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Catastrophic Risk and Institutional Investors: Evidence from Institutional Trading around 9/11

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Abstract

Using a large sample of transaction-level institutional trading data, we investigate the role of institutional investors in stock market around the terrorist attacks on September 11, 2001 (9/11), a sudden exogenous catastrophic shock to financial markets. We find that institutional investors remain net buyers amid the large market-wide crisis following 9/11. Furthermore, stocks that are highly bought by institutions earn higher abnormal future returns than stocks that are highly sold. We also examine trading patterns across different types of institutional investors and various industry sectors. Our results suggest that institutional investors act as liquidity providers rather than engage in panic selling during market crises caused by catastrophic events. We also find that their liquidity provision trading is rational and profitable. Overall, our findings support the market stabilization role played by institutional investors who lend a "steady hand" during high-stress periods in financial markets.

Keywords: Catastrophic Risk; Market Crisis and Stability; Institutional Investor; Trading

JEL Classification: G01; G12; G23

1. Introduction

During the past several decades, institutional investors (e.g., mutual funds and pension funds) have come to dominate global financial markets. Collectively, institutional investors are the majority shareholders of most publicly traded companies. As a result, institutional investors have been playing an increasingly significant role in almost all aspects of financial markets. Interesting questions naturally arise from this circumstance: What role do institutional investors play during financial market crises caused by catastrophic events? Are they sophisticated investors who provide a "steady hand" in stabilizing financial markets, or do they "panic" like many retail investors and thereby exacerbate such crises? These are important research questions with relevant practical and policy implications.

We attempt to address these questions by analyzing detailed institutional trading records around the series of terrorist attacks on September 11, 2001 (hereafter 9/11). We focus on 9/11 because it is an unexpected, unprecedented, sudden exogenous shock that caused large market-wide losses. It is therefore an ideal natural experiment and "stress test" to examine the role played by institutional investors during market crises caused by catastrophic events.

We are not alone in our focus on 9/11. For example, Chen, Doerpinghaus, Lin, and Yu (2008) study the short-run claim effect and long-run growth effect of 9/11 on insurance companies. Although terrorist attacks have happened before, their impact has not been as tremendous and widespread as 9/11. It changed the way we think of terrorism (Karolyi and Martell 2010). 9/11 also differs from other catastrophic events such as earthquakes (Shelor, Anderson, and Cross 1990; Li, Tang, and Liao 2015) and hurricanes (Lamb 2005). Most natural disasters have only local effects, while 9/11 has nation-wide impact on the economy and financial markets. Moreover, natural disasters are typically anticipated at least to some extent, while 9/11 was sudden and completely unexpected. U.S. stock markets were forced to close before opening on September 11, and they remained closed until September 17, which is the longest market closure since the Great Depression. Focusing on this important event also allows us to conduct in-depth and thorough analysis of its impact across hundreds of institutional investors and thousands of stocks.

Examining the role of institutional investors during extreme market movements, Dennis and Strickland (2002) find that quarterly institutional ownership is positively related to the magnitude of stock returns on the days when the absolute value of CRSP market index return is greater than 2%. Their findings are consistent with institutional investors contributing to market volatility when there are large market movements. This possibility implies that institutional investors play a destabilizing role, which is somewhat puzzling and surprising given that institutional investors are typically considered to be sophisticated investors. On the other hand, their inferences are based on public institutional holdings data, which are only available quarterly. We use proprietary transaction-level institutional trading data provided by Abel Noser Solutions that contain detailed information on transactions executed by hundreds of institutions, including shares traded, trading prices, as well as trading direction (buy or sell) of each transaction. This information enables us to provide direct evidence on the role of institutional investors during market crises such as 9/11.

Our main findings can be summarized as follows. Our sample institutions are net buyers for both pre- and post-9/11 periods. Both buying and selling activities of our sample institutions increase after 9/11. Daily average principle traded increases by 46% immediately after 9/11. Institutions' total trading activities increase significantly, while their buying relative to selling does not change much. Average daily buy proportion remains almost unchanged at around 52% after 9/11. Hence, we provide direct evidence that institutions act as liquidity providers and play a stabilizing role rather than engage in panic selling as the stock market plummeted after 9/11. We also study whether institutions are able to profit while providing liquidity during this market crisis period. We divide stocks into quintiles by institutional net buying (shares bought minus shares sold normalized by shares outstanding) and find that stocks most heavily bought by institutional investors earn higher abnormal returns than stocks most heavily sold by institutional investors, indicating their trading is profitable while providing liquidity to the overall market.

We further compare trading patterns of two types of institutional investors: investment managers and plan sponsors. We find that the buy proportion after 9/11 increases for plan sponsors, while it decreases for investment managers. This pattern is consistent with the notion that investment managers conduct more forced selling

because of redemption by fund investors, while plan sponsors may face less redemption pressure from plan participants. We also study institutional trading for various industry sectors. We find that institutional investors are net buyers (sellers) for most sectors with negative (positive) contemporaneous market-adjusted returns. We also find that institutional investors earn positive abnormal returns for the sectors for which they are providing liquidity, while earning negative returns for the sectors for which they are not providing liquidity. This finding implies that institutions' liquidity-provision trading can positively predict future returns during 9/11. Finally, in a regression framework, we find that institutional trading can only positively predict returns for stocks for which institutional investors are providing liquidity. A one standard deviation increase in institutional net buying of liquidity provision stocks contributes to a 10.8% increase in returns for the following 3-month period. This outcome indicates that the profitability of institutional investors mainly comes from stocks for which they are providing liquidity.

Our paper contributes to two strands of literature. First, it adds to the literature on the various roles that institutional investors play in financial markets. For example, institutional investors are regarded as critical price setters (Wermers 2002; Graham, Harvey and Rajgopal 2005; Bai, Philippon, and Savov 2016), corporate monitors (Gillan and Starks 2000; Parrino, Sias, and Starks 2003; Boone and White 2015), and information producers (Chemmanur, He, and Hu 2009; Chemmanur, Hu, and Huang 2010). Previous literature includes mixed opinions about the stabilization role of institutional investors (Hong, 2011). For example, Dennis and Strickland (2002) find that institutional investors add market volatility during market extreme movement, while Burch, Emery, and Fuerst (2016) find that institutional investors provide liquidity to the market during market-wide crisis. Using a positive feedback trading model, Hong (2011) find that institutions' ability to help stabilize the market depends on the behavior of positive feedback traders. Our research contributes to this strand of literature by highlighting the market stabilization role played by institutional investors during crises caused by catastrophic events. Our paper has implications for policy makers in regulating institutional investors and financial markets when such catastrophic events occur.

Second, our paper contributes to the literature on catastrophic risk and events, such as terrorist attacks. Specifically, numerous papers focus on the 9/11 terrorist

attack. Burch, Emery, and Fuerst (2003) use 9/11 as a natural test of the hypothesis that closed-end mutual fund discounts reflect small investor sentiment. Doherty, Lamm-Tennant, and Starks (2003) use the 9/11 setting to study the response and recovery of insurance stocks to extreme capital shocks. Carter and Simkins (2004) study the reaction of airline stock returns to unexpected catastrophic events using 9/11. Glaser and Weber (2005) study how this unprecedented crisis influences the expectations of individual investors. Poteshman (2006) studies pre-9/11 trading of two airline stock options to determine whether informed trading of stock options exists before 9/11. Kallberg, Liu, and Pasquariello (2008) utilize 9/11 to study how market participants revise their expectations about New York real estate investment trusts to shed light on market efficiency. In a related recent study, Burch, Emery, and Fuerst (2016) make use of 9/11 event to study stock price reactions and trading patterns after a sudden market wide crisis. They find that institutional investors are net buyers, while retail investors engage in panic during market-wide stock prices drop after 9/11. Our findings are therefore consistent with and provide further support for the findings in Burch, Emery, and Fuerst (2016). While we focus on and thoroughly study the role of institutional investors, they analyze the interaction between institutional investors and retail investors as well as the price recovery process. One main difference is that Burch, Emery and Fuerst (2016) use publicly available TAQ data and rely on algorithms to infer institutional trades versus retail trades and the direction of each trade. These algorithms may not be very reliable especially given market changes over time. In contrast, we utilize a proprietary institutional trading database, which allows us to make direct and accurate inferences of institutional investors' trading behavior around 9/11. Further, we also analyze trading behaviors across different types of institutional investors and various industry sectors.

Our study is related to and has important implications for research on financial markets in the Asia-Pacific region. Prior studies have examined market reactions to catastrophic events in the region (see, e.g., Ramiah, Cam, Calabro, Maher, and Ghafouri 2010 for the impact of global terrorism attacks on Australian market and Hood, Kamesaka, Nofsinger and Tamura, 2011 for the impact of Japan's 2011 earthquake.). Among them, very few have studied the behavior and roles of sophisticated institutional investors during such events (one exception is Hood, Kamesaka, Nofsinger and Tamura 2011, who find that foreign investors conduct

contrarian strategies after Japan's 2011 earthquake). Despite the widely-recognized positive feedback patterns of sophisticated investors, some papers studying market crises find that sophisticated investors conduct contrarian trading and thus play a stabilization role after market crisis (Hood, Kamesaka, Nofsinger and Tamura 2011; Karolyi 2002).

The world is now very inter-connected. Internet and big data are making the whole world developing together and sharing risk together. Unforeseeable catastrophic events can have more wide-spread impact. Even though our results are based on U.S. data, the results are still applicable globally in such a closely-connected world. Given the high frequency and importance of catastrophic events, we believe more related research is warranted.

Furthermore, our study goes one step further and study different patterns of different types of institutions during catastrophic events. The different trading and performance patterns of the two types of investors also have implications for Asia-Pacific markets. Our conclusion that institutions with more constrained liquidity play a weaker market stabilization role should also be applicable, as there are similar types of institutions in the area. For example, in China, institutional investors consist of investment funds, Qualified Foreign Institutional Investors, the National Social Security Fund, insurance companies, corporate annuity funds, and authorized security firms (See Li, Rhee, and Wang 2017). Investment funds and corporate annuity funds, for example, share similar characteristics as investment managers and plan sponsors in our sample, respectively.

The remainder of this paper is organized as follows. Section 2 describes our data and sample. Section 3 analyzes overall patterns of institutional trading around 9/11. Section 4 studies the relation between institutional trading and subsequent stock returns. Section 5 compares trading patterns and return predictability of trading between investment managers and plan sponsors. Section 6 analyzes institutional trading across different industry sectors. Section 7 studies the relation between liquidity provision trading and stock return predictability. Section 8 concludes.

2. Data and Sample Selection

We obtain proprietary transaction-level institutional trading data from Abel Noser Solutions, a leading execution quality measurement service provider for institutional investors. Abel Noser data have been used in prior publications, such as Hu (2009); Chemmanur, Hu, and Huang (2010); Puckett and Yan (2011); Anand, Irvine, Puckett, and Venkataraman (2012, 2013); Hu, McLean, Pontiff, and Wang (2014); and Chiyachantana, Jain, Jiang, and Shama (2017). Examples of working papers using Abel Noser data include Bhattacharya, Wei, and Xia (2018) and Huang, Tan, and Wermers (2018).

Abel Noser data cover equity trading transactions by a large sample of institutions. For each transaction, the data include detailed information such as the date of the transaction, the stock traded (identified by both symbols and CUSIPs), the number of shares traded, the dollar principal traded, commissions paid by the institution, and whether the institution is making a buy or sell. The institutions in the Abel Noser data are classified as either plan sponsors or investment managers. Examples of plan sponsors include the California Public Employees' Retirement System (CalPERS), the Commonwealth of Virginia, and United Airlines. Examples of investment managers are mutual fund families, such as Fidelity Investments, Putman Investments, and Lazard Asset Management. The dataset starts from January 1999 and ends in September 2011. It covers trading of 1,139 institutions, including 399 investment managers and 740 plan sponsors. Total trading principal of covered institutions amounts to $37.5 trillion, with $31.5 trillion for investment managers and $6 trillion for plan sponsors. See Hu, Jo, Wang and Xie (2018) for detailed descriptions and related issues of the Abel Noser Data.

Since we focus on examining how institutional investors trade around 9/11, we extract all institutional trading transactions from August 27 to September 28, 2001, a 20-trading-day window surrounding 9/11. We evenly divide these 20 trading days into four "trading weeks" and label them Week 1, Week 2, Week 3, and Week 4 for the rest of the paper. Week 1 (August 27 to 31) and Week 2 (September 4 to 10) are the two trading weeks prior to 9/11, while Week 3 (September 17 to 21) and Week 4 (September 24 to 28) are the two trading weeks after 9/11. For most of our analysis, Week 1 and Week 2 are used as benchmarks against which we compare institutional trading patterns and stock performance after 9/11.

Stocks included in our analysis must have at least one trading record during our sample period. We obtain stock price and return information from CRSP and accounting information from COMPUSTAT. We further restrict our sample to include only common stocks (CRSP share code equals to 10 or 11) listed on the three major U.S. stock exchanges (NYSE, AMEX, and NASDAQ). To be included in our analysis, sample stocks must have price and return data during the event window. We also exclude stocks that were newly listed after August 1, 2001, and stocks that were delisted during the event window. Our sample includes 3,632 stocks with institutional trading data available in the Abel Noser database during our sample period. Our sample includes trading transactions from 324 institutional investors, including 284 plan sponsors and 40 investment managers. As noted in prior studies, although there are more plan sponsors than investment managers, investment managers tend to be larger. Total trading principal amounts to $204 billion during our sample period.

3. Market Performance and Institutional Trading around 9/11

In this section, we first review the market performance around 9/11. We then study aggregate institutional trading around 9/11 by using our unique institutional trading database to obtain an overall picture of the role of institutional investors before and after the event. Burch, Emery, and Fuerst (2016) find evidence that institutional investors are net buyers during the stock market crash in the aftermath of 9/11. The aim of our study is to provide more direct and concrete evidence about this finding. We first construct the following variables for each trading day:

VWRet: Daily value-weighted average returns of all sample stocks, weighting by market capitalization at the end of July 2001.

CumRet: Cumulative value-weighted average returns of all sample stocks starting from August 27, 2001.

Weekly CumRet: Cumulative value-weighted returns of all sample stocks starting from the beginning of the trading week.

Ntrade: Number of trading records in Abel Noser each day.

Volume: Daily sum of shares traded by all institutional investors, in millions of shares.

Volume_Crsp: Daily sum of total volume traded of all stocks in CRSP, in millions of shares.

Principal: Daily sum of principals of all institutional trading, in millions of dollars. For each trade, trading principal is calculated as shares traded multiplied by trading price.

Buys: Daily sum of buying principals by all institutional investors.

Sells: Daily sum of selling principals by all institutional investors.

Imbalance: Difference between *buys* and *sells*.

Buy Proportion: *Buys* divided by total principal traded.

Cumulative Imbalance: Sum of daily *Imbalance* starting from August 27, 2001, the first day of the event window.

Cumulative Buy Proportion: *Cumulative Imbalance* divided by cumulative principal traded.

We report stock returns and trading summary statistics in Table 1. For a more intuitive presentation, we also plot the trends in cumulative stock returns and institutional trading for the 20-day period around 9/11 in Figure 1. Stock prices continuously drop throughout the event window. As documented in Burch, Emery, and Fuerst (2016), the stock market has a down trend before 9/11. In our sample, value-weighted stock prices drop by around 7.51% for the pre-event period from August 27 to September 10. When the market re-opens after a one-week break after 9/11, stock prices experience the most astonishing drop on September 17, with a daily price drop of 5.1%. On that day, 3,051 out of 3,632 stocks in our sample experience a price decline. The down trend of market continues for Week 3, the first post-9/11 trading week. During this week, the market value of sample stocks shrinks by 12.17%, with 2,562 of 3,632 stocks experiencing a price decline. At the industry level, market values drop in 45 out of 48 Fama-French industries. The evidence from our sample stocks is consistent with the conclusion that 9/11 causes a market-wide crisis in the U.S. stock market as reported in Burch, Emery, and Fuerst (2016).

[Insert Table 1 and Figure 1 here]

A strong rebound follows the first panic week. Stock prices increase by 7.68% in Week 4, but the market value of sample stocks is still 5.42% below their pre-9/11 level at the end of the week. The reverse in price may be partly due to previous overreaction of the market and partly due to a series of interest rate cuts by the Federal Reserve.

Institutional trading increases with the overall market trading activities during the stock market crash. From CRSP, the overall trading activities of all investors significantly increase during the two-week post-9/11 period, from 2.58 billion per day to 3.78 billion per day. From Abel Noser, trading volume by institutional investors also increase sharply after the re-open of the stock market, from a daily average of $8.28 billion pre-event to $12.11 billion in terms of trading principal and from 306 million to 473 million in terms of total trading shares. The high turnover of the market reflects the high level of exchange of opinions among market participants.

We next look at institutional buying and selling activities separately to see what trading direction contributes to the increase in total trading activities. For the period before 9/11, institutions are acting as net buyers in the stock market. They conduct $4.26 billion buying per day versus $4.01 billion selling per day on average. Both *Buys* and *Sells* increase for the post-9/11 period. The daily average of *Buys* increases by 47% to $6.28 billion, and the daily average *Sells* increases by 45% to $5.81 billion. Buying principals rise higher than selling principals, both in terms of dollar principal and percentage. The buy-to-sell ratio remains stable even after 9/11.

To look more closely at the buying activities relative to selling activities before and after 9/11, we plot the daily *Buy Proportion* and *Cumulative Buy Proportion* of institutional investors during the event window against the cumulative returns of sample stocks in Figure 1. Our sample institutions are net buyers on the market for most trading days. *Buy Proportion* is higher than 50% for 8 of 10 days pre-event, and for 7 of 10 days post-event. After 9/11, institutional investors are net buying in the market in the first two trading days, with *Buy Proportion* values of 52.36% and 55.63% respectively, which are higher than *Cumulative Buy Proportion* of the pre-event period (51.53%). For the following three days in Week 3, *Buy Proportion* drops, fluctuating slightly above or below 50%. Week 4 sees a 47.94% *Buy Proportion* on the first day of the week accompanied by a market recovery of 4.18%. *Buy Proportion* rises steadily and reaches 56.97% at the end of Week 4. We also

calculate and plot *Cumulative Buy Proportion* to determine the buying proportion of institutional investors since the beginning of event window. Although some ups and downs occur, *Cumulative Buy Proportion* remains consistently above 50% throughout the event window. By and large, institutional investors keep their roles as net buyers of the stock market. Putting results of stock returns and trading activities together, we can conclude that our sample institutions are net buyers when the market is experiencing a sharp decline. Institutional investors are actually providing liquidity to the market when other investors are panicking after the catastrophic consequences of 9/11! This conclusion further supports the findings of Burch, Emery and Fuerst (2016). They study trading activities of both institutional and retail investors during the 9/11 market-wide crisis period and find that prices decrease when retail investors are panic selling, even if institutional investors are buying in the market. While Burch, Emery, and Fuerst (2016) use TAQ data and need to infer institutional trading and trading directions by algorithms,[1] we can directly identify and study institutional buying and selling trading from Abel Noser database. This is an advantage of Abel Noser over TAQ as mentioned in Hu, Jo, Wang, and Xie (2018).

We further divide institutional trading by trade size and look at summary statistics of large and small trades separately. We use the same threshold ($50,000) as Burch, Emery, and Fuerst (2016) to separate large versus small trades. In terms of number of trades, most of trades conducted by sample institutions are less than or equal to $50,000. While in terms of trading principal, trades larger than $50,000 dominate. We also find that the liquidity provision pattern of small trades is as strong as large trades.

4. Institutional Trading around 9/11 and Subsequent Returns

In the previous section, our results suggest that institutional investors are consistently buying when the market panics after 9/11. In other words, they are providing liquidity to the market after the catastrophic event, which leads to a further interesting question: What is the predictive power of institutional trading while they are providing liquidity? In addition, will their trading exhibit similar profitability

[1] They use trades with dollar trading volume > $50,000 to proxy for institutional trading. They also use the conclusion from Sias and Starks (1997) that institutional investors dominate trading in large-cap stocks.

before and after 9/11? In this section, we conduct a test to address these questions. If institutions can profit from their trading after 9/11, then we expect that stocks being heavily bought by institutions should have higher future returns than stocks being heavily sold by institutions.

As in the previous section, we divide the event window into four trading weeks. We study the predictive power of (and thus the profitability of) institutional trading for these four weeks separately. For each trading week, we calculate the following measure as in Chemmanur, Hu, and Huang (2010) to capture net institutional buying at stock level:

$$Net\ Buying_{i,t} = \frac{Buys_{i,t} - Sells_{i,t}}{Shrout_{i,t}}, \text{t} = 1,2,3,4. \quad (1)$$

$Buys_{i,t}$ is institutional buying principal of stock *i* at week *t*, and $Sells_{i,t}$ is institutional selling principal of stock *i* at week *t*. $Shrout_{i,t}$ is shares outstanding of stock *i* at the start of week *t*. Stocks with negative *Net Buying* are sold by institutional investors in the trading week, and stocks with positive *Net Buying* are bought by institutional investors in the trading week.

For each trading week, we sort our stocks into quintiles based on *Net Buying* for that week. The lowest, middle three, and highest quintiles of institutional net buying are categorized as low, moderate, and high institutional buying, respectively. Stocks in the high *Net Buying* group are the most heavily bought by institutional investors, and stocks in the low *Net Buying* group are the most heavily sold by institutional investors. If institutional investors are able to profit from providing liquidity, then we should expect that stocks in the high *Net Buying* group should have higher future returns than stocks in the low *Net Buying* group.

We obtain aggregate subsequent returns of the two extreme quintile stocks by taking the value-weighted average of stock returns in each quintile:

$$\text{Ret}_{H,t,m} = \sum_{i=1}^{n} w_{i,t} * (Ret_{i,t,m} | i \in H), \text{t = 1, 2, 3, 4; m= 1, 2, 3}$$

$$\text{Ret}_{L,t,m} = \sum_{i=1}^{n} w_{i,t} * (Ret_{i,t,m} | i \in L), \text{t = 1, 2, 3, 4; m= 1, 2, 3.} \quad (2)$$

$\text{Ret}_{H,t,m}$ and $\text{Ret}_{L,t,m}$ are value-weighted aggregate subsequent returns of the high and low *Net Buying* quintile for *m* months after the end of trading week *t*. $w_{i,t}$ is the weight of stock at week *t*, which is calculated by market capitalization at the

beginning of week *t*. Subsequent return period *m* lasts as long as three months. We calculate subsequent raw returns as well as subsequent abnormal returns. Subsequent abnormal return is calculated as the difference between raw return and the return on the matched Fama-French 25 size and book-to-market portfolio (Daily).[2] For each return measure and each trading and post-trading period, we obtain both monthly and cumulative (after the end of trading week) returns.

We next conduct a *t*-test for testing the differences in value-weighted means of returns between high and low *Net Buying* groups for each return measure and each trading and post-trading period. Table 2 presents the aggregate returns of high and low *Net Buying* groups as well as the results for the t-tests.

[Insert Table 2 here]

Panel A shows the results generated from raw returns. Stocks from both high and low *Net Buying* groups earn positive returns for the periods after 9/11. Subsequent stock raw returns in two trading groups after trading Week 3 and trading Week 4 are much higher than returns following trading Week 1 and trading Week 2. The high Net Buying portfolio constructed in Week 3 (Week 4) earns 15.06% (9.29%) in the following month, and the low Net Buying portfolio earns 11.69% (6.25%) in the following month. This outcome suggests a strong recovery trend of the market after 9/11. Comparing stock returns across the two trading groups, we see that stocks in the high institutional net buying group earn significantly higher cumulative raw returns than stocks in the high institutional net selling group for up to three months following the post-9/11 trading weeks. These differences are mainly driven by returns in the first month, with the high *Net Buying* portfolio constructed in Week 3 (Week 4) earning returns 3.37% (3.04%) higher. While for the pre-9/11 trading week, Week 1 and Week 2, stock returns in the high *Net Buying* group are not significantly higher, suggesting that institutional trading has no predictive power before 9/11.

Panel B presents the results generated from abnormal returns. After we subtract matched Fama-French 25 size and book-to-market portfolio returns from raw returns, stocks in both trading groups still earn positive aggregate returns up to three

[2] The details of the benchmark portfolio are provided on Professor French's website http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data_Library/tw_5_ports.html

months following trading Week 3 and trading Week 4, except that stocks in the low *Net Buying* group earn a negative abnormal return in the first month following Week 3. The post-9/11 return differences between the two trading groups in Panel B have a higher magnitude and significance level than the results from Panel A (4.20% for Week 3 portfolios and 3.67% for Week 4 portfolios), and the results are still mainly driven by returns in Month 1.

The results from Table 2 indicate that institutional trading has no or negative predictive power before 9/11 but has significantly positive predictive power after 9/11. The predictive power decays over time and is mainly driven by returns during the first month after the trading period ends. This outcome suggests that institutional investors are compensated with higher future returns when they provide liquidity to the market.[3]

5. Investment Managers versus Plan Sponsors

5.1 Overall Trading Statistics and Return Predictability

We next compare the trading patterns and changes in these patterns between different types of institutional investors before and after the event. Prior literature (Manconi, Massa and Yausa 2012) suggest that institutions' trading decisions are largely determined by liquidity concerns. When investors face sudden liquidity problem, they will be forced to dump these assets with better liquidity. The 9/11 setting and the two types of institutional investors provide a nice setting for testing this hypothesis. We expect investors with more stable fund supply to exhibit a stronger liquidity-provision pattern. And investors that faced more severe funding constraints after 9/11 perform worse, especially in selling activities.

As we mentioned in the data section, the Abel Noser database includes two types of institutional investors, investment managers and plan sponsors. One major

[3] In the long-run and during normal times, our sample institutional trades do not have predictability power for future returns and are not profitable on average. In other words, institutions do not exhibit superior stock-picking ability in general. However, their market stabilizing trades post-9/11 do appear to have return predictability as market recovers. These results indicate that their liquidity provision trading post-9/11 is both rational and profitable. Our conclusion here is not to say that institutional investors do not play a stabilizing role pre-9/11. The occasional negative predictive power of institutional trading pre-9/11 may be due to the extremely bad performances of many stocks because of 9/11. Our emphasis is the market-stabilizing role of institutions during high-stress market crisis period, which they clearly demonstrate as they remain net buyers even during the market panic post-9/11.

distinction between the two types of investors is the sources of funds. Investment managers are mainly managing mutual funds, which investors are free to redeem. We expect more mutual fund redemption after 9/11 if retail investors are more likely to panic (Burch, Emery, and Fuerst 2016). For plan sponsors, their fund supply is expected to be more stable after 9/11 since they may face less redemption pressure from plan participants. As a result, we expect plan sponsors to have more stable net buying during the post-9/11 period.

We present trading statistics for investment managers and plan sponsors in Table 3. Throughout the entire event window, investment managers play a more important role in trading activities than plan sponsors in terms of both volume and principals traded. Investment managers have a daily average volume of 310 million shares and a daily average trading principal of $8.16 billion, while plan sponsors have daily averages of 79 million trading shares and $2.04 billion trading principal. During Week 3 and Week 4, similar to our conclusions from the aggregate of institutions in Table 1, both types of investors increase their trading activities compared to the pre-9/11 period. However, the increases in the magnitudes of *Buys* and *Sells* are different for the two types of institutions. The differences are clearly visible in Figure 2.

[Insert Table 3 and Figure 2 here]

For investment managers, their selling activities increase by a greater extent than buying activities, supporting our prediction that investment managers may be forced to sell due to fund redemption by retail investors. During Week 1 and Week 2, investment managers are net buyers in 8 out of 10 trading days. Their cumulative buy proportion stays above 50% all the time, with a *Cumulative Buy Proportion* of 52.06% for the whole pre-9/11 period. However, for Week 3 and Week 4, their daily *Buy Proportion* does not remain as strong as for Week 1 and Week 2. They are net sellers for five days of the post-9/11 period, and their buying principals only account for 50.22% of total trading principals for the period. This trend is represented by the down trend of the *Cumulative Buy Proportion* line in Figure 2.

The trend is opposite for plan sponsors. Although they are net sellers during the whole pre-9/11 period, with a *Cumulative Buy Proportion* of 49.30%, they become net buyers in the post-9/11 period. Their buying principals contribute to 58.84%

of total trading principals in the two post-event weeks. Looking at the trend of the three lines in Figure 2, we can infer that plan sponsors' strong buying position in Week 3 and Week 4 actually contributes to the stable buying trend of institutional investors as a whole given the downward sloping of *Cumulative Buy Proportion* of investment managers. This suggests a stronger pattern for plan sponsors than investment managers in providing liquidity during the 9/11 market crisis.

In Panels A to D of Table 4, we repeat the analysis in Section 4 separately for the trading of investment managers and plan sponsors. More specifically, we divide stocks into high-net-buying and low-net-buying groups for trading of investment managers and plan sponsors. In Panel A and Panel B, we report the results generated from raw returns. Trading activities of both types of institutional investors can positively predict subsequent raw returns only in Week 3 and Week 4. In addition, the cumulative predictive power lasts for as long as three months. The profitability of plan sponsors is slightly stronger than that of investment managers. Panel C and Panel D present the results generated from cumulative returns. The results are similar except the predictive power and thus the profitability from trading of two types of institutions do not differ significantly after adjustment for matched Fama-French 25 size and book-to-market portfolio returns.

[Insert Table 4 here]

5.2 Analysis of Selling Performance

In previous section, we find that investment managers provide less liquidity, which is consistent with the prediction that investment managers face more severe fund redemption. We also find weak evidence that investment managers perform worse than plan sponsors for the trading period right after 9/11. This further support forced selling of investment managers. In this section, we go one step further and compare selling performance of two types of institutions. Another goal to do this comparison is to see whether the performance difference between investment managers and plan sponsor exists prior to 9/11 and whether it originates from trading skill differences.

Specifically, at the end of each trading week, we form two portfolios. One consists of stocks that are sold by plan sponsors during the week, and the other consists of stocks that are sold by investment managers during the week. We then calculate value-weighted bm-size adjusted cumulative returns of each portfolio for the three-month period right after the trading week and do t-tests to compare the returns of the two portfolios.

For Week 1 and Week 2, the selling performance of investment managers are as good as and sometimes better than that of plan sponsors. For the trading conducted during the week right after 9/11, selling performance of investment managers is significantly worse than that of plan sponsors (as indicated by higher future returns of selling portfolios). The results in Table 3 and Table 4 together suggest that investment managers experience fund outflows right after 9/11 and are forced to sell due to liquidity concerns. And trading skills seem to not play an important role, as plan sponsors only out-perform investment managers for the post-9/11 period.

6. Trading Activities in Industry Sectors

Although we find in previous sections that institutional investors provide liquidity to the aggregate market during the market-wide crisis of 9/11, the stories happening at the industry level remain unknown. Previous literature has explored stock market reactions in some specific sectors, such as insurance (Chen, Doerpinghaus, Lin, and Yu 2008), real estate (Kallberg, Liu, and Pasquariello 2008), and airline (Carter and Simkins 2004). However, a thorough industry analysis has not been done. Moreover, a question remains with regard to whether the liquidity provision hypothesis still holds if we look at institutional trading at the industry level. Buying at the aggregate market level while the market is falling does not necessarily imply that institutions are trading in sectors that most need liquidity. Institutions might be coincidently buying in rising sectors and selling in falling sectors. If this is the case, they are acting more like liquidity demanders rather than liquidity suppliers. In this section, we consider institutional trading in greater detail and explore market performance and institutional trading behavior at the industry level.

We use Fama-French 49-industry classification to assign our sample stocks into industry groups. We drop stocks with no Fama-French industry classification in

this analysis.[4] We only focus on Week 3 because it is the week immediately following 9/11, when panic is most widespread and the market is desperately in need of liquidity. We present value-weighted market-adjusted industry returns, *Principal*, *Net Buy*, and *Buy Proportion* of these 48 industries for Week 3 in Table 5. Industries with negative value-weighted market-adjusted returns (thus are most in need of buying principals) are presented in Panel A, and industries with positive value-weighted market-adjusted returns are presented in Panel B. Industries are ranked in ascending order by their market-adjusted returns in both panels. We also plot *Buy Proportion* against value-weighted market-adjusted returns of each industry in Figure 3.

[Insert Figure 3 here]

In Panel A of Table 5, among 26 industries with negative market-adjusted returns, 17 industries are being net bought by institutional investors. If we drop industries with fewer than 10 firms, investors are buying in 16 out of 24 industries. Price drop is most salient in transportation and transportation vehicles (*Aircraft*, *Automobiles and Trucks*, *Transportation*) since transportation safety becomes a more salient concern after 9/11. *Recreation* and *Entertainment* also plummet, reflecting potential shrinkage in the demand for entertainment as people's concerns about 9/11 exacerbate ongoing recession. Manufacturing industries such as *Fabricated Products*, *Steel Works*, and *Electronic Equipment* also drop, probably due to the potential increase in the prices of raw materials and potential recession. Among these falling sectors, *Aircraft* and *Personal Services* industries are the most heavily bought by institutional investors and *Fabricated Products* and *Business Supplies* industries are the most heavily sold by institutional investors. The results from Panel A indicate that institutions provide principal to most of the sectors that demand buying principal.

In Panel B of Table 5, among 22 industries with positive market-adjusted returns, 12 are being net sold by institutional investors. If we drop industries with fewer than 10 firms, investors are net selling in 8 of 14 industries. Institutional investors are selling in most of the sectors that have relatively better performance than

[4] The classification details are available at: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data_Library/det_49_ind_port.html.

the market in the aftermath of 9/11. The *Defense* industry is the sector with the most salient appreciation of value, with a market-adjusted return of 22.83% in Week 3. This is consistent with an increase in demand for defense equipment after 9/11 due to fear of future war and the expectation of intensifying safeguards nationwide. However, our sample institutional investors are net selling *Defense* stocks, suggesting they perceive that other investors are overvaluing *Defense* industries. Interestingly, *Coal* and *Gold* industries are two rising sectors with the highest institutional net buying, suggesting a preference for these "safe" assets by institutional investors and also by other investors.

From Table 5, we can see that institutional investors are not coincidently buying winning sectors and selling losing sectors when they act as net buyers in the aggregate markets. Rather, they are mostly buying losing sectors and selling winning sectors, providing liquidity at the industry level. We can also see that most of the institution buying sectors exhibit positive returns for the following month, and most of the institution selling sectors exhibit negative returns for the following month, indicating that the market overreacts to the 9/11 event.

We also plot value-weighted market-adjusted returns against *Buy Proportion* of investment managers and plan sponsors separately in Panel B and Panel C of Figure 3. Sector returns increase along the horizontal line. An upward bar indicates that institutional investors are buying in the sector (*Buying Proportion* greater than 50%), and a downward bar implies that institutional investors are selling in the sector (*Buying Proportion* less than 50%). From Panel B and Panel C, we can see that the liquidity provision pattern is more prominent for plan sponsors than for investment managers. In addition, the two types of institutional investors have a higher liquidity provision trend in falling sectors than in rising sectors. This further supports our conclusion from the aggregate trading patterns that plan sponsors perform better in providing liquidity than investment managers.

7. Liquidity provision trading and future returns

7.1 Liquidity provision trading and future returns in sectors

From the previous section, we find that institutional investors are liquidity suppliers in most of the industries, while they are liquidity demanders in a few. In this

section, we further check if they profit from providing liquidity by comparing future returns between liquidity-supplying and liquidity-demanding sectors.

We select the top five and the bottom five sectors according to their sector returns in Week 3. These sectors are those most in need of liquidity. We classify these 10 sectors into four groups by the sign of sector returns and *Buy Proportion.* The classification is plotted in Figure 4. The horizontal axis and vertical axis in Figure 4 represent *Value-weighted Market-Adjusted* returns and *Buy Proportion*, respectively. Sectors in the left diagonal quadrants are sectors for which institutional investors are providing liquidity, and sectors in the right diagonal quadrants are sectors for which institutional investors are demanding liquidity.

[Insert Figure 4 here]

We calculate average subsequent returns of stocks in the four quadrants separately. We weight stock returns in each quadrant by market capitalization and adjust quadrant portfolio returns for market return. Subsequent return periods last from one week to three months. We calculate cumulative returns as well as monthly (weekly) returns. We present the results for subsequent returns in Table 6.

[Insert Table 6 here]

Stocks in the sectors that lose the market and are bought by institutional investors in Week 3 have positive abnormal returns for the periods that follow. In addition, stocks in sectors that beat the market and are sold by institutional investors in Week 3 have negative abnormal returns. This suggests that in liquidity-provision sectors, institutional trading has a positive predictive power for future returns. Institutions are able to profit by providing liquidity.

However, institutions perform poorly in the sectors that are demanding liquidity. Stocks in sectors with negative market-adjusted returns and stocks that are sold by institutional investors have positive aggregate abnormal returns for the periods following Week 3, and stocks in sectors with positive market-adjusted returns and those that are bought by institutional investors have negative aggregate abnormal returns for the post-event period.

7.2. Liquidity provision trading and future returns at stock level

From the analysis in the previous section, we can infer that institutional trading has positive predictive power for the sectors for which institutional investors are providing liquidity, while such trading has negative predictive power for the sectors that are demanding liquidity. This motivates our analysis at the stock level. In Section 4, we find that institutional trading has predictive power and is profitable during 9/11 because stocks that institutions buy extensively outperform stocks that institutions sell extensively. In this section, we explore whether this predictive power and profitability come from liquidity provision. Answering this question is important since it justifies the rationality of liquidity provision after a catastrophic event.

We hypothesize that institutional trading can positively predict future stock returns for the stocks for which institutions are providing liquidity (liquidity-provision stocks hereafter), while it cannot or can only negatively predict future stock returns for the stocks for which institutions are not providing liquidity. To test this hypothesis, we run a multivariate regression of subsequent returns on Week 3 trading. We use *Net Buying* as defined by equation (1) to capture institutional trading at the stock level, as in Section 4. We first sort stocks into quintiles by their trading week returns and then sort stocks into quintiles again by *Net Buying*. We define stocks in the bottom return quintile and the top *Net Buying* quintile or in the top return quintile and bottom *Net Buying* quintile as "liquidity provision" stocks since the liquidity provision pattern is strongest among these stocks. Other stocks are defined as "non-liquidity provision" stocks. We study the relation of subsequent returns and institutional *Net Buying* for the one-week, one-month, two-month, and three-month period after the end of Week 3. The regression model is presented as follows:

$$Subsequent\ Abnormal\ Ret_{i,t} = \beta_0 + \beta_1 * LP * Net\ Buying + \beta_2 * Net\ Buying + \beta_3 * LP + \beta_4 * Past\ Return + \beta_5 * Log(ME) + \beta_6 * Log(BTM) + \beta_7 * Leverage + \beta_8 * PPE + \beta_9 * Dividend + \beta_{10} * Profitability. \quad (3)$$

$Subsequent\ Abnormal\ Ret_{i,t}$ is cumulative subsequent returns for stock i and period t after the end of Week 3, adjusted for returns of matched Fama-French 25 size and book-to-market portfolios. t is equal to one week, one month, two months, or three months. *Net Buying* is as defined in the previous section. *LP* is an indicator variable that equals one if the stock is a liquidity provision stock and equals zero

otherwise. We add a cross term $LP * Net\ Buying$ to our regression model since we expect that the relation of subsequent returns and institutional trading should be different between liquidity provision and non-liquidity provision stocks. $Past\ Return$ is the stock weekly raw returns for Week 3. $Log(ME)$ is the natural logarithm of firm market equity. $Log(BTM)$ is the natural logarithm of the book to market value of the firm. $Leverage$ is *long-term debt plus preferred stock liquidating value* minus *deferred taxes and investment tax credits* minus *cash and short-term investments* scaled by firm *total assets*. PPE is *Property, Plant, and Equipment* scaled by *total assets*. $Dividend$ equals one if the firm pays a dividend in the most recent fiscal year and zero otherwise. $Profitability$ is firm's *earnings before interest, taxes, and depreciation* scaled by *Total Assets.* All the control variables are constructed at the start of Week 3. Note that $\beta_1 + \beta_2$ captures the relation between institutional trading and post-9/11 stock returns of liquidity-provision stocks.

We present regression coefficients and t-statistics in Table 7. The t-statistics are adjusted for heteroscedasticity. For each return period, we report results for the models with only institutional trading and liquidity provision dummy variables in the left column, and we present results for the models with other control variables in the right column. The F-statistic in the penultimate row is for the null hypothesis $\beta_1 + \beta_2 = 0$, which implies that institutional trading does not have predictive power for liquidity provision stocks.

[Insert Table 7 here]

For the models without control variables, the sum of coefficients on $Net\ Buying$ and $LP * Net\ Buying$ are positive for all post-trading periods. The null hypothesis $\beta_1 + \beta_2 = 0$ is rejected for first one, two, and three months, suggesting that institutional trading can predict future returns of liquidity-provision stocks from the first month to the third month after the first trading week of 9/11. The results are robust for Month 2 and Month 3 after we add other control variables. The results are also economically significant. A one-standard deviation increase in *Net Buying* of liquidity provision stocks contributes to 8.2% and 10.8% increases in abnormal cumulative returns for the two-month and three-month periods, respectively.

The coefficient β_2, which captures the relation between future stock returns and institutional trading for non-liquidity provision stocks, is significantly negative for the period starting from one month to three months after trading. This result indicates that for the stocks that institutional investors are trading in the same direction with the market, institutional trading can only negatively predict stock returns. It implies that institutional investors perform poorly when they are not providing liquidity.

9. Conclusion

In this paper, we investigate the role of institutional investors around the 9/11 terrorist attacks, a sudden exogenous catastrophic shock to financial markets. We make use of a large sample of proprietary transaction-level institutional trading data, which provides detailed information about institutional trading, allowing us to draw more direct and accurate inferences about the role of institutional investors around such a catastrophic event.

We find that institutional investors remain net buyers amid the large market-wide crisis in the aftermath of 9/11. Furthermore, stocks that are highly bought by institutions earn higher abnormal future returns than stocks that are highly sold. We also analyze two types of institutional investors in our database, investment managers and plan sponsors, separately. We find that investment managers conduct more panic selling than plan sponsors, as plan sponsors face less redemption pressure from fund investors. We further analyze institutional trading at the industry level. We find that institutional investors are net buyers (sellers) for most sectors with negative (positive) contemporaneous market-adjusted returns. In a regression framework, we find that institutional trading can only positively predict returns for stocks for which institutional investors are providing liquidity. This indicates that the profitability of institutional investors mainly comes from stocks for which they are providing liquidity.

Our paper contributes to two strands of literature. By providing evidence on the stabilization role of institutional investors when catastrophic events occur, our

research contributes to the literature on the various roles that institutional investors play in financial markets (Gillan and Starks 2000; Wermers 2002). This paper also contributes to the literature on catastrophic risk and events, such as terrorist attacks (Burch, Emery, and Fuerst 2003, 2016; Chen, Doerpinghaus, Lin, and Yu 2008). Consequently, our paper has implications for policy makers in regulating institutional investors and financial markets in the context of catastrophic events.

Our results suggest that institutional investors act as liquidity providers rather than engaging in panic selling during market crises caused by catastrophic events, and their liquidity provision trading is rational and profitable. Overall, our findings support the market stabilization role played by institutional investors who lend a "steady hand" during high-stress periods in financial markets.

Our research also increases our understanding of catastrophic risk. On the one hand, we review the potential consequences of catastrophic events on the stock market. As pointed out by Liu, Wu and Yu (2018), such risk identification is a first step towards further measure and manage related risks. On the other hand, our results suggest a positive role of institutional investors in risk sharing after catastrophic events. This may have implications for further study on management of such risks. We hope our results prove useful and will also motivate more studies on the risk management of catastrophic events in the Asia-Pacific region, where catastrophic events frequently happen.

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Table 1
Summary Statistics of Institutional Trading Activities around 9/11

This table presents summary statistics of institutional trading and stock returns for the 20-day period around September 11, 2001. Panel A presents summaries for all trades. Panel B divides each trade into big size (larger than $50,000) and small size (less than or equal to $50,000) and presents summary statistics separately for the two groups. We divide the 20 event days into four periods: August 27 to August 31 as Week 1; September 4 to September 10 as Week 2; September 17 to September 21 as Week 3; and September 24 to September 28 as Week 4. Our sample includes all common stocks traded on NYSE, Amex, and Nasdaq as of August 31, 2001, with stock data available from CRSP and trading data available from Abel Noser. For each trading day, we report value-weighted daily and cumulative returns of all sample stocks, number of institutional trades, trading volume (in millions of shares), trading principal (sum of shares traded multiplied by trading price, in millions of dollars), buying principal and selling principal (in millions of dollars), daily and cumulative net buying principal (in millions of dollars), and daily and cumulative percentage of buying (buying principal divided by sum of buying and selling principal). Cumulative trading volumes and returns are calculated since August 27, 2001.

Panel A: Overall Results

Week	*Date*	*VWret*	*Weekly CumRet*	*CumRet*	*Ntrade*	*Volume*	*Volume _CRSP*	*Principal*	*Buys*	*Sells*	*Imbalance*	*Cumulative Imbalance*	*Buy Proportion*	*Cumulative Buy Proportion*
	8/27/2001	-0.40%	-0.40%	-0.40%	29,805	212	1,955	6,365	3,520	2,840	678	678	55.33%	55.33%
	8/28/2001	-1.48%	-1.88%	-1.88%	31,641	257	2,297	6,959	3,467	3,482	-7	671	49.95%	52.52%
1	8/29/2001	-0.99%	-2.85%	-2.85%	32,930	293	2,323	8,438	4,557	3,864	707	1,378	54.19%	53.17%
	8/30/2001	-1.69%	-4.50%	-4.47%	31,634	334	2,776	8,522	4,372	4,131	254	1,631	51.49%	52.69%
	8/31/2001	0.47%	-4.04%	-4.05%	26,991	252	2,023	6,114	3,141	2,958	188	1,819	51.53%	52.50%
	9/4/2001	-0.11%	-0.11%	-3.87%	29,677	270	2,555	7,599	3,903	3,692	215	2,035	51.42%	52.31%
	9/5/2001	-0.30%	-0.41%	-4.14%	29,114	383	3,134	10,706	4,996	5,693	-688	1,347	46.79%	51.23%
2	9/6/2001	-2.15%	-2.55%	-6.14%	33,948	387	3,054	10,137	5,513	4,600	930	2,277	54.59%	51.76%
	9/7/2001	-1.80%	-4.30%	-7.84%	34,739	340	3,001	8,934	4,579	4,341	244	2,521	51.37%	51.71%
	9/10/2001	0.39%	-3.93%	-7.51%	30,312	329	2,718	9,014	4,503	4,503	4	2,525	50.02%	51.53%
	9/17/2001	-5.10%	-5.10%	-12.07%	46,329	538	4,370	15,498	8,105	7,382	731	3,256	52.36%	51.66%
	9/18/2001	-0.89%	-5.95%	-12.78%	41,512	489	3,400	13,026	7,238	5,776	1,467	4,723	55.63%	52.12%
3	9/19/2001	-1.70%	-7.55%	-14.22%	54,560	528	4,361	13,515	6,692	6,816	-122	4,601	49.55%	51.84%
	9/20/2001	-3.18%	-10.49%	-16.80%	42,579	498	3,825	12,594	6,300	6,273	34	4,635	50.13%	51.69%
	9/21/2001	-1.88%	-12.17%	-18.45%	46,827	496	4,702	12,636	6,197	6,431	-231	4,403	49.08%	51.47%
	9/24/2001	4.18%	4.18%	-15.33%	50,244	468	3,655	12,036	5,762	6,252	-497	3,906	47.94%	51.20%
	9/25/2001	0.75%	4.96%	-14.65%	43,073	415	3,451	10,279	5,094	5,123	8	3,914	50.04%	51.14%
4	9/26/2001	-0.85%	4.07%	-15.20%	43,215	427	3,148	10,158	5,429	4,714	719	4,633	53.54%	51.27%
	9/27/2001	1.04%	5.15%	-14.23%	35,956	422	3,355	10,567	5,831	4,731	1,102	5,735	55.21%	51.49%
	9/28/2001	2.41%	7.68%	-12.30%	42,990	444	3,554	10,757	6,126	4,622	1,501	7,236	56.97%	51.77%

Panel B: Summarize by Trade Size

Week	*Tradedate*	*Ntrade*		*Princpal*		*Buy Proportion*	
		<=$50k	>$50k	<=$50k	>$50k	<=$50k	>$50k
1	8/27/2001	18,702	11,103	306.99	6,058.50	56.35%	55.27%
	8/28/2001	19,402	12,239	298.17	6,661.23	54.45%	49.75%
	8/29/2001	20,359	12,571	318.10	8,119.51	50.81%	54.32%
	8/30/2001	18,876	12,758	304.64	8,217.73	55.54%	51.34%
	8/31/2001	16,661	10,330	261.94	5,851.58	54.46%	51.40%
2	9/4/2001	16,706	12,971	298.75	7,300.38	53.67%	51.33%
	9/5/2001	16,277	12,837	252.23	10,453.74	58.18%	46.51%
	9/6/2001	19,769	14,179	305.17	9,832.02	56.71%	54.52%
	9/7/2001	20,467	14,272	319.92	8,614.51	56.10%	51.19%
	9/10/2001	17,269	13,043	276.76	8,737.17	55.89%	49.84%
3	9/17/2001	28,240	18,089	393.55	15,104.88	47.59%	52.48%
	9/18/2001	23,034	18,478	378.60	12,647.16	56.33%	55.61%
	9/19/2001	32,515	22,045	453.84	13,061.09	60.18%	49.18%
	9/20/2001	24,143	18,436	360.51	12,233.43	51.18%	50.10%
	9/21/2001	27,613	19,214	436.95	12,198.90	48.49%	49.11%
4	9/24/2001	31,073	19,171	428.09	11,607.83	55.42%	47.66%
	9/25/2001	26,038	17,035	386.78	9,891.81	52.42%	49.95%
	9/26/2001	26,654	16,561	394.88	9,763.55	51.03%	53.64%
	9/27/2001	21,424	14,532	336.73	10,230.12	56.85%	55.16%
	9/28/2001	23,545	19,445	383.20	10,373.44	58.78%	56.91%
Sum	Pre -9/11	184,488	126,303	2,942.66	79,846.38	55.16%	51.39%
	Post- 9/11	264,279	183,006	3,953.14	117,112.22	53.84%	51.88%

Table 2
Institutional Trading and Subsequent Returns

This table presents the value-weighted abnormal returns of high and low net-buying portfolios and their differences. We split the 20 trading days into four periods (Week 1 to Week 4). For each period, we sort stocks into quintiles by *Net Buying*. *Net Buying* of a stock is the net buying principal for that period scaled by market capitalization at the end of the period. Stocks in the top quintile are most heavily bought by institutional investors and are classified as high-net-buying, and stocks in the bottom quintile are most heavily sold by institutional investors and are classified as low-net-buying. For each net-buying group, we calculate the value-weighted average of returns for the subsequent one, two, and three months. If delisted, the CRSP delisting return is used. We calculate *Subsequent Raw Returns* as well as *Subsequent Abnormal Returns*. *Subsequent Raw Return* is buy-and-hold raw return calculating from the period right after the end of trading period. *Subsequent Abnormal Return* is the difference between *Subsequent Raw Return* and the matched Fama-French 25 size and book-to-market portfolio buy-and-hold value-weighted return. All the results are in percentages. Panel A presents results for raw returns and Panel B presents results for abnormal returns. The t-statistics in parentheses are for the null that value-weighted average of stocks returns in two portfolios are different. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Raw Returns

Week	group	First Month	First-two months	First-three months	Month 2	Month 3
1	High	-6.930	-1.723	5.574	6.337	6.484
	Low	-6.143	-0.862	4.390	6.401	5.749
	Diff	-0.786	-0.861	1.184	-0.064	0.735
	t-stat	(-1.01)	(-0.93)	(1.03)	(-0.07)	(0.92)
2	High	-0.551	2.272	2.904	2.797	-0.284
	Low	-1.047	5.746	6.688	7.149	1.068
	Diff	0.495	-3.473***	-3.784***	-4.351***	-1.351*
	t-stat	(0.61)	(-2.97)	(-2.82)	(-4.87)	(-1.76)
3	High	15.062	22.672	24.690	6.023	0.691
	Low	11.693	19.601	20.572	6.841	0.792
	Diff	3.369***	3.071**	4.118**	-0.818	-0.102
	t-stat	(3.78)	(2.21)	(2.51)	(-1.05)	(-0.14)
4	High	9.290	17.075	22.468	6.143	4.505
	Low	6.253	14.514	17.616	7.415	2.747
	Diff	3.037***	2.561*	4.852***	-1.272	1.758***
	t-stat	(3.14)	(1.71)	(2.72)	(-1.51)	(2.94)

Panel B: Abnormal Returns

week	group	First Month	First-two months	First-three months	Month 2	Month 3
1	High	1.547	1.575	2.645	0.617	-0.066
	Low	1.450	1.435	1.224	0.622	0.070
	Diff	0.097	0.141	1.421	-0.005	-0.135
	t-stat	(0.13)	(0.16)	(1.25)	(-0.01)	(-0.17)
2	High	1.114	0.613	0.163	-0.630	-1.393
	Low	0.105	2.904	3.882	3.104	1.042
	Diff	1.009	-2.290*	-3.719***	-3.733***	-2.436***
	t-stat	(1.27)	(-1.96)	(-2.81)	(-4.12)	(-3.21)
3	High	3.263	5.012	5.673	0.821	-0.475
	Low	-0.940	0.976	0.887	1.540	-0.081
	Diff	4.203***	4.036***	4.786***	-0.719	-0.394
	t-stat	(4.74)	(2.89)	(2.97)	(-0.91)	(-0.55)
4	High	6.429	8.840	9.023	0.894	-0.279
	Low	2.764	5.517	3.379	2.099	-2.125
	Diff	3.665***	3.323**	5.645***	-1.205	1.846***
	t-stat	(3.82)	(2.22)	(3.23)	(-1.39)	(3.18)

Table 3
Trading Activities of Plan Sponsors and Investment Managers around 9/11

This table presents summary statistics of institutional trading activities separately for investment managers (Panel A) and plan sponsors (Panel B) for the 20-day period around September 11, 2001. Our sample includes all common stocks traded on NYSE, Amex, and Nasdaq as of August 31, 2001, with stock data available from CRSP and trading data available from Abel Noser. For each trading day, we report number of trades, trading volume (in millions of shares), total trading principal (sum of shares traded multiplied by trading price, in millions of dollars), buying principal (in millions of dollars), selling principal (in millions of dollars), daily and cumulative net buying principal (in millions of dollars), and daily and cumulative percentage of buying (buying principal divided by sum of buying and selling principal). Cumulative trading volumes are calculated since August 27, 2001.

Panel A: Investment Managers

Week	Date	Ntrade	Volume	Principal	Buys	Sells	Netbuy	Cumulative Netbuy	Buy Proportion	Cumulative Buy Proportion
	8/27/2001	20,511	152	4,734	2,763	1,970	793	793	58.38%	58.38%
	8/28/2001	23,892	209	5,574	2,848	2,725	123	916	51.10%	54.44%
1	8/29/2001	23,137	246	7,075	3,851	3,224	627	1,543	54.43%	54.44%
	8/30/2001	23,551	265	7,033	3,750	3,283	468	2,011	53.32%	54.12%
	8/31/2001	19,038	180	4,809	2,479	2,330	149	2,159	51.55%	53.69%
	9/4/2001	19,834	206	5,701	2,883	2,818	65	2,225	50.57%	53.19%
	9/5/2001	21,357	299	8,356	4,035	4,321	-287	1,938	48.28%	52.24%
2	9/6/2001	24,206	323	8,623	4,664	3,959	705	2,643	54.09%	52.55%
	9/7/2001	25,997	274	7,514	3,822	3,693	129	2,772	50.86%	52.33%
	9/10/2001	22,088	258	7,349	3,663	3,686	-23	2,749	49.85%	52.06%
	9/17/2001	35,591	443	12,821	6,741	6,080	661	3,410	52.58%	52.14%
	9/18/2001	31,488	392	10,501	5,650	4,851	798	4,208	53.80%	52.34%
3	9/19/2001	42,482	430	11,039	5,507	5,532	-25	4,184	49.89%	52.07%
	9/20/2001	31,599	403	10,192	4,898	5,294	-396	3,787	48.06%	51.70%
	9/21/2001	35,066	406	10,399	4,909	5,490	-582	3,206	47.20%	51.32%
	9/24/2001	38,874	385	9,750	4,514	5,236	-721	2,484	46.30%	50.94%
	9/25/2001	31,768	327	8,048	4,106	3,942	163	2,648	51.01%	50.95%
4	9/26/2001	29,973	332	7,925	4,046	3,879	168	2,815	51.06%	50.95%
	9/27/2001	25,738	321	7,372	3,431	3,941	-510	2,306	46.54%	50.74%
	9/28/2001	30,645	347	8,306	4,544	3,762	782	3,088	54.71%	50.95%

Panel B: Plan Sponsors

Week	Date	Ntrade	Volume	Principal	Buys	Sells	Netbuy	Cumulative Netbuy	Buy Proportion	Cumulative Buy Proportion
	8/27/2001	9,294	60	1,632	758	873	-115	-115	46.48%	46.48%
	8/28/2001	7,749	48	1,386	628	758	-130	-245	45.31%	45.94%
1	8/29/2001	9,793	47	1,363	721	641	80	-165	52.92%	48.11%
	8/30/2001	8,083	69	1,489	638	852	-214	-379	42.82%	46.77%
	8/31/2001	7,953	72	1,305	672	633	39	-340	51.49%	47.63%
	9/4/2001	9,843	64	1,898	1,024	874	150	-190	53.95%	48.95%
	9/5/2001	7,757	84	2,350	974	1,375	-401	-591	41.46%	47.41%
2	9/6/2001	9,742	64	1,515	870	645	226	-366	57.44%	48.59%
	9/7/2001	8,742	65	1,420	768	652	115	-251	54.06%	49.13%
	9/10/2001	8,224	71	1,665	846	819	27	-224	50.80%	49.30%
	9/17/2001	10,738	95	2,678	1,374	1,304	70	-154	51.31%	49.59%
	9/18/2001	10,024	97	2,525	1,597	928	669	515	63.24%	51.21%
3	9/19/2001	12,078	98	2,476	1,189	1,287	-98	417	48.03%	50.88%
	9/20/2001	10,980	95	2,402	1,416	986	430	847	58.96%	51.62%
	9/21/2001	11,761	90	2,237	1,294	944	350	1,197	57.83%	52.11%
	9/24/2001	11,370	83	2,286	1,255	1,031	224	1,422	54.91%	52.32%
	9/25/2001	11,305	89	2,230	1,038	1,193	-155	1,267	46.52%	51.93%
4	9/26/2001	13,242	95	2,233	1,392	841	551	1,818	62.33%	52.59%
	9/27/2001	10,218	101	3,195	2,403	792	1,612	3,429	75.22%	54.48%
	9/28/2001	12,345	97	2,451	1,585	866	719	4,148	64.66%	55.09%

Table 4
Subsequent Returns and Trading Activities of Investment Managers and Plan Sponsors

Panel A-Panel D of this table present the value-weighted average returns and differences of average returns of high and low net-buying portfolios generated from trading of investment managers and plan sponsors, respectively. Panel E compares future returns of stocks sold by investment managers versus plan sponsors. We split the 20 trading days into four periods (Week 1 to Week 4). In Panel A-Panel D, we sort stocks into quintiles by *Net Buying* of investment managers and plan sponsors separately for each week. *Net Buying* of a stock is net buying principal for that period scaled by market capitalization at the end of the period. Stocks in the top quintile are most heavily bought by institutional investors and are classified as high-net-buying, and stocks in the bottom quintile are most heavily sold by institutional investors and are classified as low-net-buying. For each net-buying group, we calculate the value-weighted average of returns for the subsequent one, two, and three months. If delisted, the CRSP delisting return is used. In Panel E, we calculate value-weighted returns of stocks sold by investment managers and plan sponsors respectively. For all panels, we calculate *Subsequent Raw Returns* as well as *Subsequent Abnormal Returns. Subsequent Raw Return* is buy-and-hold raw return calculated from the period right after the end of trading period. *Subsequent Abnormal Return* is the difference between *Subsequent Raw Return* and the matched Fama-French 25 size and book-to-market portfolio buy-and-hold value-weighted return. All the results are in percentages. The t-statistics in parentheses are for the null that value-weighted average of stocks returns in two portfolios are different. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A*: Subsequent Raw Return*, Investment Managers

Week	group	First Month	First-two months	First-three months	Month 2	Month 3
1	High	-6.087	-1.889	4.862	5.496	6.208
	Low	-6.609	-1.249	4.240	6.418	6.085
	Diff	0.522	-0.639	0.622	-0.923	0.123
	t-stat	(0.66)	(-0.72)	(0.56)	(-1.04)	(0.16)
2	High	-0.704	3.041	4.449	3.853	0.568
	Low	-1.239	5.467	6.603	7.040	1.256
	Diff	0.535	-2.426**	-2.154*	-3.187***	-0.688
	t-stat	(0.71)	(-2.25)	(-1.71)	(-3.75)	(-0.96)
3	High	14.952	21.918	23.587	5.490	0.520
	Low	11.925	19.880	21.693	6.909	1.609
	Diff	3.027***	2.038	1.893	-1.418*	-1.089
	t-stat	(3.64)	(1.56)	(1.23)	(-1.94)	(-1.58)
4	High	8.238	16.014	20.855	6.402	4.052
	Low	5.457	12.898	16.537	6.794	3.267
	Diff	2.780***	3.116**	4.318***	-0.391	0.785
	t-stat	(3.11)	(2.27)	(2.65)	(-0.50)	(1.44)

Panel B: *Subsequent Raw Return*, Plan Sponsors

Week	group	First Month	First-two months	First-three months	Month 2	Month 3
1	High	-10.048	-4.193	3.668	7.140	8.638
	Low	-9.514	-1.429	5.685	9.592	7.654
	Diff	-0.534	-2.763***	-2.017*	-2.451***	0.985
	t-stat	(-0.67)	(-2.99)	(-1.77)	(-2.77)	(1.37)
2	High	2.673	6.169	7.578	3.666	1.525
	Low	-1.811	5.519	6.293	7.627	0.877
	Diff	4.484***	0.650	1.285	-3.961***	0.648
	t-stat	(6.04)	(0.64)	(1.13)	(-5.27)	(1.19)

3	High	15.708	24.325	27.069	6.883	1.058
	Low	12.461	21.575	24.206	7.719	1.818
	Diff	3.248***	2.750*	2.863*	-0.835	-0.760
	t-stat	(3.63)	(1.95)	(1.65)	(-1.07)	(-1.04)
4	High	9.185	20.055	27.548	9.509	6.194
	Low	5.557	13.452	19.531	7.135	5.324
	Diff	3.627***	6.604***	8.017***	2.374***	0.870
	t-stat	(3.82)	(4.50)	(4.53)	(3.16)	(1.53)

Panel C: *Subsequent Abnormal Return*, Investment Managers

Week	group	First Month	First-two months	First-three months	Month 2	Month 3
1	High	1.752	0.725	1.769	-0.213	0.269
	Low	0.957	0.888	0.995	0.535	0.519
	Diff	0.796	-0.163	0.774	-0.748	-0.250
	t-stat	(1.05)	(-0.19)	(0.69)	(-0.83)	(-0.33)
2	High	0.474	0.406	1.461	-0.032	0.180
	Low	-0.025	2.823	3.907	3.146	1.176
	Diff	0.499	-2.417**	-2.446**	-3.178***	-0.996
	t-stat	(0.66)	(-2.24)	(-1.98)	(-3.69)	(-1.40)
3	High	2.916	3.990	4.521	0.251	-0.460
	Low	-1.086	1.007	1.914	1.732	0.830
	Diff	4.002***	2.983**	2.607*	-1.480**	-1.290*
	t-stat	(4.82)	(2.25)	(1.71)	(-1.98)	(-1.90)
4	High	5.455	7.917	8.038	1.232	-0.287
	Low	2.133	4.052	2.649	1.457	-1.336
	Diff	3.321***	3.865***	5.388***	-0.226	1.049*
	t-stat	(3.73)	(2.79)	(3.36)	(-0.28)	(1.96)

Panel D: *Subsequent Abnormal Return*, Plan Sponsors

Week	group	First Month	First-two months	First-three months	Month 2	Month 3
1	High	-0.223	-0.339	0.301	0.468	1.056
	Low	-1.281	1.670	2.750	3.949	1.378
	Diff	1.057	-2.008**	-2.449**	-3.481***	-0.322
	t-stat	(1.32)	(-2.21)	(-2.14)	(-3.86)	(-0.45)
2	High	3.220	2.402	3.612	-0.685	1.276
	Low	-0.061	2.822	3.006	3.110	0.266
	Diff	3.281***	-0.419	0.606	-3.794***	1.011*
	t-stat	(4.56)	(-0.42)	(0.54)	(-4.91)	(1.91)
3	High	2.787	5.245	6.616	1.439	-0.107
	Low	-0.317	2.356	3.825	2.022	0.819
	Diff	3.104***	2.889**	2.791	-0.583	-0.926
	t-stat	(3.46)	(2.01)	(1.61)	(-0.72)	(-1.30)
4	High	4.861	9.951	11.771	3.990	1.083
	Low	1.773	3.724	4.355	1.423	0.391
	Diff	3.088***	6.227***	7.417***	2.567***	0.692
	t-stat	(3.20)	(4.19)	(4.18)	(3.33)	(1.24)

Panel E: Selling Performance of Investment Managers versus Plan Sponsors

Week	Group	Weighted by Size		Weighted by Trading Principal	
		Raw Returns	Abnormal Returns	Raw Returns	Abnormal Returns
1	Investment Managers	12.377	12.377	5.812	3.063
	Plan Sponsors	13.947	13.947	5.405	2.802
	Diff	-1.570	-1.570	0.407	0.261
	T	(-0.76)	(-0.76)	(0.23)	(0.15)
2	Investment Managers	16.399	16.399	11.993	7.765
	Plan Sponsors	21.507	21.507	11.269	7.133
	Diff	-5.108**	-5.108**	0.723	0.632
	T	(-2.34)	(-2.34)	(0.39)	(0.34)
3	Investment Managers	39.754	39.754	38.787	16.755
	Plan Sponsors	26.970	26.970	32.938	11.084
	Diff	12.785***	12.785***	5.849**	5.671**
	T	(5.32)	(5.32)	(2.57)	(2.50)
4	Investment Managers	37.497	37.497	36.450	18.928
	Plan Sponsors	38.684	38.684	38.752	20.809
	Diff	-1.188	-1.188	-2.302	-1.880
	T	(-0.45)	(-0.45)	(-0.89)	(-0.72)

Table 5
Sector Returns and Institutional Trading

This table presents returns and institutional trading activities among the 49 Fama-French industries for the trading week right after September 11, 2001. The 49 industries are sorted by value-weighted market-adjusted returns in descending order. We present value-weighted market-adjusted sector returns for the trading week as well as for the one month following the trading week. We also total dollar volume traded, buying minus selling and buying proportion by institutional investors in the sector. Panel A presents results for the sectors with negative returns, and Panel B presents results for the sectors with positive returns.

Panel A: Sectors with negative market-adjusted return

Rank	Industry	FFI49	VW-MktAdj Return	Subsequent 1 month return	$ Traded ($millions)	$NetBuy ($millions)	Buying Proportion
1	Aircraft	Aero	-16.42%	0.71%	1,983.03	1,024.93	75.84%
2	Textiles	Txtls	-14.20%	23.68%	14.46	2.45	58.46%
3	Automobiles and Trucks	Autos	-10.84%	0.59%	512.57	-53.01	44.83%
4	Entertainment	Fun	-10.17%	-3.11%	608.62	82.90	56.81%
5	Fabricated Products	FabPr	-8.98%	-3.13%	18.48	-8.48	27.04%
6	Transportation	Trans	-7.74%	-2.95%	1,805.03	191.79	55.31%
7	Recreation	Toys	-7.57%	6.34%	187.23	-22.87	43.89%
8	Electronic Equipment	Chips	-7.51%	14.91%	4,545.25	603.62	56.64%
9	Steel Works Etc	Steel	-7.07%	3.52%	497.59	-43.45	45.63%
10	Personal Services	PerSv	-6.79%	0.41%	471.71	276.94	79.36%
11	Electronic Equipment	ElcEq	-6.49%	6.29%	1,705.64	19.08	50.56%
12	Machinery	Mach	-6.23%	1.66%	1,150.86	-134.44	44.16%
13	Other	Other	-5.29%	-7.72%	390.61	284.97	86.48%
14	Construction	Cnstr	-5.28%	1.70%	224.36	3.60	50.80%
15	Non-Metallic and Industrial Metal Mining	Mines	-3.80%	-0.74%	111.00	14.23	56.41%
16	Construction Materials	BldMt	-3.52%	5.05%	593.95	4.32	50.36%
17	Trading	Fin	-2.75%	6.22%	3,532.80	489.34	56.93%
18	Measuring and Control Equipment	LabEq	-2.73%	5.48%	424.19	59.80	57.05%
19	Computers	Hardw	-2.72%	6.69%	2,796.05	-491.76	41.21%
20	Business Supplies	Paper	-2.46%	-1.19%	698.94	-160.87	38.49%
21	Apparel	Clths	-2.17%	-2.25%	301.07	15.37	52.55%
22	Rubber and Plastic Products	Rubbr	-1.95%	-0.60%	33.95	6.62	59.75%
23	Computer Software	Softw	-1.92%	7.61%	4,335.61	218.08	52.52%
24	Restaurants, Hotels, Motels	Meals	-1.84%	-1.35%	678.31	-95.02	43.00%
25	Business Services	BusSv	-1.11%	1.02%	2,038.09	326.31	58.01%
26	Chemicals	Chems	-0.48%	5.12%	1,482.49	-275.67	40.70%
27	Petroleum and Natural Gas	Oil	-0.29%	-2.81%	2,107.44	304.82	57.23%

Panel B: Sectors with positive market-adjusted return

Rank	Industry	FFI49	VW-MktAdj Return	Subsequent 1 month return	$ Traded ($millions)	$NetBuy ($millions)	Buying Proportion
28	Shipping Containers	Boxes	0.09%	0.98%	97.79	8.74	54.47%
29	Agriculture	Agric	0.45%	-2.32%	5.69	-0.65	44.24%
30	Consumer Goods	Hshld	0.48%	-3.04%	1,167.53	-455.27	30.50%
31	Retail	Rtail	0.50%	5.31%	5,620.47	136.84	51.22%
32	Insurance	Insur	2.14%	4.58%	3,990.29	374.58	54.69%
33	Wholesale	Whlsl	2.14%	-2.70%	1,049.81	-249.48	38.12%
34	Printing and Publising	Books	2.35%	-7.42%	410.91	-75.01	40.87%
35	Healthcare	Hlth	3.14%	-5.67%	707.14	-233.64	33.48%
36	Banking	Banks	3.57%	-7.47%	4,667.16	291.67	53.12%
37	Medical Equipment	MedEq	3.65%	3.97%	763.20	-350.57	27.03%
38	Pharmaceutical Products	Drugs	3.84%	1.74%	6,175.34	-380.72	46.92%
39	Food	Food	4.10%	-7.70%	663.56	69.99	55.27%
40	Beer & Liquid	Beer	4.23%	-8.53%	113.59	-12.63	44.44%
41	Real Estate	RlEst	5.15%	-6.02%	14.78	-0.39	48.68%
42	Utilities	Util	5.44%	-9.37%	1,820.81	-69.76	48.08%
43	Coal	Coal	6.12%	11.15%	31.60	15.26	74.14%
44	Communication	Telcm	7.73%	-10.68%	4,097.96	158.35	51.93%
45	Candy & Soda	Soda	7.91%	-8.66%	1,094.36	54.53	52.49%
46	Tobacco Products	Smoke	9.72%	-4.13%	384.79	65.31	58.49%
47	Precious Metals	Gold	17.42%	-21.58%	53.55	36.32	83.91%
48	Shipbuilding, Railroad Equipment	Ships	19.37%	-10.82%	523.33	-58.93	44.37%
49	Defense	Guns	22.83%	0.52%	413.37	-100.17	37.88%

Table 6
Liquidity Provision and Subsequent Sector Returns

This table presents subsequent returns for the sectors that have the most significant price changes during 9/11. We select the top five and bottom five industries ranked by their value-weighted sector returns during the first week after 9/11. We classify the 10 sectors into four groups by whether the sectors have positive market-adjusted returns during Week 3 and whether the institutions are net buyers in the sector. We then calculate value-weighted abnormal returns for the stocks in each group. Abnormal return is the difference between raw return and the matched Fama-French 25 size and book-to-market portfolio buy-and-hold value-weighted return. Numbers in parentheses are the t-statistic for the test that the aggregate returns in the group are 0. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Return group	Buying Proportion	First Week	First Month	First two months	First three months	Month2	Month3
Abnormal Return	MktAdj Ret < 0	BP > 0	-0.009	5.658***	10.056***	10.666***	3.217***	0.036
			(-0.04)	(14.94)	(17.09)	(15.20)	(10.04)	(0.11)
		BP < 0	-1.175***	3.588***	9.682***	10.887***	5.132***	1.051***
			(-3.57)	(6.55)	(11.78)	(12.03)	(9.89)	(2.96)
	MktAdj Ret > 0	BP > 0	1.780***	-3.534***	-5.043***	-4.775***	-1.355***	0.213
			(7.40)	(-8.01)	(-8.25)	(-6.75)	(-3.90)	(0.85)
		BP < 0	-1.004***	-1.739***	-7.358***	-9.113***	-4.869***	-1.485***
			(-3.45)	(-3.97)	(-13.59)	(-14.23)	(-15.82)	(-4.52)

Table 7
Liquidity Provision and Subsequent Stock Returns

This table presents regression analysis of trading by all institutions in the first week after 9/11 and subsequent stock returns from one week to three months after the trading week. The dependent variable is *Subsequent Abnormal Return*, which is cumulative stock returns during the holding period adjusted for matched Fama-French 25 size and book-to-market portfolio. If delisted, the CRSP delisting return is used. *LP* is a dummy variable indicating whether institutional investors are providing liquidity to the stock. *Net Buying* is *Buys* minus *Sells* scaled by shares outstanding at the beginning of Week 3. *Past Return* is the stock returns during Week 3. *Log(me)* is the natural logarithm of market equity. *Log(BTM)* is the natural logarithm of book-to-market ratio. *Leverage* is *Long-term Debt plus Preferred Stock Liquidating Value* minus *Deferred Taxes and Investment Tax Credits* minus *Cash and Short-term Investments* scaled by *Total Assets*. *PPE* is *Net Plant, Property, and Equipment* scaled by *Total Assets. Dividend* is a dummy variable that equals 1 for dividend-paying firms, and 0 otherwise. *Profitability* is *Earnings Before Interest, Taxes, and Depreciation* divided by *Total Assets*. F statistic is for the null that the sum of coefficients on *LP*Net Buying* and *Net Buying* is 0. The numbers in parentheses are t-statistics, and *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Week 1		Month1		Month2		Month3	
LP*Net Buying	**1.757**	**-0.093**	**11.073*** **	**3.873**	**25.404*** **	**15.409*** **	**31.175*** **	**19.302*** **
	(1.34)	**(-0.06)**	**(5.07)**	**(1.39)**	**(6.95)**	**(3.10)**	**(5.91)**	**(2.93)**
Net Buying	**-1.040**	**-0.829**	**-2.461*** **	**-0.338**	**-7.780*** **	**-4.453*** **	**-9.016*** **	**-4.846** **
	(-1.63)	**(-1.30)**	**(-2.61)**	**(-0.32)**	**(-5.27)**	**(-2.59)**	**(-4.31)**	**(-2.25)**
LP	0.006	0.003	0.042**	0.039**	0.053**	0.044*	0.055*	0.045
	(0.65)	(0.38)	(2.48)	(2.32)	(2.12)	(1.75)	(1.83)	(1.48)
Past Return		-0.004***		-0.001		-0.000		-0.003
		(-2.86)		(-0.32)		(-0.02)		(-0.64)
Log (me)		-0.096***		-0.041***		0.069**		0.043
		(-10.88)		(-2.67)		(2.13)		(1.12)
Log (BTM)		0.015		-0.147***		-0.260***		-0.307***
		(0.86)		(-5.76)		(-6.68)		(-6.36)
Leverage		-0.036***		-0.016		-0.072***		-0.123***
		(-3.47)		(-0.95)		(-2.95)		(-3.94)
PPE		0.010**		-0.043***		-0.102***		-0.097***
		(2.10)		(-5.31)		(-7.17)		(-5.35)
Dividend		0.018		-0.094***		-0.244***		-0.234***
		(1.00)		(-2.74)		(-4.39)		(-3.22)
Profitability		-0.101***		-0.247***		-0.281**		-0.387**
		(-3.81)		(-3.61)		(-2.18)		(-2.45)

Intercept	-0.003	0.064***	0.023***	0.065***	0.055***	0.095**	0.059***	0.133***
	(-1.02)	(5.06)	(5.46)	(2.65)	(8.04)	(2.32)	(7.16)	(2.72)
$\beta_1 + \beta_2$	0.717	-0.922	8.612	3.535	17.624	10.956	22.159	14.456
F-Statistic	0.39	0.52	19.13	2.29	27.79	6.90	20.96	6.20
p-value	0.53	0.47	0.00	0.13	0.00	0.01	0.00	0.01
N	2928	2928	2916	2899	2877	2877	2865	2848
adj. R-sq	0.001	0.014	0.023	0.023	0.088	0.079	0.117	0.104

Figure 1
Market Performance and Institutional Trading Activities around 9/11

This figure plots daily and cumulative daily trading activities of institutional investors and cumulative value-weighted returns of all sample stocks and CRSP stocks for the 20-day period around September 11, 2001. Percentage of buying is institutional buying principal as a percentage of institutional total trading principal (buying plus selling). Trading principal is sum of trading shares multiplied by trading price. Cumulative trading volumes and returns are calculated as of August 27, 2001.

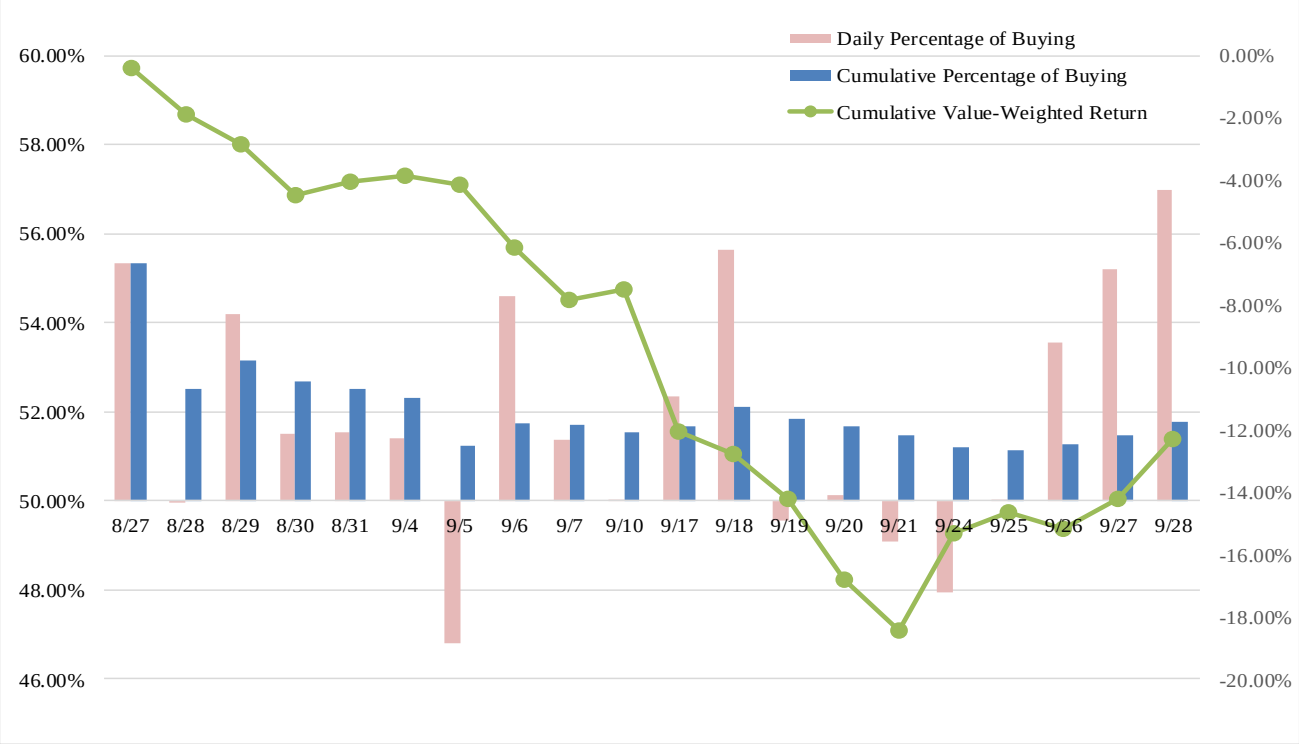


Figure 2
Plan Sponsors versus Investment Managers around 9/11

This figure plots cumulative trading activities of plan sponsors and investment managers for the 20-day period from August 27, 2001, to September 28, 2001. We plot cumulative net buying in millions of dollars and cumulative buying proportions. Cumulative net buying is dollar volume of institutional buying minus dollar volume of institutional selling starting from August 27, 2001. Cumulative buying proportion is total dollar volume of institutional buying divided by sum of institutional buying dollar volume and selling dollar volume.

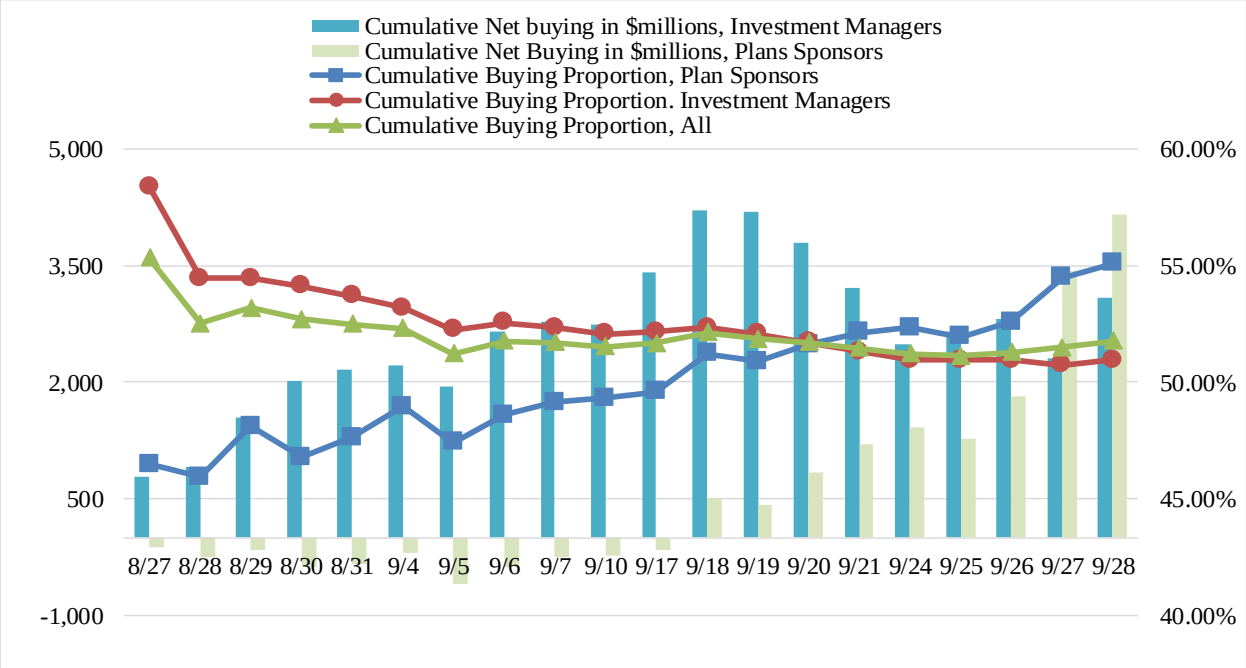
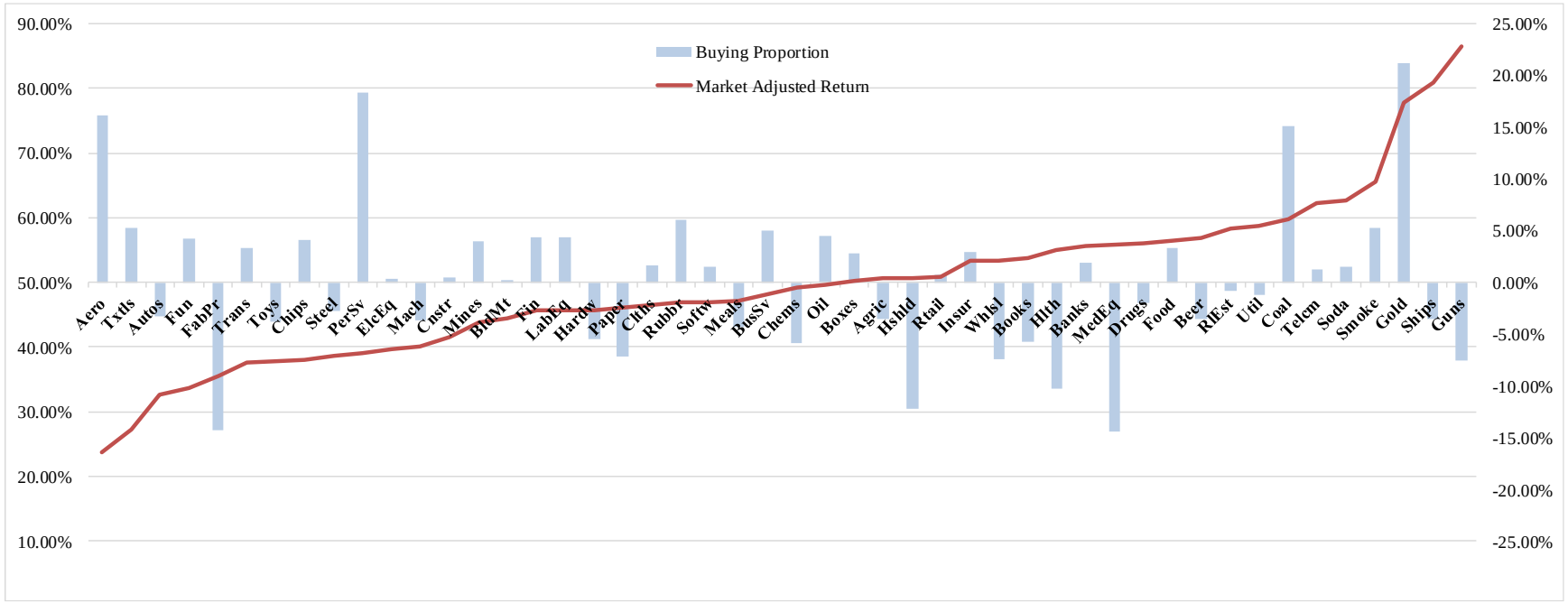


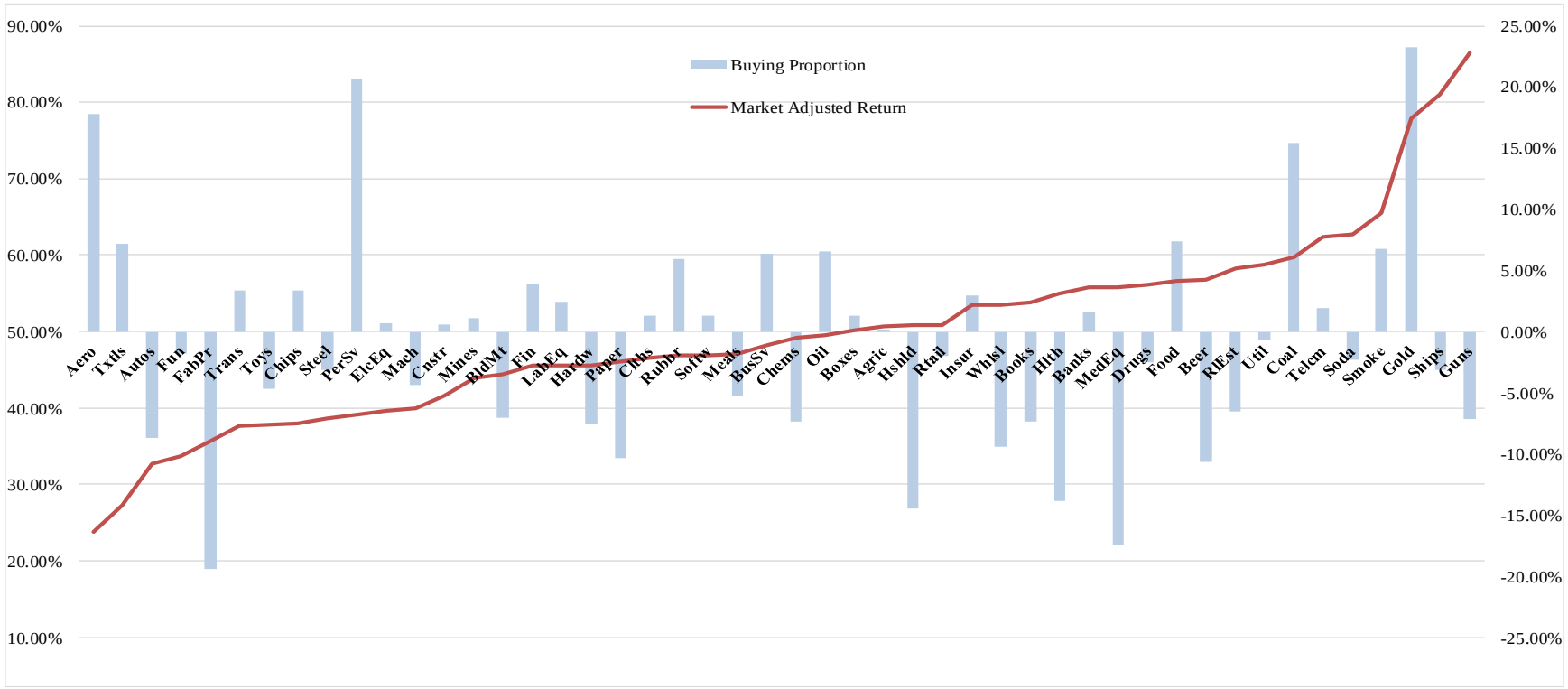
Figure 3
Market-Adjusted Returns and Buying Proportion in Fama-French 48 industries

This figure plots sector returns against *Buy Proportion* of institutional investors for Week 3 of our event window. We use Fama-French 49 identification to define industries (Excluding *Other* industry). The 48 industries are ranked by value-weighted market-adjusted returns and listed from left to the right. Panel A plots trading by all institutions, Panel B plots trading only by investment managers and Panel C plots trading only by plan sponsors.

Panel A: Trading by All Institutions



Panel B: Trading by Investment Managers



Panel C: Trading by Plan Sponsors

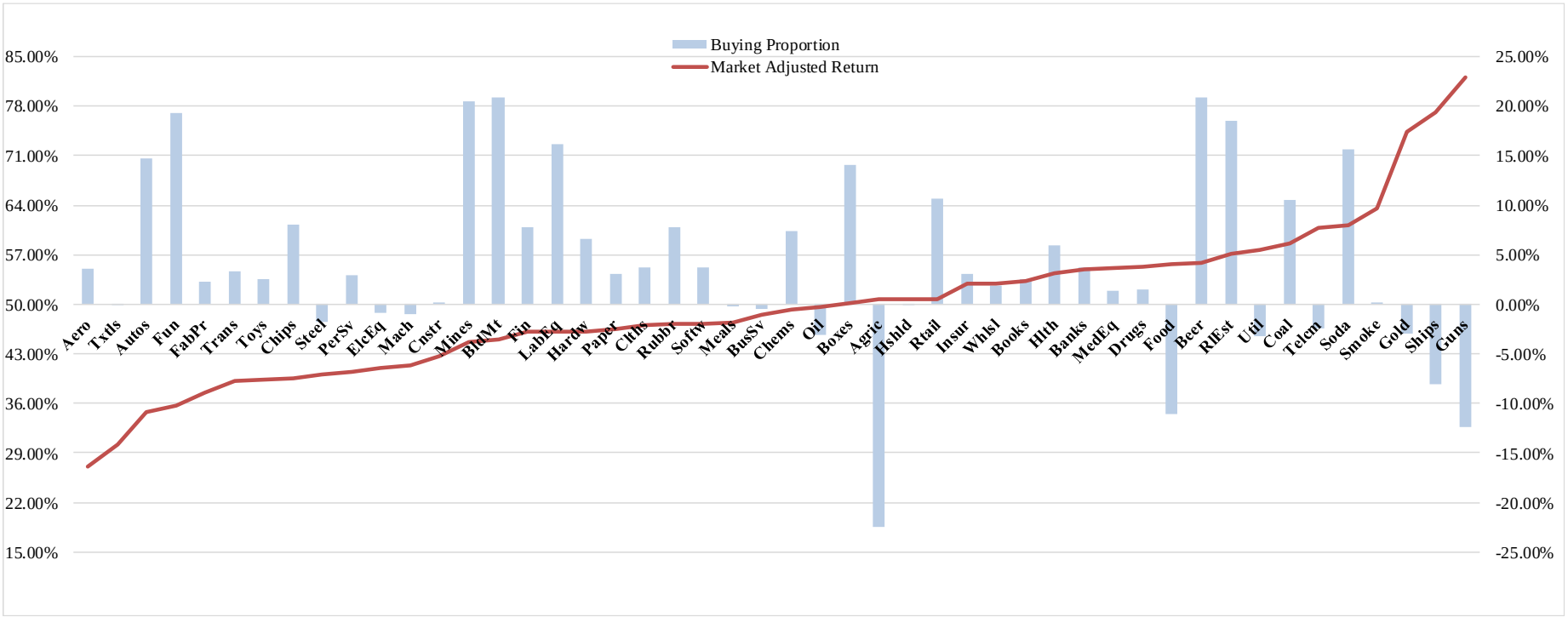


Figure 4
Liquidity Provision and Subsequent Sector Returns

This figure plots groupings of industries by their market-adjusted returns and institutional net buying. Each quadrant represents one trading-return group. Points in the top left quadrant are sectors being bought by institutional investors with negative market-adjusted return in Week 3. Points in the bottom right quadrant are sectors being sold by institutional investors with positive market-adjusted return in Week 3. Points in the top right and bottom left quadrants are classified as trace return sectors, whose institutional trading and market-adjusted returns have the same direction.