INDIVIDUAL STOCK INVESTOR SENTIMENT, STOCK ISSUANCE,

AND FINANCIAL MARKET ANOMALIES

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ABSTRACT

INDIVIDUAL STOCK INVESTOR SENTIMENT, STOCK ISSUANCE, AND FINANCIAL MARKET ANOMALIES

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There is an interaction effect between cross sectional variation in individual stock investor sentiment and a broad set of financial market anomalies. An average anomaly strategy earns higher (lower) 3-factor alpha conditioned on higher (lower) individual stock investor sentiment. This is mainly driven by the very negative alpha of the high sentiment conditioned short leg of each anomaly. Consequently, buying the low sentiment long leg of each anomaly and shorting the high sentiment short leg of each anomaly yields 0.434% to 0.474% more in monthly three-factor alpha than an unconditional anomaly strategy on average. In contrast, buying the high sentiment long leg of each anomaly and shorting the low sentiment short leg of each anomaly result in no alpha on average.

I present novel evidence that the financial market anomalies are mispricings: firms act as arbitrageurs and tend to issue shares if they are in the short leg of an anomaly. In contrast, firms tend to repurchase shares and/or pay cash dividends if they are in the long leg of an anomaly. Individual stock investor sentiment exaggerates these effects. In particular, firms in the high sentiment short leg of anomalies trade equity ownership for cash or services (e.g. issuance of shares) while firms in the low sentiment long leg of anomalies pay or trade cash for equity ownership (e.g. cash dividends). The difference, measured using the Daniel and Titman (2006) composite issuance measure, is on average 0.535% to 0.632% per month. This is stronger than the unconditional effect by 0.132% to 0.351% per month.

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1 Introduction

Individual stock investor sentiment is a pervasive, yet elusive concept in asset pricing. At any point in time, investors may be more bullish or bearish about one stock over another based on reasons beyond firm fundamentals. There are many reasons why this may happen. Psychological biases may induce individuals to make systematically biased assessments about firms with certain characteristics. Heuristical limitations like investor inattention may cause certain firms to be neglected. If these effects affect enough investors, then there may be asset pricing implications in the presence of arbitrage. The demand (or lack thereof) that these psychological biases and heuristical limitations generate can be viewed generally as sentiment-induced positive or negative demand[1]. In this paper, I am agnostic about the underlying mechanism which leads to the positive or negative sentiment shock. Instead, I look for measures that proxy for individual stock investor sentiment broadly, independent of the particular underlying cause.

Using these proxies, I explore the role that individual stock investor sentiment plays in the abnormal returns across a broad set of financial market anomalies. Financial market anomalies can be defined as time series or cross sectional patterns in returns that cannot be easily explained by classic finance theory based on risk and return. Hence, they represent an interesting starting point to investigate the potential role that an alternative paradigm based on investor sentiment and limits to arbitrage may play in explaining observed patterns in returns. In this alternative paradigm, psychological biases, heuristical limitations, or other factors may drive sentiment-induced demand (or lack thereof) which pushes prices away from fundamental value. Counteracting forces from arbitrageurs may be limited due to limited capacity of non-

[1]Negative demand can be viewed generally as an active shorting demand or a passive lack of demand.

diversified arbitrageurs to withstand idiosyncratic risks (Shleifer and Vishny (1997)) and short sale constraints. Consequently, prices may remain far from fundamental value for protracted periods of time, and only converge gradually as the underlying sentiment shock subsides. I focus on eleven well documented financial market anomalies in the cross section that cannot be explained by the standard Fama-French three factor model. For each of the eleven anomalies, a long-short strategy based on extreme quintile portfolios formed by sorting stocks on a variable of interest and assigning them to ten portfolios earns Fama-French (1993) three factor alpha.

Previous behavioral approaches to explaining financial market anomalies have tried to link systematic investor psychological biases to the variables of interest, which are usually firm characteristics. An implicit assumption in this approach is that such investor biases affect the cross-section of stocks which share the same levels of firm characteristics uniformly. In particular, individual stocks which are in the same decile or quintile of the variable of interest are on average affected by psychological biases by the same magnitude. This may not be the case. Here, I allow for the possibility that even if, on average, a certain firm characteristic is associated with higher sentiment-induced demand, there are firms which are less affected and this can be deduced by measuring individual stock investor sentiment directly.

Take the accrual anomaly as an example. Sloan (1996) conjectures that due to limited attention, investors may overemphasize the total accounting earnings of a firm, while neglecting incremental information from the cash flow component of earnings. Consider firms that have the highest quintile levels of accrual. In the cross section, some companies may be more explicit in making statements relating to the high levels of accrual than others. For example, the management of a high accrual firm may explicitly make earnings guidance that show mean reversion, citing sales made on credit near the end of the quarter are typically orders that occur in the next

quarter. If this is the case, investors are less likely to overreact to the high earnings in the current quarter. In my framework, this would be a high accrual firm with low individual stock investor sentiment. In this case, low subsequent returns are not expected because the "average" effect of high accrual is mitigated by low individual stock investor sentiment.

I now turn to the asset pricing implications. If individual stock investor sentiment is an important force in driving the return predictability of the financial market anomalies, it should be true that varying stock sentiment varies the magnitude and significance of the returns to each anomaly strategy. In particular, we should expect stronger positive Fama-French three factor alphas in the low individual stock sentiment conditioned long quintile portfolios. On the other hand, we should expect stronger negative Fama-French three factor alphas in the high individual stock sentiment conditioned short quintile portfolios. Furthermore, the relative difficulty of short selling versus buying may limit the ability of rational traders to correct overpricing more so than underpricing. Hence, the effect that high sentiment has on the short leg of each anomaly is much greater than the effect that low sentiment has on the long leg of each anomaly. My results show that this is the case. On average, buying the low sentiment long leg of each anomaly and shorting the high sentiment short leg of each anomaly yields 0.434% to 0.474% more in Fama-French three factor alpha than an unconditional anomaly strategy, depending on the proxy of sentiment. This is mainly driven by the very negative alpha of the high-sentiment-conditioned short leg of each anomaly, consistent with the notion that overpricing is more difficult to correct than underpricing. In contrast, buying the high sentiment long leg of each anomaly and shorting the low sentiment short leg of each anomaly does not result in significant abnormal returns. This demonstrates the important role that individual stock investor sentiment plays in financial market anomalies.

Next, I look at the phenomenon from the alternative viewpoint of arbitrageurs. Traditionally, hedge funds and other professional money managers are seen as natural candidates to fill the role of a rational arbitrageur. Here, I focus on the role of the firm as a rational arbitrageur. If the spread in cross sectional returns generated by buying the low sentiment conditioned long leg of anomalies and shorting the high sentiment conditioned short leg of anomalies is not a proxy for an unspecified risk, I expect that firms, being rational and informed agents, will respond to the mispricing opportunistically. My results are consistent with such behavior. In fact, I show that firms respond to the financial market anomalies *unconditionally*, consistent with the notion that the anomalies proxy for mispricing rather than an unspecified risk.

Intuitively, one can expect forces that limit arbitrage for professional managers to be less severe for the company itself. Firstly, even though it may take time for a firm to undertake a seasoned equity offering, short sale constraints such as prohibitively negative short rebate rates or the potential of short squeezes do not apply. The scenario documented in Shleifer and Vishny (1997) and later experienced by Long Term Capital Management, where delegated portfolio managers liquidate when mispricing is the greatest, also does not apply. It is fair to say that limits to arbitrage are less severe when the firm takes the role of a rational arbitrageur. For example, the manager of a firm that undertakes a seasoned equity offering at \$50 only to see the stock rise to \$75 the following month is unlikely to be under any pressure from board members, activist managers or individual investors for timing the market poorly. Indeed, such management can easily excuse itself by pointing to the brilliant new projects being undertaken using proceeds from the offering as the main reasons for the increase in stock price.

Thus, if firms are in the high sentiment short leg of anomalies, they will respond by engaging in activities which trade equity ownership for cash or services (e.g. issuance

of shares, stock acquisitions). This opportunistically takes advantage of the low cost of equity afforded by sentiment-induced demand. On the other hand, if firms are in the low sentiment long leg of anomalies, they will respond by engaging in activities which pay or trade cash or services for equity ownership (e.g. cash dividends, repurchase of shares). Activities which pay cash for equity ownership like paying cash dividends can be viewed as a way for firm managers to signal to the market that the equity is underpriced (e.g. Miller and Rock (1985)). The difference, measured using the Daniel and Titman (2006) composite issuance measure, is 0.535% to 0.632% per month. These results largely affirm the role of a firm as an arbitrageur. In this regard, I provide a novel link between asset pricing anomalies and the issuance behavior of the firm.

A closely related paper to mine is Stambaugh, Yu and Yuan (2012). They analyze the asset pricing implications of time series investor sentiment and the same set of financial market anomalies. Other papers have looked at the effect of turnover, one of our proxies for individual stock investor sentiment, and anomalies. Lee and Swaminathan (2000) analyze the effect of turnover on price momentum. Hou, Peng and Xiong (2009) analyze the effect of turnover on post earnings announcement drift and price momentum.

The remainder of the paper is organized as follows. Section 2 describes my two proxies for individual stock investor sentiment. Section 3 describes the eleven financial market anomalies I consider. Section 4 describes how the data is constructed. Section 5 shows that there is an interaction effect between cross sectional variation in individual stock investor sentiment and the eleven financial market anomalies I consider. Section 6 describes my first hypothesis ("Individual Stock Investor Sentiment Hypothesis") and shows the related results. Section 7 describes my second hypothesis ("Firm as Arbitrageur Hypothesis") and shows the related results. Section

8 concludes.

2 Individual Stock Investor Sentiment

Individual stock investor sentiment can be broadly defined as optimism or pessimism about a stock that is unrelated to projected cash flows or risk based information about discount rates which leads to aggregate positive or negative demand shocks on the particular stock[2]. In a classical finance theory setting, discount rates fluctuate due to information about the risk of the cash flow of a company and macroeconomic risks. In this setting, discount rates may fluctuate due to sentiment-induced demand shocks. The attempt to measure and quantify individual stock investor sentiment is to try to separate these two cases.

Such broad concept of sentiment does not take a view on whether the 'optimistic' or 'pessimistic' beliefs are driven by irrational beliefs about cash-flows or discount rates or some higher-order-beliefs about other people's optimism or pessimism that is orthogonal to fundamentals. Brunnermeier and Nagel (2004) show that both types of investors can co-exist for high sentiment stocks. During the two years leading up to the peak of the technology bubble in 2000, a period of high sentiment for technology stocks in general, hedge funds captured the upturn by overweighing the technology sector but avoided much of the downturn by reducing their positions both ahead of and during the decline. This shows that hedge fund managers are willing to buy stocks at above fundamental value if they believe that the aggregate demand of irrational investors is able to drive prices higher. However, it does appear that the existence of

[2]Baker and Wurgler (2006) broadly defines investor sentiment as "proximity to speculate" or "optimism or pessimism about stocks in general". Harrison and Kreps (1978) defines speculation as follows: "Investors exhibit speculative behavior if the right to resell a stock makes them willing to pay more for it than they would pay if obliged to hold it forever." Hence, speculation are trades that are not related to liquidity, tax-losses, or rebalancing needs.

a sizable demand from irrational investors is a necessary condition. Otherwise, the "rational" higher-order-beliefs about other people's optimism or pessimism would be false.

Although my approach of measuring stock sentiment is agnostic about the source of such sentiment, such aggregate demand shocks may manifest themselves in proxies that are both measurable and quantifiable empirically. Baker and Wurgler (2006) use the first principal component of six sentiment related variables to quantify fluctuation of investor sentiment in the time series. Here, I identify variables related to investor sentiment in the cross section: at any particular time, there may be more sentiment-induced aggregate demand shocks on certain companies than others. A proxy which can be used to measure individual stock investor sentiment need to fulfill at least two criteria. First, it needs to plausibly proxy for sentiment-induced positive or negative demand. Second, a high measure of sentiment needs to predict low subsequent risk adjusted average returns. In other words, high (low) sentiment corresponds to high (low) prices. I describe my two measures of individual stock investor sentiment and the rationale for choosing them below.

2.1 Turnover

The first measure of individual stock investor sentiment is average monthly turnover. Monthly turnover is the number of shares traded divided by total shares outstanding of a particular stock in a particular month. My base case measure averages the monthly turnover of 12 trailing months for each stock. Monthly turnover has the literal meaning of being the average percentage of shares that is traded in a month. Hence, it measures the intensity in which a fixed float of shares is being traded.

Historically, for the US equity market, high (low) trailing turnover in the time series is associated with periods of high (low) stock sentiment. Baker and Wurgler

(2006) use 5-year detrended annual market turnover as one of the six components in constructing their index on time series sentiment. While some precision is lost in measuring time series sentiment with only trailing aggregate turnover, it nonetheless shows a remarkable 71% correlation with the sentiment index from 1965-2000. It is also the only component of their index which can be easily adapted to analysis in the cross section.

There is evidence that this correlation holds in the cross-section. Ofek and Richardson (2003) empirically examine the dotcom mania and one of the salient features of the episode is the high turnover of internet firms. They examine a total of 400 companies in pure Internet-related sectors and find that during their sample period from January 1998 to December 2000, the median daily share turnover of internet stock is 1.25%, roughly 4 times higher than that of non-internet stocks, 0.34%. In addition, the magnitude of this difference in turnover likely underestimates the trading intensity of internet stocks, as a significant number of shares were not allowed to trade during the lockup period following these firm's IPOs. Lamont and Thaler (2003) empirically examine six equity carve-outs with unambiguously negative stub prices in which the parent has stated its intention to promptly spin off its remaining shares of the subsidiary from April 1996 to August 2000. A negative stub price represents a severe violation of law of one price: the subsidiary is traded at a higher market value than the market value of the parent's holding of the subsidiary. They compute turnover[3] for the first 20 days of trading for both parent and subsidiary, excluding the first day of trading. The subsidiary has turnover that is more than five times that of parent turnover, with an average 37.8% of all tradable shares turning over per day versus an average of 6.56% for the parent.

Earlier papers (e.g. Datar, Naik, Radcliffe (1998)), which tend to interpret

[3]Turnover of subsidiary is computed by no. of shares traded/no. of shares sold to public in IPO.

turnover as a proxy for liquidity, find that high turnover in the cross section predicts lower subsequent abnormal returns. Later papers provide evidence which cast doubts on this interpretation. Lee and Swaminathan (2000) report cross-sectional Spearman rank correlations of trading turnover and relative spread of -0.12. Lamont and Thaler (2003) show that even though the subsidiaries have five times the turnover of the parents in the case of equity carve-outs, there is no significant difference in bid/ask spread between the parents and subsidiaries.

These results show that high turnover is associated with high prices (and hence low subsequent returns) after correcting for firm characteristics in the cross section. High turnover also appears to be a salient feature of investor optimism both in the time series and cross section. These results provide ample empirical support for using high turnover as a proxy for high sentiment.

There is also a growing number of theoretical papers which predicts high turnover in high sentiment period. Harrison and Kreps (1978) wrote the first dynamic model which features trading and overpricing. They show that with short sale constraint and heterogeneous expectations about dividend streams among different class of investors, stock prices can be above the valuation of the most optimistic investor in a given state. This occurs due to the option value of being able to sell to another investor class in a state where the other investor class has a more bullish belief about the value of the stock. While Harrison and Kreps (1978) are silent about the reason why different investor classes disagree, Scheinkman and Xiong (2003) extend their model to continuous time and model overconfidence as a source of disagreement. In doing so, they are able to explain the excessive turnover that tends to happen in a bubble. They show that when agents are more overconfident about their own signal, given a small transaction cost, the size of the bubble is larger and turnover is also higher. Consistent with this hypothesis, Grinblatt and Keloharju (2009) use

a comprehensive dataset from Finland to show that measures of overconfidence are positively related to trading activity. Baker and Stein (2004) suggest that turnover can serve as a sentiment index. In the presence of short sales constraint, irrational investors are more likely to trade when they are optimistic and betting on rising stocks. This explains the correlation between turnover and prices. These theoretical papers provide additional support for using turnover as a proxy for sentiment.

2.2 FL Flow

Frazzini and Lamont (2008) construct an individual stock investor sentiment variable based on mutual fund flows. The variable, which I name FL Flow, is the increase in mutual fund ownership in a stock that results from actual dollar flow exceeding the amount that would have flown to portfolio managers if they received flows proportionate to their total net asset under management. In calculating the variable, Frazzini and Lamont makes two assumptions. First, they assume that portfolio managers do not alter their percentage allocated to different stocks given varying levels of dollar flows. Second, they assume that stock prices are unaffected by the buying (selling) demand of the mutual fund sector. Intuitively, a large and positive FL Flow for a stock means that the mutual funds which hold the stock are experiencing a larger proportion of inflow than their current market share of total net assets under management in the mutual fund industry.

A simple example shows the basic intuition. Suppose at quarter 0, there are two funds in the mutual fund industry: a social media fund with $10 billion in assets under management and a value fund also with $10 billion in assets under management. Suppose that at quarter 1, the mutual fund sector experienced a net inflow of 2 billion. Hence the counterfactual flow, which assumes inflow proportionate to trailing assets under management, would be 1 billion for each of the social media fund and value

fund. In reality, the social media fund captured all of the inflows while the value fund did not experience any net flows. Suppose further that at quarter 1, the social media fund held 1.2 billion worth of Facebook, while the value fund does not hold any. Suppose further that Facebook is worth 12 billion. Hence the total mutual fund industry holds 10% of Facebook. Also, the social media fund holds 10% of its portfolio in Facebook. Counterfactually, if both funds experienced inflows proportionate to their previous total assets, then the social media fund would only have 11 billion in assets. If it does not change its portfolio weights under the counterfactual flow, then it would hold 1.1 billion worth of Facebook. Hence, if Facebook share price does not change, then the mutual fund industry would hold 1.1/12=9.17% of Facebook. Hence, the (one quarter) FL Flow for Facebook will be calculated as 10%-9.17%=0.83%.

This measure is interesting in that it infers individual stock investor sentiment from measuring the active reallocation decision of individual investors, who are relatively more likely to be influenced by sentiment than professional investors. Hence, it plausibly proxies for sentiment-induced positive or negative demand that is unrelated to the fundamentals of the company. I leave the details of the construction of the FL Flow variable in the Appendix. Following Frazzini and Lamont (2008), I use the Three Year FL Flow as my proxy for individual stock investor sentiment.

3 Financial Market Anomalies

I explore eleven previously documented financial market anomalies which earn positive Fama and French (1993) 3-factor adjusted abnormal returns. This is the same set of anomalies which Stambaugh, Yu, Yuan (2012) consider in a recent related paper which explores the relationship between time series sentiment and the eleven financial market anomalies. Five of these anomalies are also examined in Fama and French

(2008). I briefly describe these anomalies below:

Anomaly 1 and 2: *Accruals and Net Operating Assets*

In any particular period, accounting earnings from continuing operations can be separated into two components: the accrual component and the cash flow component. A rudimentary example would be sales made on credit. While this increases accounting income, it does not impact cash flow- it is an accrual. Sloan (1996) conjectures that investors may fail to distinguish between the accrual and cash flow components of current earnings and naively only condition on overall earnings. In this case, if the accrual component of earnings is less persistent than the cash flow component of earnings, then high accruals would predict low future returns as investors overestimate the persistence of earnings of high accrual firms. Following Sloan (1996), I measure accrual as follows:

$$\text{Accrual} = \frac{(\Delta CA - \Delta Cash) - (\Delta CL - \Delta STD - \Delta TP) - Dep}{\text{Average Total Assets}} \tag{1}$$

where ΔCA is the change in current asset (item ACT), $\Delta Cash$ is the change in cash/cash equivalents (item CHE), ΔCL is the change in current liabilities (item DLC), ΔSTD is the change in debt included in current liabilities (item LCT), ΔTP is the change in income taxes payable (item TXP), and Dep is depreciation and amortization expenses (item DP). Average Total Assets is the average of the beginning and end of year book value of total assets (item AT).

Hirshleifer, Hou, Teoh, Zhang (2004) defines a related concept. An accounting identity states that:

$$\text{Net Operating Assets}_T = \sum_0^T \text{Operating Income}_t - \sum_0^T \text{Free Cash Flow}_t \tag{2}$$

Hence, Net Operating Asset is a cumulative measure of the deviation between accounting value added and cash value added. Hirshleifer, Hou, Teoh, Zhang (2004) conjecture that investors naively only condition on overall earnings in forming valuations of a firm. In this case, high net operating asset would predict low future returns since investors overvalue the high accounting earnings in high net operating asset firms. Similar to the accrual variable, net operating asset is scaled by lagged total assets and is coded as follows:

$$\text{Net Operating Asset} = \frac{\text{Operating Assets} \ - \ \text{Operating Liabilities}}{\text{Lagged Total Assets}} \tag{3}$$

where Operating Assets is defined as total assets (item AT) minus cash/cash equivalents (item CHE). Operating Liabilities is defined as total assets (item AT) minus short term debt (item DLC) minus long term debt (item DLTT) minus minority interest (item MIB) minus preferred stock (item PSTK) minus common equity (item CEQ). Note that there is a relationship between accrual and net operating assets. Net operating assets can be restated as

$$\text{Net Operating Asset}_T = \sum_{0}^{T} \text{Operating Accruals}_t + \sum_{0}^{T} \text{Net Investment}_t \tag{4}$$

Hence, Sloan's accrual provides a single period flow measure of a component of Net Operating Asset. As reported in Hirshleifer, Hou, Teoh, Zhang (2004), neither effect subsumes each other.

Anomaly 3 and Anomaly 4: *Investment-to-Asset Growth and Asset Growth*

Titman, Wei, Xie (2004) shows that firms which substantially increase capital investments subsequently achieve negative abnormal returns. They conjecture this to be due to investor's tendency to ignore the negative information contained in a firm's

action to increase capital investment. Following Chen, Novy-Marx, Zhang (2011), Stambaugh, Yu, Yuan (2012), I measure Investment-to-Asset as the annual change in gross property, plant, and equipment (item PPEGT) plus the annual change in inventories (item INVT) divided by the lagged book value of assets (item AT)[4].

Cooper, Gulen, Schill (2008) expands on this notion of misvaluing growth. Instead of looking at the growth of a component of a firm's total investment activity, they look at total asset growth. I follow Cooper, Gulen, Schill (2008) and measure asset growth as the year-on-year percentage change in total assets (item AT). They interpret the results as evidence that investors over-extrapolate past gains to growth.

Anomaly 5 and Anomaly 6: *Net equity issues and composite issuance*

There is a long history of papers which relates issuance, repurchase, and dividend activities to cross sectional abnormal returns. Loughran and Ritter (1995) show that returns following an initial public offering or a seasoned equity offering are low. On the other hand, Ikenberry, Lakonishok, Vermaelen (1995) show that returns following open market share repurchase announcements are high. In addition, Loughran and Vijh (1997) show that returns of acquirers that complete stock mergers are low but acquirers that complete cash tender offers are high. Taken together, these effects can be summarized as follows: low returns follow high stock issuance, high returns follow negative stock issuance. This turns out to be a general result. Pontiff and Woodgate (2008) show that directly measuring a comprehensive net issuance measure has incremental predictive power on subsequent stock returns after excluding the data used in the studies for seasoned equity offering, repurchase announcements, and stock mergers. Following Fama and French (2008), Chen, Novy-Marx, Zhang (2011) and Stambaugh, Yu, Yuan (2012), I measure net issuance as the annual change in

[4]This is a more direct way of measuring increase in capital investments relative to Titman, Wei, Xie (2004)

the natural log of the split-adjusted share outstanding. The split adjusted share outstanding is share outstanding (item CSHO) times the adjustment factor (item ADJEX_C)[5]. In the decile portfolio sorts, all stocks with negative net issues are grouped into the lowest decile and all stocks with zero net issues are grouped into decile 2. The remaining stocks are sorted into the remaining eight deciles. Similarly, in the quintile portfolio sorts, all stocks with negative or zero net issues are grouped into the lowest quintile. The remaining stocks are sorted into the remaining four deciles.

Daniel and Titman (2006) expands on this literature by studying composite issuance, which measures the part of a firm's growth in market value that is not attributable to stock returns. Twelve months composite issuance can be measured as:

$$\text{composite issuance}_{t,t-12} = \log(\frac{ME_t}{ME_{t-12}}) - r_{t,t-12} \tag{5}$$

Only CRSP data is required for constructing this measure. In contrast to net issuance, it is a comprehensive measure of the actions the firm takes to trade equity ownership for cash or services (e.g. equity issues, employee stock option plans), or pay cash or services for equity ownership (e.g. share repurchase, cash dividends). One important component that is present in composite issuance but not in net issuance is the payment in cash dividends. In this light, it incorporates an older literature (e.g. Charest (1978), Miller and Scholes (1978, 1982), Litzenberger and Ramaswany (1979,1980,1982), Keim (1985)) which documents that dividends are associated with abnormal returns before SEC rule 10b-18 in 1982[6]. After 1982, the percentage of corporate payout in the form of repurchase programs grew substantially. Boudoukh, Michaely, Richardson, Roberts (2008) document the structural break in predictive

[5] Pontiff and Woodgate (2008) use a similarly defined measure based on CRSP data.

[6] Rule 10b-18 made it easier for companies to buy back their shares on the open market without fear of stock-manipulation charges.

power of cash dividend after the rule was enacted and argue for viewing cash dividends and share repurchases together as a payout yield.

Anomaly 7 and Anomaly 8: *Return-on-Assets and Gross Profitability*

Haugen and Baker (1996), Fama and French (2006) show that high profitability, as measured by return on book equity, predicts high abnormal returns. However, Fama and French (2008) show that this effect is not very robust. More recently, Chen, Novy-Marx, Zhang (2010) shows that the related profitability measure- return on asset, income before extraordinary item (item IBQ) divided by total assets last fiscal quarter (item ATQ), produce more robust results using quarterly data instead of annual data. Separately, Novy-Marx (2012) shows that high gross profitability, measured by dividing gross profit (item GP) by total assets (item AT), predicts high abnormal return more robustly than return on book equity. He conjectures this is because gross profit is a cleaner measure of true economic profitability.

Anomaly 9 and Anomaly 10: *Financial Distress: O-Score and Failure Probability*

Dichev (1998) is the first paper which analyzes the role of bankruptcy risk, as measured by Ohlson (1980) O-Score and Altman (1968) Z-Score, in cross-sectional returns. Surprisingly, he finds that higher bankruptcy risk is associated with low subsequent average returns, contrary to the notion that investors should be compensated for bearing higher distress risk. Campbell, Hilscher, Szilagyi (2008) constructs a dynamic logit model to predict failure probability in the vein of works by Shumway (2001) and Chava and Jarrow (2004). They also analyze distress risk in the context of cross sectional returns, and find that high distress stocks earn low average returns. I measure distress using both Ohlson (1980) O-Score and Campbell, Hilscher, Szilagyi (2008) 12 month ahead failure probability. The details of constructing each variable are included in the appendix of this paper.

Anomaly 11: *Price Momentum (11/1/3)*

Jegadeesh and Titman (1993) show that high prior returns predict high subsequent abnormal returns. I measure price momentum by ranking stocks according to their prior 12 months of return, skipping the most recent month[7]. I then hold portfolios for 3 months. Hence, the monthly return is based on an equal-weighted average of the of portfolio returns from this month's strategy, last month's strategy, and the strategy from two months ago.

4 Data Construction

For many of the anomalies, accounting data from Compustat is necessary for constructing the variables. I use the CRSP/Compustat Merged Database (CCM) Linking Tables to link CRSP monthly data to Compustat annual data and quarterly data. I ensure that the linkage is one-to-one for all months in my sample[8]. For stocks which delist in a particular month[9], the linking table often specifies the exact delist date as the final date in which the link is valid. As delistings often do not fall exactly at the end of a month, a naïve use of the CCM Linking Tables would result in excluding the returns for the delisting month[10]. I correct for this problem by separately identifying the Compustat gvkey, if available, of stocks which delist in a particular month. Accounting variables in Compustat annual files are used in portfolio sorts four months after the end of the fiscal year, while accounting variables in Compustat quarterly files are used in portfolio sorts in the month immediately after the most recent public

[7] In the original paper, they skip only one week. The practice of skipping one month has been used by Fama and French (2008), Hou, Peng, Xiong (2009), Chen, Novy-Marx, Zhang (2010) and others.

[8] I delete entries where LINKTYPE='LX' or 'LD' or LINKPRIM='N' or 'J'

[9] Stocks with delisting code DLSTCD>=200

[10] This may complicate the well-known CRSP delisting bias. Even when CRSP delisting bias is corrected, the delisting returns are excluded when using CCM Linking Tables to merge with Compustat data.

earnings announcement month (Compustat quarterly item RDQ). If RDQ is missing, information is assumed to be publicly available three months after the end of the quarter end. I include only common stocks (shrcd=10 or 11) in my analysis. For results which use turnover as a measure of sentiment, I follow Lee and Swaminathan (2000) and include only NYSE and AMEX stocks. This is because turnover for Nasdaq stocks is inflated relative to NYSE and AMEX stock due to double counting of dealer trades. I include NYSE, AMEX, and Nasdaq stocks when FL flow is used as a measure of sentiment. I correct for CRSP delisting bias by following a methodology similar to Sumway (1997) and Shumway and Warther (1999). The exact details of the procedure I use is documented in the Appendix.

5 Anomalies, Individual Stock Sentiment, and Stock Returns

5.1 Long-short Strategies

Table 0A reports the Fama and French (1993) three factor alphas of the long leg and short leg of each strategy as well as the zero-cost portfolio which is the combination of these two legs. I verify that the zero-cost long-short portfolio based on all eleven strategies produce positive and statistically significant alpha when extreme decile portfolios are considered. When extreme quintile portfolios are used instead, the two growth based strategies, asset growth and investment-to-asset growth, lose their statistical significance. The magnitude of the spread is also significantly reduced. The two sentiment measures I consider, 12 month average turnover and 3 Year FL Flow, also produce positive and statistically significant alphas. This is consistent with the notion that a high measure of sentiment should predict low subsequent risk adjusted

Table 0A: Summary Statistics

This table reports calendar time portfolio Fama and French (1993) three factor alphas. At the beginning of each calendar month, stocks are ranked and assigned to one of ten decile portfolios or one of five quintile portfolios in a manner determined by previous studies and described in Section 2 and Section 3 of the main text. The combination of anomalies portfolio is constructed by equally weighing over the eleven anomalies. All stocks are value weighted within a given portfolio, and the portfolios are rebalanced every calendar month to maintain value weights. This table includes all NYSE/AMEX/Nasdaq stocks with non-missing sentiment or anomaly variable information at portfolio formation. Nasdaq stocks are excluded in the calculation of the 12 month average turnover sentiment variable. Alpha is the intercept on a regression of monthly excess return from the rolling strategy. The explanatory variables are the monthly returns from Fama and French (1993) mimicking portfolios. L/S is the alpha of a zero-cost portfolio that longs the long leg and shorts the short leg of each strategy. Start date of each strategy is reported while end date is December 2011 for all strategies except for 3 year FL Flow, which ends in September 2010. Alphas are in monthly percent, t-statistics are shown below the coefficient estimates and are based on the heteroskedasticity-consistent standard errors of White (1980). 5% statistical significance is indicated in bold.

	Decile Portfolios				Quintile Portfolios			
Anomaly	Start Date	Long Leg	Short Leg	L/S (1)	Start Date	Long Leg	Short Leg	L/S (2)
Panel A: Financial Market Anomalies								
Accrual	May-51	**0.205**	**-0.406**	**0.612**	Feb-51	**0.132**	**-0.306**	**0.438**
		[2.29]	[-4.30]	[4.47]		[2.30]	[-4.30]	[4.15]
Asset Growth	May-52	0.039	**-0.305**	**0.344**	Feb-52	0.055	-0.096	0.151
		[0.41]	[-3.34]	[2.49]		[0.85]	[-1.58]	[1.58]
Composite Equity Issues	May-27	**0.17**	**-0.451**	**0.621**	May-27	**0.147**	**-0.312**	**0.459**
		[2.65]	[-6.63]	[6.39]		[2.88]	[-5.41]	[5.30]
Failure Probability	Oct-71	**0.289**	**-1.162**	**1.451**	Oct-71	**0.264**	**-1.195**	**1.459**
		[3.21]	[-4.51]	[4.77]		[4.09]	[-6.09]	[6.21]
Gross Profitability	May-51	**0.437**	**-0.446**	**0.883**	Mar-51	**0.373**	**-0.408**	**0.781**
		[5.50]	[-4.00]	[6.26]		[6.02]	[-4.36]	[7.01]
Investment To Assets Growth	May-51	**0.267**	**-0.294**	**0.561**	Feb-51	-0.009	**-0.127**	0.118
		[3.59]	[-3.60]	[4.89]		[-0.14]	[-2.30]	[1.29]
Momentum (12/1/3)	Mar-27	**0.535**	**-1.3**	**1.835**	Mar-27	**0.42**	**-0.907**	**1.327**
		[5.09]	[-8.58]	[8.33]		[5.62]	[-7.55]	[7.43]
Net Equity Issues	May-62	**0.177**	**-0.465**	**0.642**	May-62	**0.135**	**-0.446**	**0.581**
		[3.72]	[-5.43]	[6.41]		[3.11]	[-6.39]	[6.28]
Net Operating Assets	Dec-62	**0.217**	**-0.466**	**0.683**	Nov-62	0.119	**-0.294**	**0.413**
		[2.00]	[-5.62]	[4.86]		[1.59]	[-5.12]	[4.12]
Ohlson s O-Score	Oct-71	**0.245**	**-0.384**	**0.629**	Oct-71	**0.159**	-0.217	**0.376**
		[3.56]	[-1.97]	[2.87]		[3.15]	[-1.62]	[2.52]
Return On Assets	Apr-71	**0.418**	**-1.065**	**1.483**	Apr-71	**0.295**	**-0.645**	**0.94**
		[5.10]	[-5.30]	[6.60]		[5.08]	[-3.83]	[4.84]
Combination Of Anomalies	Oct-71	**0.26**	**-0.679**	**0.938**	Oct-71	**0.191**	**-0.483**	**0.674**
		[6.43]	[-8.26]	[9.54]		[6.73]	[-7.66]	[8.67]
Panel B: Individual Stock Investor Sentiment								
12 Month Average Turnover	Jan-27	**0.237**	**-0.291**	**0.528**	Jan-27	**0.148**	**-0.262**	**0.41**
		[3.12]	[-3.02]	[3.94]		[2.55]	[-3.47]	[3.88]
3 Year FL Flow	Apr-83	0.135	**-0.322**	**0.456**	Apr-83	0.147	**-0.318**	**0.465**
		[1.04]	[-2.19]	[1.98]		[1.36]	[-2.86]	[2.40]

Table 0B: Summary Statistics

This table reports Pearson correlation coefficient. At the beginning of each calendar month, stocks are ranked and assigned to one of five quintile portfolios in a manner determined by previous studies and described in Section 2 and Section 3 of the main text. The combination of anomalies portfolio is constructed by equally weighing over the eleven anomalies. All stocks are value weighted within a given portfolio, and the portfolios are rebalanced every calendar month to maintain value weights. This table includes all NYSE/AMEX/Nasdaq stocks with non-missing sentiment or anomaly variable information at portfolio formation. Nasdaq stocks are excluded in the calculation of the 12 month average turnover sentiment variable. Start date of each strategy is reported in Table 0A while end date is December 2011 for all strategies except for 3 year FL Flow, which ends in September 2010.

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Panel A: Financial Market Anomalies															
(1)	Accrual	1.00													
(2)	Asset Growth	0.12	1.00												
(3)	Composite Equity Issues	0.13	0.58	1.00											
(4)	Failure Probability	0.00	0.14	0.55	1.00										
(5)	Gross Profitability	0.09	-0.23	-0.03	0.43	1.00									
(6)	Investment To Assets Growth	-0.08	0.66	0.51	0.12	-0.36	1.00								
(7)	Momentum (12/1/3)	0.11	-0.07	0.21	0.55	0.26	-0.09	1.00							
(8)	Net Equity Issues	0.11	0.47	0.78	0.59	0.17	0.40	0.19	1.00						
(9)	Net Operating Assets	0.05	0.19	0.12	0.05	-0.10	0.31	0.07	0.21	1.00					
(10)	Ohlson s O-Score	0.07	-0.41	0.05	0.58	0.45	-0.30	0.51	0.14	0.04	1.00				
(11)	Return On Assets	-0.19	0.11	0.45	0.75	0.36	0.14	0.28	0.49	-0.06	0.36	1.00			
(12)	Combination Of Anomalies	0.14	0.32	0.66	0.91	0.47	0.26	0.64	0.70	0.17	0.56	0.72	1.00		
Panel B: Individual Stock Investor Sentiment															
(13)	12 Month Average Turnover	0.14	0.37	0.50	0.53	0.04	0.31	0.18	0.54	0.08	0.19	0.39	0.54	1.00	
(14)	FL Three Year Flow	-0.22	0.45	0.54	0.51	0.06	0.34	0.19	0.51	0.20	0.10	0.48	0.53	0.37	1.00

average returns. Table 0B reports the Pearson's correlation coefficient of the eleven financial market anomalies and the two individual stock investor sentiment measures when using extreme quintile portfolios to form the long-short strategies. Overall, the strategies are not highly correlated with each other. Of the eleven financial market anomalies, the highest correlation is between composite issuance and net equity issues. They have a correlation of 0.77. The financial market anomalies are positively correlated with the individual stock investor sentiment strategies, except between 3 year FL Flow and Accrual. When 12 month Average Turnover is used as a measure of sentiment, the correlation ranges from 0.04 with Gross Profitability to 0.54 with Net Operating Assets. When 3 year FL Flow is used as a measure of sentiment, the correlation ranges from -0.22 with Accrual to 0.54 with Composite Issuance.

5.2 Relationship between anomalies and individual stock investor sentiment

In Table 1, I take a closer look at the relation between the financial market anomalies and the individual stock investor sentiment measures. At the beginning of calendar month t, for each of the 11 anomalies, I independently sort stocks based on the value of the anomaly variable at the end of calendar month t-1 and assign them into 5 quintiles (A1 to A5). A1 represents the long leg portfolio while A5 represents the short leg portfolio as determined by previous studies. I also independently sort these same firms with non-missing anomaly information using each of the two sentiment measures (turnover, flow) in ascending order, and divide them into five sentiment quintiles (S1 to S5). The stocks are then assigned to 25 portfolios whose composition is jointly determined by their membership in the 5 anomaly and 5 sentiment quintiles. The 25 portfolios are rebalanced every calendar month to maintain value weights. The

Table 1: Combination of Anomalies vs Individual Stock Investor Sentiment

This table reports calendar time portfolio abnormal returns. At the beginning of each calendar month, stocks are double sorted on the basis of each of the eleven anomaly measure and each of my two individual stock investor sentiment measure: 12 month average turnover and 3 year FL Flow into 5x5 value weighted portfolios. For each strategy, stocks are ranked in an order such that a smaller (higher) number in the ranking variable corresponds to higher (lower) returns as documented in previous studies. All stocks are value weighted within a given portfolio, and the portfolios are rebalanced every calendar month to maintain value weights. The combination of anomalies portfolio is constructed by equally weighing over the eleven anomalies for each of the 25 value weighted portfolios. This table includes all NYSE/AMEX/Nasdaq stocks with non-missing sentiment or anomaly variable information at portfolio formation. Nasdaq stocks are excluded when 12 month average turnover is used as a sentiment variable. Alpha is the intercept on a regression of monthly excess return from the rolling strategy. The explanatory variables are the monthly returns from Fama and French (1993) mimicking portfolios. L/S is the alpha of a zero-cost portfolio that longs the bottom 20% of stock and shorts the top 20% of stock as determined by the ranking variables. When 12 month average turnover is used as a measure of sentiment, start date is February 1975 and end date is December 2011. When 3 year FL Flow is used as a measure of sentiment, start date is July 1983 and end date is September 2010. Returns and alphas are in monthly percent, t-statistics are shown below the coefficient estimates and are based on the heteroskedasticity-consistent standard errors of White (1980). 5% statistical significance is indicated in bold.

Panel A: Combination of Anomalies vs 12 month Average Turnover

		Combination of Anomalies				Long Leg
12 month Average Turnover	Long Leg				Short Leg	minus Short Leg
	A1	A2	A3	A4	A5	L/S
S1	**0.246**	**0.182**	0.128	0.027	-0.105	**0.352**
	[2.81]	[2.06]	[1.52]	[0.31]	[-1.05]	[3.67]
S2	**0.186**	**0.197**	**0.146**	0.106	-0.101	**0.287**
	[2.26]	[2.39]	[2.08]	[1.44]	[-1.07]	[2.91]
S3	**0.178**	**0.141**	0.115	0.025	**-0.215**	**0.392**
	[2.61]	[2.07]	[1.93]	[0.40]	[-2.43]	[4.26]
S4	0.077	0.031	-0.042	**-0.198**	**-0.394**	**0.47**
	[1.20]	[0.48]	[-0.61]	[-3.02]	[-4.92]	[5.69]
S5	0.032	-0.114	-0.183	**-0.316**	**-0.714**	**0.746**
	[0.32]	[-1.20]	[-1.88]	[-3.19]	[-6.24]	[7.49]
Low Turnover minus High Turnover	0.214	**0.295**	**0.311**	**0.343**	**0.608**	**-0.395**
	[1.51]	[2.11]	[2.31]	[2.53]	[4.25]	[-3.16]

Panel B: Combination of Anomalies vs 3 year FL Flow

						Long Leg
3 year FL Flow	Long Leg				Short Leg	minus Short Leg
	A1	A2	A3	A4	A5	L/S
S1	**0.324**	0.191	0.088	0.018	-0.216	**0.54**
	[2.93]	[1.79]	[0.88]	[0.18]	[-1.80]	[4.70]
S2	**0.323**	**0.176**	0.107	0.019	**-0.265**	**0.588**
	[3.77]	[2.43]	[1.47]	[0.25]	[-2.66]	[5.25]
S3	**0.231**	0.093	0.131	-0.066	**-0.36**	**0.591**
	[2.87]	[1.14]	[1.75]	[-0.81]	[-2.80]	[4.07]
S4	0.097	-0.048	-0.055	-0.095	**-0.529**	**0.626**
	[1.15]	[-0.61]	[-0.77]	[-1.02]	[-4.33]	[5.10]
S5	-0.034	-0.182	**-0.23**	**-0.367**	**-0.794**	**0.76**
	[-0.38]	[-1.94]	[-2.24]	[-2.92]	[-5.38]	[6.44]
Low Flow minus High Flow	**0.358**	**0.373**	0.318	**0.385**	**0.578**	**-0.22**
	[2.21]	[2.26]	[1.85]	[2.01]	[3.05]	[-2.05]

combination-of-anomalies portfolio is constructed by equal-weighting over the eleven anomalies for each of the 25 value weighted portfolios. I require all 25 portfolios to continuously have at least 8 stocks in each month for sufficient diversification. As the completeness of the information required for each anomaly varies, the start date varies from 12:1947 for composite issuance to 2:1975 for the distress and O-Score anomaly. The complete list of start dates is included in Table 2.

I focus my analysis on the combination of anomalies portfolio, which can be interpreted as an "average" anomalies effect which has diversified away some of the idiosyncratic components of each of the anomaly. Panel A of Table 1 reports Fama French 3-factor alphas when 12 month Average Turnover is used as a measure of individual stock investor sentiment. The right-most column shows whether there is an average anomalies effect within each turnover quintile. If the average anomalies effect dominates the turnover effect, then this column should be equal to zero. The data strongly rejects this hypothesis. Across all five turnover quintiles, the anomalies effect remains statistically significant with an economically significant magnitude of 28.7 to 74.6 basis points per month.

The bottom row shows whether there is a turnover effect within each anomalies quintile. If the turnover effect dominates the average anomalies effect, then this row should be equal to zero. The data strongly rejects this. Across all five anomalies quintiles, the turnover effect remains statistically significant with an economically significant magnitude of 21.4 to 60.8 basis points per month.

Panel B reports Fama French 3-factor alphas when 3 year FL Flow is used as a measure of individual stock investor sentiment. The results are very similar to the case when 12 month Average Turnover is used as a measure of individual stock investor sentiment. One salient feature of the results in Panel A and Panel B is that the average anomalies effect is substantially larger within the largest sentiment

quintile. On the other hand, the sentiment effect is also substantially larger within the largest average anomalies quintile. This suggests that there is an interaction effect between individual stock investor sentiment and the average anomalies effect. A closer examination reveals that this interaction effect is primarily driven by the very low return of the high sentiment short leg of the average anomaly (the A5S5 portfolio).[11] We will explore this phenomenon in greater depth in the next few sections.

6 Individual Stock Sentiment Hypothesis

In this section I describe the first hypothesis and describe a few approaches to test the hypothesis. I conjecture that the anomaly return is partially driven by cross-sectional variation in individual stock investor sentiment.

HYPOTHESIS 1 (INDIVIDUAL STOCK SENTIMENT HYPOTHESIS):
A zero-cost long-short portfolio based on each of the 11 financial market anomalies we consider earn positive 3-factor alpha. If this is primarily driven by sentiment shocks pushing stock prices away from fundamental value, then the positive abnormal return of the long leg of each anomaly is concentrated in low sentiment stocks. Similarly, the negative abnormal return of the short leg of each anomaly is concentrated in high sentiment stocks.
Furthermore, the relative difficulty of short selling versus buying may limit the ability of rational traders to correct overpricing more so than underpricing. If this is the case, the effect that high sentiment has on the short leg of each anomaly is much greater than the effect that low sentiment has on the long leg of each anomaly.

[11] This interaction effect does not appear by just choosing any two anomaly and forming extreme quitile portfolios by double sorting them. For example, in Appendix Table 2, I report CAPM alphas when double sorting on value and size. It is notable that the large capitalization growth portfolio has negative alpha that is not statistically significant.

6.1 Fama-MacBeth regressions

There are three main implications of Hypothesis 1. Firstly, Hypothesis 1 implies that there is an interaction effect between low sentiment and the long leg of each anomaly. Secondly, it implies that there is an interaction effect between high sentiment and the short leg of each anomaly. Thirdly, it says that the effect high sentiment has on the short leg of each anomaly is much larger than the effect that low sentiment has on the long leg of each anomaly. The idea that short sale constraints may cause some securities to be overpriced traces back to at least Miller (1977) and was recently applied in Stambaugh, Yu, Yuan (2012). To test for these interaction effects, I use a Fama and MacBeth (1973) cross sectional regression approach separately for each financial market anomalies and for each individual stock investor sentiment variable. The dependent variable is excess return in month t. The independent variables of interest are two dummy variables constructed using the 25 portfolios constructed by independently sorting all stocks into five anomaly categories and five stock sentiment categories.[12] The first dummy variable returns a value of 1 if the stock is in the low sentiment long leg of a particular anomaly (A1S1) at the end of month t-1. The second dummy variable returns a value of 1 if the stock is in the high sentiment short leg of a particular anomaly (A5S5) at the end of month t-1. Hypothesis 1 implies that the estimated coefficient of dummy(A1S1) is positive and the estimated coefficient of dummy(A5S5) is negative. Furthermore, the absolute value of the estimated coefficient of dummy(A5S5) should be larger than the absolute value of the estimated coefficient of dummy(A1S1).

[12]Recall from Section 5.2 that at the beginning of calendar month t, for each of the 11 anomalies, I independently sort stocks based on the anomaly variable known at the end of calendar month t-1 and assign them into 5 quintile portfolios (A1 to A5). A1 represents the long leg portfolio while A5 represents the short leg portfolio as determined by previous studies. I then independently sort these same firms with non-missing anomaly information based on each of the two sentiment measure (turnover, flow) in ascending order, and divide them into five sentiment portfolios (S1 to S5).

I include as controls the logarithm of size and logarithm of book-to-market.[13] This controls for well-known cross sectional determinants of return related to size and book-to-market. In addition, I include the anomaly variable and the individual stock investor sentiment variable to pinpoint the *incremental effects* of being in the A1S1 or A5S5 portfolio.

Table 2 shows that the result is broadly consistent with my first hypothesis. When I use 12 month Average Turnover as a measure of stock sentiment, the estimated coefficient for dummy(A5S5) is negative across all eleven anomalies and statistically significant for ten of the eleven anomalies. It is only statistically insignificant for the Investment to Asset Growth anomaly. This means that after controlling for size, book-to-market, 12 month Average Turnover (the sentiment variable), and the anomaly variable itself, there is still an incremental effect of being in the high sentiment short leg portfolios. On the other hand, there does not appear to be evidence of an interaction effect between low turnover and the long leg of anomalies.

When I use 3 year FL Flow, the results are similar. The estimated coefficient for dummy(A5S5) is negative across all eleven anomalies and statistically significant for nine of the eleven anomalies. It is only insignificant for the momentum anomaly and the Ohlson's O-Score anomaly. On the other hand, the interaction effect between low sentiment and the long leg of anomalies appears stronger than when turnover is used as a measure of sentiment. The estimated coefficient for dummy(A1S1) is positive across all 11 anomalies and statistically significant for 5 of the 11 anomalies.

One interesting result here which holds for both measures of sentiment is that once the dummy variables are included in the Fama-MacBeth regressions, the sentiment measure itself loses its statistical significance for most of the anomalies. This means that both of our sentiment measures have strong predictive powers only in the

[13] I report results which include two liquidity related controls- Dollar Volume and the Amihud Illiquidity Measure in Appendix Table 3. These do not alter the main results.

Table 2: Fama-MacBeth Regressions

This table reports coefficients of firm characteristics when predicting excess returns. At the beginning of each calendar month, stocks are double sorted on the basis of each of the eleven anomaly measure and each of my two individual stock investor sentiment measure: 12 month average turnover and 3 year FL Flow into 5x5 portfolios. For each strategy, stocks are ranked in an order such that a smaller (higher) number in the ranking variable corresponds to higher (lower) returns as documented in previous studies. I create two dummy variables to indicate whether or not a stock is in two of these 25 portfolios. The first dummy variable equals 1 when the stock is in the lowest sentiment quintile and the lowest anomaly quintile. The second dummy variable equals to 1 when the stock is in the highest sentiment quintile and in the highest anomaly quintile. I run monthly Fama-MacBeth regressions of excess returns on firm characteristics, financial market anomaly variable, individual stock investor sentiment variable, and the two dummy variables. A separate regression is performed for each anomaly-sentiment combination. The columns (1) through (11) report results when (1) Accrual , (2) Asset Growth, (3) Composite Equity Issues, (4) Failure Probability, (5) Gross Profitability, (6) Investment To Assets Growth, (7) Momentum, (8) Net Equity Issues, (9) Net Operating Assets, (10) Ohlson's O-Score, (11) Return On Assets is the financial market anomaly respectively. Start date of each strategy is reported. End date is December 2011 and September 2010 when 12 Month Average Turnover and 3 year FL Flow are used as sentiment measures respectively. Fama-Macbeth t-statistics are reported below the coefficient estimates.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A: Sentiment Measure: 12 Month Average Turnover											
Start Date	Feb-63	Mar-63	Dec-47	Feb-75	Oct-60	Dec-62	Jul-68	May-62	May-65	Feb-75	Dec-71
dummy(low sentiment long leg)	-0.114	0.061	-0.104	0.037	-0.026	0.09	0.023	-0.027	0.018	**-0.21**	**0.449**
	[-1.11]	[0.53]	[-1.46]	[0.38]	[-0.30]	[0.90]	[0.22]	[-0.41]	[0.21]	[-2.23]	[5.01]
dummy(high sentiment short leg)	**-0.27**	**-0.332**	**-0.304**	**-1.022**	**-0.358**	-0.174	**-0.697**	**-0.473**	**-0.431**	**-0.554**	**-0.935**
	[-3.00]	[-3.62]	[-4.13]	[-7.09]	[-2.43]	[-1.88]	[-5.56]	[-4.92]	[-4.63]	[-2.73]	[-5.96]
log(size)	**-0.102**	**-0.092**	**-0.081**	**-0.231**	**-0.107**	**-0.093**	-0.091	**-0.1**	**-0.104**	-0.099	**-0.119**
	[-2.15]	[-1.96]	[-2.13]	[-6.31]	[-2.34]	[-1.97]	[-1.94]	[-2.13]	[-2.10]	[-1.95]	[-2.35]
log(book-to-market)	**0.036**	**0.053**	**0.059**	**-0.027**	**0.048**	**0.034**	**0.055**	**0.047**	**0.034**	**0.046**	**0.063**
	[2.72]	[3.78]	[3.42]	[-2.08]	[2.96]	[2.53]	[4.64]	[3.43]	[2.72]	[3.58]	[3.24]
log(12 month average turnover)	-0.102	-0.07	-0.083	0.002	-0.12	-0.088	**-0.195**	-0.087	-0.099	-0.101	-0.042
	[-1.31]	[-0.92]	[-1.40]	[0.03]	[-1.59]	[-1.14]	[-2.61]	[-1.14]	[-1.25]	[-1.14]	[-0.50]
financial market anomalies	**-1.718**	**-0.331**	**-0.616**	0.044	**0.358**	**-0.728**	**0.745**	**-0.533**	**-0.337**	-0.023	**9.46**
	[-6.16]	[-4.62]	[-4.73]	[0.54]	[3.02]	[-7.19]	[4.19]	[-4.53]	[-6.29]	[-0.66]	[7.06]
Panel B: Sentiment Measure: 3 year FL Flow											
Start Date	Apr-83	Apr-83	Apr-83	Apr-83	Apr-83	Apr-83	Jul-83	Apr-83	Apr-83	Apr-83	Apr-83
dummy(low sentiment long leg)	0.152	**0.345**	0.064	**0.346**	0.092	**0.231**	0.117	0.116	**0.344**	0.138	**0.374**
	[1.43]	[2.80]	[0.68]	[3.66]	[1.05]	[2.09]	[0.97]	[1.28]	[2.77]	[1.37]	[3.69]
dummy(high sentiment short leg)	**-0.239**	**-0.649**	**-0.29**	**-0.582**	**-0.347**	**-0.576**	-0.265	**-0.386**	**-0.627**	-0.075	**-0.667**
	[-2.09]	[-3.50]	[-2.00]	[-4.01]	[-2.25]	[-4.04]	[-1.82]	[-2.70]	[-4.71]	[-0.52]	[-3.06]
log(size)	-0.022	-0.016	-0.037	**-0.203**	-0.019	-0.019	-0.091	-0.024	-0.024	-0.069	-0.053
	[-0.39]	[-0.28]	[-0.67]	[-5.20]	[-0.35]	[-0.34]	[-1.89]	[-0.44]	[-0.43]	[-1.11]	[-1.02]
log(book-to-market)	**0.059**	**0.051**	**0.047**	-0.006	**0.059**	**0.055**	**0.058**	**0.051**	**0.058**	**0.058**	**0.052**
	[3.55]	[3.19]	[2.96]	[-0.38]	[3.51]	[3.27]	[3.51]	[3.07]	[3.43]	[4.07]	[3.33]
3 year FL Flow	-1.44	-0.823	-1.183	-1.283	-1.666	-0.948	**-2.043**	-1.222	-0.711	-0.93	-0.421
	[-1.44]	[-0.87]	[-1.28]	[-1.30]	[-1.72]	[-0.97]	[-2.26]	[-1.25]	[-0.72]	[-0.93]	[-0.42]
financial market anomalies	**-1.471**	**-0.119**	**-1.338**	-0.044	**0.558**	**-0.368**	**0.955**	**-0.572**	**-0.204**	-0.037	**4.262**
	[-4.68]	[-4.41]	[-4.90]	[-0.39]	[4.35]	[-4.16]	[4.08]	[-3.85]	[-5.29]	[-0.64]	[5.54]

intersection of the extreme deciles in sentiment and the financial market anomalies considered. These results in Table 2 are broadly supportive of hypothesis 1.

6.2 Calendar time portfolio approach

I also test hypothesis 1 using a calendar time portfolio approach. Table 3A and Table 3B report the portfolio abnormal returns of the long leg, short leg, and long minus short zero-cost portfolio for each of the 11 anomalies separately for low sentiment and high sentiment.

Table 3A reports Fama and French 3-factor alphas when using 12 month Average Turnover[14] as a measure of individual stock investor sentiment while Table 3B reports Fama and French 3-factor alphas when using 3 year FL Flow as a measure of individual stock investor sentiment. I first consider the equal weighted average of the anomalies using 12 month Average Turnover (3 year FL Flow) as a measure of sentiment. For the long leg, the low sentiment portfolio outperforms the high sentiment portfolio by 0.214% (0.358%) per month [t-statistics: 1.51 (2.21)]. For the short leg, the high sentiment portfolio underperforms the low sentiment portfolio by 0.608% (0.578%) per month [t-statistics: 4.25 (3.05)]. As consistent with the results from the Fama MacBeth regressions, sentiment has a larger effect on the short leg than it does on the long leg of anomalies. This difference is statistically significant [t-statistics: 3.18 (2.05)]. This asymmetry seems to be a unique feature that sentiment has on financial market anomalies and is absent when other measures are used. In Appendix Table 4, I report results when liquidity related measures are used in lieu of sentiment related measures. The main result there is that the assymetry dissappears.

Now I turn to looking into the set of 11 anomalies on an individual basis, which

[14]I also report results using different specification of Average Turnover in Appendix Table 4. In particular, I report results using 1,3,6,12 (base case), 24, 36, 60 months Average Turnover as my first measure of individual stock sentiment. The results are similar.

Table 3A: Anomalies return conditioned on low stock sentiment and high stock sentiment

This table reports calendar time portfolio abnormal returns. At the beginning of each calendar month, stocks are independently double sorted on the basis of each of the eleven anomaly measure and my first sentiment measure: 12 month average turnover into 5x5 value weighted portfolios. All stocks are value weighted within a given portfolio, and the portfolios are rebalanced every calendar month to maintain value weights. This table includes all NYSE/AMEX stocks with non-missing sentiment and anomaly variable information at portfolio formation. Alpha is the intercept on a regression of monthly excess return from the rolling strategy. The explanatory variables are the monthly returns from Fama and French (1993) mimicking portfolios. The long leg and short leg portfolios are as determined by previous studies, and represent the extreme quintile portfolios of different anomaly variables. Low turnover represent the lowest 20% quintile in 12 month average turnover. High turnover represent the highest 20% quintile in 12 month average turnover. Long-Short is the alpha of a zero-cost portfolio that longs the long leg and shorts the short leg of each strategy, with low turnover and high turnover separately reported. Start date of each strategy is as reported in table 4A while end date is December 2011. Returns and alphas are in monthly percent, t-statistics are shown below the coefficient estimates and are based on the heteroskedasticity-consistent standard errors of White (1980). 5% statistical significance is indicated in bold.

Sentiment Measure: 12 Month Average Turnover

	Long Leg			Short Leg			Long - Short		
Anomaly	Low Turnover	High Turnover	Low - High	Low Turnover	High Turnover	Low - High	Low Turnover	High Turnover	Low - High
Fama-Frech 3-factor alpha									
Accrual	0.128	0.053	0.075	-0.115	**-0.645**	**0.53**	0.243	**0.698**	-0.455
	[0.88]	[0.36]	[0.37]	[-0.87]	[-4.62]	[2.93]	[1.24]	[4.07]	[-1.92]
Asset Growth	-0.066	-0.14	0.074	0.152	**-0.412**	**0.564**	-0.218	0.272	**-0.49**
	[-0.46]	[-0.98]	[0.35]	[0.99]	[-2.92]	[2.95]	[-1.06]	[1.71]	[-2.06]
Composite Equity Issues	0.095	-0.051	0.147	0.071	**-0.571**	**0.641**	0.025	**0.519**	**-0.495**
	[1.00]	[-0.44]	[0.99]	[0.61]	[-5.20]	[4.08]	[0.17]	[3.92]	[-2.62]
Failure Probability	**0.438**	0.153	0.284	-0.191	**-1.255**	**1.064**	**0.629**	**1.409**	**-0.78**
	[3.36]	[1.02]	[1.37]	[-0.96]	[-5.12]	[3.64]	[2.63]	[4.51]	[-2.20]
Gross Profitability	**0.341**	0.029	0.312	-0.077	**-0.462**	0.385	**0.418**	**0.491**	-0.073
	[2.80]	[0.19]	[1.58]	[-0.66]	[-2.90]	[1.94]	[2.72]	[2.59]	[-0.31]
Investment To Assets Growth	0.186	-0.102	0.288	0.109	**-0.311**	**0.42**	0.077	0.209	-0.131
	[1.52]	[-0.76]	[1.51]	[0.67]	[-2.10]	[2.01]	[0.39]	[1.22]	[-0.54]
Momentum (12/1/3)	0.263	0.083	0.18	**-0.523**	**-1.223**	**0.699**	**0.786**	**1.306**	-0.519
	[1.72]	[0.55]	[0.94]	[-2.61]	[-6.32]	[3.40]	[2.76]	[5.01]	[-1.84]
Net Equity Issues	0.166	0.141	0.026	-0.197	**-0.701**	**0.505**	**0.363**	**0.842**	**-0.479**
	[1.59]	[1.08]	[0.15]	[-1.47]	[-5.01]	[2.64]	[2.23]	[5.67]	[-2.22]
Net Operating Assets	0.15	-0.083	0.233	0.003	**-0.667**	**0.67**	0.147	**0.584**	-0.437
	[1.39]	[-0.55]	[1.29]	[0.02]	[-4.46]	[3.44]	[0.85]	[3.46]	[-1.91]
Ohlson s O-Score	0.224	-0.067	0.291	0.005	**-0.831**	**0.836**	0.219	**0.765**	-0.545
	[1.40]	[-0.49]	[1.34]	[0.03]	[-3.33]	[2.82]	[0.90]	[2.62]	[-1.43]
Return On Assets	**0.536**	0.038	**0.498**	**-0.693**	**-0.982**	0.289	**1.229**	**1.02**	0.21
	[3.44]	[0.24]	[2.16]	[-4.08]	[-5.50]	[1.18]	[5.37]	[4.53]	[0.66]
Combination Of Anomalies	**0.246**	0.032	**0.214**	-0.105	**-0.714**	**0.608**	**0.352**	**0.746**	**-0.395**
	[2.81]	[0.32]	[1.51]	[-1.05]	[-6.24]	[4.25]	[3.67]	[7.49]	[-3.16]

Table 3B: Anomalies return conditioned on low stock sentiment and high stock sentiment

This table reports calendar time portfolio abnormal returns. At the beginning of each calendar month, stocks are independently double sorted on the basis of each of the eleven anomaly measure and my second sentiment measure: 3 year FL Flow into 5x5 value weighted portfolios. All stocks are value weighted within a given portfolio, and the portfolios are rebalanced every calendar month to maintain value weights. This table includes all NYSE/AMEX/Nasdaq stocks with non-missing sentiment and anomaly variable information at portfolio formation. Alpha is the intercept on a regression of monthly excess return from the rolling strategy. The explanatory variables are the monthly returns from Fama and French (1993) mimicking portfolios. The long leg and short leg portfolios are as determined by previous studies, and represent the extreme quintile portfolios of different anomaly variables. Low turnover represent the lowest 20% quintile in 12 month average turnover. High turnover represent the highest 20% quintile in 12 month average turnover. Long-Short is the alpha of a zero-cost portfolio that longs the long leg and shorts the short leg of each strategy, with low turnover and high turnover separately reported. All strategies start in April 1983 except price momentum, which starts in July 1983. All strategies end in September 2010. Returns and alphas are in monthly percent, t-statistics are shown below the coefficient estimates and are based on the heteroskedasticity-consistent standard errors of White (1980). 5% statistical significance is indicated in bold.

Sentiment Measure: Three Year FL Flow

	Long Leg			Short Leg			Long - Short		
Anomaly	Low Flow	Flow	- High	Low Flow	Flow	- High	Low Flow	Flow	- High
Fama-Frech 3-factor alpha									
Accrual	0.208	-0.063	0.271	-0.154	**-0.632**	0.479	0.362	**0.57**	-0.208
	[1.31]	[-0.39]	[1.13]	[-0.73]	[-3.52]	[1.64]	[1.48]	[2.87]	[-0.72]
Asset Growth	0.218	0.039	0.179	-0.038	**-0.65**	**0.612**	0.256	**0.689**	-0.433
	[1.42]	[0.25]	[0.85]	[-0.22]	[-3.75]	[2.51]	[1.21]	[3.09]	[-1.61]
Composite Equity Issues	0.162	-0.102	0.263	0.098	**-0.622**	**0.72**	0.063	**0.52**	**-0.457**
	[1.31]	[-0.86]	[1.52]	[0.59]	[-3.75]	[2.94]	[0.35]	[2.90]	[-1.97]
Failure Probability	0.378	0.035	0.342	**-1.283**	**-1.449**	0.167	**1.66**	**1.485**	0.176
	[2.56]	[0.25]	[1.88]	[-3.64]	[-4.97]	[0.46]	[4.02]	[4.25]	[0.46]
Gross Profitability	**0.328**	0.175	0.153	0.003	**-0.596**	**0.598**	0.325	**0.771**	-0.446
	[2.10]	[1.14]	[0.70]	[0.01]	[-2.95]	[2.01]	[1.31]	[2.93]	[-1.54]
Investment To Assets Growth	0.031	-0.327	0.358	0	**-0.61**	**0.61**	0.03	0.283	-0.252
	[0.21]	[-2.23]	[1.61]	[0.00]	[-3.57]	[2.59]	[0.16]	[1.45]	[-0.99]
Momentum (12/1/3)	**0.491**	0.173	0.318	**-0.56**	**-1.267**	**0.708**	**1.05**	**1.44**	-0.39
	[2.62]	[1.14]	[1.56]	[-2.04]	[-4.06]	[2.75]	[2.65]	[3.81]	[-1.36]
Net Equity Issues	**0.257**	-0.125	**0.382**	**-0.229**	**-0.553**	0.324	**0.487**	**0.429**	0.058
	[2.02]	[-1.02]	[2.06]	[-1.37]	[-3.26]	[1.26]	[2.79]	[2.38]	[0.26]
Net Operating Assets	**0.385**	0.021	0.364	-0.233	**-0.679**	0.446	**0.618**	**0.7**	-0.082
	[2.22]	[0.12]	[1.47]	[-1.54]	[-3.92]	[1.84]	[3.36]	[3.14]	[-0.35]
Ohlson s O-Score	**0.42**	-0.205	**0.625**	0.104	**-0.569**	**0.673**	0.316	0.364	-0.049
	[2.81]	[-1.33]	[2.60]	[0.47]	[-2.53]	[2.56]	[1.13]	[1.47]	[-0.15]
Return On Assets	**0.569**	0.11	**0.458**	-0.214	**-0.944**	**0.73**	**0.782**	**1.054**	-0.272
	[3.79]	[0.74]	[2.02]	[-0.84]	[-3.76]	[2.39]	[2.72]	[3.53]	[-0.87]
Combination Of Anomalies	**0.324**	-0.034	**0.358**	-0.216	**-0.794**	**0.578**	**0.54**	**0.76**	**-0.22**
	[2.93]	[-0.38]	[2.21]	[-1.80]	[-5.38]	[3.05]	[4.70]	[6.44]	[-2.05]

paints a similar picture to the results obtained when looking at the equal weighted average of the anomalies. Using 12 month Average Turnover (3 year FL Flow) as a measure of sentiment, all 11 (11) anomalies produce higher returns following low sentiment rather than high sentiment for the long leg. However, this is only statistically significant at the 5% level for one (three) of the eleven anomalies. For the short leg, all 11 (11) anomalies produce lower return following high sentiment rather than low sentiment. This is statistically significant at the 5% level for 9 (7) of the eleven anomalies. Taken together, the long-short portfolio is higher following high sentiment for 10 (9) of the eleven anomalies.

Similar to the time series result of Stambaugh, Yu, Yuan (2012), I find that the effect of individual stock investor sentiment on the 11 anomalies that survive risk adjustment by the Fama and French 3-factor model is more pronounced in the short leg. This result is slightly stronger when 12 month average turnover is used as a measure of sentiment instead of 3 year FL Flow. This is consistent with the notion that it is relatively more difficult for arbitrageurs to correct for overpricing by shorting stocks.

A related study by Gervais, Kaniel, Mingelgrin (2001) find that stocks experiencing unusually high (low) trading volume[15] over a day or a week tend to appreciate (depreciate) over the course of the following month. At first blush, this may be contradictory with what we find. In our study, high turnover-conditioned short legs of anomalies earn much lower returns than low turnover-conditioned short legs. I examine this potential contradiction by analyzing my results using 12 month Average Turnover that skips the turnover of the most recent month. The results are shown in Appendix Table 5. Surprisingly, the high turnover-conditioned short legs does not have more negative returns without conditioning on the most recent month turnover,

[15] A stock whose trading volume that day is among its top (bottom) five daily trading volumes over the last 50 trading days is categorized as a "high-volume" ("low-volume") stock.

as might be expected given the results of Gervais, Kaniel, Mingelgrin. This result suggests that persistently high turnover is capturing a subset of stocks which is very different from those which experience a sudden and unusual spike in volume.

6.3 Sentiment-conditioned Strategies

Hypothesis 1 and the previous results imply that a sentiment-based anomaly long-short strategy, in which I restrict the long leg of each anomaly to low sentiment stock and the short leg of each anomaly to high sentiment stock, should yield significantly higher returns than a simple anomaly long-short strategy. I refer to this sentiment-based anomaly long-short strategy as the sentiment-enhanced anomaly strategy. In contrast, Hypothesis 1 also implies that a sentiment-based anomaly long-short strategy, in which I restrict the long leg of each anomaly to high sentiment stock and the short leg of each anomaly to low sentiment stock, should yield significantly lower returns than a simple anomaly long-short strategy. I refer to this sentiment-based anomaly long-short strategy as the sentiment-impaired anomaly strategy. Recall that I've constructed 25 portfolios by independently sorting all stocks into five anomaly categories and five stock sentiment categories.[16] Then the sentiment-enhanced anomaly strategy is the portfolio A1S1-A5S5; while the sentiment-impaired anomaly strategy is A1S5-A5S1.

To benchmark these sentiment conditioned strategies, I also construct a simple anomaly strategy which is not conditional on any sentiment information (A1-A5). I use only the sample of stocks contained in the 25 portfolios used to construct the sen-

[16] Recall from Section 5.2 that at the beginning of calendar month t, for each of the 11 anomalies, I independently sort stocks based on the anomaly variable known at the end of calendar month t-1 and assign them into 5 quintile portfolios (A1 to A5). A1 represents the long leg portfolio while A5 represents the short leg portfolio as determined by previous studies. I then independently sort these same firms with non-missing anomaly information based on each of the two sentiment measure (turnover, flow) in ascending order, and divide them into five sentiment portfolios (S1 to S5).

timent conditioned anomaly strategies. This provides an apples to apples comparison to the sentiment conditioned anomaly strategies.

6.4 Results

Table 4A and Table 4B show the basic result. For each of the 11 anomalies, and separately for each measure of sentiment, I report calendar time portfolio abnormal returns associated with the sentiment-enhanced anomaly strategy, the sentiment-impaired anomaly strategy, and the simple anomaly strategy. The rightmost three columns report the difference in abnormal returns between the sentiment-enhanced anomaly strategy and the simple anomaly strategy, the sentiment-impaired anomaly strategy and the simple anomaly strategy, and the two sentiment strategies. Table 4A reports the results when using 12 month Average Turnover as a measure of sentiment. Table 4B reports the results when using 3 Year FL Flow as a measure of sentiment. I adjust portfolio returns using the Fama and French 3-factor model. I first look at the results which use 12 month Average Turnover as a measure of sentiment. As implied by Hypothesis 1, the column (1)-(3), which reports the abnormal return of the sentiment-enhanced strategy minus the simple anomaly strategy, should be positive. As consistent with my hypothesis, the equal weighted average of the anomalies show a positive difference in abnormal returns between the sentiment-enhanced strategy and the simple anomaly strategy. The difference in return becomes statistically significant at the 5% level. The difference in the magnitude of the abnormal returns is also economically significant. The simple anomaly strategy earns abnormal returns of 0.526% per month [t-statistic = 6.88]. In contrast, the sentiment-enhanced strategy earns abnormal returns of 0.96% [t-statistic = 6.37], which is roughly 82% larger than the simple anomaly strategy.

Using 3 year FL Flow as a measure of sentiment yields similar results. For

Table 4A: sentiment conditioned strategies, abnormal returns

This table reports calendar time portfolio abnormal returns. At the beginning of each calendar month, stocks are double sorted on the basis of each of the eleven anomaly measure and my first individual stock sentiment measure: 12 month average turnover into 5x5 value weighted portfolios. All stocks are value weighted within a given portfolio, and the portfolios are rebalanced every calendar month to maintain value weights. This table includes all NYSE/AMEX stocks with non-missing sentiment and anomaly variable information at portfolio formation. Alpha is the intercept on a regression of monthly excess return from the rolling strategy. The explanatory variables are the monthly returns from Fama and French (1993) mimicking portfolios. Two strategies are created using the 5x5 value weighted portfolios: the sentiment enhanced anomaly strategy and the sentiment impaired anomaly strategy. The details of the construction of these strategies are in Section five of the main text. L/S is the alpha of a zero-cost portfolio that longs the long leg and shorts the short leg of each strategy. Differences in the returns to the three long short strategies are reported in the last 3 columns. Start date of each strategy is reported as in Table2 while end date is December 2011. Returns and alphas are in monthly percent, t-statistics are shown below the coefficient estimates and are based on the heteroskedasticity-consistent standard errors of White (1980). 5% statistical significance is indicated in bold.

Sentiment Measure: 12 Month Average Turnover

	Sentiment Enhanced Anomaly Strategy			Sentiment Impaired Anomaly Strategy			Simple Anomaly Strategy					
Anomaly	Long Leg	Short Leg	L/S (1)	Long Leg	Short Leg	L/S (2)	A1	A5	L/S (3)	(1)-(3)	(2)-(3)	(1)-(2)
Fama-Frech 3-factor alpha												
Accrual	0.128	**-0.645**	**0.773**	0.053	-0.115	0.168	0.065	**-0.343**	**0.408**	**0.365**	-0.24	**0.605**
	[0.88]	[-4.62]	[3.83]	[0.36]	[-0.87]	[0.80]	[1.01]	[-3.73]	[3.43]	[2.02]	[-1.23]	[2.02]
Asset Growth	-0.066	**-0.412**	0.346	-0.14	0.152	-0.292	0.041	**-0.154**	**0.195**	0.151	**-0.487**	0.638
	[-0.46]	[-2.92]	[1.57]	[-0.98]	[0.99]	[-1.38]	[0.54]	[-2.08]	[1.99]	[0.79]	[-2.35]	[1.95]
Composite Equity Issues	0.095	**-0.571**	**0.666**	-0.051	0.071	-0.122	**0.111**	**-0.282**	**0.394**	**0.272**	**-0.516**	**0.788**
	[1.00]	[-5.20]	[4.29]	[-0.44]	[0.61]	[-0.76]	[2.29]	[-4.85]	[5.04]	[1.99]	[-3.06]	[3.29]
Failure Probability	**0.438**	**-1.255**	**1.693**	0.153	-0.191	0.344	**0.19**	**-0.851**	**1.041**	**0.652**	**-0.697**	**1.349**
	[3.36]	[-5.12]	[5.72]	[1.02]	[-0.96]	[1.30]	[2.34]	[-4.23]	[4.20]	[3.61]	[-2.50]	[3.71]
Gross Profitability	**0.341**	**-0.462**	**0.803**	0.029	-0.077	0.106	**0.268**	**-0.323**	**0.591**	0.211	**-0.485**	**0.696**
	[2.80]	[-2.90]	[3.80]	[0.19]	[-0.66]	[0.55]	[3.41]	[-3.67]	[5.08]	[1.09]	[-2.55]	[2.20]
Investment To Assets Growth	0.186	**-0.311**	**0.497**	-0.102	0.109	-0.211	-0.037	**-0.154**	0.117	**0.38**	-0.328	**0.708**
	[1.52]	[-2.10]	[2.54]	[-0.76]	[0.67]	[-0.95]	[-0.49]	[-2.05]	[1.02]	[2.15]	[-1.52]	[2.24]
Momentum (12/1/3)	0.263	**-1.223**	**1.486**	0.083	**-0.523**	**0.606**	**0.299**	**-0.862**	**1.161**	**0.325**	**-0.555**	**0.879**
	[1.72]	[-6.32]	[5.50]	[0.55]	[-2.61]	[2.20]	[2.82]	[-4.83]	[4.57]	[1.99]	[-2.69]	[3.14]
Net Equity Issues	0.166	**-0.701**	**0.868**	0.141	-0.197	0.337	**0.129**	**-0.396**	**0.524**	**0.344**	-0.187	0.531
	[1.59]	[-5.01]	[4.65]	[1.08]	[-1.47]	[1.80]	[2.62]	[-5.52]	[5.91]	[2.09]	[-0.99]	[1.77]
Net Operating Assets	0.15	**-0.667**	**0.817**	-0.083	0.003	-0.086	-0.036	**-0.29**	**0.254**	**0.563**	-0.34	**0.903**
	[1.39]	[-4.46]	[4.50]	[-0.55]	[0.02]	[-0.41]	[-0.48]	[-4.23]	[2.50]	[3.58]	[-1.71]	[3.05]
Ohlson s O-Score	0.224	**-0.831**	**1.056**	-0.067	0.005	-0.072	**0.124**	-0.102	0.226	**0.83**	-0.297	**1.127**
	[1.40]	[-3.33]	[3.57]	[-0.49]	[0.03]	[-0.33]	[2.12]	[-0.72]	[1.50]	[3.58]	[-1.37]	[3.18]
Return On Assets	**0.536**	**-0.982**	**1.518**	0.038	**-0.693**	**0.731**	**0.213**	**-0.668**	**0.881**	**0.637**	-0.15	**0.787**
	[3.44]	[-5.50]	[6.46]	[0.24]	[-4.08]	[3.00]	[2.89]	[-4.94]	[5.33]	[3.16]	[-0.61]	[2.23]
Combination Of Anomalies	**0.246**	**-0.714**	**0.96**	0.032	-0.105	0.138	**0.128**	**-0.398**	**0.526**	**0.434**	**-0.388**	**0.822**
	[2.81]	[-6.24]	[6.37]	[0.32]	[-1.05]	[0.94]	[2.85]	[-5.99]	[6.88]	[3.42]	[-2.52]	[3.21]

Table 4B: sentiment conditioned strategies, abnormal returns

This table reports calendar time portfolio abnormal returns. At the beginning of each calendar month, stocks are double sorted on the basis of each of the eleven anomaly measure and my second individual stock sentiment measure: 3 year FL Flow into 5x5 value weighted portfolios. All stocks are value weighted within a given portfolio, and the portfolios are rebalanced every calendar month to maintain value weights. This table includes all NYSE/AMEX/Nasdaq stocks with non-missing sentiment and anomaly variable information at portfolio formation. Alpha is the intercept on a regression of monthly excess return from the rolling strategy. The explanatory variables are the monthly returns from Fama and French (1993) mimicking portfolios. Two strategies are created using the 5x5 value weighted portfolios: the sentiment enhanced anomaly strategy and the sentiment impaired anomaly strategy. The details of the construction of these strategies are in Section five of the main text. L/S is the alpha of a zero-cost portfolio that longs the long leg and shorts the short leg of each strategy. Differences in the returns to the three long short strategies are reported in the last 3 columns. All strategies start in April 1983 except price momentum, which starts in July 1983. All strategies end in September 2010. Returns and alphas are in monthly percent, t-statistics are shown below the coefficient estimates and are based on the heteroskedasticity-consistent standard errors of White (1980). 5% statistical significance is indicated in bold.

Sentiment Measure:Three Year FL Flow

	Sentiment Enhanced Anomaly Strategy			Sentiment Impaired Anomaly Strategy			Simple Anomaly Strategy					
Anomaly	Long Leg	Short Leg	L/S (1)	Long Leg	Short Leg	L/S (2)	A1	A5	L/S (3)	(1)-(3)	(2)-(3)	(1)-(2)
Fama-Frech 3-factor alpha												
Accrual	0.208	**-0.632**	**0.841**	-0.063	-0.154	0.091	0.035	**-0.351**	**0.386**	0.454	-0.295	0.75
	[1.31]	[-3.52]	[3.31]	[-0.39]	[-0.73]	[0.29]	[0.34]	[-3.00]	[2.08]	[1.72]	[-1.20]	[1.66]
Asset Growth	0.218	**-0.65**	**0.868**	0.039	-0.038	0.077	0.089	-0.173	0.262	**0.606**	-0.185	**0.791**
	[1.42]	[-3.75]	[3.31]	[0.25]	[-0.22]	[0.32]	[0.89]	[-1.87]	[1.73]	[2.76]	[-0.80]	[2.14]
Composite Equity Issues	0.162	**-0.622**	**0.783**	-0.102	0.098	-0.2	**0.168**	**-0.362**	**0.53**	0.253	**-0.73**	**0.983**
	[1.31]	[-3.75]	[3.44]	[-0.86]	[0.59]	[-0.90]	[2.54]	[-4.56]	[4.41]	[1.36]	[-3.18]	[2.77]
Failure Probability	**0.378**	**-1.449**	**1.827**	0.035	**-1.283**	**1.318**	**0.236**	**-1.272**	**1.508**	0.319	-0.189	0.509
	[2.56]	[-4.97]	[4.77]	[0.25]	[-3.64]	[3.24]	[3.04]	[-4.91]	[4.86]	[1.28]	[-0.70]	[1.18]
Gross Profitability	**0.328**	**-0.596**	**0.924**	0.175	0.003	0.173	**0.397**	**-0.509**	**0.906**	0.017	**-0.734**	0.751
	[2.10]	[-2.95]	[3.28]	[1.14]	[0.01]	[0.53]	[4.50]	[-3.28]	[5.21]	[0.07]	[-2.55]	[1.72]
Investment To Assets Growth	0.031	**-0.61**	**0.64**	-0.327	0	-0.327	-0.095	-0.164	0.069	**0.571**	-0.396	**0.968**
	[0.21]	[-3.57]	[2.52]	[-2.23]	[0.00]	[-1.46]	[-1.07]	[-1.87]	[0.48]	[2.73]	[-1.75]	[2.55]
Momentum (12/1/3)	**0.491**	**-1.267**	**1.758**	0.173	**-0.56**	0.732	**0.302**	**-0.793**	**1.095**	**0.663**	-0.362	**1.025**
	[2.62]	[-4.06]	[3.94]	[1.14]	[-2.04]	[2.06]	[2.32]	[-2.93]	[2.95]	[2.74]	[-1.68]	[2.80]
Net Equity Issues	**0.257**	**-0.553**	**0.811**	-0.125	-0.229	0.105	**0.17**	**-0.429**	**0.599**	0.212	-0.495	0.706
	[2.02]	[-3.26]	[3.28]	[-1.02]	[-1.37]	[0.46]	[3.04]	[-5.00]	[5.04]	[1.01]	[-2.10]	[1.82]
Net Operating Assets	**0.385**	**-0.679**	**1.065**	0.021	-0.233	0.254	0.175	**-0.327**	**0.501**	**0.563**	-0.247	0.811
	[2.22]	[-3.92]	[3.66]	[0.12]	[-1.54]	[1.00]	[1.64]	[-4.71]	[3.72]	[2.38]	[-0.92]	[1.88]
Ohlson s O-Score	**0.42**	**-0.569**	**0.989**	-0.205	0.104	-0.309	**0.162**	-0.152	0.314	**0.675**	**-0.623**	**1.298**
	[2.81]	[-2.53]	[3.18]	[-1.33]	[0.47]	[-1.20]	[3.23]	[-1.00]	[1.86]	[2.83]	[-2.74]	[3.33]
Return On Assets	**0.569**	**-0.944**	**1.512**	0.11	-0.214	0.324	**0.358**	**-0.552**	**0.91**	**0.602**	**-0.586**	**1.188**
	[3.79]	[-3.76]	[4.57]	[0.74]	[-0.84]	[0.97]	[5.07]	[-2.97]	[3.95]	[2.36]	[-2.22]	[2.70]
Combination Of Anomalies	**0.324**	**-0.794**	**1.118**	-0.034	-0.216	0.181	**0.182**	**-0.462**	**0.644**	**0.474**	**-0.462**	**0.937**
	[2.93]	[-5.38]	[4.91]	[-0.38]	[-1.80]	[1.13]	[5.02]	[-5.78]	[6.43]	[2.71]	[-2.60]	[2.79]

the equal weighted average of the anomalies, using the 3-factor model as a base case, the sentiment-enhanced anomaly strategy earns abnormal returns of 1.118% [t-statistics=4.91] per month. In comparison, the simple anomaly strategy earns abnormal returns of 0.542% [t-statistics=5.95] per month. The difference of 0.474% per month is statistically significant at the 5% level [t-statistics=2.71]. The magnitude of the difference is economically nontrivial: it translates to roughly 5.83% in annualized return.

Now I turn to looking into the set of 11 anomalies on an individual basis. For both measures of sentiment, all 11 anomalies show a positive difference in abnormal returns.

Using 12 month Average Turnover as a measure of sentiment, 9 of these are statistically significant at the 5% level after adjusting the return using the Fama and French 3-factor model. Using 3 year FL Flow as a measure of sentiment, 6 of these are statistically significant at the 5% level using the Fama French 3-factor model.

Next I turn to the second implication of hypothesis 1, which says that the abnormal return of the simple anomaly strategy minus the sentiment-impaired anomaly strategy should be negative. Using turnover as a measure of sentiment, the equal weighted average of the anomalies show a negative difference in abnormal returns. Similar to the result reported for (1)-(3), the difference in return become statistically significant at the 5% level when abnormal returns are adjusted using any of the three factor models I consider. What is more surprising, however, is that the sentiment-impaired strategy earns Fama and French (1993) abnormal returns of only 0.137% per month and the strategy becomes statistically insignificant [t-statistics 0.94]. This means that without properly conditioning for sentiment, anomaly strategies no longer deliver abnormal returns that survive Fama and French (1993) adjustments.

Using 3 year FL Flow as a measure of sentiment again yields similar results. For

the equal weighted average of the anomalies, using the 3-factor model to adjust for risk, the sentiment-impaired anomaly strategy earns abnormal returns of only 0.182 % [t-statistics=1.13] per month. This is 0.462% [t-statistics=2.59] lower than the result for the simple anomaly strategy.

Looking at the anomalies on an individual basis, all 11 anomalies show a negative difference in Fama French 3 factor alphas for both measures of sentiment. In addition, 5 of these are statistically significant at the 5% level for both measures of sentiment. Overall, the strength of the difference in abnormal return between the simple anomaly strategy and the sentiment-impaired strategy is slightly weaker than the difference in abnormal return between the sentiment-enhanced strategy and the simple anomaly strategy.

Finally, I look at the abnormal return of the sentiment-enhanced anomaly strategy minus the sentiment-impaired anomaly strategy. This strategy has the interesting property that it is anomaly neutral. This is easy to see: the strategy is long the low sentiment long leg of the anomaly and short the high sentiment long leg of the anomaly. On the other hand, it is long the low sentiment short leg of the anomaly and short the high sentiment short leg of the anomaly. If sentiment is not a driving force in the abnormal returns of anomalies, we should expect the abnormal returns to be 0. Naturally, this is strongly rejected in the data, as implied from our previous two results. Using the baseline Fama French 3 factor model to calculate abnormal returns and using turnover (flow) as a measure of sentiment, the equal weighted average of the anomalies show a positive abnormal return of 0.822% (0.937%) per month [t-statistics = 3.21 (2.79)] for this anomaly neutral strategy. Looking at the individual anomalies, this result is very robust: all 11 (11) anomalies show a positive sign with 9 (6) of these being statistical significant at the 5% level.

Taken together, these results strongly support the hypothesis that sentiment

shocks are partially responsible for the previously documented abnormal returns of anomaly strategies. They show that there is a lot of cross sectional variation in returns within firms that have the same quintile of firm characteristics; and this cross-sectional variation within characteristics can be sorted out using measures that proxy for individual stock investor sentiment.

6.5 Robustness to size

In this section, I analyze the effect of firm size on the results. As the analysis involves double sorting stocks along each anomaly variable and each sentiment variable, further partitioning this sample along the size dimension would lead to too many portfolios with insufficient stocks. Since the objective of this paper is to analyze the systematic impact of sentiment shocks on anomalies as opposed to idiosyncratic effects on a particular anomaly, I focus my efforts in analyzing only the equal weighted average of anomalies.

Recall that for each anomaly, stocks are assigned to one of 25 portfolios based on anomaly ranking and sentiment ranking. It follows that for the equal weighted average of the anomalies, the weights of a stock j in a particular anomaly-sentiment portfolio will be as follows: $\text{combination weights}_j = \sum_{i=1}^{11} \left(\frac{\text{value weights}_{i,j}}{11} \right)$.

Using NYSE/AMEX breakpoints, I further assign each stock that appears in any of the combination of anomalies-sentiment portfolios into one of the 5 NYSE/AMEX size quintiles. Notice that the combination weights depend on two factors: how large the stock is relative to the other stocks in a particular anomaly-sentiment portfolio; and the number of times the same stock appears in the same anomaly-sentiment portfolio across the eleven anomalies. Hence, if I simply re-calculate the value weights of each stock based on whether they appear in a particular anomaly-sentiment portfolio or not, this will underweight stocks which appear in the same anomaly-sentiment

portfolio of many of the anomalies and overweight stocks that appear only in one of the anomalies but is relatively large in size. To avoid this problem, I weigh each stock using the combination weights combination weights$_j$ and rescale it so that it sums to 100% for each combination of anomalies-sentiment-size portfolio, i.e. new combination weights$_j$=$\frac{\text{combination weights}_j}{\sum_{j \in size\_portfolio} \text{combination weights}_j}$.

Table 5A reports the results when 12 month average turnover is used as a measure of sentiment. The sentiment-enhanced anomaly strategy has 3-factor alpha that monotonously decreases as size increases from 2.412% per month for the smallest quintile to 0.78% per month for the largest quintile. On the other hand, the sentiment-impaired anomaly strategy has 3-factor alpha that shows less of a trend across size quintiles. However, it also appears to be larger as size increases. For the smallest quintile, 3-factor alpha is -1.807% per month while for the largest quintile, it is -0.096% per month. Taken together, the spread between the sentiment-enhanced anomaly strategy and the sentiment-impaired anomaly strategy is largest in the smallest decile with a 3-factor alpha of 4.219% per month [t-statistics = 5.02]. This translates to 64.19% annualized alpha. This drops off significantly to 1.851% per month [t-statistics=4.07] for the second smallest quintile and 0.875% per month [t-statistics=2.28] for the largest quintile. Nevertheless, the results are all statistically significant and the economic magnitudes are all nontrivial.

Table 5B reports the results where flow is used as a measure of sentiment. The sentiment-enhanced anomaly strategy has 3 factor alpha that is relatively stable between 0.876% per month to 1.144% per month. The sentiment-impaired anomaly strategy is less stable across quintiles. It is lowest in the extreme quintiles but higher in the middle quintiles. The overall effect is that the spread between the sentiment-enhanced anomaly strategy and the sentiment-impaired anomaly strategy is only positive in 4 of the 5 quintiles. It is only statistically significant for the largest quin-

Table 5A: sentiment conditioned strategies and size, abnormal returns

This table reports calendar time portfolio abnormal returns. At the beginning of each calendar month, stocks are independently double sorted on the basis of each of the eleven anomaly measure and my first sentiment measure: 12 month average turnover into 5x5 value weighted portfolios. The combination of anomalies portfolio is constructed by equally weighing over the eleven anomalies. I further assign each stock that appears in any of the combination of anomalies-sentiment portfolios into one of the five NYSE/AMEX size quintiles. I then weigh each stock using the combination weights and rescale it so that it sums to 100% for each combination of anomalies-sentiment-size portfolio. All stocks are value weighted within a given portfolio, and the portfolios are rebalanced every calendar month to maintain value weights. This table includes all NYSE/AMEX stocks with non-missing sentiment and anomaly variable information at portfolio formation. Alpha is the intercept on a regression of monthly excess return from the rolling strategy. The explanatory variables are the monthly returns from Fama and French (1993) mimicking portfolios and Pastor and Stambaugh (2003) liquidity factor. Two strategies are created using the 5x5 value weighted portfolios: the sentiment enhanced anomaly strategy and the sentiment impaired anomaly strategy. The details of the construction of these strategies are in Section five of the main text. L/S is the alpha of a zero-cost portfolio that longs the long leg and shorts the short leg of each strategy. Differences in the returns to the three long short strategies are reported in the last 3 columns. Start date of each strategy is reported in Table2 while end date is December 2011. Returns and alphas are in monthly percent, t-statistics are shown below the coefficient estimates and are based on the heteroskedasticity-consistent standard errors of White (1980). 5% statistical significance is indicated in bold.

Sentiment Measure: 12 Month Average Turnover

	Sentiment Enhanced Anomaly Strategy			Sentiment Impaired Anomaly Strategy			Simple Anomaly Strategy					
Market Capitalization Quintle (NYSE/AMEX breakpoints)	Long Leg	Short Leg	L/S (1)	Long Leg	Short Leg	L/S (2)	A1	A5	L/S (3)	(1)-(3)	(2)-(3)	(1)-(2)
Fama-Frech 3-factor alpha												
1	0.119	**-2.293**	**2.412**	**-1.984**	-0.177	**-1.807**	-0.176	**-0.663**	**0.487**	**1.925**	**-2.294**	**4.219**
	[0.72]	[-4.53]	[5.05]	[-4.26]	[-0.85]	[-4.11]	[-1.00]	[-3.23]	[6.40]	[4.08]	[-5.28]	[5.02]
2	0.133	**-1.323**	**1.456**	**-0.743**	**-0.348**	-0.395	-0.061	**-0.629**	**0.568**	**0.887**	**-0.964**	**1.851**
	[1.07]	[-4.82]	[5.13]	[-3.86]	[-2.46]	[-1.72]	[-0.62]	[-4.54]	[6.24]	[3.72]	[-3.95]	[4.07]
3	**0.298**	**-1.152**	**1.45**	0.004	**-0.32**	0.324	0.068	**-0.589**	**0.657**	**0.793**	-0.333	**1.126**
	[2.27]	[-6.61]	[6.91]	[0.03]	[-1.92]	[1.58]	[0.79]	[-4.88]	[7.12]	[4.50]	[-1.62]	[3.29]
4	**0.254**	**-0.59**	**0.843**	0.075	-0.008	0.084	0.141	**-0.274**	**0.415**	**0.428**	-0.331	**0.76**
	[1.98]	[-3.83]	[4.66]	[0.63]	[-0.05]	[0.44]	[1.71]	[-2.41]	[4.72]	[2.89]	[-1.65]	[2.39]
5	0.157	**-0.622**	**0.78**	0.03	0.126	-0.096	**0.123**	**-0.354**	**0.477**	**0.303**	**-0.572**	**0.875**
	[1.08]	[-4.78]	[3.74]	[0.25]	[0.71]	[-0.42]	[2.79]	[-5.34]	[5.73]	[1.61]	[-2.32]	[2.28]

Table 5B: sentiment conditioned strategies and size, abnormal returns

This table reports calendar time portfolio abnormal returns. At the beginning of each calendar month, stocks are independently double sorted on the basis of each of the eleven anomaly measure and my second individual stock sentiment measure: 3 year FL Flow into 5x5 value weighted portfolios. The combination of anomalies portfolio is constructed by equally weighing over the eleven anomalies. I further assign each stock that appears in any of the combination of anomalies-sentiment portfolios into one of the five NYSE/AMEX size quintiles. I then weigh each stock using the combination weights and rescale it so that it sums to 100% for each combination of anomalies-sentiment-size portfolio. I report the returns to each combination of anomalies-sentiment-size portfolio only. All stocks are value weighted within a given portfolio, and the portfolios are rebalanced every calendar month to maintain value weights. This table includes all NYSE/AMEX/Nasdaq stocks with non-missing sentiment and anomaly variable information at portfolio formation. Alpha is the intercept on a regression of monthly excess return from the rolling strategy. The explanatory variables are the monthly returns from Fama and French (1993) mimicking portfolios and Pastor and Stambaugh (2003) liquidity factor. Two strategies are created using the 5x5 value weighted portfolios: the sentiment enhanced anomaly strategy and the sentiment impaired anomaly strategy. The details of the construction of these strategies are in Section five of the main text. L/S is the alpha of a zero-cost portfolio that longs the long leg and shorts the short leg of each strategy. Differences in the returns to the three long short strategies are reported in the last 3 columns. All strategies start in April 1983 except price momentum, which starts in July 1983. All strategies end in September 2010. Returns and alphas are in monthly percent, t-statistics are shown below the coefficient estimates and are based on the heteroskedasticity-consistent standard errors of White (1980). 5% statistical significance is indicated in bold.

Sentiment Measure:FL Three Year Flow

	Sentiment Enhanced Anomaly Strategy			Sentiment Impaired Anomaly Strategy			Simple Anomaly Strategy					
Market Capitalization Quintle (NYSE/AMEX breakpoints)	Long Leg	Short Leg	L/S (1)	Long Leg	Short Leg	L/S (2)	Q1	Q5	L/S (3)	(1)-(3)	(2)-(3)	(1)-(2)
Fama-Frech 3-factor alpha												
1	0.356	**-0.789**	**1.144**	0.07	-0.227	0.297	0.185	-0.474	**0.659**	0.485	-0.361	0.847
	[1.37]	[-2.46]	[3.70]	[0.29]	[-0.78]	[1.27]	[0.81]	[-1.69]	[6.92]	[1.71]	[-1.57]	[1.80]
2	0.195	**-0.681**	**0.876**	**0.261**	**-0.735**	**0.996**	0.175	**-0.759**	**0.934**	-0.058	0.063	-0.12
	[1.43]	[-3.46]	[4.15]	[2.10]	[-3.77]	[5.62]	[1.83]	[-4.39]	[8.08]	[-0.37]	[0.38]	[-0.40]
3	0.241	**-0.726**	**0.967**	**0.205**	**-0.561**	**0.766**	**0.203**	**-0.628**	**0.83**	0.137	-0.065	0.201
	[1.87]	[-4.25]	[4.23]	[2.03]	[-2.97]	[3.85]	[3.45]	[-4.98]	[6.92]	[0.80]	[-0.35]	[0.61]
4	0.238	**-0.7**	**0.937**	0.104	-0.265	0.369	**0.166**	**-0.41**	**0.576**	**0.361**	-0.208	0.569
	[1.85]	[-3.87]	[4.08]	[0.89]	[-1.46]	[1.74]	[2.41]	[-3.35]	[4.70]	[2.06]	[-0.92]	[1.53]
5	**0.355**	**-0.659**	**1.014**	-0.185	-0.089	-0.095	**0.195**	**-0.351**	**0.547**	0.468	**-0.642**	**1.109**
	[2.80]	[-2.84]	[3.39]	[-1.20]	[-0.47]	[-0.38]	[4.59]	[-3.98]	[5.18]	[1.78]	[-2.47]	[2.35]

tile using the 3-factor model. Nevertheless, the magnitudes are large: it is 0.847% per month for the smallest quintile and 1.109% per month for the largest quintile. The weaker statistical significance relative to turnover as a sentiment measure may be partially contributed by its relatively shorter time series. The somewhat surprising result for flow where the effect is strongest for the largest stocks is consistent with the findings of Frazinni and Lamont (2008), who find that the long-short portfolio constructed by ranking the 3 year FL Flow variable is stronger for large capitalization stocks. Overall, the results in Table 4A and Table 4B are largely robust to size.

6.6 Other robustness checks

Table 6A and Table 6B show the abnormal returns to the sentiment-enhanced anomaly strategy, the sentiment-impaired strategy, and the simple anomaly strategy using alternative models to adjust for excess returns. In particular, I use the CAPM, the Cahart (1997) 4-factor model, a 4-factor model which augments the 3-factor model with the Pastor and Stambaugh (2003) traded liquidity factor, and a 5-factor model which augments the 3-factor model with the Cahart (1997) momentum factor and the Pastor and Stambaugh (2003) traded liquidity factor to adjust for portfolio excess returns. I focus my efforts in analyzing only the equal weighted average of anomalies. This pattern of return appears to be robust to the different factor models employed. The sentiment-enhanced anomaly strategy outperforms the simple anomaly strategy, which in turn outperforms the sentiment-impaired anomaly strategy even when the 5-factor model is used to correct for risks for both measures of sentiment. The sentiment-impaired strategy no longer delivers any statistically significant abnormal returns different from 0 when using alternative factor models to correct for risks as well. This is the same result to what we find in previous sections of the paper.

In Panel B, I consider the alphas of the different strategies when equal weighted

Table 6A: robustness checks: sentiment conditioned strategies, abnormal returns

This table reports calendar time portfolio abnormal returns. At the beginning of each calendar month, stocks are double sorted on the basis of each of the eleven anomaly measure and my first individual stock sentiment measure: 12 month average turnover into 5x5 value weighted or equal weighted portfolios. In Panel A (B), all stocks are value (equal) weighted within a given portfolio, and the portfolios are rebalanced every calendar month to maintain value (equal) weights. The combination of anomalies portfolio is constructed by equally weighing over the eleven anomalies for each of the 25 value weighted or equal weighted portfolios. This table includes all NYSE/AMEX stocks with non-missing sentiment and anomaly variable information at portfolio formation. Alpha is the intercept on a regression of monthly excess return from the rolling strategy. The explanatory variables are the monthly returns from Fama and French (1993) mimicking portfolios, the Cahart (1997) momentum factor and the Pastor and Stambaugh (2003) liquidity factor. Two strategies are created using the 5x5 value weighted or equal weighted portfolios: the sentiment enhanced anomaly strategy and the sentiment impaired anomaly strategy. The details of the construction of these strategies are in Section five of the main text. L/S is the alpha of a zero-cost portfolio that longs the long leg and shorts the short leg of each strategy. Differences in the returns to the three long short strategies are reported in the last 3 columns. Start date of each strategy is reported in Table 2 while end date is December 2011. Returns and alphas are in monthly percent, t-statistics are shown below the coefficient estimates and are based on the heteroskedasticity-consistent standard errors of White (1980). 5% statistical significance is indicated in bold.

Sentiment Measure: 12 Month Average Turnover

	Sentiment Enhanced Anomaly Strategy			Sentiment Impaired Anomaly Strategy			Simple Anomaly Strategy					
Risk Adjustments	Long Leg	Short Leg	L/S (1)	Long Leg	Short Leg	L/S (2)	Q1	Q5	L/S (3)	(1)-(3)	(2)-(3)	(1)-(2)
Panel A: Combination Of Anomalies (Value-weighted)												
CAPM alpha	**0.4**	**-0.567**	**0.968**	0.097	0.133	-0.036	**0.164**	**-0.255**	**0.42**	**0.548**	**-0.456**	**1.004**
	[4.14]	[-4.64]	[6.21]	[0.91]	[1.16]	[-0.24]	[3.05]	[-3.42]	[5.31]	[4.17]	[-2.95]	[3.80]
Cahart 4-factor alpha	**0.23**	**-0.516**	**0.746**	-0.014	0.009	-0.024	0.075	**-0.215**	**0.29**	**0.456**	-0.314	**0.77**
	[2.59]	[-4.50]	[4.88]	[-0.14]	[0.10]	[-0.16]	[1.76]	[-4.17]	[5.35]	[3.36]	[-1.93]	[2.79]
Liquidity 4-factor alpha	**0.248**	**-0.686**	**0.935**	0.005	-0.113	0.118	**0.142**	**-0.376**	**0.518**	**0.417**	**-0.399**	**0.816**
	[2.85]	[-5.90]	[6.10]	[0.05]	[-1.14]	[0.81]	[3.16]	[-5.59]	[6.76]	[3.23]	[-2.57]	[3.14]
5-factor alpha	**0.232**	**-0.492**	**0.724**	-0.04	0	-0.041	**0.09**	**-0.195**	**0.286**	**0.438**	**-0.326**	**0.765**
	[2.61]	[-4.21]	[4.63]	[-0.38]	[0.00]	[-0.28]	[2.08]	[-3.74]	[5.18]	[3.19]	[-1.98]	[2.74]
Panel B: Combination Of Anomalies (Equal-weighted)												
CAPM alpha	**0.817**	**-0.741**	**1.558**	0.069	**0.428**	**-0.359**	**0.469**	-0.077	**0.546**	**1.012**	**-0.905**	**1.917**
	[5.31]	[-3.98]	[10.62]	[0.49]	[2.19]	[-2.30]	[4.00]	[-0.49]	[7.75]	[7.55]	[-6.42]	[7.14]
Fama Frech 3-factor alpha	**0.45**	**-1.091**	**1.541**	**-0.196**	0.008	-0.204	**0.162**	**-0.453**	**0.615**	**0.926**	**-0.82**	**1.745**
	[4.15]	[-7.66]	[10.76]	[-1.97]	[0.05]	[-1.26]	[2.24]	[-3.91]	[8.65]	[6.79]	[-5.87]	[6.48]
Cahart 4-factor alpha	**0.533**	**-0.752**	**1.285**	-0.114	0.202	-0.316	**0.227**	-0.195	**0.423**	**0.862**	**-0.739**	**1.6**
	[4.67]	[-5.22]	[8.47]	[-1.07]	[1.17]	[-1.81]	[3.05]	[-1.72]	[6.49]	[5.78]	[-4.73]	[5.36]
Liquidity 4-factor alpha	**0.472**	**-1.043**	**1.515**	-0.169	0.014	-0.183	**0.185**	**-0.434**	**0.619**	**0.896**	**-0.802**	**1.698**
	[4.37]	[-7.33]	[10.33]	[-1.67]	[0.09]	[-1.18]	[2.60]	[-3.96]	[9.21]	[6.49]	[-5.74]	[6.28]
5-factor alpha	**0.553**	**-0.709**	**1.262**	-0.088	0.205	-0.294	**0.249**	-0.179	**0.429**	**0.834**	**-0.722**	**1.556**
	[4.87]	[-4.83]	[8.09]	[-0.82]	[1.26]	[-1.74]	[3.41]	[-1.66]	[6.81]	[5.56]	[-4.63]	[5.21]

Table 6B: robustness checks: sentiment conditioned strategies, abnormal returns

This table reports calendar time portfolio abnormal returns. At the beginning of each calendar month, stocks are double sorted on the basis of each of the eleven anomaly measure and my second individual stock sentiment measure: 3 year FL Flow into 5x5 value weighted or equal weighted portfolios. All stocks are value (equal) weighted within a given portfolio, and the portfolios are rebalanced every calendar month to maintain value (equal) weights in Panel A (B). The combination of anomalies portfolio is constructed by equally weighing over the eleven anomalies for each of the 25 value weighted or equal weighted portfolios. This table includes all NYSE/AMEX/Nasdaq stocks with non-missing sentiment and anomaly variable information at portfolio formation. Alpha is the intercept on a regression of monthly excess return from the rolling strategy. The explanatory variables are the monthly returns from Fama and French (1993) mimicking portfolios, the Cahart (1997) momentum factor and the Pastor and Stambaugh (2003) liquidity factor. Two strategies are created using the 5x5 value weighted or equal weighted portfolios: the sentiment enhanced anomaly strategy and the sentiment impaired anomaly strategy. The details of the construction of these strategies are in Section five of the main text. L/S is the alpha of a zero-cost portfolio that longs the long leg and shorts the short leg of each strategy. Differences in the returns to the three long short strategies are reported in the last 3 columns. All strategies start in April 1983 except price momentum, which starts in July 1983. All strategies end in September 2010. Returns and alphas are in monthly percent, t-statistics are shown below the coefficient estimates and are based on the heteroskedasticity-consistent standard errors of White (1980). 5% statistical significance is indicated in bold.

Sentiment Measure:Three Year FL Flow

	Sentiment Enhanced Anomaly Strategy			Sentiment Impaired Anomaly Strategy			Simple Anomaly Strategy					
Risk Adjustments	Long Leg	Short Leg	L/S (1)	Long Leg	Short Leg	L/S (2)	Q1	Q5	L/S (3)	(1)-(3)	(2)-(3)	(1)-(2)
Panel A: Combination Of Anomalies (Value-weighted)												
CAPM alpha	**0.313**	**-0.896**	**1.209**	-0.119	-0.141	0.022	**0.158**	**-0.464**	**0.623**	**0.586**	**-0.601**	**1.187**
	[2.93]	[-4.91]	[4.91]	[-1.05]	[-1.07]	[0.13]	[4.30]	[-4.96]	[5.55]	[3.25]	[-3.11]	[3.32]
Cahart 4-factor alpha	**0.213**	**-0.525**	**0.737**	-0.014	-0.098	0.083	**0.128**	**-0.281**	**0.409**	0.328	-0.326	**0.654**
	[2.04]	[-4.22]	[3.79]	[-0.16]	[-0.84]	[0.52]	[3.93]	[-4.58]	[5.66]	[1.94]	[-1.91]	[2.04]
Liquidity 4-factor alpha	**0.403**	**-0.795**	**1.198**	-0.054	-0.133	0.079	**0.192**	**-0.438**	**0.63**	**0.568**	**-0.551**	**1.119**
	[3.76]	[-5.41]	[5.41]	[-0.60]	[-1.11]	[0.49]	[5.31]	[-5.46]	[6.28]	[3.36]	[-3.12]	[3.42]
5-factor alpha	**0.292**	**-0.531**	**0.823**	-0.034	-0.019	-0.014	**0.138**	**-0.262**	**0.4**	**0.423**	**-0.414**	**0.837**
	[2.88]	[-4.26]	[4.26]	[-0.36]	[-0.17]	[-0.09]	[4.22]	[-4.28]	[5.48]	[2.57]	[-2.44]	[2.68]
Panel B: Combination Of Anomalies (Equal-weighted)												
CAPM alpha	**0.457**	**-0.761**	**1.218**	0.103	-0.165	**0.268**	**0.337**	**-0.455**	**0.792**	**0.426**	**-0.524**	**0.95**
	[3.19]	[-3.28]	[5.69]	[0.66]	[-0.87]	[2.02]	[2.35]	[-2.02]	[6.69]	[3.20]	[-3.06]	[3.23]
Fama French 3-factor alpha	**0.345**	**-0.725**	**1.07**	**0.124**	**-0.306**	**0.43**	**0.303**	**-0.452**	**0.755**	**0.315**	**-0.325**	**0.64**
	[3.88]	[-3.98]	[5.34]	[1.34]	[-2.42]	[3.52]	[3.91]	[-2.58]	[6.43]	[2.53]	[-2.09]	[2.38]
Cahart 4-factor alpha	**0.372**	**-0.329**	**0.701**	**0.243**	-0.066	**0.309**	**0.392**	-0.103	**0.495**	0.206	-0.186	0.392
	[4.22]	[-2.18]	[4.00]	[2.71]	[-0.61]	[2.50]	[4.66]	[-0.59]	[4.62]	[1.72]	[-1.09]	[1.47]
Liquidity 4-factor alpha	**0.408**	**-0.722**	**1.13**	0.129	-0.246	**0.376**	**0.322**	**-0.446**	**0.768**	**0.363**	**-0.392**	**0.755**
	[4.61]	[-4.26]	[6.07]	[1.49]	[-1.93]	[3.03]	[4.37]	[-2.78]	[7.15]	[2.96]	[-2.74]	[2.97]
5-factor alpha	**0.434**	**-0.333**	**0.767**	**0.246**	-0.012	**0.258**	**0.408**	-0.104	**0.512**	**0.255**	-0.254	**0.508**
	[5.00]	[-2.31]	[4.58]	[2.85]	[-0.11]	[2.14]	[5.05]	[-0.63]	[5.07]	[2.15]	[-1.62]	[2.00]

returns are used instead of value weighted returns. Overall, when equal weights are used in forming the double sorted portfolios, the results become more dramatic when 12 month Average Turnover is used as a measure of sentiment. On the other hand, it remains similar in magnitude when 3 year FL Flow is used as a measure of sentiment. For example, using 12 month Average Turnover as a measure of individual stock investor sentiment, the 3-factor alpha of the sentiment-enhanced anomaly strategy increases from 0.96% per month to 1.541% per month. In addition, the sentiment-impaired anomaly strategy decreases from 0.138% to -0.204% per month. On the other hand, using 3 year FL Flow as a measure of individual stock investor sentiment, the 3-factor alpha of the sentiment-enhanced anomaly strategy stays roughly the same while the 3-factor alpha of the sentiment-impaired anomaly strategy actually increases. Overall, the results in Table 4A and Table 4B are also robust to adjusting risks using alternative factor models and using equal weights instead of value weights in forming the 25 portfolios.

7 Relationship of sentiment, issuance, and anomaly returns

In this section I describe the second hypothesis which links issuance activities of managers with individual stock investor sentiment and anomaly returns. There is a long literature which shows that firms tend to issue equity when the cost of equity is high, and repurchase equity when the cost of equity is low. I conjecture that the firm, being rational and informed, will issue or repurchase shares to take advantage of the abnormal returns of anomalies.

HYPOTHESIS 2 (FIRM AS ARBITRAGEUR HYPOTHESIS):

If the abnormal returns to the broad set of anomalies represent mispricings, a natural candidate to take advantage of these mispricings is the firm. If a firm is in the short leg of an anomaly, then the firm should respond by engaging in activities which trade equity ownership for cash or services (e.g. issuance of shares, stock acquisitions). This opportunistically takes advantage of the low cost of equity afforded by sentiment-induced demand. On the other hand, if a firm is in the long leg of anomalies, then the firm should respond by engaging in activities which trade cash for equity ownership (e.g. repurchase of shares). In addition, at least since Miller and Rock (1985), paying cash dividends can be viewed as a way for firm managers to signal to market participants that the equity is underpriced. Hence, if a firm is in the long leg of anomalies, then the firm should also be more likely to generally engage in activities which pay cash for equity ownership (e.g. cash dividends). Given the asset pricing results, we should expect the sentiment-enhanced strategy to have a larger issuance spread than a simple anomaly strategy. Similarly, we should expect the sentiment-impaired strategy to have a smaller issuance spread than a simple anomaly strategy.

I use a monthly version of the composite issuance measure of Daniel and Titman (2006) to investigate the relationship of sentiment, issuance, and anomalies. In particular,

$$\text{modified composite issuance}_{t,t-1} = exp(log(MV_t/MV_{t-1}) - log(1 + R_{t,t-1})) - 1 \quad (6)$$

I then define the monthly value weighted composite issuance of a portfolio by weighing the individual monthly composite issuance by its market capitalization at the beginning of the month. This is a natural measure to use to test the implications

of Hypothesis 2. In particular, hypothesis 2 implies that firms in the long leg of each anomaly would have low modified composite issuance, while firms in the short leg of each anomaly would have high modified composite issuance. In addition, hypothesis 2 implies that the sentiment-enhanced anomaly long-short strategy should yield significantly higher spread in composite issuance than a simple anomaly long-short strategy. In contrast, Hypothesis 2 also implies that the sentiment-impaired anomaly long-short strategy should yield significantly lower spread in composite issuance than a simple anomaly long-short strategy.

Table 7 reports the relationship of financial market anomalies with monthly value weighted composite issuance. Previous literature has established that firms tend to issue shares when the cost of equity is high as measured by the market-to-book ratio. I control for this in a manner similar to the method Daniel, Grinblatt, Titman, Wermers (1997) use in controlling for firm characteristics in portfolio returns. In particular, every month I assign each stock to one of the size quintile portfolios based on NYSE breakpoints. Within each size quintile, I rank stocks in ascending order based on market-to-book ratio. I then assign stocks to one of five market-to-book quintiles based on the ranking. I then calculate the monthly value weighted composite issuance for each of the 25 portfolios. I then correct for size and market-to-book effects by subtracting from the monthly value weighted composite issuance of each stock to the benchmark portfolio which matches the size and market to book ratio quintiles of the stock. This benchmark adjusted value weighted composite issuance is reported in Panel B while the raw measure is reported in Panel A.

Looking at Panel A, we see that firms in the long leg of each anomaly tend to engage in activities which pay cash out of the firm, while firms in the short leg of each anomaly tend to engage in activities which trade ownership of the firm for cash or services. On average, firms in the long leg of each anomaly pay out 0.106% per month

Table 7: Financial market anomalies and composite issuance

This table shows calendar time portfolio modified composite issuance. At the beginning of every calendar month, stocks are ranked and assigned to one of five quintile portfolios in a manner determined by previous studies and described in Section 2 and Section 3 of the main text. Daniel and Titman (2006) composite issuance is modified to a monthly measure analogous to monthly returns as follows: .

$$modified\ composite\ issuance_{t,t-1} = \exp\left(\log\left(\frac{MV_t}{MV_{t-1}}\right) - \log(1 + R_{t,t-1})\right) - 1$$

All stocks are value weighted within a given portfolio, and the portfolios are rebalanced every calendar month to maintain value weights. In Panel B, modified composite issuance of each stock is adjusted by subtracting the value weighted modified composite issuance of a portfolio in the same size-market to book portfolio. This table includes all NYSE/AMEX/Nasdaq stocks with non-missing anomaly variable information at portfolio formation. Modified composite issuance is in monthly percent, t-statistics are shown below the coefficient estimates and are based on the heteroskedasticity-consistent standard errors of White (1980). 5% statistical significance is indicated in bold.

	Long Leg				Short Leg	Long Leg minus Short Leg
Financial Market Anomaly	A1	A2	A3	A4	A5	L/S
Panel A: Raw value weighted composite issuance						
Accrual	**-0.069**	**-0.151**	**-0.159**	**-0.089**	**0.092**	**-0.161**
	[-3.51]	[-7.12]	[-7.66]	[-4.91]	[3.05]	[-5.59]
Asset Growth	**-0.19**	**-0.224**	**-0.17**	**-0.051**	**0.202**	**-0.392**
	[-7.44]	[-13.57]	[-8.41]	[-2.77]	[7.05]	[-12.33]
Composite Equity Issues	**-0.434**	**-0.28**	**-0.085**	**0.065**	**0.157**	**-0.591**
	[-29.86]	[-17.32]	[-5.64]	[3.65]	[5.74]	[-22.44]
Failure Probability	**-0.152**	**-0.114**	-0.012	0.021	**0.501**	**-0.653**
	[-8.19]	[-5.69]	[-0.46]	[0.37]	[9.67]	[-12.95]
Gross Profitability	**-0.112**	**-0.144**	**-0.164**	**-0.141**	**0.042**	**-0.154**
	[-7.36]	[-9.58]	[-8.39]	[-5.57]	[1.38]	[-5.36]
Investment To Assets Growth	**-0.166**	**-0.123**	**-0.193**	**-0.107**	**0.125**	**-0.29**
	[-8.87]	[-6.25]	[-11.68]	[-4.76]	[4.95]	[-12.45]
Momentum (12/1/3)	-0.036	**-0.183**	**-0.21**	**-0.224**	-0.035	-0.001
	[-1.55]	[-11.74]	[-14.20]	[-10.90]	[-1.03]	[-0.03]
Net Equity Issues	**-0.27**	**-0.19**	**-0.069**	**0.071**	**0.301**	**-0.571**
	[-20.38]	[-11.17]	[-3.90]	[2.19]	[6.80]	[-13.67]
Net Operating Assets	-0.006	**-0.166**	**-0.158**	**-0.121**	**0.161**	**-0.167**
	[-0.25]	[-7.61]	[-8.91]	[-4.56]	[5.00]	[-5.24]
Ohlson s O-Score	**-0.104**	**-0.16**	**-0.115**	**0.106**	**0.483**	**-0.587**
	[-5.68]	[-4.77]	[-4.59]	[3.06]	[10.38]	[-13.13]
Return On Assets	**-0.072**	**-0.134**	**-0.108**	0.023	**0.324**	**-0.396**
	[-4.14]	[-6.63]	[-4.03]	[0.48]	[6.40]	[-7.93]
Combination Of Anomalies	**-0.106**	**-0.139**	**-0.105**	-0.007	**0.285**	**-0.391**
	[-6.89]	[-8.93]	[-6.52]	[-0.27]	[10.05]	[-17.82]

Financial Market Anomaly	Long Leg A1	A2	A3	A4	Short Leg A5	Long Leg minus Short Leg L/S
Panel B: Size and market to book adjusted value weighted composite issuance						
Accrual	0.029	-0.013	**-0.032**	0.007	**0.122**	**-0.093**
	[1.95]	[-1.09]	[-2.75]	[0.50]	[5.48]	[-3.29]
Asset Growth	**-0.109**	**-0.076**	**-0.032**	**0.047**	**0.227**	**-0.336**
	[-5.15]	[-5.49]	[-3.00]	[3.43]	[12.93]	[-11.20]
Composite Equity Issues	**-0.195**	**-0.08**	**0.049**	**0.171**	**0.249**	**-0.444**
	[-17.41]	[-7.47]	[4.74]	[14.14]	[13.83]	[-18.87]
Failure Probability	**-0.053**	-0.007	**0.083**	0.055	**0.329**	**-0.382**
	[-5.40]	[-0.49]	[4.60]	[1.55]	[8.15]	[-8.97]
Gross Profitability	**-0.053**	**-0.057**	-0.022	0.024	**0.148**	**-0.201**
	[-5.61]	[-3.45]	[-1.52]	[1.68]	[7.74]	[-8.65]
Investment To Assets Growth	**-0.051**	-0.011	**-0.047**	0.006	**0.164**	**-0.215**
	[-3.50]	[-0.77]	[-5.08]	[0.48]	[9.80]	[-8.95]
Momentum (12/1/3)	**0.093**	-0.001	-0.017	**-0.039**	0.061	0.032
	[6.19]	[-0.07]	[-1.63]	[-2.96]	[1.76]	[0.82]
Net Equity Issues	**-0.124**	**-0.066**	**0.029**	**0.149**	**0.325**	**-0.449**
	[-11.16]	[-4.66]	[2.21]	[8.17]	[10.37]	[-11.76]
Net Operating Assets	**0.054**	**-0.066**	**-0.034**	-0.007	**0.204**	**-0.151**
	[2.79]	[-4.20]	[-3.36]	[-0.46]	[9.68]	[-4.99]
Ohlson s O-Score	**-0.026**	-0.039	-0.007	**0.144**	**0.353**	**-0.379**
	[-3.05]	[-1.87]	[-0.36]	[4.89]	[9.68]	[-9.95]
Return On Assets	**-0.022**	-0.02	0.023	**0.108**	**0.2**	**-0.222**
	[-2.44]	[-1.44]	[1.24]	[3.65]	[5.17]	[-5.37]
Combination Of Anomalies	**-0.037**	**-0.034**	-0.004	**0.066**	**0.247**	**-0.284**
	[-6.03]	[-7.06]	[-0.85]	[7.11]	[14.88]	[-15.50]

while firms in the short leg of each anomaly issues 0.285% per month in stocks. The average issuance spread of 0.391% between the long leg and short leg of each anomaly is economically and statistically significant. This is consistent with our hypothesis that the broad set of anomalies represent mispricings, and the firm takes advantage of them by issuing stocks, repurchasing stocks, or paying dividends. As seen in Panel B, correcting for size and market-to-book effects do not change the results.

Table 8 reports the relationship of individual stock investor sentiment with monthly value weighted composite issuance. Looking at Panel A, the first row reports result using 12 month average turnover as a measure of sentiment. We see that low sentiment stocks tend to engage in activities which pay cash out of the firm, while high sentiment stocks tend to engage in activities which trade ownership of the firm for cash or services. This result is robust across the earlier period of 1927-1959 and the later period of 1960-2011. The forth row, which reports result using 3 year FL Flow, is similar. In aggregate, the difference in composite issuance between the high sentiment portfolio and the low sentiment portfolio ranges from 0.213% per month to 0.453% per month and are all statistically significant.

Looking at Panel B, size and market-to-book adjusted result is fairly robust when 12 month average turnover is used as a measure of sentiment in the overall period and also in each of the sub-period. However, the difference in composite issuance between low sentiment stocks and high sentiment stocks disappears when 3 year FL Flow is used as a measure of sentiment. Although issuance activity slowly turns negative as we move from the highest sentiment portfolio to the second lowest sentiment portfolio, the lowest sentiment portfolio appears to buck this trend after benchmark adjustments. These results largely support the idea that on average, high sentiment stocks engage in more activities which trade equity ownership for cash or services than low sentiment stocks.

Table 8: Individual stock sentiment and composite issuance

This table shows calendar time portfolio modified composite issuance. At the beginning of every calendar month, stocks are ranked in ascending order on the basis of the level of individual stock investor sentiment, as measured by 12 month average turnover and three year FL Flow, in the previous month. The ranked stocks are assigned to one of five quintile portfolios. Daniel and Titman (2006) composite issuance is modified to a monthly measure analogous to monthly returns as follows: .

$$modified\ composite\ issuance_{t,t-1} = \exp\left(\log\left(\frac{MV_t}{MV_{t-1}}\right) - \log(1 + R_{t,t-1})\right) - 1$$

All stocks are value weighted within a given portfolio, and the portfolios are rebalanced every calendar month to maintain value weights. In Panel B, modified composite issuance of each stock is adjusted by subtracting the value weighted modified composite issuance of a portfolio in the same size-market to book portfolio. This table includes all NYSE/AMEX/Nasdaq stocks with non-missing sentiment information at portfolio formation, but Nasdaq stocks are excluded when 12 month average turnover is used as a measure of sentiment. When the 12 month average turnover is used as a measure of sentiment, the sample starts from 1927 and ends in December 2011. When the three year FL Flow is used as a measure of sentiment, the sample starts in April 1983 and ends in September 2010. Modified composite issuance is in monthly percent, t-statistics are shown below the coefficient estimates and are based on the heteroskedasticity-consistent standard errors of White (1980). 5% statistical significance is indicated in bold.

Sentiment Measure	Low Sentiment S1	S2	S3	S4	High sentiment S5	High sentiment minus Low sentiment
Panel A: Raw value weighted composite issuance						
12 month average turnover	**-0.249**	**-0.268**	**-0.213**	**-0.125**	**0.147**	**-0.396**
	[-13.47]	[-13.39]	[-12.20]	[-6.19]	[3.45]	[-9.29]
Turnover (1927-1959)	**-0.334**	**-0.289**	**-0.327**	**-0.232**	**-0.028**	**-0.307**
	[-9.50]	[-9.06]	[-11.58]	[-6.29]	[-0.32]	[-3.52]
Turnover (1960-2011)	**-0.196**	**-0.255**	**-0.142**	**-0.058**	**0.257**	**-0.453**
	[-9.69]	[-9.91]	[-6.50]	[-2.51]	[5.91]	[-10.65]
3 year FL Flow	0.011	**-0.128**	**-0.087**	0.048	**0.225**	**-0.213**
	[0.36]	[-5.11]	[-2.76]	[1.67]	[7.22]	[-5.45]

Sentiment Measure	Low Sentiment S1	S2	S3	S4	High sentiment S5	High sentiment minus Low sentiment
Panel B: Size and market to book adjusted value weighted composite issuance						
12 month average turnover	**-0.075**	**-0.06**	-0.02	**0.041**	**0.271**	**-0.347**
	[-5.01]	[-5.73]	[-1.75]	[3.07]	[9.24]	[-9.73]
Turnover (1927-1959)	-0.016	-0.009	**-0.044**	0.03	**0.236**	**-0.252**
	[-0.66]	[-0.55]	[-2.34]	[1.18]	[4.30]	[-3.99]
Turnover (1960-2011)	**-0.113**	**-0.092**	-0.004	**0.048**	**0.294**	**-0.406**
	[-5.90]	[-6.97]	[-0.29]	[3.28]	[8.87]	[-9.65]
3 year FL Flow	**0.07**	-0.041	-0.038	0.026	**0.089**	-0.019
	[3.98]	[-1.87]	[-1.36]	[1.23]	[4.63]	[-0.68]

Table 9A and Table 9B report the monthly value weighted composite issuance of the sentiment-enhanced strategy, the sentiment-impaired strategy, and the corresponding simple anomaly strategy when 12 month average turnover and 3 year FL Flow are used as measures of individual stock investor sentiment respectively. This is analogous to the results in Table 4A and 4B, only that monthly value weighted composite issuance is reported instead of the value weighted monthly returns.

I first look at the results for the equal weighted combination of anomalies when 12 month average turnover (3 year FL Flow) is used as a measure of individual stock investor sentiment. First note that the long leg of the simple anomaly strategy pay out 0.164% (0.095%) per month [t-statistics=9.86 (5.96)]. The short leg of the simple anomaly strategy, on the other hand, on net issues 0.117% (0.307%) per month [t-statistics=4.73 (9.85)]. The difference of 0.281% (0.402%) per month is statistically significant [t-statistics=12.85 (14.83)] and translates to roughly 3.42% (4.93%) per annum. Looking at Panel B, correcting for size and market to book does not alter this result. In particular, the adjusted spread in composite issuance is 0.228% (0.298%) per month and retains its statistical significance [t-statistics=12.37 (13.18)]. This is consistent with hypothesis 2, which implies that managers understand financial market anomalies and opportunistically trade equity for cash or services and vice versa depending on the direction of the mispricing.

Now I turn to the sentiment-enhanced strategy. The long leg of the sentiment-enhanced strategy, which represents the low sentiment conditioned long leg of the anomalies, pays out 0.167% (0.018%) of the firm value per month [t-statistics=2.96 (0.69)]. On the other hand, the short leg of the strategy, which represents the high sentiment conditioned short leg of the anomalies, issues 0.465% (0.517%) per month [t-statistics=10.94 (12.01)]. The difference of 0.632% (0.535%) [t-statistics=8.99 (12.19)] is significantly higher than the difference of 0.281% (0.402%) for the simple anomaly

Table 9A: Individual stock sentiment, financial market anomalies, and composite issuance

This table shows calendar time portfolio modified composite issuance. At the beginning of each calendar month, stocks are independently double sorted on the basis of each of the eleven anomaly measure and my first individual stock investor sentiment measure: 12 month average turnover into 5x5 value weighted portfolios. Daniel and Titman (2006) composite issuance is modified to a monthly measure analogous to monthly returns as follows:

$$modified\ composite\ issuance_{t,t-1} = \exp\left(\log\left(\frac{MV_t}{MV_{t-1}}\right) - \log\left(1 + R_{t,t-1}\right)\right) - 1$$

All stocks are value weighted within a given portfolio, and the portfolios are rebalanced every calendar month to maintain value weights. In Panel B, modified composite issuance of each stock is adjusted by subtracting the value weighted modified composite issuance of a portfolio in the same size-market to book portfolio. This table includes all NYSE/AMEX stocks with non-missing sentiment and anomaly variable information at portfolio formation. Two strategies are created using the 5x5 value weighted portfolios: the sentiment enhanced anomaly strategy and the sentiment impaired anomaly strategy. The details of the construction of these strategies are in Section five of the main text. L/S is the modified composite issuance of a zero-cost portfolio that longs the long leg and shorts the short leg of each strategy. Differences in the modified composite issuance to the three long short strategies are reported in the last 3 columns. Start date of each strategy is the same as in Table2 while end date is December 2011. Modified composite issuance is in monthly percent, t-statistics are shown below the coefficient estimates and are based on the heteroskedasticity-consistent standard errors of White (1980). 5% statistical significance is indicated in bold.

Sentiment Measure: 12 Month Average Turnover

	Sentiment Enhanced Anomaly Strategy			Sentiment Impaired Anomaly Strategy			Simple Anomaly Strategy					
Anomaly	Long Leg	Short Leg	L/S (1)	Long Leg	Short Leg	L/S (2)	A1	A5	L/S (3)	(1)-(3)	(2)-(3)	(1)-(2)
Panel A: Raw value weighted composite issuance												
Accrual	0.055	**0.404**	-0.349	**0.275**	**-0.114**	**0.39**	**-0.075**	**0.078**	**-0.153**	-0.196	**0.542**	**-0.738**
	[0.27]	[6.17]	[-1.66]	[4.80]	[-4.52]	[6.83]	[-2.71]	[2.27]	[-3.99]	[-0.95]	[8.00]	[-3.27]
Asset Growth	-0.079	**0.478**	**-0.557**	**0.124**	-0.023	**0.147**	**-0.233**	**0.129**	**-0.362**	-0.194	**0.509**	**-0.704**
	[-0.50]	[7.36]	[-3.24]	[2.88]	[-0.92]	[3.30]	[-7.54]	[3.95]	[-9.10]	[-1.18]	[8.48]	[-3.87]
Composite Equity Issues	**-0.433**	**0.465**	**-0.898**	**-0.2**	-0.002	**-0.199**	**-0.418**	**0.173**	**-0.591**	**-0.307**	**0.392**	**-0.699**
	[-19.50]	[7.14]	[-13.58]	[-4.08]	[-0.04]	[-3.67]	[-23.87]	[5.10]	[-18.24]	[-5.82]	[6.14]	[-7.54]
Failure Probability	**-0.29**	**0.437**	**-0.727**	**0.095**	**0.15**	-0.055	**-0.178**	**0.168**	**-0.345**	**-0.382**	**0.29**	**-0.671**
	[-11.62]	[7.45]	[-11.77]	[2.66]	[2.78]	[-0.87]	[-8.11]	[4.31]	[-7.92]	[-7.45]	[4.26]	[-7.32]
Gross Profitability	**-0.204**	**0.434**	**-0.637**	**0.108**	-0.04	0.148	**-0.138**	-0.012	**-0.126**	**-0.512**	**0.274**	**-0.785**
	[-10.16]	[5.74]	[-8.57]	[2.88]	[-0.57]	[1.89]	[-8.27]	[-0.46]	[-4.49]	[-7.68]	[3.48]	[-6.77]
Investment To Assets Growth	**-0.228**	**0.443**	**-0.671**	0.099	**-0.066**	**0.164**	**-0.183**	**0.077**	**-0.259**	**-0.412**	**0.423**	**-0.835**
	[-7.32]	[7.01]	[-10.16]	[1.91]	[-2.05]	[2.99]	[-7.76]	[2.63]	[-8.54]	[-6.50]	[7.33]	[-8.92]
Momentum (12/1/3)	-0.042	**0.216**	**-0.258**	**0.32**	0.572	-0.252	0.033	-0.035	0.068	**-0.326**	-0.32	-0.006
	[-1.41]	[3.64]	[-4.04]	[6.72]	[0.93]	[-0.41]	[1.17]	[-0.89]	[1.51]	[-5.34]	[-0.52]	[-0.01]
Net Equity Issues	**-0.321**	**0.69**	**-1.011**	-0.003	**0.099**	-0.101	**-0.291**	**0.211**	**-0.503**	**-0.508**	**0.401**	**-0.91**
	[-17.09]	[7.70]	[-11.29]	[-0.06]	[2.03]	[-1.80]	[-18.68]	[3.76]	[-9.28]	[-7.40]	[5.18]	[-8.21]
Net Operating Assets	-0.072	**0.591**	**-0.662**	**0.34**	-0.029	**0.368**	**-0.078**	**0.066**	**-0.144**	**-0.518**	**0.513**	**-1.031**
	[-0.69]	[6.98]	[-4.94]	[4.76]	[-0.85]	[5.07]	[-3.07]	[2.05]	[-4.32]	[-4.24]	[6.64]	[-6.30]
Ohlson s O-Score	**-0.262**	**1.023**	**-1.284**	**0.098**	**0.113**	-0.015	**-0.172**	**0.384**	**-0.556**	**-0.729**	**0.541**	**-1.269**
	[-15.25]	[5.64]	[-7.03]	[2.88]	[2.74]	[-0.29]	[-9.71]	[7.50]	[-10.53]	[-4.96]	[8.22]	[-6.75]
Return On Assets	**-0.245**	**0.269**	**-0.514**	**0.22**	0.293	-0.072	**-0.113**	-0.039	-0.075	**-0.44**	0.002	-0.442
	[-11.59]	[4.32]	[-7.97]	[5.04]	[0.80]	[-0.20]	[-5.32]	[-1.05]	[-1.81]	[-8.66]	[0.01]	[-1.18]
Combination Of Anomalies	**-0.167**	**0.465**	**-0.632**	**0.097**	0.128	-0.031	**-0.164**	**0.117**	**-0.281**	**-0.351**	**0.25**	**-0.601**
	[-2.96]	[10.94]	[-8.99]	[3.47]	[1.15]	[-0.27]	[-9.86]	[4.73]	[-12.85]	[-5.29]	[2.14]	[-3.41]

	Sentiment Enhanced Anomaly Strategy			Sentiment Impaired Anomaly Strategy			Simple Anomaly Strategy					
Anomaly	Long Leg	Short Leg	L/S (1)	Long Leg	Short Leg	L/S (2)	A1	A5	L/S (3)	(1)-(3)	(2)-(3)	(1)-(2)
Panel B: Size and market to book adjusted value weighted composite issuance												
Accrual	0.12	**0.391**	-0.271	**0.31**	**-0.15**	**0.46**	0.038	**0.144**	**-0.105**	-0.165	**0.565**	**-0.731**
	[0.57]	[7.02]	[-1.24]	[6.72]	[-6.14]	[7.89]	[1.70]	[5.96]	[-2.89]	[-0.77]	[8.51]	[-3.15]
Asset Growth	-0.084	**0.476**	**-0.56**	**0.168**	-0.012	**0.18**	**-0.118**	**0.197**	**-0.315**	-0.245	**0.494**	**-0.74**
	[-0.50]	[8.55]	[-3.11]	[4.12]	[-0.45]	[3.72]	[-4.76]	[8.22]	[-8.39]	[-1.40]	[8.23]	[-3.87]
Composite Equity Issues	**-0.277**	**0.52**	**-0.796**	-0.07	0.026	-0.095	**-0.202**	**0.298**	**-0.5**	**-0.296**	**0.405**	**-0.701**
	[-10.94]	[11.27]	[-14.51]	[-1.11]	[0.60]	[-1.27]	[-12.22]	[10.84]	[-14.50]	[-6.24]	[4.81]	[-6.87]
Failure Probability	**-0.216**	**0.41**	**-0.626**	**0.163**	-0.066	**0.23**	**-0.057**	**0.156**	**-0.213**	**-0.414**	**0.442**	**-0.856**
	[-8.26]	[7.40]	[-10.20]	[5.27]	[-1.22]	[3.59]	[-4.12]	[4.33]	[-5.38]	[-8.10]	[6.60]	[-9.28]
Gross Profitability	**-0.278**	**0.531**	**-0.809**	**0.077**	0.06	0.017	**-0.081**	**0.152**	**-0.233**	**-0.576**	**0.25**	**-0.826**
	[-11.19]	[7.77]	[-10.53]	[2.40]	[0.78]	[0.20]	[-7.22]	[7.21]	[-8.96]	[-8.29]	[2.89]	[-6.77]
Investment To Assets Growth	**-0.221**	**0.446**	**-0.667**	**0.166**	**-0.065**	**0.231**	**-0.056**	**0.142**	**-0.198**	**-0.47**	**0.428**	**-0.898**
	[-6.47]	[8.70]	[-10.59]	[3.69]	[-1.99]	[4.17]	[-2.87]	[6.51]	[-6.29]	[-7.52]	[7.47]	[-9.84]
Momentum (12/1/3)	**-0.083**	**0.208**	**-0.291**	**0.329**	0.63	-0.302	**0.092**	0.026	0.066	**-0.357**	-0.368	0.011
	[-3.21]	[4.82]	[-5.61]	[9.02]	[0.87]	[-0.41]	[5.30]	[0.83]	[1.69]	[-8.44]	[-0.51]	[0.01]
Net Equity Issues	**-0.222**	**0.712**	**-0.935**	0.027	**0.13**	-0.103	**-0.142**	**0.315**	**-0.457**	**-0.477**	**0.354**	**-0.831**
	[-10.27]	[8.81]	[-10.40]	[0.68]	[2.88]	[-1.79]	[-10.04]	[7.58]	[-8.89]	[-7.28]	[4.64]	[-7.71]
Net Operating Assets	-0.034	**0.579**	**-0.613**	**0.367**	0.003	**0.364**	0.025	**0.157**	**-0.132**	**-0.48**	**0.496**	**-0.977**
	[-0.33]	[8.36]	[-4.76]	[5.85]	[0.11]	[5.24]	[1.33]	[7.00]	[-4.28]	[-4.03]	[6.90]	[-6.34]
Ohlson s O-Score	**-0.202**	**0.935**	**-1.136**	**0.156**	-0.072	**0.228**	**-0.059**	**0.31**	**-0.369**	**-0.768**	**0.596**	**-1.364**
	[-10.13]	[5.29]	[-6.32]	[5.33]	[-1.80]	[4.62]	[-6.14]	[6.82]	[-7.85]	[-5.27]	[9.19]	[-7.33]
Return On Assets	**-0.268**	**0.316**	**-0.584**	**0.231**	0.199	0.032	**-0.028**	0.045	-0.073	**-0.51**	0.105	-0.615
	[-11.16]	[5.35]	[-9.10]	[6.13]	[0.55]	[0.09]	[-2.21]	[1.26]	[-1.87]	[-9.94]	[0.29]	[-1.67]
Combination Of Anomalies	**-0.164**	**0.471**	**-0.635**	**0.147**	0.075	0.072	**-0.053**	**0.175**	**-0.228**	**-0.407**	**0.3**	**-0.707**
	[-2.94]	[12.98]	[-9.07]	[6.75]	[0.64]	[0.60]	[-6.39]	[10.92]	[-12.37]	[-6.22]	[2.43]	[-3.87]

Table 9B: Individual stock sentiment, financial market anomalies, and composite issuance

This table reports calendar time portfolio modified composite issuance. At the beginning of each calendar month, stocks are independently double sorted on the basis of each of the eleven anomaly measure and my second individual stock investor sentiment measure: Three Year FL Flow into 5x5 value weighted portfolios. Daniel and Titman (2006) composite issuance is modified to a monthly measure analogous to *monthly returns as follows:*

$$\textit{modified composite issuance}_{t,t-1} = \exp\left(\log\left(\frac{MV_t}{MV_{t-1}}\right) - \log(1 + R_{t,t-1})\right) - 1$$

All stocks are value weighted within a given portfolio, and the portfolios are rebalanced every calendar month to maintain value weights. In Panel B, modified composite issuance of each stock is adjusted by subtracting the value weighted modified composite issuance of a portfolio in the same size-market to book portfolio. This table includes all NYSE/AMEX/Nasdaq stocks with non-missing sentiment and anomaly variable information at portfolio formation. Two strategies are created using the 5x5 value weighted portfolios: the sentiment enhanced anomaly strategy and the sentiment impaired anomaly strategy. The details of the construction of these strategies are in Section five of the main text. L/S is the modified composite issuance of a zero-cost portfolio that longs the long leg and shorts the short leg of each strategy. Differences in the modified composite issuance to the three long short strategies are reported in the last 3 columns. All strategies start in April 1983 except price momentum, which starts in July 1983. All strategies end in September 2010. Modified composite issuance is in monthly percent, t-statistics are shown below the coefficient estimates and are based on the heteroskedasticity-consistent standard errors of White (1980). 5% statistical significance is indicated in bold.

Sentiment Measure: Three Year FL Flow

	Sentiment Enhanced Anomaly Strategy			Sentiment Impaired Anomaly Strategy			Simple Anomaly Strategy					
Anomaly	Long Leg	Short Leg	L/S (1)	Long Leg	Short Leg	L/S (2)	Q1	Q5	L/S (3)	(1)-(3)	(2)-(3)	(1)-(2)
Panel A: Raw value weighted composite issuance												
Accrual	0.043	**0.364**	**-0.321**	**0.293**	**0.236**	0.057	0.045	**0.237**	**-0.192**	-0.129	**0.249**	**-0.378**
	[0.91]	[7.90]	[-5.20]	[6.40]	[4.01]	[0.85]	[1.28]	[5.26]	[-3.75]	[-1.92]	[3.63]	[-3.99]
Asset Growth	**-0.125**	**0.557**	**-0.682**	**0.196**	**0.384**	**-0.189**	**-0.15**	**0.34**	**-0.49**	**-0.192**	**0.301**	**-0.493**
	[-2.77]	[10.13]	[-10.12]	[4.46]	[7.62]	[-2.97]	[-3.75]	[9.86]	[-10.13]	[-2.88]	[4.33]	[-5.39]
Composite Equity Issues	**-0.241**	**0.641**	**-0.882**	**-0.18**	**0.424**	**-0.604**	**-0.336**	**0.424**	**-0.759**	**-0.123**	**0.155**	**-0.278**
	[-6.99]	[11.55]	[-13.70]	[-5.91]	[7.47]	[-9.56]	[-15.35]	[9.38]	[-15.85]	[-2.00]	[2.55]	[-3.16]
Failure Probability	-0.024	**0.66**	**-0.684**	**0.12**	**0.438**	-0.318	**-0.129**	**0.473**	**-0.602**	-0.082	**0.285**	-0.366
	[-0.76]	[9.31]	[-9.07]	[3.03]	[2.31]	[-1.68]	[-6.60]	[4.52]	[-5.87]	[-0.73]	[2.14]	[-1.78]
Gross Profitability	-0.02	**0.488**	**-0.508**	**0.106**	**0.302**	**-0.197**	**-0.086**	**0.201**	**-0.287**	**-0.221**	0.09	**-0.312**
	[-0.74]	[6.62]	[-7.05]	[2.79]	[4.18]	[-2.42]	[-4.29]	[4.33]	[-5.88]	[-3.15]	[1.29]	[-2.96]
Investment To Assets Growth	-0.054	**0.458**	**-0.511**	**0.138**	**0.268**	-0.13	**-0.102**	**0.243**	**-0.345**	**-0.167**	**0.214**	**-0.381**
	[-1.17]	[11.65]	[-9.03]	[2.50]	[4.89]	[-1.73]	[-3.48]	[7.31]	[-8.57]	[-2.95]	[2.87]	[-4.13]
Momentum (12/1/3)	**0.317**	**0.259**	0.059	**0.485**	0.047	**0.437**	**0.193**	**0.156**	0.038	0.021	**0.399**	**-0.379**
	[5.65]	[5.07]	[0.78]	[11.13]	[1.20]	[7.60]	[6.24]	[3.03]	[0.63]	[0.30]	[6.17]	[-4.21]
Net Equity Issues	**-0.201**	**0.591**	**-0.793**	-0.029	**0.524**	**-0.552**	**-0.252**	**0.403**	**-0.655**	**-0.137**	0.103	**-0.24**
	[-7.07]	[10.45]	[-12.93]	[-0.60]	[5.73]	[-5.30]	[-12.57]	[8.78]	[-13.31]	[-2.36]	[1.19]	[-2.14]
Net Operating Assets	0.064	**0.492**	**-0.428**	**0.374**	**0.278**	0.096	**0.082**	**0.219**	**-0.136**	**-0.292**	**0.232**	**-0.524**
	[1.28]	[11.25]	[-7.12]	[6.62]	[5.85]	[1.43]	[2.68]	[6.70]	[-3.71]	[-5.83]	[3.49]	[-5.54]
Ohlson s O-Score	0.007	**0.658**	**-0.651**	**0.173**	**0.399**	**-0.227**	**-0.085**	**0.45**	**-0.535**	-0.117	**0.308**	**-0.425**
	[0.19]	[5.26]	[-5.02]	[4.85]	[6.13]	[-3.20]	[-4.57]	[8.58]	[-10.20]	[-1.02]	[4.13]	[-2.88]
Return On Assets	0.027	**0.534**	**-0.507**	**0.238**	**0.375**	-0.136	**-0.041**	**0.374**	**-0.415**	-0.092	**0.278**	**-0.37**
	[0.81]	[5.06]	[-4.86]	[7.51]	[4.31]	[-1.55]	[-2.14]	[7.08]	[-7.96]	[-1.02]	[3.55]	[-2.76]
Combination Of Anomalies	-0.018	**0.517**	**-0.535**	**0.173**	**0.336**	**-0.163**	**-0.095**	**0.307**	**-0.402**	**-0.132**	**0.24**	**-0.372**
	[-0.69]	[12.01]	[-12.19]	[6.16]	[7.24]	[-3.39]	[-5.96]	[9.85]	[-14.83]	[-3.34]	[5.27]	[-5.09]

	Sentiment Enhanced Anomaly Strategy			Sentiment Impaired Anomaly Strategy			Simple Anomaly Strategy					
Anomaly	Long Leg	Short Leg	L/S (1)	Long Leg	Short Leg	L/S (2)	Q1	Q5	L/S (3)	(1)-(3)	(2)-(3)	(1)-(2)
Panel B: Size and market to book adjusted value weighted composite issuance												
Accrual	0.07	**0.148**	-0.078	**0.117**	**0.22**	-0.103	**0.071**	**0.195**	**-0.125**	0.047	0.021	0.026
	[1.70]	[3.74]	[-1.37]	[2.91]	[4.06]	[-1.61]	[2.62]	[5.40]	[-2.56]	[0.74]	[0.33]	[0.30]
Asset Growth	**-0.102**	**0.332**	**-0.434**	0.043	**0.331**	**-0.289**	**-0.131**	**0.283**	**-0.415**	-0.019	0.126	-0.145
	[-2.37]	[7.10]	[-6.94]	[1.13]	[7.38]	[-4.67]	[-3.86]	[10.85]	[-9.07]	[-0.30]	[1.89]	[-1.73]
Composite Equity Issues	**-0.126**	**0.45**	**-0.575**	**-0.221**	**0.408**	**-0.629**	**-0.202**	**0.367**	**-0.568**	-0.007	-0.061	0.054
	[-4.08]	[9.90]	[-10.30]	[-7.19]	[7.89]	[-10.13]	[-10.09]	[10.33]	[-12.73]	[-0.13]	[-1.03]	[0.68]
Failure Probability	0.024	**0.386**	**-0.361**	-0.021	0.286	**-0.307**	**-0.06**	**0.287**	**-0.348**	-0.013	0.041	-0.054
	[0.92]	[6.23]	[-5.17]	[-0.61]	[1.88]	[-1.98]	[-5.01]	[4.11]	[-4.66]	[-0.15]	[0.34]	[-0.32]
Gross Profitability	**-0.047**	**0.381**	**-0.428**	**-0.142**	**0.348**	**-0.49**	**-0.084**	**0.232**	**-0.315**	-0.113	**-0.174**	0.062
	[-2.07]	[6.18]	[-6.49]	[-3.94]	[5.53]	[-6.52]	[-6.08]	[6.65]	[-7.76]	[-1.75]	[-2.64]	[0.65]
Investment To Assets Growth	0.013	**0.253**	**-0.24**	0.029	**0.256**	**-0.227**	**-0.053**	**0.208**	**-0.261**	0.021	0.035	-0.014
	[0.32]	[8.34]	[-4.57]	[0.57]	[5.08]	[-3.11]	[-2.23]	[8.11]	[-6.69]	[0.39]	[0.49]	[-0.16]
Momentum (12/1/3)	**0.318**	0.066	**0.252**	**0.281**	0.015	**0.265**	**0.159**	**0.089**	0.07	**0.182**	**0.196**	-0.014
	[6.42]	[1.34]	[3.49]	[10.06]	[0.42]	[5.66]	[7.51]	[2.02]	[1.38]	[2.70]	[3.40]	[-0.16]
Net Equity Issues	**-0.119**	**0.389**	**-0.509**	**-0.13**	**0.499**	**-0.629**	**-0.153**	**0.355**	**-0.509**	0	-0.121	0.12
	[-4.28]	[8.47]	[-9.43]	[-2.94]	[5.91]	[-6.33]	[-8.55]	[9.51]	[-11.30]	[-0.00]	[-1.45]	[1.16]
Net Operating Assets	**0.093**	**0.308**	**-0.214**	**0.205**	**0.279**	-0.074	**0.08**	**0.212**	**-0.131**	-0.083	0.058	-0.141
	[2.15]	[9.30]	[-3.89]	[4.25]	[6.47]	[-1.18]	[3.29]	[7.77]	[-3.64]	[-1.75]	[0.96]	[-1.66]
Ohlson s O-Score	0.034	**0.432**	**-0.397**	-0.018	**0.291**	**-0.309**	**-0.037**	**0.311**	**-0.348**	-0.049	0.039	-0.088
	[1.24]	[3.58]	[-3.15]	[-0.57]	[4.60]	[-4.35]	[-3.98]	[6.80]	[-7.26]	[-0.44]	[0.55]	[-0.61]
Return On Assets	0.026	**0.292**	**-0.266**	0	**0.25**	**-0.249**	**-0.026**	**0.232**	**-0.258**	-0.008	0.008	-0.016
	[0.92]	[3.10]	[-2.70]	[0.01]	[3.09]	[-2.93]	[-2.30]	[5.67]	[-5.68]	[-0.09]	[0.11]	[-0.13]
Combination Of Anomalies	0.017	**0.311**	**-0.294**	0.012	**0.29**	**-0.277**	**-0.054**	**0.244**	**-0.298**	0.004	0.021	-0.017
	[0.94]	[9.98]	[-7.89]	[0.63]	[7.79]	[-6.53]	[-6.46]	[13.15]	[-13.18]	[0.13]	[0.52]	[-0.27]

strategy. The difference of the difference is also statistically significant with t-statistics of 5.29 (3.34).

The long leg of the sentiment-impaired strategy, which represents the high sentiment conditioned long leg of the anomalies, issue 0.097% (0.173%) per month [t-statistics=3.47 (6.16)]. The short leg of the sentiment-impaired strategy, which represent the low sentiment conditioned short leg of the anomalies, issue 0.128% (0.336%) per month [t-statistics=1.15 (7.24)]. The resulting difference of 0.031% (0.163%) [t-statistics=0.27 (3.39)] is significantly lower than the difference of 0.281% (0.402%) for the simple anomaly strategy. This difference of the difference is statistically significant with t-statistics of 2.14 (5.27).

Taken together, the sentiment-enhanced strategy boasts an issuance spread of 0.632% (0.535%) per month while the sentiment-impaired strategy has an issuance spread of 0.031% (0.163%) per month. The difference of 0.601% (0.372%) is statistically significant at the 1% level with a t-statistics of 3.41 (5.09). Panel B of Table 9A and Table 9B report the results with size and market-to-book adjusted composite issuance. All of the salient features described above are preserved when 12 month average turnover is used as a measure of sentiment. For example, with size and market-to-book adjusted composite measure, the sentiment-enhanced strategy has an issuance spread of 0.635% per month while the sentiment-impaired strategy has an issuance spread of 0.053% per month. The difference of 0.707% per month is also statistically significant at the 1% level with a t-statistics of 3.87. However, when 3 year FL Flow is used as a measure of sentiment, the difference in spread between the sentiment-enhanced strategy and sentiment-impaired strategy narrows and become statistically insignificant after correcting for size and market to book.

Now I turn to looking into the set of 11 anomalies on an individual basis when 12 month average turnover (3 year FL Flow) is used as a measure of sentiment. The

sentiment-enhanced strategy has a larger issuance spread than the simple anomaly strategy in all 11 (10) anomalies. It is statistically significant at the 5% level for 9 (6) out of the 11 anomalies. On the other hand, the simple anomaly strategy has a larger issuance spread than the sentiment-impaired strategy in 10 (11) of the 11 anomalies. Of those, 9 (9) of the differences are statistically significant. Viewed together, the sentiment-enhanced strategy has a larger and statistically significant spread in 9 (10) of the 11 anomalies. The remaining two have the correct sign.

These results are highly supportive of the very refined hypothesis that 1. Firms act as rational arbitrageurs who take advantage of financial market anomalies unearthed by academics; and 2. Such arbitrage activities are concentrated in the low sentiment portion of the long leg of anomalies and the high sentiment portion of the short leg of anomalies. Recall that these patterns correspond exactly to the pattern of abnormal returns reported in the earlier sections. In particular, abnormal excess returns on the long side are concentrated in stocks with low individual stock investor sentiment. At the same time, these are also the stocks which engage in the most repurchase and cash disbursement activities. On the other hand, abnormal excess returns on the short side are concentrated in stocks with high individual stock investor sentiment. These are also the stocks which engage in the most issuance activities.

8 Conclusion

With limits to arbitrage, variation in individual stock investor sentiment may be an important variable in determining cross sectional asset returns. This paper uses two proxies for individual stock investor sentiment, 12 month average turnover and 3 year FL Flow, and provides compelling evidence that this is the case. In particular, the abnormal returns in a broad set of financial market anomalies depends on the level of

individual stock investor sentiment. To add to the mounting evidence that financial market anomalies represent mispricing instead of an unidentified risk factor, I identify the firm as a natural rational arbitrageur, and show that composite issuance is high when firms are overpriced, while composite issuance is low when firms are underpriced. This pattern of firm behavior is consistent with the firm taking advantage of mispricing that occurs due to stock sentiment-induced demand shocks. Broadly speaking, this paper provides a uniform view of how underreaction and overreaction happens concurrently: investors have underreacted when individual stock investor sentiment is low, and have overreacted when individual stock investor sentiment is high. This paper clearly specifies likely variables that proxy for individual stock investor sentiment, and shows that individual stock investor sentiment can be high for some stocks and low for other stocks simultaneously. With limits to arbitrage being more binding to the asset management industry, the firm emerges as a natural candidate to take advantage of these mispricing.

9 Appendix

9.1 FL Flows

I calculate mutual fund flows using the CRSP Mutual Fund Database and the Thomson Reuters Mutual Fund Ownership data (formerly known as the CDA S12 data). I use the MFLINKS tables (developed by CRSP and Professor Russ Wermers) to merge the CRSP Mutual Fund data with the Thomson Reuters Mutual Fund Ownership data. I focus on all domestic equity funds that exist at any date between 1Q1980 and 3Q2010 for which we can match CRSP data with the Thomson Reuters common stock holding data.

There are multiple variables which allow me to screen for US equity funds in the CRSP dataset. I use Policy Code, Wiesenberger Objective Codes, Strategic Insights Objective Code, Lipper Objective Code, Lipper Classification Code and Lipper Asset Code to screen for US equity funds. My approach is to first use these codes to eliminate funds which unequivocally specify a non-US or non-equity focus. After this first filter, I further distinguish funds which are labeled under more ambiguous categories. A complete list of the categories of funds excluded and contingently included can be found in Appendix Table 1. For example, we contingently include balanced funds, asset allocation funds, and income funds. While some of these funds hold primarily US equity, there is a significant portion which holds primarily non-equity assets. To tackle this problem, we further delete mutual funds which hold more than 30% in non-equity holdings at any point in time[17]. In addition, I remove mutual funds with fund names which specify a non-US or non-equity focus. I investigate

[17] I require that PER_PREF +PER_CONV +PER_CORP +PER_MUNI +PER_GOVT +PER_OTH +PER_BOND > 30

Appendix Table 1:

This table uses codes in the CRSP Mutual Fund Database to filter out funds that are likely non US-equity focused in nature. Funds that are contingently included are further screened using criteria laid out in the main text.

Code	Excluded	Contingently Included
Policy Code (1980-1989)	Bond and preferred stocks ('B&P') Bonds ('Bonds') Canadian and International ('C&I') Government securities ('GS') Income fund ('I-S') Holds equity in lease contracts ('Leases') Money market fund ('MM') Preferred stocks ('Pfd') Tax-free fund ('TF') Tax-free exchange fund ('TFE') Tax-free money market fund ('TFM')	Balanced Fund ('Bal') Common stocks ('CS') Flexible strategy ('Flex') Leverage and/or short-selling ('Hedge') Multi-manager fund ('MF') Sector or highly speculative fund ('Spec')
Wiesenberger Objective Code (1980-1992)	Corporate Bond ('CBD') Corporate high-yield bond ('CHY') Government securities ('GOV') Gold and precious metals ('GPM') International bond ('IBD') International equity ('INT') Municipal bond ('MBD') Municipal high-yield ('MHY') Money market fund ('MMF') Municipal single state ('MSS') Government mortgage-backed ('MTG') Tax-free money market ('TFM') Taxable money market ('TMM')	Asset Allocation ('AAL') Balanced ('BAL') Energy/Natural resources ('ENR') Financial sector ('FIN') Growth and current income ('GCI') Health Sector ('HLT') Equity income ('IEQ') Flexible income ('IFL') Long-term growth ('LTG') Maximum capital gains ('MCG') Other (not classified) ('OTH') Small capitalization growth ('SCG') Technology sector ('TCH') Utilities ('UTL')
Strategic Insights Objective Code (1993-1998)	The 174 categories of fund which are listed on p.27-p.29 of the CRSP Survivor-Biased-Free US Mutual Fund Database Guide which does not appear in the "Included" column to the left. These categories generally unequivocally specify a bond, international or commodities focus.	Equity USA Aggressive Growth ('AGG') Asset Allocation USA Balanced ('BAL') Equity USA Environmental ('ENV') Asset Allocation USA Principle Return ('EPR') Equity USA Financial Sector ('FIN') Asset Allocation USA Flexible ('FLX') Equity USA Midcaps ('GMC') Equity USA Growth & Income ('GRI') Equity USA Growth ('GRO') Equity USA Health ('HLT') Equity USA Income & Growth ('ING') Equity Natural Resources & Energy ('NTR') Equity USA Real Estate ('RLE') Equity USA Small Companies ('SCG') Equity USA Technology ('TEC') Equity USA Utilities ('UTI')
Lipper Objective and Classification Code (6/30/1998-)	The 143 categories of fund which are listed on p.16-p.26 of the CRSP Survivor-Biased-Free US Mutual Fund Database Guide which does not appear in the "Included" column to the left. These categories generally unequivocally specify a bond, international or commodities focus.	Absolute-Return Funds ('ABR') Balanced Funds ('B') Basic Materials Funds ('BM') Capital Appreciation Funds ('CA') Consumer Goods Funds ('CG') Consumer Services Funds ('CS') Equity Leverage Funds ('DL') Dedicated Short Bias Funds ('DSB') Equity Income Funds ('EI' and 'EIEI') Extended U.S. Large-Cap Core Funds ('ELCC') Equity Market Neutral Funds ('EMN') Financial Services Funds ('FS') Growth Funds ('G') Growth and Income Funds ('GI') Health/Biotechnology Funds ('H') Income Funds ('I') Industrial Funds ('ID') Large-Cap Core Funds ('LCCE')

Code	Excluded	Contingently Included
Lipper Objective and Classification Code (6/30/1998-) [continued]		Large-Cap Growth Funds ('LCGE') Large-Cap Value Funds ('LCVE') Long/Short Equity Funds ('LSE') Mixed-Asset Target Funds ('MATA', 'MATB', 'MATC', 'MATD', 'MATE', 'MATF', 'MATG', 'MATH', 'MATI') Mixed-Asset Target Alloc Consv Funds ('MTAC') Mixed-Asset Target Alloc Growth Funds ('MTAG') Mixed-Asset Target Alloc Moderate Funds ('MTAM') Mid-Cap Funds ('MC') Mid-Cap Core Funds ('MCCE') Mid-Cap Growth Funds ('MCGE') Mid-Cap Value Funds ('MCVE') Multi-Cap Core Funds ('MLCE') Multi-Cap Growth Funds ('MLGE') Multi-Cap Value Funds ('MLVE') Micro-Cap Funds ('MR') Natural Resources Funds ('NR') Real Estate Funds (RE') Specialty/Miscellaneous Funds ('S') Small-Cap Core Funds ('SCCE') Small-Cap Growth Funds ('SCGE') Small-Cap Value Funds ('SCVE') Specialty Diversified Equity Funds ('SESE') Small-Cap Funds ('SG') S&P 500 Index Objective Funds ('SP' and 'SPSP') Science & Technology Funds ('TK') Telecommunication Funds ('TL') Utility Funds ('UT')
Lipper Asset Code (12/31/1999 –)	Taxable Fixed Income Funds ('TX') Tax Free Fixed Income Funds ('MB')	Equity Funds ('EQ')

mutual fund which contains the following strings:

municipal,muni,government,govt,gov't,gvt,convertible,duration, FixedInc,treasury, mortgage obligations,highyield,high-yield,international,internatl,intl,int'l,japan,asia, emergingmarket,euro,europe,foreign,metal,precious, developingmarket

I further check this list manually to ensure that all of these funds have a non-US or non-equity focus. This process is non-redundant. For example, there is an equity fund named "Williamsburg Investment Trust: Government Street Mid-Cap Fund" (crsp_fundno '032458') which contains the string 'government' in the context of a name.

9.1.1 Calculating flows

FL Flows are calculated using fund returns and total net asset (TNA) monthly data from CRSP. Of the universe of all domestic equity funds, I delete funds which have never had a valid return and month-end TNA. I further delete funds which have annually updated return and TNA value. I determine the first month in which a fund exists as the first month which has valid month end TNA. Similarly, the last month in which a fund exists is the last month in which a fund has a valid return and month end TNA data. (This is done as CRSP often has empty entries before a fund starts and after a fund dies). For any month in which a fund is alive (i.e. between our start month and last month), if CRSP returns a TNA of 0, I set it to equal 0.01, which is the second lowest TNA value in the CRSP data. CRSP often returns missing TNA or missing return value during the lifetime of a fund's existence. If possible, I would use available information to deduce the missing value, assuming that no inflows or outflows occur. For example, if TNA value is present for t-1,

return information is available for time t, but TNA value is missing for time t, then I calucluate TNA_t^i=(1+R_t^i)TNA_{t-1}^i. This is done so that we do not lose excessive data points. If a fund is merged into another fund, I assume that the merge takes place during the month immediately after the last month of a fund's existence. Following Frazzini et al. (2008), I compute flows for fund i in quarter t, F_t^i, as the dollar value of net new issues and redemptions using: F_t^i=TNA_t^i- (1+R_t^i)TNA_{t-1}^i.This assumes that inflows and outflows occur at the end of the quarter, and that existing investors reinvest dividends and other distribution in the fund. If a merge of funds took place at time t, I merge the lagged TNA and returns of the two funds to calculate flows. Returns are merged by calculating the TNA-weighted returns of the two funds. I assume that investors in the merged funds place their money in the surviving fund.

9.1.2 Constructing counterfactual flows

K-period counterfactual flows represent the amount each fund receives if they are allocated a pro-rate share of the total dollar flow to the mutual fund sector between date t-k and date t, with the proportion depending on TNA as of quarter t-k. Following this definition, funds that were newly created in the past k quarters have a counterfactual flow of 0. I only consider funds that were alive between date t-k and date t when computing k-period counterfactual flows. In particular, let F_s^{agg} be the actual aggregate flows for all funds alive in quarter t, for all t-k$\leq$s$\leq$t. TNA_s^{agg} be the lagged actual aggregate TNA over those funds that exists in both month t-k and month t. A fund's counterfactual TNA can be calculated using:

$$\widehat{F}_s^i = (TNA_{t-k}^i / TNA_{t-k}^{Agg}) F_s^{agg} \tag{7}$$

Initial Condition- $$\widehat{TNA}_{t-k} = TNA_{t-k} \tag{8}$$

$$\widehat{TNA}_s^{\,i} = (1 + R_t^i)\widehat{TNA}_{s-1}^{\,i} + \widehat{F}_s^i \text{ for } t-k+1 \leq s \leq t \tag{9}$$

If a merge of funds took place between time t-k and t, I merge the lagged TNA and returns of all funds that were merged into the surviving fund to calculate counterfactual flows. Returns are again merged by calculating the TNA-weighted returns of all merged funds. Finally, let x_{it} be the total net asset of fund i in month t as a percentage of total assets of the mutual fund sector:

$$x_{it} = TNA_t^i / TNA_t^{agg} \tag{10}$$

The counterfactual under proportional flows is:

$$\widehat{x}_{it} = \widehat{TNA}_t^{\,i} / \widehat{TNA}_t^{\,agg} \tag{11}$$

Let z be the actual percent of the shares outstanding held by the mutual fund sector:

$$z_{jt} = (\sum_i x_{it} w_{ijt} TNA_t^{agg}) / MKTCAP_{jt.} \tag{12}$$

The ownership that would have occurred with proportional flows into all funds and unchanged fund stock allocation and stock prices would be $\widehat{z}$:

$$\widehat{z}_{jt} = (\sum_i \widehat{x}_{it} w_{ijt} TNA_t^{agg}) / MKTCAP_{jt.} \tag{13}$$

Then, for each stock j, the percent of the shares outstanding with mutual fund ownership attributable to flows is:

$$FL\ FLOW_{jt} = z_{jt} - \widehat{z}_{jt} \tag{14}$$

FL FLOW$_{jt}$ is the increase in mutual fund ownership in stock j that results from actual dollar flow exceeding counterfactual dollar flow. Recall that counterfactual dollar flow is the amount that would have flown to portfolio managers if they received flows proportionate to their TNA for the last k periods. This assumes that portfolio managers do not alter their percent allocation of total assets to different stocks given varying levels of dollar flows. This also assumes that stock prices are unchanged from the buying (selling) demand of the mutual fund sector. I refer readers to the appendix of Frazzini, Lamont for an additional numerical example.

9.2 Constructing Book Value

I follow Cohen, Polk, Vuolteenaho (2003) in defining book equity value. Book equity value is used in I first define stockholder's equity. Depending on availability, I use stockholders' equity number reported by COMPUSTAT (item SEQ) or Moody's in that order for stockholder's equity. If neither one is available, I measure stockholders' equity as the book value of common equity (CEQ), plus the par value of preferred stock (item PSTK). If common equity is not available, I compute stockholders' equity as the book value of assets (item AT) minus total liabilities (item LT). Book equity is defined as the stockholders' equity, plus balance sheet deferred taxes (item TXDB) and investment tax credit (item ITCB; if available), plus postretirement benefit assets (item PRBA; if available), minus the book value of preferred stock. Depending on availability, I use redemption (item PSTKRV), liquidation (PSTKL), or par value

(item PSTK) in that order for the book value of preferred stock. Following Campbell, Hilscher, and Szilagyi (2008), I add 10% of the difference between market and book equity. For firms that still have negative values for book equity, I assign positive values of $1 to ensure that they lie in the correct tail of the distrbution when market-to-book or book-to-market ratios are formed and ranked in the cross section.

9.3 Calculating Distress Measures

I construct the distress measure following Campbell, Hilscher, and Szilagyi (2008). It is the 12-month ahead probability of financial failure estimated by a dynamic logit model:

$$\begin{aligned}\text{Distress} \equiv & -9.164 - 202.64 NIMTAAVG_{t,t-12} + 1.416 TLMTA_t \\ & - 7.129 EXRETAVG_{t,t-12} + 1.411 SIGMA_{t,t-3} \\ & - 0.045 RSIZE_t - 2.132 CASHMTA_t + 0.075 MB_t \\ & - 0.058 PRICE_t \end{aligned} \tag{15}$$

where $NIMTAAVG$ and $EXRETAVG$ is a geometrically decreasing average of $NIMTA$ and $EXRET$.Setting $\phi = 2^{-1/3}$,

$$NIMTAAVG_{t,t-12} \equiv \frac{1-\phi^3}{1-\phi^{12}}(NIMTA_{t,t-3} + ... + \phi^9 NIMTA_{t-9,t-12}) \tag{16}$$

$$EXRETAVG_{t,t-12} \equiv \frac{1-\phi}{1-\phi^{12}}(EXRET_{t,t-1} + ... + \phi^{11} EXRET_{t-11,t-12}) \tag{17}$$

$NIMTA$ is the net income (Compustat quarterly item NIQ) divided by the sum of market equity and total liabilities (item LTQ).$EXRET \equiv \log(1 + R_{it}) - \log(1 +$

$R_{S\&P500,t}$) is the monthly log excess return on each firm's equity relative to the S&P 500 index. Missing $NIMTA$ and $EXRET$ are replaced with the cross-sectional mean in calculating $NIMTAAVG$ and $EXRETAVG$. $TLMTA$ is the ratio of total liabilities (item LTQ) divided by the sum of market equity and total liabilities. $SIGMA_{i,t,t-3} \equiv \sqrt{\frac{252}{N-1}\sum_{k\in\{(t,t-1),(t-1,t-2),(t-2,t-3)\}} r_{i,k}^2}$ is the annualized three-month rolling sample standard deviation. $SIGMA$ is treated as missing if there are less than six nonzero observations over the three months in the rolling window. In this case it is replaced with its cross-sectional mean. $RSIZE$ is the relative size of each firm measured as the log ratio of its market equity to that of the S&P 500 index. $CASHMTA$ is the ratio of cash and short-term investments (item CHEQ) divided by the sum of market equity and total liabilities. MB is the market-to-book equity, in which book equity is defined as in Cohen, Polk, and Vuolteenaho (2003) and described above. Following Campbell, Hilscher, and Szilagyi (2008), I add 10% of the difference between market and book equity. For firms that still have negative values for book equity, I assign positive values of \$1 to ensure that the market-to-book ratios for these firms are in the right tail of the distrbution. $PRICE$ is each firm's log price per share. All explanatory variables are cross-sectionally winsorized above and below the 5% level to eliminate outliers, except for $PRICE$, where the value is winsorized above at \$15.

I follow Ohlson (1980) to construct the O-score:

$$\begin{aligned}\text{O-score} \equiv & -1.32 - 0.407\log(MKTASSET/CPI) + 6.03TLTA - 1.43WCTA \\ & + 0.076CLCA - 1.72OENEG - 2.37NITA - 1.83FUTL \\ & + 0.285INTWO - 0.521CHIN\end{aligned} \tag{18}$$

CPI is the consumer price index.$MKTASSET$ is total liabilities (item LTQ) plus market value of equity. $TLTA$ is the leverage ratio defined as the book value of debt (item DLCQ plus item DLTTQ) divided by $MKTASSET$. $WCTA$ is working capital (item ACTQ - item LCTQ) divided by $MKTASSET$. $CLCA$ is current liabilities (item LCTQ) divided by current assets (item ACTQ). $OENEG$ is one if total liabilities (item LTQ) exceeds total assets (item ATQ) and is zero otherwise. $NITA$ is net income (item NIQ) divided by assets, $MKTASSET$. $FUTL$ is the fund provided by operations (item PIQ) divided by liabilities (item LTQ). $INTWO$ is equal to one if net income (item NIQ) is negative for the last two years and zero otherwise. $CHIN$ is $(NI_t\text{-}NI_{t-1})/(|NI_t|+|NI_{t-1}|)$, where NI_t is net income (item NIQ) for the most recent quarter.

9.4 CRSP delisting bias correction

I determine the last trading month of a stock to be the month where CRSP returns a delisting code (DLSTCD) to be above '200'[18]. There are two components to the returns of the last month of trading. The first component is the month-to-delist day return- which is the return from the beginning of the month to the last day of trading. The second component is the actual delisting return- the return from the post-delist value and the last trading date.

CRSP treats delistings that occur on the last date of the month and in the middle of the month differently. I first consider the case when the last trading date is not the last date of the month. If both month-to-delist day return and delisting return are available, then CRSP combines these two returns and codes this in the delisting return field (DLRET). CRSP identifies both variables as present by coding Delisting Payment Date field (DLPDT) to be greater than the value in the Delisting Date field

[18] A DLSTCD code below 200 indicates that the stock is still actively traded on the exchange.

(DLSTDT). If the month-to-delist day return is available but not the delisting return, then CRSP reports the month-to-delist day return in the delisting return column as well (DLRET). CRSP identifies this by coding the Delisting Payment Date field (DLPDT) to be less than or equal to the value in the Delisting Date field (DLSTDT). If both variables are not present, then this is coded as .A (-88.00), .P (-99.00), .S (-55.00), or .T (-66.00).

Now I consider the case when the last trading date is the last date of the month. In this case, the month-to-delist day return, if available, is reported in the Return (RET) field. The delisting return is reported in the Delisting Return field (DLRET). As the delisting return field may or may not be equal to the delisting month return, this may be a potential source of error when computing the last month of return for a delisted stock. I have taken care to account for these CRSP issues when computing delisting returns.

Following Shumway (1997) and Shumway and Warther (1999), I only estimate the delisting month return of stocks which have CRSP delisting codes of 500-599. Those are stocks which were dropped from an exchange due to poor performance. If delisting month return is absent, I estimate the delisting month return by setting the missing return to the average of the delisting month return of stocks with the same delisting code[19].

Since delistings usually occur in the middle of the month for most of the observations, I cannot separately estimate the month-to-delist day return and the delisting return as they have been lumped together by CRSP. In observations where month-to-delist day return is available but not the delisting return, I have made the assumption that most of the observed average negative return occurs after the actual delisting.

[19]When estimating average delisting monthly return, I exclude the delisting return of permno=74369, which shows a delisting return of 13767%. I also only include stocks with shrcd=10 or shrcd=11, exchcd=1,2,3,31,32,33.

In these cases, the delisting month return is the month-to-delist day return reported by CRSP plus the estimated delisting return. Note that in Shumway (1997) and Shumway and Warther (1999), the objective was to estimate a single replacement value for performance related delisting. At the time of their research, most delisting returns were missing from CRSP. The sample of delisting returns they found formed the basis of the sample now present in CRSP, and they assumed that the delisting returns they couldn't find should be -100% in calculating the single replacement value. I do not incorporate this assumption as it basically assumes that stocks with missing delisting return remaining in the CRSP data now should have -100% delisting return.

Appendix Table 2: Size vs Book-to-Market

This table reports calendar time portfolio abnormal returns. At the beginning of each calendar month, stocks are double sorted on the basis of book-to-market ratio in descending order and size in ascending order into 5x5 value weighted portfolios. All stocks are value weighted within a given portfolio, and the portfolios are rebalanced every calendar month to maintain value weights. This table includes all NYSE/AMEX/Nasdaq stocks with non-missing book-to-market and size variable information at portfolio formation. Alpha is the intercept on a regression of monthly excess return from the rolling strategy. The explanatory variables are the monthly returns of the market return minus the risk free rate. L/S is the alpha of a zero-cost portfolio that longs the bottom 20% of stock and shorts the top 20% of stock as determined by the ranking variables. Start date is July 1964 and end date is December 2011. Returns and alphas are in monthly percent, t-statistics are shown below the coefficient estimates and are based on the heteroskedasticity-consistent standard errors of White (1980). 5% statistical significance is indicated in bold.

		Book-to-Market				
Size	Value				Growth	Value minus Growth
	BM1	BM2	BM3	BM4	BM5	L/S
S1	**1.064**	**0.564**	0.197	-0.284	-0.223	**1.288**
	[4.42]	[2.78]	[0.91]	[-1.15]	[-0.70]	[6.54]
S2	**0.458**	0.294	0.011	-0.313	**-0.526**	**0.983**
	[2.26]	[1.96]	[0.06]	[-1.66]	[-2.19]	[4.90]
S3	**0.418**	**0.399**	0.19	-0.031	-0.317	**0.735**
	[2.19]	[2.90]	[1.47]	[-0.20]	[-1.59]	[3.40]
S4	**0.456**	**0.507**	0.155	-0.035	-0.118	**0.574**
	[2.55]	[4.33]	[1.50]	[-0.30]	[-0.72]	[2.40]
S5	0.2	0.129	0.069	-0.02	-0.108	0.308
	[1.20]	[1.33]	[0.92]	[-0.35]	[-1.24]	[1.37]
Small Cap minus Large Cap	**0.864**	**0.435**	0.127	-0.263	-0.116	**0.98**
	[3.51]	[1.97]	[0.53]	[-0.98]	[-0.34]	[3.79]

Appendix Table 3: Fama-MacBeth Regressions (with additional liquidity related controls)

This table reports coefficients of firm characteristics when predicting excess returns. At the beginning of each calendar month, stocks are double sorted on the basis of each of the eleven anomaly measure and each of my two individual stock investor sentiment measure: 12 month average turnover and 3 year FL Flow into 5x5 portfolios. For each strategy, stocks are ranked in an order such that a smaller (higher) number in the ranking variable corresponds to higher (lower) returns as documented in previous studies. I create two dummy variables to indicate whether or not a stock is in two of these 25 portfolios. The first dummy variable equals 1 when the stock is in the lowest sentiment quintile and the lowest anomaly quintile. The second dummy variable equals to 1 when the stock is in the highest sentiment quintile and in the highest anomaly quintile. I run monthly Fama-MacBeth regressions of excess returns on firm characteristics, additional liquidity variables, financial market anomaly variable, individual stock investor sentiment variable, and the two dummy variables. A separate regression is performed for each anomaly-sentiment combination. I report only the coefficients of the dummy variables of interest. The columns (1) through (11) report results when (1) Accrual , (2) Asset Growth, (3) Composite Equity Issues, (4) Failure Probability, (5) Gross Profitability, (6) Investment To Assets Growth, (7) Momentum, (8) Net Equity Issues, (9) Net Operating Assets, (10) Ohlson's O-Score, (11) Return On Assets is the financial market anomaly respectively. Start date of each strategy is reported. End date is December 2011 and September 2010 when 12 Month Average Turnover and 3 year FL Flow are used as sentiment measures respectively. Fama-Macbeth t-statistics are reported below the coefficient estimates.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A: Sentiment Measure: 12 Month Average Turnover											
Start Date	Feb-63	Mar-63	Dec-47	Feb-75	Oct-60	Dec-62	Jul-68	May-62	May-65	Feb-75	Dec-71
Controlling for Dollar Volume:											
dummy(low sentiment long leg)	-0.098	0.065	-0.053	-0.089	-0.005	0.092	0.035	0.015	0.051	**-0.237**	**0.453**
	[-0.96]	[0.57]	[-0.68]	[-1.02]	[-0.06]	[0.92]	[0.34]	[0.22]	[0.60]	[-2.54]	[5.03]
dummy(high sentiment short leg)	**-0.289**	**-0.342**	**-0.365**	**-1.151**	**-0.406**	**-0.187**	**-0.981**	**-0.55**	**-0.438**	**-0.673**	**-1.049**
	[-3.29]	[-3.84]	[-4.19]	[-8.71]	[-2.92]	[-2.05]	[-8.24]	[-5.93]	[-4.81]	[-3.56]	[-7.52]
Controlling for Amihud Measure:											
dummy(low sentiment long leg)	-0.117	0.162	-0.141	0.013	0.082	0.118	**0.246**	-0.055	0.021	**-0.203**	**0.46**
	[-0.97]	[1.30]	[-1.57]	[0.13]	[0.81]	[1.08]	[2.11]	[-0.80]	[0.22]	[-2.12]	[4.86]
dummy(high sentiment short leg)	**-0.214**	**-0.308**	**-0.389**	**-0.84**	**-0.31**	-0.132	**-0.633**	**-0.482**	**-0.378**	**-0.517**	**-0.899**
	[-2.37]	[-3.43]	[-4.37]	[-5.93]	[-2.06]	[-1.47]	[-4.94]	[-5.08]	[-4.37]	[-2.57]	[-5.80]
Controlling for both Liquidity-related Measures:											
dummy(low sentiment long leg)	-0.097	0.18	**-0.133**	**-0.174**	0.091	0.129	0.191	-0.057	0.03	**-0.229**	**0.448**
	[-0.87]	[1.54]	[-1.61]	[-2.00]	[0.97]	[1.24]	[1.66]	[-0.82]	[0.32]	[-2.38]	[4.68]
dummy(high sentiment short leg)	**-0.227**	**-0.314**	**-0.421**	**-0.959**	**-0.321**	-0.143	**-0.835**	**-0.477**	**-0.391**	**-0.603**	**-0.945**
	[-2.60]	[-3.59]	[-4.77]	[-7.22]	[-2.30]	[-1.62]	[-7.20]	[-5.35]	[-4.61]	[-3.24]	[-6.97]

Appendix Table 4: Combination of Anomalies return conditioned on differently specified Average Turnover and Other Liquidity Related Measures

This table reports calendar time portfolio abnormal returns. At the beginning of each calendar month, stocks are independently double sorted on the basis of each of the eleven anomaly measure and T-month average turnover, Amihud Measure, or Dollar Volume into 5x5 value weighted portfolios. All stocks are value weighted within a given portfolio, and the portfolios are rebalanced every calendar month to maintain value weights. This table includes all NYSE/AMEX stocks with non-missing sentiment and anomaly variable information at portfolio formation. Only the results for the Combination of Anomalies portfolio are reported. Alpha is the intercept on a regression of monthly excess return from the rolling strategy. The explanatory variables are the monthly returns from Fama and French (1993) mimicking portfolios. Low turnover (liquidity) represent the lowest 20% quintile in T-month average turnover (the liquidity measure). High turnover (liquidity) represent the highest 20% quintile in T-month average turnover (the liquidity measure). Long-Short is the alpha of a zero-cost portfolio that longs the long leg and shorts the short leg of the Combination of Anomalies strategy, with low turnover (liquidity) and high turnover (liquidity) separately reported. Start date of each strategy is as reported in table 4A while end date is December 2011. Returns and alphas are in monthly percent, t-statistics are shown below the coefficient estimates and are based on the heteroskedasticity-consistent standard errors of White (1980). 5% statistical significance is indicated in bold.

Panel A: Sentiment Measure: Average Turnover of Different Months

	Long Leg			Short Leg			Long - Short		
Combination Of Anomalies	Low Turnover	High Turnover	Low - High	Low Turnover	High Turnover	Low - High	Low Turnover	High Turnover	Low - High
Fama-Frech 3-factor alpha									
Average Turnover (1 month)	-0.005	0.079	-0.084	**-0.381**	**-0.733**	**0.353**	**0.376**	**0.812**	**-0.437**
	[-0.06]	[0.80]	[-0.61]	[-3.59]	[-6.16]	[2.22]	[3.91]	[8.29]	[-3.30]
Average Turnover (3 months)	0.122	0.039	0.083	**-0.256**	**-0.681**	**0.425**	**0.378**	**0.72**	**-0.342**
	[1.37]	[0.40]	[0.62]	[-2.35]	[-5.99]	[2.78]	[3.70]	[7.71]	[-2.73]
Average Turnover (6 months)	**0.214**	0.018	0.196	-0.206	**-0.698**	**0.492**	**0.42**	**0.716**	**-0.296**
	[2.58]	[0.18]	[1.45]	[-1.96]	[-6.14]	[3.28]	[4.45]	[7.37]	[-2.49]
Average Turnover (9 months)	**0.215**	0.036	0.179	-0.16	**-0.717**	**0.557**	**0.375**	**0.753**	**-0.378**
	[2.54]	[0.36]	[1.33]	[-1.57]	[-6.35]	[3.79]	[3.92]	[7.62]	[-3.00]
Average Turnover (12 months)	**0.246**	0.032	0.214	-0.105	**-0.714**	**0.608**	**0.352**	**0.746**	**-0.395**
	[2.81]	[0.32]	[1.51]	[-1.05]	[-6.24]	[4.25]	[3.67]	[7.49]	[-3.16]
Average Turnover (24 months)	**0.311**	0.049	0.262	-0.036	**-0.648**	**0.612**	**0.347**	**0.697**	**-0.35**
	[3.50]	[0.48]	[1.79]	[-0.36]	[-5.74]	[4.41]	[3.38]	[7.26]	[-2.74]
Average Turnover (36 months)	**0.288**	0.048	0.239	-0.042	**-0.61**	**0.567**	**0.33**	**0.658**	**-0.328**
	[3.25]	[0.47]	[1.62]	[-0.43]	[-5.11]	[3.89]	[3.37]	[6.83]	[-2.73]
Average Turnover (60 months)	**0.264**	0.057	0.207	-0.019	**-0.556**	**0.538**	**0.283**	**0.613**	**-0.33**
	[2.68]	[0.56]	[1.32]	[-0.19]	[-4.63]	[3.48]	[2.61]	[6.52]	[-2.50]

Panel B: Liquidity Measures: Dollar Volume and Amihud Measure

	Long Leg			Short Leg			Long - Short		
Combination Of Anomalies	Low Liquidity	High Liquidity	Low - High	Low Liquidity	High Liquidity	Low - High	Low Liquidity	High Liquidity	Low - High
Fama-Frech 3-factor alpha									
Dollar Volume	**0.202**	**0.15**	0.052	**-0.549**	**-0.462**	-0.086	**0.751**	**0.612**	**0.138**
	[2.18]	[3.01]	[0.75]	[-4.75]	[-7.08]	[-1.09]	[10.15]	[9.53]	[2.08]
Amihud Measure	**1.035**	**0.14**	**0.894**	**0.718**	**-0.281**	**0.999**	**0.317**	**0.422**	-0.105
	[10.29]	[2.66]	[9.22]	[6.63]	[-3.90]	[8.60]	[3.70]	[4.80]	[-0.97]

Appendix Table 5: Anomalies return conditioned on low turnover and high turnover (skipping most recent month)

This table reports calendar time portfolio abnormal returns. At the beginning of each calendar month, stocks are independently double sorted on the basis of each of the eleven anomaly measure and 12 month average turnover that skips the most recent month into 5x5 value weighted portfolios. All stocks are value weighted within a given portfolio, and the portfolios are rebalanced every calendar month to maintain value weights. This table includes all NYSE/AMEX stocks with non-missing sentiment and anomaly variable information at portfolio formation. Alpha is the intercept on a regression of monthly excess return from the rolling strategy. The explanatory variables are the monthly returns from Fama and French (1993) mimicking portfolios. The long leg and short leg portfolios are as determined by previous studies, and represent the extreme quintile portfolios of different anomaly variables. Low turnover represent the lowest 20% quintile in 12 month average turnover. High turnover represent the highest 20% quintile in 12 month average turnover. Long-Short is the alpha of a zero-cost portfolio that longs the long leg and shorts the short leg of each strategy, with low turnover and high turnover separately reported. Start date of each strategy is as reported in table 4A while end date is December 2011. Returns and alphas are in monthly percent, t-statistics are shown below the coefficient estimates and are based on the heteroskedasticity-consistent standard errors of White (1980). 5% statistical significance is indicated in bold.

Sentiment Measure: 12 Month Average Turnover; Skipping Most Recent Month

	Long Leg			Short Leg			Long - Short		
Anomaly	Low Turnover	High Turnover	Low - High	Low Turnover	High Turnover	Low - High	Low Turnover	High Turnover	Low - High
Fama-Frech 3-factor alpha									
Accrual	0.162	0.044	0.118	-0.115	**-0.661**	**0.546**	0.277	**0.706**	-0.429
	[1.09]	[0.30]	[0.59]	[-0.87]	[-4.76]	[2.97]	[1.40]	[4.17]	[-1.78]
Asset Growth	-0.079	-0.151	0.071	0.183	**-0.427**	**0.61**	-0.263	0.276	**-0.539**
	[-0.56]	[-1.06]	[0.34]	[1.21]	[-3.01]	[3.20]	[-1.30]	[1.74]	[-2.27]
Composite Equity Issues	0.083	0.019	0.064	0.135	**-0.537**	**0.671**	-0.052	**0.555**	**-0.607**
	[0.66]	[0.13]	[0.34]	[0.81]	[-4.03]	[3.18]	[-0.26]	[3.25]	[-2.40]
Failure Probability	**0.441**	0.131	0.31	-0.161	**-1.24**	**1.079**	**0.603**	**1.372**	**-0.769**
	[3.46]	[0.88]	[1.51]	[-0.83]	[-5.10]	[3.71]	[2.62]	[4.44]	[-2.21]
Gross Profitability	**0.418**	0	**0.418**	-0.07	**-0.456**	**0.386**	**0.488**	**0.456**	0.031
	[3.33]	[0.00]	[2.11]	[-0.61]	[-2.88]	[1.96]	[3.12]	[2.42]	[0.13]
Investment To Assets Growth	0.19	-0.13	0.32	0.079	**-0.363**	**0.442**	0.111	0.233	-0.122
	[1.57]	[-0.96]	[1.70]	[0.49]	[-2.48]	[2.16]	[0.57]	[1.37]	[-0.50]
Momentum (12/1/3)	0.284	0.087	0.197	**-0.528**	**-1.214**	**0.686**	**0.811**	**1.301**	-0.489
	[1.85]	[0.58]	[1.01]	[-2.64]	[-6.32]	[3.39]	[2.83]	[5.04]	[-1.74]
Net Equity Issues	0.144	0.13	0.013	-0.194	**-0.717**	**0.523**	**0.338**	**0.847**	**-0.509**
	[1.41]	[1.03]	[0.08]	[-1.48]	[-5.10]	[2.77]	[2.08]	[5.73]	[-2.37]
Net Operating Assets	0.156	-0.073	0.229	-0.012	**-0.718**	**0.706**	0.168	**0.645**	**-0.477**
	[1.45]	[-0.48]	[1.26]	[-0.09]	[-4.84]	[3.62]	[0.99]	[3.83]	[-2.06]
Ohlson s O-Score	0.158	-0.098	0.256	0.017	**-0.884**	**0.902**	0.141	**0.786**	-0.645
	[1.02]	[-0.72]	[1.20]	[0.10]	[-3.52]	[3.09]	[0.59]	[2.69]	[-1.72]
Return On Assets	**0.582**	-0.004	**0.586**	**-0.687**	**-1.003**	0.316	**1.268**	**0.999**	0.269
	[3.88]	[-0.03]	[2.55]	[-3.95]	[-5.72]	[1.29]	[5.59]	[4.48]	[0.85]
Combination Of Anomalies	**0.255**	0.004	0.251	-0.103	**-0.72**	**0.617**	**0.358**	**0.724**	**-0.366**
	[2.96]	[0.04]	[1.79]	[-1.02]	[-6.32]	[4.36]	[3.72]	[7.31]	[-2.94]

Panel B: Sentiment Measure: 3 year FL Flow

Start Date	Apr-83	Apr-83	Apr-83	Apr-83	Apr-83	Apr-83	Jul-83	Apr-83	Apr-83	Apr-83	Apr-83
Controlling for Dollar Volume:											
dummy(low sentiment long leg)	0.094	**0.303**	0.15	**0.255**	0.073	**0.232**	0.137	0.036	**0.337**	0.087	0.151
	[0.99]	[2.82]	[1.69]	[3.38]	[0.65]	[2.34]	[1.30]	[0.45]	[2.86]	[0.96]	[1.43]
dummy(high sentiment short leg)	-0.19	**-0.58**	**-0.408**	**-0.652**	-0.066	**-0.555**	-0.303	**-0.39**	**-0.625**	-0.114	**-0.629**
	[-1.96]	[-4.65]	[-3.55]	[-4.92]	[-0.50]	[-5.28]	[-1.85]	[-2.89]	[-5.79]	[-0.84]	[-3.58]
Controlling for Amihud Measure:											
dummy(low sentiment long leg)	0.049	**0.301**	0.161	**0.311**	0.091	**0.216**	0.134	0.07	**0.346**	0.129	0.16
	[0.49]	[2.55]	[1.57]	[3.64]	[0.82]	[2.04]	[1.23]	[0.84]	[2.76]	[1.37]	[1.50]
dummy(high sentiment short leg)	-0.202	**-0.638**	**-0.437**	**-0.593**	-0.074	**-0.576**	-0.34	**-0.393**	**-0.65**	-0.084	**-0.612**
	[-1.98]	[-4.27]	[-3.30]	[-4.34]	[-0.53]	[-4.98]	[-1.86]	[-2.79]	[-5.63]	[-0.58]	[-3.22]
Controlling for both Liquidity-related Measures:											
dummy(low sentiment long leg)	0.088	**0.299**	**0.157**	**0.25**	0.095	**0.219**	0.163	0.048	**0.342**	0.078	0.162
	[0.96]	[2.88]	[2.04]	[3.35]	[0.85]	[2.26]	[1.58]	[0.61]	[2.92]	[0.90]	[1.56]
dummy(high sentiment short leg)	-0.162	**-0.563**	**-0.392**	**-0.608**	-0.049	**-0.527**	-0.248	**-0.341**	**-0.606**	-0.088	**-0.6**
	[-1.65]	[-4.66]	[-3.44]	[-4.50]	[-0.37]	[-5.08]	[-1.52]	[-2.51]	[-5.71]	[-0.64]	[-3.44]

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