computed as the one-month ahead beta-adjusted USD total return vs. the MSCI World index (CAPM returns) using 5 year rolling betas. Signal refers to variants of our text-based signal. Topic proportion refers to the Z-scored signal versus other securities in the universe each month. Size-adjusted signal is the orthogonalised version of the text-based signal to market cap. Indicator variable equal to 1 if a security exhibits news for the topic, and 0 otherwise. Value is defined as an equal-weighted composite of sector-neutral earning yield, dividend yield and free cash flow yield. Price Momentum is defined as the first 11 of the past 12 months total return. Quality is defined as an equal-weighted composite of sector-neutral (Sloan accruals, Percent accruals), Return on Equity (ROE) and Debt to Equity. For each variable we report corresponding test statistic (in parentheses). Standard errors are clustered by firm following Petersen (2009). For each variable we report corresponding robust t-statistic (in parentheses). An absolute value greater than 2 implies that the variable is highly statistically significant, where *** indicates statistical significance at the 1% level, ** at the 5% level and * at the 10% level. Sample period: 2007-2018.

	Topic proportion			Size-adjusted signal			Indicator variable		
	Coefficient	T-statistic		Coefficient	T-statistic		Coefficient	T-statistic	
Signal	0.0007	(4.13)	***	0.0006	(3.69)	***	0.0013	(3.52)	***
Controls:									
Price Momentum	0.0004	(1.97)	**	0.0004	(1.96)	**	0.0004	(2.01)	**
Value	0.0010	(3.36)	***	0.0010	(3.36)	***	0.0010	(3.36)	***
Quality	0.0014	(7.09)	***	0.0014	(7.13)	***	0.0014	(7.22)	***
Market Cap	-0.0002	(-0.63)		0.0000	(-0.03)		-0.0002	(-0.67)	***
Region effects	Yes			Yes			Yes		
Sector effects	Yes			Yes			Yes		
Adj. R sq	0.002			0.002			0.002		

Source: Dow Jones Newswires, Deutsche Bank

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Corporate Culture Awards: Backtest Results

L/S indexed returns

Source: Dow Jones Newswires, Deutsche Bank

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Example: ESG Controversies

- The ESG controversies signal is an equally-weighted average of six topics.

Illustrative example of news stories

Topic	Example text
Accidents/health& safety	A group of Taylor Farms employees and advocates from Working Partnerships USA, the Consumer Federation of California, HEAL Food Alliance and the Teamsters protested today to call on Chipotle Mexican Grill to hold its supplier Taylor Farms accountable for health and safety violations.
Corporate deception	Volkswagen AG has agreed to pay more than $10 billion to settle claims from U.S. owners of diesel-powered vehicles affected by the German auto maker's emissions-cheating scandal, said people familiar with the matter.
Corruption/fraud	Kim Woo Choong, founder of the defunct Daewoo Group, was convicted of fraud and embezzlement, sentenced to 10 years in prison and ordered to forfeit more than $22 billion, after contributing to the biggest business failure in South Korean history.
Environmental Contamination	BP PLC agreed to pay $18.7 billion to settle all federal and state claims arising from the 2010 Deepwater Horizon oil spill, including the biggest pollution penalty in U.S. history.
Insider Trading	The Spanish prosecutor who tried Telefonica SA's (TEF) chairman Cesar Alierta for alleged insider trading in a Madrid Court in April said Tuesday his office is preparing to appeal a recent ruling that dismissed the charges.
Labor disputes/strikes	Thousands of South Korean auto and shipbuilding workers are set to launch partial strikes this week, adding extra headwinds for the country's export-dependent economy. Unionized workers at Hyundai Motor (005380.SE) plan to down tools for at least four hours a day from Tuesday to Friday

Source: Dow Jones Newswires, Deutsche Bank

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ESG Controversies: Data Coverage

Number of companies in the MSCI World with at least one controversy news over different look-back windows

Average number of controversy news per month for stocks in the MSCI World

Source: Dow Jones Newswires, Deutsche Bank

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ESG Controversies: Characteristic Regressions

Regression results of the signal on firm characteristics

To assess the factor exposures of our signal, we employ the following regression: $Signal_{i,t} = \beta_1 Momentum_{i,t} + \beta_2 Valuation_{i,t} + \beta_3 Quality_{i,t} + \beta_4 Size_{i,t} + \Sigma Controls_{i,t} + \varepsilon_{i,t}$.

The dependent variable in the regressions is our text-based signal. Topic proportion refers to the Z-scored signal versus other securities in the universe each month. Size-adjusted signal is the orthogonalised version of the Topic proportion signal with respect to market cap. Indicator variable equal to 1 if a security has news for the topic in the look-back window and 0 otherwise. Value is defined as an equal-weighted composite of sector-neutral earning yield, dividend yield and free cash flow yield. Price Momentum is defined as the first 11 of the past 12 months total return. Quality is defined as an equal-weighted composite of sector-neutral Percent accruals, Return on Equity (ROE) and Debt to Equity. All the variable are ranked monthly cross-sectionally and then z-scored, For each variable we report estimated coefficient and corresponding robust t-statistic (in parentheses). Standard errors are clustered by firm following Petersen (2009). *** indicates statistical significance at the 1% level, ** at the 5% level and * at the 10% level. Sample period: 2007-2018.

	Topic proportion		Size-adjusted signal		Indicator variable	
	Coefficient	T-statistic	Coefficient	T-statistic	Coefficient	T-statistic
Price Momentum	-0.0990	(-15.56) ***	-0.0570	(-9.81) ***	-0.0420	(-15.67) ***
Value	-0.0570	(-4.27) ***	-0.0350	(-2.89) ***	-0.0250	(-4.43) ***
Quality	-0.0370	(-3.34) ***	-0.0140	(-1.48)	-0.0160	(-3.33) ***
Market Cap	0.2890	(18.05) ***	0.0160	(1.21)	0.1290	(18.99) ***
Region effects	Yes		Yes		Yes	
Sector effects	Yes		Yes		Yes	
Adj. R2	0.155		0.047		0.372	

Source: Dow Jones Newswires, Deutsche Bank

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ESG Controversies: Return Regressions

Regression results for the prediction of excess returns

To assess return predictability, we employ the following regression methodology: $R_{i,t+1} = \beta_1 Signal_{i,t} + \beta_2 PriceMomentum_{i,t} + \beta_3 Valuation_{i,t} + \beta_4 Quality_{i,t} + \beta_4 Size_{i,t} + \Sigma Controls_{i,t} + \varepsilon_{i,t}$

The dependent variable in the regressions is each stock's one-month ahead excess return. Excess returns are computed as the one-month ahead beta-adjusted USD total return to the MSCI World index (CAPM returns) using 5 -year rolling betas. Signal refers to variants of our text-based signal. Topic proportion refers to the Z-scored signal versus other securities in the universe each month. Size-adjusted signal is the orthogonalised version of the Topic proportion signal with respect to market cap. Indicator variable equal to 1 if a security exhibits news for the topic in the look-back window and 0 otherwise. Value is defined as an equal-weighted composite of sector-neutral earning yield, dividend yield and free cash flow yield. Price Momentum is defined as the first 11 of the past 12 months total return. Quality is defined as an equal-weighted composite of sector-neutral Percent accruals, Return on Equity (ROE) and Debt to Equity. All the variable are ranked monthly cross-sectionally and then z-scored, For each variable we report estimated coefficient and corresponding robust t-statistic (in parentheses). Standard errors are clustered by firm following Petersen (2009). *** indicates statistical significance at the 1% level, ** at the 5% level and * at the 10% level. Sample period: 2007-2018.

	Topic proportion			Size-adjusted signal			Indicator variable		
	Coefficient	T-statistic		Coefficient	T-statistic		Coefficient	T-statistic	
Signal	0.0001	(0.69)		0.0000	(-0.12)		0.0003	(0.82)	
Controls:									
Price Momentum	0.0004	(1.94)	*	0.0004	(1.88)	*	0.0004	(1.96)	**
Value	0.0011	(3.44)	***	0.0010	(3.41)	***	0.0011	(3.45)	***
Quality	0.0015	(7.57)	***	0.0015	(7.55)	***	0.0015	(7.58)	***
Market Cap	-0.0001	(-0.29)		0.0000	(-0.17)		-0.0001	(-0.31)	***
Region effects	Yes			Yes			Yes		
Sector effects	Yes			Yes			Yes		
Adj. R2	0.002			0.002			0.002		

Source: Dow Jones Newswires, Deutsche Bank

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ESG Controversies: Backtest Results

L/S indexed returns

Year-on-year analysis

Source: Dow Jones Newswires, Deutsche Bank

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10-K/10-Q Regulatory Filings

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10-K/10-Q Regulatory Filings: Overview (1/2)

- Manually reading filings can be difficult - they are typically hundreds of pages long, written in very small fonts.
- Moreover, companies often copy and paste large amounts of text from one quarter to the next, making it difficult to find new information.

Illustrative example of a 10-Q filing

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

Form 10-Q

QUARTERLY REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the quarterly period ended June 28, 2014

or

For the transition period from _____ to _____

Commission File Number: 000-10030

APPLE INC.

(Exact name of registrant as specified in its charter)

Company's foreign currency denominated sales and earnings. Conversely, a strengthening of foreign currencies relative to the U.S. dollar, while generally beneficial to the Company's foreign currency-denominated sales and earnings, could cause the Company to reduce international pricing and incur losses on its foreign currency derivative instruments, thereby limiting the benefit. Additionally, strengthening of foreign currencies may also increase the Company's cost of product components denominated in those currencies, thus adversely affecting gross margins.

Hedging risks ← The Company uses derivative instruments, such as foreign currency forward and option contracts, to hedge certain exposures to fluctuations in foreign currency exchange rates. The use of such hedging activities may not offset any or more than a portion of the adverse financial effects of unfavorable movements in foreign exchange rates over the limited time the hedges are in place.

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The Company is exposed to credit risk and fluctuations in the market values of its investment portfolio.

Credit risks ← Given the global nature of its business, the Company has both domestic and international investments. Credit ratings and pricing of the Company's investments can be negatively affected by liquidity, credit deterioration, financial results, economic risk, political risk, sovereign risk or other factors. As a result, the value and liquidity of the Company's cash, cash equivalents and marketable securities may fluctuate substantially. Therefore, although the Company has not realized any significant losses on its cash, cash equivalents and marketable securities, future fluctuations in their value could result in a significant realized loss.

The Company is exposed to credit risk on its trade accounts receivable, vendor non-trade receivables and prepayments related to long-term supply agreements, and this risk is heightened during periods when economic conditions worsen.

The Company distributes its products through third-party cellular network carriers, wholesalers, retailers and value-added resellers. The Company also sells its products directly to small and mid-sized businesses and education, enterprise and government customers. A substantial majority of the Company's outstanding trade receivables are not covered by collateral, third-party financing arrangements or credit insurance. The Company's exposure to credit and collectability risk on its trade receivables is higher in certain international markets and its ability to mitigate such risks may be limited. The Company also has unsecured vendor non-trade receivables resulting from purchases of components by outsourcing partners and other vendors that manufacture sub-assemblies or assemble final products for the Company. In addition, the Company has made prepayments associated with long-term supply agreements to secure supply of inventory components. As of June 28, 2014, a significant portion of the Company's trade receivables was concentrated within cellular network carriers, and its non-trade receivables and prepayments related to long-term supply agreements were concentrated among a few individual vendors located primarily in Asia. While the Company has procedures to monitor and limit exposure to credit risk on its trade and vendor non-trade receivables as well as long-term prepayments, there can be no assurance such procedures will effectively limit its credit risk and avoid losses.

For example, in June 2014, the European Commission opened a formal investigation to examine whether decisions by the tax authorities in Ireland with regard to the corporate income tax to be paid by two of the Company's Irish subsidiaries comply with European Union rules on state aid. If the European Commission were to take a final decision against Ireland, it could require changes to existing tax rulings that, in turn, could increase the Company's taxes in the future. The European Commission could also require Ireland to recover from the Company past taxes reflective of the disallowed state aid.

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Item 2. Unregistered Sales of Equity Securities and Use of Proceeds.

Share repurchase activity during the three months ended June 28, 2014 was as follows:

Q3 2014 Fiscal Periods	Total Number of Shares Purchased (in thousands)	Average Price Paid Per Share	Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs (in thousands)	Approximate Dollar Value of Shares That May Yet Be Purchased Under the Plans or Programs (in millions) (a)
March 30, 2014 to May 3, 2014	16,965	$ 80.74	16,965	

Source: SEC, Deutsche Bank

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10-K/10-Q Regulatory Filings: Overview (2/2)

- To illustrate the challenges associated with finding new information, we downloaded filings for S&P1500 companies over the period 2004-2017 and divided the text written in the Risk Factors section of each filing into ten equal segments.

- On average, an analyst has to read 70-80% through a filing before uncovering new material information….

Illustrative example of a Regulatory filing

Analysis of where new litigation and regulatory discussions are typically written within the Risk factors section of 10-K/10-Q filings

Source: SEC, Deutsche Bank

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10-K/10-Q Regulatory Filings: Methodology

- Each sentence text in a company's 10-K filing is compared versus the previous year's 10-K. Similarly, the text in a 10-Q filing is compared versus the previous quarter.

Illustrative example of additional disclosures

Concerns about climate change and further regulation of greenhouse gas emissions may adversely affect Occidental's operations or results.

Continuing political and social attention to the issue of climate change has resulted in both existing and pending international agreements and national, regional and local legislation and regulatory programs to reduce greenhouse gas emissions. These and other government actions relating to greenhouse gas emissions could require Occidental to incur increased operating and maintenance costs, such as costs to purchase and operate emissions control systems, to acquire emissions allowances or comply with new regulatory or reporting requirements, or they could promote the use of alternative sources of energy and thereby decrease demand for oil, natural gas and other products that Occidental's businesses produce. Any such legislation or regulatory programs could also increase the cost of consuming, and thereby reduce demand for, oil, natural gas and other products produced by Occidental's businesses. Consequently, government actions designed to reduce emissions of greenhouse gases could have an adverse effect on Occidental's business, financial condition and results of operations. In addition, increasing attention to climate change risks has resulted in an increased possibility of governmental investigations and additional private litigation against Occidental, which could increase our costs or otherwise adversely affect our business.

It is difficult to predict the timing and certainty of such government actions and the ultimate effect on Occidental, which could depend on, among other things, the type and extent of greenhouse gas reductions required, the availability and price of emissions allowances or credits, the availability and price of alternative fuel sources, the energy sectors covered, and Occidental's ability to recover the costs incurred through its operating agreements or the pricing of the company's oil, natural gas and other products.

Concerns about climate change and further regulation of greenhouse gas emissions may adversely affect Occidental's operations or results.

Continuing political and social attention to the issue of climate change has resulted in both existing and pending international agreements and national, regional and local legislation and regulatory programs to reduce greenhouse gas emissions. In December 2009, the EPA determined that emissions of carbon dioxide, methane and other greenhouse gases endanger public health and the environment because emissions of such gases are, according to the EPA, contributing to warming of the Earth's atmosphere and other climatic changes. Based on these findings, the EPA began adopting and implementing regulations to restrict emissions of greenhouse gases under existing provisions of the Clean Air Act. For example, the EPA issued rules restricting methane emissions from hydraulically fractured and refractured gas wells, compressors, pneumatic controls, storage vessels, and natural gas processing plants.

In the absence of federal legislation to significantly reduce emissions of greenhouse gases to date, many state governments have have established rules aimed at reducing greenhouse gas emissions, including greenhouse gas cap and trade programs. Most of these cap and trade programs work by requiring major sources of emissions, such as electric power plants, or major producers of fuels, such as refineries and natural gas processing plants, to acquire and surrender emission allowances. In the future, the United States may also choose to adhere to international agreements targeting greenhouse gas reductions. These and other government actions relating to greenhouse gas emissions could require Occidental to incur increased operating and maintenance costs, such as costs to purchase and operate emissions control systems, to acquire emissions allowances, pay carbon taxes, or comply with new regulatory or reporting requirements, or they could promote the use of alternative sources of energy and thereby decrease demand for oil, natural gas and other products that Occidental's businesses produce. Any such legislation or regulatory programs could also increase the cost of consuming, and thereby reduce demand for, oil, natural gas and other products produced by Occidental's businesses and lower the value of its reserves. Consequently, government actions designed to reduce emissions of greenhouse gases could have an adverse effect on Occidental's business, financial condition, results of operations, cash flows and reserves.

There also have been efforts in recent years to influence the investment community, including investment advisers and certain sovereign wealth, pension and endowment funds promoting divestment of fossil fuel equities and pressuring lenders to limit funding to companies engaged in the extraction of fossil fuel reserves. Such environmental activism and initiatives aimed at limiting climate change and reducing air pollution could interfere with our business activities, operations and ability to access capital. Finally, increasing attention to climate change risks has resulted in an increased possibility of governmental investigations and additional private litigation against Occidental without regard to causation or our contribution to the asserted damage, which could increase our costs or otherwise adversely affect our business. We have been named in certain private litigation relating to these matters.

It is difficult to predict the timing and certainty of such government actions and the ultimate effect on Occidental, which could depend on, among other things, the type and extent of greenhouse gas reductions required, the availability and price of emissions allowances or credits, the availability and price of alternative fuel sources, the energy sectors covered, and Occidental's ability to recover the costs incurred through its operating agreements or the pricing of the company's oil, NGL, natural gas and other products.

Source: SEC, Deutsche Bank

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Is text predictive of stock returns?

- In theory, we could identify which keywords from the Risk Factors disclosures predict share price underperformance (e.g. using regularization techniques).
- One concern with this approach is that once companies learn the keywords they could avoid using specific language in their communications.

Coefficients of a regularized regression model to predict future stock returns

Source: SEC, Deutsche Bank

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Classifying text into topics

- Our models differentiates between litigation text (illustrated via the blue cluster of words below) versus operating problems (e.g. accidents, disruptions, ESG controversies) as highlighted in red.

Illustrative example of litigation words

Illustrative example of operating problem words

Source: SEC, Deutsche Bank

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Regression test #1: Investor inattention

- We analyse abnormal trading volumes around the 10-K/Q filing date (day -1 to +1).
- Our findings suggest that the stockmarket quickly reacts to litigation text (the blue cluster in the previous slide).
- On the other hand, operating problems (the red cluster) appear to be overlooked.
- Our findings our consistent with the idea that the stockmarket takes time to process and decipher intangible news.

	(1)		(2)		(3)	
Intercept	0.106		0.051		0.049	
	(1.89)	***	(1.84)	*	(1.81)	*
Novelty score (cosine similarity)	-0.011		-0.009		-0.007	
	(-1.15)		(-1.04)		(-0.85)	
Sentiment	-0.009		-0.006		-0.007	
	(-3.17)	**	(-2.27)	**	(-2.46)	**
FOG readability index			0.002		0.003	
			(0.42)		(0.56)	
Document length			0.001		0.001	
			(0.77)		(1.01)	
% Operating Problem news					-0.044	
					(-2.13)	**
% of Litigation Risk news					0.080	
					(4.15)	***
Size	-0.102		-0.083		-0.083	
	(-3.70)	***	(-3.08)	***	(-3.02)	***
Valuation	-0.008		-0.009		-0.008	
	(-1.39)		(-1.72)		(-1.56)	
12mth Price Momentum	0.027		0.026		0.025	
	(2.46)	***	(2.71)	***	(2.58)	***
Analyst Revisions	0.005		0.004		0.004	
	(1.84)		(1.74)		(1.51)	
Previous earnings surprise	0.015		0.009		0.009	
	(2.49)		(2.92)	**	(2.93)	***
10-Q filing indicator variable	0.026		0.032		0.032	
	(2.69)	***	(2.67)	***	(2.59)	***
Sector effects	Yes		Yes		Yes	

For each variable we report corresponding test statistic (in parentheses). An absolute value greater than 2 implies that the variable is highly statistically significant.

Source: SEC, Deutsche Bank

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Regression test #2: Future stock returns

- Next we design a logistic regression to predict the probability of stock underperformance over the time window t+5 to t+60 post the announcement of a 10-K/Q filing.
- Our findings suggest that companies that discuss new problems (the red word cluster), on average, underperform.
- These findings are robust after controlling for valuation, price momentum, and consensus analyst revisions.

Prob(Abnormal $Ret_{t+1} < 0$)	(1)	(2)	(3)
Intercept	-0.086	-0.085	-0.368
	(-0.34)	(-0.34)	(-0.24)
Novelty score (cosine similarity)	0.136	0.136	0.124
	(1.95) *	(1.46)	(1.32)
Sentiment	0.055	0.056	0.037
	(1.67) *	(1.70) *	(1.47)
FOG readability index			0.022
			(2.52) **
% Operating Problem news		0.827	0.535
		(3.75) ***	(2.17) **
% of Litigation Risk news			0.790
			(0.92)
Market cap	-0.771	-0.769	-0.792
	(-3.37) ***	(-3.36) ***	(-3.46) ***
Valuation	-0.120	-0.122	-0.128
	(-1.03)	(-1.04)	(-1.09)
12mth Price Momentum	0.346	0.343	0.362
	(2.17) **	(2.15) **	(2.27) **
Analyst Revisions	0.088	0.088	0.090
	(0.75)	(0.73)	(0.77)
Previous earnings surprise	-0.697	-0.696	-0.703
	(-3.27) ***	(-3.27) ***	(-3.33) ***
Sector effects	Yes	Yes	Yes

For each variable we report corresponding test statistic (in parentheses). An absolute value greater than 2 implies that the variable is highly statistically significant.

Source: SEC, Deutsche Bank

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Regression test #3: Future earnings surprises

- We employ a logistic regression to predict the probability of a negative earnings surprise during the following quarter.
- Our findings suggest that companies that discuss new problems are indeed associated with negative earnings surprises.
- Effects are more noticeable for small-cap companies with less sell-side analyst coverage (consistent with the idea of investor inattention).

Prob($SUE_{t+1} < 0$)	(1)	(2)	(3)
Intercept	0.758	0.770	0.511
	(1.83) *	(1.37) *	(1.09)
Novelty score (cosine similarity)	-0.145	-0.159	-0.162
	(-0.84)	(-0.92)	(-0.95)
Sentiment	-0.031	0.397	-0.050
	(-0.55)	(1.31)	(-0.84)
FOG readability index			0.018
			(1.17)
% Operating Problem news		0.956	0.850
		(2.49) **	(2.01) **
% of Litigation Risk news			0.455
			(0.29)
Market cap	-2.573	-2.598	-2.604
	(-2.42) **	(-2.48) **	(-2.49) **
Valuation	-0.010	0.013	-0.025
	(-0.05)	(0.06)	(-0.12)
12mth Price Momentum	-0.598	-0.583	-0.568
	(-2.22) **	(-2.17) **	(-2.11) **
Analyst Revisions	0.106	0.106	0.107
	(0.56)	(0.53)	(0.51)
Previous earnings surprise	-2.307	-2.300	-2.314
	(-2.91) ***	(-3.88) ***	(-2.94) ***
Sector effects	Yes	Yes	Yes

For each variable we report corresponding test statistic (in parentheses). An absolute value greater than 2 implies that the variable is highly statistically significant.

Source: SEC, Deutsche Bank

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Thematic Investing

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Applications to Impact Investing

- In recent years, a number of asset managers have launched strategies tilted towards certain themes in order to 'invest with purpose' along the lines of the United Nation's Sustainable Development Goals (SDGs).

- The SDGs are a set of 17 aspirational goals and targets with the intention of tackling the world's most prominent problems by 2030.

- The goals include ending poverty and hunger, improving health and education, making cities more sustainable, combating climate change, and protecting oceans and forests.

Source: United Nations

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Text analysis of company reports

Average percentage of text in sustainability reports associated with SDG topics

	1 NO POVERTY / 2 ZERO HUNGER	3 GOOD HEALTH AND WELL-BEING	4 QUALITY EDUCATION	5 GENDER EQUALITY	6 CLEAN WATER AND SANITATION	7 AFFORDABLE AND CLEAN ENERGY	9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
Consumer discretionary	0.4%	3.2%	3.9%	2.0%	1.4%	1.2%	9.7%
Consumer staples	0.6%	9.3%	2.3%	2.0%	3.8%	0.9%	6.1%
Energy	0.3%	3.6%	2.7%	1.2%	[illegible]	1.3%	6.9%
Financials	0.2%	2.8%	3.5%	1.7%	1.3%	1.4%	8.7%
Health care	0.3%	18.7%	2.5%	1.5%	1.7%	0.9%	6.8%
Industrials	0.2%	[illegible]	2.9%	1.3%	1.9%	1.6%	11.3%
Information technology	0.2%	2.1%	4.6%	2.0%	1.2%	0.8%	12.8%
Materials	0.2%	4.2%	2.2%	1.5%	3.5%	1.3%	8.3%
Real estate	0.4%	3.0%	3.2%	1.4%	2.1%	1.4%	8.3%
Telecommunications	0.2%	3.4%	4.6%	2.4%	0.6%	0.7%	15.4%
Utilities	0.5%	1.6%	1.9%	1.3%	3.3%	4.0%	11.3%

	10 REDUCED INEQUALITIES	11 SUSTAINABLE CITIES AND COMMUNITIES	12 RESPONSIBLE CONSUMPTION AND PRODUCTION	13 CLIMATE ACTION	14 LIFE BELOW WATER	15 LIFE ON LAND	16 PEACE, JUSTICE AND STRONG INSTITUTIONS
Consumer discretionary	1.9%	3.6%	5.8%	3.0%	0.2%	4.6%	0.1%
Consumer staples	1.1%	4.6%	5.7%	3.4%	0.5%	5.5%	0.1%
Energy	0.9%	5.0%	4.5%	16.0%	0.9%	7.0%	0.1%
Financials	1.6%	4.0%	2.4%	3.5%	0.1%	4.2%	0.0%
Health care	1.3%	2.0%	3.4%	2.5%	0.1%	4.3%	0.1%
Industrials	1.4%	2.9%	4.5%	4.0%	0.4%	5.2%	0.0%
Information technology	1.8%	3.3%	6.8%	5.4%	0.1%	4.9%	0.0%
Materials	1.0%	4.6%	6.1%	5.9%	0.4%	6.7%	0.0%
Real estate	1.0%	5.8%	3.6%	4.3%	0.2%	5.8%	0.1%
Telecommunications	1.8%	[illegible]	5.3%	3.0%	0.0%	4.7%	0.2%
Utilities	1.0%	3.0%	3.6%	7.5%	0.2%	4.6%	0.1%

Source: Deutsche Bank

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Thematic Investing: Overview

- One limitation of reported sales exposures is the reliance upon accounting information.
- To address this limitation, we process text from company awards, patent filings, press releases, and financial media news.

Example text

EVERSOURCE ENERGY

EVERSOURCE ENERGY

Eversource Begins Using Drones to Inspect Electric Lines in Connecticut

September 4, 2018

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Leveraging innovative technologies, Eversource is now using drones to more efficiently inspect electric lines throughout Connecticut. The aerial devices provide the energy company with a close look at high-voltage energy infrastructure, including those spanning remote, hard-to-reach areas.

"Drone technology offers a safe, cost-effective and environmentally-friendly way to perform required inspections of electrical lines, structures and equipment," said Eversource President of Regional Electric Operations Craig Hallstrom. "This high-tech solution provides a critical, bird's-eye view, enabling us to identify any potential issues in an effort to ensure our customers have the energy they need for every moment of their lives."

The use of drones is limited to inspections of Eversource equipment by certified operators, without compromising the privacy of nearby property owners. Using drones will decrease the need for periodic inspections by low-flying helicopters, reducing the use of fossil fuels and lowering the costs associated with annual inspections which are paid for by customers. Drone inspections will also reduce the need for vehicle access to inspect equipment in environmentally sensitive areas.

In addition to its routine annual inspections, Eversource plans to also use drones to assess damage to the electric system in the wake of major storms. During an emergency, the company can launch a camera-equipped drone to collect accurate and timely power line damage information and immediately transfer data to restoration planners. Armed with detailed assessments, system operators can more accurately dispatch crews, establish repair priorities and communicate more precise restoration information to customers.

Eversource (NYSE: ES) transmits and delivers electricity to 1.2 million customers in 149 cities and towns, provides natural gas to 232,000 customers in 73 communities, and supplies water to approximately 197,000 customers in 51 communities across Connecticut. Recognized as the top U.S. utility for its energy efficiency programs by the sustainability advocacy organization Ceres, Eversource harnesses the commitment of about 8,000 employees across three states to build a single,

Source: Dow Jones Newswires, Deutsche Bank

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Challenges of text-mining

- One of the key challenges for Natural Language Processing (NLP) algorithms is the need to identify "false positives" to identify companies that are incorrectly associated with a thematic.

Cryptocurrencies

Long Blockchain Gets Hit With SEC Subpoena After Nasdaq Ouster

By Lily Katz
01 August 2018 22:16

Long Blockchain Corp., the iced-tea company that rebranded itself with one of last year's hottest buzzwords, was subpoenaed by the U.S. Securities and Exchange Commission.

The agency asked for certain documents, the company said in a regulatory filing Wednesday, without disclosing further details. The subpoena was dated July 10.

Source: Bloomberg, Deutsche Bank

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Thematic Investing: Methodology

- The sub-components are computed by equally-weighting four metrics:

Metric	Description	Interpretation
% of Thematic News	The percentage of thematic-related news to total news over the past 12 months.	The higher the percentage the greater the perception that the thematic is important to the company.
Diversity across News Media	A percentile score indicating the extent to which the company is discussed across different media sources (corporate awards, patents, product news, press releases and other news media).	A high score implies a greater prevalence across multiple independent sources of information. A lower score may be indicative that the company is spinning its communications.
Lexical Diversity	A percentile score indicating the diversity of synonymns used to discuss the thematic.	This score is intended to mitigate "false positives". The greater the number of synonyms, the more likely the company is associated with the theme.
Mentions Network	A percentile score derived from a network analysis of companies/journalists discussing other companies in conjunction with the thematic.	This score is intended to mitigate "false positives". The higher the score, the greater the number of mentions towards the company and thematic by other journalists/companies.
Thematic News score	An equally-weighted composite of the above four metrics.	The composite is designed to capture exposure towards a given thematic.

- The premise is to create a balanced composite by sourcing and averaging information across a variety of media sources.

Source: Dow Jones Newswires, Deutsche Bank

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Metric 1: % of Thematic News

- The percentage of thematic-related news to total news for a company (measured over the past 12 months) proxies the relative importance of the thematic to the company.

- **Interpretation:** The higher the percentage the greater the perception that the thematic is important to the company.

Sustainability Thematics

Overview:

- This screen identifies companies exposed to a range of sustainability themes.
- Our algorithms text-mine information reported in company announcements (corporate awards, press releases), patents and media news.
- Please click here to email any questions on Thematics
- Source: Dow Jones Newswires, Factset, Deutsche Bank. Thematic data rebalanced monthly, as at 28 February

Thematic: Nutrition

Stock Screen | Scores | Text | Trending Keywords | Trending Mentions | Treemap of sub-industry groups | Visualisation

Watchlist	Ticker	Company	Region	Country	Sector	Industry	Sub-Industry	Count of thematic news over past 12 months	Count of total news over past 12 months	% of Thematic news	% of Corporate awards news	% of Patents news	% of Products news	% of Press release news	% of Other news	Diversity Across News Media Score
	HLF UN	Herbalife Nutrition Ltd.	LatAm	Cayman Islands	Consumer Staples	Household & Personal Products	Nutritional Health Pharmaceuticals	128	239	53.56 %	1.56 %	0.00 %	0.78 %	25.78 %	71.88 %	0.38
	GLB ID	Glanbia Plc	Europe	Ireland	Consumer Staples	Food Beverage & Tobacco	Food Production	33	92	35.87 %	0.00 %	0.00 %	0.00 %	0.00 %	100.00 %	0.07
	1717 HK	Ausnutria Dairy Corp. Ltd.	Dev. Asia Pacific Ex. Japan	Hong Kong	Consumer Staples	Food Beverage & Tobacco	Food Production	40	143	27.97 %	0.00 %	0.00 %	0.00 %	0.00 %	100.00 %	0.07
	RYTM UQ	Rhythm Pharmaceuticals, Inc.	North America	United States	Health Care	Pharmaceuticals Biotechnology & Life Sciences	Weight Management Biopharmaceuticals	32	117	27.35 %	0.00 %	0.00 %	0.00 %	59.38 %	40.62 %	0.6
	KYG ID	Kerry Group Plc Class A	Europe	Ireland	Consumer Staples	Food Beverage & Tobacco	Additives Manufacturing	18	76	23.68 %	0.00 %	0.00 %	0.00 %	0.00 %	100.00 %	0.07
	BN FP	Danone SA	Europe	France	Consumer Staples	Food Beverage & Tobacco	Food Production	61	259	23.55 %	0.00 %	0.00 %	0.00 %	27.87 %	72.13 %	0.34

Source: Dow Jones Newswires, Deutsche Bank

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Metric 2: Diversity across News Media

- A percentile score indicating the extent to which the company is discussed across different media sources (corporate awards, patents, product news, press releases and other news media).

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	HLF UN	Herbalife Nutrition Ltd.	LatAm	Cayman Islands	Consumer Staples	Household & Personal Products	Nutritional Health Pharmaceuticals	128	239	53.56 %	1.56 %	0.00 %	0.78 %	25.78 %	71.88 %	0.38
	GLB ID	Glanbia Plc	Europe	Ireland	Consumer Staples	Food Beverage & Tobacco	Food Production	33	92	35.87 %	0.00 %	0.00 %	0.00 %	0.00 %	100.00 %	0.07
	1717 HK	Ausnutria Dairy Corp. Ltd.	Dev. Asia Pacific Ex. Japan	Hong Kong	Consumer Staples	Food Beverage & Tobacco	Food Production	40	143	27.97 %	0.00 %	0.00 %	0.00 %	0.00 %	100.00 %	0.07
	RYTM UQ	Rhythm Pharmaceuticals, Inc.	North America	United States	Health Care	Pharmaceuticals Biotechnology & Life Sciences	Weight Management Biopharmaceuticals	32	117	27.35 %	0.00 %	0.00 %	0.00 %	59.38 %	40.62 %	0.6
	KYG ID	Kerry Group Plc Class A	Europe	Ireland	Consumer Staples	Food Beverage & Tobacco	Additives Manufacturing	18	76	23.68 %	0.00 %	0.00 %	0.00 %	0.00 %	100.00 %	0.07
	BN FP	Danone SA	Europe	France	Consumer Staples	Food Beverage & Tobacco	Food Production	61	259	23.55 %	0.00 %	0.00 %	0.00 %	27.87 %	72.13 %	0.34

Source: Dow Jones Newswires, Deutsche Bank

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Metric 3: Lexical Diversity

- A percentile score indicating the diversity of synonyms used to discuss the thematic.
- **Interpretation:** This score is intended to mitigate "false positives". The greater the number of synonyms, the more likely the company is associated with the theme.

Sustainability Thematics

Overview:

- This screen identifies companies exposed to a range of sustainability themes.
- Our algorithms text-mine information reported in company announcements (corporate awards, press releases), patents and media news.
- Please click here to email any questions on Thematics
- Source: Dow Jones Newswires, Factset, Deutsche Bank. Thematic data rebalanced monthly, as at 28 February

Thematic: Nutrition

Stock Screen | Scores | Text | Trending Keywords | Trending Mentions | Treemap of sub-industry groups | Visualisation

Ticker	Company	Region	Country	Sector	Industry	Sub-Industry	Count of thematic news over past 12 months	Count of total news over past 2 months	% of Thematic news	% of Corporate awards news	% of Patents news	% of Products news	% of Press release news	% of Other news	Diversity Across News Media Score	Lexical Diversity Score	Mentions Network score	Thematic news sentiment	Thematic news score
OPK UQ	OPKO Health, Inc.	North America	United States	Health Care	Pharmaceuticals Biotechnology & Life Sciences	Ambulatory and Outpatient Diagnostic Patient Care	13	287	4.53 %	0.00 %	0.00 %	0.00 %	76.92 %	23.08 %	0.29	1.00	0.10	0.09	0.36
HLF UN	Herbalife Nutrition Ltd.	LatAm	Cayman Islands	Consumer Staples	Household & Personal Products	Nutritional Health Pharmaceuticals	128	239	53.56 %	1.56 %	0.00 %	0.78 %	25.78 %	71.88 %	0.38	0.98	0.57	0.45	1
DVA UN	DaVita Inc.	North America	United States	Health Care	Health Care Equipment & Services	Other Ambulatory and Outpatient Patient Care	15	26											
REGN UQ	Regeneron Pharmaceuticals, Inc.	North America	United States	Health Care	Pharmaceuticals Biotechnology & Life Sciences	Ophthalmology Biopharmaceuticals	14	42											
CL UN	Colgate-Palmolive Company	North America	United States	Consumer Staples	Household & Personal Products	General Personal Care and Cleaning Products Makers	17	29											

Company	Text
Herbalife Nutrition Ltd.	herbalife nutrition foundation pledges an additional 1 million to support at-risk children in recognition of giving tuesday los
Herbalife Nutrition Ltd.	with our herbalife nutrition independent distributors we are committed to providing solutions to global trends of poor nutrition and obesity a population that wants to age in a healthier manner skyrocketing public healthcare costs as well herbalife nutrition donates 30,000 to build roof for win...
Herbalife Nutrition Ltd.	these items are made using a base of organic chickpea flour providing an exciting addition to any plant-based diet earth 's best organic r l expands its line of better-for-you formula feeding options with safer herbal medicine systems is also an important factor shineco inc. nasd herbali...
Herbalife Nutrition Ltd.	herbalife nutrition achieves n ... der implementation -
Herbalife Nutrition Ltd.	herbalife distributors gather f ... ng to further company 's purpose-driven appr to nutrition los angeles -- bus ... o learning about how the company is offering positive sol...

these items are made using a base of organic chickpea flour providing an exciting addition to any plant-based diet earth 's best organic r brand expands its line of better-for-you formula feeding options with safer herbal medicine systems is also an important factor shineco inc. nasdaq tyht herbalife nutrition ltd. nyse hlf the hain celestial group nasdaq hain united

Source: Dow Jones Newswires, Deutsche Bank

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Metric 4: Mentions Network score

- A percentile score derived from a network analysis of companies/journalists discussing other companies in conjunction with the thematic.

Interpretation:

- This score is intended to mitigate "false positives".
- The higher the score, the greater the number of mentions towards the company and thematic by other journalists/companies.

Source: Dow Jones Newswires, Deutsche Bank

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Metric 5: Media sentiment

- Infer whether the news is positive or negative towards companies and those themes.

MARKETS | HEARD ON THE STREET

Why Nvidia Shares Can't Rise Forever

Chipmaker's business should keep growing strong, but its expensive stock may be in for a breather

By Dan Gallagher
Jan. 12, 2018 5:30 a.m. ET

Nvidia to date has said nothing about plans to build flyi
a shame, as its stock has clearly figured out how to de
gravity.

The company, whose graphics processing chips are be
components in the artificial-intelligence systems being
centers and automobiles, saw its market value double
tripling the year before. It has picked up another 16% r

TECH

Nvidia Is Poised to Report a Strong Lift from AI and Gaming

Chip maker's hardware is popular in cloud computing and cryptomining

By Ted Greenwald
May 10, 2018 5:30 a.m. ET

Nvidia Corp. is scheduled to announce earnings for its first quarter after the market closes Thursday. Here's what to look for:

EARNINGS FORECAST: Analysts expect Nvidia to report per-share earnings of $1.47, according to a survey by Thomson Reuters, up 86% from the same quarter a year earlier. A year ago, the graphics-chip maker reported net income of $507 million.

Source: Dow Jones Newswires, Deutsche Bank

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Evaluation: Assessing factor exposures

Regression results of the signal on firm characteristics

		Model1	Model2	Model3	Model4
	Intercept	0.510 (246.65)	0.505 (238.17)	0.496 (136.62)	0.494 (150.18)
Fundamentals	Beta	0.005 (2.50)	0.001 (0.78)	0.005 (2.33)	-0.000 (-0.04)
	Size	0.014 (4.65)	0.015 (5.63)	0.013 (4.37)	0.014 (5.22)
	Earnings yield	-0.003 (-1.41)	0.002 (0.90)	-0.003 (-1.17)	0.002 (0.97)
	Quality	0.002 (1.17)	0.002 (1.36)	0.001 (0.79)	0.002 (1.08)
	Price momentum	0.002 (1.65)	0.003 (2.04)	0.002 (1.53)	0.002 (1.74)
	Prior earnings surprise	0.002 (1.87)	0.001 (0.55)	0.002 (1.50)	0.000 (0.27)
Sectors	Energy		-0.003 (-2.02)		-0.004 (-2.55)
	Health care		0.002 (1.04)		0.001 (0.65)
	Industrials		0.001 (0.55)		0.001 (1.17)
	Information technology		0.031 (8.74)		0.032 (8.92)
	Materials		0.001 (0.47)		0.001 (0.55)
	Telecommunication services		0.004 (1.54)		0.005 (1.68)
	Utilities		0.001 (0.91)		0.000 (0.22)

Source: Dow Jones Newswires, Deutsche Bank

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Regression analysis of SDG sales scores

- To assess the accuracy of our SDG measures, we downloaded the holdings of impact funds invested in publically-listed equities and calculated the average active stock positions versus MSCI AC World.
- We then conducted a statistical analysis, regressing the active weights on our SDG sales % scores.

Regression results of the average active weights for impact funds

	GICS Sector baseline model	SDG sales exposure model	SDG + Sin exposure model
MSCI constituent	0.756	0.627	0.627
	(2.46)	(1.86)	(1.86)
Size	-0.056	-0.001	-0.001
	(-0.49)	(-0.37)	(-0.37)
Sin stock			-0.009
			(-0.01)
%SDG2		0.004	0.005
		(2.20)	(2.20)
%SDG3		0.003	0.003
		(2.17)	(2.17)
%SDG4		0.003	0.000
		(1.91)	(1.91)
%SDG6		0.002	0.002
		(1.66)	(1.66)
%SDG7		0.009	0.009
		(2.15)	(2.15)
%SDG9		0.003	0.003
		(3.13)	(3.13)
ConsumerStaples	0.002	0.001	0.001
	(3.02)	(2.94)	(2.95)
HealthCare	0.002	0.002	0.002
	(3.31)	(2.81)	(2.81)

Source: Factset, Deutsche Bank

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Geopolitical Risk

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Quantifying geopolitical risks

Markets have a tendency toward hyperbole, and as **Donald Trump** appeared to be headed toward a win they bet on the four horsemen of the **Trumpocalypse** hitting Mexico. The **peso** fell more than 10% to its lowest ever against the **dollar**, as **traders** focused on the clearest **Trump trade**.

Mr. Trump called for **Brexit** times but aside from the **peso** he's getting a **market reaction** to his likely **presidency** only somewhat worse than the **British vote** to **leave** the **European Union** in June. The **flight to safety** has seen the **dollar** itself fall 3% against the **Japanese yen**, gold leap $43 and U.S. **stock futures** predict at one point a 5% plunge in the **S&P 500** when it opens.

There's one exception: The **flight to safety** has been tempered in **government bonds**. Usually when **investors** panic they pile into **Treasurys**, and sure enough the **10-year yield** is down 0.05 percentage point at 1.8%. That's a chunky move, but less than half the **post- Brexit** fall in **yield** (**prices** rise when **yields** fall).

The **market moves** tell us that **traders** are worried, but don't tell us much about how **investors** will fare under a **President Trump**. **Market moves** between **Election Day** and **inauguration** have had no obvious link to **performance** during **presidential** terms in the past, as data compiled by Birinyi Associates shows. Indeed, **markets** fell sharply after the **elections** of two of the **presidents** who oversaw the biggest **bull markets** once they were **elected**, **Franklin Roosevelt** and **Barack Obama**.

Time series for selected news topics
(% news topic is discussed in the financial media)

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Example: Emerging markets

Time series for selected news topics in Emerging markets
(% news topic is discussed in the financial media)

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Modelling market volatility

	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	0.02	-0.441	-0.409	-0.027	-0.287	-0.129
	(0.8)	(-1.29)	(-1.19)	(-1.64)	(-1.08)	(-0.49)
$MediaNews_t$	0.007	0.007	0.007	0.005	0.005	0.004
	(2.01)	(1.99)	(1.84)	(1.82)	(1.78)	(1.68)
$\Delta EquityRisk_{t-20,t-1}$	-0.003	-0.001	-0.003			
	(-0.07)	(-0.02)	(-0.06)			
ICGR $score_t$		0.505	0.559		0.285	0.353
		(1.35)	(1.49)		(0.98)	(1.24)
$ln(CDS)_t$			0.215			-0.2
			(2.25)			(-3.61)
$\Delta CDS_{t-20,t-1}$			-0.022			-0.059
			(-0.99)			(-3.73)
Country effects	Yes	Yes	Yes	Yes	Yes	Yes
Time effects	Yes	Yes	Yes	Yes	Yes	Yes
Adj R^2	0.121	0.121	0.122	0.121	0.121	0.120

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Recent factor performance

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Overview

- The second week of September saw 5 standard deviation moves in weekly factor returns as investors rotated out of Momentum and into Value.

Year-to-date factor performance

Regression of stock returns in September 2019

```
Coefficients:
                        Estimate Std. Error t value Pr(>|t|)
(Intercept)            0.0445210  0.0416993   1.068 0.286013
BP                     0.0112161  0.0030146   3.721 0.000214 ***
CF_EV                 -0.0050122  0.0047934  -1.046 0.296069
DY                     0.0097348  0.0026635   3.655 0.000275 ***
EBIT_to_EV             0.0120555  0.0052894   2.279 0.022937 *
EBITDA_to_EV          -0.0010983  0.0070733  -0.155 0.876650
FCF_EV                 0.0004986  0.0034422   0.145 0.884873
pmom_long             -4.2951262  1.4482488  -2.966 0.003115 **
pmom_short             2.3545425  1.8350138   1.283 0.199845
north_america         -0.0027952  0.0114566  -0.244 0.807310
japan                  0.0296191  0.0121577   2.436 0.015072 *
europe_ex_Uk          -0.0146783  0.0118365  -1.240 0.215331
united_kingdom         0.0056755  0.0135094   0.420 0.674520
Energy                -0.0048238  0.0409697  -0.118 0.906305
Industrials           -0.0195604  0.0402884  -0.486 0.627456
ConsumerDiscretionary -0.0118076  0.0403523  -0.293 0.769899
HealthCare            -0.0489629  0.0405940  -1.206 0.228135
Materials             -0.0066306  0.0405116  -0.164 0.870034
CommunicationServices -0.0556208  0.0409530  -1.358 0.174820
ConsumerStaples       -0.0362917  0.0406248  -0.893 0.371961
InformationTechnology -0.0266978  0.0404597  -0.660 0.509545
Utilities             -0.0151763  0.0408080  -0.372 0.710076
```

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Diversification across Value components

- The correlation between Value and Momentum is at extreme levels (-0.77), implying that both strategies are vulnerable at turning points.

Time-series correlation across L/S factor returns

Correlation across factor scores (as at end August)

	Value composite (orthogonal to PMom)	Value composite (raw signal)	B/P	CF/EV	DY	EBIT to EV	EBITDA to EV	FCF to EV	Pmom
Value composite (orthogonal to PMom)	-	0.91	0.51	0.81	0.56	0.76	0.80	0.65	-0.05
Value composite (raw signal)	0.91	-	0.63	0.86	0.63	0.84	0.90	0.65	-0.42
B/P	0.53	0.64	-	0.45	0.36	0.40	0.60	0.13	-0.40
CF/EV	0.81	0.87	0.47	-	0.39	0.67	0.77	0.67	-0.33
DY	0.57	0.63	0.38	0.42	-	0.42	0.46	0.26	-0.29
EBIT to EV	0.76	0.84	0.42	0.68	0.44	-	0.87	0.51	-0.36
EBITDA to EV	0.79	0.90	0.61	0.79	0.48	0.87	-	0.43	-0.43
FCF to EV	0.65	0.65	0.16	0.67	0.30	0.50	0.43	-	-0.15
Pmom	-0.08	-0.43	-0.40	-0.35	-0.31	-0.36	-0.44	-0.16	-

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Correlation to bond yields

- The correlation between monthly changes in Value and the U.S. 10s2s spread reached record highs of 0.48.
- After inverting in August, the 10s2s spread steepened during the first half of September before flattening during the second half of the month. The steepening was reflected in the outperformance of Value.

Change in the US term structure

Correlation to Value (daily L/S returns)

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Valuation spreads

- As at end Sept, the bottom quintile of Value (expensive companies) trades on a median next 12 month P/E of 27x vs. 11x for the top quintile (cheap companies).
- This valuation spread equates to a time-series Z-score of 2.32. A similar valuation spread was last seen in Q4 2008.

Time-series analysis for the valuation of Value

Comparison of P/Es for Long and Short Value portfolios

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Contribution to Returns

Value

Long Value	Asia ex Japan	Europe ex UK	Japan	North America	UK	Other	Total
Energy	-0.01%	0.01%	0.00%	0.38%	0.00%	0.00%	0.38%
Consumer Discretionary	-0.04%	0.18%	0.11%	0.44%	0.08%	0.00%	0.77%
Health Care	0.00%	-0.07%	0.03%	0.06%	0.00%	0.00%	0.02%
Materials	0.00%	0.05%	0.05%	0.12%	-0.01%	0.00%	0.22%
Industrials	0.01%	0.10%	0.16%	0.26%	0.13%	0.00%	0.66%
Information Technology	0.00%	-0.01%	0.16%	0.24%	0.00%	0.00%	0.39%
Consumer Staples	0.00%	0.05%	0.06%	0.01%	0.07%	0.00%	0.19%
Communication Services	0.00%	0.06%	-0.06%	-0.02%	0.04%	0.00%	0.02%
Utilities	0.00%	0.05%	0.00%	0.08%	0.01%	0.00%	0.14%
Other	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total	-0.03%	0.42%	0.51%	1.57%	0.32%	0.00%	2.79%

Short Value	Asia ex Japan	Europe ex UK	Japan	North America	UK	Other	Total
Energy	0.05%	0.00%	0.00%	-0.01%	0.00%	0.00%	0.04%
Consumer Discretionary	0.01%	-0.16%	0.12%	-0.07%	-0.01%	0.00%	-0.11%
Health Care	0.00%	-0.06%	0.10%	-0.51%	0.00%	0.00%	-0.47%
Materials	0.08%	0.12%	0.04%	-0.18%	-0.03%	0.00%	0.02%
Industrials	-0.05%	-0.15%	0.26%	-0.21%	0.05%	0.00%	-0.10%
Information Technology	0.00%	-0.12%	-0.05%	-0.19%	0.00%	0.00%	-0.36%
Consumer Staples	0.00%	-0.10%	0.05%	-0.02%	-0.05%	0.00%	-0.11%
Communication Services	0.00%	-0.08%	-0.09%	-0.16%	-0.04%	0.00%	-0.37%
Utilities	0.00%	0.06%	0.00%	0.02%	0.02%	0.00%	0.10%
Other	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total	0.08%	-0.49%	0.44%	-1.33%	-0.05%	0.00%	-1.36%

Momentum

Long Momentum	Asia ex Japan	Europe ex UK	Japan	North America	UK	Other	Total
Energy	0.00%	0.01%	0.00%	0.00%	0.00%	0.00%	0.01%
Health Care	-0.01%	-0.03%	0.01%	-0.36%	-0.01%	0.00%	-0.40%
Consumer Discretionary	0.00%	-0.02%	0.04%	-0.13%	0.00%	0.00%	-0.11%
Materials	0.02%	-0.02%	0.01%	-0.33%	0.01%	0.00%	-0.31%
Real Estate	-0.05%	0.00%	0.00%	-0.10%	0.00%	0.00%	-0.15%
Financials	-0.07%	0.13%	-0.03%	-0.30%	0.04%	0.00%	-0.23%
Communication Services	-0.03%	0.02%	-0.04%	-0.19%	0.00%	0.00%	-0.25%
Consumer Staples	-0.03%	0.02%	0.00%	-0.13%	-0.02%	0.00%	-0.16%
Information Technology	0.00%	-0.15%	-0.03%	-0.45%	0.01%	0.00%	-0.62%
Industrials	-0.03%	-0.04%	0.00%	-0.11%	0.01%	0.00%	-0.18%
Utilities	0.00%	0.02%	0.00%	0.02%	0.00%	0.00%	0.04%
Other	0.00%	-0.03%	0.00%	0.02%	0.00%	0.00%	-0.01%
Total	-0.20%	-0.09%	-0.05%	-2.07%	0.04%	0.00%	-2.37%

Short Momentum	Asia ex Japan	Europe ex UK	Japan	North America	UK	Other	Total
Energy	0.04%	0.04%	0.08%	0.54%	0.00%	0.00%	0.69%
Health Care	0.00%	-0.07%	-0.04%	-0.05%	0.03%	0.00%	-0.13%
Consumer Discretionary	0.00%	-0.03%	0.27%	0.55%	0.07%	0.00%	0.86%
Materials	0.05%	0.23%	0.06%	0.21%	-0.03%	0.00%	0.51%
Real Estate	0.00%	0.00%	0.00%	0.11%	0.06%	0.00%	0.17%
Financials	0.01%	0.26%	0.18%	0.20%	0.00%	0.00%	0.65%
Communication Services	0.00%	-0.10%	-0.06%	0.05%	0.02%	0.00%	-0.10%
Consumer Staples	0.00%	0.00%	0.09%	0.16%	0.04%	0.00%	0.29%
Information Technology	0.01%	-0.01%	0.09%	0.14%	0.00%	0.00%	0.24%
Industrials	0.00%	0.01%	0.18%	0.09%	0.07%	0.00%	0.35%
Utilities	0.00%	-0.03%	-0.03%	0.00%	0.02%	0.00%	-0.04%
Other	0.00%	0.08%	0.00%	0.02%	0.00%	0.00%	0.11%
Total	0.12%	0.39%	0.81%	2.00%	0.27%	0.00%	3.60%

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Contribution to Risk

Value factor exposures

Momentum factor exposures

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Regime analysis

Regime analysis for ISM survey

Average monthly returns in different ISM regimes

	> 51 & ↑	> 51 and ↓	49-51	< 49 & ↑	< 49 and ↓
Value (DBRPGENU)	0.11%	-0.38%	0.54%	1.02%	0.83%
Momentum (DBRPGENU)	0.37%	1.11%	-0.68%	1.39%	0.31%
Quality (DBRPGEQU)	0.15%	0.17%	0.07%	-0.35%	0.30%
Low Beta (DBRPGEBU)	0.59%	0.66%	0.19%	-1.46%	0.19%

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