Sector Sentiment, Mispricing and Future Stock Returns[1]

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Abstract

We examine the relationship between sector sentiment sensitivity and cross-sectional stock returns. Our findings reveal a negative association between a stock's sector sentiment sensitivity and its cross-sectional returns across most stocks. Even after controlling for market sentiment, sector-specific sentiment remains a key driver of the sector sentiment premium, as it provides additional information. Stocks with low sector sentiment sensitivity generate positive and significant returns, while those with high sensitivity yield near-zero and insignificant returns, highlighting that the sector sentiment premium is primarily attributed to stocks less affected by sector sentiment fluctuations. Low-sensitivity stocks are typically characterized by larger market capitalization, lower illiquidity, narrower bid-ask spreads, and greater analyst coverage. Motivated by the facts, we show that the undervaluation of low-sensitive stocks, driven by investor underreaction, is a leading cause for their subsequent positive returns. The magnitude and direction of sector sentiment premiums vary across sectors. By analyzing sector-level characteristics, we find that highly concentrated sectors tend to exhibit lower sentiment premiums. Additionally, the relationship between sector sentiment sensitivity and stock returns is more pronounced following periods of low market sentiment compared to high sentiment periods.

Keywords: Sector Sentiment, Stock Return, Investor Behavior

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1. Introduction

Studies have consistently shown that what investors think and feel, known as investor sentiment, is key to understanding stock performance. This includes their current attitudes and what they expect will happen in the market in the future (Glushkov (2006), Baker and Wurgler (2006), Jacoby et al. (2024)). A lot of research has been done on this topic, highlighting how these feelings and expectations significantly influence both individual investment choices and the broader movements of the market (Baker and Wurgler, 2006; Glushkov, 2006; Da et al., 2015; Huang et al., 2015; Chen et al., 2021). Much of this research has looked at the big picture, studying how the overall mood among investors affects the performance of the market as a whole. There's also been a focus on how individual investor sentiment impacts stock returns. Yet, the area of sector sentiment, which examines how investors feel about specific market sectors, hasn't received as much attention. Peng and Xiong (2006) state that stock returns are determined by three elements: firm-level, sector-level and market-level factors, suggesting that sector-level factors contain distinguished information. Sector sentiment, which brings together the collective misjudgments made about a sector by various firms, provides a detailed view that can help us better understand the complex behaviors of the market.

Our paper is mainly driven by the understanding that investor sentiment isn't the same for every stock or sector (Shefrin, 2008; Seok et al., 2019b). Different sectors can trigger varied emotional reactions from investors, influenced by specific news, trends, and traits unique to each sector. This variation in sentiment points to the possibility that a closer look could reveal mispricing and investor actions that broad market studies may miss. Moreover, understanding how investors feel about different sectors could give investors valuable information, helping them make better choices and possibly discovering new investment chances that haven't been noticed before.

Previous studies have laid the groundwork for our exploration of sector sentiment. First, notably, research has highlighted the role of irrational investors in reacting strongly to sentiment fluctuations, often disregarding fundamentals in favor of noise or perceived signals. This behavior introduces challenges for arbitrageurs and contributes to stock mispricing. Empirical studies, such as those by Glushkov (2006) and Baker and Wurgler (2006), have established a relationship between sentiment and stock returns, with recent work by Jacoby et al. (2024) further affirming the positive impact of market sentiment on stock returns following low-sentiment periods. However, these studies predominantly focus on market-level sentiment, leaving a gap in our understanding of sector-specific sentiment dynamics. In addition, some research has focused on sector analysis. For instance, Molchanov and Stangl (2017) looked into how investor sentiment and sector features are related. However, they found only limited proof that the characteristics of an industry would change how market sentiment affects that industry's returns. On the other hand, Hou (2007) used industry characteristics to explore differences across sectors in how quickly information is reflected in stock

prices. He discovered that sectors with poorer information environments, indicated by higher concentration (HHI) and more disagreement among investors, show a significant change in these timing effects. Building on this, our paper explores deeper into how sector-level characteristics influence the extra returns that come from sector sentiment.

Our paper investigates the less explored area of sector sentiment and its impact on the cross-section of stock returns across different sectors. We use the Refinitiv MarketPsych Indices (TRMI) to measure sentiment at the sector level for 10 different sectors, including Energy, Basic Materials, Industrials, Cyclical Consumer Goods and Services, Non-Cyclical Consumer Goods and Services, Financial, Healthcare, Technology, Telecommunications Services, and Utilities. The sample period is from January 4th, 1999, to December 31st, 2019, spanning 5,283 trading days, and covers a total of 6,482 stocks. To determine the sector sentiment beta, we perform a regression analysis, using the excess stock return as the dependent variable and sector sentiment changes, market beta, and market sentiment as independent variables. Our study includes both univariate and bivariate analyses to explore how sentiment beta influences stock returns, specifically examining if it leads to a premium and if this premium remains significant after accounting for factors identified in the literature that affect individual returns. We also assess if common risk factors, as outlined in well-known factor models like the Fama-French 3- and 5-factor models and the Carhart 4-factor model, can explain the premium. Our findings include abnormal returns, annualized Sharpe ratios, and cumulative results for various portfolios. Additionally, we investigate characteristics such as illiquidity, momentum, reversal, bid-ask spread, analyst coverage, and institutional ownership of portfolios sorted based on sector sentiment beta. Furthermore, we utilize Fama-MacBeth regressions to evaluate the impact of sector sentiment on future returns.

Our findings reveal a general negative relationship between sentiment beta and stock returns across most sectors, with some notable exceptions. In particular, the Materials sector shows a positive monthly return spread, indicating a distinct reaction to sector sentiment. Our research highlights the significant impact of sector sentiment on stock returns, even when market sentiment is taken into account, emphasizing the importance of analyzing specific sectors.

In specific, we highlight several key findings. First, the univariate analysis of monthly quintile portfolios reveals a nuanced impact of sector sentiment on stock returns, with significant return spreads observed in eight sectors. Seven sectors demonstrated a negative impact of sector sentiment on returns, indicating that stocks with lower sentiment beta typically outperform those with higher sentiment beta. The Materials (MAT) sector stood out with a positive impact, showcasing the strongest effect of sector sentiment. The study also found that common risk factors could not fully explain the significant return spreads, suggesting an inherent sector sentiment premium. This premium is primarily driven by stocks with lower sensitivity to sector sentiment changes, indicating an asymmetry in the sector sentiment effect across sectors.

Cumulative returns analysis further supports these findings, with variations in performance between the bottom and top quintile portfolios, particularly during the global financial crisis, highlighting the differential impact of sector sentiment on stock returns. This comprehensive analysis underscores the importance of considering sector sentiment and its nuanced effects in investment strategies.

Second, our results uncover key insights into stock behavior across sentiment beta quintiles, revealing a progressive increase in sentiment beta, with the highest quintile predominantly consisting of small-cap stocks that paradoxically offer lower returns. This suggests the sentiment effect is distinct from the size effect. Stocks with lower sentiment beta are attractive for their positive short-term and intermediate-term returns, unlike their higher sentiment beta counterparts. Surprisingly, high sentiment beta stocks, expected to command an illiquidity premium, yield nearly zero returns, challenging traditional beliefs about compensation for illiquidity risks. These stocks are also characterized by a poorer information environment, higher disagreement among investors, and greater market and firm-level risks. Overall, the findings indicate a divergence in investor preferences, with lower sentiment beta stocks seen as safer, more stable investments, while higher sentiment beta stocks attract speculative interest due to their increased uncertainty and volatility.

Third, we show that over half of the sectors demonstrate a significant relationship between sentiment beta and future stock returns, even after controlling for the factors affecting the returns documented by the literature. The results highlight the limited explanatory power of these factors for the sector sentiment effect, underscoring the robust influence of sector sentiment on stock returns.

We further investigate the potential mechanism of investor underreaction driving the observed relationship. Our analysis indicates that the better performance of stocks with low sentiment beta is primarily driven by investor underreaction. Also, the observed sector return spreads are larger following the low sector sentiment periods larger than that following the medium or high sector sentiment periods. Moreover, we assess how sector characteristics influence the sector sentiment premium, finding that product market structure—measured by concentration levels—significantly explains cross-sector variations in sentiment premiums.

Our paper enriches the literature by highlighting the significance of sector sentiment in influencing stock returns, providing evidence that sector sentiment carries additional information beyond market sentiment. Furthermore, our analysis of the mechanisms underlying the sector sentiment effect and the moderating role of sector characteristics offers valuable insights for both academics and market participants, particularly those focusing on sector-based investing strategies.

The structure of this paper is outlined as follows: Section 2 offers a review of relevant literature. In Section 3, we detail the data and variables used in our paper. The

methodology employed and the empirical findings are presented in Section 4. Section 5 is dedicated to additional analyses. Finally, Section 6 concludes the paper.

2. Literature Review

Extensive research has demonstrated that investor sentiment significantly influences asset prices, both theoretically and empirically (DSSW, 1990; Barberis et al., 1998; Baker and Wurgler, 2006; Da et al., 2015; Huang et al., 2015; Chen et al., 2021; Jacoby et al., 2024). However, the majority of these studies have concentrated on market and firm-level sentiment, with sector-level sentiment receiving comparatively little attention. This study aims to investigate the impact of sector-wide sentiment on various stock returns.

2.1. Investor Sentiment

Traditional finance theories assert that investors are rational, seeking to maximize their returns. It was previously thought that irrational investors would be short-lived in the market, as rational, profit-maximizing investors would exploit and eliminate them. However, subsequent research has developed models to explain the persistence and significant impact of irrational investors. De Long et al. (1990) introduced a model featuring two types of investors: noise traders and rational investors. Noise traders are those who act on incorrect information about future returns as if it were accurate, generating investor sentiment. This sentiment leads to irrational demand for risky assets, thereby distorting asset prices from their fundamental values (Glushkov, 2006; Liang, 2018; Kozak et al., 2018; Chen et al., 2021). Furthermore, the unpredictable nature of noise traders' beliefs can lead to more extreme market positions rather than a reversion to rational expectations. Given the finite investment horizon, rational investors may hesitate to counteract noise traders, fearing they may not be able to exit their positions before prices correct. Shleifer and Vishny (1997) also identified significant barriers to arbitrage, such as short-selling constraints and transaction costs, which prevent rational investors from correcting mispriced assets. Consequently, investor sentiment can lead to significant mispricing in asset prices.

Theoretically, investor sentiment is posited as a risk factor in asset pricing, acting as either a state variable or an individual risk factor (Liang, 2018; Kozak et al., 2018). Liang (2018) and Kozak et al. (2018) regard investor sentiment as a state variable that influences stock returns by altering the dynamics of other pricing factors. Kozak et al. (2018) introduced a sentiment adjusted ICAPM, suggesting that market sentiment comprises both idiosyncratic and systematic components. Liang (2018) distinguished between consumption sentiment and investment sentiment, incorporating changes in sentiment into the consumption utility function, thus affecting investment decisions and asset risk. This perspective implies that shifts in sentiment significantly influence demand for risky assets.

In addition to theoretical frameworks, empirical research has provided evidence that sentiment impacts financial markets. Most studies have examined how investor sentiment influences individual stocks (Glushkov, 2006; Baker and Wurgler, 2006; Liang, 2018; Chen et al., 2021; Jacoby et al., 2024), with fewer focusing on temporal effects (Da et al., 2015; Huang et al., 2015; Sun et al., 2016). Time-series analyses, such as Baker and Wurgler (2000), have utilized the equity issue share index as a proxy for sentiment, finding it predictive of lower market returns. More recent studies, like Huang et al. (2015), have demonstrated that an enhanced monthly BW (2006) sentiment index can predict overall stock market performance. Additionally, Da et al. (2015) developed a daily sentiment index, FEARS, which predicts short-term return reversals. Sun et al. (2016) found that past investor sentiment can forecast higher intraday S&P 500 index returns.

A seminal paper by Baker and Wurgler (2006) explored how market sentiment differentially affects stock returns, finding that stocks with certain characteristics are more sensitive to sentiment. Other researchers have directly investigated how sentiment influences stock returns through the lens of sentiment beta, which measures a stock's return sensitivity to changes in investor sentiment. The relation between sentiment beta and future asset returns has yielded mixed results, highlighting the need for further research.

2.2. Why Study Sector-level Sentiment?

Building on existing research, we discuss the rationale for investigating sector-level sentiment, with a particular focus on sector-based style investing and the distinct characteristics of sector-level sentiment.

Recent trends show that investors increasingly consider sector effects in their investment decisions. Swensen (2000) and Barberis et al. (2005) characterized industry as a form of style investing, where investors categorize financial assets into groups or styles and base their investments on these classifications. Specifically, sector investing involves allocating investments across different sectors identified by classifications such as TRBC and GSIC. This approach emphasizes the importance of sector-level information over market-wide or individual stock data, potentially enhancing portfolio diversification and efficiency. Meanwhile, previous research indicates that investor sentiment varies across sectors, providing unique and valuable information (A.Salhin et al., 2016). Sector-level factors offer distinct insights not captured by market-wide sentiment, affecting stock returns within the sector. Furthermore, stocks within the same sector are influenced by common factors, such as technological changes and regulatory shifts, underscoring the importance of sector-specific information.

Given the advancements in sentiment indices and the limited focus on sector sentiment in existing literature, our study aims to investigate the impact of sector-wide sentiment on stock returns across ten sectors, contributing to the understanding of sector-level sentiment's role in asset pricing.

3. Data and Sources

In this section, we outline the dataset and variables employed for our empirical analysis. The study encompasses ten sectors: Energy (ENE), Basic Materials (MAT), Industrials (IND), Cyclical Consumer Goods and Services (YCY), Non-Cyclical Consumer Goods and Services (NCY), Financial (FIN), Healthcare (HLC), Technology (TEC), Telecommunications Services (COM), and Utilities (UTL), incorporating a total of 6,482 stocks. The analysis spans from January 4th, 1999, to December 31st, 2019, covering 5,283 trading days. The focal variables include sector and market sentiment, alongside both firm- and sector-level control variables, as detailed in Table A1.

3.1. Sentiment Data

Sentiment data is sourced from the Refinitiv MarketPsych Indices (TRMI), which provides updates on a minutely basis starting from 1998. Derived from social and news media, the TRMI sentiment ranges from -1 (most negative) to 1 (most positive). This index, utilized in studies like Sun et al. (2016) and Fuss et al. (2020), is pivotal for examining the predictive power of high-frequency investor sentiment. We calculate each sector's sentiment as a weighted average of the sentiment of individual stocks within that sector, and market sentiment as a weighted average of the sentiment across all sectors.

Figure 1 illustrates monthly market sentiment from January 1999 to December 2019, highlighting notably low sentiment levels during two recessionary periods. Figure 2 presents time-series plots of daily sentiment across the ten sectors, revealing significant variation. Notably, the FIN sector experienced a pronounced decline in sentiment in 2015, remaining low thereafter. Conversely, the HLC and IND sectors show upward trends in sentiment, indicating a sustained increase over time.

[Insert Figure 1]
[Insert Figure 2]

3.2. Control Variables

Daily stock returns, prices, and trading volumes are obtained from CRSP, while the risk-free rate[2], SMB, HML, UMD, CMA, and RMW data are sourced from the Kenneth R. French Online Data Library. Sector-level data represent weighted averages of stock-level data.

Data from CRSP/Compustat Merge are used to calculate the book-to-market ratio and profitability for listed stocks. The book-to-market ratio is determined by dividing the previous quarter's book value of equity by the market value of equity in month t.

[2] Risk Free rate refers to 1-month Treasury bill from Ibbotson Association, which is downloaded from the Kenneth French website.

Profitability is calculated as income before extraordinary items divided by the book equity from the previous quarter.

One-year ahead earning-per-share (EPS) and the number of estimations are retrieved from Thomson Reuters' Institutional Brokers Estimate System (I/B/E/S) database. We first compute stock-level analyst disagreement, then calculate sector-level analyst disagreement and coverage as weighted averages of individual stocks' data.

Stock-level institutional ownership data, ranging from 0 to 1, are collected from Thomson Reuters. Following Jacoby et al. (2024), we apply a logit transformation to institutional ownership as follows:

$$logit(Insitutional\ Ownership) = \log\left(\frac{Institutional\ Ownership}{1 - Insitutional\ Ownerhsip}\right)$$

Table 1 presents the summary statistics of sector sentiment and returns for each of the ten sectors. Panel A reveals that value-weighted sector sentiment is generally lower than equal-weighted sentiment, suggesting that smaller companies exhibit higher sentiment levels. For instance, MAT has the highest average daily sentiment at 0.0301, while UTL and FIN have the lowest average daily sentiment after size adjustment. FIN exhibits the highest sentiment volatility, whereas TEC has the lowest standard deviation at 0.0240 when size adjusted. Panel B details sector returns, with COM, FIN, MAT, and NCY showing negative daily average returns in equal-weighted terms, while other sectors present positive returns. Size adjustment reveals that small-size stocks tend to have lower returns compared to large-sized stocks in certain sectors. For example, TEC and ENE exhibit the highest return volatilities at 0.0134 and 0.0123, respectively, with HLC maintaining the lowest volatility.

[Insert Table 1]

Table 2 offers descriptive statistics for stock-level variables, indicating that stocks in HLC have larger sentiment beta, suggesting greater sensitivity to changes in sector sentiment. Conversely, UTL stocks show the least sensitivity. Moreover, COM records the lowest average stock-level profitability at -4.3801, while MAT has the highest average stock-level book-to-market ratio at 5.5310.

[Insert Table 2]

Table 3 displays a correlation matrix that illustrates the varying levels of correlation between sector sentiment and market sentiment. For example, COM, UTL, and YCY demonstrate the highest correlations with market sentiment, while IND and TEC show the strongest correlations in value-weighted terms, underscoring the differential impact of sector-specific dynamics on overall market sentiment.

[Insert Table 3]

4. Methodology and Empirical Results of Baseline Analysis

4.1 Sector Sentiment Beta

In our analysis, we determine a stock's sector sentiment beta through conducting a regression analysis where a stock's excess returns are regressed against changes in sector sentiment, the market factor, and market sentiment. This beta serves as an indicator of the stock's responsiveness to fluctuations in sector sentiment. Following the methodology suggested by Baker and Wurgler (2006) and Jacoby et al. (2024), we incorporate market sentiment into our regression model to control for its possible influence on stock returns. The sentiment beta is estimated using the following time-series regression:

$$R_{j,i,t} - r_{f,t} = \alpha_j + \beta_{MRKT,j}(r_{mrkt,t} - r_{f,t}) + \beta_{Sent,j}\Delta Sent_{i,t} + \beta_{MS,j,t}MS_t + \varepsilon_{j,t} \quad (1)$$

Where $R_{j,i,t} - r_{f,t}$ represents the excess return of stock (j) in sector (i) on day (t), calculated by subtracting the T-bill rate on day (t), $r_{f,t}$, from the stock's raw return. The market portfolio return on day (t) is denoted as $r_{mrkt,t}$. Changes in sector sentiment for sector (i) on day (t), denoted as $\Delta Sent_{i,t}$, are determined by the difference in sentiment between day (t) and the previous day ((t-1)). MS_t represents the value-weighted TRMI market sentiment on day (t). To estimate the sentiment beta, $\beta_{Sent,j}$, for each stock, Equation (1) employs a monthly estimation process using a one-month rolling window. The absolute value of the estimated $\beta_{Sent,j}$ (Equation 2) is used to gauge stock (j)'s return sensitivity to sector sentiment changes in month (t). Consequently, stocks with larger (either positive or negative) sentiment beta values are categorized as having high sensitivity, whereas those with smaller values are considered to have low sensitivity.

$$Sector\ Sentiment\ Beta = \left|\beta_{Sent,j}\right| \quad (2)$$

The use of the absolute value of $\beta_{Sent,j}$ as the primary metric for assessing sentiment sensitivity is based on the understanding that firms are significantly impacted by both strong negative and positive sentiment changes. This approach aims to capture a firm's responsiveness to extreme sentiment fluctuations, regardless of direction. In our analysis, positive sensitivity from regressing a firm's excess stock return against sector sentiment changes indicates that the stock's returns move in tandem with sector sentiment. Conversely, negative sensitivity suggests an inverse relationship. By adopting this methodology, we ensure that stocks sensitive to significant sentiment shifts, whether positive or negative, are recognized as having a higher sector sentiment beta, streamlining the measurement of sentiment sensitivity.

The rationale for using the absolute value of $\beta_{Sent,j}$ is further validated by empirical findings. Following Cuculiza et al. (2024), we present an analysis of returns for five portfolios, sorted based on actual value of sector sentiment beta across various industries from 1999 to 2019, as shown in Figure 3. This analysis uncovers a non-linear relationship between sector sentiment beta and portfolio returns. Specifically, for the majority of sectors (7 out of the total), the relationship displays an inverted U-shape, indicating that stocks with the most pronounced sentiment sensitivity have returns close to zero, whereas stocks with the least sentiment beta achieve the highest average monthly excess returns, approximately 1.51%. Conversely, for the COM and MAT sectors, the relationship is U-shaped, suggesting that stocks with the highest sentiment sensitivity have returns near zero, while those with minimal sensitivity exhibit the lowest average monthly excess returns, around -6.5%. Given that investors respond similarly to both positive and negative sentiment changes, the absolute value of sector sentiment beta is employed to quantify stock sensitivity to such changes. This approach groups firms with either highly positive or negative sentiment sensitivity (as seen in portfolios 1 and 5 in Figure 3) into a single category, highlighting stocks most susceptible to sentiment fluctuations.

[Insert Figure 3]

4.2 Univariate Analysis

Monthly quintile portfolios were constructed from February 1999 to December 2019 by sorting stocks based on the absolute sentiment beta estimated in the preceding month. A long-short strategy was employed, buying stocks in the lowest quintile (those with the smallest sentiment beta in month (t-1)) and selling stocks in the highest quintile (those with the largest sentiment beta in month (t-1)). This portfolio was rebalanced monthly, and return differentials were calculated without a one-month lag. We examined whether the average return differences between the first and fifth quintiles significantly deviated from zero, with negative (positive) and significant return spreads suggesting a positive (negative) influence of sentiment beta on stock returns cross-sectionally. Table 4 presents the value-weighted returns of stocks categorized by sector sentiment beta[3].

The analysis revealed that eight sectors exhibited statistically significant return spreads at the 1% significance level, while two sectors showed insignificant spreads. Seven sectors—ENE, FIN, HLC, IND, NCY, TEC, and YCY—demonstrated positive and statistically significant return spreads, ranging from 0.0120 (t-statistic of 2.63 for FIN) to 0.0762 (t-statistic of 3.56 for ENE), suggesting a negative impact of sector sentiment on stock returns within these sectors. Conversely, the MAT sector showed a negative and significant monthly average return spread of -0.1733 (t-statistic of -4.83), indicating a positive impact of sector sentiment beta on stock returns. The highest

[3]We apply VIX as an alternative proxy for market sentiment and repeat the univariate portfolio analysis. The results are consistent with our main results

sentiment beta stocks yielded low, insignificant monthly returns, while stocks with the lowest sentiment beta produced significant, positive monthly returns, highlighting a premium associated with low sentiment beta stocks. Notably, the average return and return spread for the MAT sector were substantially higher than those for the other sectors, suggesting the strongest effect of sector sentiment on stocks within MAT. The distinction between MAT and the other sectors could be due to intra-sector or inter-sector characteristics. Moreover, MAT exhibited the highest annualized Sharpe ratio among the sectors at 2.0626, indicating potentially higher returns relative to risk for sentiment-based investment strategies within this sector.

Panel B assessed if common risk factors could explain the significant return spreads by regressing them on known predictors using four different factor models: CAPM, Fama-French three-factor, Carhart four-factor, and Fama-French five-factor models. The persistence of statistically significant alphas and unchanged signs suggested that sector sentiment premiums are not fully accounted for by these common risk factors, with only a small portion of the premium explained as more factors are introduced.

Panels C and D reported the abnormal returns for the bottom and top portfolios, respectively. The findings indicated that the sector sentiment effect was predominantly driven by stocks less sensitive to sector sentiment changes in most sectors, while stocks with the highest sensitivity only showed significant alphas in sectors COM and HLC. This asymmetry underscores that stocks with minimal sentiment sensitivity are the primary contributors to the sector sentiment effect across most sectors.

[Insert Table 4]

Figure 4 shows the cumulative returns for the bottom portfolio (shown with a solid line) and the top portfolio (shown with a dashed line) across different sectors. In seven sectors with positive and significant differences in returns, stocks with a higher sentiment beta have lower cumulative returns compared to those with a lower sentiment beta. This indicates that stocks in the bottom quintile perform better than those in the top quintile. Specifically, in these sectors, the cumulative returns for stocks with a high sentiment beta are slightly positive. However, in the MAT sector, which has a negative and statistically significant average return difference, the top portfolio's cumulative return is higher than that of the bottom portfolio. In this sector, stocks with the highest sentiment beta show slightly positive cumulative returns, while those with the lowest sentiment beta have a downward trend, falling below zero. Generally, the cumulative returns for the bottom portfolio in most sectors either show an upward trend above zero or a downward trend below zero, whereas the cumulative returns for the top portfolio are mostly around zero. Additionally, in the UTL sector, the cumulative returns for the top and bottom quintiles mix together throughout the entire sample period. For the COM sector, the difference in cumulative returns grows, stabilizes between 1999 and 2007, but then decreases from 2007 to 2019. Before September 2018, stocks with a lower sentiment beta performed better than those with a higher sentiment beta, but this

trend reversed afterward. It is noted that, except for the NCY sector, the cumulative returns for both top and bottom portfolios dropped sharply from 2008 to 2009 due to the global financial crisis. The decrease in cumulative returns was more significant for the top portfolios than for the bottom portfolios.

[Insert Figure 4]

To provide an exhaustive analysis of the attributes of five portfolios sorted by sentiment beta within each sector, we present summary statistics for various characteristics across each quintile in Table 5. These characteristics encompass sentiment beta, illiquidity (adjusted by 10^6), momentum, return reversal, size, bid-ask spread, price, book-to-market ratio, profitability, analyst disagreement, analyst coverage, market beta, institutional ownership, and idiosyncratic volatility[4]. Across ten sectors, a consistent pattern emerges regarding the characteristics of these portfolios. Specifically, stocks with a lower sentiment beta are associated with reduced levels of illiquidity, bid-ask spread, analyst disagreement, idiosyncratic volatility, and market beta. Conversely, they exhibit elevated levels of return momentum, return reversal, price, size, analyst coverage, and institutional ownership.

[Insert Table 5]

Our analysis reveals several key insights into the behavior of stocks across sentiment beta quintiles. Firstly, sentiment beta increases progressively across quintiles, with a notable surge in the top quintile, indicating that stocks with the highest sentiment beta are primarily small-cap stocks. Contrary to expectations, these stocks exhibit lower returns, suggesting that the sentiment effect may be independent of the size effect. Secondly, lower sentiment beta stocks demonstrate positive short-term and intermediate-term returns, indicating their attractiveness in both periods, while higher sentiment beta stocks do not follow this trend. Thirdly, despite the expectation of an illiquidity premium, stocks in the top sentiment-beta quintile generate near-zero returns, challenging the conventional belief in compensation for illiquidity risks. Additionally, our findings show that high sentiment beta stocks tend to have a poorer information environment, characterized by lower analyst coverage and institutional ownership, but higher levels of disagreement and bid-ask spread. These stocks also exhibit greater market and firm-level risks, as indicated by higher market beta and idiosyncratic volatility. In summary, stocks with lower sentiment beta are perceived as safer and more stable investments with a favorable information environment, while those with higher sentiment beta attract speculative investors due to their greater uncertainty and volatility. This suggests a divergence in investor appeal, with sentiment-driven investors gravitating towards high sentiment beta stocks and more rational investors preferring stocks with lower sentiment beta.

[4]Detailed definitions of these variables are available in the Appendix.

4.3 Bivariate Analysis

This section investigates the robustness of the univariate analysis results by considering the impact of well-documented factors that influence stock returns. Prior research has extensively identified several key factors, including market beta, illiquidity, size, return reversal, momentum, profitability, and book-to-market ratio, as significant determinants of stock returns (Ross, 1977; Amihud, 2002; Fama and French, 1993; Bali et al., 2011; Cosemans and Frehen, 2021). The aim is to assess whether the initial findings remain consistent when these established factors are controlled for. Our methodology involves, for instance, adjusting for market beta by creating quintile portfolios based on this factor. Within each market beta quintile, stocks are further sorted into quintiles according to sector sentiment beta, with quintile 1 containing stocks with the lowest sentiment beta and quintile 5 comprising those with the highest.

To concisely present our findings, Table 6 displays the returns for quintiles 1 and 5, the return spreads between these quintiles, and the abnormal returns adjusted using the Fama-French 5 Factor model. The results demonstrate that the sector sentiment premium remains significant in nearly half of the sectors, even after accounting for the six aforementioned factors. This underscores the robust influence of sector sentiment on stock returns in a substantial portion of the sectors examined.

[Insert Table 6]

Panel A illustrates the outcomes for value-weighted portfolios after adjusting for market beta. The analysis reveals that seven sectors display statistically significant return differentials, with the Energy (ENE), Technology (TEC), and Utilities (UTL) sectors showing no significant differences. Specifically, six sectors—Finance (FIN), Industrials (IND), Healthcare (HLC), Consumer Non-Cyclicals (NCY), Technology (TEC), and Consumer Cyclicals (YCY)—exhibit positive and significant return spreads. Conversely, the Communication Services (COM) and Materials (MAT) sectors present significant negative return disparities. For instance, the Finance sector (FIN) demonstrates a positive, statistically significant return spread of 0.0143, supported by a t-statistic of 3.62. This suggests that market beta and associated market risks do not account for the sentiment's influence. Additionally, the return disparities across these six sectors are not explained by size, value, momentum, profitability, and reversal factors, indicating their abnormal returns are statistically significant.

In Panel B, after controlling for illiquidity, seven sectors (COM, ENE, FIN, HLC, NCY, TEC, and UTL) have positive and significant return spreads, and the remaining three sectors (IND, MAT, and YCY) have insignificant return spreads. The estimated alphas for these six sectors are also positive and significant, indicating that illiquidity cannot subsume the sector sentiment impact. For instance, the return spread for ENE is 0.180 with a t - statistic of 3.98, and the corresponding estimated alphas range from 0.0188 with a t - statistic of 4.81 to 0.184 with a t - statistic of 4.02.

Compared to single sorting, the return spreads and abnormal returns for IND, MAT, and YCY become insignificant, suggesting that illiquidity can subsume the sector sentiment effect. The return spreads and estimated alphas for ENE, FIN, HLC, NCY, and TEC remain positive and significant and increase in value. For COM and UTL, the return spreads and estimated alphas become positive and significant, indicating that the sector sentiment effect is induced after controlling for illiquidity. This implies that the positive impact of illiquidity may offset the negative effect of sector sentiment.

Panel C examines adjustments based on size. Post-adjustment, six sectors report positive and significant return spreads, with four sectors (Materials (MAT), Consumer Non-Cyclicals (NCY), Utilities (UTL), and Consumer Cyclicals (YCY)) showing no significant spreads. The return spreads and estimated alphas indicate that size adjustments do not fully capture the negative impacts of sector sentiment across most sectors. In specific, compared to single sorting, five sectors (ENE, FIN, HLC, IND, and TEC) continue to exhibit positive and significant return differentials and estimated alphas, with values increasing after controlling for size. However, for three sectors (MAT, NCY, and YCY), the return differentials and estimated alphas become insignificant, indicating that controlling for the size effect subsumes the sentiment beta effect for these sectors. Only for COM, the return spreads and estimated alphas turn negative and significant, suggesting that controlling for the size effect induces the sector sentiment beta effect, meaning that the small - size premium offsets the low sentiment beta effect

Panel D, after controlling for return reversal, reveals that six sectors maintain positive and significant return spreads, while four sectors show no significant spreads. This suggests that sector sentiment continues to positively influence cross-section returns even after accounting for return reversal. Similarly, when controlling for momentum (Panel E), six out of ten sectors (COM, ENE, FIN, HLC, IND, and UTL) have negative and significant return spreads, and the remaining sectors (MAT, NCY, TEC, and YCY) have insignificant return spreads. The monthly return spreads for these six sectors range from 0.0061 (t - statistic = - 2.30) for UTL to - 0.0129 (t - statistic = 2.68) for HLC, and their abnormal returns are positive and significant. This indicates that momentum cannot explain the returns of long - short portfolios, and the return spreads cannot be captured by it.

Panel F, addressing profitability adjustments, shows that seven sectors have statistically significant return spreads, and the other three sectors have insignificant return spreads. The estimated alphas for the seven sectors are positive and significant, indicating that profitability cannot explain the cross - sectional impact of sector sentiment.

Finally, Panel G, after controlling for the book-to-market ratio, reports that six sectors (COM, FIN, HLC, MAT, NCY, and YCY) have positive and significant return spreads, and four sectors have insignificant return spreads. The return spreads for the six sectors

range from 0.0040 (t - statistic = - 1.95) for FIN to 0.0366 (t - statistic = 2.38) for YCY, and their corresponding estimated alphas are positive and significant. Thus, the book - to - market ratio has no explanatory power for the sector sentiment premium.

In summary, the analysis across various panels indicates that over half of the sectors demonstrate a significant relationship between sentiment beta and future stock returns, even after controlling for multiple risk factors. This highlights the limited explanatory power of common risk factors for the sector sentiment effect, underscoring the robust influence of sector sentiment on stock returns.

4.4. Firm-Level Fama-MacBeth Regressions

We perform Fama-MacBeth (1973) regressions within each sector to investigate the impact of sector sentiment on stock returns. We estimate the return premium for sector sentiment by regressing excess stock returns in month t+1 on a firm's sector sentiment beta and a vector of control variables $X_{j,t}$ measured in month t.

$$R_{j,t+1} - r_{f,t+1} = \alpha_t + \beta_{1,t} SentiBeta_{j,t} + \beta_{2,t} X_{j,t} + \varepsilon_{j,t} \quad (3)$$

$X_{j,t}$ includes market beta (Beta), size, book-to-market ratio (BEME), momentum (MOM), short-term reversal (REV), illiquidity, idiosyncratic volatility (ivol), profitability, analyst coverage, and institutional ownership (IO). Each independent variable is winsorised and is standardized to have a mean of zero and a standard deviation of one in each month t. Therefore, the regression coefficients measure the impact of one standard deviation change in the independent variables on the stock returns of the next month.

Table 7 displays the outcomes. Within each panel, column (1) outlines the findings from univariate Fama-MacBeth regressions. Seven sectors out of ten—specifically, Finance (FIN), Healthcare (HLC), Industrials (IND), Consumer Non-Cyclicals (NCY), Technology (TEC), Utilities (UTL), and Consumer Cyclicals (YCY)—exhibit negative and significant coefficients, signifying a negative correlation between sector sentiment beta and stock returns. Conversely, the Materials (MAT) sector shows a positive and significant coefficient, indicating a positive correlation between sector sentiment beta and stock returns. The remaining two sectors, Communication Services (COM) and Energy (ENE), present insignificant coefficients, implying that sector sentiment does not influence stock returns in these cases.

[Insert Table 7]

When comparing these findings to the single sorting results discussed in Section 4.2, it is observed that the outcomes of the univariate Fama-MacBeth regressions align for eight sectors, with the exceptions being ENE and UTL. The Energy (ENE) sector demonstrates an insignificant coefficient, suggesting that stock returns are unaffected by sector sentiment in a stock-level cross-sectional regression. This indicates that the

influence of sector sentiment might be concentrated within a specific subset of stocks. Conversely, the Utilities (UTL) sector exhibits a negative and significant impact from sector sentiment when analyzed through stock level regression, indicating a shift in sentiment's effect on stock returns within this sector.

Columns (2) through (10) present the outcomes of multi-variate Fama-MacBeth regressions, which account for a variety of control variables. Regrettably, the analysis reveals that the significance of the sector sentiment beta coefficients diminishes, with them becoming less significant, reduced in magnitude, or even turning insignificant in most sectors (eight out of ten). This indicates that the cross-sectional influence of sector sentiment beta may be explained by a range of common risk factors and other well-documented predictors or market anomalies. Despite this, there remain several significant findings. For instance, we find that after controlling for market beta, size, book-to-market ratio, momentum, return reversal, and illiquidity, the coefficients of sector sentiment beta remain significant for Healthcare (HLC), Materials (MAT), Consumer Non-Cyclicals (NCY), and Technology (TEC). However, their significance is greatly reduced when idiosyncratic volatility is considered, suggesting that much of sector sentiment's effect may overlap with idiosyncratic risks. For the Finance (FIN) and Utilities (UTL) sectors, sentiment beta retains its significance only when market beta is controlled for, indicating that sector-specific information rather than market movements has a more pronounced effect on stock returns. Yet, this significance is lost upon further control for size, book-to-market ratio, and momentum, with these factors explaining much of the variation in stock returns. Consumer Cyclicals (YCY) and Industrials (IND) show that sentiment beta becomes insignificant after controlling for common risk factors, indicating a lack of a robust impact. Notably, for YCY, sentiment beta turns positively significant with the inclusion of analyst coverage and institutional ownership, suggesting a nuanced influence in this sector. Communication Services (COM) consistently show no significant impact from sector sentiment across all controls, mirroring single sorting results. In contrast, the Energy (ENE) sector displays a significant positive impact from sector sentiment after controlling for market beta and other factors, but this significance disappears with the inclusion of idiosyncratic volatility, analyst coverage, and institutional ownership. This indicates that while sector sentiment has a discernible impact on stock returns, its effect is closely intertwined with stock-specific risks and uncertainties.

In summary, our findings underscore two key points. Firstly, the outcomes from the univariate Fama-MacBeth regressions are largely consistent with those obtained from single sorting, affirming the influence of sector sentiment across most sectors. Secondly, the results from multivariate analyses exhibit considerable variation across different sectors. Notably, the significance of the sector sentiment premium varies significantly by sector, and the common factors influencing its significance also differ markedly between sectors. Hence, it is crucial to take into account sector-specific characteristics when examining the effect of sector sentiment on stock returns.

5. Further Analysis

In this section, we explore whether investor underreaction and limits-to-arbitrage could explain the positive sector sentiment premium. Additionally, we analyze subsample periods to determine if market sentiment states influence the cross-sectional impact of sector sentiment. Lastly, we study whether sector characteristics could explain the heterogenous impact of sector sentiment on stock returns.

5.1. Investor Underreaction

We propose that investor underreaction explains the positive relationship between sector sentiment beta and returns. Barberis et al. (1998) argue that overreaction occurs for stocks with high sector sentiment beta, while underreaction affects stocks with low beta. Our prior findings indicate that the stocks with lower sector sentiment beta are less sensitive to the sectoral sentiment changes, and are featured with large size, low volatility and high analyst coverage. Such stocks are considered as safe and mature, with stable cash flows. Conversely, stocks with highest sector sentiment beta are more sensitive to sector sentiment fluctuations, often speculative and attract investors seeking quick gains (Baker and Wurgler, 2006).

Irrational investors tend to focus on high sentiment beta stocks, potentially overlooking low beta stocks. A positive sector sentiment shift, creates undervaluation in low beta stocks as capital flows to high beta stocks. Rational investors eventually correct this underpricing, but the process is gradual, taking several quarters due to the lower speculative appeal of these stocks (Cohen and Frazzini, 2008). Furthermore, low sentiment beta stocks are perceived as safe and stable (Zheng and Osmer, 2021). The rational investors tend to pay insufficient attention initially, leading to delayed price adjustments and sustained demand, which result in persistent positive returns (Fuss et al., 2019). During negative sentiment shifts, low beta stocks experience limited overpricing due to restricted cash outflows, with price corrections occurring slowly. Overall, low sector sentiment beta stocks are more likely to be undervalued, contributing to positive returns.

Stocks with high sector sentiment beta, influenced by transient daily sentiment effects (Da et al., 2016), exhibit short-lived returns. Hence, we anticipate no significant monthly impact of sector sentiment on these stocks. This dynamic underpins the positive return spread between low and high sentiment beta stocks over extended periods. To validate this, we extend holding periods to 3, 6, 12, 24, 36, 48, and 60 months, with a one-month formation period.

Table 8 presents cumulative returns and alphas for long-short portfolios of the top and bottom quintiles across sectors. Results for HLC and MAT are shown as examples, with other sectors detailed in Appendix 3-1. The sentiment beta effect persists for 3 to 60

months in seven sectors (ENE, FIN, HLC, MAT, NCY, TEC, and YCY). For IND, significant effects are observed for 12- and 24-month holding periods but not beyond. In contrast, COM and UTL exhibit significant return spreads for longer holding periods. Appendix 3-2 shows cumulative returns and alphas for high-sentiment beta stocks. Most sectors display insignificant returns for 3 to 12 months, with some significance emerging at 60 months. Appendix 2-3 reports results for low-sentiment beta stocks, where eight sectors demonstrate significant returns and increasing trends within 12 months, except for COM and UTL. For 24 to 60 months, eight sectors remain significant, with ENE and FIN as exceptions.

In summary, the sentiment beta effect is robust over extended periods. The return continuation for low-sentiment beta stocks indicates that underpricing persistence drives the sector sentiment effect.

[Insert Table 8]

5.2.Subsample Periods

To explore the asymmetric pricing effects of sentiment on asset prices conditional on aggregate investors' sentiment, we follow the method of Jacoby et al. (2024) and divide the sample into low-, medium-, and high-sentiment months based on market sentiment. We classify months into low-, medium-, and high-sentiment months using the breakpoints calculated by the average monthly median market sentiment of the full-sample periods minus or plus 0.5 of a full-sample standard deviation. Table 9 shows that there are 252 months in total, with 91 low-sentiment months, 88 medium-sentiment months, 73 high-sentiment months. According to Baker and Wurgler (2006) and Shen et al. (2017), rational investors dominate the market during low sentiment. In section 5.1, since rational investors are believed to significantly impact the low-sentiment beta stocks, the low market sentiment will strengthen rational investors' underreaction, leading to pervasive undervaluation. In contrast, during the high-sentiment periods, irrational investors dominate the market, causing overpricing. We anticipate that undervaluation-driven sector sentiment premiums occur more frequently following low-sentiment periods.

[Insert Table 9]

Table 10 reports the value-weighted portfolio results for each sentiment regime (low-, medium-, high-sentiment months in Panel A, B, and C). Aligned with the results from full-sample periods, Panel A shows significant return spreads for seven sectors during low-sentiment months, with stronger spreads compared to medium and high periods. Specifically, ENE, HLC, IND, NCY, TEC and YCY display positive and significant return spreads, with an average monthly excess return spreads of 7.00% at least 5% significance level, suggesting that stocks with the highest sector sentiment beta tend to generate lower average excess returns following the low-sentiment months.

In contrast, column (6) displays that the return spread for MAT is negative and significant, with an average monthly excess return spread of -30.7% at a 1% significance level, suggesting that stocks with higher sector sentiment beta tend to generate higher average excess returns following the low-sentiment periods. The magnitude of return spreads for MAT is much greater than those for other sectors, indicating that sector sentiment has a stronger impact on MAT compared to the other sectors. We also report risk-adjusted returns (alphas) for the long-short sector sentiment beta portfolios to examine whether common risk factors may have explanatory power over the statistically significant portfolios. We find that the FF5 Alphas are significant for seven sectors, suggesting that common risk factors cannot explain the negative relation between sentiment beta and returns following the low-sentiment months.

[Insert Table 10]

In Panel B, we present the single sorting results following the medium-sentiment months. Although the results are consistent with those during the full-sample periods, fewer sectors display significant return spreads. Six sectors (i.e., ENE, FIN, HLC, IND, TEC and YCY) show positive and significant return spreads, with an average monthly excess return spreads around 3.75% at least 5% significance level, indicating that stocks with higher sector sentiment beta tend to have lower average excess returns following the medium-sentiment months. Besides, we find that the FF5 Alphas are significant for four out of six sectors except for FIN and TEC, indicating that commonly used asset pricing model can explain the sentiment-beta relation for these sectors following the medium-sentiment months (except for FIN and TEC). We present the results during the high-sentiment periods in Panel C. Four sectors display significant return spreads. The results for ENE, MAT and YCY are consistent with those during full sample periods. FF5 Alphas are significant only for COM and MAT, indicating that those common risk factors have no explanatory power for the sentiment-beta relation following the high-sentiment months.

Overall, the results show that most sectors are positively and significantly affected by sector sentiment during low-sentiment months, with stronger spreads compared to medium and high periods. Panels B and C show fewer significant spreads for medium and high sentiment months, respectively, supporting the hypothesis that low-sentiment periods amplify the sector sentiment effect.

5.3. Sector Characteristics and Sector Sentiment Beta Premium

Prior research suggests that characteristics affecting stock valuation uncertainty stimulate speculative demand, thereby influencing the impact of sentiment on stock returns (Glushkov, 2006). Specifically, stocks categorized as "hard-to-value" and subject to high arbitrage costs tend to experience greater sentiment-induced mispricing. This insight informs our examination of sector-specific characteristics. Similarly, Molchanov and Stangl (2017) find that sectors with distinctive valuation-related

attributes are more susceptible to investor sentiment. Moreover, Hou (2007) investigates cross-sector lead-lag effects driven by factors related to the information environment, proposing that a deficient information environment, indicative of inefficient information assimilation, amplifies sentiment's role in stock returns.

Building on this literature, our study explores whether sector characteristics related to valuation uncertainty, information environment and concentration can explain the variations in the impact of sector sentiment on cross-sectional returns across the ten sectors under consideration. We identify several sector-specific characteristics pertinent to speculative demand, including momentum, return volatility, market beta, and the book-to-market ratio. Additionally, we consider variables related to the information environment, such as analyst coverage and institutional ownership (IO). Size and the Herfindahl concentration index (HHI) are employed as proxies for the product market. Panel regression analysis is conducted to examine the relationship between sector sentiment beta premium and these characteristics across the ten sectors, with detailed results presented in Table 12.

$$Return\ Spread_{i,t+1} = \alpha + \beta_X X_{i,t} + \varepsilon_{i,t} \quad (5)$$

$Return\ Spread_{i,t+1}$ refers to the return differentials between the bottom and top portfolios sorted by sector sentiment beta for each sector *i* at month $t+1$. $X_{i,t}$ denotes the sector characteristics for each sector *i* at month *t*. We include sector characteristics of three categories and discuss their hypothesized relationship with sector sentiment beta premium in the following.

Valuation Uncertainty

Sector Momentum

Sector return momentum serves as a proxy for speculative demand, consistent with Molchanov and Stangl (2017). Return momentum is calculated as the cumulative return from month $t-12$ to $t-2$ to avoid short-term return reversal. Moskowitz and Grinblatt (1999) find the persistence of industry momentum, where past winner industries tend to earn higher returns in the future and past loser industries tend to earn lower future returns. Barberis et al. (2005) propose a model where irrational investors base their decisions on past performance, channeling more capital into outperforming styles and withdrawing from underperforming ones. Consequently, capital inflows increase for winner sectors and decrease for loser sectors, amplifying returns for the former.

Larger momentum reflects greater speculative opportunities, attracting more irrational and speculative investors. In such sectors, stocks with low sector sentiment beta are more heavily undervalued due to disproportionate capital flows favoring high sentiment beta stocks. As the market recognizes and corrects the mispricing, these low-beta stocks are expected to outperform. Thus, we anticipate a positive relationship between sector momentum and sector sentiment premium, with higher momentum

sectors yielding greater monthly return spreads (P1-P5) between stocks with the lowest and highest sentiment beta.

Volatility and Market Beta

We employ sector return volatility and market beta as proxies of speculative demand. Prior studies (Peng and Xiong, 2006; Kumar, 2009) link speculative demand with heightened return volatility. We estimate sector volatility using a 12-month rolling standard deviation, while market beta is estimated via a single-index CAPM model over a 26-month rolling window. Sectors with higher volatility and beta attract speculative trading, drawing irrational investors while deterring rational ones. This dynamic exacerbates the underpricing of low sentiment beta stocks, which subsequently experience higher future returns as the market corrects the mispricing. Hence, we hypothesize a positive relationship between both volatility measures and sector sentiment premium.

Book-to-Market Ratio

We use book-to-market ratio (BE/ME) to measure a sector's growth potential. It is calculated as the equal-weighted BE/ME of stocks within a sector. Stocks with low BE/ME ratios are growth firms which are hard to value. Baker and Wurglur (2006) suggest a positive association between growth firms and sentiment-induced returns since growth firms are easily affected by sentiment due to valuation uncertainty. In a similar spirit, Sectors with lower BE/ME ratios, characterized by high growth potential and valuation uncertainty, attract irrational and speculative investors. Stocks with low sentiment beta within these sectors suffer from pronounced underpricing due to underinvestment. Over time, as the market recognizes the fundamentals of these undervalued stocks, they attract increased investment and deliver higher returns. Consequently, sectors with higher growth potential are expected to exhibit lower return spreads, leading us to assume a negative relationship between the book-to-market ratio and sector sentiment premium.

Information Environment

Analyst Coverage and Institutional Ownership

Following Hou (2007), we use analyst coverage and institutional ownership (IO) as proxies, to explore how the sector information environment affects the impact of sector sentiment. Analyst coverage is calculated as the equal-weighted average of stock-level analyst coverage within a sector, measured by the natural logarithm of the number of analyst reports. Stocks with higher levels of analyst coverage typically have greater institutional ownership, as institutional investors tend to favor stocks with more robust analyst coverage.

Sectors characterized by higher analyst coverage and institutional ownership are associated with more efficient information environments. Hou (2007) shows that in such sectors, investors incorporate information in a more timely manner and make more rational decisions. Institutional investors, equipped with better to information,

predominantly rely on fundamental values rather than sentiment when making investment decisions. Additionally, increased analyst coverage enhances information disclosure, ensuring that market participants are better informed and contributing to more efficient pricing mechanisms.

In an efficient information environment, stocks with low sector sentiment beta are less prone to underpricing, as information is priced in promptly such that prices reflect fundamentals rather than sentiment. Sophisticated investors, who base their decisions on these fundamentals, further mitigate the potential for sentiment-driven mispricing. Consequently, sectors with higher levels of analyst coverage and institutional ownership are expected to exhibit lower return spreads, indicating a negative relationship between sector sentiment beta premium and both analyst coverage and institutional ownership.

Sector Structure Concentration

The Herfindahl Index and Sector Size

The Herfindahl index (HHI) is a direct measure of concentration whereby a higher HHI indicates a greater level of concentration and a lower level of competitiveness. HHI is estimated by the sum of the squared market share of all firms within a sector. Sector size, measured as the average natural logarithm of the market capitalization of stocks within a sector, provides an alternative indirect proxy for competitiveness, as suggested by Molchanov and Stangl (2017). Larger sector size is generally associated with lower levels of competitiveness.

Highly competitive sectors are often characterized by uncertain growth prospects and elevated perceived risks, making them more susceptible to sentiment-driven fluctuations. In less concentrated sectors (lower HHI), the mispricing of low sentiment beta stocks is more pronounced, as capital disproportionately shifts toward high sentiment beta stocks. This dynamic exacerbates the undervaluation of low sentiment beta stocks, leading to a stronger positive relationship between sector sentiment beta and stock returns. Consequently, we hypothesize a negative relationship between the sector sentiment premium and the sector's concentration level, as measured by both HHI and sector size.

Table 11 summarizes sector-level characteristics. MAT stands out with the largest average BE/ME ratio, reflecting a pronounced value premium. Additionally, COM and MAT also exhibit the highest levels of analyst disagreement, suggesting greater information uncertainty within these sectors.

[Insert Table 11]

In Table 12, we present the results of the panel regression between sector sentiment premium and sector characteristics. Column (1) presents the results of the pooling regression. The BE/ME ratio has a significant and negative coefficient of -0.0152 at the

5% significance level, indicating that sectors with higher BE/ME ratios, which are less subject to valuation uncertainty, tend to have smaller sentiment-induced return spreads. This finding aligns with our expectations. As far as the role of information enviroment is concerned, we find that the coefficients of IO and analyst coverage are significant with opposite signs, indicating an offset effect between the two on driving the sentiment beta premium. Additionally, HHI show a significant negative coefficient of -0.0511, suggesting that less concentrated sectors (those with lower HHI) tend to have larger sentiment-related return spreads.

To further explore the relationship between sector sentiment beta characteristics and sentiment beta premium, Column (2) reports the results of panel regression under sector fixed effect. The result shows only HHI and BE/ME have significant coefficients. In comparison to pooling regression, it suggests that the significance of the information environment variables (IO and analyst coverage) under pool regression mainly comes from sector heterogeneity, indicating that the relations between these variables and sentiment-induced return spreads are not robust. The coefficient of HHI is -0.2147 with a t-statistics of -4.97, consistent with our expectation. It implies that sectors with lower HHI, which is less concentrated, tend to have higher sentiment return spreads. However, we find that the coefficient of BEME is 0.0096 with a t-statistics of 1.93, suggesting a positive relation between BEME and sentiment-induced return spreads. It is inconsistent with our expectation, implying the negative relation may be mainly attributed to cross-sector variations instead of time-series variations of the BEME ratio. We also present the results under year fixed effect in column (3). The results are similar to those obtained from the pooled regression except for IO, suggesting that differences across years have a minimal impact on the overall results. The coefficient of institutional ownership becomes insignificant but still negative, -0.0089 with a t-statistics of -1.24, which is consistent with our expectation.

Finally, we report the results under two-way fixed effects in Column (4). Among all significant variables in Columns (1)-(3), only HHI shows a significant and negative coefficient of -0.2073 with t-statistics of -3.73, indicating that sectors with higher HHI tend to have less sentiment-related return spreads. On the other hand, the coefficient of return volatility is -0.0139 with a t-statistics of -1.75. The results align with our expectation, suggesting that sectors with higher return volatility, subject to high valuation uncertainty, tend to have higher sentiment-induced return spreads due to severe undervaluation of stocks with low sector sentiment beta.

[Insert Table 12]

In summary, our results in this section indicate that sector concentration, proxied by HHI, consistently exhibits a robust and significant negative impact on sentiment-induced mispricing, even after accounting for sector and year fixed effects. In contrast, the effect of valuation uncertainty and information environment is less robust, becoming statistically insignificant when fixed effects are applied. Furthermore, the

findings suggest that year-to-year variations have minimal influence on the relationships between the book-to-market ratio (BEME), analyst coverage, and the sector sentiment premium. These results underscore the importance of sector-level concentration as a key determinant of sector sentiment-induced mispricing, while highlighting the importance of sector heterogeneity in shaping the pricing of sentiment.

6. Conclusion

This paper investigates the relationship between sector sentiment beta and cross-sectional stock returns. Using the method of Jacoby et al. (2024), we estimate monthly sector sentiment beta for individual stocks and sort them into quintiles based on their sentiment beta, from low to high. A long-short portfolio strategy, holding low-sentiment beta stocks and shorting high-sentiment beta stocks, reveals that monthly portfolio returns are positive and statistically significant for most sectors. This indicates a negative relationship between sector sentiment beta and stock returns, where stocks with the lowest sentiment beta outperform those with the highest sentiment beta. However, a positive sentiment beta-return relationship is observed in the materials (MAT) sector, while communication (COM) and utilities (UTL) sectors show no significant impact of sector sentiment on cross-sectional returns.

An analysis of stock characteristics within the sentiment beta quintiles highlights that low-sentiment beta stocks tend to exhibit lower levels of illiquidity, bid-ask spreads, analyst disagreement, idiosyncratic volatility, and market beta. Conversely, these stocks demonstrate higher levels of return momentum, return reversal, price, size, analyst coverage, and institutional ownership. These findings suggest that low-sensitivity stocks are less constrained by arbitrage and less attractive to speculative and irrational investors compared to high-sensitivity stocks.

We propose investor underreaction as a potential mechanism underlying the negative sentiment beta-return relationship. Our results show that return spreads between low- and high-sentiment beta stocks are significant and increase with longer holding periods. Low-sensitivity stocks yield consistently positive cumulative returns over 3 to 60 months, while high-sensitivity stocks generate near-zero and statistically insignificant returns over the same periods. This supports the hypothesis that irrational investors underreact to low-sensitivity stocks, leading to their initial underpricing and gradual correction over time. Speculative investors tend to favor high-sensitivity stocks, perceiving them as opportunities for quick gains, while overlooking low-sensitivity stocks, which are deemed safer (Zheng and Osmer, 2021).

Through subsample analysis, we find that the return spread associated with sector sentiment beta is more pronounced during low-sentiment months, underscoring the influence of broader market sentiment. Additionally, since sector sentiment premiums vary across sectors, we explore whether sector-level characteristics moderate the impact of sentiment on cross-sectional returns. Our analysis shows that sectors with

higher levels of market concentration are more likely to exhibit lower sector sentiment return premiums, highlighting the role of market structure in shaping sentiment-driven returns.

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Main Figures and Tables

Figure 1

Monthly Market Sentiment.

We plot the monthly market sentiment from January 1999 to December 2019. The daily market sentiment is aggregated from the weighted average of the daily stock sentiment.

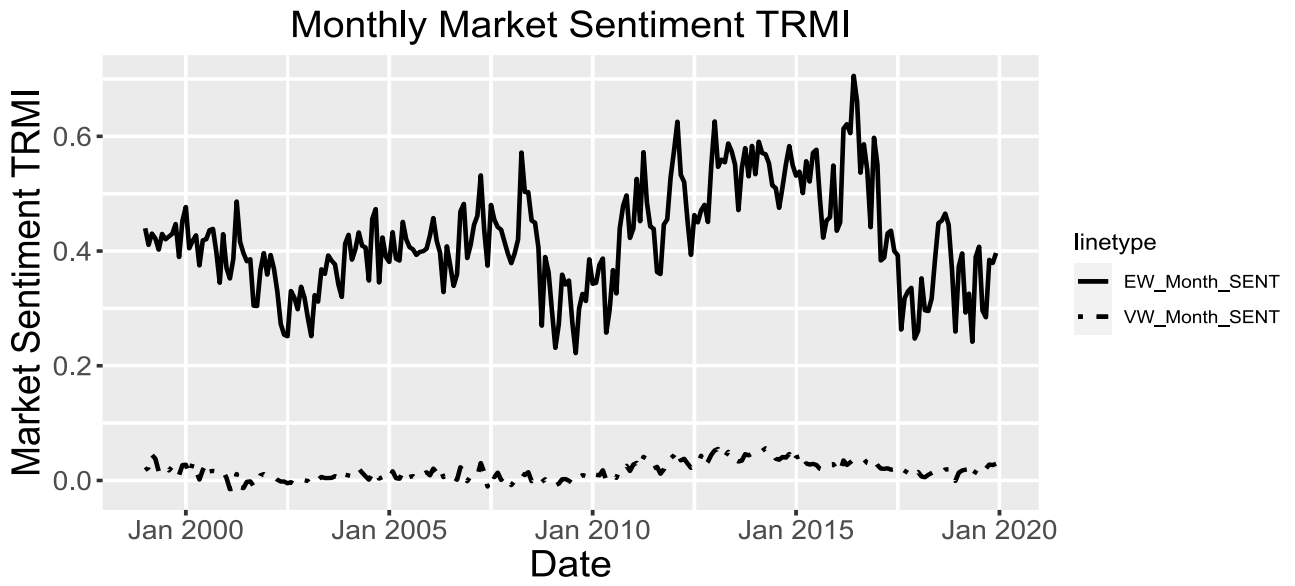

Figure 2

We plot the daily sector sentiment for each sector from January 4th, 1999, to December 31st, 2019. The daily sector sentiment is aggregated from the weighted average of the daily stock sentiment.

Figure 2-A: Equal-weighted Sector Sentiment:

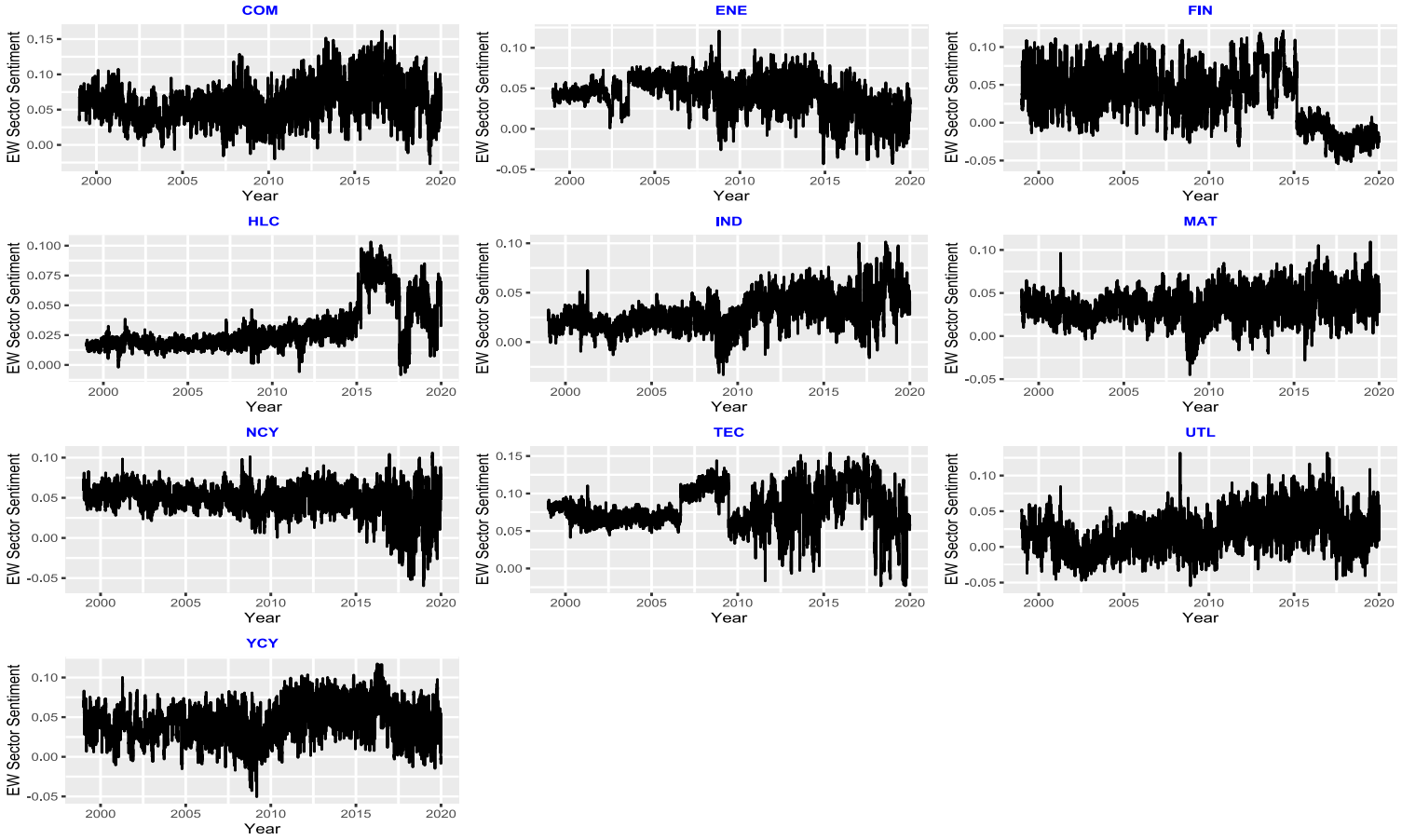

Figure 2-B: Value-weighted Sector Sentiment:

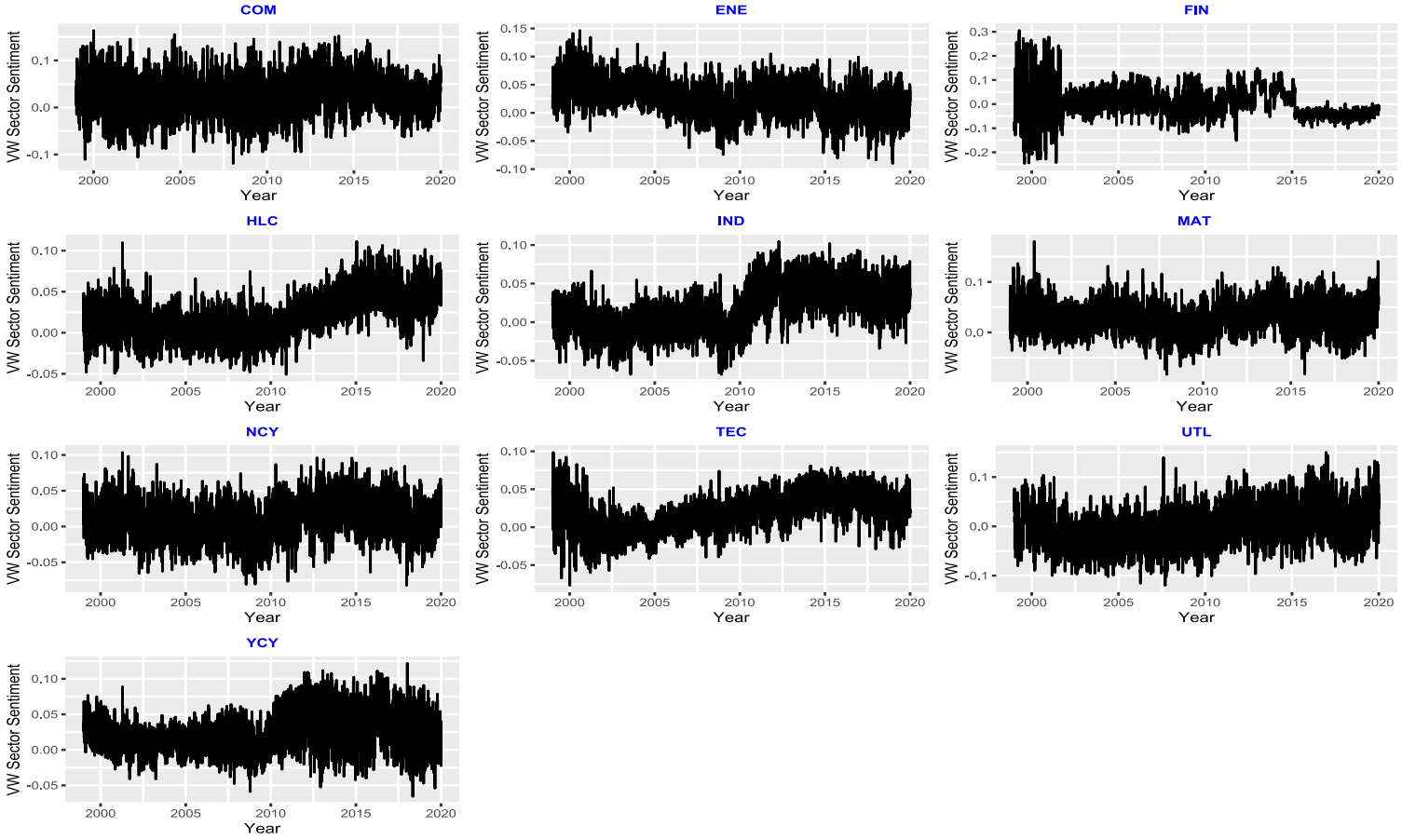

Figure 3: Returns of Portfolio Sorted by Raw Sector Sentiment Beta

This figure plots the relationship between raw sector sentiment sensitivity and portfolio performance within each sector from 1999 to 2019. The returns for five portfolios sorted by one-month lagged raw sector sentiment sensitivity.

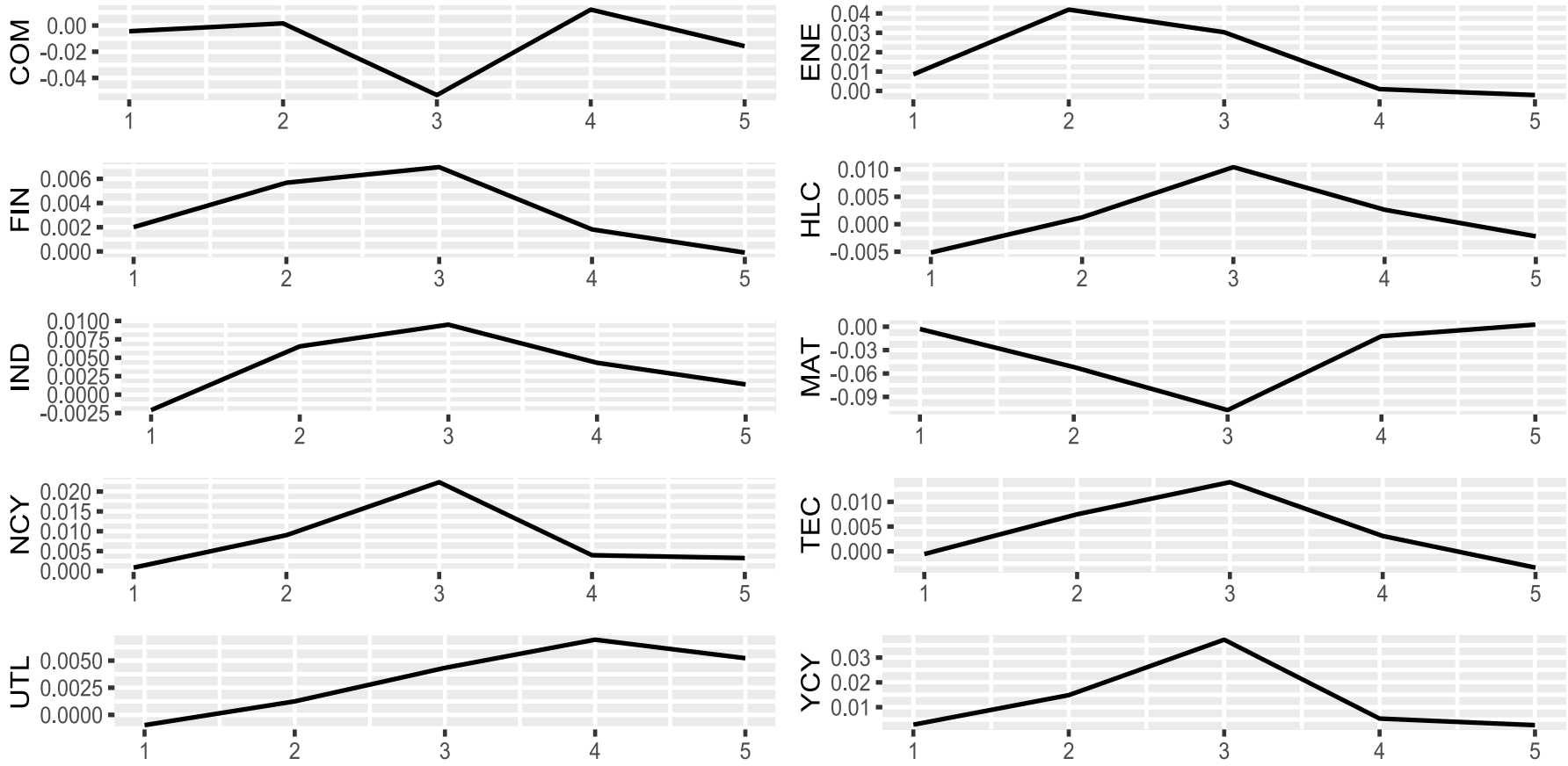

Figure 4:

This figure presents the value-weighed cumulative returns of bottom and top portfolios sorted by sentiment beta for 10 sectors from February 1999 to December 2019. The cumulative returns are plotted for the long portfolio (Dashed Line), and the short portfolio (Solid line).

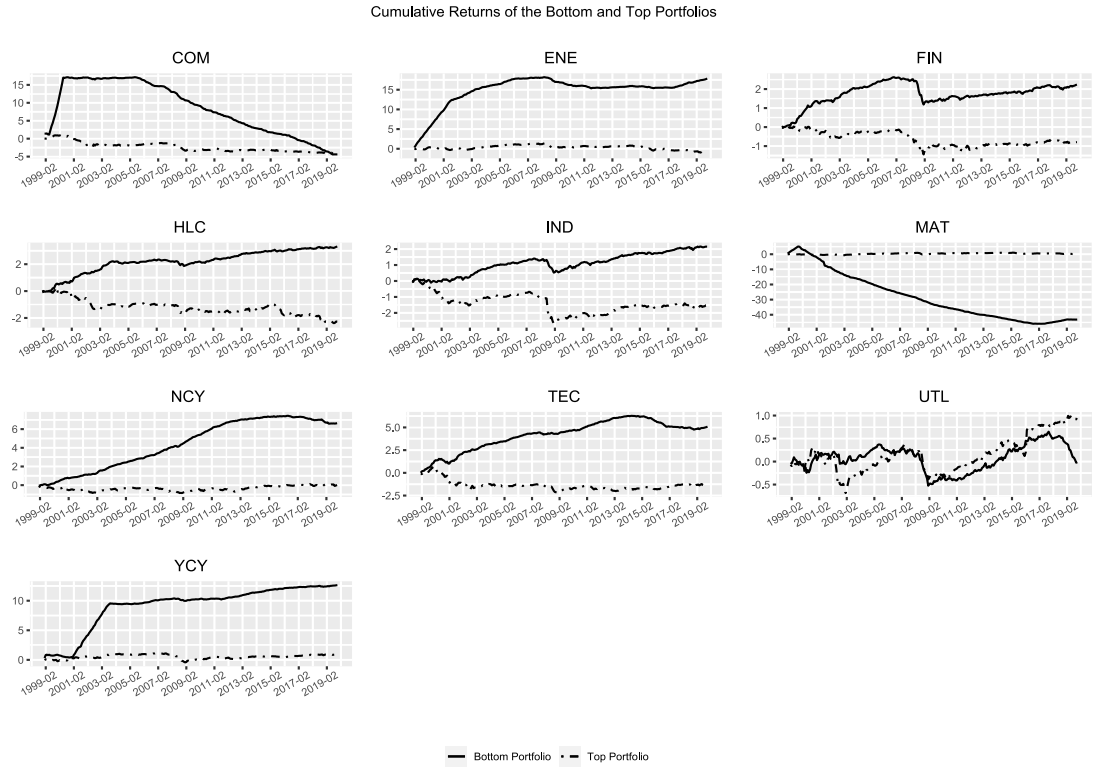

Table 1

Summary Statistics for Sector Sentiment

This table presents summary statistics for the equal-weighted and value-weighted daily sentiment and daily returns for 10 sectors.

Panel A-1: Equal-Weighted Sector Sentiment

	COM	ENE	FIN	HLC	IND	MAT	NCY	TEC	UTL	YCY
N	5283	5283	5283	5283	5283	5283	5283	5283	5283	5283
Mean	0.0605	0.0413	0.0329	0.0304	0.0305	0.0363	0.0474	0.0807	0.0220	0.0442
Stdev	0.0258	0.0211	0.0363	0.0197	0.0173	0.0164	0.0178	0.0264	0.0254	0.0224
P25	0.0423	0.0285	0.0049	0.0177	0.0185	0.0258	0.0403	0.0645	0.0032	0.0288
P50	0.0594	0.0438	0.0350	0.0227	0.0278	0.0360	0.0498	0.0755	0.0204	0.0445
P75	0.0762	0.0566	0.0562	0.0341	0.0420	0.0467	0.0583	0.1002	0.0395	0.0595

Panel A-2: Value-Weighted Sector Sentiment

	COM	ENE	FIN	HLC	IND	MAT	NCY	TEC	UTL	YCY
N	5283	5283	5283	5283	5283	5283	5283	5283	5283	5283
Mean	0.0272	0.0271	0.0032	0.0215	0.0207	0.0301	0.0122	0.0211	0.0024	0.0260
Stdev	0.0385	0.0278	0.0635	0.0255	0.0295	0.0275	0.0247	0.0240	0.0382	0.0249
P25	0.0022	0.0092	-0.0375	0.0018	-0.0025	0.0111	-0.0053	0.0037	-0.0249	0.0087
P50	0.0260	0.0289	-0.0065	0.0188	0.0187	0.0294	0.0115	0.0220	0.0008	0.0237
P75	0.0518	0.0461	0.0359	0.0408	0.0453	0.0487	0.0295	0.0391	0.0291	0.0415

Panel B-1: Equal-Weighted Sector Return

	COM	ENE	FIN	HLC	IND	MAT	NCY	TEC	UTL	YCY
N	5283	5283	5283	5283	5283	5283	5283	5283	5283	5283
Mean	-0.0040	0.0004	-0.0017	0.0014	0.0025	-0.0078	-0.0048	0.0083	0.0051	0.0002
Stdev	0.0109	0.0106	0.0076	0.0069	0.0091	0.0119	0.0145	0.0179	0.0087	0.0098
P25	-0.0114	-0.0041	-0.0051	-0.0016	-0.0021	-0.0150	-0.0186	-0.0027	0.0001	-0.0050
P50	-0.0045	0.0017	-0.0016	0.0026	0.0029	-0.0066	-0.0008	0.0036	0.0053	0.0006
P75	0.0035	0.0060	0.0019	0.0056	0.0073	-0.0002	0.0058	0.0115	0.0101	0.0057

Panel B-2: Value-Weighted Sector Return

	COM	ENE	FIN	HLC	IND	MAT	NCY	TEC	UTL	YCY
N	5283	5283	5283	5283	5283	5283	5283	5283	5283	5283
Mean	-0.0006	0.0029	-0.0017	-0.0002	0.0011	-0.0019	0.0031	-0.0025	0.0009	0.0010
Stdev	0.0104	0.0123	0.0129	0.0077	0.0108	0.0110	0.0071	0.0134	0.0091	0.0099
P25	-0.0058	-0.0027	-0.0069	-0.0041	-0.0039	-0.0074	-0.0007	-0.0087	-0.0036	-0.0041
P50	-0.0005	0.0033	-0.0017	-0.0001	0.0014	-0.0014	0.0031	-0.0020	0.0014	0.0011
P75	0.0045	0.0095	0.0034	0.0041	0.0067	0.0040	0.0068	0.0039	0.0060	0.0064

Table 2

Summary Statistics for Sector Returns

This table presents summary statistics for the value-weighted sentiment beta and other stock-level characteristics.

	Stock-Level Variables											
	Illiquidity	Momentum	Price	BEME	Profitability	Disagreement	Analyst Coverage	Market Beta	Ivol	IO	Size	Sentiment beta
						COM						
N	8886	8886	8886	5950	5950	6156	6156	10591	10409	7780	10076	10076
Mean	1.0267	-0.0511	21.8172	0.7065	-4.3801	0.1837	2.2512	1.2025	0.0221	0.0807	20.9556	0.3396
Stdev	30.1650	0.7043	22.5431	1.2930	193.9624	0.3031	0.6965	1.4168	0.0204	2.7181	2.0791	0.5240
P25	0.0006	-0.2461	5.6785	0.2027	-0.0432	0.0294	1.6094	0.3226	0.0108	-0.9325	19.5887	0.0701
P50	0.0031	0.0403	15.6327	0.3945	0.0101	0.0800	2.3026	0.9871	0.0170	0.2311	20.7495	0.1853
P75	0.0153	0.2635	31.1283	0.8404	0.0494	0.1967	2.7726	1.7729	0.0269	1.5866	22.2437	0.4085
						ENE						
N	50309	50309	50309	31466	31466	32969	32969	54595	57051	48084	54822	54822
Mean	0.9415	-0.0370	29.5914	0.9531	0.3614	0.1991	2.3018	1.3587	0.0236	0.0124	20.6231	0.6958
Stdev	32.1512	0.5821	30.7090	4.9080	4.9618	0.3329	0.6644	3.0031	0.0196	2.5089	1.9512	1.0212
P25	0.0005	-0.2601	9.0232	0.2876	-0.0114	0.0465	1.7918	0.4677	0.0126	-1.2542	19.3831	0.1574
P50	0.0026	0.0468	22.9367	0.5150	0.0291	0.0988	2.3026	1.1618	0.0187	0.3024	20.6273	0.3865
P75	0.0191	0.2882	41.6271	0.8343	0.0717	0.2048	2.8332	2.0295	0.0284	1.5539	21.9015	0.8437

FIN												
N	170494	170494	170494	62624	62624	88647	88647	178130	190101	165219	182969	182969
Mean	3.5921	0.0394	30.4437	2.5459	0.0223	0.0879	1.9281	0.8784	0.0161	-0.3657	20.1568	0.3692
Stdev	60.7753	0.3722	46.3200	65.9740	0.3925	0.2074	0.6201	1.1226	0.0153	2.2628	1.9041	0.5310
P25	0.0009	-0.0790	11.9716	0.4388	0.0032	0.0154	1.3863	0.2522	0.0081	-1.5880	18.7572	0.0854
P50	0.0074	0.0770	20.1883	0.7221	0.0201	0.0314	1.7918	0.7382	0.0118	-0.1809	20.0444	0.2136
P75	0.0939	0.2195	34.4117	1.0932	0.0401	0.0735	2.3979	1.3114	0.0186	1.0213	21.4593	0.4648
HLC												
N	94701	94701	94701	67338	67338	59156	59156	101416	109057	93548	105046	105046
Mean	1.7560	-0.0493	25.6489	0.4060	-0.7865	0.1294	2.0462	1.3541	0.0298	0.0180	19.8504	1.6588
Stdev	46.3893	0.6385	42.3162	1.2607	99.7828	0.2543	0.6271	1.9553	0.0254	2.5815	2.0525	2.3176
P25	0.0011	-0.3278	4.0278	0.1438	-0.1389	0.0180	1.6094	0.3388	0.0149	-1.2681	18.4293	0.3806
P50	0.0081	0.0242	12.3233	0.2755	-0.0142	0.0526	1.9459	1.1190	0.0239	0.3041	19.7250	0.9599
P75	0.0753	0.2925	32.7452	0.4826	0.0409	0.1350	2.4849	2.0931	0.0368	1.6354	21.0779	2.0499
IND												
N	101600	101600	101600	76106	76106	65271	65271	110432	113950	100611	109115	109115
Mean	2.2941	0.0379	38.3258	0.9507	0.0248	0.0804	2.0915	1.2680	0.0207	0.6733	20.3273	0.6902
Stdev	54.4699	0.4499	119.3754	8.0144	1.4185	0.1988	0.6163	2.5412	0.0175	2.1409	2.0230	0.9647
P25	0.0007	-0.1522	10.7737	0.2888	0.0036	0.0132	1.6094	0.5259	0.0105	-0.3296	18.9387	0.1632
P50	0.0043	0.0811	23.4488	0.4747	0.0307	0.0272	2.0794	1.1714	0.0162	0.8684	20.3588	0.3985
P75	0.0494	0.2782	43.7327	0.7716	0.0587	0.0639	2.5649	1.8211	0.0254	1.8810	21.6536	0.8518

MAT												
N	35810	35810	35810	26626	26626	22911	22911	39408	40584	35558	38778	38778
Mean	1.6532	0.0237	33.4035	5.5310	0.0306	0.1267	2.0678	1.3612	0.0211	0.3959	20.5761	0.4862
Stdev	27.3204	0.4916	37.5470	102.3693	2.3598	0.2698	0.5829	1.4930	0.0179	2.3155	1.9276	0.7133
P25	0.0005	-0.1801	10.8663	0.3107	-0.0071	0.0209	1.6094	0.5529	0.0108	-0.4871	19.3972	0.1152
P50	0.0026	0.0679	24.1566	0.4947	0.0266	0.0488	2.0794	1.1845	0.0166	0.7803	20.7414	0.2846
P75	0.0248	0.2691	45.0572	0.7821	0.0592	0.1178	2.5649	1.9668	0.0260	1.7188	21.8706	0.6052
NCY												
N	35585	35585	35585	23977	23977	23469	23469	39517	40033	34507	38349	38349
Mean	1.5214	0.0415	37.2733	0.5577	0.0030	0.0574	2.2063	0.8355	0.0195	0.3173	20.8712	0.4409
Stdev	56.7324	0.4168	44.8683	0.7757	3.9306	0.1617	0.6270	1.4431	0.0163	2.0699	2.1789	0.6179
P25	0.0003	-0.1326	12.8122	0.2042	0.0087	0.0094	1.6094	0.1909	0.0098	-0.5955	19.3553	0.0981
P50	0.0026	0.0752	27.5516	0.3832	0.0357	0.0180	2.3026	0.7299	0.0152	0.6177	20.7488	0.2539
P75	0.0337	0.2543	47.7150	0.7022	0.0680	0.0408	2.7726	1.3577	0.0238	1.5244	22.5693	0.5504
TEC												
N	95863	95863	95863	68961	68961	66687	66687	109282	110337	94916	105892	105892
Mean	1.7388	-0.0027	25.4437	2.2277	-0.0266	0.1227	2.1840	1.5565	0.0254	0.5192	20.3367	0.8328
Stdev	75.1542	0.5783	42.8712	47.0001	1.1363	0.2556	0.6855	1.7944	0.0203	2.2374	2.0537	1.1942
P25	0.0006	-0.2596	6.2404	0.2058	-0.0351	0.0187	1.6094	0.5515	0.0127	-0.5882	18.9392	0.1385
P50	0.0036	0.0398	14.8922	0.3843	0.0101	0.0430	2.0794	1.3658	0.0202	0.6983	20.3366	0.4086
P75	0.0351	0.3027	30.9471	0.6639	0.0391	0.1112	2.7081	2.3202	0.0322	1.8452	21.6252	1.0546

UTL												
N	20182	20182	20182	15773	15773	14451	14451	22603	22908	20097	21808	21808
Mean	0.2732	0.0561	35.0294	2.9583	0.0419	0.0727	2.2054	0.5510	0.0130	0.1292	21.4084	0.2082
Stdev	5.7131	0.3251	21.0045	22.0976	0.2743	0.2022	0.5765	1.1894	0.0127	1.7292	1.7828	0.2868
P25	0.0002	-0.0226	21.3274	0.6356	0.0171	0.0138	1.7918	0.0442	0.0070	-0.4571	20.4342	0.0570
P50	0.0008	0.0950	31.4930	0.8069	0.0363	0.0240	2.1972	0.4171	0.0096	0.2507	21.6117	0.1298
P75	0.0039	0.2016	45.0761	1.0143	0.0549	0.0493	2.7081	0.8328	0.0145	0.9053	22.6820	0.2534
YCY												
N	102455	102455	102455	60831	60831	70440	70440	113756	115674	98569	110899	110899
Mean	2.3299	0.0113	34.7240	1.3617	0.1535	0.1046	2.2103	1.2830	0.0222	0.7501	20.4277	0.3917
Stdev	160.0639	0.5299	92.2336	15.4594	35.6641	0.2443	0.6548	2.1596	0.0185	2.2536	1.9776	0.5993
P25	0.0005	-0.2052	9.3278	0.2584	-0.0083	0.0153	1.6094	0.4859	0.0118	-0.3022	19.0865	0.0895
P50	0.0031	0.0565	20.2465	0.4904	0.0276	0.0314	2.1972	1.1932	0.0175	0.9495	20.4377	0.2182
P75	0.0369	0.2872	37.8932	0.8769	0.0577	0.0836	2.7081	1.9775	0.0268	2.0170	21.7751	0.4668

Table 3

Correlation Matrix

The table reports the correlation matrix for ten sector value-weighted monthly Sentiment (i.e., COM, ENE, FIN, HLC, IND, MAT, NCY, TEC, UTL, and YCY) and value-weighted monthly market sentiment for the period Jan 1999 to December 2019.

Correlation For Value-Weighted Sectors Sentiment											
	COM	ENE	FIN	HLC	IND	MAT	NCY	TEC	UTL	YCY	Market Sentiment
COM											
ENE	0.0357										
FIN	0.0754	0.2122									
HLC	0.2241	-0.1038	-0.0776								
IND	0.2732	-0.0312	0.0355	0.6382							
MAT	0.1749	0.2854	0.1643	0.2997	0.3855						
NCY	0.1870	0.1055	0.1104	0.3813	0.4673	0.2611					
TEC	0.2765	-0.0852	0.0431	0.5572	0.6907	0.3068	0.3696				
UTL	0.1886	-0.0438	-0.0128	0.4742	0.4816	0.2634	0.2648	0.4613			
YCY	0.2220	0.0533	0.0668	0.4405	0.5651	0.2932	0.3684	0.5072	0.3312		
Market Sentiment	0.3548	0.2071	0.5900	0.5580	0.7175	0.5030	0.5367	0.6914	0.4566	0.6225	

Table 4

Univariate Portfolio Analysis: single sorting by sentiment beta.

Quintile portfolios are formed every month from February 1999 to December 2019 by sorting stocks based on stocks' sector sentiment beta over past one month. It reports the results of univariate sorting for 10 sectors. Portfolio 1(5) is the portfolio of stocks with the lowest (highest) sector sentiment beta over the past one month. The return spreads are calculated as the return differentials between portfolio 1 and 5, and corresponding t-statistics are reported. Panel A reports the value-weighted (VW) average monthly returns of the sentiment beta portfolios in the following month, and Panel B reports the difference in alphas with respect to the CAPM model, the Fama-French three factor model, Fama-French-Carhart four factor model, and Fama-French five factor model. Panel C and D reports the estimated alphas for bottom and top portfolios, respectively. The annualized Sharpe ratio is reported. The t-statistics are adjusted using Newey-West with the lag of 4.

Panel A: Value-weighted Returns on Sentiment Beta Portfolios

	COM	ENE	FIN	HLC	IND	MAT	NCY	TEC	UTL	YCY
P1 (Low)	-0.0174	0.0711	0.0089	0.0132	0.0086	-0.1721	0.0264	0.0203	0.0000	0.0503
	(-0.30)	(2.98)	(1.65)	(3.97)	(2.56)	(-4.72)	(5.36)	(2.89)	(-0.01)	(2.93)
P2	-0.0036	0.0055	0.0024	0.0007	0.0055	0.0021	0.0049	0.0052	0.0039	0.0008
	(-0.70)	(1.45)	(0.62)	(0.26)	(1.68)	(0.50)	(1.89)	(1.06)	(1.41)	(0.22)
P3	-0.0076	0.0039	0.0040	0.0024	0.0057	0.0012	0.0035	-0.0015	0.0054	0.0040
	(-1.05)	(0.82)	(1.02)	(0.76)	(1.54)	(0.26)	(1.21)	(-0.28)	(1.89)	(1.03)
P4	-0.0112	0.0003	0.0012	0.0000	0.0032	0.0013	0.0033	0.0004	0.0044	0.0035
	(-1.79)	(0.06)	(0.28)	(0.00)	(0.89)	(0.34)	(1.27)	(0.08)	(1.60)	(0.80)
P5 (High)	-0.0161	-0.0051	-0.0031	-0.0090	-0.0061	0.0013	0.0000	-0.0052	0.0039	0.0040
	(-1.69)	(-0.72)	(-0.80)	(-1.72)	(-0.92)	(0.22)	(0.01)	(-0.81)	(0.88)	(0.71)
Low-High	-0.0013	**0.0762**	**0.0120**	**0.0223**	**0.0147**	**-0.1733**	**0.0264**	**0.0255**	-0.0039	**0.0464**
	(-0.02)	**(3.56)**	**(2.63)**	**(3.99)**	**(3.37)**	**(-4.83)**	**(4.70)**	**(2.98)**	(-0.98)	**(2.96)**
Annualized Low-High	-0.0151	1.4146	0.1544	0.3025	0.1910	-0.8982	0.3672	0.3520	-0.0462	0.7226
Annualized Sharpe Ratio	-0.0126	1.6775	0.7922	0.9468	0.8006	-2.0626	1.4405	1.0150	-0.2425	1.3620

Panel B: Alphas for the Return Spreads

CAPM Alpha	0.0008	0.0783	0.0123	0.0237	0.0152	-0.1769	0.0269	0.0264	-0.0024	0.0491
	(0.02)	(3.03)	(2.78)	(3.75)	(3.59)	(-5.99)	(4.64)	(3.46)	(-0.67)	(3.60)
FF3 Alpha	0.0005	0.0769	0.0121	0.0229	0.0144	-0.1751	0.0271	0.0260	-0.0031	0.0488
	(0.01)	(3.35)	(3.07)	(4.07)	(3.95)	(-5.10)	(4.93)	(3.66)	(-0.86)	(3.87)
CH4_Alpha	-0.0010	0.0751	0.0117	0.0225	0.0147	-0.1738	0.0272	0.0257	-0.0029	0.0484
	(-0.02)	(4.07)	(2.36)	(4.07)	(3.45)	(-5.64)	(5.00)	(3.63)	(-0.83)	(2.41)
FF5_Alpha	0.0042	0.0771	0.0116	0.0216	0.0138	-0.1705	0.0251	0.0236	-0.0041	0.0463
	(0.07)	(3.99)	(2.25)	(3.83)	(3.95)	(-4.34)	(4.79)	(2.28)	(-1.17)	(2.54)

Panel C: Alphas for Low Sentiment Beta Stocks										
CAPM Alpha	-0.0165	0.0719	0.0085	0.0129	0.0080	-0.1765	0.0263	0.0211	-0.0002	0.0521
	(-0.30)	(3.27)	(1.58)	(3.97)	(2.33)	(-6.17)	(6.25)	(2.79)	(-0.05)	(3.12)
FF3 Alpha	-0.0158	0.0703	0.0084	0.0130	0.0080	-0.1738	0.0264	0.0213	-0.0004	0.0516
	(-0.31)	(3.05)	(1.75)	(3.80)	(2.35)	(-5.25)	(6.21)	(3.49)	(-0.13)	(3.29)
CH4_Alpha	-0.0189	0.0688	0.0080	0.0137	0.0079	-0.1713	0.0271	0.0208	-0.0003	0.0510
	(-0.42)	(3.35)	(1.43)	(4.21)	(1.92)	(-6.15)	(6.41)	(3.24)	(-0.07)	(2.77)
FF5_Alpha	-0.0083	0.0713	0.0081	0.0134	0.0092	-0.1688	0.0252	0.0212	-0.0002	0.0504
	(-0.14)	(3.23)	(1.35)	(3.46)	(2.53)	(-4.12)	(6.02)	(3.61)	(-0.06)	(3.22)
Panel D: Alphas for High Sentiment Beta Stocks										
CAPM Alpha	-0.0174	-0.0064	-0.0038	-0.0108	-0.0071	0.0005	-0.0006	-0.0052	0.0023	0.0029
	(-1.75)	(-0.92)	(-1.03)	(-2.29)	(-1.10)	(0.08)	(-0.21)	(-0.78)	(0.57)	(0.47)
FF3 Alpha	-0.0163	-0.0066	-0.0038	-0.0099	-0.0064	0.0013	-0.0007	-0.0047	0.0026	0.0028
	(-1.69)	(-0.95)	(-1.04)	(-1.89)	(-1.04)	(0.23)	(-0.24)	(-0.75)	(0.69)	(0.47)
CH4_Alpha	-0.0179	-0.0063	-0.0037	-0.0088	-0.0067	0.0025	-0.0001	-0.0049	0.0026	0.0026

	(-1.79)	(-0.92)	(-0.94)	(-2.01)	(-1.02)	(0.41)	(-0.04)	(-0.72)	(0.70)	(0.44)
FF5_Alpha	-0.0125	-0.0057	-0.0035	-0.0083	-0.0047	0.0017	0.0001	-0.0024	0.0039	0.0041
	(-1.32)	(-0.78)	(-0.87)	(-1.80)	(-0.76)	(0.29)	(0.02)	(-0.43)	(1.17)	(0.66)

Table 5

Summary statistics for quintile portfolios of stocks sorted by absolute sentiment beta for each sector.

Quintile portfolios are formed every month from February 1999 to December 2019 by sorting stocks based on the sector sentiment beta over the past one month. Portfolio 1 (5) is the equal-weighted portfolio of stocks with the lowest (highest) sector sentiment beta over the past one month. The table reports the monthly values of various stock characteristics in each quintile. The variables include sentiment beta, illiquidity (scaled by 10^6), momentum, return reversal, size, bid-ask spread, price, book-to-market ratio, profitability, disagreement, analyst coverage, market beta, institutional ownership and idiosyncratic volatility.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	Senti Beta	Illiquidity	Momentum	Rev	Size	Bid-Ask Spread	Price	BEME	Profitability	Disagreement	Analyst Coverage	Market Beta	IO percentage	IVOL
Panel A: COM														
Q1	0.1518	4.0427	0.0104	0.0110	165.2700	0.0153	210.2364	2.4922	-0.4312	0.8941	12.3732	8.1073	4.1097	0.1055
Q2	0.4061	2.4506	0.0548	0.0305	149.8193	0.0142	177.2137	3.2254	0.1875	0.7803	10.9177	9.1506	3.4986	0.1384
Q3	0.7333	3.0796	0.0736	-0.0060	150.9039	0.0150	173.9659	2.5099	-10.3754	0.7518	10.5672	9.2874	2.9310	0.1477
Q4	1.2011	2.3696	-0.3136	-0.0497	147.4290	0.0177	145.8057	3.3625	0.1018	0.9467	10.3585	10.5786	3.1775	0.1789
Q5	2.8952	25.5693	-1.5490	-0.1763	149.6557	0.0352	96.2291	3.6015	-0.0359	1.1512	10.4582	12.7795	2.3304	0.3099
Q5-Q1	2.7433	21.5265	-1.5594	-0.1872	-15.6143	0.0199	-114.0073	1.1093	0.3953	0.2570	-1.9151	4.6722	-1.7792	0.2043
Panel B: ENE														
Q1	1.4051	13.3535	1.1131	-0.0010	881.4249	0.1059	1437.8307	22.5805	6.3168	4.3127	58.5289	48.6578	15.5496	0.7176
Q2	4.3001	12.8850	0.2926	-0.0221	870.6786	0.1014	1381.8641	19.6616	11.9221	4.3672	57.0156	51.7335	16.5467	0.8063
Q3	7.7380	15.8747	-0.0605	0.0372	868.6953	0.1122	1346.8703	17.8199	12.7877	4.8245	58.1327	56.4552	18.7136	0.8912
Q4	12.5070	24.3242	-1.1317	-0.2582	861.8729	0.1214	1213.0010	22.0307	6.2186	5.2970	58.8342	62.7894	20.3806	1.0438
Q5	26.9161	98.9431	-7.5916	-0.8312	831.1766	0.2110	805.5198	24.8038	3.9124	6.2508	56.9518	75.6058	15.3832	1.6868
Q5-Q1	25.5110	85.5896	-8.7047	-0.8301	-50.2482	0.1051	-632.3110	2.2233	-2.4045	1.9382	-1.5771	26.9480	-0.1665	0.9692

Panel C: FIN														
Q1	3.1551	198.1712	9.1248	0.8996	2895.0092	0.4722	4659.7943	70.7066	-5.0271	5.3793	133.4435	115.2189	34.0427	1.6579
Q2	9.9036	226.2358	8.3277	0.9651	2884.9944	0.4851	4640.9408	39.5154	0.7625	5.5713	131.6956	120.9464	37.6029	1.8066
Q3	18.1104	285.0993	8.0065	0.8220	2884.1295	0.5158	4645.9492	113.7000	0.4385	5.5118	130.8981	125.4366	36.9599	1.9782
Q4	29.8564	403.7963	6.2816	0.7004	2855.7343	0.6196	4307.8373	42.7866	0.6797	6.0146	128.7546	129.7744	37.3049	2.3108
Q5	68.7942	1395.5167	-4.0650	-0.3879	2755.7641	1.2057	3307.4497	350.9504	0.0761	7.5692	124.2653	142.3000	16.1674	3.8655
Q5-Q1	65.6392	1197.3455	-13.1897	-1.2874	-139.2451	0.7335	-1352.3446	280.2438	5.1032	2.1899	-9.1783	27.0811	-17.8753	2.2075
Panel D: HLC														
Q1	3.5939	47.0000	1.8357	0.2557	1621.5300	0.2192	2829.1314	11.2446	-1.1055	4.7785	98.9492	89.7065	45.8592	1.6150
Q2	11.2028	52.2913	0.9901	0.1517	1596.9584	0.2383	2601.6291	17.1619	4.2042	4.7567	96.0114	97.4965	48.6110	1.8494
Q3	21.0251	78.1541	-1.1395	-0.0809	1571.8430	0.2677	2168.8942	16.6238	-4.5007	5.5095	92.5548	106.6618	41.7143	2.1202
Q4	36.4680	91.9534	-4.7455	-0.5357	1531.7831	0.3350	1543.8194	18.4838	-4.6130	6.7641	87.7999	118.7551	29.2019	2.5819
Q5	87.3131	402.3214	-15.1578	-1.6058	1481.9587	0.5323	941.4633	12.1076	-0.2577	7.5484	81.7382	134.9297	11.3573	4.2492
Q5-Q1	83.7192	355.3214	-16.9935	-1.8615	-139.5713	0.3131	-1887.6680	0.8630	0.8478	2.7699	-17.2111	45.2232	-34.5018	2.6342
Panel E: IND														
Q1	2.7325	75.3782	5.9874	0.7256	1773.5337	0.2177	3845.3145	23.4649	2.1743	3.1898	107.7426	109.3553	59.1276	1.2355
Q2	8.4402	70.2246	5.1815	0.6292	1751.6539	0.2298	3768.2355	28.4658	1.4675	2.9887	105.9543	107.5415	59.2811	1.3676
Q3	15.5519	95.3833	4.5839	0.4931	1732.5922	0.2526	3488.7497	23.0278	0.8078	3.4303	103.5828	109.9390	59.3145	1.5262
Q4	26.2726	162.2719	3.7311	0.2369	1697.1738	0.3235	3013.9114	33.1910	-0.6806	4.1171	99.7290	114.5067	54.3177	1.8122
Q5	61.5523	529.7523	-2.8599	-0.3604	1625.6089	0.6004	2093.9741	45.2855	-0.5920	6.3290	93.2502	124.9083	32.1050	2.9964
Q5-Q1	58.8198	454.3741	-8.8473	-1.0860	-147.9247	0.3826	-1751.3404	21.8205	-2.7664	3.1392	-14.4923	15.5530	-27.0226	1.7609

Panel F: MAT														
Q1	0.6913	18.4491	1.5207	0.2042	631.3992	0.0737	1200.4214	252.7372	0.3214	1.5926	37.4622	38.0030	21.3463	0.4402
Q2	2.0951	23.9071	1.4812	0.1765	619.9333	0.0758	1158.7101	6.5675	0.4079	1.8025	36.0574	40.6826	20.0371	0.4949
Q3	3.8129	19.2662	1.3777	0.1026	616.2678	0.0818	1102.9254	8.5383	-0.5171	1.9081	35.6878	42.0636	20.3995	0.5536
Q4	6.4128	44.7660	0.6746	0.0598	605.9624	0.1013	918.4740	11.7047	2.6771	2.3255	34.6968	45.2773	18.4728	0.6644
Q5	14.9415	134.1519	-1.3562	-0.1348	586.9088	0.1981	591.3979	10.5608	-0.0439	3.2804	33.5525	48.4601	11.6231	1.0943
Q5-Q1	14.2503	115.7028	-2.8769	-0.3390	-44.4904	0.1244	-609.0236	-242.1764	-0.3653	1.6878	-3.9097	10.4570	-9.7232	0.6542
Panel G: NCY														
Q1	0.7103	20.5323	2.0492	0.2561	641.1726	0.0689	1306.4619	5.9489	0.2767	0.7170	42.1291	23.2283	16.7461	0.3951
Q2	2.1547	16.0689	1.9920	0.2038	625.2733	0.0708	1241.3972	5.5597	0.7871	0.7790	39.4398	25.1463	16.0591	0.4511
Q3	3.8981	34.9310	1.6917	0.1920	620.4782	0.0752	1201.8417	5.6031	0.9903	0.8148	38.8723	26.4685	16.5150	0.4967
Q4	6.5124	28.8042	1.2381	0.0670	608.3147	0.0939	1052.6921	6.1733	-1.0238	0.9809	37.8448	27.6409	15.1492	0.6023
Q5	15.2880	123.7640	-0.8581	-0.1260	587.2993	0.1716	714.8188	7.2826	-0.0445	1.7219	35.7691	32.5021	12.2743	1.0127
Q5-Q1	14.5777	103.2317	-2.9073	-0.3821	-53.8733	0.1026	-591.6432	1.3336	-0.3211	1.0048	-6.3600	9.2738	-4.4718	0.6176
Panel H: TEC														
Q1	3.9320	53.3230	2.5602	0.4899	1655.5261	0.1955	2441.8971	27.3485	0.2776	5.1548	115.4660	114.9441	55.7106	1.3790
Q2	12.3022	129.6870	2.3350	0.3403	1639.0796	0.2056	2351.2065	52.2998	0.0754	5.4849	112.0894	133.4503	54.0673	1.7112
Q3	22.5482	94.2599	1.1561	0.2354	1624.7202	0.2262	2157.5786	39.9464	-0.7728	5.7296	111.0626	138.3503	52.3073	1.8951
Q4	37.6714	67.1322	0.0738	-0.1234	1603.9682	0.2591	1847.6121	74.3119	-0.4264	6.3569	108.9281	145.6619	45.5758	2.2051
Q5	83.7561	329.8046	-5.8476	-0.8340	1552.0766	0.4415	1331.9887	127.8202	-1.7214	8.0267	103.9711	154.5567	23.6826	3.4196
Q5-Q1	79.8241	276.4816	-8.4078	-1.3239	-103.4495	0.2460	-1109.9084	100.4717	-1.9990	2.8719	-11.4949	39.6126	-32.0279	2.0407

Panel L: UTL														
Q1	0.2613	1.7180	1.4517	0.1553	370.2758	0.0267	625.4859	69.0837	0.2606	0.7045	24.2680	8.8948	6.8202	0.1691
Q2	0.6854	1.0003	1.3667	0.1739	359.1427	0.0251	629.1303	13.5208	0.4686	0.5289	23.2782	8.0290	6.7287	0.1771
Q3	1.1274	1.4694	1.2929	0.1401	359.9313	0.0240	628.8200	12.8259	0.5099	0.5240	23.9344	8.2190	6.9763	0.1832
Q4	1.6970	2.9968	1.1908	0.1193	357.6665	0.0262	600.6097	13.6357	0.3756	0.6420	23.4457	8.6043	6.9116	0.2032
Q5	4.0034	14.6651	-0.5888	-0.1003	351.7500	0.0570	450.6905	19.7492	0.3672	1.4389	23.4751	15.2993	6.7208	0.3935
Q5-Q1	3.7421	12.9471	-2.0404	-0.2555	-18.5258	0.0304	-174.7954	-49.3345	0.1066	0.7344	-0.7929	6.4045	-0.0994	0.2245
Panel J: YCY														
Q1	2.8202	76.6047	4.5659	0.5899	1781.1642	0.2201	3551.8348	90.6855	0.3819	4.6732	123.0139	101.7617	65.4932	1.3493
Q2	8.7650	72.6945	3.6974	0.5609	1762.3869	0.2223	3558.3273	20.3526	-8.4010	4.7156	120.9020	118.1526	61.9750	1.5471
Q3	15.9259	73.1665	2.8382	0.2753	1748.9495	0.2401	3254.2413	22.8323	0.4660	4.9603	119.0784	119.7114	61.0859	1.6977
Q4	26.5767	162.1776	1.1141	0.0597	1722.8187	0.2927	2646.7640	27.4424	-1.1689	5.7093	115.8591	124.5625	55.6978	1.9924
Q5	59.8545	591.8993	-6.9311	-0.7504	1663.6773	0.5180	1788.3370	28.2421	-0.2590	8.0817	109.2952	133.8374	39.5304	3.1804
Q5-Q1	57.0344	515.2945	-11.4970	-1.3403	-117.4870	0.2979	-1763.4977	-62.4434	-0.6409	3.4085	-13.7187	32.0757	-25.9628	1.8312

Table 6

Bivariate Portfolio Analysis.

Returns on portfolios of stocks sorted by sector sentiment beta after controlling for market beta, illiquidity, size, return reversal, momentum, profitability, and book-to-market ratio. Double-sorted and value-weighted quintile portfolios are formed every month from February 1999 to December 2019. In each case, we sort the stocks into quintiles using control variable, and then within each quintile, we sort stocks into quintile portfolios based on the sector sentiment beta over the past one month. Thus, portfolio 1 (5) contains stocks with the lowest (highest) sector sentiment beta. It presents the value-weighted (VW) average monthly returns across the five control quintiles to produce quintile portfolios with dispersion in sentiment beta but with similar levels of control variables. 'Low-High' refers to the return differential in average monthly returns between the lowest sentiment beta stocks and highest sentiment beta stocks. We also report the difference in alphas with respect to Fama-French five-factor model. The annualized Sharpe ratio is reported. The t-statistics are adjusted using Newey-west.

Panel A: Portfolios Sorting After Controlling for Market Beta										
	COM	ENE	FIN	HLC	IND	MAT	NCY	TEC	UTL	YCY
P1 (Low)	-0.0403	0.0196	0.0168	0.0126	0.0148	-0.1979	0.0260	0.0060	0.0081	0.0401
	(-3.24)	(1.12)	(4.20)	(2.24)	(2.97)	(-8.27)	(5.77)	(0.97)	(1.85)	(4.24)
P5 (High)	-0.0180	-0.0083	-0.0014	-0.0053	-0.0024	-0.0004	0.0039	-0.0024	0.0053	0.0040
	(-2.31)	(-1.12)	(-0.30)	(-0.96)	(-0.32)	(-0.06)	(1.09)	(-0.39)	(1.25)	(0.75)
Low-High	**-0.0224**	0.0264	**0.0143**	**0.0186**	**0.0180**	**-0.1991**	**0.0225**	0.0092	0.0021	**0.0360**
	(-1.72)	(1.53)	**(3.62)**	**(2.88)**	**(3.09)**	**(-8.58)**	**(4.85)**	(1.29)	(0.42)	**(3.57)**
FF5_Alpha	**-0.0293**	0.0263	**0.0156**	**0.0158**	**0.0153**	**-0.1969**	**0.0205**	0.0078	0.0013	**0.0345**
	(-2.18)	(1.89)	**(4.20)**	**(1.93)**	**(3.73)**	**(-9.86)**	**(4.31)**	(0.76)	(0.30)	**(2.75)**
Panel B: Portfolios Sorting After Controlling for Illiquidity										
	COM	ENE	FIN	HLC	IND	MAT	NCY	TEC	UTL	YCY
P1 (Low)	-0.0008	0.0069	0.0064	0.0012	0.0050	0.0046	0.0053	0.0022	0.0065	0.0049
	(-0.15)	(1.51)	(1.90)	(0.27)	(1.12)	(1.11)	(2.20)	(0.35)	(2.77)	(0.90)
P5 (High)	-0.0209	-0.0111	0.0014	-0.0115	0.0016	0.0004	-0.0006	-0.0064	0.0022	0.0004
	(-2.57)	(-1.46)	(0.40)	(-2.06)	(0.33)	(0.06)	(-0.16)	(-0.93)	(0.56)	(0.06)
Low-High	**0.0207**	**0.0180**	**0.0031**	**0.0100**	0.0024	0.0032	**0.0054**	**0.0095**	**0.0050**	0.0035
	(3.62)	**(3.98)**	**(2.16)**	**(2.71)**	(1.07)	(1.02)	**(1.98)**	**(2.48)**	**(1.68)**	(1.22)
FF5_Alpha	**0.0177**	**0.0184**	**0.0031**	**0.0069**	0.0011	0.0026	**0.0046**	**0.0099**	0.0039	0.0020
	(3.29)	**(4.02)**	**(2.22)**	**(1.76)**	(0.61)	(0.78)	**(1.73)**	**(3.42)**	(1.55)	(0.69)

Panel C: Portfolios Sorting After Controlling for Size										
	COM	ENE	FIN	HLC	IND	MAT	NCY	TEC	UTL	YCY
P1 (Low)	-0.0013	0.0077	0.0061	-0.0032	0.0052	0.0044	0.0051	-0.0009	0.0070	0.0034
	(-0.26)	(1.71)	(1.71)	(-0.73)	(1.27)	(0.98)	(1.48)	(-0.16)	(2.89)	(0.66)
P5 (High)	-0.0165	-0.0113	0.0012	-0.0158	0.0013	-0.0004	0.0003	-0.0081	0.0028	-0.0023
	(-2.64)	(-1.38)	(0.30)	(-2.40)	(0.25)	(-0.05)	(0.07)	(-1.18)	(0.68)	(-0.37)
Low-High	**0.0156**	**0.0174**	**0.0063**	**0.0114**	**0.0041**	0.0046	0.0049	**0.0073**	0.0043	0.0040
	(3.37)	**(3.69)**	**(3.35)**	**(3.93)**	**(2.22)**	(1.59)	(1.57)	**(2.94)**	(1.54)	(1.47)
FF5_Alpha	**0.0156**	**0.0182**	**0.0067**	**0.0094**	0.0022	0.0037	0.0042	**0.0062**	0.0040	0.0028
	(3.53)	**(3.78)**	**(3.20)**	**(3.37)**	(1.36)	(1.12)	(1.16)	**(2.25)**	(1.68)	(1.30)
Panel D: Portfolios Sorting After Controlling for Return Reversal										
	COM	ENE	FIN	HLC	IND	MAT	NCY	TEC	UTL	YCY
P1 (Low)	-0.0028	0.0045	0.0038	0.0000	0.0056	0.0048	0.0043	-0.0027	0.0074	0.0030
	(-0.58)	(0.95)	(0.98)	(-0.01)	(1.61)	(1.16)	(2.05)	(-0.47)	(3.06)	(0.76)
P5 (High)	-0.0233	-0.0052	0.0001	-0.0110	-0.0016	-0.0002	0.0017	-0.0047	0.0029	-0.0007
	(-2.12)	(-0.70)	(0.03)	(-1.95)	(-0.25)	(-0.03)	(0.45)	(-0.70)	(0.89)	(-0.12)
Low-High	**0.0195**	**0.0114**	**0.0061**	**0.0093**	**0.0085**	0.0043	0.0019	0.0043	**0.0048**	0.0015
	(2.36)	**(2.72)**	**(2.63)**	**(2.28)**	**(2.12)**	(1.39)	(0.62)	(1.51)	**(2.05)**	(0.45)
FF5_Alpha	**0.0125**	**0.0123**	**0.0076**	**0.0084**	**0.0066**	0.0052	0.0010	0.0058	0.0034	0.0030
	(2.22)	**(2.98)**	**(3.05)**	**(2.04)**	**(2.47)**	(1.75)	(0.38)	(2.67)	(1.49)	(0.87)
Panel E: Portfolios Sorting After Controlling for Momentum										
	COM	ENE	FIN	HLC	IND	MAT	NCY	TEC	UTL	YCY
P1 (Low)	-0.0075	0.0043	0.0048	0.0020	0.0047	0.0052	0.0027	-0.0042	0.0079	0.0031
	(-1.09)	(0.93)	(1.10)	(0.60)	(1.25)	(1.21)	(0.92)	(-0.72)	(3.34)	(0.68)
P5 (High)	-0.0175	-0.0045	-0.0012	-0.0107	-0.0040	0.0018	0.0030	-0.0050	0.0020	0.0005
	(-2.25)	(-0.62)	(-0.28)	(-1.75)	(-0.49)	(0.28)	(0.83)	(-0.72)	(0.50)	(0.08)
Low-High	**0.0103**	**0.0114**	**0.0056**	**0.0129**	**0.0095**	0.0017	-0.0007	-0.0010	**0.0061**	0.0025
	(1.84)	**(2.53)**	**(2.30)**	**(2.68)**	**(1.72)**	(0.48)	(-0.26)	(-0.40)	**(2.30)**	(0.62)
FF5_Alpha	**0.0135**	**0.0127**	**0.0051**	**0.0116**	**0.0064**	0.0013	-0.0024	-0.0010	**0.0058**	0.0018
	(2.78)	**(2.78)**	**(2.03)**	**(2.45)**	**(1.84)**	(0.43)	(-0.70)	(-0.43)	**(2.12)**	(0.50)

Panel F: Portfolios Sorting After Controlling for Profitability										
	COM	ENE	FIN	HLC	IND	MAT	NCY	TEC	UTL	YCY
P1 (Low)	0.0186	-0.0128	0.0074	0.0251	0.0054	0.0041	0.0371	-0.0301	0.0080	0.0367
	(1.67)	(-0.81)	(1.60)	(3.90)	(1.28)	(0.82)	(5.93)	(-4.27)	(2.84)	(2.57)
P5 (High)	-0.0074	-0.0030	-0.0017	-0.0012	-0.0004	-0.0021	-0.0018	-0.0070	-0.0001	0.0004
	(-0.94)	(-0.41)	(-0.34)	(-0.24)	(-0.07)	(-0.31)	(-0.50)	(-0.92)	(-0.02)	(0.07)
Low-High	**0.0257**	-0.0106	**0.0088**	**0.0267**	0.0057	0.0066	**0.0392**	**-0.0249**	**0.0086**	**0.0369**
	(2.82)	(-0.59)	**(2.47)**	**(4.50)**	(1.15)	(1.23)	**(6.43)**	**(-4.50)**	**(2.86)**	**(2.75)**
FF5_Alpha	**0.0271**	-0.0081	**0.0095**	**0.0270**	0.0065	0.0067	**0.0405**	**-0.0237**	**0.0081**	**0.0328**
	(2.88)	(-0.52)	**(2.40)**	**(4.39)**	(2.34)	(1.12)	**(7.15)**	**(-3.83)**	**(3.05)**	**(3.35)**
Panel G: Portfolios Sorting After Controlling for Book-to-Market Ratio										
	COM	ENE	FIN	HLC	IND	MAT	NCY	TEC	UTL	YCY
P1 (Low)	0.0186	-0.0013	0.0060	0.0170	-0.0029	0.0071	0.0325	-0.0110	0.0069	0.0342
	(1.62)	(-0.08)	(1.33)	(3.55)	(-0.24)	(1.46)	(4.70)	(-1.72)	(2.34)	(2.25)
P5 (High)	0.0000	-0.0022	0.0014	-0.0032	-0.0028	-0.0002	0.0021	-0.0053	0.0036	-0.0004
	(-0.00)	(-0.31)	(0.28)	(-0.54)	(-0.34)	(-0.04)	(0.60)	(-0.72)	(1.09)	(-0.07)
Low-High	**0.0189**	0.0001	**0.0040**	**0.0200**	0.0002	**0.0083**	**0.0303**	-0.0071	0.0032	**0.0366**
	(2.41)	(0.01)	**(1.95)**	**(3.40)**	(0.02)	**(1.84)**	**(4.48)**	(-1.59)	(1.26)	**(2.38)**
FF5_Alpha	**0.0211**	0.0007	**0.0054**	**0.0193**	0.0018	**0.0089**	**0.0300**	-0.0091	0.0038	**0.0310**
	(2.51)	(0.06)	**(1.98)**	**(3.04)**	(0.25)	**(1.93)**	**(5.49)**	(-1.78)	(1.55)	**(3.08)**

Table 7

Firm-level Fama-MacBeth Regressions.

This table reports the results for Fama-MacBeth regression. The dependent variable is excess stock returns in month t+1, and a vector of control variables are measured in month t. The last column reports the most general regression specifications, including the firm characteristics, namely, market beta (Beta), size, book-to-market ratio (BEME), momentum (MOM), short-term reversal (REV), illiquidity, idiosyncratic volatility (ivol), profitability, analyst coverage, and institutional ownership (IO). Each independent variable is winsorised and is standardized to have a mean of zero and a standard deviation of one in each month t. The table presents the time-series average of the cross-section regression coefficients. The Newey-West t-statistics are reported with the lag of 4.

Panel A: COM									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Sentiment Beta	-0.0078	-0.0017	-0.0045	-0.0002	-0.0008	0.0003	-0.0013	0.0020	0.0019
	(-1.39)	(-0.27)	(-0.75)	(-0.05)	(-0.18)	(0.07)	(-0.26)	(0.40)	(0.28)
Beta		-0.0036	0.0002	-0.0014	0.0000	-0.0005	-0.0018	0.0026	-0.0074
		(-0.54)	(0.06)	(-0.45)	(0.01)	(-0.17)	(-0.54)	(0.78)	(-1.40)
Size			-0.0038	-0.0041	-0.0034	-0.0027	-0.0034	-0.0018	-0.0012
			(-1.70)	(-1.79)	(-1.47)	(-1.01)	(-1.05)	(-0.74)	(-0.31)
BEME			**-0.0226**	**-0.0241**	**-0.0230**	**-0.0234**	**-0.0221**	**-0.0219**	-0.0108
			(-4.28)	(-4.05)	(-3.71)	(-3.99)	(-3.73)	(-3.67)	(-1.48)
MOM				0.0049	0.0076	0.0059	0.0035	0.0020	-0.0056
				(0.94)	(1.35)	(1.04)	(0.66)	(0.39)	(-0.71)
REV					0.0041	0.0029	0.0022	0.0023	0.0020
					(0.95)	(0.65)	(0.55)	(0.52)	(0.31)
Illiquidity						0.0715	0.0693	0.0968	0.0076
						(1.42)	(1.30)	(1.80)	(0.23)
Ivol							0.0003	-0.0035	-0.0116
							(-0.07)	(-0.66)	(-1.29)
Profitability								0.7483	0.8852
								(2.07)	(1.79)
Analyst Coverage									-0.0009
									(-0.19)
IO									-0.0031
									(-0.71)

Panel B: ENE									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Sentiment Beta	0.0069	**0.0187**	**-0.0063**	**-0.0055**	**-0.0048**	**-0.0052**	-0.0022	-0.0019	-0.0021
	(1.09)	(2.03)	(-2.74)	(-2.69)	(-2.43)	(-2.52)	(-1.02)	(-0.89)	(-1.13)
Beta		**-0.0755**	-0.0033	-0.0044	-0.0041	-0.0032	-0.0021	-0.0027	-0.0007
		(-2.05)	(-0.88)	(-1.14)	(-1.03)	(-0.83)	(-0.62)	(-0.79)	(-0.14)
Size			-0.0011	-0.0008	-0.0006	-0.0011	**-0.0038**	**-0.0033**	-0.0030
			(-0.65)	(-0.58)	(-0.46)	(-0.91)	(-2.49)	(-2.53)	(-1.46)
BEME			**-0.0615**	**-0.0621**	**-0.0587**	**-0.0578**	**-0.0563**	**-0.0580**	**-0.0248**
			(-7.67)	(-7.45)	(-7.32)	(-6.89)	(-5.80)	(-5.83)	(-5.43)
MOM				-0.0004	-0.0008	-0.0005	-0.0014	-0.0018	**-0.0045**
				(-0.16)	(-0.32)	(-0.19)	(-0.53)	(-0.70)	(-1.74)
REV					0.0009	0.0012	0.0010	0.0006	-0.0004
					(0.60)	(0.80)	(0.61)	(0.35)	(-0.19)
Illiquidity						0.0009	-0.0155	-0.0071	**0.0386**
						(0.03)	(-0.41)	(-0.21)	(1.87)
Ivol							**-0.0078**	**-0.0087**	**-0.0073**
							(-2.91)	(-3.00)	(-3.12)
Profitability								-0.0080	**0.0314**
								(-0.54)	(4.02)
Analyst Coverage									-0.0011
									(-0.45)
IO									0.0032
									(1.57)

Panel C: FIN									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Sentiment Beta	**-0.0073**	**-0.0064**	-0.0019	-0.0022	-0.0019	-0.0017	0.0000	-0.0005	-0.0003
	(-3.07)	(-3.27)	(-1.28)	(-1.48)	(-1.33)	(-1.12)	(0.01)	(-0.32)	(-0.13)
Beta		0.0005	0.0006	0.0007	0.0003	0.0004	0.0009	0.0009	-0.0003
		(0.14)	(0.42)	(0.54)	(0.26)	(0.30)	(0.81)	(0.73)	(-0.23)
Size			**-0.0040**	**-0.0037**	**-0.0038**	**-0.0039**	**-0.0044**	**-0.0046**	**-0.0054**
			(-3.17)	(-3.01)	(-3.08)	(-3.13)	(-3.80)	(-4.14)	(-3.65)
BEME			**-0.4035**	**-0.4099**	**-0.4163**	**-0.3942**	**-0.3885**	**-0.3727**	**-0.0771**
			(-4.41)	(-4.42)	(-4.49)	(-4.42)	(-4.21)	(-4.21)	(-7.06)
MOM				0.0011	0.0014	0.0015	0.0015	0.0006	-0.0017
				(0.79)	(0.96)	(1.03)	(1.01)	(0.40)	(-1.23)
REV					0.0013	0.0012	0.0011	0.0009	0.0001
					(1.27)	(1.18)	(1.06)	(0.83)	(0.10)
Illiquidity						-0.0164	-0.0042	-0.0081	-0.0214
						(-0.62)	(-0.18)	(-0.34)	(-0.26)
Ivol							**-0.0030**	**-0.0028**	-0.0004
							(-2.26)	(-2.19)	(-0.24)
Profitability								**0.0418**	**0.0208**
								(6.04)	(3.39)
Analyst Coverage									0.0010
									(0.87)
IO									0.0000
									(-0.01)

0

Panel D: HLC									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Sentiment Beta	**-0.0073**	**-0.0059**	**-0.0057**	**-0.0062**	**-0.0061**	**-0.0063**	0.0008	0.0009	0.0002
	(-3.30)	(-2.81)	(-3.54)	(-4.02)	(-3.96)	(-4.06)	(0.42)	(0.50)	(0.12)
Beta		-0.0027	**-0.0047**	**-0.0052**	**-0.0053**	**-0.0054**	**-0.0036**	-0.0027	**-0.0043**
		(-0.83)	(-2.09)	(-2.57)	(-2.73)	(-2.47)	(-1.71)	(-1.42)	(-1.80)
Size			-0.0027	-0.0021	-0.0020	-0.0011	**-0.0038**	**-0.0041**	-0.0040
			(-1.36)	(-1.16)	(-1.09)	(-0.56)	(-2.39)	(-2.61)	(-1.60)
BEME			**-0.0832**	**-0.0838**	**-0.0843**	**-0.0879**	**-0.0884**	**-0.0879**	**-0.0920**
			(-11.90)	(-11.82)	(-12.13)	(-12.05)	(-14.37)	(-13.96)	(-13.53)
MOM				-0.0010	-0.0011	-0.0013	-0.0013	-0.0015	**-0.0064**
				(-0.60)	(-0.65)	(-0.74)	(-0.79)	(-0.94)	(-3.22)
REV					-0.0024	-0.0025	**-0.0027**	**-0.0027**	**-0.0048**
					(-1.48)	(-1.54)	(-1.70)	(-1.67)	(-2.32)
Illiquidity						**0.0960**	**0.1222**	**0.1227**	**0.0609**
						(2.08)	(2.91)	(2.99)	(2.15)
Ivol							**-0.0143**	**-0.0137**	**-0.0075**
							(-5.49)	(-5.10)	(-2.25)
Profitability								**0.2026**	**0.0926**
								(2.52)	(2.00)
Analyst Coverage									**-0.0024**
									(-1.73)
IO									**0.0089**
									(5.17)

Panel E: IND									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Sentiment Beta	**-0.0091**	-0.0061	-0.0047	-0.0048	-0.0045	-0.0049	-0.0027	-0.0029	0.0001
	(-2.68)	(-1.40)	(-1.23)	(-1.28)	(-1.30)	(-1.31)	(-0.71)	(-0.74)	(0.16)
Beta		-0.0442	-0.0036	-0.0042	-0.0051	-0.0041	-0.0039	-0.0036	-0.0007
		(-1.58)	(-0.97)	(-1.17)	(-1.31)	(-1.26)	(-1.14)	(-1.04)	(-0.31)
Size			**-0.0087**	**-0.0082**	**-0.0084**	**-0.0074**	**-0.0085**	**-0.0090**	**-0.0046**
			(-4.69)	(-4.38)	(-4.23)	(-4.53)	(-5.36)	(-6.15)	(-3.12)
BEME			**-0.2156**	**-0.2221**	**-0.2245**	**-0.2263**	**-0.2262**	**-0.2254**	**-0.0210**
			(-8.98)	(-9.44)	(-9.74)	(-9.06)	(-8.68)	(-7.70)	(-10.90)
MOM				-0.0012	-0.0009	-0.0005	-0.0003	-0.0006	**-0.0031**
				(-0.86)	(-0.57)	(-0.28)	(-0.20)	(-0.30)	(-2.08)
REV					0.0001	0.0005	0.0007	0.0007	**-0.0022**
					(0.06)	(0.20)	(0.28)	(0.25)	(-2.21)
Illiquidity						**0.1014**	**0.0996**	**0.1002**	**0.3223**
						(2.45)	(2.49)	(2.23)	(4.23)
Ivol							**-0.0047**	**-0.0042**	**-0.0032**
							(-3.40)	(-3.04)	(-2.26)
Profitability								0.0352	**0.0447**
								(1.10)	(3.99)
Analyst Coverage									-0.0003
									(-0.29)
IO									**0.0022**
									(2.49)

Panel F: MAT									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Sentiment Beta	**0.0225**	**0.0196**	**-0.0032**	**-0.0036**	**-0.0036**	**-0.0036**	-0.0002	0.0000	0.0022
	(7.10)	(6.68)	(-2.02)	(-2.20)	(-2.19)	(-2.18)	(-0.09)	(-0.02)	(0.95)
Beta		**0.0321**	0.0020	0.0006	-0.0005	-0.0005	-0.0002	-0.0007	-0.0015
		(7.23)	(1.02)	(0.35)	(-0.29)	(-0.25)	(-0.14)	(-0.38)	(-0.59)
Size			**-0.0082**	**-0.0073**	**-0.0072**	**-0.0071**	**-0.0076**	**-0.0078**	**-0.0052**
			(-4.93)	(-4.50)	(-4.61)	(-4.41)	(-5.19)	(-5.34)	(-2.40)
BEME			**-0.1901**	**-0.1893**	**-0.1909**	**-0.1906**	**-0.1912**	**-0.1880**	**-0.0363**
			(-11.46)	(-11.68)	(-12.02)	(-11.72)	(-11.71)	(-11.09)	(-6.52)
MOM				**-0.0069**	**-0.0066**	**-0.0064**	**-0.0061**	**-0.0059**	-0.0039
				(-3.02)	(-2.94)	(-2.86)	(-2.95)	(-2.90)	(-1.61)
REV					-0.0024	-0.0023	-0.0024	-0.0025	-0.0014
					(-1.45)	(-1.38)	(-1.60)	(-1.63)	(-0.81)
Illiquidity						-0.0212	0.0363	0.0332	0.0094
						(-0.35)	(1.11)	(1.01)	(0.25)
Ivol							**-0.0051**	**-0.0049**	0.0003
							(-2.32)	(-2.26)	-0.11
Profitability								**0.0279**	**0.0244**
								(3.08)	(1.91)
Analyst Coverage									0.0026
									(1.18)
IO									0.0006
									(0.41)

Panel G: NCY									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Sentiment Beta	**-0.0046**	**-0.0056**	**-0.0042**	**-0.0046**	**-0.0044**	**-0.0040**	-0.0024	-0.0024	-0.0018
	(-1.73)	(-2.37)	(-2.81)	(-3.23)	(-3.10)	(-2.70)	(-1.35)	(-1.42)	(-1.23)
Beta		0.0022	0.0003	0.0003	0.0007	0.0004	0.0001	0.0003	0.0015
		(0.52)	(0.21)	(0.19)	(0.46)	(0.28)	(0.09)	(0.23)	(0.86)
Size			**-0.0044**	**-0.0042**	**-0.0042**	**-0.0045**	**-0.0052**	**-0.0057**	**-0.0044**
			(-3.31)	(-3.19)	(-3.17)	(-3.19)	(-4.08)	(-4.42)	(-3.78)
BEME			**-0.0121**	**-0.0121**	**-0.0118**	**-0.0119**	**-0.0108**	**-0.0103**	**-0.0139**
			(-5.82)	(-5.87)	(-5.84)	(-5.47)	(-6.29)	(-6.26)	(-5.02)
MOM				0.0002	0.0006	0.0001	0.0002	-0.0004	-0.0005
				(0.12)	(0.43)	(0.10)	(0.13)	(-0.33)	(-0.37)
REV					0.0004	0.0002	0.0000	-0.0002	-0.0012
					(0.38)	(0.16)	(-0.00)	(-0.15)	(-0.87)
Illiquidity						0.0139	0.0525	0.0467	-0.0029
						(0.22)	(0.85)	(0.73)	(-0.43)
Ivol							**-0.0042**	**-0.0037**	**-0.0036**
							(-2.17)	(-2.00)	(-1.83)
Profitability								**0.1111**	**0.0448**
								(4.70)	(2.46)
Analyst Coverage									-0.0003
									(-0.23)
IO									0.0002
									(0.18)

Panel H: TEC									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Sentiment Beta	**-0.0066**	-0.0038	**-0.0024**	**-0.0022**	**-0.0022**	**-0.0026**	0.0010	0.0011	0.0018
	(-3.00)	(-1.61)	(-2.19)	(-2.17)	(-2.16)	(-2.47)	(0.97)	(0.99)	(1.59)
Beta		-0.0071	-0.0015	-0.0025	**-0.0030**	-0.0028	-0.0021	-0.0017	-0.0006
		(-1.32)	(-0.80)	(-1.51)	(-1.70)	(-1.62)	(-1.28)	(-1.08)	(-0.41)
Size			**-0.0074**	**-0.0066**	**-0.0066**	**-0.0060**	**-0.0082**	**-0.0090**	**-0.0107**
			(-4.44)	(-4.06)	(-3.98)	(-3.69)	(-5.28)	(-5.82)	(-7.17)
BEME			**-1.3384**	**-1.3862**	**-1.3847**	**-1.4215**	**-1.4480**	**-1.4653**	**-0.0435**
			(-14.35)	(-15.02)	(-15.22)	(-14.85)	(-15.21)	(-15.82)	(-14.19)
MOM				**-0.0043**	**-0.0046**	**-0.0046**	**-0.0048**	**-0.0059**	**-0.0079**
				(-3.03)	(-3.14)	(-3.10)	(-3.27)	(-3.92)	(-5.53)
REV					-0.0015	-0.0015	-0.0018	**-0.0021**	**-0.0024**
					(-1.28)	(-1.27)	(-1.57)	(-1.83)	(-2.01)
Illiquidity						**0.2287**	**0.2682**	**0.2506**	0.0597
						(2.90)	(3.18)	(3.02)	(1.62)
Ivol							**-0.0087**	**-0.0078**	**-0.0060**
							(-5.39)	(-4.82)	(-4.05)
Profitability								**0.0468**	**0.0383**
								(6.58)	(5.37)
Analyst Coverage									0.0001
									(0.09)
IO									**0.0045**
									(3.42)

Panel L: UTL									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Sentiment Beta	**-0.0331**	**-0.0293**	0.0006	-0.0013	-0.0009	-0.0007	0.0012	0.0011	0.0009
	(-7.39)	(-4.55)	(0.20)	(-0.97)	(-0.66)	(-0.57)	(0.90)	(0.78)	(0.66)
Beta		-0.0185	-0.0020	-0.0019	-0.0017	-0.0020	-0.0010	-0.0005	-0.0025
		(-1.45)	(-0.79)	(-1.21)	(-1.03)	(-1.24)	(-0.68)	(-0.35)	(-1.38)
Size			-0.0019	-0.0002	-0.0002	-0.0003	-0.0007	-0.0006	-0.0024
			(-1.06)	(-0.19)	(-0.20)	(-0.30)	(-0.76)	(-0.63)	(-1.43)
BEME			**-0.1074**	**-0.1157**	**-0.1140**	**-0.1152**	**-0.1118**	**-0.1158**	**-0.0529**
			(-5.33)	(-5.79)	(-5.67)	(-5.88)	(-5.73)	(-5.63)	(-6.13)
MOM				**-0.0048**	**-0.0047**	**-0.0049**	**-0.0045**	**-0.0047**	**-0.0030**
				(-3.08)	(-3.08)	(-3.28)	(-3.08)	(-3.26)	(-1.65)
REV					0.0017	0.0010	0.0004	0.0003	0.0018
					(1.18)	(0.70)	(0.28)	(0.19)	(1.16)
Illiquidity						0.0099	0.0080	0.0004	0.0058
						(0.23)	(0.18)	(0.01)	(0.39)
Ivol							**-0.0042**	-0.0034	-0.0007
							(-1.82)	(-1.45)	(-0.32)
Profitability								0.0014	-0.0018
								(0.56)	(-1.00)
Analyst Coverage									0.0007
									(0.50)
IO									0.0019
									(1.20)

Panel J: YCY									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Sentiment Beta	**-0.0076**	-0.0062	-0.0017	-0.0014	-0.0017	-0.0016	0.0002	0.0001	**0.0021**
	(-2.03)	(-1.61)	(-1.42)	(-1.25)	(-1.44)	(-1.34)	(0.13)	(0.07)	(1.78)
Beta		0.0034	0.0010	-0.0002	0.0002	0.0000	0.0003	0.0003	-0.0002
		(0.41)	(0.60)	(-0.17)	(0.16)	(0.01)	(0.21)	(0.19)	(-0.14)
Size			**-0.0049**	**-0.0043**	**-0.0046**	**-0.0047**	**-0.0046**	**-0.0047**	**-0.0069**
			(-3.64)	(-3.59)	(-3.74)	(-3.31)	(-3.67)	(-3.71)	(-3.55)
BEME			**-0.0607**	**-0.0629**	**-0.0636**	**-0.0654**	**-0.0650**	**-0.0644**	**-0.0399**
			(-7.76)	(-7.83)	(-7.81)	(-8.57)	(-8.66)	(-8.77)	(-11.66)
MOM				0.0005	0.0004	0.0003	0.0006	0.0004	**-0.0039**
				(0.37)	(0.25)	(0.22)	(0.39)	(0.27)	(-2.50)
REV					-0.0003	-0.0001	0.0001	0.0000	**-0.0030**
					(-0.25)	(-0.07)	(0.08)	(0.02)	(-2.29)
Illiquidity						-0.0590	**0.2583**	**0.2622**	0.0200
						(-0.18)	(2.07)	(2.08)	(0.63)
Ivol							-0.0024	-0.0021	**-0.0028**
							(-1.58)	(-1.42)	(-1.91)
Profitability								**0.2829**	**0.2657**
								(2.90)	(2.81)
Analyst Coverage									0.0010
									(0.76)
IO									**0.0026**
									(2.32)

Table 8

Portfolio Returns and Different Holding Periods

This table reports average returns for the long–short portfolios, the bottom and top portfolios for HLC and MAT. Average monthly alphas for different holding periods between 1 month and 60 months are reported. T-statistics are Newey-West (1987) adjusted. More results are reported in Appendix 3.

Panel A: HLC								
	1-month	3-month	6-month	12-month	24-month	36-month	48-month	60-month
Return Spreads for Long Short Portfolios								
Time-Series Mean	**0.0223**	**0.0643**	**0.1228**	**0.2685**	**0.3024**	**0.2871**	**0.2771**	**0.3617**
	(3.99)	**(4.33)**	**(3.81)**	**(4.44)**	**(6.11)**	**(7.82)**	**(8.77)**	**(9.47)**
FF5 Alpha	**0.0216**	**0.0602**	**0.1232**	**0.2629**	**0.3057**	**0.2979**	**0.285**	**0.3588**
	(3.84)	**(4.48)**	**(4.82)**	**(5.63)**	**(4.16)**	**(6.94)**	**(8.13)**	**(10.65)**
Returns for Bottom Portfolios								
Time-Series Mean	**0.0132**	**0.0411**	**0.0804**	**0.151**	**0.2179**	**0.2673**	**0.3249**	**0.461**
	(3.97)	**(3.62)**	**(3.37)**	**(3.59)**	**(3.91)**	**(4.23)**	**(3.76)**	**(4.45)**
FF5 Alpha	**0.0134**	**0.0425**	**0.0855**	**0.1498**	**0.2178**	**0.2684**	**0.3081**	**0.452**
	(3.46)	**(4.48)**	**(3.39)**	**(4.02)**	**(4.25)**	**(3.92)**	**(3.68)**	**(3.96)**
Returns for Top Portfolios								
Time-Series Mean	**-0.009**	-0.0232	-0.0424	**-0.1175**	-0.0845	-0.0199	0.0479	0.0993
	(-1.72)	(-1.47)	(-1.50)	**(-2.36)**	(-1.58)	(-0.32)	(0.62)	(1.04)
FF5 Alpha	**-0.0083**	-0.0178	-0.0377	**-0.1131**	-0.0879	-0.0295	0.0231	0.0931
	(-1.80)	(-1.30)	(-1.56)	**(-2.19)**	(-1.52)	(-0.53)	(0.33)	(0.80)

Panel B: MAT								
	1-month	3-month	6-month	12-month	24-month	36-month	48-month	60-month
Return Spreads for Long Short Portfolios								
Time-Series Mean	**-0.1733**	**-0.5455**	**-1.1801**	**-2.6171**	**-5.1778**	**-8.1356**	**-11.1201**	**-14.7643**
	(-4.83)	**(-5.32)**	**(-5.97)**	**(-6.50)**	**(-8.00)**	**(-10.11)**	**(-11.31)**	**(-11.45)**
FF5 Alpha	**-0.1705**	**-0.5405**	**-1.1852**	**-2.6021**	**-5.1796**	**-8.2583**	**-11.3783**	**-15.1235**
	(-4.34)	**(-6.48)**	**(-6.82)**	**(-8.41)**	**(-7.00)**	**(-10.60)**	**(-8.45)**	**(-11.27)**
Returns for Bottom Portfolios								
Time-Series Mean	**-0.1721**	**-0.5462**	**-1.1943**	**-2.6048**	**-5.1197**	**-8.0691**	**-11.0696**	**-14.7766**
	(-4.72)	**(-5.56)**	**(-6.25)**	**(-6.59)**	**(-8.04)**	**(-10.33)**	**(-11.43)**	**(-11.58)**
FF5 Alpha	**-0.1688**	**-0.5403**	**-1.1952**	**-2.5853**	**-5.1073**	**-8.1862**	**-11.3132**	**-15.1105**
	(-4.12)	**(-6.80)**	**(-7.53)**	**(-8.56)**	**(-7.02)**	**(-10.82)**	**(-8.49)**	**(-11.39)**
Returns for Top Portfolios								
Time-Series Mean	0.0013	-0.0008	-0.0142	0.0123	0.0581	0.0666	0.0504	-0.0123
	(0.22)	(-0.03)	(-0.29)	(0.22)	(0.89)	(0.85)	(0.60)	(-0.17)
FF5 Alpha	0.0017	0.0002	-0.01	0.0168	0.0723	0.072	0.0651	0.013
	(0.29)	(0.01)	(-0.24)	(0.31)	(0.98)	(0.76)	(0.88)	(0.18)

Table 9

Summary Statistics of Monthly Market Sentiment.

The full sample period is divided into three subsample periods according to market sentiment, namely, low-, medium-, and high-sentiment periods. Following Jacoby et al. (2024), we classify months into low-, medium-, and high-sentiment months using the breakpoints calculated by the average monthly median market sentiment of the full-sample periods minus or plus 0.5 of a full-sample standard deviation. The tables report the summary statistics for the full sample and three subsample periods.

Value-Weighted Monthly Market Sentiment				
	Full Sample	Low-Sentiment Months	Medium-Sentiment Months	High-Sentiment Months
N	252	91	88	73
Mean	0.0168	0.0013	0.0165	0.0364
Stdev	0.0154	0.0059	0.0043	0.0084
P25	0.0056	-0.0018	0.0131	0.0289
P50	0.0157	0.0023	0.0166	0.0350
P75	0.0275	0.0061	0.0199	0.0420

Table 10

Return spreads following different sentiment periods.

We follow the method of Jacoby et al. (2024) and divide the full-sample periods into three subsample periods for the whole market according to market sentiment. We classify months into low-, medium-, and high-sentiment months using the breakpoints calculated by the average monthly median market sentiment of the full-sample periods minus or plus 0.5 of a full-sample standard deviation. The return spreads and corresponding estimated alphas following the low-, medium-, and high-sentiment periods are presented in the Panel A, B and C, respectively. T-statistics are Newey-West (1987) adjusted, where the lag is set to 4.

Panel A： Low Sentiment Periods										
	COM	ENE	FIN	HLC	IND	MAT	NCY	TEC	UTL	YCY
Low-High	-0.0183	**0.0815**	0.0119	**0.0423**	**0.0326**	**-0.3074**	**0.0449**	**0.0908**	0.0055	**0.1250**
	(-0.78)	**(2.13)**	(1.18)	**(3.16)**	**(2.42)**	**(-7.24)**	**(5.69)**	**(2.48)**	(0.69)	**(3.48)**
FF5 Alpha	-0.0404	**0.0641**	0.0116	**0.0258**	**0.0172**	**-0.3061**	**0.0497**	**0.0858**	-0.0067	**0.0989**
	(-1.73)	**(2.45)**	(0.91)	**(2.06)**	**(1.88)**	**(-5.14)**	**(6.32)**	**(1.76)**	(-1.04)	**(2.79)**
Panel B: Medium Sentiment Periods										
	COM	ENE	FIN	HLC	IND	MAT	NCY	TEC	UTL	YCY
Low-High	0.0344	**0.1247**	**0.0176**	**0.0304**	**0.0169**	-0.0041	0.0109	**0.0206**	-0.0027	**0.0148**
	(0.47)	**(2.30)**	**(2.10)**	**(3.62)**	**(2.53)**	(-0.04)	(1.04)	**(1.97)**	(-0.30)	**(2.30)**
FF5 Alpha	0.0457	**0.1311**	0.0122	**0.0350**	**0.0177**	0.0232	-0.0005	0.0196	0.0097	**0.0232**
	(0.62)	**(2.72)**	(1.29)	**(3.89)**	**(2.56)**	(0.33)	(-0.05)	(1.53)	(0.98)	**(3.20)**
Panel C: High Sentiment Periods										
	COM	ENE	FIN	HLC	IND	MAT	NCY	TEC	UTL	YCY
Low-High	**-0.0735**	**0.0169**	0.0031	0.004	-0.0005	**-0.1205**	0.0061	-0.0031	-0.0069	**0.041**
	(-3.00)	**(2.17)**	(0.75)	(0.56)	(-0.24)	**(-9.73)**	(1.13)	(-0.19)	(-0.93)	**(2.12)**
FF5 Alpha	**-0.0897**	0.0129	0.003	-0.0026	-0.0002	**-0.1252**	0.0078	-0.0133	0.0072	0.054
	(-3.65)	(1.37)	(0.49)	(-0.33)	(-0.05)	**(-9.29)**	(1.15)	(-0.83)	(1.47)	(1.52)

Table 11

Summary Statistics

The table reports the summary statistics for eight sector-level variables, namely institutional ownership, BEME, analyst coverage, size, HHI, return momentum, market beta and return volatility.

Cross-sector Characteristics										
Institutional ownership										
	COM	ENE	FIN	HLC	IND	MAT	NCY	TEC	UTL	YCY
Mean	0.7841	0.8765	0.4218	0.7817	0.9893	0.9907	0.8439	0.9855	0.5878	1.0574
Stdev	0.3616	0.3734	0.3977	0.4304	0.5099	0.4374	0.3943	0.4539	0.3685	0.4255
P25	0.5014	0.7062	0.1842	0.5861	0.7289	0.6710	0.6806	0.7292	0.3596	0.8987
P50	0.8282	0.9330	0.3865	0.7985	1.1251	1.0443	0.9788	1.0788	0.6159	1.1837
P75	1.0661	1.1174	0.6606	1.0818	1.3628	1.3638	1.1598	1.3699	0.8460	1.3335
BEME										
	COM	ENE	FIN	HLC	IND	MAT	NCY	TEC	UTL	YCY
Mean	1.5340	2.0558	6.8219	0.9163	1.2389	5.8612	1.2029	2.5943	3.4425	1.7510
Stdev	9.0943	8.8916	17.3517	4.5090	2.4845	9.1626	5.7417	3.3189	4.6976	3.8295
P25	0.5419	0.7133	0.8630	0.3616	0.6186	0.5573	0.4890	0.4789	0.7661	0.6365
P50	0.6398	0.8801	1.1284	0.4308	0.8721	0.7703	0.5463	0.6560	3.8829	1.0726
P75	0.9400	1.1468	4.3722	0.5224	1.2161	4.9034	0.6319	3.1684	5.0214	1.8912
Analyst Coverage										
	COM	ENE	FIN	HLC	IND	MAT	NCY	TEC	UTL	YCY
Mean	2.2315	2.2737	1.9426	2.0478	2.0812	2.0545	2.2025	2.1917	2.1901	2.2087
Stdev	0.2168	0.1266	0.0855	0.0815	0.0963	0.1148	0.0784	0.0598	0.1599	0.0812
P25	2.1644	2.2024	1.8989	2.0004	2.0096	1.9719	2.1464	2.1576	2.1027	2.1470
P50	2.2301	2.2740	1.9334	2.0370	2.0853	2.0340	2.2131	2.1813	2.2155	2.2108
P75	2.3449	2.3336	1.9648	2.0792	2.1532	2.1364	2.2530	2.2166	2.2664	2.2623
Log Market Capitalization										
	COM	ENE	FIN	HLC	IND	MAT	NCY	TEC	UTL	YCY
Mean	26.8819	27.4828	28.5406	28.2039	28.2317	27.3503	27.9414	28.6245	26.8877	28.2942
Stdev	0.3184	0.6325	0.4780	0.4179	0.4333	0.3285	0.3227	0.3969	0.4804	0.4571
P25	26.6711	26.7825	28.2529	27.9188	27.8876	27.0174	27.6377	28.3771	26.5177	27.9707
P50	26.9362	27.6738	28.5592	28.0714	28.1502	27.3561	27.9138	28.5172	26.9070	28.1847
P75	27.1331	28.0256	28.9273	28.5960	28.6001	27.6718	28.2579	28.8814	27.2879	28.7065

HHI										
	COM	ENE	FIN	HLC	IND	MAT	NCY	TEC	UTL	YCY
Mean	0.3287	0.0793	0.0326	0.0470	0.0262	0.2181	0.0434	0.0487	0.0328	0.0532
Stdev	0.0557	0.0258	0.0062	0.0038	0.0072	0.0488	0.0044	0.0082	0.0088	0.0081
P25	0.2782	0.0530	0.0275	0.0447	0.0188	0.1990	0.0403	0.0438	0.0269	0.0476
P50	0.3701	0.0822	0.0334	0.0464	0.0262	0.2336	0.0417	0.0473	0.0314	0.0520
P75	0.3785	0.1026	0.0360	0.0493	0.0343	0.2558	0.0450	0.0488	0.0334	0.0563
Return Momentum										
	COM	ENE	FIN	HLC	IND	MAT	NCY	TEC	UTL	YCY
Mean	-0.9058	0.1382	-0.3950	0.3612	0.5814	-1.7833	-1.0465	1.9853	1.2127	0.0432
Stdev	1.5001	0.7649	0.4373	0.7654	0.4752	1.4166	2.6914	3.4579	0.8179	0.7092
P25	-2.3261	-0.0097	-0.7448	-0.0764	0.3851	-3.1467	-4.4441	0.0945	0.4332	-0.4542
P50	-1.1810	0.4057	-0.5166	0.6504	0.7812	-1.0639	0.4351	0.6509	1.5879	-0.0973
P75	0.7005	0.6892	0.0529	0.9397	0.9056	-0.5055	1.0750	1.0469	2.0106	0.7433
Market Beta										
	COM	ENE	FIN	HLC	IND	MAT	NCY	TEC	UTL	YCY
Mean	0.6029	0.6140	0.5064	0.4527	0.7322	0.7739	0.5126	0.6402	0.4938	0.7218
Stdev	0.1985	0.4062	0.1400	0.2202	0.2279	0.2910	0.2024	0.2048	0.2339	0.2040
P25	0.4689	0.3170	0.4211	0.2898	0.5894	0.6081	0.4143	0.5226	0.3543	0.5822
P50	0.5898	0.5937	0.5032	0.3904	0.7442	0.7991	0.5080	0.6060	0.5101	0.7448
P75	0.7277	0.8228	0.5827	0.5767	0.8653	0.9569	0.6107	0.7319	0.6467	0.8635
Return Volatility										
	COM	ENE	FIN	HLC	IND	MAT	NCY	TEC	UTL	YCY
Mean	0.0458	0.0396	0.0278	0.0287	0.0386	0.0481	0.0418	0.0748	0.0321	0.0401
Stdev	0.0241	0.0175	0.0135	0.0126	0.0169	0.0255	0.0285	0.1010	0.0136	0.0201
P25	0.0298	0.0265	0.0191	0.0199	0.0255	0.0309	0.0247	0.0337	0.0224	0.0275
P50	0.0388	0.0346	0.0239	0.0266	0.0349	0.0402	0.0376	0.0450	0.0280	0.0320
P75	0.0565	0.0547	0.0328	0.0323	0.0491	0.0578	0.0477	0.0625	0.0378	0.0503

Table 12

Panel regression between sector sentiment premium and sector characteristics.

This table reports the results for $Return\ Spread_{i,t+1} = \alpha + \beta_X Variables\ X_{i,t} + \varepsilon_{i,t}$ where i denotes sector and $Variable\ X_{i,t}$ refers to different cross-sector characteristics. All independent variables are standardised and winsorised. Column (1) reports the results of pooling regression. Column (2), (3) and (4) presents results of panel regression under sector fixed-effects, year fixed-effects and both sector and year fixed effects, respectively. T-statistics are Newey-West (1987) adjusted, where the lag is set to 4.

	(1)	(2)	(3)	(4)
HHI	**-0.0511**	**-0.2147**	**-0.0520**	**-0.2073**
	(-1.94)	**(-4.97)**	**(-6.77)**	**(-3.73)**
BEME	**-0.0152**	**0.0096**	**-0.0195**	0.0105
	(-2.32)	**(1.93)**	**(-2.90)**	(1.19)
IO	**-0.0219**	-0.0225	-0.0089	-0.0083
	(-1.86)	(-1.45)	(-1.24)	(-0.68)
Size	0.0077	0.0080	0.0057	-0.0122
	(0.57)	(0.26)	(1.03)	(-0.40)
MOM	-0.0015	0.0005	-0.0007	0.0028
	(-0.17)	(0.05)	(-0.18)	(0.27)
Return Volatility	-0.0017	-0.0074	-0.0074	**-0.0139**
	(-0.37)	(-1.32)	(-0.89)	**(-1.75)**
Market Beta	-0.0107	-0.0069	0.0007	0.0031
	(-0.93)	(-0.45)	(0.18)	(0.23)
Analyst Coverage	**0.0322**	-0.0038	**0.0301**	-0.0076
	(2.50)	(-0.69)	**(3.08)**	(-1.28)
R Square	0.1751	0.1379	0.1642	0.1178
Adj R Square	(0.17)	(0.13)	(0.15)	(0.10)
N	2390	2390	2390	2390
Sector FE	NO	YES	NO	YES
Time FE	NO	NO	YES	YES

Internet Appendix:

1. Correlation Matrix

The table reports the correlation matrix for ten sector equal-weighted monthly sentiment (i.e., COM, ENE, FIN, HLC, IND, MAT, NCY, TEC, UTL, and YCY) and equal-weighted monthly market sentiment for the period January 1999 to December 2019.

Correlation of Equal-Weighted Sectors Sentiment											
	COM	ENE	FIN	HLC	IND	MAT	NCY	TEC	UTL	YCY	Market Sentiment
COM											
ENE	-0.0985										
FIN	-0.0530	0.5205									
HLC	0.4918	-0.3364	-0.4148								
IND	0.3944	-0.0525	-0.1426	0.4886							
MAT	0.2759	0.1332	-0.0484	0.3672	0.5475						
NCY	0.0539	0.4023	0.4143	-0.1675	-0.0614	0.0646					
TEC	0.2726	-0.0465	-0.1180	0.3255	0.1069	0.1160	-0.0017				
UTL	0.4076	-0.0289	-0.0289	0.4361	0.4562	0.3447	0.0340	0.2517			
YCY	0.3822	0.1207	0.0823	0.3925	0.4178	0.3741	0.1617	0.1529	0.3786		
Market Sentiment	0.6185	0.3543	0.3531	0.4440	0.5529	0.5543	0.3886	0.4256	0.6385	0.6675	

2. We apply VIX as an alternative proxy for market sentiment and repeat the univariate portfolio analysis. The results are consistent with our main results.

Value-Weighted Returns on Sentiment Beta Portfolios Using VIX as Market Sentiment										
	COM	ENE	FIN	HLC	IND	MAT	NCY	TEC	UTL	YCY
P1 (Low)	-0.0240	0.0710	0.0084	0.0134	0.0105	-0.1551	0.0293	0.0220	-0.0004	0.0506
	-0.46	2.92	2.18	3.73	3.14	-5.49	5.99	3.02	-0.11	2.76
P5 (High)	-0.0234	-0.0062	-0.0055	-0.0062	-0.0041	0.0021	0.0029	-0.0068	0.0038	0.0004
	-2.58	-0.83	-1.29	-1.18	-0.66	0.34	0.79	-1.06	0.87	0.07
Low-High	-0.0005	**0.0772**	**0.0138**	**0.0197**	**0.0147**	**-0.1572**	**0.0264**	**0.0289**	-0.0042	**0.0501**
	-0.01	**3.24**	**4.06**	**3.26**	**3.61**	**-5.53**	**5.37**	**2.97**	-1.09	**2.90**
Annualized Low-High	0.9936	2.4413	1.1794	1.2633	1.1911	0.1285	1.3667	1.4069	0.9505	1.7986
Annualized Sharpe Ratio	-0.0058	1.6175	1.0611	0.7454	0.8329	-2.2455	1.4811	1.1169	-0.2579	1.3944
CAPM Alpha	0.0011	**0.0795**	**0.0147**	**0.0210**	**0.0154**	**-0.1589**	**0.0270**	**0.0300**	-0.0026	**0.0531**
	0.02	**2.95**	**4.58**	**3.37**	**4.09**	**-4.67**	**5.59**	**3.97**	-0.70	**3.54**
FF3 Alpha	0.0012	**0.0781**	**0.0145**	**0.0206**	**0.0146**	**-0.1570**	**0.0273**	**0.0295**	-0.0030	**0.0528**
	0.02	**3.28**	**4.72**	**3.47**	**4.44**	**-5.51**	**5.92**	**4.28**	-0.87	**3.28**
CH4 Alpha	-0.0003	**0.0762**	**0.0138**	**0.0197**	**0.0148**	**-0.1583**	**0.0275**	**0.0292**	-0.0032	**0.0531**
	-0.01	**3.36**	**3.89**	**3.27**	**4.04**	**-6.48**	**5.56**	**3.21**	-0.88	**2.43**
FF5 Alpha	0.0073	**0.0760**	**0.0137**	**0.0212**	**0.0134**	**-0.1497**	**0.0258**	**0.0256**	-0.0045	**0.0500**
	0.12	**3.56**	**4.30**	**2.95**	**4.25**	**-5.29**	**5.41**	**2.60**	-1.23	**2.31**

3. Portfolio Returns and Different Holding Periods

This table reports average returns for the long–short portfolios in Appendix 3-1, returns for the bottom portfolios in Appendix 3-2, and returns for the top portfolios in Appendix 3-3 for each sector. Average monthly alphas for different holding periods between 1 month and 60 months are reported.

Appendix 3-1:

Panel A: COM								
	1-month return	3-month return	6-month return	12-month return	24-month return	36-month return	48-month return	60-month return
Time-Series Mean	-0.0013	-0.0625	-0.2594	**-0.9893**	**-2.1768**	**-3.5557**	**-5.5011**	**-7.6731**
	-0.02	-0.32	-1.25	-5.39	-7.21	-7.43	-8.75	-8.91
CAPM Alpha	0.0008	-0.0629	-0.2696	**-0.9847**	**-2.1782**	**-3.5514**	**-5.5532**	**-7.8126**
	0.02	-0.31	-1.37	-5.81	-7.86	-6.83	-7.77	-8.45
FF3 Alpha	0.0005	-0.0668	-0.2766	**-1.0082**	**-2.2175**	**-3.5837**	**-5.5861**	**-7.8062**
	0.01	-0.42	-1.45	-5.39	-7.51	-6.88	-8.71	-8.34
CH4 Alpha	-0.0010	-0.0749	-0.2972	**-1.0045**	**-2.2268**	**-3.5825**	**-5.5930**	**-7.8248**
	-0.02	-0.50	-1.83	-5.12	-8.24	-7.42	-8.81	-8.44
FF5 Alpha	0.0042	-0.0552	-0.2577	**-1.0323**	**-2.3013**	**-3.6438**	**-5.6078**	**-8.0060**
	0.07	-0.28	-1.35	-5.87	-7.40	-7.30	-9.27	-8.52

Panel B: ENE								
	1-month return	3-month return	6-month return	12-month return	24-month return	36-month return	48-month return	60-month return
Time-Series Mean	**0.0762**	**0.2224**	**0.3920**	**0.5824**	**0.4977**	**0.5058**	**0.8828**	**1.2133**
	3.56	3.00	3.08	2.91	2.26	1.77	2.50	2.89
CAPM Alpha	**0.0783**	**0.2250**	**0.3984**	**0.5931**	**0.5080**	**0.4945**	**0.8579**	**1.1643**
	3.03	3.02	3.11	2.74	2.22	1.64	2.77	3.17
FF3 Alpha	**0.0769**	**0.2197**	**0.3875**	**0.5615**	**0.4944**	**0.4910**	**0.8566**	**1.1647**
	3.35	3.25	3.00	2.57	2.14	1.66	2.78	3.15
CH4 Alpha	**0.0751**	**0.2136**	**0.3736**	**0.5454**	**0.4777**	**0.4598**	**0.8476**	**1.1487**
	4.07	3.18	3.39	2.62	1.83	1.37	2.81	3.20
FF5 Alpha	**0.0771**	**0.2152**	**0.3792**	**0.5649**	**0.5161**	**0.5435**	**0.9187**	**1.2639**
	3.99	3.30	3.03	3.52	2.39	2.05	2.73	3.19
Panel C: FIN								
	1-month return	3-month return	6-month return	12-month return	24-month return	36-month return	48-month return	60-month return
Time-Series Mean	**0.0120**	**0.0331**	**0.0635**	**0.1196**	**0.1969**	**0.3095**	**0.3376**	**0.2597**
	2.63	2.67	2.91	3.04	3.39	5.01	3.89	2.25
CAPM Alpha	**0.0123**	**0.0330**	**0.0646**	**0.1209**	**0.1984**	**0.2987**	**0.3413**	**0.2629**
	2.78	3.25	3.52	3.76	4.04	4.96	5.03	2.31
FF3 Alpha	**0.0121**	**0.0313**	**0.0618**	**0.1157**	**0.1909**	**0.2981**	**0.3430**	**0.2629**
	3.07	3.50	3.05	2.81	3.47	4.70	4.87	2.28
CH4 Alpha	**0.0117**	**0.0301**	**0.0594**	**0.1119**	**0.1854**	**0.3003**	**0.3468**	**0.2690**
	2.36	2.75	3.62	3.89	3.29	4.76	4.71	2.33
FF5 Alpha	**0.0116**	**0.0312**	**0.0629**	**0.1115**	**0.2027**	**0.3031**	**0.3309**	**0.2596**
	2.25	3.29	3.85	3.38	3.35	4.58	4.01	2.14

Panel D: HLC								
	1-month return	3-month return	6-month return	12-month return	24-month return	36-month return	48-month return	60-month return
Time-Series Mean	**0.0223**	**0.0643**	**0.1228**	**0.2685**	**0.3024**	**0.2871**	**0.2771**	**0.3617**
	3.99	4.33	3.81	4.44	6.11	7.82	8.77	9.47
CAPM Alpha	**0.0237**	**0.0645**	**0.1235**	**0.2716**	**0.3076**	**0.2857**	**0.2746**	**0.3569**
	3.75	4.46	4.25	5.80	6.50	7.56	7.50	10.27
FF3 Alpha	**0.0229**	**0.0620**	**0.1201**	**0.2677**	**0.3055**	**0.2879**	**0.2765**	**0.3562**
	4.07	4.08	4.19	4.97	5.95	7.04	7.51	10.65
CH4 Alpha	**0.0225**	**0.0619**	**0.1194**	**0.2709**	**0.3039**	**0.2850**	**0.2753**	**0.3540**
	4.07	4.78	4.30	5.89	6.24	7.92	7.77	11.14
FF5 Alpha	**0.0216**	**0.0602**	**0.1232**	**0.2629**	**0.3057**	**0.2979**	**0.2850**	**0.3588**
	3.84	4.48	4.82	5.63	4.16	6.94	8.13	10.65

Panel E: IND								
	1-month return	3-month return	6-month return	12-month return	24-month return	36-month return	48-month return	60-month return
Time-Series Mean	**0.0147**	0.0780	**0.2450**	**0.7407**	**2.2239**	1.5949	1.2358	2.3457
	3.37	1.52	1.64	1.65	1.94	0.97	0.60	0.90
CAPM Alpha	**0.0152**	0.0781	**0.2480**	**0.7459**	**2.4084**	1.8552	1.6379	2.5231
	3.59	1.28	2.90	1.41	1.95	1.09	0.77	0.96
FF3 Alpha	**0.0144**	0.0713	0.2343	**0.7380**	**2.5599**	1.9623	1.6445	2.4723
	3.95	1.36	1.41	1.76	1.97	1.12	0.78	1.03
CH4 Alpha	**0.0147**	0.0745	0.2375	**0.7426**	**2.5210**	1.8620	1.5322	2.3592
	3.45	1.35	1.34	1.63	1.96	1.06	0.72	0.99
FF5 Alpha	**0.0138**	0.0657	0.2092	**0.6792**	**2.6149**	2.0239	1.4685	1.9195
	3.95	1.62	1.45	1.75	1.91	1.16	0.69	0.75
Panel F: MAT								
	1-month return	3-month return	6-month return	12-month return	24-month return	36-month return	48-month return	60-month return
Time-Series Mean	**-0.1733**	**-0.5455**	**-1.1801**	**-2.6171**	**-5.1778**	**-8.1356**	**-11.1201**	**-14.7643**
	-4.83	-5.32	-5.97	-6.50	-8.00	-10.11	-11.31	-11.45
CAPM Alpha	**-0.1769**	**-0.5571**	**-1.2036**	**-2.6591**	**-5.2551**	**-8.1527**	**-11.1189**	**-14.8720**
	-5.99	-6.72	-8.26	-8.64	-11.11	-10.83	-13.74	-12.31
FF3 Alpha	**-0.1751**	**-0.5518**	**-1.1902**	**-2.6217**	**-5.2100**	**-8.1247**	**-11.1306**	**-14.8910**
	-5.10	-6.10	-7.09	-7.90	-7.89	-11.00	-11.94	-11.10
CH4 Alpha	**-0.1738**	**-0.5456**	**-1.1829**	**-2.6012**	**-5.2144**	**-8.1965**	**-11.2270**	**-14.9661**
	-5.64	-6.15	-8.26	-9.38	-8.92	-11.92	-13.22	-12.19
FF5 Alpha	**-0.1705**	**-0.5405**	**-1.1852**	**-2.6021**	**-5.1796**	**-8.2583**	**-11.3783**	**-15.1235**
	-4.34	-6.48	-6.82	-8.41	-7.00	-10.60	-8.45	-11.27

Panel G: NCY								
	1-month return	3-month return	6-month return	12-month return	24-month return	36-month return	48-month return	60-month return
Time-Series Mean	**0.0264**	**0.0848**	**0.1696**	**0.3223**	**0.6203**	**0.7821**	**0.7842**	**0.8737**
	4.70	5.97	6.46	6.11	6.02	5.71	6.32	6.98
CAPM Alpha	**0.0269**	**0.0856**	**0.1710**	**0.3247**	**0.6239**	**0.7860**	**0.8024**	**0.8917**
	4.64	5.76	6.88	7.23	6.92	7.17	6.04	7.04
FF3 Alpha	**0.0271**	**0.0866**	**0.1730**	**0.3299**	**0.6273**	**0.7881**	**0.8029**	**0.8918**
	4.93	4.80	8.03	8.13	6.99	5.52	9.05	7.80
CH4 Alpha	**0.0272**	**0.0876**	**0.1755**	**0.3367**	**0.6382**	**0.7930**	**0.8099**	**0.8975**
	5.00	4.84	6.68	7.89	7.10	5.77	9.38	7.43
FF5 Alpha	**0.0251**	**0.0826**	**0.1642**	**0.3103**	**0.6193**	**0.7753**	**0.7686**	**0.8491**
	4.79	4.24	6.88	6.25	6.86	5.40	8.30	6.74
Panel H: TEC								
	1-month return	3-month return	6-month return	12-month return	24-month return	36-month return	48-month return	60-month return
Time-Series Mean	**0.0255**	**0.0732**	**0.1324**	**0.2446**	**0.3447**	**0.2705**	0.1148	**-0.3612**
	2.98	2.78	2.70	3.30	3.40	1.71	0.51	**-1.98**
CAPM Alpha	**0.0264**	**0.0766**	**0.1390**	**0.2534**	**0.3608**	**0.2844**	0.1120	**-0.3573**
	3.46	2.73	3.32	3.23	3.44	1.80	0.61	**-2.42**
FF3 Alpha	**0.0260**	**0.0743**	**0.1358**	**0.2444**	**0.3502**	**0.2732**	0.1121	**-0.3539**
	3.66	2.96	3.51	3.37	3.91	1.85	0.59	**-2.28**
CH4 Alpha	**0.0257**	**0.0734**	**0.1335**	**0.2431**	**0.3546**	**0.2781**	0.1197	**-0.3517**
	3.63	3.72	3.79	2.61	3.74	1.89	0.64	**-1.95**
FF5 Alpha	**0.0236**	**0.0659**	**0.1191**	**0.2228**	**0.3287**	**0.2776**	0.1097	**-0.3781**
	2.28	3.15	2.80	2.97	3.50	1.81	0.57	**-2.30**

Panel I: UTL								
	1-month return	3-month return	6-month return	12-month return	24-month return	36-month return	48-month return	60-month return
Time-Series Mean	0.0039	0.0030	0.0064	-0.0337	**0.1629**	**0.3191**	**0.4490**	**0.4924**
	0.98	0.34	0.41	-0.90	2.78	2.46	2.52	1.84
CAPM Alpha	0.0024	0.0013	0.0047	-0.0345	**0.1644**	**0.3149**	**0.4392**	**0.5010**
	0.67	0.14	0.27	-0.94	2.31	2.67	3.23	1.74
FF3 Alpha	0.0031	0.0019	0.0065	-0.0285	**0.1627**	**0.3096**	**0.4422**	**0.5093**
	0.86	0.21	0.45	-0.95	2.29	3.04	2.60	1.97
CH4 Alpha	0.0029	0.0026	0.0092	-0.0236	**0.1567**	**0.3034**	**0.4369**	**0.5024**
	0.82	0.31	0.62	-0.86	2.15	2.90	2.62	2.34
FF5 Alpha	0.0041	0.0070	0.0160	-0.0109	**0.1489**	**0.3316**	**0.4672**	**0.5104**
	1.17	0.87	1.10	-0.37	1.98	3.14	2.89	2.71
Panel J: YCY								
	1-month return	3-month return	6-month return	12-month return	24-month return	36-month return	48-month return	60-month return
Time-Series Mean	**0.0464**	**0.1261**	**0.2447**	**0.4402**	**0.8230**	**0.7009**	**0.3972**	0.1903
	2.96	2.46	2.37	2.35	1.98	3.67	2.64	1.07
CAPM Alpha	**0.0491**	**0.1318**	**0.2558**	**0.4601**	**0.8699**	**0.7149**	**0.3866**	0.1617
	3.60	2.76	2.41	2.09	1.76	3.88	3.01	1.20
FF3 Alpha	**0.0488**	**0.1300**	**0.2513**	**0.4559**	**0.8452**	**0.6979**	**0.3828**	0.1561
	3.87	2.84	2.64	2.29	2.40	3.51	2.57	1.00
CH4 Alpha	**0.0484**	**0.1285**	**0.2471**	**0.4497**	**0.8331**	**0.6816**	**0.3703**	0.1512
	2.41	2.13	2.16	1.75	2.52	3.63	2.77	1.14
FF5 Alpha	**0.0463**	**0.1205**	**0.2365**	**0.4267**	**0.7333**	**0.6074**	**0.3549**	0.1464
	2.54	2.75	2.63	2.50	2.90	3.64	2.22	0.97

Appendix 3-2: Returns of Bottom Portfolios

Panel A: COM								
	1-month return	3-month return	6-month return	12-month return	24-month return	36-month return	48-month return	60-month return
Time-Series Mean	-0.0174	-0.1077	**-0.3636**	**-1.1796**	**-2.4248**	**-3.9191**	**-6.0076**	**-8.5011**
	-0.30	-0.53	-1.77	-7.38	-7.45	-7.83	-9.54	-11.30
CAPM Alpha	-0.0165	-0.1076	**-0.3718**	**-1.1703**	**-2.4185**	**-3.9034**	**-6.0366**	**-8.6227**
	-0.30	-0.52	-1.88	-8.74	-7.97	-8.28	-9.87	-10.99
FF3 Alpha	-0.0158	-0.1076	**-0.3727**	**-1.1909**	**-2.4506**	**-3.9376**	**-6.0655**	**-8.6044**
	-0.31	-0.60	-2.03	-7.58	-8.56	-8.80	-9.58	-10.34
CH4 Alpha	-0.0189	-0.1176	**-0.3946**	**-1.1904**	**-2.4573**	**-3.9413**	**-6.0706**	**-8.6315**
	-0.42	-0.77	-2.51	-5.27	-7.96	-8.87	-8.62	-10.27
FF5 Alpha	-0.0083	-0.0925	**-0.3459**	**-1.1990**	**-2.5365**	**-4.0351**	**-6.0563**	**-8.8203**
	-0.14	-0.45	-1.80	-7.53	-8.36	-8.47	-9.13	-10.57
Panel B: ENE								
	1-month return	3-month return	6-month return	12-month return	24-month return	36-month return	48-month return	60-month return
Time-Series Mean	**0.0711**	**0.1971**	**0.3473**	**0.5098**	0.3048	0.1425	0.0480	-0.0347
	2.98	2.43	2.70	2.64	1.24	0.51	0.33	-0.30
CAPM Alpha	**0.0719**	**0.1992**	**0.3522**	**0.5190**	0.3136	0.1564	0.0667	-0.0250
	3.27	2.71	2.40	2.72	1.23	0.61	0.43	-0.24
FF3 Alpha	**0.0703**	**0.1937**	**0.3427**	**0.4850**	0.2931	0.1412	0.0647	-0.0232
	3.05	2.60	2.44	2.21	1.26	0.52	0.45	-0.22
CH4 Alpha	**0.0688**	**0.1893**	**0.3309**	**0.4730**	0.2885	0.1246	0.0738	-0.0165
	3.35	3.02	2.78	2.19	1.12	0.40	0.53	-0.16
FF5 Alpha	**0.0713**	**0.1930**	**0.3397**	**0.4976**	0.3248	0.1704	0.0826	-0.0313
	3.23	3.06	2.79	2.87	1.47	0.69	0.53	-0.24

Panel C: FIN								
	1-month return	3-month return	6-month return	12-month return	24-month return	36-month return	48-month return	60-month return
Time-Series Mean	**0.0089**	**0.0291**	**0.0603**	**0.1109**	0.1542	**0.2232**	0.2318	0.2238
	1.65	1.73	2.05	2.23	1.60	2.14	1.29	0.79
CAPM Alpha	0.0085	0.0283	**0.0602**	**0.1116**	**0.1538**	**0.2067**	0.2253	0.2194
	1.58	1.44	2.11	2.60	1.80	1.93	1.40	0.73
FF3 Alpha	**0.0084**	0.0275	**0.0600**	**0.1073**	**0.1478**	**0.2052**	0.2206	0.2185
	1.75	1.31	1.74	2.59	2.03	1.68	1.43	0.80
CH4 Alpha	0.0080	0.0272	**0.0602**	**0.1067**	**0.1449**	**0.2105**	**0.2316**	0.2287
	1.43	1.28	1.88	2.19	1.71	1.86	1.71	0.81
FF5 Alpha	0.0081	**0.0297**	**0.0616**	**0.1066**	**0.1537**	0.2011	0.1994	0.1995
	1.35	1.82	2.33	2.42	2.03	1.63	0.96	0.55
Panel D: HLC								
	1-month return	3-month return	6-month return	12-month return	24-month return	36-month return	48-month return	60-month return
Time-Series Mean	**0.0132**	**0.0411**	**0.0804**	**0.1510**	**0.2179**	**0.2673**	**0.3249**	**0.4610**
	3.97	3.62	3.37	3.59	3.91	4.23	3.76	4.45
CAPM Alpha	**0.0129**	**0.0398**	**0.0785**	**0.1515**	**0.2216**	**0.2670**	**0.3232**	**0.4628**
	3.97	4.34	3.72	5.31	3.82	3.89	3.80	3.86
FF3 Alpha	**0.0130**	**0.0402**	**0.0786**	**0.1502**	**0.2227**	**0.2689**	**0.3209**	**0.4621**
	3.80	4.00	3.91	4.21	4.01	4.34	3.79	4.75
CH4 Alpha	**0.0137**	**0.0416**	**0.0808**	**0.1564**	**0.2232**	**0.2705**	**0.3241**	**0.4651**
	4.21	3.78	4.08	3.94	3.64	4.37	4.25	3.89
FF5 Alpha	**0.0134**	**0.0425**	**0.0855**	**0.1498**	**0.2178**	**0.2684**	**0.3081**	**0.4520**
	3.46	4.48	3.39	4.02	4.25	3.92	3.68	3.96

Panel E: IND								
	1-month return	3-month return	6-month return	12-month return	24-month return	36-month return	48-month return	60-month return
Time-Series Mean	**0.0086**	**0.0279**	**0.0571**	**0.1281**	-0.1348	-1.2577	**-2.0797**	**-3.8303**
	2.56	2.56	2.71	4.04	-0.42	-1.26	-1.60	-2.46
CAPM Alpha	**0.0080**	**0.0269**	**0.0552**	**0.1262**	-0.1463	-1.2419	**-2.0571**	**-3.8964**
	2.33	2.32	3.19	4.24	-0.49	-1.43	-1.81	-2.56
FF3 Alpha	**0.0080**	**0.0264**	**0.0551**	**0.1236**	-0.1543	-1.2651	**-2.0177**	**-3.8868**
	2.35	2.40	2.62	4.91	-0.52	-1.44	-1.98	-2.68
CH4 Alpha	**0.0079**	**0.0266**	**0.0564**	**0.1262**	-0.1527	-1.3058	**-2.0635**	**-3.9130**
	1.92	2.42	3.05	5.07	-0.51	-1.58	-1.95	-2.13
FF5 Alpha	**0.0092**	**0.0312**	**0.0624**	**0.1319**	-0.1571	-1.2675	**-2.1729**	**-3.8278**
	2.53	2.76	3.25	4.31	-0.46	-1.31	-1.72	-2.76
Panel F: MAT								
	1-month return	3-month return	6-month return	12-month return	24-month return	36-month return	48-month return	60-month return
Time-Series Mean	**-0.1721**	**-0.5462**	**-1.1943**	**-2.6048**	**-5.1197**	**-8.0691**	**-11.0696**	**-14.7766**
	-4.72	-5.56	-6.25	-6.59	-8.04	-10.33	-11.43	-11.58
CAPM Alpha	**-0.1765**	**-0.5586**	**-1.2190**	**-2.6474**	**-5.1963**	**-8.0822**	**-11.0660**	**-14.8815**
	-6.17	-7.14	-8.10	-8.80	-11.17	-11.72	-13.86	-12.44
FF3 Alpha	**-0.1738**	**-0.5520**	**-1.2032**	**-2.6104**	**-5.1495**	**-8.0536**	**-11.0785**	**-14.9016**
	-5.25	-6.52	-7.91	-8.06	-7.67	-11.21	-12.02	-11.22
CH4 Alpha	**-0.1713**	**-0.5436**	**-1.1902**	**-2.5837**	**-5.1469**	**-8.1195**	**-11.1675**	**-14.9701**
	-6.15	-7.00	-9.03	-8.57	-8.96	-11.36	-12.47	-12.26
FF5 Alpha	**-0.1688**	**-0.5403**	**-1.1952**	**-2.5853**	**-5.1073**	**-8.1862**	**-11.3132**	**-15.1105**
	-4.12	-6.80	-7.53	-8.56	-7.02	-10.82	-8.49	-11.39

Panel G: NCY								
	1-month return	3-month return	6-month return	12-month return	24-month return	36-month return	48-month return	60-month return
Time-Series Mean	**0.0264**	**0.0878**	**0.1791**	**0.3416**	**0.6044**	**0.8003**	**0.9386**	**1.0416**
	5.36	6.49	7.17	6.86	6.17	6.60	8.61	8.59
CAPM Alpha	**0.0263**	**0.0874**	**0.1787**	**0.3415**	**0.6052**	**0.7994**	**0.9449**	**1.0544**
	6.25	5.70	7.24	8.71	5.05	5.91	9.94	9.90
FF3 Alpha	**0.0264**	**0.0873**	**0.1791**	**0.3429**	**0.6057**	**0.8005**	**0.9440**	**1.0548**
	6.21	5.61	6.86	6.87	5.54	5.99	9.90	9.89
CH4 Alpha	**0.0271**	**0.0888**	**0.1831**	**0.3506**	**0.6198**	**0.8076**	**0.9531**	**1.0638**
	6.41	6.50	7.84	8.89	6.71	6.82	10.61	10.15
FF5 Alpha	**0.0252**	**0.0860**	**0.1780**	**0.3380**	**0.6015**	**0.7843**	**0.9210**	**1.0206**
	6.02	5.06	6.06	6.77	5.71	7.00	9.29	8.28
Panel H: TEC								
	1-month return	3-month return	6-month return	12-month return	24-month return	36-month return	48-month return	60-month return
Time-Series Mean	**0.0203**	**0.0612**	**0.1154**	**0.2026**	**0.4258**	**0.4473**	**0.2413**	-0.1836
	2.89	3.76	3.77	4.62	4.55	3.41	2.03	-1.60
CAPM Alpha	**0.0211**	**0.0642**	**0.1210**	**0.2090**	**0.4406**	**0.4641**	**0.2398**	-0.1780
	2.79	3.36	4.59	4.83	5.64	3.86	2.06	-1.56
FF3 Alpha	**0.0213**	**0.0647**	**0.1222**	**0.2062**	**0.4350**	**0.4548**	**0.2369**	-0.1769
	3.49	3.57	4.32	4.97	5.89	4.28	2.09	-1.57
CH4 Alpha	**0.0208**	**0.0652**	**0.1235**	**0.2105**	**0.4389**	**0.4579**	**0.2451**	-0.1733
	3.24	3.79	4.19	4.84	5.36	4.09	2.13	-1.58
FF5 Alpha	**0.0212**	**0.0620**	**0.1183**	**0.1979**	**0.4212**	**0.4501**	**0.2447**	-0.1934
	3.61	2.88	4.03	4.34	4.96	3.97	1.73	-1.73

Panel I: UTL								
	1-month return	3-month return	6-month return	12-month return	24-month return	36-month return	48-month return	60-month return
Time-Series Mean	0.0000	0.0005	0.0031	0.0241	**0.1124**	**0.2052**	**0.2425**	**0.2539**
CAPM Alpha	-0.01 -0.0002	0.05 0.0007	0.17 0.0021	0.70 0.0206	2.88 0.1107	5.04 **0.2046**	5.20 **0.2396**	3.26 **0.2552**
FF3 Alpha	-0.05 -0.0004	0.07 0.0003	0.11 0.0021	0.81 0.0203	3.09 **0.1133**	5.24 **0.2052**	5.37 **0.2396**	4.01 **0.2566**
CH4 Alpha	-0.13 -0.0003	0.03 0.0009	0.10 0.0031	0.66 0.0205	3.47 **0.1158**	6.15 **0.2087**	5.63 **0.2437**	3.93 **0.2591**
FF5 Alpha	-0.07 -0.0002	0.08 0.0028	0.15 0.0060	0.71 0.0264	3.76 **0.1180**	6.07 **0.2048**	5.45 **0.2368**	4.15 **0.2511**
	-0.06	0.26	0.32	0.96	3.61	6.22	4.84	3.40
Panel J: YCY								
	1-month return	3-month return	6-month return	12-month return	24-month return	36-month return	48-month return	60-month return
Time-Series Mean	**0.0503**	**0.1377**	**0.2752**	**0.5356**	**0.9203**	**0.7359**	**0.3970**	**0.1579**
CAPM Alpha	2.93 **0.0521**	2.48 **0.1423**	2.54 **0.2854**	2.67 **0.5545**	2.49 **0.9663**	3.44 **0.7517**	1.78 **0.3921**	0.58 0.1450
FF3 Alpha	3.12 **0.0516**	2.18 **0.1401**	1.99 **0.2804**	2.14 **0.5388**	1.93 **0.9291**	3.47 **0.7318**	2.02 **0.3885**	0.66 0.1391
CH4 Alpha	3.29 **0.0510**	2.31 **0.1390**	2.24 **0.2786**	2.53 **0.5320**	2.45 **0.9136**	3.39 **0.7219**	2.03 0.3874	0.60 0.1447
FF5 Alpha	2.77 **0.0504**	1.97 **0.1317**	2.06 **0.2580**	1.96 **0.4886**	2.85 **0.8014**	3.46 **0.6342**	1.63 **0.3485**	0.62 0.1090
	3.22	2.07	1.91	1.92	2.71	3.18	1.72	0.48

Appendix 3-3: Returns of Top Portfolios

Panel A: COM								
	1-month return	3-month return	6-month return	12-month return	24-month return	36-month return	48-month return	60-month return
Time-Series Mean	**-0.0161**	**-0.0453**	**-0.1042**	**-0.1903**	**-0.2480**	**-0.3634**	**-0.5065**	**-0.8281**
	-1.69	-2.04	-2.58	-2.83	-3.60	-3.61	-3.84	-3.79
CAPM Alpha	**-0.0174**	**-0.0447**	**-0.1023**	**-0.1856**	**-0.2403**	**-0.3520**	**-0.4835**	**-0.8101**
	-1.75	-2.02	-2.71	-3.25	-3.76	-3.10	-3.64	-3.53
FF3 Alpha	**-0.0163**	**-0.0407**	**-0.0961**	**-0.1827**	**-0.2331**	**-0.3539**	**-0.4794**	**-0.7982**
	-1.69	-2.00	-2.56	-2.94	-3.52	-2.93	-3.72	-3.53
CH4 Alpha	**-0.0179**	**-0.0427**	**-0.0973**	**-0.1858**	**-0.2305**	**-0.3588**	**-0.4776**	**-0.8067**
	-1.79	-1.98	-2.59	-3.11	-3.70	-2.82	-3.63	-3.40
FF5 Alpha	-0.0125	**-0.0374**	**-0.0881**	**-0.1668**	**-0.2353**	**-0.3913**	**-0.4484**	**-0.8144**
	-1.32	-1.71	-2.44	-2.76	-3.35	-2.94	-4.02	-3.22
Panel B: ENE								
	1-month return	3-month return	6-month return	12-month return	24-month return	36-month return	48-month return	60-month return
Time-Series Mean	-0.0051	-0.0254	-0.0447	-0.0726	-0.1929	-0.3632	**-0.8348**	**-1.2480**
	-0.72	-1.01	-0.80	-0.82	-1.40	-1.52	-2.02	-2.55
CAPM Alpha	-0.0064	-0.0258	-0.0462	-0.0741	-0.1944	-0.3381	**-0.7912**	**-1.1893**
	-0.92	-0.98	-0.83	-0.83	-1.38	-1.46	-2.15	-3.08
FF3 Alpha	-0.0066	-0.0261	-0.0448	-0.0765	-0.2013	-0.3497	**-0.7919**	**-1.1879**
	-0.95	-1.15	-0.88	-0.83	-1.48	-1.54	-2.22	-2.99
CH4 Alpha	-0.0063	-0.0243	-0.0427	-0.0723	-0.1892	-0.3353	**-0.7738**	**-1.1652**
	-0.92	-0.91	-0.82	-0.82	-1.31	-1.35	-2.21	-2.95
FF5 Alpha	-0.0057	-0.0222	-0.0395	-0.0673	-0.1913	-0.3731	**-0.8361**	**-1.2952**
	-0.78	-0.92	-0.79	-0.76	-1.30	-1.54	-2.32	-3.01

Panel C: FIN								
	1-month return	3-month return	6-month return	12-month return	24-month return	36-month return	48-month return	60-month return
Time-Series Mean	-0.0031	-0.0040	-0.0032	-0.0087	-0.0427	-0.0864	-0.1058	-0.0360
	-0.80	-0.26	-0.10	-0.16	-0.44	-0.53	-0.56	-0.19
CAPM Alpha	-0.0038	-0.0048	-0.0044	-0.0093	-0.0446	-0.0920	-0.1159	-0.0436
	-1.03	-0.32	-0.13	-0.16	-0.40	-0.56	-0.55	-0.25
FF3 Alpha	-0.0038	-0.0038	-0.0018	-0.0084	-0.0431	-0.0929	-0.1224	-0.0443
	-1.04	-0.32	-0.06	-0.15	-0.45	-0.61	-0.72	-0.25
CH4 Alpha	-0.0037	-0.0029	0.0009	-0.0052	-0.0405	-0.0898	-0.1152	-0.0403
	-0.94	-0.18	0.03	-0.10	-0.43	-0.61	-0.77	-0.25
FF5 Alpha	-0.0035	-0.0015	-0.0013	-0.0049	-0.0490	-0.1020	-0.1315	-0.0602
	-0.87	-0.09	-0.04	-0.10	-0.46	-0.65	-0.80	-0.35
Panel D: HLC								
	1-month return	3-month return	6-month return	12-month return	24-month return	36-month return	48-month return	60-month return
Time-Series Mean	**-0.0090**	-0.0232	-0.0424	**-0.1175**	-0.0845	-0.0199	0.0479	0.0993
	-1.72	-1.47	-1.50	-2.36	-1.58	-0.32	0.62	1.04
CAPM Alpha	**-0.0108**	-0.0247	**-0.0450**	**-0.1202**	-0.0860	-0.0186	0.0485	0.1059
	-2.29	-1.63	-1.69	-2.27	-1.77	-0.35	0.70	1.37
FF3 Alpha	**-0.0099**	-0.0218	-0.0415	**-0.1175**	-0.0828	-0.0190	0.0445	**0.1059**
	-1.89	-1.63	-1.60	-2.31	-1.82	-0.36	0.74	1.39
CH4 Alpha	**-0.0088**	-0.0203	-0.0386	**-0.1145**	-0.0807	-0.0145	0.0488	0.1111
	-2.01	-1.43	-1.54	-2.25	-1.48	-0.34	0.71	1.43
FF5 Alpha	**-0.0083**	-0.0178	-0.0377	**-0.1131**	-0.0879	-0.0295	0.0231	0.0931
	-1.80	-1.30	-1.56	-2.19	-1.52	-0.53	0.33	0.80

Panel E: IND								
	1-month return	3-month return	6-month return	12-month return	24-month return	36-month return	48-month return	60-month return
Time-Series Mean	-0.0061	-0.0501	-0.1878	-0.6126	-2.3587	**-2.8525**	**-3.3155**	**-6.1760**
	-0.92	-0.85	-1.16	-1.31	-1.54	-1.71	-1.70	-2.40
CAPM Alpha	-0.0071	-0.0512	-0.1928	-0.6196	**-2.5547**	**-3.0971**	**-3.6951**	**-6.4194**
	-1.10	-0.93	-1.31	-1.13	-1.82	-1.74	-1.86	-2.37
FF3 Alpha	-0.0064	-0.0450	-0.1792	-0.6144	**-2.7143**	**-3.2274**	**-3.6622**	**-6.3591**
	-1.04	-0.74	-0.95	-1.34	-1.78	-1.82	-1.82	-2.42
CH4 Alpha	-0.0067	-0.0479	-0.1812	-0.6164	**-2.6737**	**-3.1678**	**-3.5957**	**-6.2722**
	-1.02	-0.74	-0.92	-1.33	-1.78	-1.83	-1.83	-2.43
FF5 Alpha	-0.0047	-0.0345	-0.1468	-0.5473	**-2.7719**	**-3.2914**	**-3.6414**	**-5.7473**
	-0.76	-0.71	-0.90	-1.32	-1.69	-1.76	-1.72	-2.31
Panel F: MAT								
	1-month return	3-month return	6-month return	12-month return	24-month return	36-month return	48-month return	60-month return
Time-Series Mean	0.0013	-0.0008	-0.0142	0.0123	0.0581	0.0666	0.0504	-0.0123
	0.22	-0.03	-0.29	0.22	0.89	0.85	0.60	-0.17
CAPM Alpha	0.0005	-0.0015	-0.0154	0.0117	0.0588	0.0705	0.0529	-0.0095
	0.08	-0.06	-0.33	0.20	0.89	0.82	0.75	-0.15
FF3 Alpha	0.0013	-0.0003	-0.0130	0.0114	0.0605	0.0711	0.0520	-0.0106
	0.23	-0.01	-0.28	**0.22**	0.96	0.97	0.71	-0.16
CH4 Alpha	0.0025	0.0021	-0.0072	0.0175	0.0675	0.0770	0.0595	-0.0040
	0.41	0.08	-0.16	0.32	1.07	1.01	0.81	-0.07
FF5 Alpha	0.0017	0.0002	-0.0100	0.0168	0.0723	0.0720	0.0651	0.0130
	0.29	0.01	-0.24	0.31	0.98	0.76	0.88	0.18

Panel G: NCY								
	1-month return	3-month return	6-month return	12-month return	24-month return	36-month return	48-month return	60-month return
Time-Series Mean	0.0000	0.0029	0.0095	0.0193	-0.0159	0.0182	**0.1545**	**0.1679**
	0.01	0.29	0.56	0.65	-0.24	0.22	2.35	2.54
CAPM Alpha	-0.0006	0.0019	0.0077	0.0168	-0.0188	0.0134	**0.1425**	**0.1627**
	-0.21	0.18	0.49	0.53	-0.30	0.19	2.79	2.83
FF3 Alpha	-0.0007	0.0007	0.0061	0.0130	-0.0216	0.0124	**0.1411**	**0.1630**
	-0.24	0.07	0.39	0.51	-0.32	0.16	2.17	2.66
CH4 Alpha	-0.0001	0.0012	0.0076	0.0139	-0.0184	0.0146	**0.1432**	**0.1663**
	-0.04	0.12	0.49	0.50	-0.29	0.21	2.27	2.08
FF5 Alpha	0.0001	0.0034	0.0138	0.0278	-0.0178	0.0090	**0.1523**	**0.1714**
	0.02	0.38	0.97	1.05	-0.27	0.11	2.61	2.05
Panel H: TEC								
	1-month return	3-month return	6-month return	12-month return	24-month return	36-month return	48-month return	60-month return
Time-Series Mean	-0.0052	-0.0120	-0.0170	-0.0420	0.0811	**0.1768**	0.1265	0.1777
	-0.81	-0.58	-0.41	-0.70	1.37	2.26	1.15	1.20
CAPM Alpha	-0.0052	-0.0124	-0.0180	-0.0444	0.0798	**0.1798**	0.1278	0.1793
	-0.78	-0.60	-0.43	-0.72	1.51	2.54	1.50	1.43
FF3 Alpha	-0.0047	-0.0096	-0.0136	-0.0381	**0.0847**	**0.1816**	0.1248	0.1770
	-0.75	-0.56	-0.38	-0.60	1.64	2.83	1.42	1.28
CH4 Alpha	-0.0049	-0.0082	-0.0100	-0.0326	0.0843	**0.1799**	0.1253	0.1784
	-0.72	-0.45	-0.30	-0.57	1.47	2.58	1.53	1.24
FF5 Alpha	-0.0024	-0.0039	-0.0007	-0.0249	**0.0925**	**0.1725**	0.1350	0.1848
	-0.43	-0.23	-0.02	-0.53	1.97	2.58	1.47	1.03

Panel I: UTL								
	1-month return	3-month return	6-month return	12-month return	24-month return	36-month return	48-month return	60-month return
Time-Series Mean	0.0039	0.0035	0.0094	-0.0095	-0.0506	-0.1139	-0.2065	-0.2385
	0.88	0.24	0.34	-0.20	-0.75	-0.82	-1.06	-0.85
CAPM Alpha	0.0023	0.0019	0.0067	-0.0139	-0.0537	-0.1103	-0.1996	-0.2458
	0.57	0.14	0.27	-0.26	-0.64	-0.80	-1.29	-0.80
FF3 Alpha	0.0026	0.0022	0.0086	-0.0082	-0.0494	-0.1045	-0.2026	-0.2526
	0.69	0.18	0.39	-0.18	-0.65	-0.84	-1.24	-0.80
CH4 Alpha	0.0026	0.0036	0.0123	-0.0031	-0.0409	-0.0947	-0.1932	-0.2434
	0.70	0.30	0.54	-0.07	-0.55	-0.84	-1.18	-0.86
FF5 Alpha	0.0039	0.0098	0.0219	0.0155	-0.0309	-0.1268	-0.2303	-0.2594
	1.17	0.95	1.03	0.42	-0.39	-1.05	-1.48	-0.97
Panel J: YCY								
	1-month return	3-month return	6-month return	12-month return	24-month return	36-month return	48-month return	60-month return
Time-Series Mean	0.0040	0.0116	0.0305	0.0953	0.0973	0.0350	-0.0001	-0.0323
	0.71	0.63	0.85	1.33	1.17	0.33	0.00	-0.20
CAPM Alpha	0.0029	0.0105	0.0297	0.0944	0.0964	0.0368	0.0054	-0.0166
	0.47	0.55	0.81	1.15	0.93	0.29	0.04	-0.12
FF3 Alpha	0.0028	0.0100	0.0291	0.0829	0.0839	0.0339	0.0057	-0.0169
	0.47	0.55	0.84	1.68	1.19	0.36	0.05	-0.13
CH4 Alpha	0.0026	0.0105	0.0315	0.0823	0.0806	0.0403	0.0171	-0.0065
	0.44	0.52	0.93	1.44	0.95	0.46	0.14	-0.04
FF5 Alpha	0.0041	0.0112	0.0216	0.0619	0.0681	0.0268	-0.0064	-0.0374
	0.66	0.62	0.69	1.16	0.91	0.28	-0.05	-0.25

Appendix A1: Stock-Level Characteristics

Variable (Frequency)	Definition	Data Source
Sentiment Data		
Market/Sector Sentiment (Daily)	The market and sector sentiment are calculated using a weighted average method, both equal-weighted and value-weighted, of individual stock sentiments. The value-weighted method considers the size effect.	Thomson Reuters MarketPsych Indices (TRMIs)
Individual Sentiment (Daily)	Word Embedded Method.	Thomson Reuters MarketPsych Indices (TRMIs)
Stock Return (Daily)	The daily sector returns are constructed by aggregating the daily individual stock returns for each sector using the equal-weighted and value-weighted methods. The logarithm of the returns is used in the tests.	CRSP
Market Beta (daily)	CAPM Beta, computed as the sensitivity of individual stock excess return to market excess return.	/
MOM Past 11-Month Returns (Monthly)	The momentum of each stock at month *i* is estimated using the cumulative return from month *t*-12 to *t*-2 to avoid short-term reversal effects.	CRSP/ COMPUSTAT MERGE
Illiquidity (Monthly)	According to Amihud's (2002), illiquidity is calculated as stock's absolute return divided by its daily dollar trading volume, scaled by 10^6.	CRSP/ COMPUSTAT MERGE
Size (Monthly)	Size is measured by the natural log of market capitalization.	CRSP
Fundamental Values (Firm Characteristics)		
BE/ME (Monthly)	BE/ME is computed as the book value of equity in the previous quarter divided by the market value in month t of equity. (BE/ME = (SEQQ+TXDBQ)/(PRC*SHROUT))	CRSP/ COMPUSTAT MERGE
Profitability (Monthly)	Return on Equity 1. According to Baker and Wurgler (2006), profitability characteristics is proxied by the return on equity. It is a dummy variable, whereby profitability greater zero takes value one for profitable firms, and less than zero takes value zero for unprofitable firms.	CRSP/ COMPUSTAT MERGE

	Profitability=E/BE=(IBQ+TXDIQ-DVPQ)/(SEQQ+TXDBQ) 2. According to Hou, Xue and Zhang (2015), profitability is computed as income before extraordinary items (IBQ) divided by 1-quarter-lag book equity. It is not a dummy variable. Profitability=E/BE=(IBQ)/(SEQQ+TXDBQ)	
Analyst Data		
Stock-level Disagreement (monthly)	According to Diether et al. (2002), stock-level disagreement as the standard deviation of analyst forecasts of one-year ahead earning-per-share (EPS) in the most recent month, scaled by the absolute value of the mean forecast in the previous month.	IBES
Analyst Coverage (Monthly)	The natural log of the number of analyst estimations.	IBES
Other Variables		
Institutional Ownership	Reference: Jacoby et al. (2024) and Nagel (2005).	Thomson

Appendix A2: Value-weighted Sector-Level Characteristics

Variables	**Calculation**
Return Momentum	Return Momentum is estimated by the cumulative return from month *t*-12 to *t*-2 to avoid short-term reversal effects.
Return Volatility and Systematic Market	1. SD: Using a 12- month rolling window estimation of sector standard deviations. 2. Market Beta: a single-index morel over 26 month rolling windows.
Valuation Ratios (BE/ME)	Book-to-market ratio is equal-weighted stock-level book-to-market ratio in a sector.
Capitalization	Capitalization is the average natural log of stock size.
HHI	The sum of the squared market share of all firms in a sector.
Institutional Ownership	The equal-weighted stock-level institutional ownership.
Analyst Coverage	The equal-weighted stock-level Analyst Coverage.