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Quantamental
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Bonding with Style Investing

Value and Momentum in Corporate Bonds

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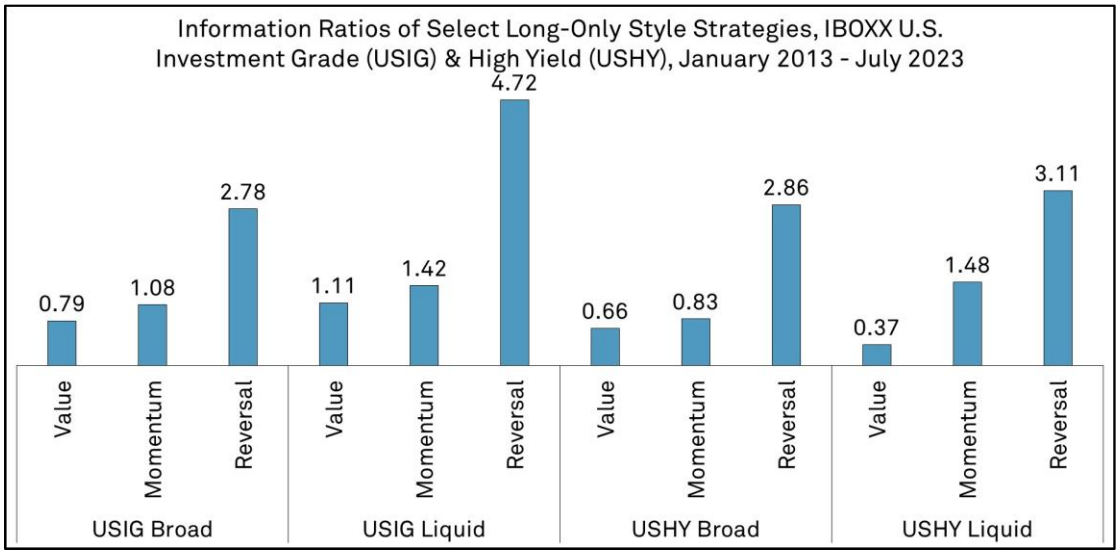
The application of 'smart beta' strategies is expanding into corporate bonds, beyond its equity roots. This paper explores value, momentum, and short-term reversal styles in fixed income, highlighting the potential to enhance returns and diversify portfolios. The analysis shows that value and momentum strategies in iBoxx U.S. investment-grade (USIG) and high-yield (USHY) bonds generated statistically significant alpha, with low correlations to the comparable equity styles and markets premia.



Source: S&P Global Market Intelligence Quantamental Research. Data as of July 2023.

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Key research findings include:

- **Value and Momentum:** Back-test results show long/short USIG (USHY) value and USIG (USHY) momentum styles delivered 2.0% (2.7%) and 1.1% (4.7%) annualized alpha respectively, after controlling for common equity styles and markets risk premia.

- **Momentum and Liquidity:** Momentum performed better in the liquids bond universe relative to the broader bond universe with an annualized 0.4% in the USIG and 0.9% in the USHY.

- **Low Correlations**: Returns to value and momentum styles have historically shown weak correlations with commonly used style factors including equity styles. Correlations range from -0.3 to 0.3, suggesting diversification benefits.

- **Value, Momentum and Credit Rating:** Value performance strengthened as spread dispersions widened from AAA to BB ratings. This advantage diminished in B ratings, as default risk subsumed the value premium. The momentum signal proved more effective in lower rated credit with more room for price appreciation.

1. Introduction

Several recent studies (Houweling & Zundert 2017; Israel, Palhares & Richardson 2018; and Jostova 2013) have documented value and momentum effects in corporate bond markets. Value effects capture the tendency of underpriced assets to outperform their peers. In corporate bond markets, the option adjusted spread (OAS) is used to buy bonds with higher (lower price) OAS relative to their fundamentals. Momentum relies on the continuation of price trends. Outperforming(underperforming) assets over medium time horizons are expected to continue outperforming(underperforming) in this approach. The reversal effect, well-studied in equity markets, reflects the tendency of securities with low(high) short-term returns (monthly or weekly) to deliver positive(negative) returns in following month (or week). Although this phenomenon is less well studied in corporate bond markets, the efficacy and analyze implementation hurdles are explored herein.

2. Methodology and Signals Definitions

2.1. Methodology

Monthly corporate bond excess returns are computed by subtracting duration matched treasuries returns from bonds' total returns. Back-test results and subsequent analysis are based on excess returns with intention to examine the drivers of credit returns. At the beginning of every month, the latest available data was used to form signals, which were then used to form factor portfolios to be held for rest of the month.

The entire investable universe was divided into five quintiles. Top quintile bucket is the long portfolio as implied by signal ranks, while for long-short factor portfolios, top quintile bucket is the long portfolio, and the lowest quintile is the short portfolio. In constructing signals and factor portfolios, sector, credit rating, and maturity are neutralized to ensure that the resulting strategy does not simply load on these well-known credit risk factors. A market value-weighted approach was used to form the factor portfolios, mitigating against small-size bias. In US high yield universe, CCC-rated securities were excluded due to implementation concerns.

2.2. Signal Definitions

Value

The value factor aims to pick undervalued securities relative to their fundamentals. A simple definition is used that selects bonds with highest option adjusted spreads (OAS) within given sector, credit rating and maturity group.

Momentum

Similar to the widely followed definition in equity markets, momentum is defined by using 11-month cumulative excess return of bond while skipping most recent month.

Reversal

Excess returns from the previous month is used, ranking bonds high that underperformed last month and vice-versa.

3. Performance

Back-test results for factors are displayed in the **Exhibit 1** and **2** for US investment grade and US high yield universe, respectively. Results show strong performance by value, momentum and reversal factors across both investment grade and high yield sectors of credit markets. The reversal factor displayed extremely compelling performance across credit markets in both broader and liquid universes. This unusually strong performance is further examined in subsequent sections, revealing steep alpha decay and raising doubts about its efficacy.

Exhibit 1: Factors Performance: iBoxx US Investment Grade (Jan 2013 - Jul 2023)

	Active Return: Long-Only		**Information Ratio: Long-Only**		**Active Return: Long-Short**		**Information Ratio: Long- Short**	
Factor	Broad Index	Liquid Index	Broad Index	Liquid Index	Broad Index	Liquid Index	Broad Index	Liquid Index
Value	1.58%**	1.53%***	0.79	1.11	2.97%***	2.91%***	1.04	1.42
Momentum	0.85%***	1.24%***	1.08	1.42	0.85%*	1.09%**	0.51	0.72
Reversal	3.64%***	4.56%***	2.78	4.7	5.44%***	6.5%***	3.02	4.29

*** Statistically significant at 1% level; ** statistically significant at 5% level; * statistically significant at 10% level.

Source: S&P Global Market Intelligence Quantamental Research. Data as of July 31, 2023.

Exhibit 2: Factors Performance: iBoxx US High Yield (Jan 2013 - Jul 2023)

	Active Return: Long-Only		Information Ratio: Long-Only		Active Return: Long-Short		Information Ratio: Long- Short	
Factor	Broad Index	Liquid Index	Broad Index	Liquid Index	Broad Index	Liquid Index	Broad Index	Liquid Index
Value	2.33%**	1.40%	0.66	0.37	5.41%***	3.78%*	0.87	0.62
Momentum	1.97%**	3.06%***	0.83	1.48	2.19%	3.66%***	0.47	0.81
Reversal	7.4%***	7.77%***	2.86	3.11	10.78%***	10.52%***	2.7	2.84

*** Statistically significant at 1% level; ** statistically significant at 5% level; * statistically significant at 10% level.

Source: S&P Global Market Intelligence Quantamental Research. Data as of July 31, 2023.

3.1. Robustness to Equity Styles and Traditional Market Premia

Exhibit 3 analyzes whether these factors can be explained by equity styles or market factors such as credit and equity premia. Regression shows strong and statistically significant value and momentum performance. These findings are important as they imply that fixed income style portfolios can be built such that they are neither exposed to credit and equity risk premia nor to equity styles. This is consistent with other studies documenting diversification benefits of investing across styles.

Exhibit 3: Long/Short Factors Performance Adjusted for Fama-French Five Factor Model, Equity Price Momentum and Credit Market Premia[1] (Jan 2013 – Jul 2023)

	Equity Styles and Markets Premia							
		Beta Exposures						
	Annualized Alpha	Momentum	Investment	Value	Profitability	Size	Equity Market	Credit Market
USHY: Value	2.7%**	-0.085***	0.07**	-0.14***	-0.052	0.053**	-0.042	0.63****
USHY Liquid: Momentum	4.7%***	0.089**	-0.013	0.162***	0.015	-0.03	-0.008	-0.19**
USIG: Value	2.0%***	-0.026	0.014	-0.042**	-0.001	-0.002	0.004	0.5****
USIG Liquid: Momentum	1.1%**	0.037***	-0.005	0.035**	-0.002	-0.017	-0.02**	0.14***

*** Statistically significant at 1% level; ** statistically significant at 5% level; * statistically significant at 10% level.
Source: S&P Global Market Intelligence Quantamental Research. Data as of July 2023.

3.2. Better Momentum in Liquid Bonds

One interesting finding of the research is the bifurcation of momentum factor performance in liquid versus broad universes, with stronger performance in the former. Results as shown in **Exhibit 4** are statistically significant and are persistent across time (see Appendix A.3 and A.4) with stronger momentum in more liquid credit market as implied by age, liquidity score and monthly trading volume of representative issuer. This is likely the result of how securities are priced in the fixed income market. In the illiquid segment, a larger proportion of bond prices are model-driven, increasing signal noise.

Exhibit 4: Performance and Liquidity Metrics of Liquid and Broad-based Long-Only Momentum

	Return	Liquidity Score		Age		Trading Volume($million)	
	Liquid - Broad	Broad	Liquid	Broad	Liquid	Broad	Liquid
USIG	0.39%**	1.2	1.1	4.96	4.88	82	129
USHY	0.91%**	1.23	1.07	4.3	3.67	70	88

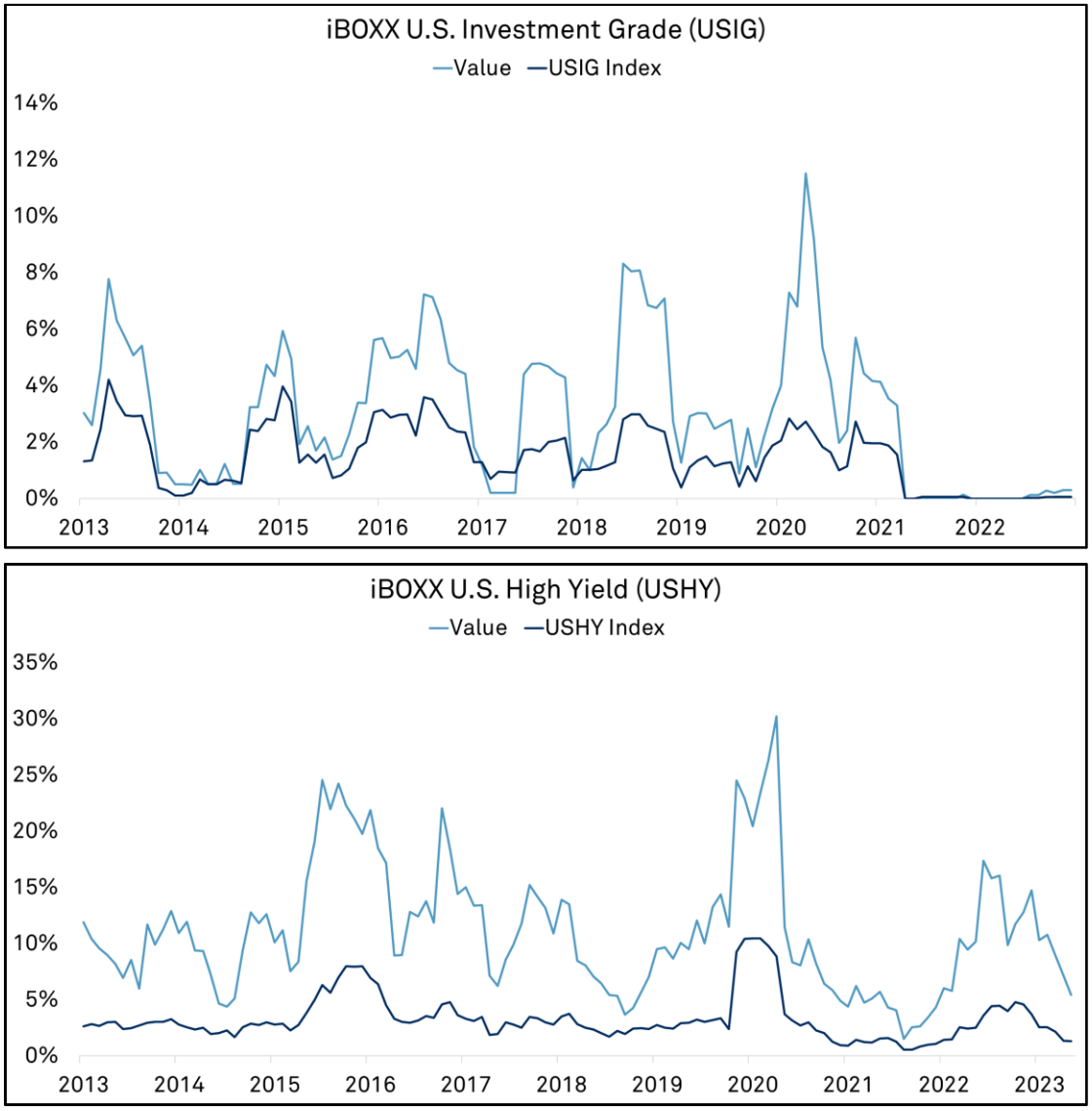
*** Statistically significant at 1% level; ** statistically significant at 5% level; * statistically significant at 10% level.
Source: S&P Global Market Intelligence Quantamental Research. Data as of July 2023.

What Drives Value Returns?

The natural question for investor is what drives the return for value signal. It appears to be a compensation for taking on certain types of risk, particularly the risk of downgrade or default, which drives the spreads higher for these bonds. Investors are compensated for accepting this risk. **Exhibit 5** illustrates the proportion of downgrades occurring in the long-only value portfolio and respective benchmark indices. Clearly, the value portfolio not only suffers from high downgrades compared to the broader universe but also tends to be pro-cyclical, peaking during period of higher volatility.

[1] Credit market premia is defined as market value weighted excess return of corresponding benchmark.

Exhibit 5: Rate of Downgrade in Long-Only Value Strategy, 2013-2023



Source: S&P Global Market Intelligence Quantamental Research. Data as of July 2023

3.3. Value, Momentum and Credit Rating

Exhibit 6 and 7 further breakdown value and momentum factor performance by credit ratings. Since value signal is targeting higher (OAS) spread securities, it is susceptible to higher default risk, especially in lower rated credit. **Exhibit 6** highlights the weakening efficacy of value signal as we move from BB to B credit ratings, default risk begins to dominate in lower rated credit where spreads fail to mean revert since higher spreads in this instance are indicative of higher risks.

Empirical findings for the momentum factor align with existing literature, showing weaker momentum in lower spread securities (credit rating A and above) given little scope for price appreciation. Performance improves as we move into BBB and lower rated segments, where higher spread names present more opportunities for price appreciation.

Exhibit 6: Active Excess Returns of Long-Only Value Factor by Credit

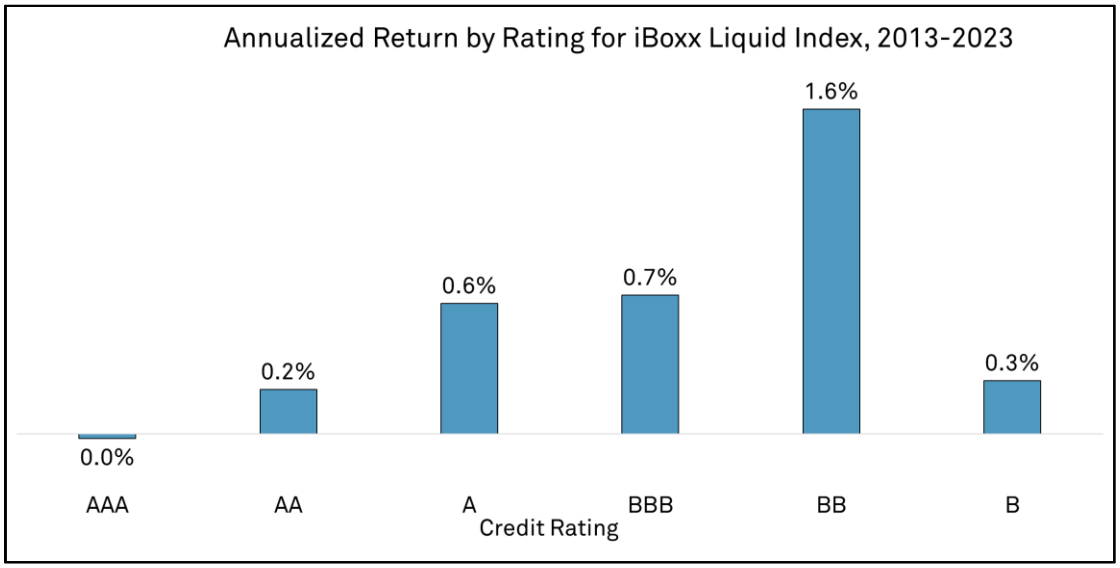
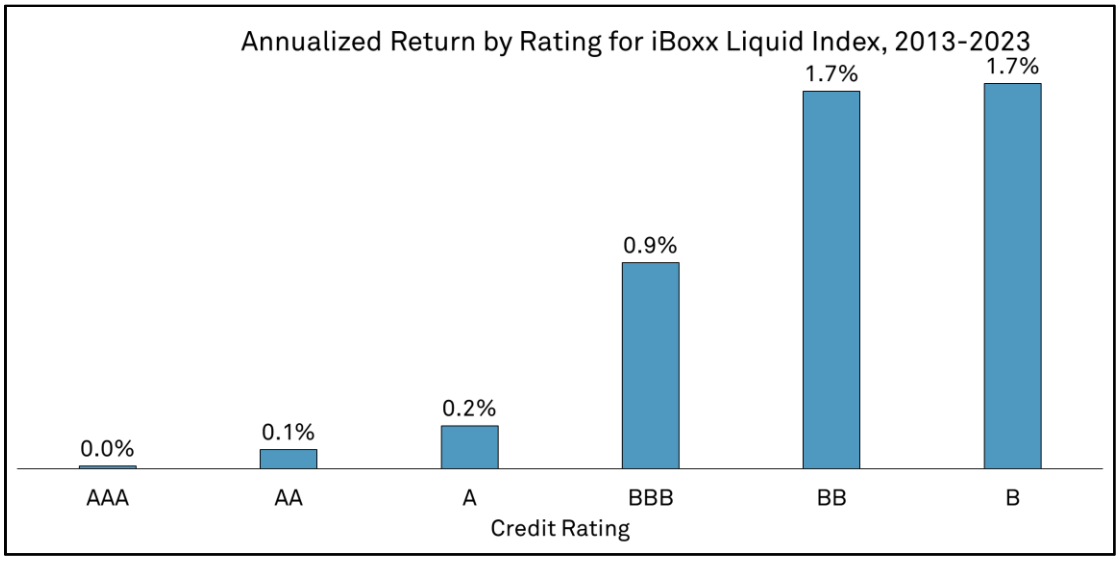


Exhibit 7: Active Excess Returns of Long-Only Momentum Factor by Credit Rating

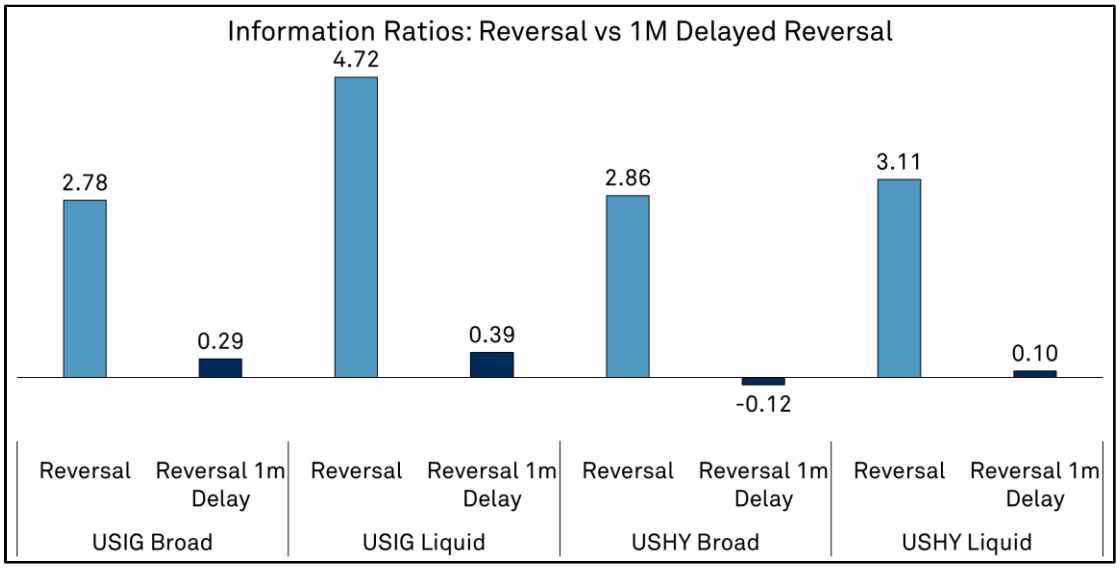


Source (ex. 6&7): S&P Global Market Intelligence Quantamental Research. Data is from January 2013 to July 2023

3.4. Is Strong Short-Term Reversal Effect for Real?

In **Exhibit 8**, the strong performance of reversal factor is investigated by delaying the implementation of signal by one month. The findings reveal that the signal's efficacy mostly dissipates, casting doubt on the viability of this strategy in practice.

Exhibit 8: Information Ratios of Long-Only Reversal Factor in Red and 1 Month Lagged Reversal Signal (Jan 2013 – Jul 2023)



Source: S&P Global Market Intelligence Quantamental Research. Data is from January 2013 to July 2023

4. Robustness Tests

Exhibits 9 and **10** present several robustness tests evaluating value, momentum, and reversal factors against liquidity and credit risk-related metrics using a bivariate sort framework. Due to high transaction costs in fixed income markets, investors are rightly worried about impact of trading and liquidity on these factors. Several liquidity-related metrics were chosen, including TRACE volume, age, size, and a proprietary liquidity score. Factor portfolios were subsequently formed after controlling for these variables one at a time. The findings indicate that factor performance remains robust to liquidity and credit risk (DTS) controls across both investment-grade and high-yield markets for all three factors.

Exhibit 9: Long-Only Factors Information Ratio After Controlling for Liquidity and Credit Risk: US Investment Grade (Jan 2013 - Jul 2023) *

Control Factor	Index	Value	Momentum	Reversal
Trace Volume	USIG	0.74	1.17	2.11
	USIG Liquid	1.34	2.62	4.15
Age	USIG	0.78	0.58	2.10
	USIG Liquid	1.36	2.17	4.27
Liquidity	USIG	0.78	1.16	2.19
	USIG Liquid	1.32	2.5	4.09
Size	USIG	0.71	1.22	2.03
	USIG Liquid	1.20	2.54	4.41
DTS	USIG	1.08	1.54	3.39
	USIG Liquid	1.19	2.47	7.00

Source: S&P Global Market Intelligence Quantamental Research. Data as of July 2023.

Exhibit 10: Long-Only Factors Information Ratio After Controlling for Liquidity and Credit Risk: US High Yield (Jan 2013 - Jul 2023) *

Control Factor	Index	Value	Momentum	Reversal
Trace Volume	USHY	0.74	0.99	3.12
	USHY Liquid	0.35	1.35	3.01
Age	USHY	0.83	1.01	3.11
	USHY Liquid	0.46	1.25	3.09
Liquidity	USHY	0.81	1.08	3.17
	USHY Liquid	0.31	1.38	3.31
Size	USHY	0.72	1.06	3.00
	USHY Liquid	0.36	1.36	3.25
DTS	USHY	1.45	1.70	3.63
	USHY Liquid	1.09	1.80	4.61

Source: S&P Global Market Intelligence Quantamental Research. Data as of July 2023.

5. Correlation and Scenario Analysis

This section examines factor return correlations as presented in **Exhibits 11** and **12**. The factor returns used in **Exhibit 12** were adjusted for credit market exposure by regressing out any influence from the credit market. The low correlation among factors in both investment-grade and high-yield universes, as well as with equity styles and markets, demonstrates the diversification benefits of these investment styles in multi-factor portfolio.

Exhibit 11: Factors Returns Correlations (Jan 2013 - Jul 2023) *

	US Investment Grade				US High Yield			
	Value	Momentum	Reversal	Benchmark	Value	Momentum	Reversal	Benchmark
Value	100%	-10%	-14%	13%	100%	-13%	22%	24%
Momentum	-10%	100%	-17%	-33%	-13%	100%	4%	0%
Reversal	-14%	-17%	100%	32%	22%	4%	100%	30%

Source: S&P Global Market Intelligence Quantamental Research. Returns used are for long-only top quintile portfolio vs benchmark for broad-based universe. Data as of July 2023.

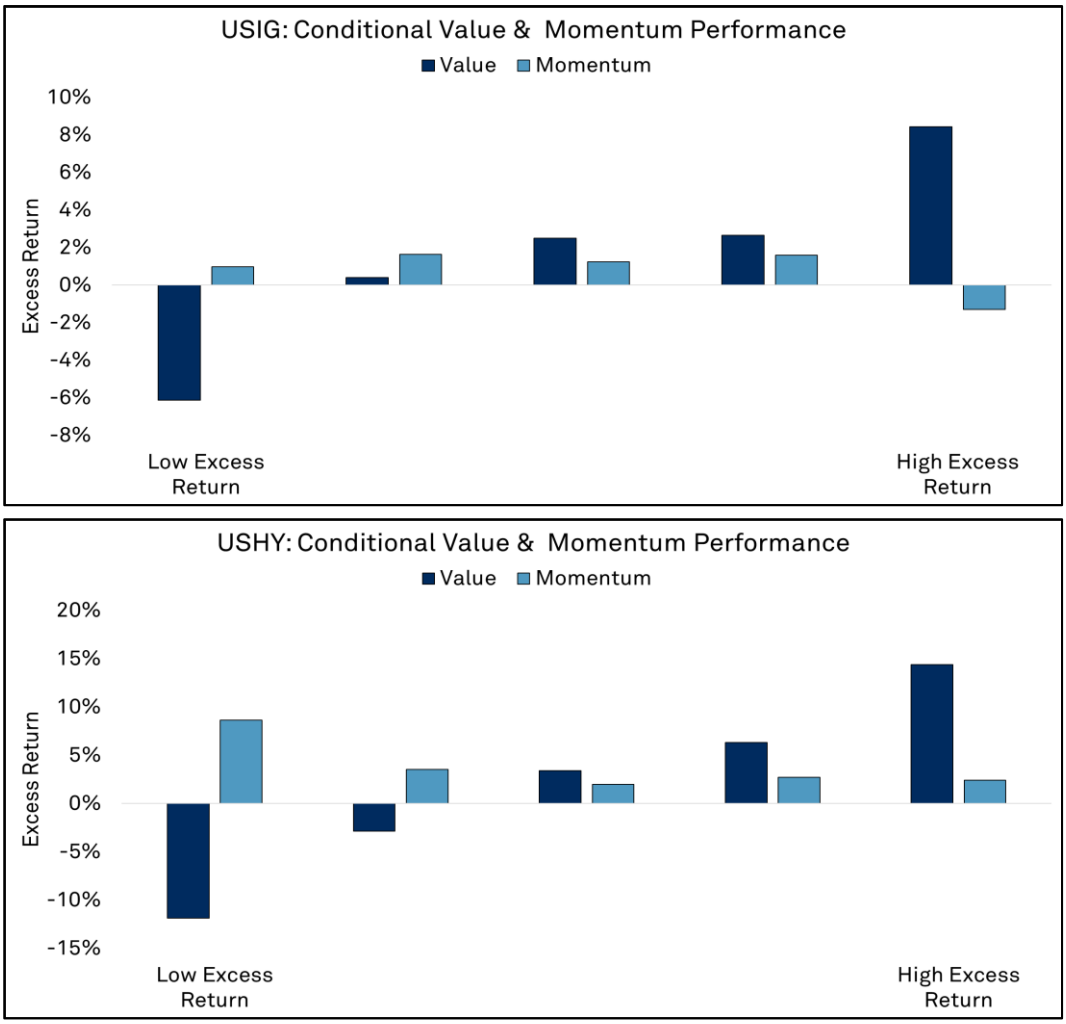
Exhibit 12: Factors Returns Correlation with Equity Styles and Equity Market (Jan 2013 - Jul 2023) *

	Equity Styles and Market Correlation					
Factor	Momentum	Investment	Value	Profitability	Size	Equity Market
USHY: Value	-21%	17%	4%	-16%	19%	-4%
USHY Liquid: Momentum	6%	8%	16%	-4%	-2%	-3%
USIG: Value	-5%	1%	-9%	3%	-3%	4%
USIG Liquid: Momentum	24%	5%	-3%	4%	-18%	-14%

Source: S&P Global Market Intelligence Quantamental Research. Returns used are for long-short quintile portfolio vs for broad-based universe for value and more liquid universe for momentum. Data as of July 2023.

Exhibit 13 examines the conditional performance of value and momentum factors under various credit market conditions. The value factor tends to underperform during credit market sell-offs and outperform in stable or positive markets, while the momentum factor demonstrates a useful hedging property during credit market sell-offs, offsetting losses from the value strategy.

Exhibit 13: Factor Return Correlations Conditional on Credit Market Conditions



Source: S&P Global Market Intelligence Quantamental Research. Returns used are for long-only top quintile portfolio vs benchmark for broad-based universe. Data as of July 2023

6. Conclusion

Our results show that fixed income credit value and momentum factor delivered strong risk adjusted performance in both U.S. investment-grade and U.S. high-yield credit sectors. The factors' performance was robust to existing markets (equity, and credit) and equity style premia, making them extremely useful as a return-enhancer and diversifier to existing return streams. The short-term reversal factor although extremely strong, decays very quickly, showing no efficacy if implemented with one-month delay. We also find that momentum performance is more potent in more liquid credit markets, which is extremely useful given high transaction costs and liquidity concerns in corporate bond markets.

7. Data

S&P Global Market Intelligence bond pricing and liquidity data forms the basis of bond returns and liquidity-related robustness checks. Bond pricing data is updated daily covering US, European and Asian corporate bonds with historical records available since January 2013.

We used the following S&P Markit iBoxx fixed income indices and their analytics in signal and factor portfolio construction.

- Markit iBoxx USD Benchmark Index
- Markit iBoxx USD Liquid Indexment Grade Index
- Markit iBoxx USD High Yield Developed Market Index
- Markit iBoxx USD Liquid High Yield Capped Index

8. References

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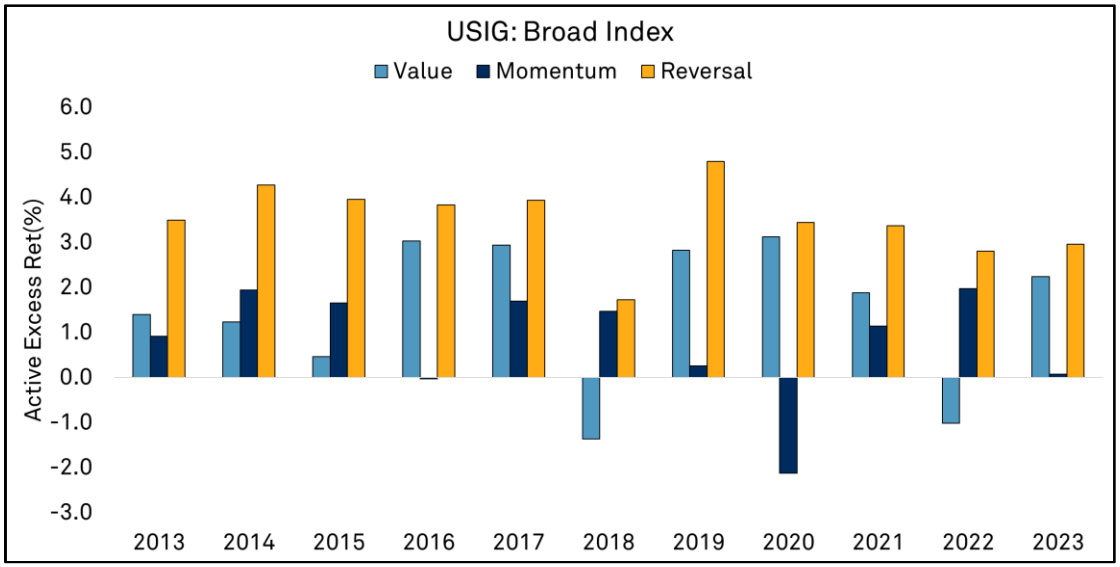
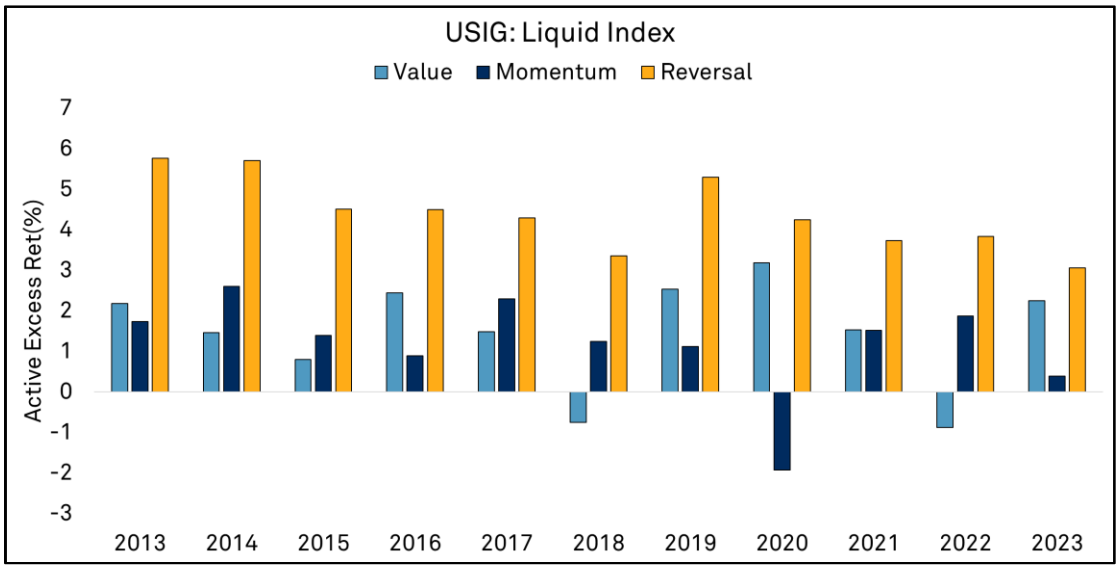
9. Appendix

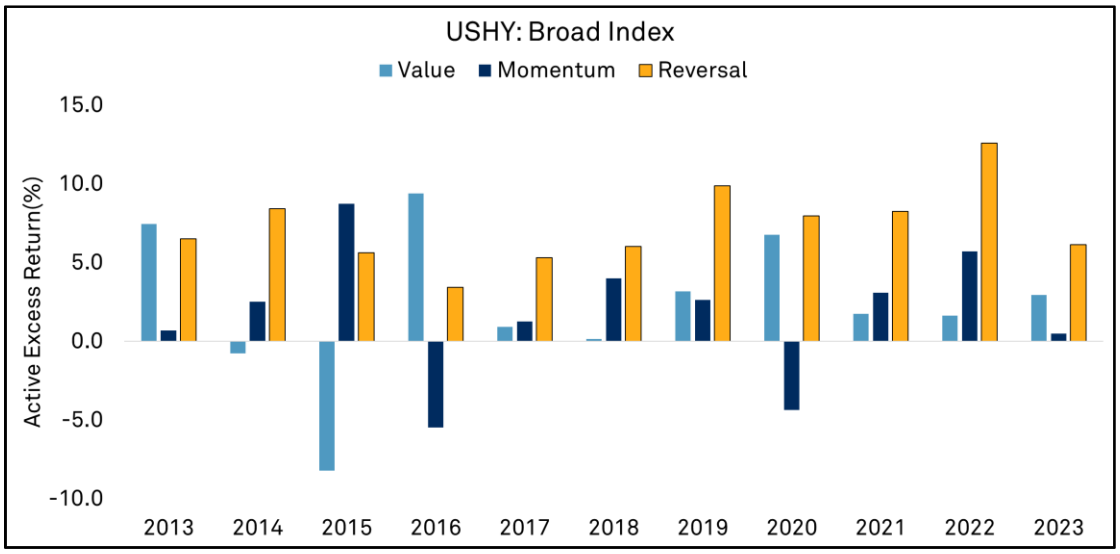
9.1. Active excess returns of long-only value, momentum and reversal factors for US investment grade for both broader and liquid universe

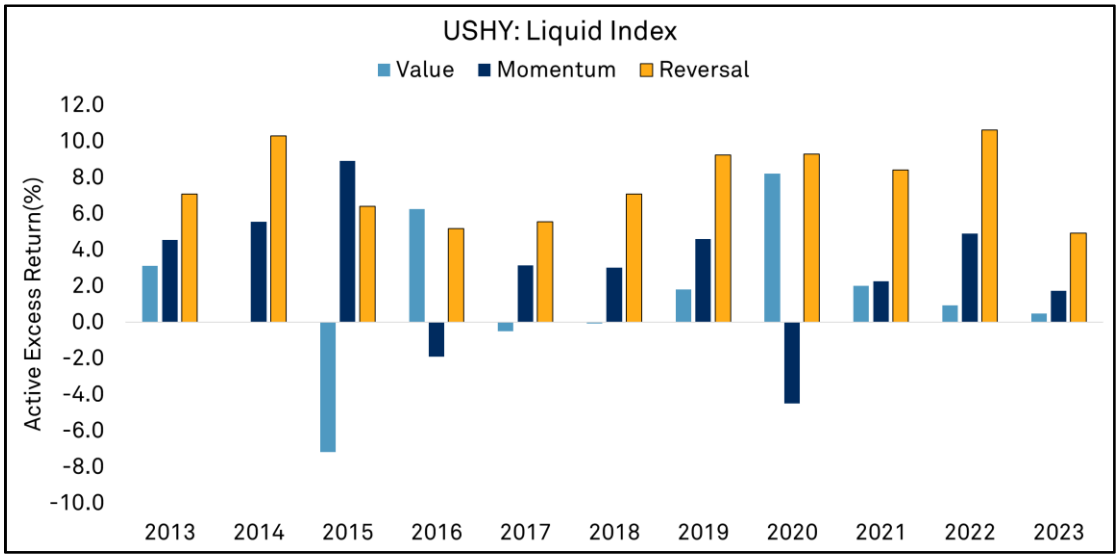




Source: S&P Global Market Intelligence Quantamental Research. Data as of July 2023.

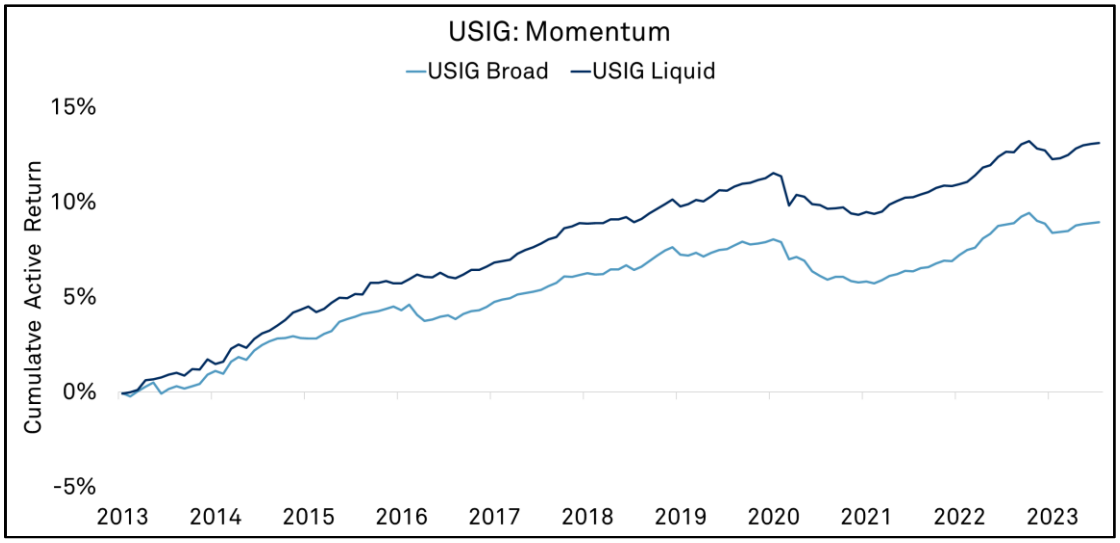
9.2. Active excess returns of long-only value, momentum and reversal factors for US high yield





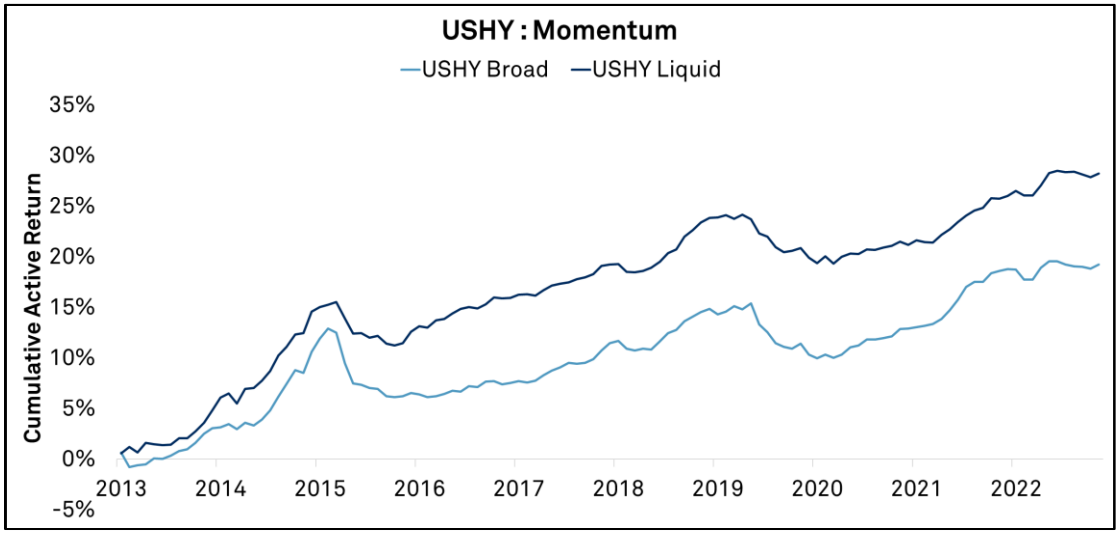
Source: S&P Global Market Intelligence Quantamental Research. Data as of July 2023.

A.3 Cumulative active excess returns of long-only momentum factor for US investment grade for both broader and liquid universe



Source: S&P Global Market Intelligence Quantamental Research. Data as of July 2023.

A.4 Cumulative active excess returns of long-only momentum factor for US high yield for both broader and liquid universe



Source: S&P Global Market Intelligence Quantamental Research. Data as of July 2023.

Our Recent Research

July 2024: Calm Markets, Confident PE Executives: Private Equity Earnings Calls Reflect Renewed Optimism in Q1'24

Stable public markets are the secret to private equity (PE) optimism. An NLP analysis of publicly-traded PE firms' Q1'24 earnings call transcripts reveals a significant rebound in PE confidence over the last two years. After peaking in Q3'21, PE executives' sentiment declined in 2022 as inflation, geopolitics and fed-driven volatility ended a post-COVID calm. However, with rates finding footing, Global PMI at a 12-month high and volatility subsiding, PE sentiment in Q1'24 reflects renewed optimism. This quarter, PE executive sentiment surged to its second-highest level in 57 earnings seasons, underscoring the inverse relationship between market turbulence and PE industry morale.

April 2024: Data Arbitrage with Proprietary Dividend Forecasts - Historically Precise Updates Led to U.S. Outperformance

Sell-side forecasts tend to focus on the top- and bottom-line and are often slow to reflect new dividend policies. Our empirical results have shown that S&P Global Market Intelligence's Dividend Forecasting dataset has historically captured these dividend revisions in both a precise and timely manner, providing investors with an informational edge. This publication details how practitioners can leverage the dataset for equity investing in the U.S. market when the in-house FQ1 forecasts diverge from their sell-side counterparts.

March 2024: Executives Exuberant Amid "Rightsizing" Workforce - An NLP Analysis of the Q4'23 Earnings Season

AI, geopolitics, labor 'rightsizing' (and other layoff euphemisms), and a sanguine tone characterized the Q4'23 earnings season. Nvidia is riding the AI wave and pulling its connected network along with it. An NLP analysis of earnings call transcripts was used to quantify the discussion.

March 2024: Elusive Parity: Key Gender Parity Metric Falls for First Time in 2 Decades

The growth in women's representation among senior corporate positions, once a bright spot for gender parity, potentially faces an alarming turning point. Exponential growth over a decade is showing signs of losing momentum. Growth no longer appears exponential. A waning focus on diversity initiatives suggests a potential inflection point and calls our previous gender parity estimates into question.

February 2024: Deal Sourcing: A Data Science Approach - Impact of Financial Characteristics on Acquisition Likelihood

Deal sourcing is hard. Finding a target for acquisition has been likened to finding 'a needle in a haystack'. Firm financials are a valuable starting point for systematic identification of acquisition targets. This publication provides actionable insights and a detailed blueprint on how practitioners can leverage computational finance for deal sourcing. Specifically, five firm-level financial dimensions are identified that differentiate targets from their comparable non-targets based on global data from the most recent 10 years.

February 2024: The Ripple Effect – Finding Company Estimates from Detailed Estimates

Intel's (NASDAQ: INTC) share price jumped 9.3% on Friday, Oct. 27, 2023, after the company reported strong earnings. Cadence Design Systems (NASDAQ: CDNS), which announced earlier in the week, was flat. Over the next 2 weeks (Oct 30 – Nov 14), CDNS would outperform INTC by 544 bps, as investors connected the dots between the two. INTC and CNDS do not share a GICS industry, however the two firms share something potentially more meaningful: sell-side analysts.

November 2023: Reading Between the Lines in Earnings Calls: 6 Things to Watch as the Q3'23 Earnings Season Unfolds

Watch for Q3'23 sentiment near 5-year highs, despite a quarter-on-quarter decline. Sentiment for Q3'23 is estimated to decline by 5% compared to last quarter; but remains on track to be the 7th most positive of the last 60 quarters. What a difference three quarters can make! As ranked by the sentiment of language on earnings calls, Q3'22 was one of the worst quarters of the last 5 years. Just 3 quarters later, Q2'23 sentiment improved 24% to make the season the 4th most positive over the period. Major drivers of positivity including abating supply chain disruption, declining inflation, and hope for a more dovish U.S. Federal Reserve roadmap.

August 2023: Breaking Boundaries: Women Poised for Milestone Achievement in Parity Amidst Otherwise Bleak Outlook

Diversity in leadership has received increasing attention. However, most data show slow, incremental improvements at best. Yet in an otherwise bleak landscape, a bright spot has emerged: an analysis of 86,000 executives from 7,300 U.S. firms over 12 years found that women could reach parity in senior leadership positions between 2030 and 2037, among companies in the Russell 3000.

June 2023: Mixed Financials Diverge from Bullish Sentiment: A Textual Review of the Q1'23 U.S. Earnings Call Season

A bullish sentiment during the Q1'23 season has taken hold. The excitement surrounding the '*iPhone Moment'* of AI, the resiliency in the labor market, the receding likelihood of a banking crisis and the end of the current rate hike cycle have all uplifted the prospects of the U.S. economy. However, the exuded level of sentiment may not be supported by the financials. The breadth of firms citing growth deteriorated on a quarterly and yearly basis. Forecasts for the next season have come down materially from their bullish Q1'23 levels. Ominous clouds are on the horizon as banks' commercial loan portfolios come under scrutiny. Vacancy rates for office buildings have hit all-time highs. For the first time in the past five seasons, banks are prominently discussing their exposures to the commercial real estate market.

April 2023: Sentiment Rebounds While Regional Banks Tip Their Hand: A Textual Review of the Q4'22 U.S. Earnings Call Season

The sentiment from S&P 500 firms' latest earnings calls rebounded for the first time in 2022. Earnings continued its recovery after hitting a trough two quarters ago. The headwind surrounding the strong dollar started to recede. Defensive sectors led the way while the cyclicals continued their struggle. The recent implosions of SVB Financial Group and Signature Bank have intensified this divergence. Other regional banks appear susceptible as the sentiment from their latest calls has turned negative, a rare historical occurrence that preceded the demise of the two, now FDIC seized, banks.

March 2023: Singing the (Banking) Blues: Navigating the Current Volatility in the Banking Industry

The collapse of Silicon Valley Bank (SIVB) led to a reassessment of liquidity and contagion risks across the banking industry. Regional banks have borne the brunt of the subsequent market sell-off. Month-to-date, regional bank stocks are down by 28%, versus 0% for the S&P 500. This report introduces a screen to help both equity and fixed income investors navigate the current volatility in the banking industry. The screen identifies regional banks with unfavorable exposures to liquidity, investor sentiment and management sentiment indicators.

February 2023: Watch Your Language: Executives' Remarks on Earnings Calls Impact CDS Spreads

While company earnings calls are targeted at equity analysts, information relevant to credit investors are discussed on these calls. This report documents that executive remarks have an impact on credit default swap spreads. The percentage change in CDS spreads of companies with the worst executive sentiment reading is larger than that of companies with the best sentiment reading post earnings call. Credit investors should consider using executive sentiment as an additional tool to gauge the direction of future CDS spread movements.

January 2023: Machines Signal Q4'22 Guidance Not Falling Off a Cliff: An In-Depth Textual Review of Q3'22 Earnings Call Transcripts

In Q3'22, the sentiment of S&P 500 firms has deteriorated to a level not seen since the IMF Greek Debt Default. Firms' focus has shifted away from pandemic-related concerns to interest rate-related ones. Financial growth is uneven. The breadth of firms citing profitability growth remains a bright spot yet the number of firms citing bottom-line growth has been mired in an "earnings recession" throughout 2022. Guidance for Q4'22 is far from falling off a cliff. This series demonstrates the richness and the intuitiveness of insights that could be surfaced algorithmically from textual data.

October 2022: Hanging on Every Negative Word: Natural Language Processing Analysis of Credit Rating Action Reports

Credit ratings are opinions about credit risk. When a credit rating changes, the analyst explains why, in a report. The 'why' is important. For an equity investor, a downgrade due to a rapid decline in a company's sales has a negative implication, whereas a downgrade due to an increase in leverage arising from a share buyback program may be viewed as positive. This study finds that the relative size of the price impact following a downgrade is dependent on the magnitude of the tone and the topics of focus in the report (Figure 1). Downgrades with

strong negative sentiment underperform downgrades with positive sentiment by 2.7% over the following month.

March 2022: The Sounds of Silence: No Response Speaks Volumes

No simple remedy for gender discrimination exists. But the first step in solving any problem is collecting the data to understand it. This research shows firms that share their data on diversity, equity, and inclusion (DEI) have taken further steps to address gender equity concerns. The S&P Global Corporate Sustainability Assessment (CSA) is a premier benchmarking survey and litmus test for inclusion in the S&P Dow Jones Sustainability Index. Firms that participated in the CSA survey in 2021 had better DEI outcomes.

October 2021: Glass Floors and Ceilings: Why Closing the Median Wage Gap Isn't Fair

The gender wage gap describes the disparity in compensation between women and men doing the same work. Progress on this issue is commonly measured by comparing the median compensation for women to men. This research demonstrates that firms are catering to the focus on median compensation and are paying women in a tighter range around the median, compared to men in equivalent positions. Effectively, women have been given a glass floor as redress for the still-present glass ceiling. This 'Gender-Based Compensation Management' not only undermines the goal of equitable pay; but because the high end of the compensation range can be much farther from the median than the low end, this paradigm is a net disadvantage for women.

September 2021: The Board Matrix: The (ESG) Value of Well-Connected Directors

Corporate boards are responsible for shaping and overseeing environmental, social and governance (ESG) policies for their organizations. This report examines the relationship between companies connected through shared board members and ESG performance. It finds that companies with strong board networks (companies with directors who serve on more than one corporate board or are well-connected) have better certain ESG outcomes than firms with weak board networks. Well-connected directors can utilize their network for information on emerging ESG trends/best practices and share this knowledge with their companies. Given their roles on multiple boards, well-connected directors are also better informed about the needs of different stakeholders (governments, communities, ESG activists) than directors with little or no network. This awareness of stakeholder management translates to better ESG performance for companies with well-connected directors.

August 2021: Technology Momentum: Peer Networks from Patents

Companies with similar patent portfolios exhibit peer group momentum. A strategy that buys (sells) stocks of focal companies in the Russell 3000 with outperforming (underperforming) technology peers produces an annualized risk-adjusted return of 5.23% in a historical backtest. The strategy returns are more pronounced for smaller companies. In the Russell 2000, the strategy demonstrates more efficacy with annualized long-short return of 7.32%. The strategy is distinct from sector momentum strategies. After controlling for sector momentum, 3.60% excess return in the Russell 3000 can be attributed to technology peer group momentum.

July 2021: Branching Out: Graph Theory Fundamentals

Investment analysis has evolved beyond financial data to non-financial, or alternative data. Typically, the focus has been on using alternative datasets that are purely time-series and tabular. Graph networks meanwhile offer investors the ability to gain deeper insights into the connections between economies, industries, and individual corporations.

May 2021: U.S Filings: No News is Good News

Company annual filings are a vital but often under-analyzed source of information for investors. Market moving content is buried within an ever-growing body of text that on average is equivalent to a 240-page novel. The filings contain subtle revisions making a computational linguistic approach imperative. Faced with this voluminous amount of text and the minute number of changes, investors have historically overlooked the newly embedded information and the implications of those additions.

March 2021: Hiding in Plain Sight – Risks That Are Overlooked

This report uses three metrics (Minimum Edit Distance, Jaccard Similarity, and Cosine Similarity) to identify companies that made significant changes to the "Risk Factors" section of their filings. These metrics can serve as alpha signals or be used to quickly identify a pool of companies that require further investigation.

January 2021: Leadership Change That Matters: A Value and Momentum Story
December 2020: Warranted Optimism: Sentiment vs. Supply Chain
December 2020: A Dark Winter for REITS: Trouble Brewing
October 2020: Sweet Spots in the C-Suite: Executive Best Practices for Shareholder Friendly Firms
October 2020: Just the (Build)Fax: Property Intelligence from Building Permit Data
August 2020: The Analyst Matrix: Profiting from Sell-Side Analysts' Coverage Networks
June 2020: The Information Supply Chain Begins Recovering From COVID
May 2020: Never Waste a Crisis: Following the Smart Money Through Beneficial Ownership Filings
May 2020: Risky Business: Foot Traffic, Vacancy Rates and Credit Risks
May 2020: Finding the Healthy Stocks in Health Care During Lockdown
May 2020: No More Walks in the (Office) Park: Tying Foot Traffic Data to REITs
May 2020: Do Markets Yearn for the Dog Days of Summer: COVID, Climate and Consternation
April 2020: Cold Turkey - Navigating Guidance Withdrawal Using Supply Chain Data
April 2020: Data North Star - Navigating Through Information Darkness
March 2020: Long Road to Recovery: Coronavirus Lessons from Supply Chain and Financial Data
February 2020: Ship to Shore: Mapping the Global Supply Chain with Panjiva Shipping Data in Xpressfeed™
January 2020: Natural Language Processing – Part III: Feature Engineering Applying NLP Using Domain Knowledge to Capture Alpha from Transcripts

December 2019: The "Trucost" of Climate Investing: Managing Climate Risks in Equity Portfolios
October 2019: #ChangePays: There Were More Male CEOs Named John than Female CEOs
June 2019: Looking Beyond Dividend Yield: Finding Value in Cash Distribution Strategies
June 2019: The Dating Game: Decrypting the Signals in Earnings Report Dates
May 2019: Bridges for Sale: Finding Value in Sell-Side Estimates, Recommendations, and Target Prices
February 2019: U.S Stock Selection Model Performance Review
February 2019: International Small Cap Investing: Unlocking Alpha Opportunities in an Underutilized Asset Class
January 2019: Value and Momentum: Everywhere, But Not All the Time
November 2018: Forging Stronger Links: Using Supply Chain Data in the Investing Process
September 2018: Their Sentiment Exactly: Sentiment Signal Diversity Creates Alpha Opportunity
September 2018: Natural Language Processing – Part II: Stock Selection: Alpha Unscripted: The Message within the Message in Earnings Calls
July 2018: A Case of 'Wag the Dog'? - ETFs and Stock-Level Liquidity
June 2018: The (Gross Profitability) Trend is Your Friend
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
November 2015: Late to File - The Costs of Delayed 10-Q and 10-K Company Filings
October 2015: Global Country Allocation Strategies
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
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
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
October 2014: Lenders Lead, Owners Follow - The Relationship between Credit Indicators and Equity Returns
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
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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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