Looking Beyond Dividend Yield: Finding Value in Cash Distribution Strategies

Author
Vivian Ning CFA
Quantamental Research
(312) 233-7148
vning@spglobal.com

Global dividends payouts rose 7.8% to a first-quarter record of $263.3 billion,[1] while S&P 500 companies repurchased $227 billion of their own shares. Do such payouts benefit stockholders? In this paper, we examine the relationship between yield-oriented strategies (dividend yield, buyback yield, and combined shareholder yield, or SY) and future stock return, across multiple countries/regions. We also provide insights into two additional topics:

- Which company fundamental characteristics support and enhance future shareholder payouts?
- Under which interest rate environment should investors favor yield-oriented strategies? Investors generally assume that yield-oriented strategies, such as dividend yield, perform well in a low interest rate environment as they can offer a more attractive yield than other asset classes such as bonds.

Our research findings include:

- **Investors have historically been rewarded for investing in higher-yield stocks globally**. In the US and Europe, buybacks outperform dividends, as the former has become a preferred way for companies to return cash due to tax advantages. In Japan, where interest rates remain depressed, dividend yield works best. In developed Asia (ex-Japan) and the emerging markets, the combined shareholder yield (SY) strategy was most effective (Exhibit 3 and Exhibit 10). Annualized long-short return for the combined shareholder yield (SY) strategy ranges from 6.3% to 12.6% across regions.
- **Cash flow growth and capital efficiency metrics can enhance the performance of a shareholder yield strategy.** Firms ranked highest (lowest) on both SY and 3-year cash flow growth, or highest (lowest) on both SY and cash flow return on invested capital, outperformed (underperformed) across all regions (Exhibit 8 and Exhibit 11). This result confirms our hypothesis that high-yield firms with improving cash flow metrics have a higher probability of sustaining their yield compared to their peers with deteriorating metrics.
- **Counter to our hypothesis, the return difference between rising and falling interest rate regimes for yield-oriented strategies in the US is not significant,** indicating that yield-oriented strategies are equally effective across interest rate environments (Exhibit 7).
- **Historical test results for yield-oriented strategies were stronger in the Russell 3000 Growth than in the Russell 3000 Value universe.** A growth company that also has high shareholder yield may signal that the firm is confident in its ability to fund both cash distributions to shareholders and future growth opportunities from cash flows (Exhibit 5).

[1] US breaks record for dividends as investor payouts surge around the world (https://www.cnbc.com/2019/05/20/us-breaks-all-time-record-for-dividends-as-investor-payouts-surge.html)

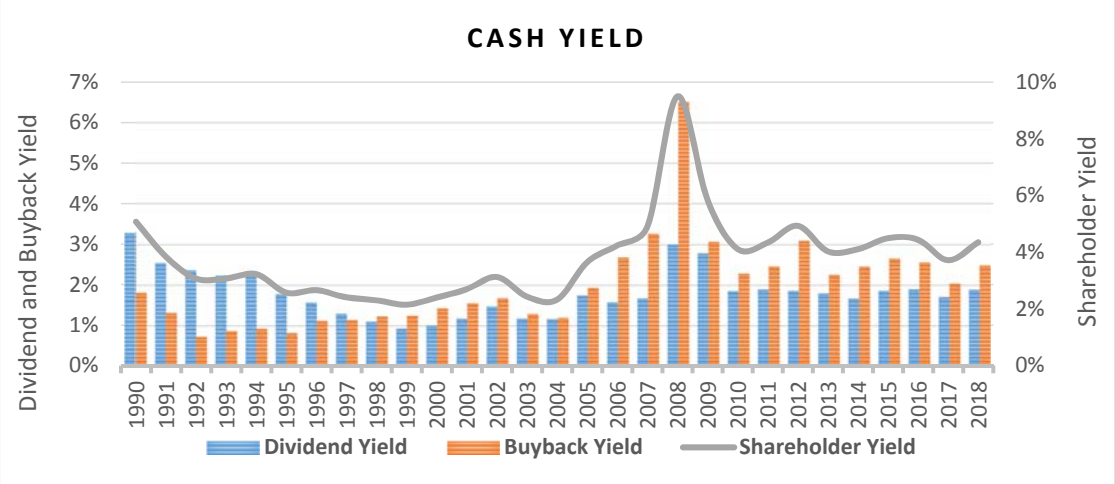
Introduction

Corporate managers have several options for using cash: reinvest in the business, make acquisitions/invest in other businesses, pay dividends and compensate executives, repurchase shares, or pay down debt. Dividends, buybacks, and debt reductions represent a return of cash to stock and/or bond investors. Corporate cash allocation policies and payout decisions should provide important information about future company performance and investment returns.

Dividends have been in use since at least the 17th century, by the Dutch East India Company, and US companies historically have paid out a large portion of their earnings as dividends. Stock buybacks are a more recent vehicle for the return of capital. Prior to 1982, buybacks were considered a form of stock price manipulation and were illegal. In 1982, the SEC put in place Rule 10B-18, which provides a safe harbor for shares repurchases under certain conditions.

Over the last 20 years, buybacks in the US have surged. Buybacks are tax-efficient, are viewed as discretionary (while dividends are viewed as "obligatory"), and are used to boost per-share metrics (e.g., EPS). While dividend yields have fallen, "buyback yields" have risen. In fact, buyback yield[2] has been higher than dividend yield for the Russell 3000 for the past 21 years (Exhibit 1). Manconi, Peyer and Vermaelen (2018) reported that share repurchases are associated with significant positive short-term and long-term excess returns globally.

Exhibit 1 – Dividend, Buyback and Shareholder Yield: Russell 3000 (1990-2018)



Source: S&P Global Market Intelligence Quantamental Research. Data as of 05/01/2019.

A number of recent studies[3] show that debt has been used to fund dividends and buybacks, given the low interest rate environment. While cheap debt may be good for short-term shareholder results, it also increases long-term risks to a company's financial health. We also include changes in debt in our *total shareholder yield* (*TSY*) strategy, to understand whether risk reduction (a decrease in debt) matters in terms of either stock price returns or return volatility**. Gray and Vogel (2019) found the addition of net-debt-reduction to a shareholder yield strategy enhanced risk-adjusted returns and created a more robust metric over time.**

[2] Buyback yield and dividend yield is calculated as weighted average of buyback yield or dividend yield for each company in Russell 1000.
[3] E.g., "Long-Term Investment, the Cost of Capital and the Dividend and Buyback Puzzle". *OECD Journal, 2013.*

1. Strategy Formulation

In this paper, we look at four types of cash return strategies: dividends, share buybacks, dividends + buybacks (*shareholder yield*), and shareholder yield + net debt reduction (*total shareholder yield*). Goyal and Welch (2003) find that, with dividends declining, dividend yield has become a poor predictor of future stock returns. Boudoukh, Michaely, Richardson and Roberts (2007) also reported that dividend yield was less predictive; however, "net payout yield," or dividends plus net share repurchases, generated significant excess returns.

We note that not all buybacks are the same. For example, some buyback programs are used to offset dilution from share issuance (thus the importance of *net* buybacks that result in a reduction in shares outstanding). Other buybacks, as well as dividends, are funded by debt issuance, increasing leverage, and as a result, financial risk for shareholders. Adding net total debt reduction to the shareholder yield strategies helps separate companies that are funding shareholder payouts through increases in debt from those funding payouts through internally generated cash flow. It also identifies companies, in the short portfolio, that are funding growth by heavy access to the debt and equity markets.

The table below shows the detailed definition for each yield-oriented strategy.

Exhibit 2 – Yield-Oriented Strategy Definition

Strategy	Definition
Dividend Yield (DY)	The ratio of trailing four quarter dividend per share to current stock price
Buyback Yield (BY)	The ratio of Net repurchases of common stock (repurchase of common stock - issuance of common stock) to market capitalization
Shareholder Yield (SY)	The ratio of trailing four quarter dividend and net repurchases of common stock to market capitalization (***SY = Dividend Yield + Buyback Yield***)
Total Shareholder Yield (TSY)	The ratio of trailing four quarter dividend, net repurchases of common stock and net debt reduction (total debt repaid - total debt issued) to market capitalization (***TSY = Dividend Yield + Buyback Yield + Net Debt Reduction Yield***)

2. Empirical Results – U.S.

2.1 Performance of Individual Yield-Oriented Strategy

Dividends tend to be paid by more mature and established companies with solid and steady cash flow. Given the structural difference between dividend and non-dividend paying companies, we excluded all non-dividend paying companies from our analysis for the standalone dividend yield strategy. Exhibit 3 shows performance for the four yield-oriented strategies defined above, for the Russell 3000. All strategies are ranked relative to their economic sectors (GICS level I); and all returns are in USD and Fama-French 4-factor[4] adjusted.

[4] Fama-French 4-factors: market beta, book-to-market ratio (value), market capitalization (size), and price momentum.

Exhibit 3 – Performance Summary for Yield Strategies - Russell 3000 (Jan. 1990 - Mar. 2019)

Factor/Signal	Start Date	Avg Count	Annualized Long-Only Active	Annualized Long-Only Info Ratio	Long-Only Active Hit Rate	Annualized Q1/Q5 Act. Return	Average 1-Month IC
Dividend Yield (DY)	Jan-90	290	1.58%**	0.46	57%**	3.65%***	0.015***
Buyback Yield (BY)	Jan-90	586	3.04%***	1.27	66%***	8.47%***	0.019***
Shareholder Yield (SY)	Jan-90	574	3.05%***	1.00	61%***	8.29%***	0.021***
Total Shareholder Yield (TSY)	Jan-90	574	3.36%***	1.16	65%***	9.62%***	0.021***

*** 1% level of significance; ** 5% level of significance; * 10% level of significance

Source: S&P Global Market Intelligence Quantamental Research. All returns and indices are unmanaged, statistical composites and their returns do not include payment of any sales charges or fees an investor would pay to purchase the securities they represent. Such costs would lower performance. It is not possible to invest directly in an index. Past performance is not a guarantee of future results. Data as of 05/01/2019.

Historically, all yield-oriented strategies result in excess stock returns in the Russell 3000 universe. All but one signal (dividend yield) have annualized long-only active returns and hit rates[5], long-short active returns[6], and information coefficients (ICs)[7] that are significant at the 1% level. Compared to dividend yield, buyback yield is a much more effective strategy during our testing period. The return differences between these two strategies are significant from both long-only and long-short perspectives (Appendix A). Also note that total shareholder yield (TSY) generated the highest long and long-short active returns among all strategies. Return difference between TSY and DY are significant at the 1% level (both long-only and long-short returns) (Appendix A). These results confirmed Grey and Vogel's (2019) findings that incorporation of net-debt-reduction to a shareholder yield enhanced risk-adjusted returns.

2.2 Fundamental Characteristics of Shareholder Yield Portfolios

Academic literature on yield-oriented strategies has shown that higher yield dividend-paying stocks tend to be smaller, cheaper, and less volatile then lower yielding stocks. We compare six fundamental characteristics for the higher (long portfolio, or Q1) and lower (short portfolio, or Q5) yield companies in Exhibit 4. The key takeaways are as follows:

- Higher yield companies are larger firms (except in the case of dividend yield).
- Higher yield securities have lower valuations and are less volatile.
- Higher DY, SY and TSY companies are more capital efficient (indicated by ROE), more profitable, and less risky (measured by lower interest coverage ratio) vs. their counterparts.

DY shows the opposite characteristics for most metrics – lower capital efficiency and higher financial risk; which might partially explain why the DY strategy underperforms when compared to other yield-oriented strategies. Full descriptions of the metrics in the table below is provided in Appendix B.

[5] Hit rates are the percentage of times that the average return of a portfolio exceeds the return of the benchmark index.
[6] All returns shown in this paper are Fama French 4-factor adjusted total returns.
[7] The information coefficient (IC) is the average correlation between factor ranks and associated forward returns.

Exhibit 4 – Fundamental Characteristics for Securities in Long/Short Portfolio of Yield-Oriented Strategies: Russell 3000 (Jan. 1990 - Mar. 2019)

Fundamental Metrics (in Median)	Quintile	Dividend Yield	Buyback Yield	Shareholder Yield	Total Shareholder Yield
Market Cap (in mil)	Q1	871	1,353	1,199	856
	Q5	1,447	522	518	549
	Q1 - Q5	-576***	830***	681***	307***
Beta	Q1	0.86	1.02	0.98	1.04
	Q5	0.98	1.11	1.12	1.16
	Q5 - Q1	0.12***	0.09***	0.14***	0.12***
ROE	Q1	9.1%	12.3%	11.9%	9.4%
	Q5	12.9%	6.0%	6.6%	6.8%
	Q1 - Q5	-3.8%***	6.3%***	5.3%***	2.6%***
Interest Coverage Ratio	Q1	4.09	7.54	6.85	4.57
	Q5	5.71	2.58	2.41	2.47
	Q1 - Q5	-1.62***	4.96***	4.44***	2.1***
Leverage (LTDE)	Q1	0.722	0.366	0.416	0.481
	Q5	0.414	0.348	0.342	0.674
	Q1 - Q5	0.308***	0.018	0.074***	-0.193***
Earnings to Price	Q1	0.053	0.050	0.052	0.048
	Q5	0.045	0.020	0.022	0.027
	Q1 - Q5	0.008***	0.03***	0.03***	0.021***

*** 1% level of significance; ** 5% level of significance; * 10% level of significance
Source: S&P Global Market Intelligence Quantamental Research. Data as of 05/01/2019.

2.3 Performance of Yield-Oriented Strategies in Value and Growth Universes

DY is one type of valuation metric commonly used by value investors. We examine the effectiveness of yield strategies in the Russell 3000 value and growth universe (Exhibit 5).

Exhibit 5 – Performance Summary for Yield Strategies: Russell 3000 Value (Jan. 1990 - Mar. 2019)

Factor/Signal	Start Date	Avg Count	Annualized Long-Only Active	Annualized Long-Only Info Ratio	Long-Only Active Hit Rate	Annualized Q1/Q5 Act. Return	Average 1-Month IC
Dividend Yield (DY)	Jan-90	228	1.76%**	0.37	52%	3.06%***	0.015***
Buyback Yield (BY)	Jan-90	403	2.67%***	1.12	64%***	6.64%***	0.013***
Shareholder Yield (SY)	Jan-90	391	2.38%***	0.85	58%***	5.55%***	0.017***
Total Shareholder Yield (TSY)	Jan-90	394	2.23%***	0.80	62%***	7.56%***	0.016***

Performance Summary for Yield Strategies: Russell 3000 Growth (Jan. 1990 - Mar. 2019)

Factor/Signal	Start Date	Avg Count	Annualized Long-Only Active	Annualized Long-Only Info Ratio	Long-Only Active Hit Rate	Annualized Q1/Q5 Act. Return	Average 1-Month IC
Dividend Yield (DY)	Jan-90	148	4.16%***	0.57	54%	6.56%***	0.016***
Buyback Yield (BY)	Jan-90	361	3.68%***	1.14	69%***	9.86%***	0.024***
Shareholder Yield (SY)	Jan-90	358	4.01%***	1.07	64%***	10.30%***	0.028***
Total Shareholder Yield (TSY)	Jan-90	355	4.56%***	1.20	64%***	11.88%***	0.026***

*** 1% level of significance; ** 5% level of significance; * 10% level of significance

Source: S&P Global Market Intelligence Quantamental Research. All returns and indices are unmanaged, statistical composites and their returns do not include payment of any sales charges or fees an investor would pay to purchase the securities they represent. Such costs would lower performance. It is not possible to invest directly in an index. Past performance is not a guarantee of future results. Data as of 05/01/2019.

All yield-oriented strategies show better performance in the Russell 3000 Growth universe than in the Russell 3000 Value universe. The return difference is statistically significant for both long-only and long-short portfolios (Appendix C). Results indicate that although yield-oriented strategies are important for all companies, **they are especially important for growth companies, perhaps because they signal a firm's confidence in its ability to fund both cash distributions and future growth opportunities from cash flows.**

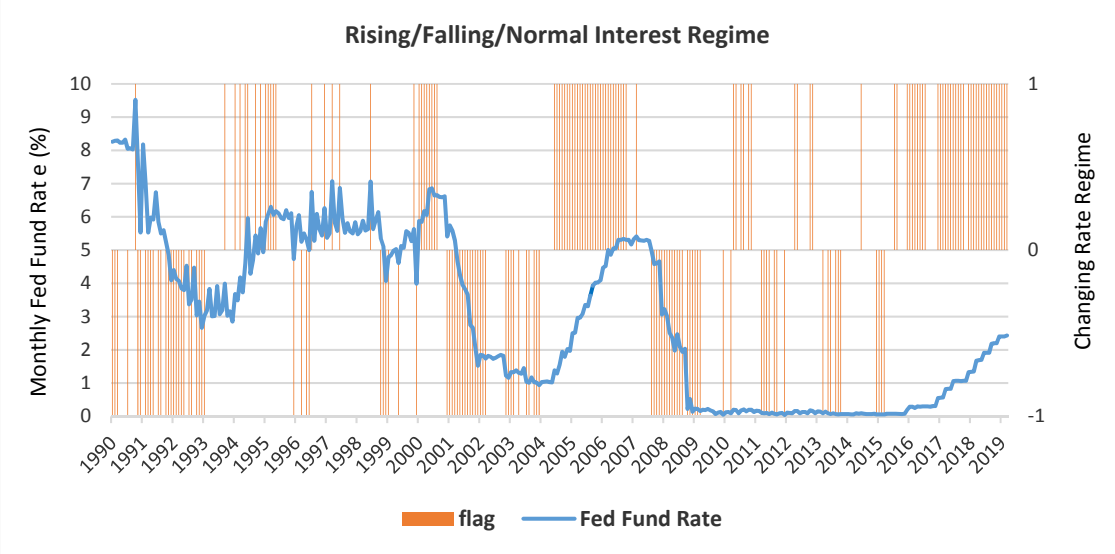
2.4 Performance of Yield-Oriented Strategies in Rising and Falling Interest Rate Regimes

We hypothesized that investors might assume yield-oriented strategies work well (poorly) in a falling (rising) interest rate environment since higher yielding stocks become more (less) attractive as bond yields fall (rise). In this section we examine how yield-oriented strategies perform in rising and falling interest regimes.

The interest rate regime used in Exhibit 6 is defined in a later section (methodology). The left axis is the monthly fed funds rate (blue line), while the right axis is a flag indicating if a given month is classified as a rising interest rate month (orange bars above "0", with flag set to 1) or falling interest rate regime (orange bars below "0", with flag set to -1). The flag is set to "0" for months classified as normal interest rate months (not classified as falling or rising interest rates).

From January 1990 to March 2019, there are 104 months identified as rising interest rate month, 100 months classified as falling interest rate months and 146 months tagged as normal interest rate months (Exhibit 6).

Exhibit 6 – Federal Funds Rate and Rising/Falling/Normal Interest Rate Regime



Source: S&P Global Market Intelligence Quantamental Research. Data as of 05/01/2019.

The performance comparison for SY and TSY is detailed in Exhibit 7. Both strategies generated annualized long-short active returns ranging from 6.18% to 10.41% (SY) and 7.43% to 10.32% (TSY), with significance at the 1% level. Although both yield strategies had higher returns in the falling rate regime, **the return difference between falling and rising rate regimes is not significant.**

This result is contrary to our hypothesis. We find that the majority of the outperformance during the falling rate regime came from just one period – the collapse of the dot-com bubble (2001 – early 2002); it is also a period of unusually steep declines in interest rates (rates were cut more than 5% in 14 months). Both SY and TSY provided a cushion when the broad market had significant drawdowns.

Exhibit 7 – Changing Rate Regime Analysis for Yield Strategies - Russell 3000 (Jan. 1990 - Mar. 2019)

	Ann. Long-Only Active Return			Ann. Q1-Q5 Active Return		
Factor/Signal	Rising Rates	Falling Rates	Difference Falling - Rising	Rising Rates	Falling Rates	Difference Falling - Rising
Shareholder Yield (SY)	1.99%**	4.41%***	2.42%	6.18%***	10.41%***	4.22%
Total Shareholder Yield (TSY)	1.74%*	3.92%***	2.17%	7.43%***	10.32%***	2.88%

*** 1% level of significance; ** 5% level of significance; * 10% level of significance

Source: S&P Global Market Intelligence Quantamental Research. All returns and indices are unmanaged, statistical composites and their returns do not include payment of any sales charges or fees an investor would pay to purchase the securities they represent. Such costs would lower performance. It is not possible to invest directly in an index. Past performance is not a guarantee of future results. Data as of 05/01/2019.

As a robustness check, a regression analysis was performed to examine the performance of SY and TSY in rising and falling regimes. The results from the regression support the conclusion that the performance difference between falling and rising interest rate regimes are not statistically different.

2.5 Can Cash Flow Growth/Efficiency Signals Improve the Performance of Shareholder Yield Strategies?

Shareholder yield cannot be sustained without the support of free cash flow. In order for companies to continue to grow their free cash flow, they need to be managed and operated efficiently. We hypothesize that higher yielding companies with growing free cash flow and better operational efficiency should outperform.

To test our hypothesis, we use the following three fundamental signals for this analysis. Definitions for these signals are provided in Appendix E.

- CFROIC: Cash flow return on invested capital
- 3YChgFCF: Asset adjusted 3-year change in free cash flow
- 1YChgPayout: 1-year change in total payout (dividends, buyback, and debt reduction) per share

We sort stocks based on SY or TSY into three buckets (high SY, med SY and low SY); then sort them based on the fundamental signal (e.g. CFROIC) into three bins (high, med and low). Next, we conduct a 3X3 independent sort. The results of the independent sort of yield-oriented strategies and fundamental signals are displayed in Exhibit 8 (active returns) and Exhibit 9 (hit ratio associated with active returns).

Exhibit 8 – Active Returns of Independent Sorts Based on Yield and Fundamental Signals: Russell 3000 (Jan. 1990 - Mar. 2019)

SY and CFROIC

Shareholder Yield

CFROIC	high SY	med SY	low SY	high-low (SY)
high	4.30%***	2.99%***	3.05%***	**1.21%**
med	3.12%***	1.45%***	0.24%	**2.88%*** **
low	-2.13%***	-4.52%***	-7.48%***	**5.74%*** **
R1-R3	**6.56%*** **	**7.84%*** **	**11.30%*** **	**12.64%*** **

TSY and CFROIC

Total Shareholder Yield

CFROIC	high TSY	med TSY	low TSY	high-low (TSY)
high	4.87%***	2.95%***	2.02%***	**2.79%*** **
med	3.33%***	1.55%***	-0.01%	**3.34%*** **
low	-2.32%***	-3.26%***	-8.17%***	**6.33%*** **
R1-R3	**7.34%*** **	**6.41%*** **	**11.02%*** **	**14.09%*** **

SY and 3YChgFCF

Shareholder Yield

3YChgFCF	high SY	med SY	low SY	high-low (SY)
high	4.01%***	2.97%***	2.05%***	**1.92%** **
med	3.10%***	1.10%**	0.55%	**2.54%*** **
low	0.45%	-2.87%***	-6.73%***	**7.66%*** **
R1-R3	**3.54%*** **	**5.99%*** **	**9.36%*** **	**11.45%*** **

TSY and 3YChgFCF

Total Shareholder Yield

3YChgFCF	high TSY	med TSY	low TSY	high-low (TSY)
high	4.30%***	2.66%***	1.55%**	**2.72%*** **
med	3.48%***	1.05%*	0.32%	**3.15%*** **
low	-0.04%	-1.28%**	-7.03%***	**7.47%*** **
R1-R3	**4.34%*** **	**3.98%*** **	**9.16%*** **	**12.11%*** **

SY and 1YChgPayout

Shareholder Yield

1YChgPayout	high SY	med SY	low SY	high-low (SY)
high	2.34%***	-0.26%	-4.16%***	**6.75%*** **
med	2.19%***	0.76%	0.75%	**1.44%**
low	2.76%***	-0.28%	-4.05%***	**7.08%*** **
R1-R3	**-0.41%**	**0.03%**	**-0.11%**	**6.63%*** **

TSY and 1YChgPayout

Total Shareholder Yield

1YChgPayout	high TSY	med TSY	low TSY	high-low (TSY)
high	2.84%***	0.36%	-4.03%***	**7.14%*** **
med	2.40%***	1.66%**	-1.53%***	**3.99%*** **
low	3.15%***	-0.61%	-4.90%***	**8.42%*** **
R1-R3	**-0.29%**	**0.97%**	**0.90%**	**8.10%*** **

*** 1% level of significance; ** 5% level of significance; * 10% level of significance

Source: S&P Global Market Intelligence Quantamental Research. All returns and indices are unmanaged, statistical composites and their returns do not include payment of any sales charges or fees an investor would pay to purchase the securities they represent. Such costs would lower performance. It is not possible to invest directly in an index. Past performance is not a guarantee of future results. Data as of 05/01/2019.

The last row of each panel (R1-R3) shows the difference in returns between Row 1 and Row 3 for given column. This is done to show whether sorting on a given fundamental signal (e.g., CFROIC) improves the results for the SY/TSY strategy. For example, the top left table in Exhibit 8 shows results for SY and CFROIC. In this table, R1-R3 shows the returns of stocks with the highest SY and the *highest* CFROIC **MINUS** the returns of stocks with the highest SY and the *lowest* CFROIC.

All R1-R3 rows for both 3YChgFCF and CFROIC are significant at the 1% level, indicating these two cash flow related signals help to identify stocks in highest (lowest) yield tertile that are most likely to outperform (underperform).

One-year change in total payout per share doesn't work as effectively as both 3YChgFCF and CFROIC. Although it seems logical that companies with high cash payout rates (dividends, buybacks and debt reduction) that have also increased their payout rate over the past year should outperform SY or TSY alone, empirical results over our testing period indicate this is not the case. One reason for this poor performance may be that the increase in the payout rate is seen as a signal that a company's growth and investment opportunities have declined, an unfavorable outcome for investors.

Exhibit 9 – Hit Rate Associated with Active Return for Independent Sort Based on Yield and Fundamental Signals: Russell 3000 (Jan. 1990 - Mar. 2019)

SY and CFROIC

Shareholder Yield

CFROIC	high SY	med SY	low SY	high-low (SY)
high	64%***	62%***	61%***	**52%**
med	63%***	58%***	50%	**56%****
low	46%*	34%***	33%***	**65%*****
R1-R3	**62%*****	**70%*****	**67%*****	**68%*****

TSY and CFROIC

Total Shareholder Yield

CFROIC	high TSY	med TSY	low TSY	high-low (TSY)
high	69%***	60%***	56%**	**56%****
med	64%***	59%***	55%*	**57%****
low	39%***	39%***	31%***	**60%*****
R1-R3	**64%*****	**63%*****	**70%*****	**70%*****

SY and 3YChgFCF

Shareholder Yield

3YChgFCF	high SY	med SY	low SY	high-low (SY)
high	63%***	63%***	54%	**55%***
med	62%***	54%*	51%	**54%**
low	50%	36%***	32%***	**63%*****
R1-R3	**62%*****	**68%*****	**70%*****	**70%*****

TSY and 3YChgFCF

Total Shareholder Yield

3YChgFCF	high TSY	med TSY	low TSY	high-low (TSY)
high	66%***	61%***	55%*	**58%*****
med	62%***	54%	52%	**58%*****
low	50%	41%***	31%***	**65%*****
R1-R3	**58%*****	**64%*****	**70%*****	**70%*****

SY and 1YChgPayout

Shareholder Yield

1YChgPayout	high SY	med SY	low SY	high-low (SY)
high	63%***	49%	44%**	**59%*****
med	62%***	52%	53%	**54%**
low	59%***	51%	41%***	**58%*****
R1-R3	**52%**	**48%**	**51%**	**62%*****

TSY and 1YChgPayout

Total Shareholder Yield

1YChgPayout	high TSY	med TSY	low TSY	high-low (TSY)
high	65%***	52%	41%***	**63%*****
med	59%***	54%	45%**	**61%*****
low	57%***	48%	39%***	**62%*****
R1-R3	**48%**	**51%**	**54%**	**64%*****

*** 1% level of significance; ** 5% level of significance; * 10% level of significance

Source: S&P Global Market Intelligence Quantamental Research. All returns and indices are unmanaged, statistical composites and their returns do not include payment of any sales charges or fees an investor would pay to purchase the securities they represent. Such costs would lower performance. It is not possible to invest directly in an index. Past performance is not a guarantee of future results. Data as of 05/01/2019.

3. Empirical Results – International

3.1 Performance of Individual Yield-Oriented Strategy

Global bond yields have been declining in the past two decades and were recently near multiyear lows[8]. With dividend yields on international stocks higher than those of US stocks, international dividend investing has drawn increasing interest, particularly since international stocks can produce portfolio diversification.

Share repurchases have become increasingly popular internationally. A number of research studies[9] have shown that share repurchases are associated with significant positive short-term and long-term excess returns. In this section, we examine how yield-oriented strategies perform in developed Europe, developed Asia (excluding Japan), Japan and the Emerging Markets, using the broad market indices (BMIs).

[8] https://www.wsj.com/articles/global-bond-yields-hit-multiyear-lows-11559068245
[9] E.g., Ikenberry et al. (1995), Peyer and Vermaelen (2009), Dittmar and Field (2015), and Manconi et al. (2018).

We show both international and US results in the same table (Exhibit 10) for comparison purposes. The strongest strategy for each region is highlighted in orange. **Dividend yield was most effective in Japan**, with an annualized long-only and long-short active return of 3.51% and 7.21% respectively. Although Japanese entities are, in aggregate, among the lowest dividend paying companies in the world[10], the 'zero' interest rate in Japan over the past 20 years makes dividend paying companies attractive to Japanese investors. Our February 2019 paper (International Small Cap Investing) also documented that dividend yield is the best performing factor in the BMI Japan small cap universe.

Exhibit 10 – Performance Summary for Yield Strategies
Russell 3000, BMI Dev Europe, BMI Dev Asia ex-JP, BMI JP and BMI EM (Start Date - Mar. 2019)

Region / Country	Factor/Signal	Start Date	Avg Count	Annualized Long-Only Act. Return	Annualized Long-Only Info Ratio	Long-Only Active Hit Rate	Annualized Q1/Q5 Act. Return	Average 1-Month IC
U.S	Dividend Yield ('DY')	Jan-90	290	1.58%**	0.46	57%**	3.65%***	0.015***
	Buyback Yield ('BY')	Jan-90	586	3.04%***	1.27	66%***	8.47%***	0.019***
	Shareholder Yield ('SY')	Jan-90	574	3.05%***	1.00	61%***	8.29%***	0.021***
	Total Shareholder Yield ('TSY')	Jan-90	574	3.36%***	1.16	65%***	9.62%***	0.021***
BMI Dev Europe	Dividend Yield ('DY')	Jan-95	252	0.81%	0.30	52%	2.58%***	0.010***
	Buyback Yield ('BY')	Jan-95	237	2.25%***	1.00	64%***	7.01%***	0.022***
	Shareholder Yield ('SY')	Jan-95	292	2.32%***	0.99	61%***	6.95%***	0.025***
	Total Shareholder Yield ('TSY')	Jan-95	295	2.17%***	0.96	59%***	5.55%***	0.019***
BMI Dev Asia ex JP	Dividend Yield ('DY')	Jan-98	134	1.04%	0.20	51%	4.26%**	0.027***
	Buyback Yield ('BY')	Jan-98	130	1.92%**	0.48	62%***	9.33%***	0.029***
	Shareholder Yield ('SY')	Jan-98	166	4.81%***	1.08	64%***	12.32%***	0.044***
	Total Shareholder Yield ('TSY')	Jan-98	170	3.38%***	0.84	55%*	9.18%***	0.028***
BMI Japan	Dividend Yield ('DY')	Jan-00	249	3.51%***	1.29	65%***	7.21%***	0.027***
	Buyback Yield ('BY')	Jan-00	200	1.34%**	0.49	58%**	2.36%**	0.011***
	Shareholder Yield ('SY')	Jan-00	261	3.07%***	1.09	65%***	6.31%***	0.026***
	Total Shareholder Yield ('TSY')	Jan-00	264	2.76%***	0.84	59%***	3.91%***	0.013***
BMI EM	Dividend Yield ('DY')	Jan-00	306	3.16%***	0.88	59%***	7.90%***	0.027***
	Buyback Yield ('BY')	Jan-00	216	2.79%**	0.59	57%**	10.92%***	0.027***
	Shareholder Yield ('SY')	Jan-00	349	5.30%***	1.42	67%***	12.61%***	0.036***
	Total Shareholder Yield ('TSY')	Jan-00	362	3.04%***	1.10	64%***	7.33%***	0.022***

*** 1% level of significance; ** 5% level of significance; * 10% level of significance

Source: S&P Global Market Intelligence Quantamental Research. All returns and indices are unmanaged, statistical composites and their returns do not include payment of any sales charges or fees an investor would pay to purchase the securities they represent. Such costs would lower performance. It is not possible to invest directly in an index. Past performance is not a guarantee of future results. Data as of 05/01/2019.

In Europe, buybacks are a more effective strategy than dividend yield, similar to results in the US. The introduction of "safe harbor" provisions and the tax advantage of share repurchases over dividends in Europe have made this an attractive option of returning cash to shareholders in the region. **In both developed Asia ex Japan and the emerging markets, shareholder yield is the most effective strategy**, generating annualized long-only and long-short active returns from 4.8% to 12.3% (BMI Asia ex-JP) and 5.3% to 12.6% (BMI EM), respectively, all significant at the 1% level. In both regions, companies that issue new shares underperform significantly given the returns of the short side of the buyback yield strategy.

[10] http://www.salientpartners.com/wp-content/uploads/salient-the-dividend-signal-white-paper.pdf

Also note that there is a large difference between SY and TSY in emerging markets from both long-only and long-short perspectives, which seems counter to what we observed in the US. Both the long-only and long-short return difference between SY and TSY in emerging markets are statistically significant. This might be explained by the difference in economic environments between developed and emerging markets. Most companies in emerging regions are growth oriented; therefore, capital is needed to fund growth and low-interest debt provides such funding without diluting shareholders (as does share issuance).

3.2 Improving Yield-Oriented Strategies by Overlaying Fundamental Signals

In Section 2.5, we documented that both 3-year change in free cash flow and cash flow return on invested capital helped improve the efficacy of US yield-oriented strategies. We test whether the same hypotheses hold outside the US. We use the same methodologies (3X3 independent sort and regression analysis) to conduct the analysis. Summary results are displayed in Exhibit 11. To aid comparison across regions, we also include the US results in the table.

How to Interpret the Table: Exhibit 11 shows results for the return difference between Row 1 and Row 3 for each column of the 3 X 3 independent sort matrices (see Exhibit 8). For example, the column labeled 'HIGH SY' & 'high minus low FS Rtrn' in Exhibit 11 represents the return for stocks most attractive on SY AND *most attractive* on the fundamental signal (FS) **MINUS** the returns for stocks most attractive on SY AND *least attractive* on FS.

Exhibit 11 – Summary of Active Returns for Independent Sort Based on Yield and Fundamental Signals (FS):
Russell 3000, BMI Dev Europe, BMI Dev Asia ex-JP, BMI JP and BMI EM (Start Date - Mar. 2019)

		HIGH SY	MED SY	LOW SY
		high minus low FS Rtrn	high minus low FS Rtrn	high minus low FS Rtrn
BMI Europe	SY X CFROIC	5.46%***	4.14%***	6.61%***
	SY X 3YChgFCF	4.18%***	4.27%***	6.15%***
	SY X 1YChgPayout	-0.63%	0.43%	0.39%
BMI Asia ex JP	SY X CFROIC	6.74%***	8.48%***	11.36%***
	SY X 3YChgFCF	2.49%	5.03%***	6.28%***
	SY X 1YChgPayout	-1.13%	1.10%	2.83%
BMI Japan	SY X CFROIC	2.73%***	4.77%***	6.88%***
	SY X 3YChgFCF	1.27%	1.84%*	3.04%**
	SY X 1YChgPayout	0.30%	0.43%	2.39%**
BMI EM	SY X CFROIC	5.58%***	6.92%***	11.04%***
	SY X 3YChgFCF	3.95%***	5.14%***	6.75%***
	SY X 1YChgPayout	-0.10%	-0.14%	-0.99%
U.S.	SY X CFROIC	6.56%***	7.84%***	11.30%***
	SY X 3YChgFCF	3.54%***	5.99%***	9.36%***
	SY X 1YChgPayout	-0.41%	0.03%	-0.11%

*** 1% level of significance; ** 5% level of significance; * 10% level of significance

Source: S&P Global Market Intelligence Quantamental Research. All returns and indices are unmanaged, statistical composites and their returns do not include payment of any sales charges or fees an investor would pay to purchase the securities they represent. Such costs would lower performance. It is not possible to invest directly in an index. Past performance is not a guarantee of future results. Data as of 05/01/2019.

Statistically significant return differences in Exhibit 11 are highlighted in orange. Similar to what we observed in the US, **both 3-year change in free cash flow and cash flow return on invested capital (CFROIC) help to improve the efficacy of yield-oriented strategies.** Also similar to the US, the 1-year change in payout ratio does not improve strategy results in most regions. In particular note that both cash flow growth and CFROIC strongly improve results of the shareholder yield strategy in developed Asia ex-Japan (long-short results of 18.03% and 14.86%, respectively) and in the emerging markets (17.78% and 15.22%) (Appendix E). CFROIC seems more effective across regions.

Detailed results for each 3x3 matrix are available in Appendix E.

4. Data, Universe, Methodology and Terminology

4.1 Data

S&P Global Market Intelligence Capital IQ Premium Financials and Compustat North America packages were the sources of fundamental data for this study. Both are point-in-time databases, eliminating the potential for look-ahead bias in our backtests.

4.2 Universe

We use the following universes for signal construction and testing:

- Russell 3000 (R 3000)
- Russell 3000 Value (R 3000 VL)
- Russell 3000 Growth (R 3000 GW)
- S&P BMI Developed Markets Europe (BMI DM Euro)
- S&P BMI Developed Markets Asia Pacific, excluding Japan (BMI DM Asia ex-JP)
- S&P BMI Japan (BMI JP)
- S&P BMI Emerging Market (BMI EM SM)

The data start date for testing the U.S. is January 1990; 1995 for developed Europe; 1998 for developed Asia ex Japan; and January 2000 for both Japan and the emerging markets. The testing ends March 2019 for all regions/countries.

4.3 Methodology

Strategy Ranking and Returns:

Backtests are rebalanced monthly, and all returns include dividends and cash distributions ("total returns"). All returns presented in this paper are equal-weighted averages, calculated as the difference between individual stock total returns and the relevant benchmark total return, with additional Fama-French 4-factor adjustment. The forward excess returns are in USD and are winsorized at three standard deviations. All strategies are ranked relative to their economic sectors (GICS level I).

Change in Interest Rate Regime:
The changing interest rate regime is defined based on the following methodology:
We compute the mean, standard deviation and z-score of monthly federal funds rate using 12-month rolling window. If the monthly interest rate is one standard deviation above the mean of past 12 months, then we define this month as rising rate month. If the monthly interest rate is one standard deviation below the mean of past 12 months, then we define this month as falling rate month. The months with interest rate within one standard deviation of the mean are then defined as normal regime.

4.4 Terminology

Hit rates, defined as the percentage of times that monthly portfolio excess returns are positive, measure the consistency of a strategy in producing excess returns over time. *Information ratio,* the ratio of average excess returns to the standard deviation of excess returns, provides another measure of strategy consistency/volatility.

5. Conclusion

Corporate payout policy contains important information about company's potential performance and investment returns. In this paper, we examine the relationship between each yield-oriented strategy (DY, BY, SY and TSY) and subsequent shareholder returns around the world. Our comparative analysis shows that the effectiveness of yield strategies varies across regions - strategies built on total corporate payout metrics (shareholder yield or total shareholder yield) outperform dividend yield across most global markets, except in Japan (where dividend yield dominates). Our regime analysis shows that the outperformance of yield strategies during falling (vs. rising) rate regime is not statistically significant. In addition, we find that shareholder-yield oriented strategies have historically performed better across regions when combined with cash flow growth and capital efficiency strategies, a result that seems intuitive since high levels of shareholder payouts can continue only when supported by strong cash generation.

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APPENDIX A: Yield-Oriented Strategy Comparison

Return Difference between Yield Strategies: Russell 3000 (Jan. 1990 - Mar. 2019)

Strategy	Annualized Long-Only Active Return	Annualized Long-Short Active Return
Buyback Yield - Dividend Yield	1.38%*	4.60%***
Total Shareholder Yield - Shareholder Yield	0.32%	1.24%*
Total Shareholder Yield - Buyback Yield	0.35%	1.11%
Total Shareholder Yield - Dividend Yield	1.74%***	5.75%***

*** 1% level of significance; ** 5% level of significance; * 10% level of significance

Source: S&P Global Market Intelligence Quantamental Research. All returns and indices are unmanaged, statistical composites and their returns do not include payment of any sales charges or fees an investor would pay to purchase the securities they represent. Such costs would lower performance. It is not possible to invest directly in an index. Past performance is not a guarantee of future results. Data as of 05/01/2019.

APPENDIX B: Definition of Fundamental Metrics

Factor	Definition
Market Cap	Company's market capitalization. It's calcualted by month-end number of shares outstanding multipled by month-end price per share.
Beta	It is the sensitivity of a stock's return to the return on the market. It is measured as the slope coefficient of a regression of the stock's monthly rate of return on the market index (S&P500) return. The regression is based on the past 60 monthly observations.
ROE	The ratio of trailing four quarter income before extraordinary items available for common equity to average book value of common equity over the same period.
Interest Coverage Ratio	The ratio of operating income after depreciation to interest and related expense. It's often used to evaluate corporate financial stress.
Leverage (LTDE)	The ratio of long term debt to total shareholders' equity. It's an indicator of a company's financial leverage.
Earnings to Price	The ratio of trailing four-quarter earnings per share to current stock price.

APPENDIX C: Performance Comparison for Yield-Oriented Strategies in Value and Growth Universe

Performance Summary for Yield Strategies in Value and Growth Universe
Russell 3000 Value and Russell 3000 Growth (Jan. 1990 - Mar. 2019)

Factor/Signal	Annualized Long-Only Active Return	Annualized long-Short Active Return
Dividend Yield (GW - VL)	1.55%**	3.43%**
Buyback Yield (GW - VL)	0.99%*	3.03%***
Div&Buyback Yield (GW - VL)	1.60%***	4.52%***
Div&Buyback&NDR Yield (GW - VL)	2.28%***	4.04%***

*** 1% level of significance; ** 5% level of significance; * 10% level of significance

Source: S&P Global Market Intelligence Quantamental Research. All returns and indices are unmanaged, statistical composites and their returns do not include payment of any sales charges or fees an investor would pay to purchase the securities they represent. Such costs would lower performance. It is not possible to invest directly in an index. Past performance is not a guarantee of future results. Data as of 05/01/2019.

APPENDIX D: Definition of Fundamental Factors

Factor	Definition
AstAdj3YChgFCF	This factor is the 3 Year change in Free Cash Flow divided by the 3 Year Average Total Assets for the firm.
CFROIC	The factor measures a ratio of trailing four quarter operating net cash flow to average invested capital over the same period.
1YChgPayout	This is defined as one year change in a ratio of total payout (dividend + net share repurchases + net debt reduction) to total shares outstanding

APPENDIX E: Active Return, Associated Hit Rate and Average Number of Stocks for Independent Sort Based on Yield and Fundamental Signals

Active Return of Independent Sort: BMI Europe (Jan. 1995 – Mar. 2019)

Shareholder Yield

	high SY	med SY	low SY	high-low (SY)
CFROIC high	4.26%***	2.74%***	-0.39%	**4.67%*** **
CFROIC med	2.43%***	0.48%	-0.86%	**3.32%*** **
CFROIC low	-1.14%*	-1.35%**	-6.60%***	**5.81%*** **
R1-R3	**5.46%*** **	**4.14%*** **	**6.61%*** **	**11.56%*** **

Total Shareholder Yield

	high TSY	med TSY	low TSY	high-low (TSY)
CFROIC high	4.61%***	1.71%***	0.42%	**4.18%*** **
CFROIC med	3.06%***	0.07%	-0.89%	**3.98%*** **
CFROIC low	-1.73%***	-2.95%***	-5.08%***	**3.51%*** **
R1-R3	**6.44%*** **	**4.78%*** **	**5.76%*** **	**10.16%*** **

Shareholder Yield

	high SY	med SY	low SY	high-low (SY)
3YChgFCF high	4.26%***	2.54%***	-0.72%	**5.01%*** **
3YChgFCF med	2.51%***	0.96%**	-1.83%***	**4.41%*** **
3YChgFCF low	0.08%	-1.67%***	-6.51%***	**7.01%*** **
R1-R3	**4.18%*** **	**4.27%*** **	**6.15%*** **	**11.45%*** **

Total Shareholder Yield

	high TSY	med TSY	low TSY	high-low (TSY)
3YChgFCF high	3.59%***	1.37%***	0.32%	**3.26%*** **
3YChgFCF med	2.89%***	0.34%	-1.41%**	**4.36%*** **
3YChgFCF low	0.05%	-2.28%***	-4.79%***	**5.07%*** **
R1-R3	**3.54%*** **	**3.73%*** **	**5.35%*** **	**8.77%*** **

Shareholder Yield

	high SY	med SY	low SY	high-low (SY)
1YChgPayout high	2.64%***	0.70%	-4.13%***	**7.03%*** **
1YChgPayout med	2.65%***	1.86%***	-0.97%	**3.65%*** **
1YChgPayout low	0.73%	-0.44%	-3.59%***	**4.47%*** **
R1-R3	**1.90%** **	**1.14%**	**-0.56%**	**6.44%*** **

Total Shareholder Yield

	high TSY	med TSY	low TSY	high-low (TSY)
1YChgPayout high	1.51%***	-0.70%	-3.65%***	**5.34%*** **
1YChgPayout med	4.32%***	0.55%	-1.97%**	**6.41%*** **
1YChgPayout low	0.80%	-0.79%	-2.06%***	**2.92%*** **
R1-R3	**0.70%**	**0.09%**	**-1.62%***	**3.64%*** **

Hit Rate for Active Return of Independent Sort: BMI Europe (Jan. 1995 – Mar. 2019)

Shareholder Yield

	high SY	med SY	low SY	high-low (SY)
CFROIC high	69%***	68%***	50%	**64%*** **
CFROIC med	62%***	55%*	48%	**63%*** **
CFROIC low	42%***	46%	25%***	**65%*** **
R1-R3	**66%*** **	**65%*** **	**68%*** **	**79%*** **

Total Shareholder Yield

	high TSY	med TSY	low TSY	high-low (TSY)
CFROIC high	70%***	59%***	54%	**57%** **
CFROIC med	64%***	49%	49%	**59%*** **
CFROIC low	45%*	36%***	25%***	**59%*** **
R1-R3	**69%*** **	**67%*** **	**65%*** **	**76%*** **

Shareholder Yield

	high SY	med SY	low SY	high-low (SY)
3YChgFCF high	67%***	65%***	48%	**64%*** **
3YChgFCF med	59%***	57%**	41%***	**61%*** **
3YChgFCF low	55%*	43%**	24%***	**68%*** **
R1-R3	**62%*** **	**63%*** **	**64%*** **	**76%*** **

Total Shareholder Yield

	high TSY	med TSY	low TSY	high-low (TSY)
3YChgFCF high	67%***	57%**	52%	**62%*** **
3YChgFCF med	65%***	53%	45%	**61%*** **
3YChgFCF low	50%	41%***	28%***	**65%*** **
R1-R3	**60%*** **	**60%*** **	**64%*** **	**73%*** **

Shareholder Yield

	high SY	med SY	low SY	high-low (SY)
1YChgPayout high	65%***	48%	45%	**58%*** **
1YChgPayout med	62%***	51%	54%	**55%* **
1YChgPayout low	60%***	49%	42%***	**57%** **
R1-R3	**54%**	**49%**	**51%**	**61%*** **

Total Shareholder Yield

	high TSY	med TSY	low TSY	high-low (TSY)
1YChgPayout high	56%*	48%	36%***	**68%*** **
1YChgPayout med	65%***	54%	42%***	**64%*** **
1YChgPayout low	54%	48%	40%***	**57%** **
R1-R3	**54%**	**49%**	**48%**	**62%*** **

Active Return of Independent Sort: BMI Asia ex-JP (Jan. 1998 – Mar. 2019)

Shareholder Yield

	high SY	med SY	low SY	high-low (SY)
high	7.04%***	4.99%***	0.94%	**6.04%*** **
med	3.45%***	0.29%	-2.33%*	**5.91%*** **
low	0.28%	-3.24%***	-9.44%***	**10.64%*** **
R1-R3	**6.74%*** **	**8.48%*** **	**11.36%*** **	**18.03%*** **

CFROIC

Total Shareholder Yield

	high TSY	med TSY	low TSY	high-low (TSY)
high	6.54%***	4.76%***	-0.57%	**7.15%*** **
med	3.18%***	1.21%	-2.81%**	**6.15%*** **
low	-1.99%	-4.69%***	-7.08%***	**5.45%*** **
R1-R3	**8.69%*** **	**9.87%*** **	**6.96%*** **	**14.57%*** **

CFROIC

Shareholder Yield

	high SY	med SY	low SY	high-low (SY)
high	5.05%***	3.00%***	-2.85%*	**8.11%*** **
med	3.83%***	1.10%	-2.48%**	**6.46%*** **
low	2.50%*	-1.94%*	-8.64%***	**12.09%*** **
R1-R3	**2.49%**	**5.03%*** **	**6.28%*** **	**14.86%*** **

3YChgFCF

Total Shareholder Yield

	high TSY	med TSY	low TSY	high-low (TSY)
high	4.10%***	2.24%**	-4.35%***	**8.80%*** **
med	3.46%***	1.98%**	-2.40%**	**6.00%*** **
low	1.44%	-1.40%	-5.95%***	**7.82%*** **
R1-R3	**2.62%**	**3.70%** **	**1.70%**	**10.63%*** **

3YChgFCF

Shareholder Yield

	high SY	med SY	low SY	high-low (SY)
high	3.27%***	1.07%	-3.67%**	**7.18%*** **
med	4.73%***	1.74%	-3.46%*	**8.47%*** **
low	4.44%***	-0.03%	-6.34%***	**11.44%*** **
R1-R3	**-1.13%**	**1.10%**	**2.83%**	**10.20%*** **

1YChgPayout

Total Shareholder Yield

	high TSY	med TSY	low TSY	high-low (TSY)
high	2.63%***	0.23%	-5.05%**	**8.05%*** **
med	3.97%***	1.69%	-5.32%**	**9.77%*** **
low	5.09%***	0.25%	-4.25%***	**9.72%*** **
R1-R3	**-2.35%**	**-0.02%**	**-0.83%**	**7.16%*** **

1YChgPayout

Hit Rate for Active Return of Independent Sort: BMI Asia ex-JP (Jan. 1998 – Mar. 2019)

Shareholder Yield

	high SY	med SY	low SY	high-low (SY)
high	67%***	63%***	49%	**61%*** **
med	64%***	51%	47%	**60%*** **
low	53%	40%***	30%***	**66%*** **
R1-R3	**60%*** **	**67%*** **	**67%*** **	**71%*** **

CFROIC

Total Shareholder Yield

	high TSY	med TSY	low TSY	high-low (TSY)
high	67%***	65%***	47%	**62%*** **
med	64%***	53%	45%	**64%*** **
low	48%	42%**	32%***	**56%* **
R1-R3	**65%*** **	**65%*** **	**61%*** **	**71%*** **

CFROIC

Shareholder Yield

	high SY	med SY	low SY	high-low (SY)
high	62%***	56%*	40%***	**59%*** **
med	62%***	53%	44%*	**62%*** **
low	59%***	44%*	34%***	**69%*** **
R1-R3	**56%* **	**62%*** **	**62%*** **	**70%*** **

3YChgFCF

Total Shareholder Yield

	high TSY	med TSY	low TSY	high-low (TSY)
high	59%***	60%***	41%***	**61%*** **
med	63%***	56%*	43%**	**63%*** **
low	56%**	49%	32%***	**65%*** **
R1-R3	**50%**	**57%** **	**51%**	**66%*** **

3YChgFCF

Shareholder Yield

	high SY	med SY	low SY	high-low (SY)
high	63%***	53%	42%**	**66%*** **
med	58%***	50%	42%**	**63%*** **
low	60%***	53%	38%***	**69%*** **
R1-R3	**51%**	**52%**	**51%**	**67%*** **

1YChgPayout

Total Shareholder Yield

	high TSY	med TSY	low TSY	high-low (TSY)
high	60%***	49%	38%***	**68%*** **
med	55%*	53%	42%**	**62%*** **
low	59%***	56%**	40%***	**68%*** **
R1-R3	**45%**	**48%**	**51%**	**67%*** **

1YChgPayout

Active Return of Independent Sort: BMI JP (Jan. 2000 – Mar. 2019)

Shareholder Yield

		high SY	med SY	low SY	high-low (SY)
CFROIC	high	3.94%***	2.76%***	0.19%	**3.74%*** **
	med	3.39%***	1.58%**	-2.10%***	**5.60%*** **
	low	1.18%*	-1.92%***	-6.29%***	**7.92%*** **
	R1-R3	**2.73%*** **	**4.77%*** **	**6.88%*** **	**10.85%*** **

Total Shareholder Yield

		high TSY	med TSY	low TSY	high-low (TSY)
CFROIC	high	3.55%***	1.73%***	0.28%	**3.27%** **
	med	2.19%***	0.56%	0.72%	**1.46%**
	low	-0.46%	-1.65%**	-3.27%***	**2.90%*** **
	R1-R3	**4.03%*** **	**3.43%*** **	**3.66%*** **	**7.03%*** **

Shareholder Yield

		high SY	med SY	low SY	high-low (SY)
3YChgFCF	high	3.69%***	2.04%***	-0.62%	**4.33%*** **
	med	2.89%***	1.15%*	-2.36%***	**5.37%*** **
	low	2.39%***	0.20%	-3.56%***	**6.15%*** **
	R1-R3	**1.27%**	**1.84%* **	**3.04%** **	**7.49%*** **

Total Shareholder Yield

		high TSY	med TSY	low TSY	high-low (TSY)
3YChgFCF	high	3.03%***	0.88%	-0.57%	**3.62%*** **
	med	1.89%***	0.17%	-0.27%	**2.17%** **
	low	1.24%*	0.41%	-0.77%	**2.03%* **
	R1-R3	**1.77%* **	**0.47%**	**0.20%**	**3.83%*** **

Shareholder Yield

		high SY	med SY	low SY	high-low (SY)
1YChgPayout	high	2.28%***	0.64%	-1.92%*	**4.27%*** **
	med	5.19%***	1.79%**	-0.50%	**5.71%*** **
	low	1.97%**	0.21%	-4.21%***	**6.44%*** **
	R1-R3	**0.30%**	**0.43%**	**2.39%** **	**6.75%*** **

Total Shareholder Yield

		high TSY	med TSY	low TSY	high-low (TSY)
1YChgPayout	high	1.79%***	-1.00%	-2.48%**	**4.36%*** **
	med	4.48%***	1.39%**	1.10%	**3.35%** **
	low	2.44%**	-0.86%	-1.61%***	**4.11%*** **
	R1-R3	**-0.64%**	**-0.14%**	**-0.88%**	**3.45%*** **

Hit Rate for Active Return of Independent Sort: BMI JP (Jan. 2000 – Mar. 2019)

Shareholder Yield

		high SY	med SY	low SY	high-low (SY)
CFROIC	high	61%***	60%***	56%*	**54%**
	med	62%***	58%**	39%***	**66%*** **
	low	53%	42%**	35%***	**64%*** **
	R1-R3	**58%** **	**63%*** **	**64%*** **	**67%*** **

Total Shareholder Yield

		high TSY	med TSY	low TSY	high-low (TSY)
CFROIC	high	61%***	61%***	51%	**57%** **
	med	56%*	51%	52%	**58%** **
	low	48%	45%	38%***	**55%**
	R1-R3	**61%*** **	**59%*** **	**59%*** **	**66%*** **

Shareholder Yield

		high SY	med SY	low SY	high-low (SY)
3YChgFCF	high	61%***	58%**	47%	**59%*** **
	med	61%***	52%	40%***	**61%*** **
	low	60%***	48%	34%***	**66%*** **
	R1-R3	**55%**	**52%**	**59%*** **	**65%*** **

Total Shareholder Yield

		high TSY	med TSY	low TSY	high-low (TSY)
3YChgFCF	high	65%***	55%	46%	**58%** **
	med	54%	49%	46%	**57%** **
	low	54%	49%	45%	**62%*** **
	R1-R3	**55%**	**55%**	**52%**	**61%*** **

Shareholder Yield

		high SY	med SY	low SY	high-low (SY)
1YChgPayout	high	57%**	52%	44%*	**62%*** **
	med	66%***	55%	49%	**60%*** **
	low	55%	51%	35%***	**65%*** **
	R1-R3	**51%**	**49%**	**56%* **	**65%*** **

Total Shareholder Yield

		high TSY	med TSY	low TSY	high-low (TSY)
1YChgPayout	high	58%**	45%	43%**	**59%*** **
	med	62%***	59%***	49%	**58%** **
	low	55%	46%	42%**	**60%*** **
	R1-R3	**48%**	**49%**	**49%**	**60%*** **

Active Return of Independent Sort: BMI EM (Jan. 2000 – Mar. 2019)

Shareholder Yield

		high SY	med SY	low SY	high-low (SY)
CFROIC	high	7.70%***	4.22%***	1.49%	**6.13%*** **
	med	4.26%***	-0.44%	-2.64%***	**7.07%*** **
	low	2.02%**	-2.54%**	-8.68%***	**11.62%*** **
	R1-R3	**5.58%*** **	**6.92%*** **	**11.04%*** **	**17.78%*** **

Total Shareholder Yield

		high TSY	med TSY	low TSY	high-low (TSY)
CFROIC	high	6.11%***	4.01%***	2.97%***	**3.06%** **
	med	2.34%***	-0.07%	-1.47%*	**3.86%*** **
	low	-1.63%*	-4.59%***	-5.31%***	**3.86%*** **
	R1-R3	**7.86%*** **	**8.98%*** **	**8.70%*** **	**12.00%*** **

Shareholder Yield

		high SY	med SY	low SY	high-low (SY)
3YChgFCF	high	6.77%***	3.17%***	-1.13%	**7.98%*** **
	med	6.11%***	-0.02%	-3.89%***	**10.37%*** **
	low	2.71%***	-1.89%*	-7.43%***	**10.88%*** **
	R1-R3	**3.95%*** **	**5.14%*** **	**6.75%*** **	**15.22%*** **

Total Shareholder Yield

		high TSY	med TSY	low TSY	high-low (TSY)
3YChgFCF	high	4.02%***	2.40%***	-0.04%	**4.06%*** **
	med	3.14%***	0.16%	-1.70%**	**4.91%*** **
	low	0.73%	-2.59%**	-4.02%***	**4.93%*** **
	R1-R3	**3.27%*** **	**5.12%*** **	**4.13%*** **	**8.35%*** **

Shareholder Yield

		high SY	med SY	low SY	high-low (SY)
1YChgPayout	high	4.46%***	-0.04%	-5.49%***	**10.48%*** **
	med	5.80%***	1.01%	-2.16%*	**8.12%*** **
	low	4.57%***	0.11%	-4.55%***	**9.51%*** **
	R1-R3	**-0.10%**	**-0.14%**	**-0.99%**	**9.40%*** **

Total Shareholder Yield

		high TSY	med TSY	low TSY	high-low (TSY)
1YChgPayout	high	1.40%**	0.02%	-6.04%***	**7.88%*** **
	med	4.47%***	0.16%	-0.67%	**5.17%*** **
	low	3.60%***	0.42%	-2.52%***	**6.27%*** **
	R1-R3	**-2.13%**	**-0.40%**	**-3.61%*** **	**4.02%*** **

Hit Rate for Active Return of Independent Sort: BMI EM (Jan. 2000 – Mar. 2019)

Shareholder Yield

		high SY	med SY	low SY	high-low (SY)
CFROIC	high	71%***	65%***	56%*	**62%*** **
	med	64%***	50%	39%***	**61%*** **
	low	52%	40%***	25%***	**68%*** **
	R1-R3	**63%*** **	**64%*** **	**74%*** **	**81%*** **

Total Shareholder Yield

		high TSY	med TSY	low TSY	high-low (TSY)
CFROIC	high	67%***	67%***	56%*	**58%** **
	med	59%***	52%	46%	**63%*** **
	low	43%**	37%***	33%***	**62%*** **
	R1-R3	**67%*** **	**68%*** **	**64%*** **	**75%*** **

Shareholder Yield

		high SY	med SY	low SY	high-low (SY)
3YChgFCF	high	65%***	64%***	49%	**63%*** **
	med	67%***	51%	38%***	**70%*** **
	low	56%*	43%**	28%***	**68%*** **
	R1-R3	**61%*** **	**62%*** **	**63%*** **	**74%*** **

Total Shareholder Yield

		high TSY	med TSY	low TSY	high-low (TSY)
3YChgFCF	high	68%***	62%***	49%	**60%*** **
	med	60%***	53%	47%	**61%*** **
	low	51%	38%***	37%***	**61%*** **
	R1-R3	**58%** **	**66%*** **	**59%*** **	**70%*** **

Shareholder Yield

		high SY	med SY	low SY	high-low (SY)
1YChgPayout	high	62%***	55%	38%***	**65%*** **
	med	63%***	49%	46%	**65%*** **
	low	66%***	50%	37%***	**65%*** **
	R1-R3	**52%**	**54%**	**48%**	**64%*** **

Total Shareholder Yield

		high TSY	med TSY	low TSY	high-low (TSY)
1YChgPayout	high	61%***	54%	40%***	**65%*** **
	med	60%***	51%	48%	**62%*** **
	low	57%**	49%	38%***	**61%*** **
	R1-R3	**46%**	**49%**	**42%** **	**61%*** **

*** 1% level of significance; ** 5% level of significance; * 10% level of significance

Source: S&P Global Market Intelligence Quantamental Research. All returns and indices are unmanaged, statistical composites and their returns do not include payment of any sales charges or fees an investor would pay to purchase the securities they represent. Such costs would lower performance. It is not possible to invest directly in an index. Past performance is not a guarantee of future results. Data as of 05/01/2019.

Our Recent Research

June 2019: The Dating Game: Decrypting the Signals in Earnings Report Dates

The first part of this report focuses on companies that deviate from a historical reporting pattern. What does an advancement or delay of an earnings report date typically say about a company's fundamentals, and should investors take notice of this event? The second part of this report examines a related topic – the market's reaction to companies that postpone a previously scheduled (announced) earnings release date.

May 2019: Bridges for Sale: Finding Value in Sell-Side Estimates, Recommendations, and Target Prices

This report looks at the informativeness of analyst recommendation revisions, target price revisions, and estimate dispersion, primarily within the post-2002 regulatory environment, and finds significant results in all three areas:

- Investors should focus on shifts in consensus recommendations, as the recommendation level by itself often reflects pro-management and high-growth biases.
- Target prices, labeled by some practitioners as "fiction" likewise provide insight into changing analyst attitudes. The six-month change in target price gap (the spread between target and market price) produces statistically significant results globally.
- Analyst estimate dispersion acts as an indicator of corporate quality – high quality companies have more stable revenue and income streams that are more amenable to forecasting

February 2019: U.S Stock Selection Model Performance Review

U.S. stock returns faced headwinds due to the uncertainty around monetary and fiscal policies in 2018. At this time last year, we reported 15 months of consecutive positive returns for the S&P 500 (Dec 2016 to Jan 2017) which tied the previous 1959 record for longest winning streak for the index. Shortly thereafter, we saw the streak break when February yielded a return of -3.69%. Four of twelve months (Feb, Mar, Oct, and Dec) in 2018 saw S&P 500 declines, which pushed cumulative index returns down 7.18% on the year. The primary manifestation of this uncertainty was geopolitical events including the mid-term elections, trade tariffs, and a government shutdown that stretched into 2019 to become the longest shutdown in history.

February 2019: International Small Cap Investing: Unlocking Alpha Opportunities in an Underutilized Asset Class

Institutional investors typically overlook or underweight small cap equities in global mandates for a number of reasons, including a higher risk level (relative to large caps), a lack of operational history, liquidity, and information/data gaps which make it challenging to make informed investment decisions. However, investors who are willing to embrace the risk in small cap investing also stand to reap the benefits of allocating to this asset class – potentially earning higher risk-adjusted performance and portfolio diversification. In this report, we examine international small cap performance across various themes and provide actionable insights for both fundamental and quantitative investors, by identifying key drivers of small cap stock performance.

January 2019: Value and Momentum: Everywhere, But Not All the Time

"Momentum" and "Value" strategies have had well-documented return premia in multiple geographies and asset classes. Average monthly returns to momentum are larger than average returns to value, caveated by large pullbacks ("crashes") in the momentum portfolio. Practitioners often include both approaches in their investment strategy.

- Dynamically weighting value and momentum strategies by a function of the trailing volatility in the momentum portfolio produces a superior information ratio (IR), total return, and lower maximum drawdown compared to a naïve equal weighting.
- Results are consistent in six regions (U.S., Europe, Asia Ex-Japan, Japan, Latin America, and Emerging Markets) and in multiple robustness checks. We maintain dollar neutrality and persistent leverage of 1.0 in all specifications.
- Monte Carlo simulation supports the conclusion that the shift of tail density from left- to right-tail drives the performance improvements. That is, large drawdowns are avoided.

November 2018: Forging Stronger Links: Using Supply Chain Data in the Investing Process

Supply chain data can greatly enrich the investment process. Many of the insights gleaned from the supply chain can extend beyond what may be immediately obvious to investors. This report leverages the Panjiva content set, focused on global maritime shipping, to draw out seven major investment use cases. Working examples are provided from previously published research, including links to underlying reports, for each instance.

- Lower latency, higher frequency and finer granularity vs. financial data
- Detection of anomalous activity
- Risk event impact assessment
- Automated channel checks
- Industry deep dives
- Capital markets activities
- Thematic trading candidate identification

September 2018: Their Sentiment Exactly: Sentiment Signal Diversity Creates Alpha Opportunity

Investors sometimes view sentiment signals as interchangeable: one indicator is the same as the next. Our research shows that this is far from the case.

- Companies where management is both positive/optimistic and fact-focused outperform historically.
- Hedge fund sentiment confirms and complements management sentiment.
- Market sentiment surrounding earnings calls amplifies the effectiveness of earnings transcript-based signals.
- Analyst sentiment, as reflected in target price/recommendation changes, adds an important voice to ownership-based signals.

September 2018: Natural Language Processing – Part II: Stock Selection: Alpha Unscripted: The Message within the Message in Earnings Calls

- Sentiment-based signals: Firms whose executives and analysts exhibited the highest positivity in sentiment during earnings calls outperformed their counterparts.
- Behavioral-based signals: Firms whose executives provided the most transparency by using the simplest language and by presenting results with numbers outperformed their respective counterparts.
- Positive language from the unscripted responses by the executives during the Q&A drove the overall predictability of the positive sentiment signal.
- The sentiment of CEOs has historically been more important than the sentiment of other executives.
- The aggregate sentiment of analysts historically enhanced the predictability of the 3-month FY1 EPS analyst revision signal.

July 2018: A Case of 'Wag the Dog'? - ETFs and Stock-Level Liquidity

- We present an ETF price impact model, which posits single-day impact of up to 370 bps / day on an individual security and up to 250 bps / day on the index itself. Analyses indicate the effect is transitory and reverses over a period of 3-5 trading days.
- The Feb 2018 market correction was accompanied by a $25B outflow of assets from ticker SPY, the SSGA S&P 500 Trust ETF. Modeling suggests that as much as one-third of the pullback was due to price pressure from ETF trading and that securities more sensitive to ETF flow underperformed.
- Sensitivity to ETF flow is used to build a risk model, which generates improved performance in a historical optimization. We offer a method for estimating ETF sensitivity for funds, using the S&P Global Ownership dataset.

June 2018: The (Gross Profitability) Trend is Your Friend

Trend strategies based on changes in stock price or earnings are widely used by investors. In this report, we examine the performance of a trend strategy derived from gross profitability ("GP"). Gross profitability trend ("GPtrend"), was proposed by Akbas et al. who argued that the trajectory of a firm's profitability is just as important as the level (GP). We define GPtrend as the year-on-year difference in either quarterly or trailing twelve month GP, where GP is calculated as revenue minus cost of goods sold, divided by total assets. Our back-tests confirm that GPtrend has historically been an effective stock selection signal globally, with the added benefit of low to moderate correlation with commonly used investment strategies.

May 2018: Buying the Dip: Did Your Portfolio Holding Go on Sale?

March 2018: In the Money: What Really Motivates Executive Performance?

February 2018: The Art of the (no) Deal: Identifying the Drivers of Canceled M&A Deals

January 2018: U.S Stock Selection Model Performance Review

September 2017: Natural Language Processing - Part I: Primer

July 2017: Natural Language Processing Literature Survey

June 2017: Research Brief: Four Important Things to Know About Banks in a Rising Rate Environment

April 2017: Banking on Alpha: Uncovering Investing Signals Using SNL Bank Data

March 2017: Capital Market Implications of Spinoffs

January 2017: U.S. Stock Selection Model Performance Review 2016

November 2016: Electrify Stock Returns in U.S. Utilities

October 2016: A League of their Own: Batting for Returns in the REIT Industry - Part 2

September 2016: A League of their Own: Batting for Returns in the REIT Industry - Part 1

August 2016: Mergers & Acquisitions: The Good, the Bad and the Ugly (and how to tell them apart)

July 2016: Preparing for a Slide in Oil Prices -- History May Be Your Guide

June 2016: Social Media and Stock Returns: Is There Value in Cyberspace?

April 2016: An IQ Test for the "Smart Money" – Is the Reputation of Institutional Investors Warranted?

March 2016: Stock-Level Liquidity – Alpha or Risk? - Stocks with Rising Liquidity Outperform Globally

February 2016: U.S. Stock Selection Model Performance Review - The most effective investment strategies in 2015

January 2016: What Does Earnings Guidance Tell Us? – Listen When Management Announces Good News

December 2015: Equity Market Pulse – Quarterly Equity Market Insights Issue 6

November 2015: Late to File - The Costs of Delayed 10-Q and 10-K Company Filings

October 2015: Global Country Allocation Strategies

September 2015: Equity Market Pulse – Quarterly Equity Market Insights Issue 5

September 2015: Research Brief: Building Smart Beta Portfolios

September 2015: Research Brief – Airline Industry Factors

August 2015: Point-In-Time vs. Lagged Fundamentals – This time i(t')s different?

August 2015: Introducing S&P Capital IQ Stock Selection Model for the Japanese Market

July 2015: Research Brief – Liquidity Fragility

June 2015: Equity Market Pulse – Quarterly Equity Market Insights Issue 4

May 2015: Investing in a World with Increasing Investor Activism

April 2015: Drilling for Alpha in the Oil and Gas Industry – Insights from Industry Specific Data & Company Financials

March 2015: Equity Market Pulse – Quarterly Equity Market Insights Issue 3

February 2015: U.S. Stock Selection Model Performance Review - The most effective investment strategies in 2014

January 2015: Research Brief: Global Pension Plans - Are Fully Funded Plans a Relic of the Past?

January 2015: Profitability: Growth-Like Strategy, Value-Like Returns - Profiting from Companies with Large Economic Moats

November 2014: Equity Market Pulse – Quarterly Equity Market Insights Issue 2

October 2014: Lenders Lead, Owners Follow - The Relationship between Credit Indicators and Equity Returns

August 2014: Equity Market Pulse – Quarterly Equity Market Insights Issue 1

July 2014: Factor Insight: Reducing the Downside of a Trend Following Strategy

May 2014: Introducing S&P Capital IQ's Fundamental China A-Share Equity Risk Model

April 2014: Riding the Coattails of Activist Investors Yields Short and Long Term Outperformance

March 2014: Insights from Academic Literature: Corporate Character, Trading Insights, & New Data Sources

February 2014: Obtaining an Edge in Emerging Markets

February 2014: U.S Stock Selection Model Performance Review

January 2014: Buying Outperformance: Do share repurchase announcements lead to higher returns?

October 2013: Informative Insider Trading - The Hidden Profits in Corporate Insider Filings

September 2013: Beggar Thy Neighbor – Research Brief: Exploring Pension Plans

August 2013: Introducing S&P Capital IQ Global Stock Selection Models for Developed Markets: The Foundations of Outperformance
July 2013: Inspirational Papers on Innovative Topics: Asset Allocation, Insider Trading & Event Studies

June 2013: Supply Chain Interactions Part 2: Companies – Connected Company Returns Examined as Event Signals

June 2013: Behind the Asset Growth Anomaly – Over-promising but Under-delivering

April 2013: Complicated Firms Made Easy - Using Industry Pure-Plays to Forecast Conglomerate Returns.

March 2013: Risk Models That Work When You Need Them - Short Term Risk Model Enhancements

March 2013: Follow the Smart Money - Riding the Coattails of Activist Investors

February 2013: Stock Selection Model Performance Review: Assessing the Drivers of Performance in 2012

January 2013: Research Brief: Exploiting the January Effect Examining Variations in Trend Following Strategies

December 2012: Do CEO and CFO Departures Matter? - The Signal Content of CEO and CFO Turnover

November 2012: 11 Industries, 70 Alpha Signals -The Value of Industry-Specific Metrics

October 2012: Introducing S&P Capital IQ's Fundamental Canada Equity Risk Models

September 2012: Factor Insight: Earnings Announcement Return – Is A Return Based Surprise Superior to an Earnings Based Surprise?

August 2012: Supply Chain Interactions Part 1: Industries Profiting from Lead-Lag Industry Relationships

July 2012: Releasing S&P Capital IQ's Regional and Updated Global & US Equity Risk Models

June 2012: Riding Industry Momentum – Enhancing the Residual Reversal Factor

May 2012: The Oil & Gas Industry - Drilling for Alpha Using Global Point-in-Time Industry Data

May 2012: Case Study: S&P Capital IQ – The Platform for Investment Decisions

March 2012: Exploring Alpha from the Securities Lending Market – New Alpha Stemming from Improved Data

January 2012: S&P Capital IQ Stock Selection Model Review – Understanding the Drivers of Performance in 2011

January 2012: Intelligent Estimates – A Superior Model of Earnings Surprise

December 2011: Factor Insight – Residual Reversal

November 2011: Research Brief: Return Correlation and Dispersion – All or Nothing
October 2011: The Banking Industry

September 2011: Methods in Dynamic Weighting

September 2011: Research Brief: Return Correlation and Dispersion

July 2011: Research Brief - A Topical Digest of Investment Strategy Insights

June 2011: A Retail Industry Strategy: Does Industry Specific Data tell a different story?

May 2011: Introducing S&P Capital IQ's Global Fundamental Equity Risk Models

May 2011: Topical Papers That Caught Our Interest

April 2011: Can Dividend Policy Changes Yield Alpha?

April 2011: CQA Spring 2011 Conference Notes

March 2011: How Much Alpha is in Preliminary Data?

February 2011: Industry Insights – Biotechnology: FDA Approval Catalyst Strategy

January 2011: US Stock Selection Models Introduction

January 2011: Variations on Minimum Variance

January 2011: Interesting and Influential Papers We Read in 2010

November 2010: Is your Bank Under Stress? Introducing our Dynamic Bank Model

October 2010: Getting the Most from Point-in-Time Data

October 2010: Another Brick in the Wall: The Historic Failure of Price Momentum

July 2010: Introducing S&P Capital IQ's Fundamental US Equity Risk Model

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