Investors' Horizons and the Amplification of Market Shocks

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Abstract

After severe negative market shocks, institutional investors with short trading horizons are inclined or forced to sell their holdings to a larger extent than investors with longer trading horizons. This may amplify the effects of market-wide shocks on the prices of stocks held by short horizon investors. We test the relevance of this mechanism by exploiting the negative shock caused by Lehman Brothers' bankruptcy in September 2008. Consistent with our conjecture, short-term investors sell significantly more than long-term investors around and after the Lehman Brothers' bankruptcy. Most importantly, stocks held by short-term investors experience more severe price drops and larger price reversals than those held by long-term investors. Since they are obtained after controlling for the stocks' exposure to innovations in implied volatility, aggregate liquidity, various firms' and investors' characteristics, including the momentum effect and the propensity of institutional investors to follow an index, our results cannot be explained by characteristics of the institutions' investment styles other than their investment horizons. We also show that the effect of investor trading horizon emerges during other episodes of severe market turmoil, such as the October 1987 market crash. Overall, the empirical evidence strongly indicates that investors' short horizons amplify the effects of market-wide negative shocks.

JEL classifications: G11; G12; G14; G18; G22
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1. Introduction

Investors' trading horizons may depend on preferences, specialization, or external constraints, such as margin constraints and the responsiveness of funds under management to previous returns. When stock prices fall dramatically, investors with short trading horizons are inclined or forced to sell to a larger extent than investors with longer trading horizons (De Long, Shleifer, Summers and Waldmann (1990)). This may amplify the effects of market-wide shocks on the prices of stocks held mostly by short-term investors. In this paper, we investigate to what extent the horizons of the institutional investors holding stocks in a firm affect the share price reaction to severe market-wide bad news, which should, naturally, bear a direct impact on the firm's fundamental value.

Existing theories provide a variety of mechanisms that –more or less directly– lead to this relationship. In limits-to-arbitrage models (Shleifer and Vishny (1997)), institutional investors whose assets under management are highly responsive to previous returns are concerned about short-term returns and sell in periods of market turmoil even if they are aware that prices are below their fundamental values. In coordination failure models (Bernardo and Welch (2003) and Morris and Shin (2004)), a run on financial markets occurs because short-horizon traders sell in anticipation of the sales of other market participants resulting in panic selling. Since a short trading horizon implies that the investor will have to sell in the immediate future with high probability, not selling right away may involve selling behind the rest of the market at even lower prices (i.e., at prices that are even further below their fundamental values). Hence, for a short-term investor, the optimal strategy is to beat the rest of the market by selling immediately to avoid having to sell after a market run. Finally, in collateral-based models (Brunnermeier and Pedersen (2009), amongst others), levered investors exhibit short trading horizons because when stock prices decline considerably they hit their margin constraints and are forced to sell. Setting aside the specific mechanism of different theories, all of them imply that investors with longer trading horizons have the possibility of holding onto their shares and "waiting out the storm" for stock prices to slowly recover to their fundamental values. Thus, during episodes of market turmoil, the selling pressure experienced by different stocks may vary depending on the length of their shareholders' investment horizons.

During these episodes, it may also be hard to find potential buyers. As Shleifer and Vishny (1992) show, when a distressed seller tries to sell an asset, she will face two types of potential buyers: (a) from the same industry, for whom the value of the asset is high, and (b) outside the industry, for whom the value of the asset is presumably lower than the seller's. If buyers in the same industry are distressed, the seller will obtain fire sale prices. Although stocks are fungible, fire sales have been shown to happen also in stock markets (Coval and Stafford (2007)) because other

investors may not have sufficient buying capital when selling pressure is highest or because the stocks sold may have different characteristics from their preferred set. The frictions preventing buying capital to move quickly to temporary undervalued stocks are most significant during episodes of severe market turmoil, precisely because financial intermediaries and other market participants have problems in raising capital (Duffie (2010), and Duffie and Strulovici (2009)). Thus, when panic selling occurs, there may be both supply and demand effects driving prices below their fundamental values. Crucially, these same forces should draw a wedge between the price reaction of shares held by short-term and long-term investors.

Our strategy to explore the empirical relevance of this argument is the following. First, we ask whether stocks held by short-term investors experience larger drops subsequently to market-wide shocks. Second, we identify whether the selling pressure of short-horizon investors indeed drives prices below their fundamental values, by evaluating whether the stocks held by short-term investors experience larger price reversals.

Although we investigate different major market shocks over the 1986-2009 period, our empirical tests mostly focus on the negative shock caused by Lehman Brothers' (henceforth, Lehman) bankruptcy in September 2008 on all market participants. Following this event, there were massive and widespread price drops with the S&P500 losing close to 30% from the day of Lehman's bankruptcy up to the end of December. This prompted withdrawals from hedge funds and mutual funds, which consequently started to sell billion of dollars of securities to meet redemptions. In the business press, these large sales have often been indicated as the determinants of an "overhang for the market".[1] Just a few months after the market low, firms such as Bank of America or Dow Chemicals, were up by over 100%.[2]

We exploit differences in ownership across firms to evaluate to what extent the length of their shareholders' horizon affects the reaction of transaction prices and the subsequent reversals. We measure the horizon of the investors' holding each stock in the CRSP sample. Our main finding can be vividly summarized in Figure 1 (which we describe in detail in Section 4). Comparing the evolution of the cumulative abnormal returns of stocks held by short- and long-term investors around the Lehman shock, it emerges clearly that the stocks held to a larger extent by short-term investors experience more severe price drops and larger price reversals.

[Insert Figure 1 here]

[1] See the Wall Street Journal, November, 7, 2008.
[2] See, for instance, the Financial Times, March 18, 2010.

The mean cumulative abnormal returns up to the first five (ten) weeks following Lehman's bankruptcy are almost -9% (-10%) for stocks held by short-term investors compared to approximately 4% (3%) for stocks held by long-term investors. These severe price drops are then completely reversed by week +25. Both price declines and price reversals are smaller for stocks held to a larger extent by long-term investors. The differences in cumulative abnormal returns are qualitatively similar during other periods of severe market turmoil (as identified using a quantitative rule described in Subsection 4.6), clearly indicating the generalizability of the findings, and fully consistent with our maintained hypothesis that the trading horizon of the institutions holding the stocks acts as an amplifying mechanism.

In the empirical analysis, we ascertain that this result does not depend on the firms' different exposure to market factors, on firm characteristics, including past returns, size, market-to-book, return volatility, industry, liquidity (and possible changes in liquidity during the crisis period itself), on the momentum effect, or on characteristics of the investors' trading strategies other than their horizon. Furthermore, our results are unaffected once we consider the stocks' exposure to aggregate liquidity risk as captured by the Pastor and Stambaugh (2003) measure, and to innovations in market-wide implied volatility as measured by changes in the CBOE Volatility Index (VIX). Innovations in time-varying market volatility, often considered to reflect the probability of a market-wide meltdown, may either change the risk-return trade-off, or the expectations of future returns (Campbell (1996) and Chen (2002)). Thus, it can be argued that the price dynamics we uncover just reflect differences in the stocks' exposure to the probability of a meltdown. However, since our results are robust to controlling for the stocks' exposure to innovations in the VIX index, we can conclude that these alternative channels cannot explain our findings.

Another concern is that active investors trade to generate profits based on valuation beliefs. These may generate two types of problems for our interpretation of the empirical evidence. First, active trading strategies, instead of investors' short trading horizons, may generate selling pressure. Put differently, our proxy for investor horizon may be correlated with omitted factors characterizing a firm's shareholders. Second, investors may sell because of rational beliefs on the future performance of the stocks they hold. This could explain the drops albeit not the reversals.

To test the causal mechanism, we control for differences in shareholders' trading strategies, such as how actively a firm's investors manage their portfolios on average. Most importantly, we recognize that investors trade not only because of valuation beliefs but also because of changes of the assets under management. The latter trades do not contain much information and allow a cleaner identification of the effects of investor horizons on the amplification of shocks. We measure the extent to which the market decline may have shortened the investors' horizon by using the correlation between the investor's previous performance and changes in its assets under

management before our sample period. We surmise that institutional investors with a higher correlation between assets under management and previous performance expect to experience larger outflows during market declines. Using this correlation as an instrument for investor turnover, we exploit only the variation in investor turnover that is less likely to be driven by inside information and other features of the active trading strategy and continue to find that stocks held to a larger extent by short-term investors experience, first, significantly larger price drops, and, then, larger price reversals relative to stocks held by long-term investors.

We also investigate whether the causal mechanism behind our interpretation of the results is supported. If our maintained hypothesis is valid, then we should find that short-term investors sell significantly more than long-term investors during periods of market turmoil and in our event period in particular. For the period 1986-2009, we find clear evidence that short-term institutional investors have significantly larger net sales during periods of market turmoil compared to long-term investors. More specifically to our main event, we find that in the last quarter of 2008, when the largest price declines were experienced, short-term investors sold almost 21% of their portfolio holdings compared to 7% of the holdings sold by long-term investors. Importantly, short-term investors exhibit a higher propensity to sell all the stocks they hold (even the ones mostly held by long-term investors), indicating that their behavior is not driven by any different characteristics of the stocks in their portfolios.

Our paper belongs to a strand of the literature exploring the determinants of the cross-section of stock returns during financial crises. For instance, Lemmon and Lins (2003) and Mitton (2002) explore how corporate governance affected firm performance during the East Asian crisis; Fahlenbrach and Stulz (2011) investigate the determinants of banks' stock price performance during the 2007-2008 credit crisis. Calomiris, Love, and Peria (2010) and Tong and Wei (2011) study the determinants of the cross-section of stock returns of international firms during the 2007-2008 financial crisis.

Our results also contribute to the literature on asset fire sales, which has shown that transaction prices may temporarily deviate from fundamental values (Pulvino (1998), Mitchell, Pulvino, and Stafford (2004), Coval and Stafford (2007), Mitchell, Pedersen and Pulvino (2007), Campbell, Giglio and Pathak (2008), Ellul, Jotikasthira and Lundblad (2010) and Jotikasthira, Lundblad and Ramadorai (2009)). We indicate a new channel that may induce fire sales: The trading horizons of institutional investors. A related strand of literature explores whether after negative shocks, investor trading behavior may cause prices to drop below their fundamental value. Most of the papers in this literature are theoretical with a few notable exceptions. Hameed, Kang and Viswanathan (2010) show that stock liquidity decreases during stock market declines. Furthermore, Manconi, Massa and Yasuda (2011) show that investors more exposed to securitized

bonds, which experienced large price declines, sold more bonds and contributed to depress their prices. None of these papers explores how ownership structure and investor horizons affect stock returns in periods of market turmoil.

Finally, our paper is related to a stream of literature exploring the effects of investor horizon on corporate policies. Bushee (1998), Gaspar, Massa, and Matos (2005), Cella (2009) and Derrien, Kecskes, and Thesmar (2009) show that investors' short horizons affect different aspects of corporate policies. Even more closely related to us, Bushee and Noe (2000) and Bushee (2001) suggest not only that short-term investment may be valued more in firms' whose shareholders have short horizons, but also that increases in disclosure, associated with an increase in short-term investors' shareholdings, increase stock price volatility. Furthermore, Hotchkiss and Strickland (2003) show that investors' trading styles affect the stock price response to negative earning announcements. While these papers suggest that investors' trading horizons may have asset pricing implications, none of them explores whether the trading horizon amplifies negative shocks as we do.

The remainder of the paper is organized as follows. Section 2 describes the sample construction and the summary statistics of the data. Section 3 shows how sales are affected by investor trading horizon. Section 4 discusses the effects on stock returns. Section 5 concludes.

2. Data and Sample

2.1 The Main Event

To explore whether investors' short trading horizons may magnify negative shocks, we start by focusing on the severe market decline surrounding the bankruptcy of Lehman on September 15, 2008. Financial turbulence predated the Lehman's events and started in the residential mortgage sector in August 2007. The impact of the financial crisis, however, was limited to the valuations of financial firms until the first half of 2008. Stock market valuations of non-financial firms and the S&P500 started to decline during the summer 2008.

The market decline was largely connected to the anticipation of Lehman's difficulties: Lehman's top management made repeated moves to attract potential partners during the summer. These moves were unsuccessful.[3] Moreover, the credit default swaps of Lehman started spiking well before September 15, 2008 and increased by 66% in the first two weeks of September.

To fully capture the market decline that started in anticipation of Lehman's difficulties, and that should have produced significant impacts on institutional investors' portfolios, we start our event window from June 1, 2008, i.e., 15 weeks before Lehman's actual bankruptcy, up to the third

[3] One important potential investor was Korea Development Bank, which put talks on hold on September 9, 2008.

week in April 2009, i.e., 30 weeks after the event. During the period under consideration, the S&P500 index experienced a severe decline. The S&P500 stood at around 1,280 at the beginning of our sample period, dropped to almost 1,100 in the week of Lehman's bankruptcy, it fell by nearly 17% during the October 2008, reached a level of around 700 after 23 weeks, and still stood below 1,000 after 30 weeks. From the broad movements of the S&P500 index, we can deduce that the shock related to Lehman's bankruptcy caused an abrupt price reaction that was protracted through time. Figure A in Appendix A illustrates the dramatic movements of the S&P500. As shown in Figure B in the same Appendix, the market decline was accompanied by a sharp increase in the VIX index, a measure of implied volatility in the S&P500 index options, often considered a proxy for fear in the market (Adrian and Shin (2010)). Although we show the VIX index graphically only during our event window, it is worthwhile to mention that while the VIX index had an average value of around 18 in May 2008, its average value over the period June 1 to September 12, 2008 reached 22.5, an almost 19 percentage point increase, indicating a significantly higher level of market fears in the summer 2008.

These large market movements were accompanied by massive outflows from the stock market. In what follows, we explore how this severe shock affected different stocks depending on the trading horizons of the shareholders.

2.2 Sample Construction

We obtain data from a variety of sources. First, we use data on the quarterly holdings of institutional investors that have discretion over 13F securities that are worth $100 million or more from Thomson Financial.[4] We extract data on the holdings of all common stocks traded on New York Stock Exchange (NYSE), NASDAQ and the American Stock Exchange (AMEX). We have no information on short-selling positions. From Thomson Financial, we also obtain insiders' holdings.

Second, we obtain data on share prices, number of shares outstanding, turnover, and liquidity from the Center for Research in Security Prices (CRSP). Finally, information on firm characteristics, such as return on assets, leverage, book value of equity, and cash dividend, is from COMPUSTAT.

2.3 Investor Horizon

We think of investor horizon as a characteristic of the investor's trading style, which is associated either to its trading strategy or to the structure of its liabilities. Institutional investors

[4] The SEC requires that all investment managers with discretion over 13F securities worth $100 million or more report all equity positions greater than 10,000 shares or $200,000 to the SEC at the end of each quarter.

with short trading horizons should buy and sell frequently, while long-term investors should have longer holding periods. Consistent with existing literature, we capture investor horizon using a proxy for investors' portfolio turnover. The churn ratio of institutional investor *i* holding an investment set of firms denoted as *Q* is calculated as follows:

$$CR_{i,t} = \frac{\sum_{j \in Q} \left| N_{j,i,t} P_{j,t} - N_{j,i,t-1} P_{j,t-1} - N_{j,i,t} \Delta P_{j,t} \right|}{\sum_{j \in Q} \frac{N_{j,i,t} P_{j,t} + N_{j,i,t-1} P_{j,t-1}}{2}},$$

where $P_{j,t}$ and $N_{j,i,t}$ are the price and number of shares of stock *j* held by institution *i* at quarter *t*. The value of the churn ratio can range from 0 to 2. This measure was formalized by Gaspar et al (2005) and is similar to measures of institutional investors' trading horizons used by Carhart (1997), Barber and Odean (2000), Bushee (1998, 2000 and 2001), and Yan and Zhang (2009).

When we consider our main event, we compute institutional investors' trading horizon starting from the first quarter of 1990 until the last quarter of 2006.[5] In untabulated results, we find that the churn ratio is very stable for institutions across time, giving us comfort that the trading horizon should be considered as a permanent characteristic of an institutional investor strategy.

2.4 Institutional Investors' Characteristics

Table 1 provides descriptive statistics for our proxy of institutional investors' trading horizons and other major characteristics of their portfolios.

[Insert Table 1 here]

The average (median) churn ratio of all institutional investors is 0.34 (0.22). Importantly for our analysis, there is large variation in institutional investors' churn ratios. For example, institutions with a churn ratio in the 5th percentile on average turn over less than 1% of their portfolio in a quarter, while institutions in the 95 percentile turn over more than 50% of their holdings. It is precisely this variation in the investors' horizons that we conjecture to matter for the impact of market-wide shocks on stock prices.

There are other differences in institutional investors' portfolios, which have been shown to be more or less related to their trading horizon. For instance, institutions are believed to take a longer view on their investments and engage in monitoring firms if they take large stakes (Chen, Harford and Li (2007), and Giannetti and Laeven (2009)). In our sample, individual institutional investors'

[5] Importantly, being the churn ratio predetermined with respect to the episodes of market turmoil we consider, it cannot be affected by the negative market shocks.

shareholdings represent very small stakes (the 95th percentile is only 0.45% of the firm's capital). In untabulated correlations, we find that investors' churn ratios are positively correlated with the size of their stakes, suggesting that long-term investors are unlikely to monitor more in our sample.

Nor does the individual firm account for a large percentage of investors' portfolios: The median stock accounts for 1.41% of the portfolios of institutional investors. Differences in the portfolio weight of stocks appear unrelated to the churn ratios. Also portfolio sizes, both the dollar size and the number of shares held, appear to be unrelated to the institutional investors' trading horizons. The average (median) size of the portfolio of institutions with churn ratios above the median is more than $2,270 million ($359 million) and they hold on average 211 stocks, while the average (median) size of the portfolio of institutions with churn ratio below the median is more than $2,120 million ($282 million) and they also hold on average about 210 stocks.

Institutional investors' horizons may also be related to characteristics of their trading strategies, which may potentially affect the relation with stock prices. For instance, Chen, Jegadeesh and Wermers (2000) and Yan and Zhang (2009) suggest that investors with low churn ratio do not actively manage their portfolios because they may have inferior stock picking ability. These investors' portfolios are thus likely to be closer to the index. In other words, investors with long trading horizons may be more likely to be index funds or behave similarly to them. However, Cremers and Petajisto (2009) show that an investor's portfolio turnover has low correlation with the proportion of the portfolio that deviates from the relevant index. Therefore, our measure of investor horizon should be unlikely to capture how actively investors manage their funds. To be able to control for this portfolio characteristic, we construct the Active Share Measure, a proxy for how much an investor's portfolio deviates from the Russell 1,000 index, similarly to Cremers and Petajisto (2009).

2.5 Classification of Firms' Ownership Structure

Depending on the churn ratio of the investors holding their stocks, firms have different investor turnovers. We use the average churn ratio of the institutional investors holding stocks in each firm to measure the investor turnover for each stock in our sample. This statistic measures the average investment horizon of the institutional investors with an investment position in each firm. Denote S as the set of institutional investors in our sample and $w_{j,i,t}$ as the weight that institutional investor i has in quarter t in stock j as a percentage of the total positions held by all institutional investors. Then, in each quarter, the investor turnover of stock j is measured as the weighted average of the total portfolios churn ratios of its investors over the previous four quarters:

$$\text{Turnover of Firm } j = \sum_{i \in S} w_{j,i,t} \left(\frac{1}{4} \sum_{r=1}^{4} CR_{i,t-r+1} \right)$$

For each firm affected by our main event, we consider the average institutional investors' turnover starting from the first quarter of 1990 until the last quarter of 2006.[6] We include only observations for which we are able to measure investor turnover for at least 5 years.

Overall, our sample includes 3,949 firms. Table 2 provides descriptive statistics for investor turnover (henceforth "IT") at the stock level. Firms exhibit large differences in the horizons of their investors. The average firm's investor turnover is 0.27, but this ranges from 0.16 for firms in the 5th percentile to 0.44 for firms in the 95th percentile of investor turnover.

It is crucial for the design of the empirical analysis and the interpretation of our findings to evaluate whether turnover is systematically associated to firm characteristics. For this reason, we proceed to classify the ownership structure depending on whether a firm's shares are held by short-term institutions or long-term institutions. We classify stocks with investor turnover in the lowest tercile as those held by long-term investors (Low IT firms) and those with values in the highest tercile as held by short-term institutions (High IT firms).[7] Table 2 provides descriptive statistics about the main ownership, stock, and firm characteristics. We use data for 2007. In addition, Panel B of Table 2 describes the time-series averages of the cross-sectional correlation between institutional ownership and various firm characteristics.

[Insert Table 2 here]

The median (average) Investor Turnover of a high IT firm is 0.34 (0.37) and that of a low IT firm is 0.20 (0.19) with the difference being statistically significant. An average turnover of 0.37 (0.19) implies that institutional investors holding these stocks rotate almost 19% (9.5%) of a portfolio in each quarter, and 76% (37%) in each year. This means that on average investors in high turnover firms hold their position for less than 16 months (12 months/0.76), while investors in low turnover firms hold their position for almost 33 months (12 months/0.37).

Table 2 describes additional variables characterizing the firms' ownership structure and their shareholders' portfolios. These are important controls in our analysis, because investor turnover may be related to shareholders' characteristics other than the trading horizon. Importantly, although as noted before individual institutions hold small stakes, collectively, institutions own on average over 20% of the firms' capital. This means that whereas the action of one institution may not have significant impact, the collective action of investors is likely to have important pricing consequences.

[6] For robustness, we also use (i) the average institutional investors' turnover starting from the first quarter of 2006 until the last quarter of 2007, and (ii) the institutional investors' turnover in the first quarter of 2007. Results are very similar to the ones we report hereafter.

[7] We classify firms in high and low IT also using the median investor turnover and compute investor turnover using different periods. Results are very similar to the ones we report hereafter.

While low and high IT firms appear to have similar magnitudes of institutional ownership, insider ownership is significantly larger in firms mostly held by long-term institutions. Since insider owners normally have a long-term interest, this may just reflect that low IT firms have shareholders with longer trading horizons. Nevertheless, in the empirical analysis, we check that our results are robust to differences of insider ownership across our sample of stocks.

Turning to the main stock and firm characteristics, there are some differences between high and low IT firms that we need to take into account in designing our tests. While the market capitalization of firms held by short-term and long-term investors is very similar (a median value of $298 million for low IT firms and $301 million for high IT firms), high IT firms tend to be (a) more growth-oriented than value-oriented (a median market-to-book ratio of 1.89 versus 1.56), (b) more liquid (a median share turnover of 0.59 versus 0.38 and a quoted spread of 0.28% versus 0.30%), and (c) more volatile (a median value of return variability of 1.82% versus 1.62%). On the other hand, the average value of the beta of high IT firms is statistically undistinguishable and only slightly larger relative to low IT firms (0.99 vs. 0.97), suggesting that it is unlikely that the higher return volatility of firms with high investor turnover derives from higher exposure to market risk. Furthermore, for given selling pressure, the higher liquidity of high IT stocks should make it less likely to find larger drops and reversals for these stocks. Finally, it appears that firms with higher investor turnovers have lower leverage and longer debt maturity, which should mitigate the negative effects of market turmoil on these firms.

3. Trading Horizons and Selling Pressure

Our maintained hypothesis implies that during episodes of market turmoil, short-term investors are more likely to sell than long-term investors and, for this reason, prices of shares mostly held by short-term investors are expected to drop more than prices of shares held by long-term investors. Using data on 13F institutional investors' stockholdings, we explore how investors' net (dollar) sales during a quarter vary depending on our proxy for the investor's trading horizon, the churn ratio.

Empirical evidence on this issue is important because selling pressure during episodes of market turmoil may not necessarily be related to investors' trading horizons. For instance, some hedge funds – a category of investors that may have high churn ratios – had strict lock-up periods that limited outflows and had a lower propensity to sell during the crisis (Ben-David, Franzoni, and Moussawi (2010)). On the other hand, index mutual funds – that normally have low churn ratios – without the protection of lock-up periods may face severe redemptions leading to severe selling pressure during periods of crisis.

However, it is plausible that trading horizons and restrictions on investors' withdrawals are decided together to optimize investors' returns. Thus, whether investors with short horizons (high churn ratios) indeed sell more than investors with long horizons (low churn ratios) during a period of market turmoil is an empirical question that we address here before moving on to the main analysis.

We first investigate whether short-term investors sell more than long-term investors during periods of market turmoil. The dependent variable in the analysis is the net (dollar) sales made by each 13F institution during quarter *t* as a percentage of the total holdings of the same institution at the end of quarter *t-1*, defined as follows:[8]

$$\text{Net Sales}_{it} = \frac{\sum_{j \in Q} \left[\Delta N_{i,j,t} \times P_{i,j,t-1} \right]}{\sum_{j \in Q} \left[N_{i,j,t-1} \times P_{i,j,t-1} \right]}$$

We compute the churn ratio as a moving average of the values over the 20 quarters preceding quarter t. The main variable of interest is the interaction of the churn ratio with a dummy variable – which we call "Market Turmoil" - that defines a period during which a market-wide shock was experienced. To define such periods we use both the S&P500 Index and the VIX to guide our classification and proceed as follows. We first calculate monthly changes in the S&P500 index and the VIX index over the period 1986-2009 and use a cut-off point set at the lowest fifth percentile of the S&P 500 returns and at the highest fifth percentile of the VIX changes.[9] The variable market turmoil takes the value of 1 in quarters during which there was a month when the S&P500 returns fell in the bottom fifth percentile and the VIX changes are above the 95th percentile. With this definition, we have three quarters when the market turmoil dummy variable takes the value of 1: the fourth quarter of 1987, the third quarter of 1998, and the third quarter of 2008.

We then extend the analysis at the individual stock level to analyze whether during periods of market turmoil stocks held mostly by short-term investors experience higher selling pressures than stocks mostly held by long-term investors. The dependent variable is total net (dollar) sales made by all 13F institutions during quarter t in firm j as a percentage of the market capitalization of firm j at the end of quarter *t-1*. We compute investor turnover at the firm level as the moving average of the firm's investor turnover over the four quarters preceding quarter *t*. We use the market turmoil dummy variable as defined above and also the variable that interacts market turmoil with investor turnover.

[8] Here we assume that investor sell at the price prevailing at the beginning of the quarter. The results are invariant if we assume that investors sell at the average of the price in quarter *t-1* and *t*.
[9] We start from 1986 because VIX is only available from this year.

[Insert Table 3 here]

Results in Table 3 strongly support the notion that short-horizon investors sell more than long-term investors in periods of market turmoil.[10] The positive and significant coefficient of the interaction of the churn ratio with the market turmoil dummy in Panel A clearly shows that institutional investors with shorter trading horizons sell more during periods of market turmoil, whether we control for investor characteristics by including manager fixed effects or not, and whether we control for market conditions using quarter fixed effects or market returns and volatility. The estimates are also invariant when we control for the size of investors' portfolio (at the end of the preceding quarter). The negative coefficient of the churn ratio in Panel A shows that institutional investors with shorter trading horizons, if anything, sell less than other investors in normal times. The effects are not only statistically but also economically significant. The most conservative estimates in column 4 of Panel A imply that in periods of market turmoil, all institutional investors' net sales increase by the equivalent of almost 0.3 standard deviations for an investor with average net sales and average churn ratio. The increase in net sale is equivalent to over 0.65 standard deviations for an investor with a churn ratio in the top quartile of the distribution but to less than 0.15 standard deviations for investors with a churn ratio in the lowest quartile.[11]

Panel B of Table 4 shows that the differences in trading across investors with different trading horizons when aggregated at the stock level result in different selling pressures across stocks. Institutional investors with higher churn ratio appear to be net buyers of high IT stocks in normal times. However, the interaction of investor turnover with the market turmoil dummy in Panel B shows that in periods of market turmoil, based on estimates in column 4, the net sales of stocks (as percentage of the firms market capitalization) with IT in the top quartile increase by the equivalent of over 0.36 standard deviations with respect to average net sales. This contrasts with an increase of net sales equivalent to 0.19 standard deviations for stocks with IT in the lowest quartile. This result is both qualitatively and quantitatively invariant to the inclusion of different sets of controls for firm characteristics and market conditions.

With this evidence, we can make two important considerations for our analysis. First, the churn ratio captures investors' selling pressure across different market conditions (turmoil vs normal times) and across different institutional investors. Second, investor horizon is indeed related to the selling pressure experienced by different securities during periods of market turmoil. These

[10] In unreported regressions, we find that stocks mostly held by short-term investors indeed had higher share turnover during our sample period.

[11] The results are qualitatively similar to those in Panel A (Panel B) when we use absolute net (dollar) sales rather than net (dollar) sales at the investor level (firm level) scaled by the institutional investor's portfolio (firm's market capitalization) in the preceding quarter.

two considerations are important because they indicate the mechanism through which investor horizons may influence price dynamics of different stocks.

Figure 2 shows that selling pressure is related to investor horizon also during the period of the Lehman's bankruptcy. Focusing on the quarters included in our event window, we see a dramatic increase in the selling activity of short-term investors in the third quarter of 2008 that coincides with the drop period. This large selling pressure is evident when we compare the behavior of short-term investors with (a) long-term investors during the same period, and (b) the normal trading pattern exhibited by short-term investors in most of the quarters outside our event window.[12] Importantly, short-term investors sell to a much lower extent in the fourth quarter, when the reversals start, and, starting from the first quarter of 2009, long-term investors are net buyers.[13]

[Insert Figure 2 here]

Having established that the trading behavior of short-term investors does generate higher selling pressure during episodes of market turmoil, we turn to evaluate pricing implications.

4. Results

4.1. Empirical Methodology

The Lehman's bankruptcy represents a market-wide shock that clearly should be expected to affect stock prices even in the absence of any selling pressure because it also influences firms' fundamentals. To test the hypothesis that short-term investors may have amplified the shock, we compare each firm's actual return with alternative benchmarks capturing the return that the firm would have experienced, given the market-wide shock, but in the absence of any selling pressure. Importantly, the identification comes not from the measurement of firms' abnormal returns relative to the different benchmarks, which we describe below, but from comparing whether firms with short-term investors have systematically lower abnormal returns in the immediate aftermath of the market-wide shock, compared to firms with long-term investors. Put differently, we test whether the high IT stocks experience larger drops first in a univariate setting and then in a multivariate one.

[12] Note that this does not depend (only) on the fact that short-term investors manage more assets. As mentioned in the introduction, short-term investors sold on average 21% of their portfolios, while long-tern investors sold only 7%.

[13] This helps us to evaluate the mechanisms may lead to price reversals. Most theoretical models (e.g., Grossman and Miller (1988), Shleifer and Vishny (1997)) imply that prices converge back to fundamentals because of the resolution of fundamental uncertainty. In this case, the price reversal would not involve large turnover. Another possibility is that fundamental uncertainty does not vary much, but new arbitrage capital arrives or long-term investors significantly expand their positions. We find evidence of capital inflows in stocks held by short-term investors, but these are modest, implying that any reversals partially occur also because of the resolution of fundamental uncertainty.

However, systematic differences in abnormal returns could be justified by different fundamentals that are not adequately captured by our benchmarks. For this reason, similarly to Coval and Stafford (2007) and Mitchell, Pedersen and Pulvino (2007), in an attempt to identify the price pressure generated by short-term investors relative to long-term investors, we then look for evidence of larger price reversals for firms experiencing more severe price drops.

We use two alternative methodologies to obtain stocks' abnormal returns. First, we use the market model to compute stocks' normal returns. We estimate $R_{jt} - R_{ft} = \alpha + \beta(R_{Mt} - R_{ft}) + \varepsilon_{jt}$, where R_{jt}, R_{Mt}, R_{ft} are respectively stock *j*'s weekly return, the weekly return of the market portfolio and the risk free interest rate, and ε_{jt} is an error term. We estimate each stock's beta with the market portfolio using weekly returns from the beginning of 2003 until the end of the first quarter of 2008. We measure the return of the market portfolio with the return of the S&P500 index and the risk free interest rate with the Discount Window Primary Credit rate. The abnormal returns of stock *j* during week *t* are then computed as $AR_{jt} = R_{jt} - \hat{\beta}R_{Mt}$.

Second, similarly to Ikenberry, Lakonishok and Vermaelen (1995), we use a size-and book-to-market-based benchmark. We first sort our sample firms in deciles based on their market capitalization on May 30, 2008; then we further sort each decile of firms in deciles based on their book-to-market ratio on the same date. This sorting results in 100 benchmark portfolios, whose returns are computed as the equally weighted returns of the stocks belonging to each portfolio. Abnormal performance for each stock is then calculated by subtracting from the stock's actual return during week *t*, the return of the appropriate size and book-to-market benchmark during the same week.

Finally, following Coval and Stafford (2007), we compute cumulative abnormal returns for each stock as the sum of the abnormal returns in the relevant event window.

4.2 Univariate Analysis

We start by exploring the mean cumulative abnormal returns of stocks held by institutions with different trading horizons in a univariate setting and then proceed to investigate the robustness of the results in a multivariate setting to control for firm, stock, and ownership characteristics.

In the first three columns of Table 4 we show the mean cumulative abnormal returns calculated from the market model (henceforth "MCAR") for high and low IT firms.

[Insert Table 4]

As also shown in Figure 1, the patterns and magnitude of the difference in the MCARs around the Lehman's bankruptcy for stocks held by short-term and long-term investors is striking. In Table 4 and starting from the period before week 0, we find that the *MCAR*s turn, first, negative several weeks before Lehman's bankruptcy for both sets of stocks and, then, they become slightly positive *only* for stocks held by long-term investors. Specifically, MCARs reach about -7.53% for high IT stocks and are instead positive and equal to 3.36% for low IT stocks in week 0, with the difference being almost 11% and carrying statistically significance at the 1% confidence level.

These differences in the price declines between the two groups of stocks and before week 0 are consistent with the model of Bernardo and Welch (2003) where investors, seeing signs of possible market declines in the near future (the VIX index indicate an increase in financial market risk in the summer of 2008), start re-positioning their portfolios away from stock holdings and into cash positions. Importantly, our maintained hypothesis that stocks held by short-term investors experience larger drops is corroborated by the evidence.

Following week 0, the difference in the MCARs between the two sets of stocks continues to widen but with a somewhat volatile pattern, reaching almost 15% in week +2, 13% in week +4 and remaining in this range until week +11. Most importantly, the difference in the MCARs starts declining from week +13 onwards as the MCARs for both sets of stocks become less negative and especially the MCARs for stocks held by short-term investors quickly recover. The difference in MCARs decreases to -9.44% in week +15 and -4.31% in week +19. Following week +20, the difference in MCARs becomes statistically insignificant and economically small by week +23. Thus, prices seem to stabilize and stop reversing from their drops from week +20 onwards. At this time, as Coval and Stafford (2007) and Mitchell, Pedersen and Pulvino (2007) argue in a similar context, prices may be considered to have converged to their fundamental values. This same pattern in the difference between MCARs can be visually seen in Figure 1.

To investigate the robustness of our results, we also calculate mean cumulative abnormal returns using the size- and book-to-market-based benchmark (FFCARs). The results are shown in the last three columns of Table 4 and in Figure 3. In Figure 3, we also present results excluding financial firms (firms with SIC codes between 6000 and 6799), which may have been more exposed to Lehman's bankruptcy and may affect our results if they attract investors with systematically shorter trading horizon. The pattern and magnitude in the difference of FFCARs of stocks held by short-term and long-term investors is robust to this alternative methodology and across samples, thus confirming the hypothesis that trading horizon acts as an amplification mechanism during episodes of market turmoil. Taken together, the evidence in Table 4 and Figures 1 and 3 indicates that the MCARs reach a minimum in the period spanning from week +8 to week +11 and thus suggests that the reversals may have started around that time.

[Insert Figure 3 here]

In Table 5, we explore more directly whether the empirical evidence is consistent with larger drops and reversals. Our maintained assumption that price drops should be larger for high IT stocks implies that in the interval surrounding the Lehman's bankruptcy, the mean cumulative abnormal returns of stocks held by short-term investors should be significantly lower than those of stocks held by long-term investors. If the differential MCARs between the two groups of stocks are not due to changes in fundamentals, but rather caused by short-term investors' sales, then we should expect investors to slowly return and buy such stocks. In such a case, during the reversal period, which the data indicate to start approximately around week +9, we expect stocks held by short-term investors to experience significantly larger (positive) abnormal returns compared to stocks held by long-term investors.

[Insert Table 5 here]

Panels A and B of Table 5 present the results using MCARs and FFCARs respectively and support our conjecture. For robustness, we consider the whole sample as well as a subsample excluding the financial firms and use alternative windows that are consistent with the drop and reversal periods. We start showing that in the weeks surrounding Lehman's bankruptcy and up to week +8, stocks held by short-term investors clearly underperform stocks held by long-term investors. This result does not depend on the specific interval we choose because the underperformance of high IT stocks is obtained for both a window that starts 10 weeks before the event up to week +8 (the difference in the cumulative abnormal returns of low and high IT stocks using the MCARs is of almost 11% and almost 8% when using the FFCARs) and also for a window that starts in week 0 up to week +8 (the difference in returns using both MCARs and FFCARs is of more than 4%).

To investigate price reversals, we use alternative intervals starting from week +9, when the price decline of high IT stocks start bottoming-out, and measure mean cumulative abnormal returns in subsequent weeks. We construct intervals up to week +25 and another up to week +35. In all cases, it appears that in the weeks subsequent to Lehman's bankruptcy, high IT stocks experience higher abnormal returns than low IT stocks. For example, from week +9 to the period that ranges

from week +25 (week +35), high IT firms have 6.04% (9.12%) higher abnormal returns, when we use MCARs.[14]

The evidence presented so far points clearly to the heterogeneity of price responses across stocks depending on the trading horizon of the investors holding the stocks. Not only the initial declines but also the reversals are influenced by the trading horizon of the investors. This is consistent with our maintained hypothesis that the institution's trading horizon defines its *exposure* to panic selling during episodes of market turmoil.

Next we explore to what extent the heterogeneous price response of the two groups of stocks can be explained by firm and stock characteristics rather than the trading horizon of the institutions holding the stock. For example, Table 2 indicates that stocks held by short-term investors are more liquid and exhibit higher volatility than those held by long-term investors. It is then plausible to argue that the driving mechanism of the difference in MCARs is the set of firm and stock characteristics that attract certain type of investors because of their preferences, and not the trading horizon itself.

To start investigating this line of argument, we first sort firms in quintile portfolios based on each of the characteristics that could most likely differentiate the returns of high and low IT stocks. Thus, we create quintile portfolios using, in turn, stock liquidity, measured by the share turnover; the volatility of stock returns; and the stock past returns. Then, for each of the above quintile portfolios, we compare the MCARs (and the FFCARs) of low and high IT firms in the intervals corresponding to drops and reversals.

[Insert Table 6 here]

The results in Table 6 are broadly consistent with larger drops and reversals for stocks held by short-term investors compared to stocks held by long-term investors, thus confirming that investors' horizons remain crucial even after considering firm characteristics. Even though in a few instances the differences between high and low IT stocks are not statistically significant at conventional levels, the sign of the differences is almost always consistent with our hypotheses.

Importantly, stock liquidity does not appear to reduce the differences in drops and reversals between high and low IT stocks. Selling and buying pressures should be more easily absorbed in liquid stocks. However, short-term investors that need to liquidate their positions may be more likely to sell highly liquid stocks to reduce the negative price impact. Table 6 shows that the differences in the magnitude of drops and reversals between high and low IT stocks is larger for

[14] Note that the deviation of the firms' return from the size and market-to-book portfolios we use here can all be negative, because we are censoring cumulative abnormal returns at the 5% level and the CRSP sample from which we calculate portfolio returns is larger than the sample of firms for which we can measure investor turnover.

stocks with intermediate levels of liquidity. While the market may have been able to absorb the larger selling pressure for the most liquid stocks, it is also possible that as the theoretical model of Brown, Carlin and Lobo (2010) suggests, investors hold on to the most liquid stocks for precautionary reasons and thus the selling pressure concentrates in stocks with intermediate levels of liquidity.

Furthermore, larger drops and reversals for high IT stocks emerge clearly also when we sort stocks on the basis of their past returns. This is comforting because short-term institutional investors –as opposed to the ones with long horizons– are known to be momentum traders (Yan and Zhang, 2009). The robustness of the results across different quintile portfolios sorted on past returns indicates that our results are not driven by the momentum effect.

Since when we use the FFCARs the benchmarks are constructed on the basis of size and book-to-market portfolios, in Table 6, we do not report the comparison for quintiles based on size and book-to-market ratios as these effects are already controlled for. The un-tabulated results for MCARs, available from the authors, are qualitatively similar to those obtained for the other portfolio sorts. Interestingly, our results appear to be stronger both economically and statistically for larger firms. This is encouraging for the following reason. Yan and Zhang (2009) argue that short-term institutions possess superior information about future returns. Any informational advantage should be greater for small firms. If our results were stronger for small firms, it could be possible to argue that short-term institutions' sales are prompted by their informational advantage predicting the more severe drops (albeit not the larger reversals). The empirical evidence, however, does not support this alternative explanation.

4.3 Multivariate Analysis

So far the univariate analysis suggests striking differences between the performance of stocks held by short and long-term investors, even in subsamples of firms that are more similar on the basis of some selected observable characteristics. In this section, we investigate in a multivariate setting whether investor horizons affect firm returns after controlling for firm, stock and ownership characteristics that can potentially affect the exposure of firms to market shocks. In this way, we can also consider that investor turnover varies continuously across the sample firms.

The results for price drops are shown in Table 7. We consider as the drop period the interval [-10, +8], i.e. from the week when stocks start to experience negative abnormal returns until the week when the cumulative abnormal returns of the two groups of stocks appear to bottom-out.

[Insert Table 7 here]

In columns 1 and 2 in Panel A of Table 7, we investigate the effect of investor turnover on the price change during the drop period. Using this dependent variable, we make sure that the results we have shown so far are not an artifact of the specific benchmarks we use to measure normal returns. It clearly emerges that stocks with higher investor turnover experience larger price declines. For instance, in column 2, a one-standard deviation increase in investor turnover is associated with over 6% lower returns.

In the remaining columns of Panel A of Table 7, we use the cumulative abnormal return over the same period as before (from week -10 to week +8), instead of price changes. In this way, we fully control for the firms' exposure to market shocks using the two different benchmarks discussed in Subsection 4.1 and for firm, stock, and investor characteristics. Also in this case, the estimates show a consistently negative effect of investor turnover on firms' stock market performance. Once again the effect is economically large: In column 4, increasing investor turnover by one standard deviation leads to more than 2.5% lower cumulative abnormal returns.

The effect of the trading horizon channel is robust to the inclusion of variables aimed at controlling for competing hypotheses, specifically differences in shareholders' investment style (as proxied by the Active Share Measure), and the possibility that institutional investors pursue momentum trading strategies (as captured by Past Returns). Also, controlling for insider ownership, a feature that in Table 2 appears to differentiate low and high IT stocks, leaves the estimates unaffected. The coefficient of the variable capturing insider ownership is statistically insignificant, confirming our conjecture that insider ownership is somewhat related to investors' trading horizon. Our results are equally invariant to the inclusion of proxies capturing the dependence on firms on bank credit and refinancing, such as the firm's debt maturity and whether the firm is rated B+ or higher by S&P. Finally, the effects that we document are not driven by financial firms which had a central role during the crisis. In fact, the results are equally significant when we investigate non-financial firms only (in columns (6) and (10)) indicating clearly that the horizon effect is not confined to the financial industry.

While so far our results appear to be robust to controlling for time-invariant firm characteristics, and in particular to ex ante differences in firm liquidity, during periods of market-wide turmoil, stock characteristics, such as liquidity, may dramatically change. Although this channel would not be inconsistent with our maintained hypothesis, in Panel B, we revisit our tests in order to be able to control for contemporaneous changes in stock characteristics, such as liquidity. Instead of considering cross-sectional regressions of firms' CARs, we explore the effects of investor turnover in a panel of firm weekly abnormal returns defined for the period [-10, +8]. We cluster the errors at the firm level to account for the possible correlation of returns for the same firm and include week fixed effects to account for systematic shocks affecting all firms at a given date.

In these specifications, we also include firms' previous returns over different intervals to control more carefully for the possibility that our results are due to the momentum effect.

The estimates in Panel B of Table 7 show that even controlling for contemporaneous changes in firm liquidity and past returns over different intervals, investor turnover is still associated to lower abnormal returns. A one-standard deviation increase in investor turnover appears to lead to almost 0.2% lower abnormal returns on average for each week during the drop period. Interestingly, share turnover does not appear to be associated with firm abnormal returns, while the bid-ask spread is positive and marginally significant only in a few regressions. Thus, the price effects we detect appear not to be driven by changes in liquidity.

In Table 8, we perform the same steps as in Table 7 to explore the effects of investor turnover on price reversals. We use the interval from week +9, the week when cumulative abnormal returns appear to bottom-out, to week +25, the week when prices appear to stop their reversal process.

[Insert Table 8 here]

The effect of the investors' trading horizon is robust to the inclusion of various time-invariant (Panel A of Table 8) and time-varying (Panel B of Table 8) control variables and confirms that the more short-term investors hold a stock, the larger is the price reversal. The effect of investor turnover on firms' returns during the reversals is not only statistically but also economically significant: In column 4 of Panel A of Table 8, a one-standard-deviation increase in investor turnover increases firms' cumulative abnormal returns by about 2.25%.

Overall, it appears that our results cannot be explained by firm heterogeneity or by short-term institutions following certain investment styles that have been shown to explain cross-sectional stock returns.

Some of the control variables in Table 7 and Table 8 also provide interesting information and additional support for our maintained hypothesis. For instance, the extent to which institutional investors actively manage their portfolios (as opposed to following an index) is unrelated to the firm's return during drops or reversals (only in column 2 of Panel A of Table 7, we find a marginally significant and negative coefficient of the Active Share Measure variable). This suggests that the return patterns we observe are unlikely to be related to active investors' expectations on firms' future performance.

Interestingly, stocks of firms with high institutional ownership perform better during the drop period, possibly because these stocks are more likely to attract the few financially unconstrained buyers. This interpretation is also supported by the finding that firms whose shareholders experienced smaller negative shocks to their portfolios between 2007 and 2008 (larger change in

portfolio value) experience less severe price drops as well as smaller reversals (although the evidence is weaker in the latter case).

Finally, it is comforting to find that stocks' abnormal returns after the market decline are related to firms' fundamentals in a plausible way. The market turmoil surrounding the Lehman's bankruptcy determines lower returns for high leverage firms, which are likely to have higher demand for commercial and investment banking services. Also, unsurprisingly, firms with high profitability perform better during the market decline.

4.4 Tackling Potential Omitted Factors

Although our results are invariant to the inclusion of a long list of controls, there may still be concerns that our estimates are driven by omitted factors. For instance, if our proxy for investor horizon were related to investors' stock picking ability, high churn ratio investors could anticipate the drop in stock prices and for this reason sell more. Using such an argument it would be hard to interpret the systematic reversals we observe. Furthermore, our Active Share Measure controls for this possible channel.

Nevertheless, we can provide further evidence that our results are unlikely to be driven by this and other omitted factors as follows. Our measure of churn ratio captures not only trades whose motivation is to generate profits based on valuation beliefs, but also trades motivated by other reasons, such as redemptions causing net outflows. During periods of market turmoil, defined as in Section 3, the cross-sectional correlation between the churn ratio and net outflows for the mutual funds in our dataset, the only institutional investors for which we can observe net outflows from CRSP mutual funds, is 0.57 and is significant at the 5% level (the correlation is 0.47 and also significant at the 5% level if we consider all quarters from 1986 to 2009). Trading induced by net outflows has been shown not to contain much information (Alexander, Cici, and Gibson (2007)) and directly captures that investor horizon is shortened by external constraints of the investor, not by firm characteristics.

To capture the variation in investor horizon due to forced trades, we compute the correlation between institutions' previous portfolio performance (generated *solely* by the price changes of the stocks held in their portfolios) and change in assets under management over the period spanning from 1990 to 2006. Since we observe ownership at a quarterly frequency, we compute the correlation using the returns on the assets under management at the quarter *t-1* and the subsequent

change in assets under management between *t* and *t+1*, net of any price changes of assets already in the portfolio at *t-1*. We call this measure as the Trading-Performance Sensitivity 1.[15]

Since existing literature has shown that there are non-linearities in the flow-performance relation (e.g., Chevalier and Ellison (1997)) and we are particularly interested in the relation between previous price performance and assets under management during severe market declines, we also compute this same correlation only for periods of poor market performance. In practice, we compute the correlation between previous performance and assets under management using only the quarters in which the performance of the S&P500 is classified in the bottom decile of the distribution of all quarterly S&P500 returns over the period from 1990 to 2006. We call this measure Trading-Performance Sensitivity 2.

Both in good and in bad times, the correlation between previous performance and assets under management may differ depending on the institution's reputation, nature of investment etc. Especially during bad times, investors with lower correlation between assets under management and previous performance have the possibility to take a longer horizon on their investment and are expected to have lower investor turnover. Although in Table 1 the correlations between previous performance and assets under management are small (and even negative), they are positive and large in the right tail of their distributions: It is precisely this large variation that helps us to identify exogenous differences in trading. Used as instruments, these correlations help to capture forced trades due to expected outflows and redemptions following the market turmoil surrounding the Lehman's bankruptcy.

We average Trading-Performance Sensitivity 1 and Trading-Performance Sensitivity 2, weighing each of them with the ownership stakes of the different investors, as we do for obtaining investor turnover. We use these averages as instruments in our cross-sectional regressions (with a slight abuse of notation, we continue to refer to them using the same labels).[16] As shown in Panel B of Table 2, the correlation between Trading-Performance Sensitivity 1 and the investor turnover is positive and statistically significant at the 10% level. Trading-Performance Sensitivity 2 is even more highly related to the firm's investor turnover.

Based on the test developed by Staiger and Stock (1997), Trading-Performance Sensitivity 1 and 2 are strong instruments for investor turnover as in the first stage, after controlling for all other regressors included in the second stage, the instruments appear to be strongly significant and their

[15] We consider this predetermined measure preferable to actual flows not only because it is available for the whole sample of institutional investors, but also because differently from outflows it is predetermined. While outflows can be driven by expectations on future performance of the assets held by the fund, our instrument cannot.

[16] Since previous literature explores the correlation between previous performance and assets under management considering one-year intervals, in alternative specifications that we do not report for brevity, we use as instruments also other three correlations using the contemporaneous correlation between assets under management and performance during the same quarter and the correlation between assets under management and performance at t-2 and t-3, respectively. The results are qualitatively similar to the ones we report in Table 9.

joint F test is 36.32. In addition, in all cases, but one, the test of over-identifying restrictions does not allow us to reject the null that the instruments are valid.

[Insert Table 9 here]

The instrumental variables estimates presented in Table 9 confirm our previous findings that stocks with high investor turnover experience more severe drops and then larger reversals. In all cases, the coefficient increases in absolute value suggesting that the measurement errors in the ordinary least squares estimates reduce the magnitude of the coefficients.

The instrumental variable estimates indicate that omitted factors are unlikely to drive our results. While instruments cannot be proved to be uncorrelated with omitted factors beyond any doubt, the following simple test provides quite convincing evidence that short-term investors sold more in the aftermath of the market decline because of their horizon and not because they held stocks that on some unobservable dimensions –not included and not correlated with our long list of controls– may have justified their sales. We examine the trading behavior of short-term institutions in stocks mostly held by their peers (high IT firms) and in stocks held mostly by long-term investors (low IT firms). If short-term investors sold more than long-term investors in an indiscriminate way, i.e., across all the stocks held in their portfolios, irrespective whether they are low or high IT stocks, then it would be extremely unlikely that omitted factors drive our results.

In Figure 4, we first sort stocks on the basis of their investor turnover and, then, institutional investors on the basis of their churn ratio. For each type of institutional investor, we report the total dollar value of shares purchased of high (low) IT firms minus the dollar value of shares sold of high (low) IT firms divided by the total dollar value of their investment in high (low) IT firms. Clearly, short-term investors exhibit very similar propensities to liquidate both high and low IT stocks. For example, in the third and fourth quarter of 2008, short-term investors had a net selling position equivalent to more than 8% of both high IT stocks and low IT stocks they held in their portfolio.[17]

[Insert Figure 4 here]

In summary, the empirical evidence strongly suggests that massive selling originated mostly from short-term investors' trading strategy, not from the characteristics of the stocks in their portfolios.

[17] Recall that the net selling pressure is obtained for each type of institutional investor and for a particular group of stocks (low IT vs. high IT) as a proportion of the dollar amount invested in that group of stocks. Hence, while the selling pressure of short-term investors as measured here is roughly similar between high IT and low IT stocks, the *absolute* dollar amount of selling is much larger for high IT stocks because the amount invested in these stocks by short-term investors is larger than what they invest in low IT stocks.

4.5 Other Market Factors

The market decline surrounding the Lehman's bankruptcy coincides with a sharp increase of the VIX index which reflects significantly higher implied volatility and can be interpreted as the price of the risk of market volatility.[18] The volatility risk premium increases in times of high uncertainty and when panic selling occurs. To this extent, it is perfectly consistent with our maintained hypothesis that the wedge in returns between high and low IT stocks we observe is large when the VIX index increases.

However, Ang, Hodrick, Xing, and Zhang (2006) show that innovations in aggregate volatility risk help explain the cross-section of stock returns. Because of their different exposure to aggregate volatility risk, low and high IT stocks could have different return skewness. In turn, this channel, rather than the trading behavior of institutional investors, could explain the differences in returns we uncover. Furthermore, since the VIX index measures the investors' assessed probability of a market meltdown (Adrian and Shin (2010)), which itself changed dramatically during our event period, it can be argued that the price patterns we observe just reflect the stocks' exposure to the probability of a meltdown. To evaluate the merit of these criticisms, in what follows, we re-estimate normal returns using the multifactor model suggested by Ang, Hodrick, Xing, and Zhang (2006). In practice, we augment the market model that we have used to estimate normal returns so far by including the changes in the VIX index as an additional factor. We then obtain abnormal returns using the deviations of the actual returns of each firm from its normal returns computed using the multifactor model.[19] Panel A of Figure 5 replicates Figure 1 but the CARs are obtained after controlling for stocks' exposure to the VIX index. Our findings are unaffected and the statistical significance of the (unreported) differences in the CARs of high and low IT stocks is comparable to Table 5.

[Insert Figure 5 here]

Similar concerns could arise with respect to stocks' exposure to liquidity risk. Pastor and Stambaugh (2003) show that expected stock returns are related cross-sectionally to the sensitivities of stock returns to fluctuations in aggregate liquidity. One of the most important features of the market shock soon after Lehman's bankruptcy was the significant drying up of liquidity. It can be argued that it is precisely these liquidity dynamics, and the different exposure of stocks to liquidity risk, that may be driving our results. To evaluate this line of argument against our maintained

[18] The VIX index represents the implied volatility of a synthetic at-the-money option on the S&P 100 with a maturity of 1 month.

[19] Another way to capture the probability of a market meltdown would be using the CDX index. However, there are no models that use the CDX index as a pricing factor for stocks. For this reason, we use the VIX index instead.

hypothesis, we construct the Pastor and Stambaugh's aggregate liquidity factor with weekly frequency and estimate a multifactor model including the market return and the aggregate liquidity factor as suggested by Pastor and Stambaugh (2003). Our findings are unaffected from a qualitative point of view, as shown in Panel B of Figure 5, and differences in CARs remain highly statistically significant (not reported for brevity).

Thus, we can conclude that neither the stocks' exposure to the varying probability of a market meltdown nor the exposure to aggregate liquidity risk can explain the larger drops and reversals of high IT stocks relative to low IT stocks. These results confirm that investors' trading horizon plays a significant role as an amplifying mechanism of market-wide shocks.

4.6 Other Events

One may question whether the patterns we have shown are confined to the period surrounding the Lehman's bankruptcy or instead emerge also in the aftermath of other episodes of market turmoil. To explore the generalizability of our findings, we consider the other two periods of significant market turmoil identified using large increases in the VIX accompanied by large decreases in the S&P500, as explained in Section 3. The first event is the market crash of October 1987, when the S&P500 dropped by almost 20% in one month and the VIX increased by 187% (from 21.42 points to 61.41 points). The second event coincides with the market turmoil following the Russian default in August 1998, when the S&P500 dropped by over 13% and the VIX increased by almost 56% (from 26.27 points to 40.95 points).

In addition to these two major events, we also note that while the most recent financial crisis had its epicenter following Lehman's bankruptcy, there were two other events of interest before September 2008. The first one was the so-called Quant crisis in August 2007 and the second was the market decline surrounding the bailout of Bear Stearns in March 2008. During the first event, the VIX rose by almost 70% (from 17 points in the middle of July to 29 in the middle of August), while during the second event the VIX rose by almost 29% (from 26 points in middle of February to 34 points in the middle of March). Given their importance, we also include these two other events in our analysis.

[Insert Figure 6 and Table 10 here]

Figure 6 reports differences in the MCARs of high and low IT stocks for each of these four events, while Table 10 repeats the multivariate analysis. The length of the episodes of market turmoil and the frictions affecting how quickly buying capital moves to undervalued stocks may vary across episodes. Therefore, one should not expect the duration of drops and reversals to be

strictly comparable across all four episodes. Given the different nature of these crises, we concentrate on the magnitude of price drops and reversals. The findings of both Figure 6 and, especially Table 10, provide strong support for the hypothesis that around significant market declines, stocks held to a larger extent by short-horizon investors experience larger drops and reversals.

Consistently with the fact that none of these episodes coincided with a widespread financial crisis in U.S. markets, like the period surrounding the Lehman shock, the economic effects of a one-standard-deviation increase in investor turnover on the MCAR are somewhat smaller than for our main event. During the drop (reversal) period, the economic effect goes from slightly less than -1% (1%) for the 1987 crash to approximately -2% (2.2%) for the Russian crisis. These results show that our findings do not appear to be specific to the events of the fall 2008, but more generally indicate systematic differences in firm returns performance during episodes of market turmoil depending on the horizon of the institutional investors holding the stock.

5. Conclusions

This paper investigates whether institutional investors' short horizons amplify the effects of market-wide shocks on stock prices. Short-term and long-term institutional investors have different specialization, incentives and constraints that should have direct impacts on their trading behavior during episodes of severe market turmoil and may consequently affect the prices of the stocks they hold. Since short-term returns are more important for investors with short-term horizons, we expect short-term investors to sell the stocks they hold during severe market declines to a larger extent than long-term investors who have the possibility of waiting out the storm and hold onto their shares. Thus, during these episodes, the selling pressure experienced by different firms may vary depending on the length of their shareholders' investment horizons. We find that indeed short-term investors sell significantly more than long-term investors around and after the Lehman's bankruptcy.

As a consequence, the stocks that are mostly held by short-term investors experience more severe price drops and larger price reversals than those held by long-term investors even after controlling for firm characteristics, such as liquidity, volatility, size and book-to-market. Neither are the results driven by the characteristics of the investors' trading styles, such as active management or momentum trading strategies. Importantly, the effects of investor horizons on stock prices we highlight are not confined to the period after the Lehman's bankruptcy but emerge also during other periods when U.S. markets experienced market turmoil. Overall, this empirical evidence indicates that investors' short horizons amplify the effects of severe stock market declines.

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Appendix A

Figure A
The S&P 500 Movements Before and After Lehman Brothers' Bankruptcy

The graph shows the cumulative abnormal returns of the S&P 500 Index from June 1, 2008 until April 17, 2009. Week 0 is the week when Lehman Brothers' bankruptcy occurred (the week beginning on Monday September 15, 2008).

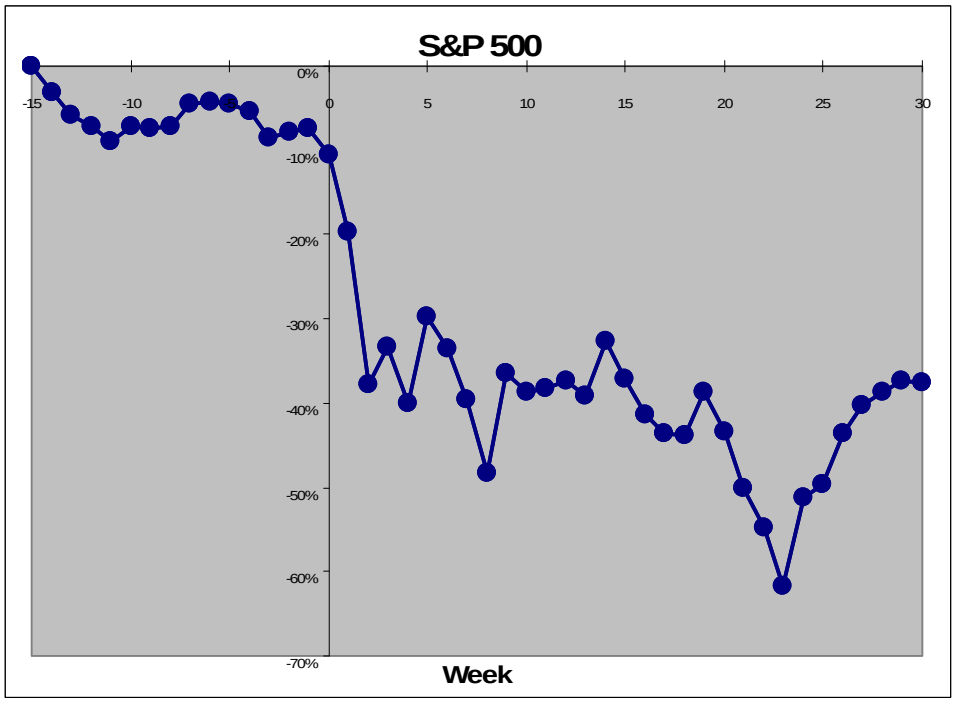
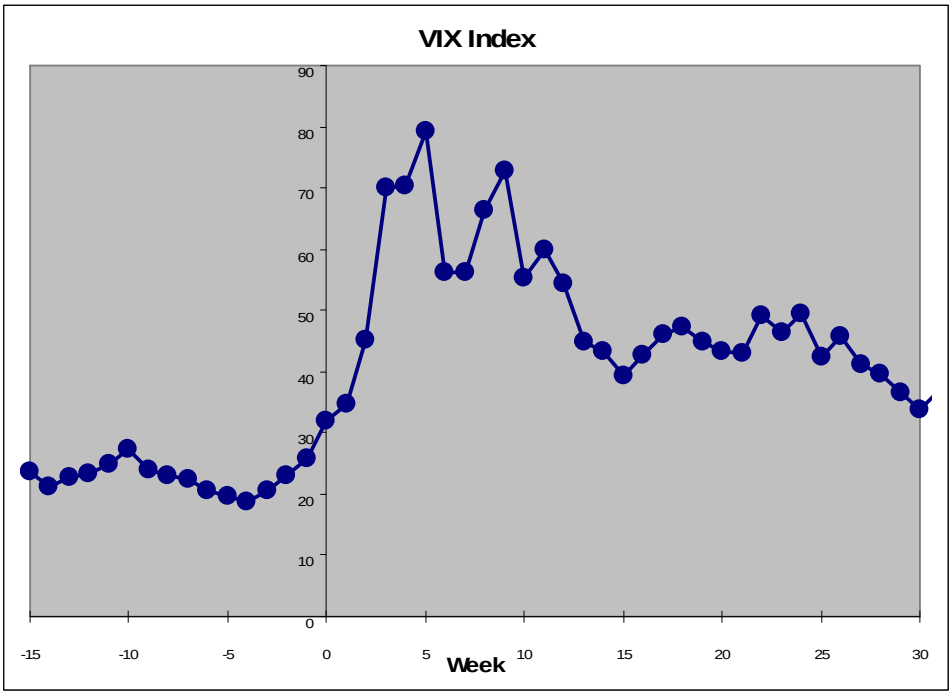


Figure B
CBOE Volatility Index (VIX) Movements

The graph shows the movements in the CBOE Volatility Index from June 1, 2008 until April 17, 2009. Week 0 is the week when Lehman Brothers' bankruptcy occurred (the week beginning on Monday September 15, 2008).



Appendix B
Variable Definitions

Panel A. Investors' Portfolios Characteristics

Churn Ratio	The churn ratio measures how frequently institutional investors rotate their positions on all the stocks of their portfolio and is constructed as in Gaspar *et al.* (2005), p. 9.
Change in Portfolio Value	For each institutional investor, we calculate the difference between the value of the investor's portfolio at the end of the year 2007 and at the end of February 2008, as follows: $$c_i = \sum_{j \in Q} N_{j,i}(p_{feb08} - p_{dec07}).$$ Then, we capture changes in portfolio value of the investors in each firm using the following weighted average: $$\text{Change in Portfolio Value}_i = \sum_{i \in Q} w_{i,j} c_i$$ where $w_{i,j}$ is given by the total number of shares held by investor i in firm j divided by the total number of shares held by all investors in the last quarter of the year 2007.
Active Share Measure	The active share measure captures the proportion of an institutional investor's portfolio that deviates from the benchmark index (see p. 3335 of Cremers and Petajisto (2009) for details). We use the Russell 1,000 for the year 2006 as the benchmark index. The Russell 1,000 is usually rebalanced the last Friday in June; therefore our active share measure is computed over the period from the third quarter of 2006 until the first quarter of 2007.
Trading-Performance Sensitivity 1	The correlation for each institutional investor i between the portfolio performance in quarter t and net trading (buying less selling) in quarter t+1. Portfolio performance is computed in the following way. First, we compute the change in the price for each stock j held by each institutional investor i between the beginning of quarter t and the end of quarter t. Second, we multiply the price change of each stock j with the dollar weight of stock j in the portfolio of investor i at the beginning of the quarter t. In this way, we obtain the portfolio performance due to price changes of the stocks held by investor i. We measure the net trading of investor i as the number of shares bought during quarter t multiplied with the price at the end of quarter t less the number of shares sold during quarter t multiplied with the price at the end of quarter t. Computed over the period from the first quarter of 1990 until the fourth quarter of 2006.
Trading-Performance Sensitivity 2	This correlation measure is calculated as Trading-Performance Sensitivity 1 but only for quarters during which the S&P 500 Index experiences the largest declines. We first calculate and then sort the quarterly performance of the S&P 500 from 1990 to 2006 and use exclusively the quarters with index performances in the bottom decile. Each of these quarters represents quarter t. Then, we measure the correlation for each institutional investor i between the portfolio performance in quarter t and net trading (buying less selling) in quarter t+1 as explained for the Trading-Performance Sensitivity 1.

Panel A. Continued - Investors' Portfolios Characteristics	
Percentage Ownership	The percentage ownership of a 13F institutional investor in a firm.
Portfolios Size	The total value, in million of dollars, of the institutional investor's portfolio at the end of each quarter.
Portfolio Weight	The weight that each stock has in the institutional investor's portfolio at the end of each quarter. This variable is constructed as: $$w_{i,j,t} = \frac{N_{j,i,t} * p_{j,t}}{\text{portfolio size}_{i,t}}$$ where $N_{j,i,t}$ represents the number of shares of stock j held by investor i at the end of the quarter t and $p_{j,,t}$ represents the price of stock j at the end of quarter t. Portfolio size is the size, in million of dollars, of the portfolio of investor i at the end of the quarter t.
Number of Stocks	For each quarter, the total number of stocks for which an institutional investor filed a 13F.

Panel B. Ownership Characteristics	
Investor Turnover	A firm's investor turnover is measured as the weighted average of the total portfolio churn ratios of its investors over the previous four quarters. In the analysis that focuses on Lehman Brothers' bankruptcy, for each firm, we consider the average institutional investors' churn ratios starting from the first quarter of 1990 until the last quarter of 2006. For the October 1987 crash, we measure investors' churn ratios in the last quarter of 1986; for the Russian default, we measure investors' churn ratios in the last quarter of 1997; for the Quant crisis, we measure investors' churn ratios in the last quarter of 2006 and for the bailout of Bear Stearns, we measure investors' churn ratios in the last quarter of 2007.
Institutional Ownership	The percentage of the shares held by all institutional investors.
Insider Ownership	The percentage of the shares held by insiders (founders, CEOs, etc).
Ownership Concentration	The Herfindal index of the institutional investors' ownership in each firm.
Number of Institutional Investors	The number of institutional investors in each firm.

Panel C. Stock Characteristics	
Market Cap	The company's shares outstanding multiplied by current market price (in million of dollars).
Market-to-Book	The market value of equity divided by the book value of common equity
Share Turnover	The daily volume of shares transacted divided by the number of shares outstanding.
Bid-Ask Spread	The average difference between bid and ask quotes divided by the daily price.
Beta	The beta of stock j is calculated using the market model.

Panel C. Continued - Stock Characteristics	
Past Returns	For the Lehman Brothers' event, this variable is given by the daily stock returns over the 180 days before June 1, 2008. For the other events, this variable is given by the daily stock returns over the last 180 days of the year before the one in which each event occurred.
Return Variability	For the Lehman Brothers' event, this variable is measured as the standard deviation of daily stock returns over the preceding two years starting from June 1, 2008. For the other events, this variable is given by the standard deviation of daily stock returns over the last month of the year before the one in which each event occurred.
Dividend Yield	The dividends per share divided by share price.

Panel D. Firm Characteristics	
Firm Size	The natural logarithm of total assets as of the month of December in the year before the one in which each event occurred.
Debt Maturity	Long-term debt maturing in 2008 divided by the firm total long-term debt.
S&P Rating	A dummy variable equal to one if the S&P domestic long-term issuer credit rating in December 2007 is above or equal B+ and zero otherwise.
Return on Assets	Net income at time *t* divided by total assets at time *t-1*, where t is the year before the one in which each event occurred.
Leverage	The book value of debt divided by the book value of total assets as of December of the year before the one in which each event occurred.

Table 1
The Portfolios of Institutional Investors

This table describes the main characteristics of the institutional investors' portfolios. All variables are defined in Appendix B and are winsorized at the 5% level. Active Share Measure is an average computed over the period from the third quarter of 2006 up to and including the first quarter of 2007. Trading-Performance Sensitivity 1 and 2 are measured for the entire period from 1990 to 2006. All other variables are computed as averages for each quarter of 2007.

	N	Mean	SD	P05	Median	P95
Churn Ratio	2,622	0.34	0.35	0.02	0.22	1.08
Active Share Measure	2,055	29.00%	10.11%	9.14%	29.96%	43.97%
Trading-Performance Sensitivity 1	1,812	-0.08	0.19	-0.37	-0.09	0.25
Trading-Performance Sensitivity 2	2,038	-0.05	0.23	-0.40	-0.06	0.36
Percentage Ownership	2,622	0.16%	0.15%	0.01%	0.11%	0.45%
Portfolio Size	2,622	2,190	7,340	23	315	9,420
Portfolio Weight	2,622	4.47%	12.37%	0.11%	1.41%	16.67%
Number of Stocks	2,622	211	465	6	71	922

Table 2
Descriptive Statistics

This table presents descriptive statistics about the main ownership, stock, and firm characteristics of the stocks held by institutional investors. For the last quarter of the year 2007, we obtain ownership data from Thompson Reuters, stock information from CRSP and accounting information from COMPUSTAT. We divide the entire sample in terciles using firms' investor turnover measured by the average investor turnover over the period 1990-2006. A firm is classified as a firm held by long-term institutional investors (Low IT Firm) if it belongs to the first tercile. A firm is classified as a firm held by short-term institutional investors (High IT Firm) if it belongs to the third tercile. Panel A reports descriptive statistics for the firms' ownership characteristics, their institutional investors' portfolio characteristics, the stock and firm characteristics of the entire sample, High IT Firm and Low IT Firms. We also report the Wilcoxon test for the difference in the medians of the various variables between low and high IT firms. Panel B provides the time-average of the cross-sectional pairwise correlation coefficients between the ownership characteristics, the stock and firm characteristics for the entire sample. We report the significance level of correlation coefficients using the Bonferroni adjustment. In Panel B, * indicates significance at 10% or less. All variables shown are described in Appendix B and are winsorized at the 5% level.

Panel A. Ownership Characteristics and Investors' Portfolio Characteristics

		Whole Sample					High IT Firms			Low IT Firms			Test
Variable	N	Mean	SD	P05	Median	P95	Mean	Median	SD	Mean	Median	SD	p-value
Ownership Characteristics													
Investor Turnover	3,949	0.27	0.09	0.16	0.26	0.44	0.37	0.34	0.09	0.19	0.20	0.03	0.000
Active Share Measure	3,941	26.04%	3.90%	19.50%	26.40%	31.20%	25.74%	26.08%	4.10%	26.22%	26.55%	4.19%	0.003
Trading-Performance Sensitivity 1	3,936	-0.09	0.07	-0.16	-0.10	0.02	-0.07	-0.08	0.08	-0.10	-0.11	0.07	0.000
Trading-Performance Sensitivity 2	3,940	-0.06	0.08	-0.15	-0.07	0.06	-0.04	-0.05	0.08	-0.07	-0.08	0.08	0.000
Institutional Ownership	3,923	21.57%	16.16%	1.82%	18.51%	50.88%	19.90%	15.43%	16.02%	19.10%	15.62%	14.99%	0.319
Insider Ownership	3,218	22.09%	22.21%	0.80%	13.07%	72.72%	22.13%	11.88%	23.38%	23.32%	14.80%	21.51%	0.000
Ownership Concentration	3,934	6.67%	11.20%	1.00%	2.81%	24.73%	7.05%	3.50%	10.53%	8.09%	3.19%	13.36%	0.252
Number of Institutional Investors	3,946	74	74	5	51	223	57	40	54	77	46	87	0.029
Investors' Portfolio Characteristics													
Portfolios Size	3,949	31,400	12,100	16,700	29,100	54,300	30,500	28,700	10,100	35,200	32,900	15,000	0.000
Portfolio Weight	3,949	0.18%	0.21%	0.01%	0.13%	0.51%	0.21%	0.15%	0.24%	0.14%	0.09%	0.18%	0.000
Number of Stocks	3,949	1,962	587	1,172	1,888	3,050	1,957	1,884	533	2,087	2,020	667	0.000

Panel A. Continued - Stock Characteristics and Firm Characteristics

		Whole Sample					High IT Firms			Low IT Firms			Test
Variable	N	Mean	SD	P05	Median	P95	Mean	Median	SD	Mean	Median	SD	p-value
Stock Characteristics													
Market Cap	3,948	1,040	1,840	35	365	4,380	704	301	1,220	1,210	298	2,300	0.612
Market-to-Book	3,160	2.19	1.59	0.51	1.70	5.78	2.46	1.89	1.78	1.94	1.56	1.39	0.000
Share Turnover	3,934	0.69%	0.57%	0.06%	0.53%	1.87%	0.78%	0.59%	0.62%	0.50%	0.38%	0.46%	0.000
Bid-Ask Spread	3,937	0.52%	0.68%	0.10%	0.26%	1.80%	0.50%	0.28%	0.62%	0.66%	0.30%	0.83%	0.098
Beta	3,949	0.99	0.23	0.65	0.99	1.32	0.99	0.97	0.29	0.97	0.97	0.20	0.145
Price	3,949	19.76	14.02	3.55	15.41	49.04	16.48	13.53	12.00	22.22	17.79	15.03	0.000
Past Returns	3,521	-12.45%	20.10%	-49.81%	-10.20%	20.02%	-14.90%	-11.61%	20.67%	-11.49%	-9.70%	19.49%	0.000
Return Variability	3,949	1.62%	0.44%	0.71%	1.70%	2.20%	1.67%	1.82%	0.50%	1.58%	1.62%	0.37%	0.000
Dividend Yield	1,038	1.46%	3.50%	0.16%	0.67%	3.72%	1.83%	0.71%	3.81%	1.11%	0.70%	2.65%	0.413
Firm Characteristics													
Firm Size	3,418	5,262	56,689	31	639	10,401	1,256	391	2,899	9,354	840	82,873	0.000
Return on Assets	3,117	1.69%	10.08%	-19.19%	2.76%	14.16%	-0.29%	2.04%	12.52%	2.91%	2.58%	7.14%	0.000
Debt Maturity	2,067	16.68%	24.98%	0	4.64%	77.91%	20.73%	5.36%	29.22%	14.76%	5.06%	21.24%	0.088
S&P Rating	3,949	5.24%	22.29%	0	0	1	4.11%	0	19.86%	6.00%	0	23.76%	0.028
Leverage	3,254	18.35%	17.46%	0.00%	14.42%	52.57%	16.58%	10.00%	18.43%	18.68%	15.83%	15.93%	0.000

Panel B. - Correlation Matrix

	Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Ownership Characteristics								
(1)	Investor Turnover	1.00						
(2)	Active Share Measure	-0.06*	1.00					
(3)	Trading-Performance Sensitivity 1	0.15*	-0.17*	1.00				
(4)	Trading-Performance Sensitivity 2	0.20*	-0.15*	0.93*	1.00			
(5)	Institutional Ownership	-0.03	0.24*	-0.22*	-0.18*	1.00		
(6)	Insider Ownership	-0.02	-0.04	0.00	0.01	-0.04	1.00	
(7)	Ownership Concentration	0.01	-0.14*	0.22*	0.17*	-0.49*	0.02	1.00
Stocks' Characteristics								
(8)	Market Cap	-0.11*	0.26*	-0.12*	-0.11*	0.49*	-0.05	-0.23*
(9)	Market-to-Book	0.13*	0.02	-0.08*	-0.06*	0.22*	0.03	-0.10*
(10)	Share Turnover	0.14*	0.11*	-0.10*	-0.06*	0.57*	-0.07*	-0.31*
(11)	Bid-Ask Spread	-0.04	-0.17*	0.21*	0.16*	-0.50*	0.09*	0.57*
(12)	Beta	0.00	0.06*	-0.09*	-0.07*	0.32*	-0.01	-0.23*
(13)	Price	-0.16*	0.24*	-0.14*	-0.12*	0.51*	-0.02	-0.27*
(14)	Past Returns	-0.07*	0.01	-0.01	-0.02	0.05	-0.01*	-0.03
(15)	Return Variability	0.09*	-0.05	-0.02	0.02	0.21*	0.15	-0.06*
(16)	Dividend Yield	0.08	-0.03	0.05	0.04	-0.04	-0.04	-0.04
Firms' Characteristics								
(17)	Firm Size	-0.04	-0.01	-0.01	-0.02	0.02	-0.07*	-0.03
(18)	Return on Assets	-0.14*	0.06	-0.04	-0.04	0.27*	0.03	-0.11*
(19)	Debt Maturity	0.08*	-0.10*	0.05	0.05	-0.12*	0.02	0.07
(20)	S&P Rating	-0.03	0.05	-0.05	-0.04	0.14*	-0.03	-0.10*
(21)	Leverage	-0.06*	0.14*	-0.03	-0.02	0.13*	-0.04	-0.08*

Panel B. Continued - Correlation Matrix

	Variable	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
Stocks' Characteristics														
(8)	Market Cap	1.00												
(9)	Market-to-Book	0.17*	1.00											
(10)	Share Turnover	0.18*	0.13*	1.00										
(11)	Bid-Ask Spread	-0.29*	-0.14*	-0.39*	1.00									
(12)	Beta	0.09*	0.02	0.39*	-0.21*	1.00								
(13)	Price	0.57*	0.20*	0.21*	-0.41*	0.05	1.00							
(14)	Past Returns	0.13*	0.09*	-0.13*	-0.12*	-0.07*	0.22*	1.00						
(15)	Return Variability	-0.09*	0.18*	0.32*	0.12*	0.40*	-0.12*	-0.20*	1.00					
(16)	Dividend Yield	-0.03	0.04	0.10	-0.02	0.12*	0.04	-0.16*	0.15*	1.00				
Firms' Characteristics														
(17)	Firm Size	0.11*	-0.07*	0.02	-0.05	0.02	0.07*	0.02	-0.06*	0.00	1.00			
(18)	Return on Assets	0.21*	0.05	0.01	-0.17*	-0.02	0.36*	0.19*	-0.22*	0.01	0.00	1.00		
(19)	Debt Maturity	-0.11*	0.7	-0.02	0.2*	-0.08*	-0.13*	-0.05	0.16*	-0.03	0.02	-0.11*	1.00	
(20)	S&P Rating	0.20*	-0.08*	0.06*	-0.10*	0.05	0.11*	0.00	0.00	-0.03	0.13*	-0.00	-0.11*	1.00
(21)	Leverage	0.15*	-0.08*	0.09*	-0.11*	0.03	0.14*	0.00	-0.18*	0.15	0.03	0.00	-0.32*	0.18*

Table 3
Investor Horizons and Selling Pressure

This table presents OLS regressions for the quarterly net dollar sales made by all 13F institutions during the period 1986-2009 at the institutional investor level (Panel A) and at the individual firm level (Panel B). The dependent variable in Panel A is the net (dollar) sales (total dollar sales less total dollar purchases) made by each 13F institution during quarter t as a percentage of the total dollar holdings of the same institution at the end of quarter t-1. The dependent variable in Panel B is the total net (dollar) sales made by all 13F institutions during quarter t as a percentage of the market capitalization of the same firm at the end of quarter t-1. The variable Market Turmoil takes the value of 1 in quarters during which there was a month when the S&P500 returns fell in the bottom fifth percentile of the returns distribution over 1986-2009 and the VIX changes are above the 95th percentile during the same period. Market Returns is the return on the S&P500 in quarter t. Market Returns Volatility is the standard deviation of the S&P500 daily returns during quarter t. Share characteristics are monthly and measured at the end of quarter t-1, while firms' characteristics are measured at the end of year t-1. Variable definitions are found in Appendix B. Dependent variables are winsorized at the 5% level. All regressions include the constant term, but the coefficient is not reported. Standard errors are White-corrected for heteroskedasticity. P-values are in parentheses. * indicates significance at 1% (***), 5% (**), 10% (*).

Panel A: Selling Pressure at the Institutional Investor Level

	(1)	(2)	(3)	(4)
Churn Ratio x Market Turmoil	**7.472****	**6.500*****	**3.522*****	**3.523*****
	(0.045)	(0.000)	(0.000)	(0.000)
Market Turmoil	**5.913****	**1.052****	**1.039****	**1.029****
	(0.044)	(0.046)	(0.024)	(0.026)
Churn Ratio	-0.176	**-0.299***	**-0.202***	**-0.203***
	(0.534)	(0.054)	(0.062)	(0.062)
Market Characteristics				
Market Returns			-0.014**	-0.014**
			(0.015)	(0.016)
Market Returns Volatility			-0.007	-0.007
			(0.825)	(0.829)
Investors' Portfolio Characteristics				
Portfolio Size				-0.131
				(0.265)
Quarter Fixed Effects	Yes	No	No	No
Manager Fixed Effects	No	Yes	Yes	Yes
N	168,785	168,785	168,785	168,785
R^2	0.0909	0.1348	0.1351	0.1351

Panel B: Selling Pressure at the Stock Level

	(1)	(2)	(3)	(4)
Investor Turnover x Market Turmoil	**1.717****	**2.526****	**2.514****	**2.481****
	(0.024)	(0.018)	(0.012)	(0.012)
Market Turmoil	**1.360*****	**1.174*****	**1.180*****	**1.218*****
	(0.000)	(0.000)	(0.000)	(0.000)
Investor Turnover	**-0.327****	**-0.374****	**-0.389****	**-0.287****
	(0.029)	(0.021)	(0.025)	(0.024)
Market Characteristics				
Market Returns		**-0.054*****	**-0.054*****	**-0.052*****
		(0.000)	(0.000)	(0.000)
Market Returns Volatility		**-0.182*****	**-0.179*****	**-0.208*****
		(0.000)	(0.000)	(0.000)
Stock Characteristics				
Past Returns				**-0.102*****
				(0.000)
Share Turnover				**-46.684***
				(0.088)
Firm Characteristics				
Firm Size			-0.022	-0.027
			(0.587)	(0.531)
Leverage			-0.126	-0.158
			(0.428)	(0.324)
Return on Assets			**0.272***	**0.194***
			(0.062)	(0.175)
Quarter Fixed Effects	Yes	No	No	No
Firm Fixed Effects	Yes	Yes	Yes	Yes
N	452,081	452,081	452,081	452,081
R^2	0.1238	0.1424	0.1584	0.1641

Table 4
Mean Comparison test of Weekly Cumulative Abnormal Returns

This table reports mean cumulative abnormal returns of high and low IT stocks. We divide the entire sample in terciles using firms' investment horizons measured by the average investors' turnover over the period 1990-2006. A firm is classified as a firm held by long-term institutional investors (Low IT Firm) if it belongs to the first tercile. A firm is classified as a firm held by short-term institutional investors (High IT Firm) if it belongs to the third tercile. The first three columns show the weekly cumulative abnormal returns calculated using the market model (MCAR) while the last three columns present the weekly cumulative abnormal returns calculated using the Fama and French's methodology (FFCAR). We report a mean comparison test for the difference of mean between the two groups. The average number of observations per week is 3,095 in the test that uses MCAR and 1,742 observations per week in the test that uses FFCAR. * indicates significance at 1% (***), 5% (**), 10% (*). Cumulative abnormal returns are winsorized at the 5% level.

	MCAR			FFCAR		
	(1)	(2)	(3)	(4)	(5)	(6)
Week	High IT Firms	Low IT Firms	(1)-(2)	High IT Firms	Low IT Firms	(4)-(5)
-15	-1.78%	-1.43%	-0.35%	-0.22%	0.09%	-0.31%
-14	-0.71%	-0.82%	0.11%	-0.21%	-0.21%	-0.01%
-13	-1.80%	-1.74%	-0.06%	-0.26%	-0.42%	0.16%
-12	-4.14%	-4.32%	0.17%	0.04%	-0.49%	0.53%
-11	-3.77%	-3.40%	-0.37%	-0.64%	-0.17%	-0.47%
-10	-3.79%	-2.17%	**-1.62%*** **	-0.85%	0.49%	**-1.34%** **
-9	-2.35%	0.19%	**-2.55%*** **	-1.92%	1.34%	**-3.26%*** **
-8	-2.16%	0.84%	**-3.00%*** **	-1.64%	1.59%	**-3.23%*** **
-7	-4.39%	-0.08%	**-4.31%*** **	-1.97%	1.67%	**-3.64%*** **
-6	-3.20%	1.39%	**-4.59%*** **	-2.11%	1.93%	**-4.04%*** **
-5	-3.85%	0.33%	**-4.19%*** **	-1.49%	1.50%	**-2.99%*** **
-4	-2.26%	1.64%	**-3.90%*** **	-1.40%	1.37%	**-2.77%*** **
-3	-2.15%	3.00%	**-5.16%*** **	-2.24%	2.29%	**-4.53%*** **
-2	-5.07%	2.60%	**-7.67%*** **	-2.79%	3.35%	**-6.13%*** **
-1	-5.54%	4.90%	**-10.44%*** **	-4.23%	5.18%	**-9.41%*** **
0	-7.53%	3.36%	**-10.89%*** **	-4.36%	5.29%	**-9.65%*** **
1	-8.55%	3.98%	**-12.53%*** **	-4.51%	6.87%	**-11.38%*** **
2	-10.65%	4.12%	**-14.77%*** **	-4.58%	8.11%	**-12.69%*** **
3	-8.18%	4.71%	**-12.90%*** **	-3.97%	8.25%	**-12.23%*** **
4	-9.36%	3.55%	**-12.91%*** **	-3.12%	8.37%	**-11.49%*** **
5	-8.92%	3.69%	**-12.61%*** **	-3.67%	8.47%	**-12.14%*** **
6	-7.81%	4.12%	**-11.93%*** **	-3.05%	8.35%	**-11.40%*** **
7	-9.64%	2.41%	**-12.05%*** **	-3.43%	9.21%	**-12.64%*** **
8	-12.44%	0.37%	**-12.81%*** **	-3.86%	8.67%	**-12.54%*** **
9	-10.06%	2.28%	**-12.34%*** **	-3.35%	8.62%	**-11.97%*** **
10	-9.99%	2.87%	**-12.86%*** **	-1.67%	9.93%	**-11.59%*** **
11	-8.28%	3.78%	**-12.06%*** **	-2.50%	8.77%	**-11.28%*** **
12	-5.34%	6.00%	**-11.34%*** **	-2.34%	8.89%	**-11.22%*** **
13	-4.92%	6.64%	**-11.56%*** **	-2.76%	8.65%	**-11.41%*** **
14	-4.11%	6.76%	**-10.87%*** **	-4.06%	4.65%	**-8.72%*** **
15	0.08%	9.52%	**-9.44%*** **	-5.30%	2.57%	**-7.87%*** **
16	0.88%	9.30%	**-8.42%*** **	-4.85%	3.19%	**-8.04%*** **
17	0.63%	7.45%	**-6.82%*** **	-4.21%	3.12%	**-7.33%*** **
18	2.39%	7.50%	**-5.11%*** **	-3.48%	2.43%	**-5.91%*** **
19	2.50%	6.80%	**-4.31%** **	-2.51%	2.27%	**-4.78%*** **
20	4.57%	7.02%	-2.45%	-2.49%	2.04%	**-4.53%*** **
21	4.08%	5.91%	-1.83%	-1.73%	2.04%	**-3.77%** **
22	5.29%	7.52%	-2.22%	-0.55%	1.80%	-2.35%
23	5.22%	4.77%	0.46%	-0.55%	2.00%	-2.55%
24	4.88%	6.09%	-1.21%	-0.14%	2.58%	**-2.72%** *
25	7.03%	8.01%	-0.98%	-0.68%	1.81%	-2.48%
26	5.94%	8.96%	-3.02%	-2.84%	0.86%	**-3.71%** **
27	7.25%	10.34%	-3.09%	-2.70%	-0.02%	**-2.68%** *
28	7.66%	11.94%	**-4.28%** **	-2.39%	-0.42%	-1.97%
29	8.54%	13.47%	**-4.93%** **	-2.59%	-1.60%	-0.99%
30	9.31%	13.65%	**-4.34%** **	-2.41%	-2.45%	0.03%
31	9.81%	13.74%	**-3.93%** **	-2.67%	-3.88%	1.21%
32	10.25%	14.40%	**-4.15%** **	-4.79%	-5.22%	0.43%
33	12.16%	13.96%	-1.80%	-3.92%	-5.64%	1.72%
34	12.73%	14.03%	-1.30%	-3.27%	-6.33%	**3.06%** **
35	13.42%	12.77%	0.65%	-2.40%	-7.11%	**4.70%** **

Table 5
Drops and Reversals

This table compares the cumulative abnormal returns of stocks held by short term investors and stocks held by long-term investors over different intervals (windows). We divide the entire sample in terciles using the average investors' turnover over the period 1990-2006. A firm is classified as a firm held by long-term institutional investors (Low IT Firm) if it belongs to the first tercile. A firm is classified as a firm held by short-term institutional investors (High IT Firm) if it belongs to the third tercile. Panel A shows the cumulative abnormal returns calculated from the market model (MCAR), while Panel B shows the cumulative abnormal returns calculated using the Fama and French's methodology (FFCAR). The last column of both Panel A and Panel B reports cumulated average sample abnormal returns over the event window for the entire sample. In each panel, we report the result of a mean comparison test for the difference of the mean between the two groups. * indicates significance at 1% (***), 5% (**), 10% (*). Abnormal returns are winsorized at the 5% level.

Panel A: Cumulated Abnormal Returns calculated using the Market Model (MCAR)

	Whole Sample			Non- Financial Firms Only			Entire Market
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Windows	High IT Firms	Low IT Firms	(1)-(2)	High IT Firms	Low IT Firms	(4)-(5)	$\overline{CAR}(\tau_1,\tau_2)=\sum_{\tau=\tau_1}^{\tau_2}\overline{AR}_\tau$
Drop							
[-10,8]	-7.87%	2.79%	**-10.66%*** **	-10.99%	-1.48%	**-9.51%*** **	-4.94%
[0,8]	-5.48%	-1.22%	**-4.26%*** **	-7.28%	-2.72%	**-4.56%*** **	-5.05%
Reversal							
[9, 25]	4.42%	-1.62%	**6.04%*** **	-0.20%	-2.38%	**2.18%** **	1.96%
[9,35]	8.57%	-0.55%	**9.12%*** **	0.39%	-1.93%	**2.32%***	4.50%

Panel B: Cumulated Abnormal Returns calculated using the Fama and French Methodology (FFCAR)

	Whole Sample			Non- Financial Firms Only			Entire Market
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Windows	High IT Firms	Low IT Firms	(1)-(2)	High IT Firms	Low IT Firms	(4)-(5)	$\overline{CAR}(\tau_1,\tau_2)=\sum_{\tau=\tau_1}^{\tau_2}\overline{AR}_\tau$
Drop							
[-10,8]	-2.23%	5.68%	**-7.91%*** **	-3.61%	2.88%	**-6.49%*** **	1.16%
[0,8]	-0.27%	3.87%	**-4.14%*** **	-0.91%	2.72%	**-3.62%*** **	2.66%
Reversal							
[9, 25]	-2.19%	-7.87%	**5.67%*** **	-1.93%	-5.47%	**3.54%*** **	-9.24%
[9,35]	-6.82%	-15.72%	**8.90%*** **	-6.70%	-11.70%	**5.00%*** **	-19.68%

Table 6
Drops and Reversals across Firms with Different Characteristics

This table reports and compares the cumulative abnormal returns of low and high IT stocks over different windows. We divide the entire sample in terciles using firms' investment horizons measured by the average investors' turnover over the period 1990-2006. A firm is classified as a firm held by long-term institutional investors (Low IT Firm) if it belongs to the first tercile. A firm is classified as a firm held by short-term institutional investors (High IT Firm) if it belongs to the third tercile. Stocks are (independently) sorted in quintiles based on their characteristics measured at the end of the year 2007 (1 indicates the lowest quintile; 5 indicates the highest quintile). We sort firms in quintiles based on their share turnover, volatility, and past returns. Stock characteristics are described in Appendix B. We report the result of a mean comparison test for the difference of the mean between high and low IT firms. Panel A shows results using cumulative abnormal returns calculated from the market model (MCAR), while Panel B shows results using the cumulative abnormal returns calculated using the Fama and French's methodology (FFCAR). * indicates significance at 1% (***), 5% (**), 10% (*).When the statistical significance of the mean comparison test differs from that of the Wilcoxon rank-sum test, the latter is reported in parentheses. Abnormal returns are winsorized at the 5% level.

Panel A: Cumulated Abnormal Returns calculated using the Market Model (MCAR)

		Share Turnover			Return Volatility			Past Returns		
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Drop		High IT Firms	Low IT Firms	(1)-(2)	High IT Firms	Low IT Firms	(4)-(5)	High IT Firms	Low IT Firms	(7)-(8)
	1	2.25%	8.72%	**-6.47%*** **	2.66%	14.10%	**-11.44%*** **	-4.18%	-2.64%	-1.54%
	2	-0.67%	5.42%	**-6.09%*** **	-0.81%	10.44%	**-11.25%*** **	-5.22%	6.99%	**-12.20%*** **
[-10, 8]	3	-8.96%	3.46%	**-12.41%*** **	-3.65%	3.54%	**-7.19%*** **	-4.56%	8.27%	**-12.83%*** **
	4	-9.31%	0.50%	**-9.80%*** **	-9.33%	-2.17%	**-7.15%*** **	-0.15%	7.96%	**-8.11%*** **
	5	-12.76%	-3.09%	**-9.66%*** **	-15.56%	-12.56%	-3.00%	-17.37%	3.20%	**-20.57%*** **
	1	2.72%	5.07%	**-2.35%***	1.51%	6.95%	**-5.44%*** **	-5.62%	-6.20%	0.58%
	2	-2.02%	0.16%	**-2.18%***	-2.91%	1.60%	**-4.51%*** **	-8.01%	-1.77%	**-6.23%*** **
[0,8]	3	-5.51%	-3.58%	-1.93%	-3.43%	-3.14%	-0.29%	-5.18%	1.07%	**-6.25%*** **
	4	-10.28%	-6.27%	**-4.01%** **	-8.30%	-5.78%	**-2.52%***	0.11%	2.36%	**-2.25%***
	5	-9.64%	-10.30%	0.66%	-10.82%	-8.94%	-1.88%	-8.45%	1.39%	**-9.84%*** **
Reversal										
	1	8.98%	2.09%	**6.89%*** **	29.36%	10.85%	**18.51%*** **	0.84%	-6.07%	**6.91%*** **
	2	16.21%	-0.89%	**17.10%*** **	3.46%	-2.02%	**5.48%*** **	-0.44%	-5.18%	**4.75%** **
[9, 25]	3	8.23%	-3.91%	**12.14%*** **	1.50%	-6.15%	**7.65%*** **	11.14%	2.72%	**8.42%*** **
	4	1.66%	-5.29%	**6.95%*** **	-0.27%	-6.69%	**6.42%*** **	15.49%	6.12%	**9.37%*** **
	5	-3.78%	-7.67%	**3.89%***	-4.45%	-7.14%	2.69%	2.44%	-3.55%	**5.99%*** **
	1	15.00%	5.91%	**9.09%*** **	50.29%	18.02%	**32.27%*** **	3.86%	-4.81%	**8.68%*** **
	2	28.85%	0.13%	**28.72%*** **	9.90%	0.28%	**9.62%*** **	3.50%	-2.71%	**6.21%** **
[9, 35]	3	16.50%	-6.56%	**23.05%*** **	0.15%	-7.05%	**7.20%** **	21.30%	2.67%	**18.63%*** **
	4	4.69%	-6.27%	**10.96%*** **	1.05%	-10.02%	**11.07%*** **	23.70%	10.21%	**13.50%*** **
	5	-7.77%	-5.47%	-2.30%	-6.64%	-9.42%	2.78%	2.58%	-5.09%	**7.67%*** **

Panel B: Cumulated Abnormal Returns calculated using the Fama and French's Methodology (FFCAR)

		Share Turnover			Return Volatility			Past Returns		
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Drop		High IT Firms	Low IT Firms	(1)-(2)	High IT Firms	Low IT Firms	(4)-(5)	High IT Firms	Low IT Firms	(7)-(8)
	1	-0.33%	7.33%	**-7.66%*** **	0.58%	13.87%	**-13.29%*** **	-5.69%	-3.31%	-2.38%
	2	-1.48%	8.68%	**-10.17%*** **	0.95%	10.69%	**-9.74%*** **	-2.13%	6.85%	**-8.98%*** **
[-10, 8]	3	-4.46%	10.63%	**-15.09%*** **	0.64%	7.46%	**-6.81%*** **	0.29%	9.81%	**-9.53%*** **
	4	-1.83%	5.71%	**-7.54%*** **	-4.24%	3.11%	**-7.35%*** **	2.24%	9.41%	**-7.17%*** **
	5	-4.99%	1.01%	**-6.00%** **	-8.59%	-7.37%	-1.22%	-4.81%	10.80%	**-15.61%*** **
	1	3.31%	7.22%	**-3.91%** **	1.31%	11.96%	**-10.64%*** **	-3.72%	-3.96%	0.24%
	2	0.48%	6.70%	**-6.22%*** **	3.47%	6.57%	**-3.10%* **	-1.25%	2.98%	**-4.23%*** **
[0,8]	3	-0.67%	6.66%	**-7.34%*** **	2.68%	4.51%	-1.83%	1.49%	6.51%	**-5.02%*** **
	4	0.39%	2.49%	-2.10%	-0.83%	0.41%	-1.23%	2.52%	7.95%	**-5.42%*** **
	5	-3.08%	-5.08%	2.00%	-4.71%	-4.74%	0.03%	0.77%	9.75%	**-8.98%*** **
Reversal										
	1	-3.62%	-8.81%	**5.19%*** **	-2.23%	-5.10%	**2.88%** **	-4.81%	-11.62%	**6.81%*** **
	2	-5.17%	-9.79%	**4.62%*** **	-4.60%	-9.49%	**4.90%*** **	-6.59%	-9.33%	**2.73%* **
[9, 25]	3	-2.55%	-8.99%	**6.44%*** **	-3.55%	-11.47%	**7.93%*** **	-1.48%	-4.62%	**3.14%** **
	4	-2.33%	-7.67%	**5.35%*** **	-1.54%	-7.72%	**6.18%*** **	-0.17%	-4.45%	**4.28%*** **
	5	-1.33%	-6.18%	**4.85%** **	-3.60%	-7.31%	**3.71%** **	-6.40%	-0.20%	**6.20%*** **
	1	-15.26%	-21.73%	**6.48%*** **	-5.13%	-17.53%	**12.40%*** **	-10.15%	-17.90%	**7.74%*** **
	2	-9.28%	-23.55%	**14.27%*** **	-14.87%	-22.68%	**7.81%*** **	-12.71%	-19.63%	**6.92%*** **
[9, 35]	3	-5.95%	-23.25%	**17.30%*** **	-12.10%	-22.74%	**10.65%*** **	-6.08%	-16.41%	**10.33%*** **
	4	-8.26%	-16.82%	**8.56%*** **	-8.94%	-19.04%	**10.10%*** **	-4.74%	-16.94%	**12.20%*** **
	5	-7.16%	-7.29%	0.13%	-7.12%	-14.47%	**7.35%*** **	-6.36%	-18.56%	**12.19%*** **

Table 7
Multivariate Analysis of Price Drops

Panel A reports the results of OLS cross-sectional regressions. The dependent variable is the price change between week -10 and week +8 in column 1 and 2, the MCARs between week -10 and week +8 in columns 3 to 6, and the FFCARs between week -10 and week +8 in columns 7 to 10. Panel B reports the results of OLS panel regressions using as the dependent variable the abnormal return of firm j in week t where t is between week -10 and week +8. In these specifications, we are able to control for contemporaneous time-varying stocks characteristics. Variable definitions are found in Appendix B. Dependent variables are winsorized at the 5% level. All regressions include the constant term, but the coefficient is not reported. Standard errors are White-corrected for heteroskedasticity. P-values are in parentheses. * indicates significance at 1% (***), 5% (**), 10% (*).

Panel A: Cross-Sectional Regressions – Window [-10,+8]

	Price Change		MMCAR				FFCAR			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Investor Turnover	**-0.598*** **	**-0.601*** **	**-0.252*** **	**-0.252*** **	**-0.242** **	**-0.251*** **	**-0.380*** **	**-0.378*** **	**-0.423*** **	**-0.368*** **
	(0.000)	(0.000)	(0.000)	(0.000)	(0.023)	(0.005)	(0.000)	(0.000)	(0.000)	(0.000)
Change in Portfolio Value	**0.369*** **	**0.354*** **	**0.275*** **	**0.268*** **	**0.310*** **	**0.174** **	**0.280*** **	**0.271*** **	**0.354*** **	**0.163** **
	(0.005)	(0.008)	(0.000)	(0.000)	(0.001)	(0.024)	(0.000)	(0.000)	(0.000)	(0.037)
Active Share Measure		**-0.416***		-0.200	-0.049	-0.153		-0.219	-0.223	-0.075
		(0.097)		(0.185)	(0.821)	(0.396)		(0.149)	(0.321)	(0.677)
Institutional Ownership	**0.189** **	**0.195** **	**0.102***	**0.104***	-0.067	**0.153** **	**0.111***	**0.113***	-0.026	**0.201*** **
	(0.049)	(0.041)	(0.070)	(0.063)	(0.395)	(0.017)	(0.055)	(0.052)	(0.760)	(0.003)
Insider Ownership					0.023				0.033	
					(0.484)				(0.327)	
Stock Characteristics										
Market-to-Book	0.004	0.005	0.006	0.006	-0.002	0.002	**0.042*** **	**0.043*** **	**0.041*** **	**0.035*** **
	(0.578)	(0.530)	(0.173)	(0.160)	(0.689)	(0.617)	(0.000)	(0.000)	(0.000)	(0.000)
Past Returns	**0.087***	**0.086***	-0.041	-0.042	-0.025	**-0.102*** **	**0.091*** **	**0.090*** **	**0.154*** **	0.027
	(0.074)	(0.077)	(0.129)	(0.125)	(0.486)	(0.001)	(0.001)	(0.001)	(0.000)	(0.385)
Return Variability	**-15.596*** **	**-16.295*** **	**-22.535*** **	**-22.890*** **	**-19.029*** **	**-25.493*** **	**-15.591*** **	**-15.964*** **	**-14.383*** **	**-19.211*** **
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Share Turnover	**-10.507*** **	**-10.504*** **	-1.832	-1.836	-0.755	-1.579	-2.067	-2.085	-1.973	-1.086
	(0.000)	(0.000)	(0.165)	(0.164)	(0.694)	(0.267)	(0.110)	(0.107)	(0.309)	(0.437)
Bid Ask Spread	**-4.339** **	**-4.515** **	0.253	0.076	-0.674	-2.004	-0.710	-0.987	-1.555	-2.395
	(0.031)	(0.025)	(0.837)	(0.950)	(0.663)	(0.247)	(0.583)	(0.442)	(0.429)	(0.130)
Firm Characteristics										
Firm Size	**-0.025*** **	**-0.023** **	-0.001	-0.000	**0.015***	**-0.023*** **	**0.020*** **	**0.021*** **	**0.039*** **	-0.004
	(0.014)	(0.024)	(0.836)	(0.937)	(0.094)	(0.003)	(0.002)	(0.001)	(0.000)	(0.633)
Debt Maturity					**0.046***				**0.052** **	
					(0.069)				(0.040)	
S&P Rating					0.029				**0.057***	
					(0.321)				(0.071)	
Leverage			**-0.184*** **	**-0.184*** **	**-0.211*** **	**-0.112*** **	**-0.326*** **	**-0.327*** **	**-0.334*** **	**-0.218*** **
			(0.000)	(0.000)	(0.000)	(0.010)	(0.000)	(0.000)	(0.000)	(0.000)
Return on Assets	**0.377*** **	**0.368*** **	**-0.110***	**-0.115***	-0.119	-0.073	0.081	0.076	0.054	**0.125***
	(0.001)	(0.002)	(0.094)	(0.081)	(0.237)	(0.286)	(0.198)	(0.228)	(0.600)	(0.055)
Ownership Concentration	0.017	0.009	0.078	0.076	0.075	-0.023	0.059	0.056	0.014	0.048
	(0.843)	(0.919)	(0.159)	(0.176)	(0.313)	(0.790)	(0.292)	(0.328)	(0.846)	(0.645)
Industry Dummies	**YES**	**YES**	**YES**	**YES**	**YES**	**NO**	**YES**	**YES**	**YES**	**NO**
Non-Financial Firms Only	**NO**	**NO**	**NO**	**NO**	**NO**	**YES**	**NO**	**NO**	**NO**	**YES**
N	2,342	2,339	2,350	2,347	1,288	1,735	2,350	2,347	1,288	1,735
Adjusted R^2	0.1677	0.1685	0.235	0.237	0.269	0.190	0.2112	0.2125	0.259	0.213

Panel B: Abnormal Returns – Window [-10,+8]

	Market Model			Fama and French's Methodology		
	(1)	(2)	(3)	(4)	(5)	(6)
Investor Turnover	**-0.016*** **	**-0.016*** **	**-0.018** **	**-0.027*** **	**-0.026*** **	**-0.030*** **
	(0.003)	(0.004)	(0.010)	(0.000)	(0.000)	(0.000)
Change in Portfolio Value	**0.015*** **	**0.015*** **	**0.009***	**0.017*** **	**0.017*** **	**0.011** **
	(0.003)	(0.003)	(0.079)	(0.000)	(0.001)	(0.032)
Active Share Measure		-0.003	-0.002		-0.006	0.004
		(0.740)	(0.863)		(0.549)	(0.733)
Institutional Ownership	-0.001	-0.001	0.001	0.0004	0.001	0.004
	(0.869)	(0.866)	(0.709)	(0.891)	(0.873)	(0.344)
Stock Characteristics						
Market-to-Book Weekly	0.000	0.000	0.000	**0.003*** **	**0.003*** **	**0.003*** **
	(0.379)	(0.356)	(0.782)	(0.000)	(0.000)	(0.000)
Past Returns	-0.000	-0.000	-0.003	**0.005** **	**0.005** **	0.001
	(0.990)	(0.972)	(0.130)	(0.014)	(0.015)	(0.696)
Past Returns over 1 Day	**-0.136*** **	**-0.137*** **	-0.017	**-0.119*** **	**-0.119*** **	-0.022
	(0.000)	(0.000)	(0.589)	(0.000)	(0.000)	(0.530)
Past Returns over 5 Days	0.008	0.009	-0.009	0.005	0.005	-0.008
	(0.282)	(0.255)	(0.294)	(0.581)	(0.560)	(0.417)
Past Returns over 15 Days	-0.006	-0.007	0.002	**-0.009***	**-0.009***	-0.001
	(0.146)	(0.140)	(0.712)	(0.062)	(0.060)	(0.879)
Past Returns over 30 Days	**0.009*** **	**0.009*** **	**0.007***	**0.008** **	**0.007** **	0.002
	(0.003)	(0.003)	(0.053)	(0.019)	(0.020)	(0.531)
Return Variability Weekly	-0.007	-0.007	0.049	**-0.126*** **	**-0.127*** **	**-0.127*** **
	(0.907)	(0.905)	(0.463)	(0.000)	(0.000)	(0.000)
Share Turnover Weekly	**0.049***	**0.049***	0.006	0.014	0.014	0.081
	(0.072)	(0.075)	(0.897)	(0.824)	(0.824)	(0.246)
Bid-Ask Spread Weekly	0.000	0.000	0.000	-0.039	-0.039	**-0.136*** **
	(0.379)	(0.356)	(0.782)	(0.176)	(0.180)	(0.003)
Firm Characteristics						
Firm Size	**0.001** **	**0.001** **	-0.000	**0.001*** **	**0.001*** **	0.00005
	(0.018)	(0.015)	(0.547)	(0.000)	(0.000)	(0.911)
Leverage	**-0.011*** **	**-0.011*** **	**-0.007** **	**-0.018*** **	**-0.018*** **	**-0.011*** **
	(0.000)	(0.000)	(0.021)	(0.000)	(0.000)	(0.000)
Return on Assets	-0.000	-0.000	0.003	**0.019*** **	**0.019*** **	**0.021*** **
	(0.993)	(0.990)	(0.531)	(0.000)	(0.000)	(0.000)
Ownership Concentration	0.003	0.003	-0.005	0.006	0.006	0.007
	(0.390)	(0.422)	(0.444)	(0.172)	(0.192)	(0.363)
Time Dummies	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**
Industry Dummies	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**
Non-Financial Firms Only	**NO**	**NO**	**YES**	**NO**	**NO**	**YES**
N	36,192	36,145	26,644	35,716	35,686	26,035
R^2	0.056	0.056	0.048	0.0307	0.0307	0.0280

Table 8
Multivariate Analysis of Price Reversal

Panel A reports the results of OLS cross-sectional regressions. The dependent variable is the price change between week +9 and week +25 in column 1 and 2, the MCARs between week +9 and week +25 in columns 3 to 6, and the FFCARs between week +9 and week +25 in columns 7 to 10. Panel B reports the results of OLS panel regressions using as the dependent variable the abnormal return of firm j in week t where t is between week +9 and week +25. In these specifications, we are able to control for contemporaneous time-varying stocks characteristics. Variable definitions are found in Appendix B. Dependent variables are winsorized at the 5% level. All regressions include the constant term, but the coefficient is not reported. Standard errors are White-corrected for heteroskedasticity. P-values are in parentheses. * indicates significance at 1% (***), 5% (**), 10% (*).

Panel A: Cross-Sectional Regressions – Window [+9,+25]

	Price Change		MMCAR				FFCAR			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Investor Turnover	**0.195****	**0.190****	**0.225*****	**0.225*****	**0.339*****	**0.251*****	**0.169*****	**0.171*****	**0.179****	**0.244*****
	(0.044)	(0.049)	(0.003)	(0.003)	(0.002)	(0.003)	(0.010)	(0.009)	(0.049)	(0.001)
Change in Portfolio Value	**-0.296****	**-0.295****	-0.013	-0.011	0.019	0.069	-0.086	-0.081	-0.033	-0.006
	(0.028)	(0.029)	(0.868)	(0.886)	(0.833)	(0.418)	(0.239)	(0.267)	(0.690)	(0.936)
Active Share Measure		0.054		0.062	0.249	-0.203		0.139	0.226	-0.100
		(0.810)		(0.672)	(0.230)	(0.253)		(0.323)	(0.246)	(0.559)
Institutional Ownership	0.138	0.141	0.008	0.010	0.101	0.015	0.037	0.037	**0.152****	-0.035
	(0.111)	(0.104)	(0.880)	(0.851)	(0.169)	(0.795)	(0.461)	(0.467)	(0.033)	(0.509)
Insider Ownership					0.029				0.011	
					(0.383)				(0.737)	
Stock Characteristics										
Market-to-Book	0.010	0.009	**0.009***	**0.008***	-0.001	**0.012****	0.003	0.003	0.004	**0.009****
	(0.142)	(0.167)	(0.054)	(0.070)	(0.899)	(0.015)	(0.414)	(0.489)	(0.513)	(0.038)
Past Returns	**0.103****	**0.105****	-0.007	-0.006	-0.015	**-0.055***	0.025	0.026	-0.007	-0.006
	(0.015)	(0.014)	(0.802)	(0.832)	(0.676)	(0.062)	(0.316)	(0.305)	(0.842)	(0.817)
Return Variability	4.007	3.756	**-18.581*****	**-18.782*****	**-20.599*****	**-17.286*****	0.990	1.000	-0.964	1.185
	(0.199)	(0.228)	(0.000)	(0.000)	(0.000)	(0.000)	(0.605)	(0.600)	(0.721)	(0.573)
Share Turnover	0.020	0.042	-1.930	-1.934	-2.405	-2.281	0.004	-0.006	0.190	0.255
	(0.994)	(0.986)	(0.148)	(0.148)	(0.218)	(0.105)	(0.997)	(0.996)	(0.919)	(0.850)
Bid-Ask Spread	1.419	1.285	**3.961*****	**3.829*****	**3.344****	**5.316*****	-0.289	-0.393	-0.709	-0.277
	(0.460)	(0.509)	(0.002)	(0.002)	(0.025)	(0.003)	(0.812)	(0.747)	(0.667)	(0.877)
Firm Characteristics										
Firm Size	-0.012	-0.013	0.003	0.002	-0.009	**0.022*****	0.005	0.005	-0.006	**0.021*****
	(0.164)	(0.142)	(0.631)	(0.709)	(0.317)	(0.004)	(0.337)	(0.428)	(0.523)	(0.002)
Debt Maturity					-0.006				**-0.043***	
					(0.813)				(0.084)	
S&P Rating					-0.004				-0.027	
					(0.910)				(0.394)	
Leverage			-0.049	-0.051	-0.065	**-0.072***	-0.020	-0.021	-0.011	-0.054
			(0.134)	(0.123)	(0.159)	(0.077)	(0.532)	(0.500)	(0.803)	(0.145)
Return on Assets	**0.213****	**0.207***	0.016	0.010	-0.081	-0.036	**0.140****	**0.137****	0.084	**0.141****
	(0.049)	(0.058)	(0.802)	(0.879)	(0.455)	(0.589)	(0.030)	(0.034)	(0.432)	(0.028)
Ownership Concentration	-0.070	-0.063	0.088	0.088	**0.185*****	0.016	0.067	0.068	**0.160****	0.043
	(0.505)	(0.552)	(0.133)	(0.136)	(0.008)	(0.868)	(0.188)	(0.183)	(0.011)	(0.609)
Industry Dummies	**YES**	**YES**	**YES**	**YES**	**YES**	**NO**	**YES**	**YES**	**YES**	**NO**
Non-Financial Firms Only	**NO**	**NO**	**NO**	**NO**	**NO**	**YES**	**NO**	**NO**	**NO**	**YES**
N	2,211	2,008	2,300	2,297	1,265	1,695	2,300	2,297	1,265	1,695
Adjusted R^2	0.1049	0.1047	0.109	0.110	0.147	0.125	0.0511	0.0512	0.086	0.0164

Panel B: Abnormal Returns - Window [+9,+25]

	Market Model			Fama and French's Methodology		
	(1)	(2)	(3)	(4)	(5)	(6)
Investor Turnover	**0.014****	**0.014****	**0.011***	**0.010***	**0.010***	**0.012****
	(0.015)	(0.013)	(0.097)	(0.071)	(0.073)	(0.041)
Change in Portfolio Value	-0.006	-0.005	0.002	**-0.009***	**-0.008***	-0.003
	(0.316)	(0.393)	(0.725)	(0.070)	(0.094)	(0.540)
Active Share Measure		**0.020***	-0.007		0.013	-0.011
		(0.088)	(0.632)		(0.254)	(0.435)
Institutional Ownership	**-0.007***	**-0.007***	**-0.007***	-0.001	-0.001	-0.005
	(0.080)	(0.084)	(0.092)	(0.795)	(0.803)	(0.259)
Stock Characteristics						
Market-to-Book Weekly	0.001	0.000	**0.001****	**-0.001*****	**-0.002*****	**-0.001****
	(0.124)	(0.174)	(0.019)	(0.001)	(0.001)	(0.039)
Past Returns	0.001	0.001	-0.003	**0.004***	**0.004***	0.0003
	(0.669)	(0.640)	(0.174)	(0.064)	(0.058)	(0.853)
Past Returns over 1 Day	**-0.237*****	**-0.236*****	**-0.239*****	**-0.241*****	**-0.241*****	**-0.214*****
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Past Returns over 5 Days	**0.029*****	**0.029*****	**0.027*****	**0.028*****	**0.028*****	**0.019****
	(0.000)	(0.000)	(0.002)	(0.000)	(0.000)	(0.036)
Past Returns over 15 Days	**-0.014*****	**-0.014*****	**-0.014*****	**-0.015*****	**-0.015*****	**-0.011*****
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.022)
Past Returns over 30 Days	**-0.004***	**-0.005***	**-0.006****	**-0.007****	**-0.007****	**-0.009*****
	(0.065)	(0.059)	(0.034)	(0.014)	(0.013)	(0.002)
Return Variability Weekly	0.053	0.048	0.016	**-0.193*****	**-0.193*****	**-0.210*****
	(0.457)	(0.505)	(0.848)	(0.000)	(0.000)	(0.000)
Share Turnover Weekly	**0.090*****	**0.089*****	**0.095****	**0.224*****	**0.221*****	**0.240*****
	(0.001)	(0.001)	(0.020)	(0.002)	(0.003)	(0.004)
Bid-Ask Spread Weekly	0.001	0.000	**0.001****	-0.026	-0.027	-0.012
	(0.124)	(0.174)	(0.019)	(0.338)	(0.327)	(0.766)
Firm Characteristics						
Firm Size	**0.001***	**0.001***	**0.002*****	0.000	0.000	0.001
	(0.052)	(0.093)	(0.000)	(0.584)	(0.481)	(0.118)
Leverage	-0.002	-0.002	-0.004	-0.003	-0.003	-0.002
	(0.474)	(0.417)	(0.226)	(0.213)	(0.196)	(0.448)
Return on Assets	0.006	0.006	0.000	**0.013****	**0.013****	**0.010***
	(0.234)	(0.260)	(0.939)	(0.022)	(0.026)	(0.075)
Ownership Concentration	**0.008***	**0.008***	0.007	0.004	0.005	-0.005
	(0.074)	(0.084)	(0.370)	(0.343)	(0.329)	(0.512)
Time Dummies	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**
Industry Dummies	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**
Non-Financial Firms Only	**NO**	**NO**	**YES**	**NO**	**NO**	**YES**
N	31,410	31,364	23,148	31,392	31,360	22,930
Adjusted R^2	0.030	0.030	0.032	0.0390	0.0391	0.0378

Table 9
Exploiting the Exogenous Variation in Investor Turnover

This table presents instrumental variable regressions for the entire sample. The variables are described in Appendix B. We use Trading-Performance Sensitivity 1 and Trading-Performance Sensitivity 2 as instruments for investor turnover. The first three columns in the table show results for the price drop period (between week -10 and week +8), while the last three columns show results for the price reversal period (between week +9 and week +25). The dependent variable is the price change in columns 1 and 4, the MCARs in column 2 and 5, and the FFCARs in columns 3 and 6. Variable definitions are found in Appendix B. Dependent variables are winsorized at the 5% level. All regressions include the constant term, but the coefficient is not reported. P-values are in parentheses. * indicates significance at 1% (***), 5% (**), 10% (*).

	Drop - Window [-10,+8]			Reversal - Window [+9+25]		
	Price Change	MMCAR	FFCAR	Price Change	MMCAR	FFCAR
	(1)	(2)	(3)	(4)	(5)	(6)
Investor Turnover	**-1.662*** **	**-1.037*** **	**-1.343*** **	**0.619***	**0.626** **	**0.534*** **
	(0.000)	(0.001)	(0.000)	(0.070)	(0.021)	(0.020)
Change in Portfolio Value	**0.313** **	**0.358*** **	**0.302*** **	**-0.278** **	-0.064	**-0.145** **
	(0.019)	(0.000)	(0.000)	(0.040)	(0.437)	(0.048)
Active Share Measure	**-0.466***	-0.133	-0.194	0.067	0.092	0.161
	(0.077)	(0.411)	(0.232)	(0.769)	(0.548)	(0.254)
Institutional Ownership	**0.212** **	0.078	**0.139** **	0.130	0.004	0.037
	(0.031)	(0.166)	(0.020)	(0.142)	(0.935)	(0.439)
Stock Characteristics						
Market-to-Book	0.005	**0.008***	**0.0432*** **	0.009	**0.011** **	0.003
	(0.544)	(0.055)	(0.00458)	(0.162)	(0.018)	(0.526)
Past Returns	0.055	**-0.099*** **	0.0407	**0.117*** **	0.007	0.040
	(0.284)	(0.000)	(0.0294)	(0.007)	(0.799)	(0.103)
Return Variability	**-14.47*** **	**-27.99*** **	**-20.74*** **	2.851	**-17.74*** **	1.686
	(0.000)	(0.000)	(2.400)	(0.382)	(0.000)	(0.378)
Share Turnover	**-7.932*** **	-0.599	-0.730	-0.948	**-2.659***	-0.005
	(0.003)	(0.706)	(1.620)	(0.710)	(0.069)	(0.997)
Bid-Ask Spread	**-5.170** **	0.950	0.170	1.789	**2.990** **	-1.201
	(0.016)	(0.474)	(1.350)	(0.376)	(0.017)	(0.311)
Firm Characteristics						
Firm Size	**-0.034*** **	0.007	**0.0147** **	-0.009	-0.002	-0.001
	(0.002)	(0.277)	(0.00710)	(0.354)	(0.726)	(0.840)
Leverage		**-0.203*** **	**-0.321*** **		-0.043	-0.011
		(0.000)	(0.0357)		(0.183)	(0.723)
Return on Assets	**0.291** **	**-0.263*** **	-0.0658	**0.236** **	0.037	**0.203*** **
	(0.019)	(0.000)	(0.0718)	(0.038)	(0.588)	(0.002)
Ownership Concentration	-0.017	**0.118** **	0.0729	-0.075	0.085	0.073
	(0.840)	(0.048)	(0.0609)	(0.488)	(0.171)	(0.152)
Over-identifying Restrictions Test (p-value)	4.55 (0.03)	0.65 (0.21)	0.24 (0.62)	0.10 (0.75)	049 (0.49)	0.53 (0.47)
Industry Dummies	**YES**	**NO**	**NO**	**YES**	**NO**	**NO**
Non-Financial Firms Only	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
N	2,338	2,345	2,345	2,208	2,295	2,295
R^2	0.1586	0.129	0.1136	0.1143	0.056	0.0241

Table 10
CARs and Investor Turnover during Other Major Market Shocks

This table presents OLS cross-sectional regressions during four episodes of large market declines (the market crash in October 1987, the Russian default in August 1998; the Quant crisis in August 2007; and the Bear Stearns' bailout in March 2008). In all cases, we compute firms' normal returns with the market model using 5 years of weekly returns before each event. For the 1987 market crash, we measure investor turnover in the last quarter of 1986; for the Russian default, we measure investor turnover in the last quarter of 1997; for the Quant crisis, we measure investor turnover in the last quarter of 2006; and for the bailout of Bear Stearns, we measure investor turnover in the last quarter of 2007. For the 1987 market crash, the drop starts in the week of October 9th and ends in the week of October 23th, while the reversal starts in the week of October 30th until the week of March 4th. For the Russian default, the drop starts in the week of June 5th and finishes in the week of October 2nd, while the reversal starts in the week of October 9th and finishes in the week of December 4th. For the Quant crisis, the drop starts in the last week of July and finishes in the week of August 10th, while the reversal starts in the week of August 17th and finishes on the last week of October. Finally, for the bailout of Bear Stearns, the drop period goes from the last week of February until the week of March 14th, and the reversal goes from the week of March 21st until the first week of April. The dependent variable in each column is the MCARs calculated over the drop and reversal periods, respectively. Control variables are measured at the end of the year before the one in which each event occurred: December 1986 for the 1987 Crash, December 1997 for the Russian Default, December 2006 for the Quant crisis, and December 2007 for the bailout of Bear Stearns. Variable definitions are found in Appendix B. Dependent variables are winsorized at the 5% level. All regressions include the constant term, but the coefficient is not reported. Standard errors are White-corrected for heteroskedasticity. P-values are in parentheses. * indicates significance at 1% (***), 5% (**), 10% (*).

	The Market Crash October 1987		The Russian Default August 1998		The Quant Crisis August 2007		Bear Stearns' Bailout March 2008	
	Drop	Reversal	Drop	Reversal	Drop	Reversal	Drop	Reversal
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Investor Turnover	**-0.024*** **	**0.028***	**-0.193*** **	**0.234*** **	**-0.176*** **	**0.142*** **	**-0.130*** **	**0.112*** **
	(0.007)	(0.075)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Stock Characteristics								
Market-to-Book	0.000	**0.001*** **	0.00002	**-0.001***	-0.00009	**0.00004*** **	0.00003	**0.00004***
	(0.125)	(0.007)	(0.403)	(0.087)	(0.349)	(0.001)	(0.217)	(0.072)
Past Returns	0.755	0.642	0.990	0.369	**-1.952*** **	-1.203	-0.613	**1.436*** **
	(0.292)	(0.619)	(0.282)	(0.632)	(0.004)	(0.216)	(0.159)	(0.000)
Return Variability	-0.050	**-0.580*** **	**-1.002*** **	**0.688*** **	-0.148	**-0.426***	**-0.330*** **	-0.111
	(0.690)	(0.010)	(0.001)	(0.005)	(0.351)	(0.067)	(0.002)	(0.193)
Share Turnover	**-8.658*** **	**-8.289*** **	**-19.655*** **	**4.818*** **	**-1.865*** **	**1.351***	**-4.022*** **	-0.151
	(0.000)	(0.006)	(0.000)	(0.001)	(0.000)	(0.054)	(0.000)	(0.655)
Bid Ask Spread	0.251	**0.861*** *	0.266	**-0.463*** *	**-7.332*** **	**3.395*** **	**-0.620***	**1.095*** **
	(0.177)	(0.010)	(0.325)	(0.042)	(0.000)	(0.000)	(0.071)	(0.000)
Firm Characteristics								
Firm Size	**0.009*** **	**-0.011*** **	**0.019*** **	**-0.013*** **	-0.001	**0.006*** *	**0.006*** **	-0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.711)	(0.010)	(0.001)	(0.348)
Leverage	**-0.111*** **	-0.003	**-0.141*** **	-0.017	**-0.054*** **	**-0.040*** *	-0.020	**-0.021*** *
	(0.000)	(0.935)	(0.000)	(0.488)	(0.000)	(0.031)	(0.124)	(0.035)
Return on Assets	**0.124*** **	-0.069	0.010	**-0.169*** **	**-0.048*** *	-0.018	**0.069*** **	0.012
	(0.000)	(0.277)	(0.826)	(0.000)	(0.024)	(0.562)	(0.001)	(0.486)
Industry Dummies	YES	YES	YES	YES	YES	YES	YES	YES
N	2,456	2,358	4,567	4,430	4,099	3,977	4,093	4,071
Adjusted R^2	0.230	0.044	0.136	0.148	0.127	0.109	0.099	0.110

Figure 1

Mean Cumulative Abnormal Returns of Stocks Held by Long-term and Short-term Investors

This figure compares the mean cumulative abnormal returns calculated by using the market model (MCARs) of (i) stocks mostly held by institutional investors with a long trading horizon, and (ii) stocks mostly held by institutional investors with short trading horizons. We divide the entire sample in terciles using firms' investor turnover measured by the average investor turnover over the period 1990-2006. A firm is classified as a firm held by long-term institutional investors (Low IT Firm) if it belongs to the first tercile. A firm is classified as a firm held by short-term institutional investors (High IT Firm) if it belongs to the third tercile. Week 0 is the week when Lehman Brothers' bankruptcy occurred (week beginning on Monday September 15, 2008).

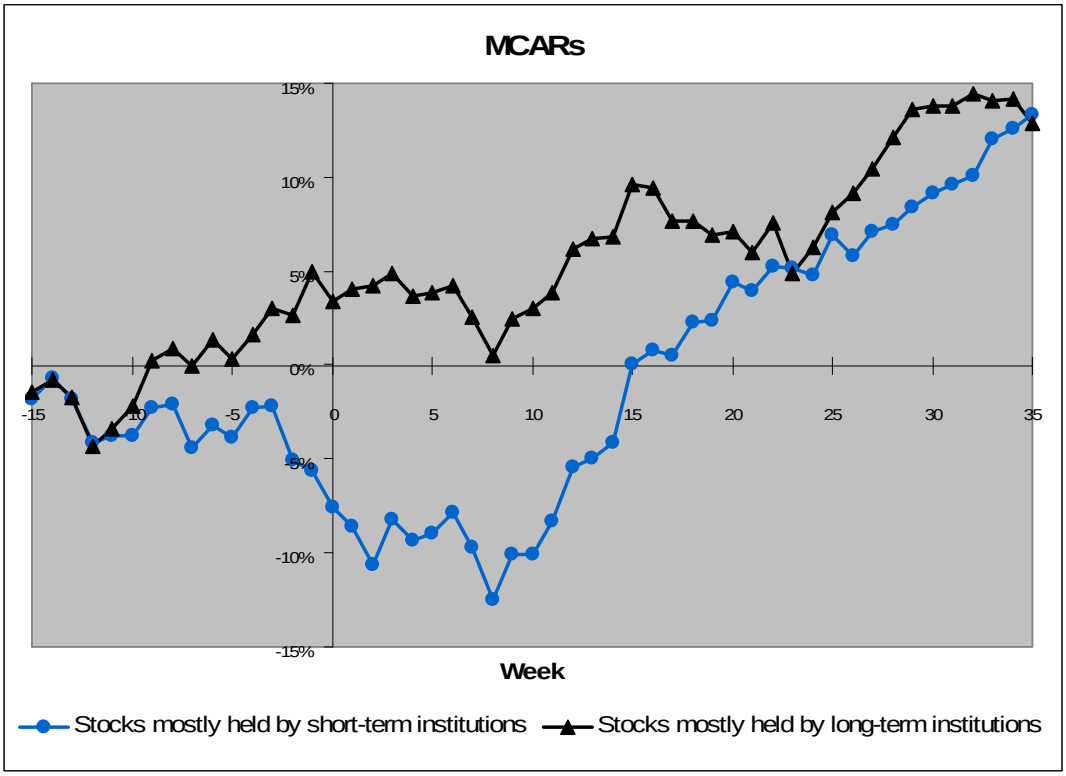


Figure 2
Institutional Investors' Net Share Volume Transacted

The figure shows the net share volume transacted (total number of shares purchased minus total number of shares sold) by (i) long-term institutional investors and (ii) short-term institutional investors over the period from the first quarter of 2007 until the second quarter of 2009.

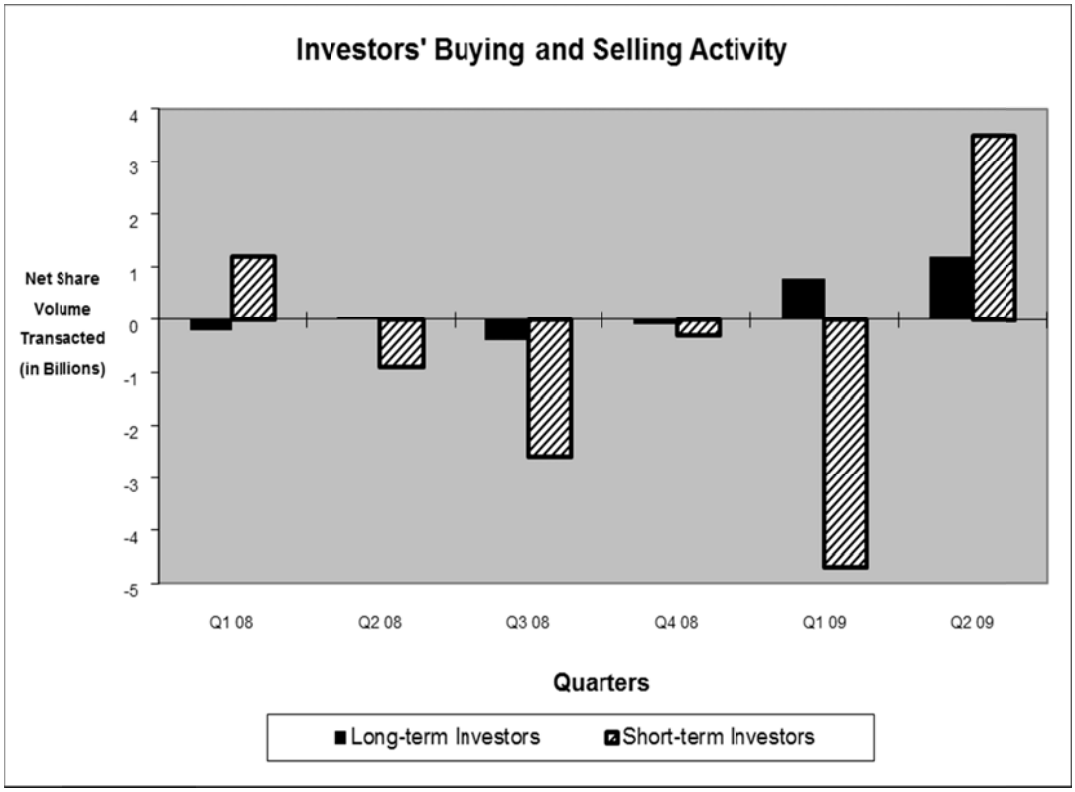


Figure 3
Fama and French Cumulative Abnormal Returns
for Stocks Held by Long-term and Short-term Investors

This figure compares the mean cumulative abnormal returns calculated by using the Fama and French's methodology (FFCARs) of (i) stocks mostly held by institutional investors with a long trading horizon, and (ii) stocks mostly held by institutional investors with short trading horizons. We divide the entire sample in terciles using firms' investor turnover measured by the average investor turnover over the period 1990-2006. A firm is classified as a firm held by long-term institutional investors (Low IT Firm) if it belongs to the first tercile. A firm is classified as a firm held by short-term institutional investors (High IT Firm) if it belongs to the third tercile. We also show the MCARs for all the stocks that do not belong to the financial industry and held by the two different groups of institutional investors. Week 0 is the week when Lehman Brothers' bankruptcy occurred (week beginning on Monday September 15, 2008).

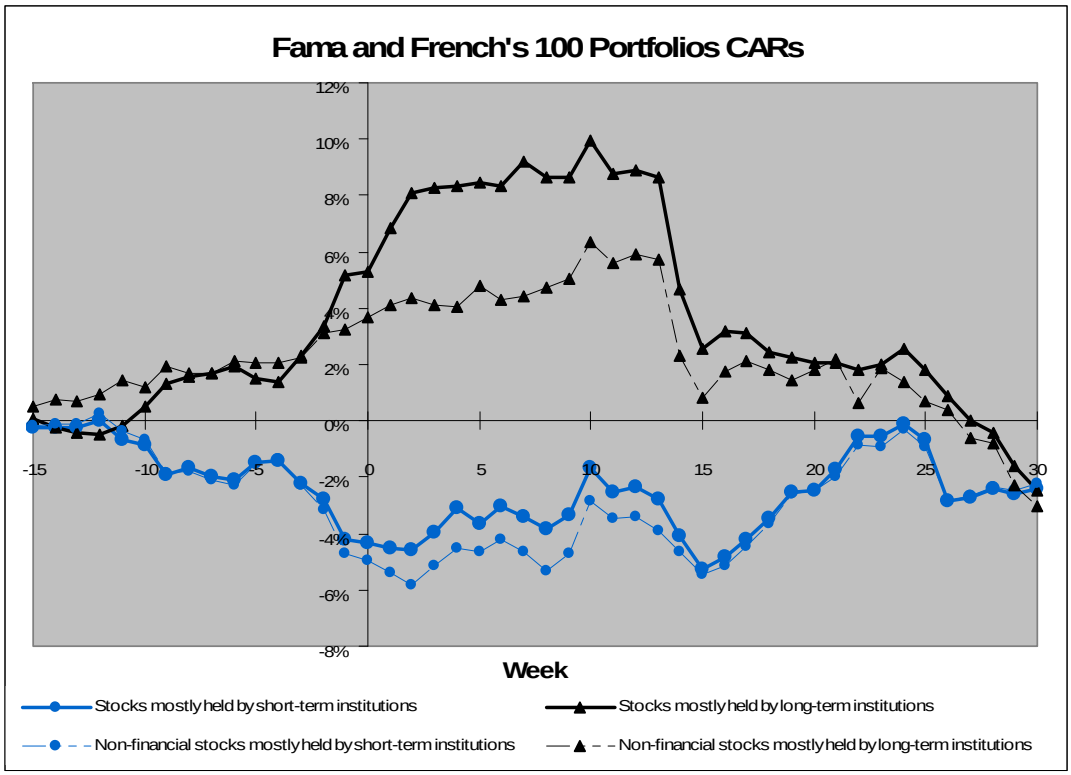
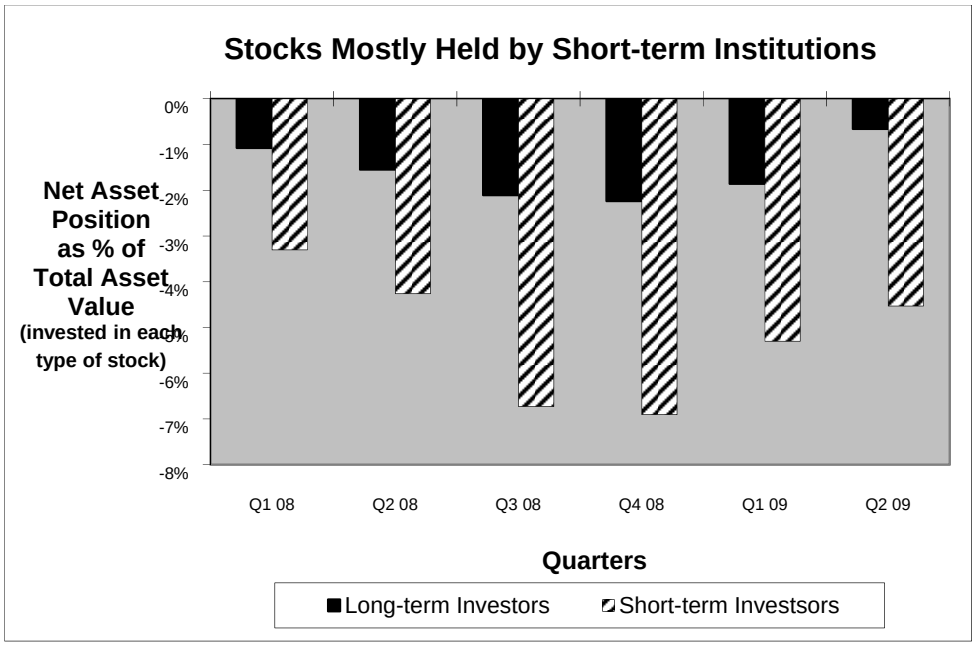


Figure 4
Sales in Firms with High and Low Investor Turnover

This figure shows the trading behavior of long-term institutional investors and short term institutional investors in (a) stocks held mostly by short-term investors and (b) stocks held mostly by long-term investors. To do so, we first sort stocks on the basis of their investor turnover and, second, investors on the basis of the churn ratio of their portfolios. For each type of investor, we report the value of the total number of shares purchased (number of shares purchased multiplied end-of-the-quarter price) minus the value of shares sold (number of shares sold multiplied by end-of-quarter price) divided by the (dollar) value of their investment in each of the two types of stocks.



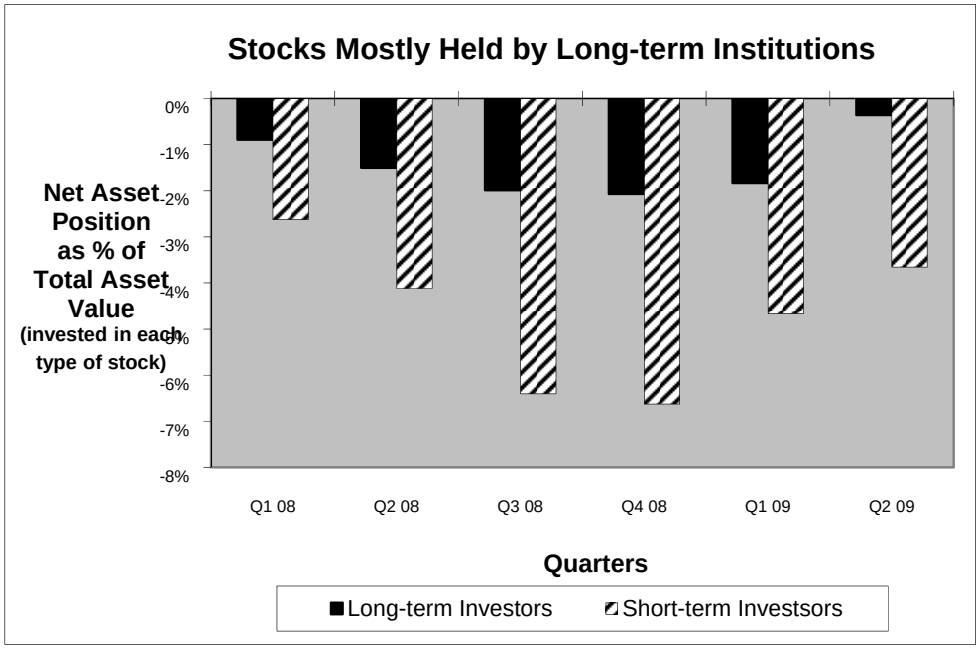
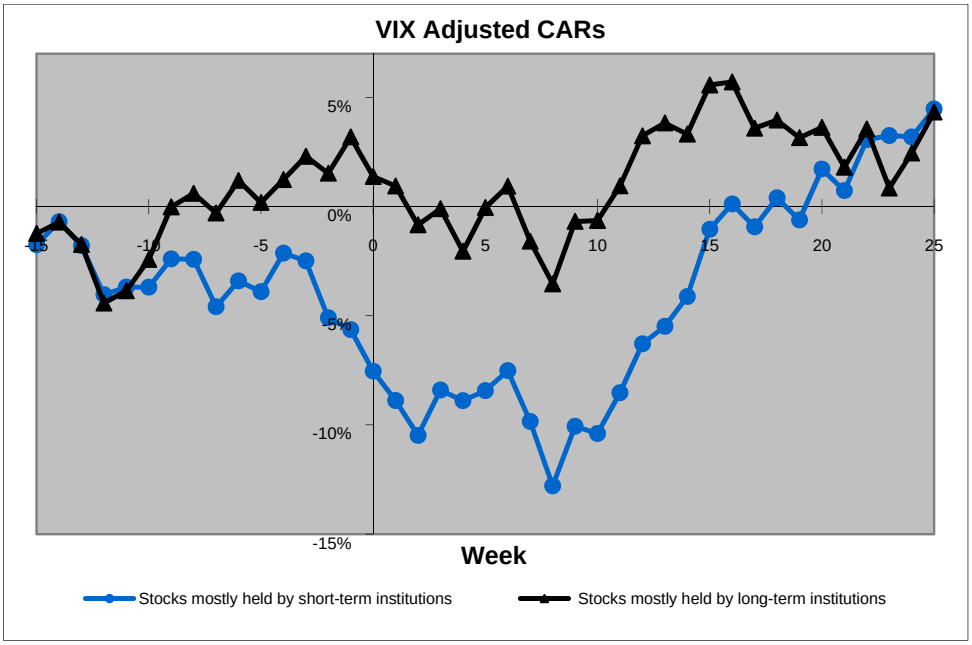


Figure 5
Exposure to Aggregate Volatility Risk, Exposure to Liquidity Risk and Returns of High and Low IT stocks

In Panel A, we compute stocks' normal returns using a multifactor model that includes the market return and aggregate volatility risk, measured by the VIX index, as in Ang, Hodrick, Xing, and Zhang (2006). In panel B, we compute stocks' normal returns using a multifactor model that includes the market return and Pastor and Stambaugh's (2003) market-wide liquidity factor, computed with weekly frequency. Both multifactor models have been estimated using weekly returns from the beginning of 2003 until the end of the first quarter of 2008. The cumulative abnormal returns for the different groups of stocks in each of these figures are calculated using abnormal returns obtained subtracting from the actual returns the expected returns estimated using each of the multifactor models.

Panel A: VIX Adjusted Cumulated Abnormal Returns



Panel B: Liquidity Adjusted Cumulated Abnormal Returns

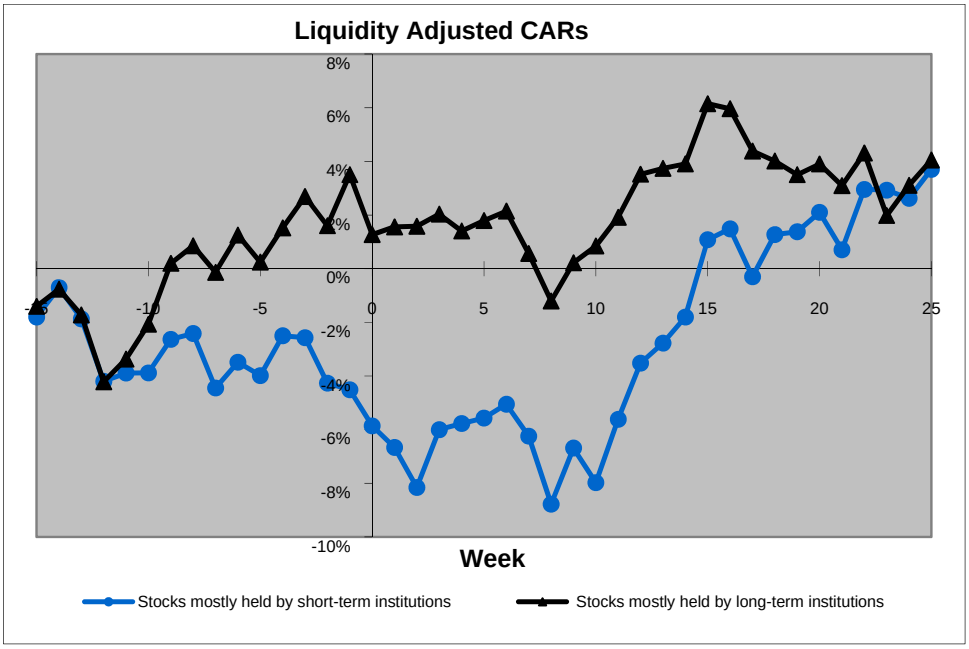


Figure 6
Other Large Market Declines

This figure reports the MCARs of high and low IT stocks during four episodes of large market declines (the market crash in October 1987, the Russian default in August 1998; the Quant crisis in August 2007; and the Bear Stearns' bailout in March 2008). In all cases, we compute firms' normal returns with the market model using 5 years of weekly returns before the events. For the 1987 market crash, we measure investor turnover in each firm in the last quarter of 1986; for the Russian default, we measure investor turnover in the last quarter of 1997; for the Quant crisis, we measure investor turnover in the last quarter of 2006 and for the bailout of Bear Stearns, we measure investor turnover in the last quarter of 2007.