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Abstract

This paper shows that during episodes of market turmoil 13F institutional investors with short trading horizons sell their stockholdings to a larger extent than 13F institutional investors with longer trading horizons. This creates price pressure for stocks mostly held by short horizon investors, which, as a consequence, experience larger price drops, and subsequent reversals, than stocks mostly held by long horizon investors. These findings, obtained after controlling for the withdrawals experienced by the investors, are not driven by other institutional investors' and firms' characteristics. Overall, the evidence indicates that investors with short horizons amplify the effects of market-wide negative shocks by demanding liquidity at times when other potential buyers' capital is scarce.

JEL classifications: G11; G12; G14; G18; G22
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They are concerned, not with what an investment is really worth to a man who buys it "for keeps", but with what the market will value it at, under the influence of mass psychology, three months or a year hence. Moreover, this behavior is not the outcome of a wrong-headed propensity. (…) For it is not sensible to pay 25 for an investment of which you believe the prospective yield to justify a value of 30, if you also believe that the market will value it at 20 three months hence.

M. Keynes, The General Theory of Employment, Interest and Money

1. Introduction

A number of influential theoretical papers explore the effect of short trading horizons on stock prices (Allen, Morris and Shin (2006); De Long, Shleifer, Summers, and Waldman (1990); Dow and Gorton (1994); Froot, Scharfstein and Stein (1992); Stein (2005); Tirole (1982)). These papers assume that some investors focus on short-term, instead of long-term, returns and show that it is optimal for these short horizon investors to have strategies that focus on predicting the short-run trades of other market participants, rather than long-run movements in asset values driven by fundamentals.[1]

During normal market conditions, short horizon investors are able to trade without affecting stock prices in a systematic way because there are many other long and short horizon investors ready to provide liquidity. During periods of market turmoil, instead, fearing weak demand from other market participants and possible price declines in the near future, short horizon investors are expected to sell all together. Coordination failure models (Bernardo and Welch (2004); Morris and Shin (2004)) formalize this mechanism. During periods of market turmoil, the desire to avoid temporary price declines leads investors with short trading horizons to sell because other market participants are selling or are feared to start selling soon. Not selling right away may involve selling behind the rest of the market at even lower prices. Short horizon investors' optimal response is to

[1] Besides the academic literature, there is ample anecdotal evidence that the trading horizon is arguably the most important feature characterizing investors' trading styles. On the one hand, Warren Buffett is quoted to say "Our favorite holding period is forever" or "I buy on the assumption that they could close the market the next day and not reopen it for five years". On the other hand, Mohamed El-Erian characterizes market participants as follows: "As the obsession for daily and weekly performance continues to dominate, short-termism is a major driver of market action." Moreover, the recent Kay Review of UK Equity Markets and Long-Term Decision Making, sponsored by the UK government, characterizes the styles of asset managers as "those whose primary focus is on the activities of the company… and those whose primary focus is on…the flow of buy and sell orders, the momentum in the share price, the short term correlations between the prices of different stocks."

attempt to beat the market by selling immediately. On the contrary, long horizon investors have the possibility of holding onto their shares and "waiting out the storm." Thus, the selling pressure experienced by different stocks is expected to depend on the horizon of the investors holding the stocks.

Importantly, during periods of market turmoil, it becomes harder to find potential buyers (Duffie (2010); Duffie and Strulovici (2009)), because other investors, including long horizon investors, may not have sufficient capital, because of slow moving capital (Mitchell, Pulvino and Stafford (2007)), or because the stocks sold do not have the characteristics preferred by potential buyers. Thus, during such episodes, there may be both demand and supply forces driving prices below their fundamental values and the trading activity of short horizon investors may have dramatic consequences. Crucially, these forces should draw a wedge between the price reaction of shares mostly held by short horizon investors and those mostly held by long horizon investors.

Using the entire universe of 13F institutional investors, which includes pension funds, endowments, insurance companies, bank trusts, mutual funds, hedge funds and independent advisors, this paper explores whether short horizon investors indeed sell more during periods of market turmoil and whether this behavior causes stock prices to temporarily drop below their fundamental values. An empirical investigation of these issues is important because we do not know whether short horizon investors indeed engage in massive selling during periods of market turmoil or instead provide liquidity and thus limit, rather than amplify, the effects of negative shocks on stock prices.

We start our analysis by investigating the investors' characteristics that existing theoretical literature suggests to be related to investors' trading horizons. We provide empirical evidence that an investor's horizon is associated with its organizational structure, funding structure, trading strategy, managerial turnover and compensation. This provides potential mechanisms through which investors' horizons impact trading and prices during periods of market turmoil.

Our empirical strategy to analyze the impact of investors' trading horizon on stocks' prices during market turmoil is the following. First, we establish that during periods of market turmoil short horizon investors sell significantly more than long horizon investors and, as a consequence, stocks

mostly held by short horizon investors experience larger selling pressure. Second, we show that the prices of stocks mostly held by short horizon investors experience larger drops below their fundamental values in comparison to stocks mostly held by long horizon investors. Finally, consistent with the notion that the larger selling pressure generated by short horizon investors causes prices to temporarily drop below their fundamental values, we show that stocks mostly held by short horizon investors experience larger price reversals relative to stocks mostly held by long horizon investors.

To evaluate to what extent the length of the shareholders' horizon affects the reaction of transaction prices to negative market shocks, we exploit *ex ante* differences in institutional ownership across firms. We measure the horizon of the investors' holding each stock in the CRSP sample with widely used proxies of the investors' average holding period measured well ahead of each market turmoil episode. Thus, investor horizon, being *predetermined*, is a characteristic of the investors, and not the result of the investors' response to the negative shock itself.

Although we investigate different episodes of market turmoil over the period from 1986 to 2009, our empirical tests mostly focus on the period surrounding the Lehman Brothers' (henceforth, Lehman) bankruptcy, when short horizon investors sold almost 21% of their portfolio holdings compared to 7% of the holdings sold by long horizon investors. Our main finding can be vividly summarized in Figure 1 (which we describe in detail in Section 5.3).

[Insert Figure 1 here]

The mean cumulative abnormal returns up to the first five (eight) weeks following Lehman's bankruptcy are almost -12% (-22%) for stocks mostly held by short horizon investors compared to approximately -4% (-0.28%) for stocks mostly held by long horizon 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 horizon investors. The differences in cumulative abnormal returns between the two groups of stocks are qualitatively similar during other periods of severe market turmoil, clearly indicating the generalizability of the findings.

One may wonder to what extent investor horizon simply captures the withdrawals experienced by various institutional investors (Coval and Stafford (2007)). This is important to fully understand the role of investor horizon and may inform the ensuing debate on whether institutional investors' funding constraints or rather other features of their demand determine panic selling, drops in liquidity and deviations of prices from fundamentals (e.g., Hameed, Kang and Viswanathan (2010)). In this respect, Karolyi, Lee and van Dijk (2011) show that institutional investors' demand and incentives to trade individual securities, rather than their funding constraints, can explain increases in liquidity commonality during periods of market turmoil. We find that the horizon of 13F institutional investors helps explain stock returns during periods of market turmoil even when we control for the selling pressure generated by the withdrawals experienced by the mutual funds and the hedge funds holding the stocks. Consistently with the findings of Karolyi, Lee and van Dijk (2011), the demand of short horizon investors plays an important role in explaining their sales and the effects on stock prices we uncover.

In the empirical analysis, we ascertain that our results do not depend on the firms' different exposure to market returns and Fama and French's risk factors, on stock characteristics, such as return volatility and 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, we consider the stocks' exposure to aggregate liquidity risk, as captured by Pastor and Stambaugh (2003), and to innovations in market-wide implied volatility, measured by changes in the VIX index, which reflects the probability of a market meltdown. Since our results are robust to various specifications, we can conclude that differences in the stocks' exposures to liquidity risk and to the probability of a market meltdown cannot explain our findings.

Another possible concern is that our proxy for investor horizon may be correlated with omitted factors characterizing a firm's shareholders. For instance, active investors who trade on the basis of valuation beliefs, instead of investors' short trading horizons, may also generate selling pressure. This argument is inconsistent with the price reversals we document because positive abnormal

returns after large price drops indicate that investors' sales are not information driven (see, for instance, Coval and Stafford (2007)).

Besides showing that the horizon of the shareholders holding a stock affects price drops and reversals in a robust way, we provide evidence supporting the causal mechanism behind our interpretation of the results. Not only do we find that short horizon investors sell significantly more than long horizon investors during periods of market turmoil and that these sales are not entirely due to withdrawals, but also that short horizon investors exhibit a higher propensity to reduce their holdings in all the stocks they hold (even those mostly held by long horizon investors), indicating that their sales are not driven by specific characteristics of the stocks in their portfolios.

Finally, to further test the causal mechanism, we focus on the investors' funding structure. We conjecture that investors whose funding in normal and especially bad market times is expected to be volatile have shorter horizons and stronger incentives to sell during episodes of market turmoil to avoid or at least reduce withdrawals. We capture incentives to sell using the correlation between the investor's previous performance and actual withdrawals, well before the episode of market turmoil. Using this correlation as an instrument for investor turnover, we exploit the variation in shareholder horizon that is less likely to be driven by stocks' unobserved heterogeneity, or inside information. Our results remain invariant even after controlling for the actual withdrawals experienced by the investors. Taken together, our findings consistently indicate that the magnitude of drops and reversals of stock prices are driven by the investors' trading horizons.

Our results contribute to the literature on asset fire sales, which has shown that transaction prices may temporarily deviate from fundamental values without considering the role of investor horizon (Shleifer and Vishny (1992), Pulvino (1998), Mitchell, Pulvino, and Stafford (2004), Coval and Stafford (2007), Mitchell, Pedersen and Pulvino (2007), Campbell, Giglio and Pathak (2011), Ellul, Jotikasthira and Lundblad (2011) and Jotikasthira, Lundblad and Ramadorai (2012)).[2] The paper is also related to a strand of the literature exploring the trading of institutional investors during financial crises. Manconi, Massa and Yasuda (2012) show that investors more exposed to securitized

[2] Boyson, Helwege and Jindra (2011) question the relevance of funding constraints and fire sales.

bonds, which experienced large price declines, sold more bonds and contributed to depress their prices. Ben-David, Franzoni and Moussawi (2012) show that, while hedge funds reduced significantly their equity holdings during the financial crisis in 2008, their sales were only partially explained by the redemptions they experienced.[3] We propose that investor short horizons, not (only) funding constraints, explain sales during periods of market turmoil and cause temporary deviations of stock prices from their fundamental values.

Finally, our paper is related to a strand of the literature that, following Stein (1989), shows that investor horizon affects corporate policies.[4] 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 horizon investors' shareholdings, increase stock price volatility. Furthermore, Hotchkiss and Strickland (2003) show that investors' trading styles affect the stock price response to negative earnings announcements, and Cremers and Pareek (2009) provide evidence that investor horizon is related to stock market anomalies. While all these papers suggest that investor horizon may have asset pricing implications, none of them explores whether the trading horizon of institutional investors amplifies the effects of negative shocks as we do.

The remainder of the paper is organized as follows. Section 2 describes sample and summary statistics. Section 3 discusses the relationship between trading horizons and investors' characteristics. Section 4 shows how sales are affected by investor horizon. Section 5 discusses the effects of investor horizon on stock returns. Section 6 concludes.

2. Data and Empirical Measures of Trading Horizon

2.1 Data Sources

Our sample combines a variety of data sources. First, from Thomson Financial, we obtain data on the quarterly holdings of institutional investors that have discretion over 13F securities worth

[3] Relatedly, Anand, Irvine, Puckett and Venkataraman (2011) show that lower liquidity increased institutional investors' trading costs during the 2007-2008 financial crisis.
[4] For empirical evidence, see Bushee (1998), Gaspar, Massa, and Matos (2005), Cella (2012) and Derrien, Kecskes, and Thesmar (2012).

$100 million or more for all common stocks traded on New York Stock Exchange (NYSE), NASDAQ, and the American Stock Exchange (AMEX).[5]

Second, to control for the withdrawals experienced by the investors, we use CRSP mutual funds and Lipper TASS Hedge Fund Database, respectively. We match by name the mutual funds and hedge funds datasets with the Thomson Financial quarterly holdings.[6]

From Capital IQ People Intelligence and annual reports, we obtain information on characteristics of the institutional investors in our sample, such as the managerial tenure and the structure of compensation. We also hand collect information from annual reports and websites of 13F investors on the presence of the founders in the executive management team of the investors.

Finally, we obtain data on share prices, number of shares outstanding, turnover, and liquidity from the Center for Research in Security Prices (CRSP), on firm characteristics from COMPUSTAT, and insiders' holdings from Thomson Financial.

Since the CBOE Volatility Index (VIX), an important component of our definition of market turmoil, becomes available as of 1986, our sample period spans from the first quarter of 1986 to the second quarter of 2009.

2.2 Investor Horizon

In existing literature, horizon is generally considered an exogenous characteristic of an investor's trading style, which does not change (or changes rarely over time). While the trading horizon of an investor is not directly observable, it is revealed through time by the investors' trading behavior: Institutional investors with short trading horizons should buy and sell more frequently than long horizon investors. Thus, consistent with existing literature, we capture an investor's horizon

[5] 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. We have no information on short-selling positions.

[6] Since there is no common identifier between Thomson Financial and CRSP mutual funds and Lipper TASS, we match CRSP mutual funds and Lipper TASS with the 13F filings by name. The matching is based on two steps. First, we remove common components in the name of each fund that may be reported in different formats in the datasets (e.g., LLC for hedge funds). Second, we match the fund names using the first 20 letters of the remaining fund name. All matches were verified and some names were matched manually.

using a proxy for its 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* in 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 investor trading horizon used by Carhart (1997), Barber and Odean (2000), and Yan and Zhang (2009). Being computed from quarterly snapshots, our churn ratio, like similar measures in existing literature, understates the investor's actual portfolio turnover. This downward bias should make it more difficult to find any effect of investor horizons on investors' trading behavior and asset prices.

Importantly, our measure of churn ratio is always *predetermined* with respect to each of the episodes of market turmoil we consider, and therefore cannot be affected by the investors' trading behavior or any withdrawals experienced during these episodes. Furthermore, for each institutional investor, we compute the churn ratio every quarter and then measure the trading horizon as the average churn ratio over a number of previous quarters.[7] Being an average across different stocks held by an institutional investor, the churn ratio evens out idiosyncratic firms' shocks that may affect investors' holding periods. Similarly, by considering the average over different quarters, we mitigate the effect of investor-specific shocks that may cause deviations of the investor's holding period from its preferred horizon. In untabulated results, we find that the churn ratio is stable for institutions across time, giving us comfort that the trading horizon of an investor strategy does not change or changes rarely over time.

We also explore the robustness of our findings to two alternative measures of horizon. First, we use the measure of quarterly portfolio turnover proposed by Wermers (2000) and Brunnermeier

[7] In the analysis of the main event we present hereafter we average the churn ratio for 22 quarters before the event. The specific number of quarters we use is immaterial for our findings and the results are invariant if, for instance, we measure the churn ratios as of the second quarter 2007 or take an average over shorter or longer periods.

and Nagel (2004). This measure is defined as the minimum of the absolute values of buys and sells made by institutional investor *i* during quarter *t*, divided by the total holdings at the end of quarter *t-1*, with buys and sells being measured using end-of-quarter *t-1* prices. Although this proxy may understate an investor's portfolio turnover, it has the advantage of capturing trades unrelated to the inflows or outflows experienced by the investor.

Second, we use the classification of short horizon and long horizon 13F investors of Bushee (1998), Bushee (2001) and Bushee and Noe (2000). Bushee distinguishes between transient investors, dedicated investors and quasi-indexers. Transient investors have high portfolio turnover, highly diversified portfolios, and their interest in the firm's stocks is driven by short-term trading profits. To the contrary, dedicated investors and quasi-indexers guarantee long-term stable ownership to firms. We consider an investor to be short horizon if in the preceding year the investor was classified as transient.

Table 1 describes the churn ratios of the investors in our sample over the period 1986-2009 along with other characteristics of their portfolios. The average (median) churn ratio of all institutional investors is 0.35 (0.25). Importantly, there is also large variation in this measure. For example, institutions with a churn ratio in the 5th percentile on average turn over about 2% of their portfolio in a quarter, while institutions in the 95th percentile turn over more than 70% of their holdings in a quarter.

[Insert Table 1]

Using the classification of 13F investors proposed by Bushee (who builds on the original classification used by Spectrum/Thomson Financial up to 1998)[8] and our own match of the 13F investors with CRSP Mutual Funds and Lipper Tass to identify mutual funds and hedge funds, respectively,[9] we are able to describe how investor horizon varies across the following nine categories of investors: (a) independent investment advisors, (b) investment companies, (c) insurance

[8] The 13F manager type code in the Spectrum/Thomson Financial dataset is not reliable after 1998. The WRDS website provides more details.

[9] Most of the mutual funds and hedge funds are originally classified as "Independent Investment Advisors" and as "Miscellaneous Investors" in the Spectrum/Thomson Financial and Bushee classification. If we can identify them as mutual funds or hedge funds, we remove them from the original category.

companies, (d) pension funds, (e) bank trusts, (f) university and foundation endowments, (g) mutual funds, (h) hedge funds, and (i) miscellaneous investors, which include any investors that cannot be classified in any of the above categories.

University and foundation endowments, pension funds, and insurance companies tend to be long horizon investors. The short horizon investors instead are found among hedge funds, bank trusts, investment companies, and independent investment advisors. The category of mutual funds comprises investors with a great variety of strategies, including indexers, and, for this reason, the average churn ratio of mutual funds is close to the average of the entire sample.

2.3 Classification of Firms' Ownership Structure

Since most of our tests are performed at the firm rather than at the institutional investor level, we need to capture the average investment horizon of the institutional investors holding stocks in each firm, to which we refer as investor turnover (henceforth "IT"). Importantly, although individual institutions hold small stakes, collectively, institutions own on average nearly 50% of the firms' shares outstanding. 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.

To measure the IT of each stock in our sample, we average the churn ratio of the institutional investors holding stocks in the firm (computed as explained in section 2.2) using the ownership weights right before each of the events we consider. We proceed in this way because only the trading of the investors' actually holding the stocks right before the event of market turmoil can generate selling pressure. 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 shares held by all institutional investors in stock j. Then, in each quarter, the investor turnover of stock j is measured as the weighted average of the total portfolio churn ratios of its investors:

$$IT_{j,t} = \sum_{i=1}^{S} \left(\sum_{m} \frac{CR_{i,t-m}}{M} \right) * w_{i,j,t},$$

where M refers to the number of quarters before t over which we average each investor's churn ratio. By lagging the churn ratio, we ensure that the trading behavior of the investors does not reflect the investors' response to the shocks. In the analysis of our main event (the period surrounding the Lehman's bankruptcy), we measure $w_{i,j,t}$ at the end of the second quarter of 2008, as in Aragon and Strahan (2012),[10] and use the average $CR_{i,t}$ calculated over the period from the first quarter of 2002 until the second quarter of 2007. This approach ensures that the investors' horizon measure is unaffected by the market shocks preceding the Lehman's bankruptcy, such as the quant crisis in August 2007.

We compute IT as a weighted average using each of the three measures of investor horizon described in Subsection 2.2 in turn. In what follows, we refer as IT1 to the proxy obtained averaging the churn ratio defined as in Gaspar, Massa and Matos (2005), as IT2 to the proxy obtained averaging the churn ratio defined as in Wermers (2000) and Brunnermeier and Nagel (2004), and as IT3 to the proxy obtained by adding up the ownership weights of transient investors.

Besides varying the definition of investor horizon, we explore the robustness of our findings using two sets of ownership weights. As mentioned before, we start by considering the weight of institutional investor i in quarter t as a proportion of the shares held by all institutional investors in stock j, like in existing literature (e.g., Gaspar et al. (2005); Yan and Zhang (2009)). In this way we focus on the subset of the firm's stocks that are arguably closer to the free float.

However, to the extent that institutional ownership varies across firms, we may obtain a more precise measure of the selling pressure that short horizon investors generate by focusing on the weight of institutional investor i in quarter t as a proportion of firm j's shares outstanding. We thus compute alternative measures of IT using these new weights. In what follows, we label IT1 the IT in which the ownership weights are computed out of the shares owned by 13F investors and IT1-Total the IT in which the ownership weights are computed out of the total shares outstanding. For the other two proxies of investor turnover, for brevity, we only report results in which weights are computed

[10] Aragon and Strahan (2012) show that stocks held by Lehman-connected hedge funds experienced greater declines in market liquidity following the Lehman's bankruptcy than other stocks.

out of the total shares outstanding and thus continue to refer to them as IT2 and IT3. Results are invariant when using the two alternative proxies for horizon with weights computed out of the shares held by all 13F institutions.

Panel B of Table 1 provides descriptive statistics for IT1 for the period 1986-2009.[11] Firms exhibit large differences in the horizons of their investors. The average firm's IT1 is 0.25, but this ranges from 0.15 for firms in the 5th percentile to 0.43 for firms in the 95th percentile of IT1. An average turnover of 0.25 implies that the institutional investors holding the stock rotate almost 13% of their portfolio in each quarter, and 52% in each year. Put differently, on average firms in 95th percentile of IT1 have investors that hold their position for less than 14 months (12 months/(0.43× 2)), while firms in the 5th percentile of IT1 have investors that on average hold their position for 40 months (12 months/(0.15× 2)). Importantly, we also find that the correlations between our main proxy for IT, IT1, and both alternative proxies, IT2 and IT3, are around 50%, indicating that these proxies allow for truly independent tests of our maintained hypothesis.

3. Trading Horizon and Investors' Characteristics

Coordination failure models establish a relationship between an investor's trading horizon and its propensity to sell during periods of market turmoil. But which investor characteristics are associated with a short trading horizon? In this section, we provide original empirical evidence to shed some light on this question.

As Yan and Zhang (2009) note, institutional investors are far from homogeneous and may have different investment horizons because of investment objectives, legal restrictions, investor clienteles, and competitive pressure. Panel A of Table 1 already shows that the churn ratios differ markedly across institutions with different organizational structures. However, there is also significant variation of the churn ratios within each category of 13F investors. This indicates that investor horizon is associated with other investor characteristics as well. We consider these possible characteristics below.

[11] We report descriptive statistics on the other measures of IT in Table 5.

First, the way in which flows respond to performance may affect dramatically an investor's trading horizon even for investors belonging to the same category. Stein (2005) shows that investors specialize in strategies that neglect long-run profit opportunities and focus on short-term trades with relatively poor abnormal returns, if they need to prevent withdrawals due to short-run underperformance. Importantly, differences in funding structures may generate different propensities to sell when sales by other market participants and price declines are feared, even if investors do *not* experience withdrawals, precisely because investors sell to avoid short run underperformance and the consequent withdrawals.

We capture an investor's trading performance sensitivity using the correlation between each 13F institutional investor's portfolio performance at quarter *t-1* (generated *solely* by the price changes of the stocks held in their portfolios) and the change in assets under management at quarter *t* computed over a rolling window of 20 quarters before quarter *t*.[12] We label this variable Trading Performance Sensitivity. We compute the churn ratio as a moving average over 20 quarters to make sure that the investor horizon does not change in response to market shocks, but also to allow for eventual changes in investor strategy.

[Insert Table 2]

Since we expect investor characteristics to vary across institutions, but little for a given institution over time, we use Fama-MacBeth (1973) cross-sectional regressions. Column 1 of Table 2 shows two important results. It confirms that the investor's organizational structure matters for trading horizons, with Investment Companies and Hedge Funds having the highest churn ratios and Insurance Companies, Pension Funds and Endowments having the lowest churn ratios compared to the residual category of Miscellaneous Investors.[13] More importantly, a higher trading performance sensitivity is indeed associated with a shorter trading horizon even if we control for the investor's organizational structure.

[12] In this test in which we use all 13F investors we can only approximate changes in assets under management using net trading (i.e., the value of stock purchases minus the value of stock sales). These results are robust if we restrict our attention to mutual funds for which we are able to compute net flows.

[13] As is evident from the positive coefficients of the dummies capturing the different investor types, the Miscellaneous Investors category includes the investors with longer horizons.

Second, investors' trading horizons may differ because the investors have adopted different investment strategies to generate returns. For instance, Vayanos and Woolley (2011) show that momentum strategies aim to produce strong risk-adjusted returns over four months. In contrast, risk-adjusted gains from a value approach emerge over horizons of more than a year and eventually overtake returns from the momentum approach.

We follow Grinblatt, Titman and Wermers (1995) and measure the extent of momentum investing of an investor as the weighted average of the returns of the stocks in the portfolio of the investor during the past quarter. This variable is naturally higher for investors that buy winners, as momentum investors do. Bushee also classifies 13F investors into four different style classes: first based on whether they are growth-oriented or value-oriented and, within each of these two classes, on whether they invest mostly in small stocks or large stocks (Abarbanell, Bushee, Raedy (2003)).

After controlling for the investor's Trading Performance Sensitivity,[14] the results in column 2 show that momentum traders have indeed higher churn ratios. This is consistent with the findings of Bushee (1998) and Hotchkiss and Strickland (2003), who show that momentum investors are more likely to be high turnover investors. We also find that growth-oriented investors have higher churn ratios, while value-oriented investors have low churn ratios whether they invest in large or small stocks.[15]

The conjecture that the trading strategy of an investor is related to the investor's trading horizon is confirmed by existing empirical evidence. For instance, while hedge funds exhibit high churn ratios on average, activist hedge funds are known to hold their positions longer than one year (Brav, Jiang, Partnoy and Thomas (2008)). In unreported results, we find that activist hedge funds – identified by the number of 13D forms they file over the period 2002-2007 scaled by the number of (long) stock positions they hold over this period – have lower churn ratios than non-activist hedge funds.

[14] We exclude the dummies capturing the investor's organizational structure to avoid quasi-multicollinearity problems.
[15] Here we use as residual category the "Large Growth" class of investors.

Finally, ownership and managerial characteristics have also been shown to affect the trading horizon of fund managers and their focus on short-term returns. Wagner (2012) argues that compensation based on short-term performance leads institutional investors' managers to have short-trading horizons, because short-term underperformance can result in lower compensation or dismissals. Goldman and Slezak (2003) show that a short managerial tenure also induces fund managers to focus on short-term returns and neglect long-term performance. In this respect, the presence of the 13F founder on the executive management team should allow for a more long-term trading strategy because of a longer-term view on his/her tenure and a focus on the long-term value of his/her equity stake.

In columns 3 to 5 of Table 2, we explore the relationship between churn ratios and ownership and managerial characteristics for a subset of 13F investors for which we are able to observe this information.[16] Column 3 shows that the churn ratio is indeed lower in institutions where the founder is still in the 13F management team.[17] Column 4 provides more direct evidence that managerial tenure matters for investors' trading horizons by showing that managerial turnover is positively associated with the churn ratio. Finally, column 5 shows that institutions that grant their managers more long-term compensation have lower churn ratios: A one standard deviation increase in the long-term compensation decreases the churn ratio by 0.40 standard deviations.[18]

Overall, it appears that a number of investor characteristics help explaining investors' trading horizon. In what follows, we abstract from the specific determinants of investor horizon, and explore how investor horizon affects investors' trading and asset prices during periods of market turmoil.

[16] For these specifications we are unable to control for organization structure (as in column 1) because the subset of 13F investors for which we observe managerial turnover, compensation and presence of founders does not span the entire classification scheme. We only have data for a subsample of publicly listed investors belonging to the following categories: (a) independent investment advisors, (b) pension funds, (c) bank trusts, (d) insurance companies, and (e) miscellaneous investors. All the results hold when we include the momentum strategy proxy as an additional control variable. Results are not shown for brevity.

[17] The sample is drastically reduced because we are able to collect this information only for institutions that have a website (and report the company's history) and from annual reports.

[18] The standard deviation of the long-term compensation is 0.20 and the standard deviation of the churn ratio for this specification is 0.29. Thus this effect is obtained as follows: (0.20*(-0.582))/0.29.

4. Trading Horizons and Selling Pressure

4.1 Net sales

Our maintained hypothesis is that during episodes of market turmoil, short horizon investors sell more than long horizon investors. Empirical evidence on this issue is important because selling pressure during episodes of market turmoil may not necessarily be related to investors' trading horizons. Short horizon investors could even be able to purchase undervalued assets if they were faster in mobilizing capital or had more liquid portfolios. Whether investors with short horizons indeed sell more is ultimately an empirical question that we address here.

To define episodes of market turmoil, we use the VIX index, a measure of implied volatility in the S&P500 index options that captures the fear of a market meltdown (Adrian and Shin (2010)), and the S&P500 index. We require that the S&P500 monthly return falls in the bottom fifth percentile and the VIX change is above the 95th percentile. With this definition, we identify three episodes: The first episode coincides with 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 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). The third episode coincides with the Lehman's bankruptcy on September 15, 2008.

In the first part of the analysis, the dependent variable is the net (dollar) sales made by investor *i* during quarter *t* as a percentage of the total holdings of the same institution at the end of quarter *t-1*, defined as follows:[19]

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

where $N_{i,j,t}$, Q and $P_{j,t}$ are defined as in Section 2. As before, we compute the churn ratio as a moving average over the 20 quarters preceding quarter *t*.[20] The main variable of interest is the

[19] Here we assume that investors sell at the price prevailing at the end of the quarter. The results are invariant if we assume that investors sell (a) at the average of the prices in quarter *t*, and (b) at the price prevailing at the beginning of quarter *t*.

interaction of the churn ratio with a dummy variable – which we call "Turmoil"– capturing quarters during which market-wide shocks are experienced.[21]

We then extend the analysis at the individual stock level to explore whether during periods of market turmoil stocks mostly held by short horizon investors experience higher selling pressures than stocks mostly held by long horizon investors. The dependent variable is the 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*. Our main explanatory variables are the Turmoil dummy variable, IT1, and, most importantly, the variable that interacts Turmoil with IT1.

[Insert Table 3 here]

In Panel A of Table 3, the positive and significant coefficient of the interaction of the churn ratio with the Turmoil dummy indicates 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 year fixed effects or market returns and volatility. This result confirms that, during episodes of market turmoil, rather than providing liquidity, short-term investors engage in panic selling. 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 suggests that institutional investors with shorter trading horizons, if anything, sell less than other investors in normal market times. The effects are not only statistically but also economically significant. The most conservative estimates for all 13F investors in column 5 of Panel A imply that during periods of market turmoil, an investor with churn ratio in the top quartile has net sales that are almost 2.3 standard deviations larger than an investor with churn ratio in the bottom quartile.[22]

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[20] Consistently with this approach, the churn ratio measures in the first part of the sample (1986-1990) are calculated using Thomson Financial data prior to 1986. For example, the churn ratio measure for Q1 1986 is measured as the average of the churn ratios for the period Q1 1981 to Q4 1985.

[21] The results we present hereafter are confirmed if we redefine the Turmoil dummy variable to take a value of 1 also during Q3 of 2007 (characterized by the Quant crisis) and Q1 of 2008 (characterized by the bailout of Bear Stearns).

[22] This effect is computed as ((0.37-0.18)*(3.905-2.735))/0.097, where the coefficient of the interaction of the churn ratio with the Turmoil dummy is 3.905, the coefficient of the churn ratio is -2.735, and the standard deviation of the net sales is 0.097.

Also negative industry shocks may generate expectations similar to market-wide shocks, although the effects may be weaker because most investors are diversified across industries. This is precisely what we find in column 3 of Panel A of Table 3. We define industry turmoil as episodes in which an industry return is below the 10^{th} percentile and that do *not* coincide with generalized market turmoil. We find that also during these episodes short-horizon investors sell more as is consistent with coordination failure models.

We then ask whether investors with shorter horizons sell more during period of market turmoil because they experience more withdrawals than other investors. This is particularly important because Ben-David, Franzoni and Moussawi (2012) find that the hedge funds facing withdrawals sold more during the 2007-2008 financial crisis. Since we can precisely estimate the net flows only for mutual funds and hedge funds, in columns 6 and 7 of Panel A of Table 3 we consider only the subsamples of mutual funds, and mutual funds and hedge funds, respectively, controlling for the flows experienced by mutual funds, and mutual funds and hedge funds.

Besides the contemporaneous fund flows, we also control for the flows experienced by the investors in the subsequent two quarters because fund investors' may react with a delay due to regulatory, contractual or behavioral constraints and the institutional investors may anticipate their withdrawals. Consistent with Ben David, Franzoni and Moussawi (2012), we find that contemporaneous fund outflows directly influence investors' selling. However, investors' trading horizons are still associated with larger sales during periods of market turmoil.

In Panel B of Table 3 we find that, when aggregated at the stock level, shorter trading horizons result in higher selling pressures. The interaction of IT with the Turmoil dummy in Panel B shows that during periods of market turmoil, based on the estimates in column 6, the net sales of stocks with IT1 in the top quartile are 1.8 standard deviations larger than for stocks with IT1 in the lowest quartile.[23]

[23] This effect is computed as ((0.29-0.20)*(1.987-1.574))/0.0204, where the coefficient of the interaction of IT with the Turmoil dummy is 1.987, the coefficient of IT is -1.574 and the standard deviation of the net sales of stock *j* is 0.0204.

This result is both qualitatively and quantitatively invariant to the inclusion of different sets of controls for firm characteristics and market conditions. In particular, we continue to find that a high IT1 increases the selling pressure experienced by a firm during episodes of market turmoil after controlling for the withdrawals experienced by the firm's investors. In column 6, we control for the net flows experienced by mutual funds, using the proxy proposed by Coval and Stafford (2007) to capture forced stock sales (and purchases). In column 7, we include the same sets of controls as in column 5, but we redefine the firm's IT1 considering only the churn ratio of the mutual funds holding the firm's stocks, that is, the investors for which we observe the net flows. Similarly, in column 8, we include as a control also a measure of net flows experienced by hedge funds, defined like the analogous proxy for mutual funds, and construct the firm's IT1 considering only the churn ratios of mutual funds and hedge funds. In all specifications, we continue to find that a high IT1 is positively related to net sales during periods of market turmoil.

To provide a more accurate characterization of investor behavior, we also explore whether short horizon investors sell to a larger extent stocks with certain characteristics during periods of market turmoil. Some theories (e.g., Brunnermeier and Pedersen (2009)) imply that investors experiencing funding constraints should sell to a larger extent high volatility stocks. We find no evidence that short horizon investors sell high volatility stocks to a larger extent during periods of market turmoil, confirming that our results are not driven by funding constraints. Consistent with the notion that the short-horizon investors profit from short-run price appreciations, we find that short horizon investors tend to sell winners at all times, and especially during periods of market turmoil. We find some evidence that short-horizon investors sell to a large extent high market to book stocks, characteristics for which we extensively control for in the empirical analysis.

With this evidence, we can make two important considerations. First, as suggested by coordination models, investor horizon, as captured by the investor's churn ratio, is indeed related to the selling pressure experienced by different securities during periods of market turmoil. Short horizon investors do not provide liquidity during these episodes and, as a consequence, short-term buying capital is not available.

Second, the effect of investor horizon appears to be mostly driven by investors' demand and incentives and not only by withdrawals and funding constraints. Furthermore, in the Internet Appendix, we provide evidence that, during the period surrounding the Lehman bankruptcy, short horizon investors exhibit similar propensities to liquidate stocks in their portfolio mostly held by other short horizon investors and stocks in their portfolio mostly held by long horizon investors. In other words, short horizon investors sell the stocks in their portfolio to a larger extent, irrespective of whether these stocks are classified as high or low investor turnover. This indicates that their sales are not driven by unobserved characteristics of the stocks they hold to a larger extent.

4.2 Cash Holdings

To provide further evidence on how short horizon investors' demand and incentive vary during periods of market turmoil, we investigate the asset allocation of mutual funds, the only category of 13F investors for which we can observe investments other than stocks, specifically in cash, at quarterly frequency from CRSP Mutual Funds. Since information on cash-holdings is provided only from 1999, we can consider only the third episode of market turmoil, the period surrounding the Lehman's bankruptcy. Since this episode of market turmoil spans the third and fourth quarter 2008, we consider how the average of the cash positions of a fund in these quarters changes with respect to the same fund's cash positions in the first and second quarter 2008 depending on the fund's churn ratio. We control for fund size, as measured by the total net assets under management, and for fund flows in quarter *t* (third quarter 2008), *t+1* (fourth quarter 2008) and *t+2* (first quarter 2009).

As Table 4 shows, we find robust evidence that funds with higher churn ratios increase their cash holdings to a larger extent during this episode of market turmoil. The effect is not only statistically but also economically significant. In all models, a one-standard deviation increase in the churn ratio explains approximately 18 percent of the increase in cash-holdings.

[Insert Table 4 here]

In summary, the empirical evidence strongly suggests that massive selling during episodes of market turmoil originates mostly from the short horizon investors' demand and incentives and that

these investors demand liquidity at times when potential buyers' capital is scarce. Having established this result, we turn to evaluate the pricing implications of this trading behavior.

5. Price Effects of Short-Trading Horizons During Market Turmoil

5.1 The Main Event

To explore whether investors' short trading horizons magnify negative shocks, we start by focusing on the period surrounding the bankruptcy of Lehman on September 15, 2008. We then show that our results can be generalized to the other episodes of market turmoil identified in Section 4.1. In what follows, we describe more in detail the events surrounding the Lehman's bankruptcy.

Financial turbulence predated the Lehman's bankruptcy 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. 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, we consider the period that goes from June 1, 2008, i.e., 15 weeks before Lehman's bankruptcy, up to the third week in May 2009, i.e., 35 weeks after the event. During the period under consideration, the S&P500 index experienced a severe decline. The market decline was accompanied by a sharp increase in the VIX index, indicating a significantly higher level of market fear in the summer 2008. 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.

5.2 Empirical Methodology

The market-wide shock surrounding the Lehman's bankruptcy is expected to influence firms' fundamentals and to affect stock prices even in the absence of any selling pressure. Therefore, to test the hypothesis that short horizon investors may have amplified this shock, we compare each firm's actual return with alternative benchmarks capturing the return that the firm would have experienced after the market-wide shock in the absence of any selling pressure. Importantly, the identification comes not from the measurement of the firms' abnormal returns relative to the different benchmarks, which we describe below, but from comparing whether firms mostly held by short horizon investors have systematically lower abnormal returns in the aftermath of the market-wide shock, compared to firms mostly held by long horizon investors. Most importantly, similarly to Coval and Stafford (2007) and Mitchell, Pedersen and Pulvino (2007), we then look for mispricing ex post, by testing whether stocks mostly held by short horizon investors also experience larger price reversals.

Our first benchmark returns are based on the market model. We estimate $R_{jt} - R_{ft} = \beta\left(R_{Mt} - R_{ft}\right) + \varepsilon_{jt}$, 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.[24] 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* with respect to this benchmark are then computed as $AR_{jt} = R_{jt} - \hat{\beta} R_{Mt}$.

We show that our results are robust when we use the following alternative methodologies to compute benchmark returns. First, we augment the market model including the Fama French factors and the momentum factor as in Carhart (1997). Second, to take into account that stock returns could

[24] Here, we estimate the parameters of the market model over a period as close as possible to the episode of market turmoil because exposure to systematic risk may change following negative shocks. Furthermore, we use weekly returns because the events of market turmoil last several weeks. Using monthly returns would be too coarse, because most of the action happens within a month. By the same token, using daily returns, given the relatively long event windows, could introduce noise. Our results, however, are similar or even stronger if we use daily returns.

have different exposures to liquidity risk, we construct the Pastor and Stambaugh's aggregate liquidity factor with weekly frequency and estimate normal returns using a multifactor model, including the market return and the aggregate liquidity factor, as suggested by Pastor and Stambaugh (2003). Third, to mitigate concerns that our results may be driven by the stocks' different exposures to aggregate volatility risk and the probability of a market meltdown, following Ang, Hodrick, Xing, and Zhang (2006), we augment the market model by including changes in the VIX index as an additional factor to estimate the benchmark returns. Finally, and most importantly given the nature of the events we consider, we estimate all the above models *during the event window* to allow the exposures to risk factors to change during periods of market turmoil.[25]

For each of the measures of abnormal returns (and for each stock), following Coval and Stafford (2007), we compute cumulative abnormal returns (CARs) as the sum of the abnormal returns in the relevant event window, which we describe below. We then explore whether the response of stock prices to market wide shocks differ systematically across firms with high and low IT by testing whether their CARs differ. To make sure that our results are not driven by outliers, in what follows, we winsorize all abnormal returns at the 1th and 99th percent level. Our results, however, are unaffected if we do not winsorize at all.

5.3 Univariate Analysis

Figure 1 shows the mean cumulative abnormal returns calculated from the market model (henceforth "MCAR") for high and low IT firms together with their 5% confidence intervals. Overall, our sample includes 3,415 firms. We classify stocks with IT1 in the lowest tercile as held by long-term investors (Low IT firms) and those with IT1 in the highest tercile as held by short-term

[25] In the Internet Appendix, we also 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.

investors (High IT firms).[26] In what follows, for convenience, we refer to the week of Lehman's bankruptcy as week 0; however, this week must not be thought as the beginning of the episode of market turmoil, as market jitters started well before the Lehman's bankruptcy. For this reason, we start the analysis well before week 0.

The patterns and magnitude of the difference in the MCARs around the Lehman's bankruptcy for stocks mostly held by short horizon and stocks mostly held by long horizon investors are striking. While the MCARs of low and high IT stocks are statistically indifferent for the entire month of June 2008, they begin to diverge 10 weeks before the Lehman's bankruptcy, when Lehman's difficulties in attracting potential buyers and financiers emerge. Specifically, in week 0, the MCARs reach about -7.15% for high IT stocks and are instead positive and equal to 1.98% for low IT stocks, with the difference being almost 10% and carrying statistical significance at the 1% confidence level. These differences in the price declines of the two groups of stocks before week 0 are consistent with the model of Bernardo and Welch (2004) in which investors, seeing signs of possible severe market declines in the near future (the VIX index indicated an increase in uncertainty in the summer of 2008), started re-positioning their portfolios away from stocks.

Following week 0, the difference in the MCARs between the two sets of stocks continues to widen, reaching over 20% in week +8. Most importantly, the difference in the MCARs starts declining from week +9 onwards as the MCARs for both sets of stocks become less negative and especially the MCARs for stocks held by short horizon investors recover. The difference in MCARs decreases to -11.21% in week +15 and becomes statistically indifferent from zero from week +25 onwards. Following week +25, the difference in MCARs is also smaller from an economic point of view. Thus, prices seem to stabilize and stop reversing from their drops from week +25 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. Thus, not only the

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

initial declines, but also the price reversals, are influenced by IT, indicating that the latter determines a stock's *exposure* to panic selling during episodes of market turmoil.

Table 5 provides descriptive statistics about the main ownership, stock, and firm characteristics.[27] Precise variable definitions are provided in the Appendix.

[Insert Table 5 here]

While low and high IT firms have similar leverage, debt maturity, profitability and ratings, they differ along a number of other dimensions, which we control for in the multivariate analysis. For instance, high IT firms tend to be (a) more growth-oriented, (b) more liquid, and (c) more volatile. Some of these differences may bias our tests against finding any effects of IT. For instance, for given selling pressure, the higher liquidity of high IT stocks should make it less likely to find larger drops and reversals.

Insider ownership is significantly larger in firms mostly held by long horizon institutions. Since insider owners normally have a long-term presence, this may just reflect that low IT firms have shareholders with longer trading horizons. Nevertheless, in the empirical analysis, we check that our results do not depend on differences in insider ownership.

To start evaluating the importance of stock heterogeneity, we also sort firms in quintile portfolios based on each of the characteristics that could most likely differentiate the returns of high and low IT stocks. The results from these portfolio sorts, shown in the Internet Appendix, are broadly consistent with larger drops and reversals for stocks mostly held by short horizon investors compared to stocks mostly held by long horizon investors.

5.4. Multivariate Analysis

We now investigate whether investor horizons affect firm returns after controlling for firm, stock and ownership characteristics that can potentially influence the firm exposure to market

[27] In the Internet Appendix, we also present the time-series averages of the cross-sectional correlation between institutional ownership and various firm characteristics.

shocks. Also, since the IT proxies vary continuously across the sample firms, we are able to fully exploit the explanatory power of IT.

5.4.1 Price drops. Based on the evidence in Figure 1, we define the drop period as the weekly interval that spans from week -10 to week +8. We start the event window at week -10 to fully account that the news emerging before the Lehman's bankruptcy.

[Insert Table 6 here]

In columns 1 to 4 in Panel A of Table 6, we investigate the effect of IT1 on the CARs computed using the market model (MCAR) including, progressively, more controls. An increase in IT1 decreases the MCARs during the drop period and the effect is not only statistically but also economically significant. For instance, in column 2, a one-standard deviation increase in IT1 is associated with almost 4% (=0.624×0.07) lower CARs. Given that the average cumulative abnormal returns for the entire sample of stocks is -8.17%, the impact of short horizon investors on price drops appears to be significant and is consistent with the view that these investors amplify, rather than attenuate, the impact of market shocks.

The effect of the trading horizon is robust to the inclusion of variables aimed at controlling for competing hypotheses, including any selling pressure that may have been caused by the withdrawals experienced by mutual funds and hedge funds. Consistent with the findings of Coval and Stafford (2007), the selling pressure generated by withdrawals from mutual funds and hedge funds makes price drops more severe. However, including these controls only slightly decrease the effect of IT1 in comparison to column 1. The estimates (omitted for brevity) are equally invariant when we consider that fund investors may be slow in reacting to shocks and include proxies for the selling pressure generated by withdrawals one quarter and two quarters ahead. These additional controls are not statistically significant. Arguably, the trades of short horizon investors may have prevented these withdrawals.

We also control for the possibility that our findings are driven by the momentum effect (as captured by the Past Stock Returns) and for insider ownership, a feature that in Table 5 appears to

differentiate low and high IT stocks. These controls leave the estimates unaffected. Insider ownership, if anything, seems to improve returns during the drop period, confirming our conjecture that insider ownership is somewhat related to the investors' trading horizon. Our results are equally invariant to the inclusion of proxies capturing the dependence of 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 (column 3). Finally, the results are qualitatively invariant when we exclude financial firms, which had a central role during the crisis (column 4).

In the remaining columns of Panel A of Table 6, we use alternative definitions of CARs (as discussed in Subsection 5.2). The estimates show a consistently negative effect of IT1 on firms' stock market performance, whether we consider all four Fama and French factors, including the momentum factor (column 5), exposure to changes in aggregate volatility risk, as measured by changes in the VIX (column 6), or to the Pastor and Stambaugh liquidity factor (column 7).

It can also be argued that exposure to systematic risk factors changes during periods of market turmoil. A larger increase in exposure to systematic risk factors for high IT stocks than for low IT stocks could bias our findings. Although we see no reason why exposure to systematic risk factors should increase to a larger extent for high IT stocks, to assess the merit of this potential criticism, we compute the CARs estimating the exposure to systematic risk factors during our event window. For brevity, we report only the estimates of the market model (column 8) and relegate the alternative specifications to the Internet Appendix. Our estimates are qualitatively invariant.

In Panel B of Table 5, we use alternative measures of IT. A first concern is that we are able to control for withdrawals only for the mutual funds and the hedge funds included in our sample. To evaluate this argument, in column 1 of Panel B, we compute IT averaging only the churn ratios of the mutual funds holding the stock (using the proportion of shares they own out of the shares owned by all 13F investors) and control for the mutual funds' contemporaneous net flows. Our results remain invariant. Columns 2 and 3 present analogous tests in which IT1 is computed averaging only the churn ratios of the hedge funds in our sample (for which we observe redemptions) and for both

the mutual funds and the hedge funds in our sample, respectively. Even the economic magnitudes are similar to the ones we obtain when we compute IT1 for the overall sample of institutional investors.

So far, in the computation of a stock's IT, we always used as weights the proportion of the stocks owned by each investor with respect to the stocks owned by all 13F institutions. Since using weights with respect to the total number of shares outstanding may give a more precise estimate of the selling pressure experienced by each stock, in column 4, we use a different measure of IT, in which each investor's ownership weight is computed as a proportion of all the shares outstanding (IT1-Total). Indeed, the estimates indicate that a one-standard-deviation increase in IT1-Total leads to an over 5 percent (=0.91×0.06) drop in the MCARs (while the corresponding effect was 4 percent in Panel A).

Finally, to further evaluate the robustness of our results to the use of alternative measures of investor horizon, we use the two alternative measures defined in Subsection 2.3, IT2 and IT3. The results in columns 5 and 6 fully confirm our findings, both qualitatively and quantitatively. Besides showing the robustness of our findings, the specification with IT2 is important because IT2 captures trading unrelated to any inflows or outflows experienced by the investors and provides further evidence that the price dynamics we uncover are not explained (exclusively) by withdrawals.

5.4.2 Price reversals. In Table 7, we perform the same steps as in Table 6 to explore the effects of IT on price reversals. To define the reversal period, we use the interval from week +9, the week after the one in which the cumulative abnormal returns bottom-out, to week +25, the week when the reversal process ends, as shown in Figure 1.

[Insert Table 7 here]

The estimates indicate that the shorter the horizon of the investors holding a stock, the larger is the price reversal. The point estimate of our main variable of interest is even larger when we control for the net flows experienced by the mutual funds and the hedge funds holding the stocks. In column 2 of Panel A of Table 7, a one-standard-deviation increase in IT1 increases firms' cumulative abnormal returns by nearly 6% (=0.822×0.07). Given that the average abnormal returns for the entire

sample of stocks is 6.11%, the impact of short horizon investors on price reversals is highly significant from an economic point of view.

As expected, larger net flows into the mutual funds and the hedge funds holding a stock tend to increase the CARs during the reversal period, but leave the effect of IT invariant. This result once again indicates that IT does not merely capture flows.

5.4.3 Other findings and robustness. Some of the control variables in Table 6 and Table 7 also provide interesting information and additional support for our maintained hypothesis. For instance, concerns may arise that churn ratios capture the extent to which institutional investors actively manage their portfolios (as opposed to following an index), instead of horizon. To mitigate these concerns, we measure how much an investor's portfolio deviates from the Russell 1,000 index, using the active share measure, constructed similarly to Cremers and Petajisto (2009), and average this proxy across the institutional investors holding stocks in a firm, as we did for IT1. When we include this control, the extent to which institutional investors actively manage their portfolio appears largely unrelated to the firm's return during drops or reversals.

It is also comforting that stocks' abnormal returns during the drop period are related to firms' fundamentals in a plausible way. For instance, high leverage firms, which are likely to have higher demand for commercial and investment banking services, experience lower returns during the period surrounding Lehman's bankruptcy

While so far our results appear to be robust to controlling for 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 the Internet Appendix, we revisit our tests in order to be able to control for contemporaneous changes in stock characteristics. We explore the effects of IT1 in a panel of firms' weekly abnormal returns defined during the drop and reversals periods, respectively. The estimates show that even controlling for contemporaneous changes in firm liquidity and past returns over different intervals, IT1 is associated with larger drops and reversals.

In summary, the robustness of our results across different proxies for abnormal returns and measures of IT, to the inclusion of different controls, and across subsamples indicates that our findings are unlikely to be explained by firm heterogeneity or by other characteristics of the institutional investors holding the stocks.

5.5 Addressing Potential Omitted Factors

One may argue that if investor horizons were related to investors' stock picking abilities, high churn ratio investors could anticipate the drop in stock prices and, for this reason, sell more. However, it is hard to interpret the sales of short horizon investors as driven by stock picking abilities because the systematic price reversals we observe imply that the stocks sold by short horizon investors perform better. Furthermore, our results are robust when we control for investors' stock picking abilities using the Active Share Measure.[28] Yet, to further address this potential criticism, we exploit that, as noted in Section 3, some institutional investors trade more not because of valuation beliefs, but to prevent or reduce withdrawals. This trading should not contain much information and should have no independent relation with stock returns (Alexander, Cici, and Gibson (2007)).

To capture the variation in investor horizon aimed at preventing withdrawals, we conjecture that institutions that in the past experienced more withdrawals due to poor performance are more likely to sell in order to avoid short-term losses and thus prevent outflows. We proxy for this using Trading Performance Sensitivity, computed over the period spanning from 2002 to 2006. As we noted in Section 3, we do not observe actual fund flows for the entire sample of institutional investors. Thus, for the whole sample of 13F institutional investors, we approximate the change in assets under management using the net trading. Since this provides a coarse approximation of the actual changes in asset under management, for the subsample of mutual funds, we also construct the

[28] Furthermore, in unreported tests, we show that while the gross purchases of short horizon investors predict future positive returns in normal times, theirs sales predict negative returns neither in normal times nor in periods of market turmoil indicating that the sales are not driven by their stock-picking abilities.

correlation between performance at quarter *t-1* and the net flows they experience at quarter *t*; we refer to this correlation as Trading Performance Sensitivity-Mutual Funds.

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 periods of poor market performance, we also compute these same correlations during stock market busts. In order to do so, we extend the period over which we compute the correlation from 1990 to 2006 and use 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. We call these measures Trading Performance Sensitivity 2 and Trading Performance Sensitivity 2-Mutual Funds.

Investors with lower correlation between funding and previous performance expect to have more stable funding and should have the possibility of taking a longer horizon on their investment. These investors are expected to have lower churn ratios. Used as instruments, these correlations help to capture the variation in investor horizon that depends on funding structure rather than skills.

We average Trading Performance Sensitivity and Trading Performance Sensitivity 2, weighing each of them with the ownership stakes of the different investors (as we do for IT1). We use these averages as instruments in our cross-sectional regressions and refer to them as Average Trading Performance Sensitivity 1 and Average Trading Performance Sensitivity 2. We also compute the same two measures only for mutual funds, as we do for IT1-Mutual Funds.

The first column of Table 8 presents the first stage.[29] IT1 depends positively on both Trading Performance Sensitivity 1 and Trading Performance Sensitivity 2; the effect is however larger for Trading Performance Sensitivity 2, indicating that the Trading Performance sensitivity during bad times matters most. As the tests of Staiger and Stock (1997) demonstrate, Trading Performance Sensitivity 1 and 2 (Trading Performance Sensitivity 1 and 2-Mutual Funds) are strong instruments for IT1 (IT1-Mutual Funds).

[Insert Table 8 here]

[29] Note that the first stages corresponding to the four alternative specifications we present are slightly different, because we control for contemporaneous flows and because IT is computed only for mutual funds in the last two specifications. For brevity, we present only the first stages corresponding to the second stage equations in columns 3 and column 4.

The instrumental variables estimates in Table 8 confirm our previous findings that stocks with high IT experience more severe drops (column 1) and then larger reversals (column 3). The results on both price drops and subsequent reversals (columns 2 and 4) are invariant when we compute IT and the instruments considering only mutual funds. In all cases, the coefficient increases in absolute value suggesting that, if anything, unobserved investors' skills reduce the magnitude of the coefficient. Overall, these results confirm our previous findings that IT helps explain the cross-section of stock returns and that its effect is unlikely to depend on unobserved investor or firm characteristics.

5.6 Other Events

Our quantitative rule in Section 4.1 identifies other two episodes of severe market turmoil: The market crash of October 1987 and the Russian default in August 1998. Here we explore whether the price dynamics that we have described so far are present also during these episodes. In addition to these two major events, we also note that while the most recent financial crisis had its epicenter around Lehman's bankruptcy, there were two other events of interest before September 2008: The Quant crisis in August 2007 and 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 consider these two events.

[Insert Table 9 here]

Table 9 repeats the cross-sectional multivariate analysis for all the above events (we provide the relative figures in the Internet Appendix). 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. We concentrate on the magnitude of price drops and reversals. The findings in Table 9 indicate that during each of these four additional episodes of market turmoil,

the stocks mostly held by short horizon investors experienced larger drops and reversals relative to stocks mostly held by long horizon investors. Thus, our findings are generalizable to other major events of market turmoil.

6. Conclusions

This paper investigates whether investors' short horizons amplify the effects of market-wide shocks on stock prices. Since short-term returns are more important for investors with short horizons, during episodes of market turmoil, short horizon investors sell the stocks they hold to a larger extent than long horizon 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 varies depending on the length of their shareholders' investment horizons. As a consequence, the stocks that are mostly held by short horizon investors experience higher selling pressure and, consequently, more severe price drops and larger price reversals than those mostly held by long horizon investors.

Importantly, the patterns we highlight are not due exclusively to the withdrawals experienced by these investors and indicate that stock prices may experience temporary deviations from their fundamental values even if the institutional investors holding the stock do not experience funding constraints. Interestingly, also other patterns commonly attributed to the net flows experienced by institutional investors, such as liquidity commonality, have been found not to depend on investors' funding constraints (Karolyi, Lee and Van Dijck (2011)). We believe that it is a fruitful area for future research to explore how investor horizons may affect these and other features of asset prices.

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Appendix - Variable Definitions

Panel A. Investor Level Variables	
Panel A.1 Measures of Horizon	
Churn Ratio	This variable measures how frequently institutional investors rotate the stocks in their portfolio and is constructed as in Gaspar *et al*. (2005).
Panel A.2 Organizational Structure	
Bank Trusts	A dummy variable that takes the value of one if an investor is classified as a bank trust and zero otherwise. Data obtained from http://acct3.wharton.upenn.edu/faculty/bushee/
Hedge Funds	A dummy variable that takes the value of one if an investor is classified as a Hedge Fund and zero otherwise. Hedge funds are identified by merging the 13F data with Lipper Tass.
Insurance Companies	A dummy variable that takes the value of one if an investor is classified as an insurance company and zero otherwise. Data obtained from http://acct3.wharton.upenn.edu/faculty/bushee/
Independent Investor Advisors	A dummy variable that takes the value of one if an investor is classified as an Independent Investor Advisor and zero otherwise. Data obtained from http://acct3.wharton.upenn.edu/faculty/bushee/ This category also contains mutual funds and hedge funds. We exclude from the class of investment companies all hedge funds and mutual funds, and report them in two separate groups. See the definitions of Hedge Funds and Mutual Funds for details about the way we identify them.
Investment Companies	A dummy variable that takes the value of one if an investor is classified as an investment company and zero otherwise. Data obtained from http://acct3.wharton.upenn.edu/faculty/bushee/
Miscellaneous Investors	Investors that cannot be classified as mutual funds, hedge funds, independent advisors, investment companies, insurance companies, pension funds, bank trusts, or university and foundation endowments. Data obtained from http://acct3.wharton.upenn.edu/faculty/bushee/
Mutual Funds	A dummy variable that takes the value of one if an investor is classified as a Mutual Fund and zero otherwise. Mutual funds are identified by merging the 13F data with CRSP Mutual Funds.
Pension Funds	A dummy variable that takes the value of one if an investor is classified as a pension fund and zero otherwise. Data obtained from http://acct3.wharton.upenn.edu/faculty/bushee/
University and Foundation Endowments	A dummy variable that takes the value of one if an investor is classified as a university and foundation endowment and zero otherwise. Data obtained from http://acct3.wharton.upenn.edu/faculty/bushee/
Panel A.3 Trading Strategy	
Large Growth	A dummy variable that takes the value of one if an investor follows a large growth strategy and zero otherwise. Data obtained from http://acct3.wharton.upenn.edu/faculty/bushee/
Large Value	A dummy variable that takes the value of one if an investor follows a large value strategy and zero otherwise. Data obtained from http://acct3.wharton.upenn.edu/faculty/bushee/
Momentum Strategy	This variable is defined as in Grinblatt, Titman and Wermers (1995) and is calculated as the time-series average of the product between the change in the weights of security *j* held by investor *i* and the returns of security *j* from quarter *t-1* to quarter *t*. The measure is first calculated for every quarter and then averaged over the 20 quarters preceding quarter *t*.
Small Growth	A dummy variable that takes the value of one if an investor follows a small growth strategy and zero otherwise. Data obtained from http://acct3.wharton.upenn.edu/faculty/bushee/
Small Value	A dummy variable that takes the value of one if an investor follows a small value strategy and zero otherwise. Data obtained from http://acct3.wharton.upenn.edu/faculty/bushee/
Panel A.4 Ownership and Managerial Characteristics	
Manager Long-Term Compensation	The ratio of cash-based (salary) and long term components of compensation (restricted stock awards and long term incentive plans) to the total annual compensation of the Chief Executive Officer. Data is obtained from Capital IQ People Intelligence and Annual Reports.
Managerial Turnover	The ratio of the number of departures from the executive management team in year *t* divided by the average number of executives between the end of year *t-1* and the end of year *t*. Data is obtained from Capital IQ People Intelligence and from Annual Reports when available.
Presence of Founder	The presence in the executive management team of the founder/s of the 13F institutional investor. Data is hand-collected from the websites and annual reports of the 13F investors, when available, and from Capital IQ People Intelligence.
Panel A.5 Other Characteristics	
Fund Flows	The quarterly change in net assets under management less the returns in quarter *t* divided by net assets under management in quarter *t-1*. The data sources are CRSP Mutual Funds for mutual funds and Lipper TASS for hedge funds.
Net Dollar Sales (Investor Level)	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*.
Number of Stocks	The number of stocks in the investor portfolio.

Percentage Ownership	The percentage ownership of each 13F institutional investor in a firm at the end of each quarter.
Portfolio Size	The total value, in millions 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.
Trading Performance Sensitivity	The correlation between the portfolio performance in quarter *t* and net trading in quarter *t+1* of each institutional investor *i* over a rolling window of 20 quarters. The portfolio performance due to price changes of the stocks held by investor *i* 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*. 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*. For the Lehman Brothers' event we compute this measure from the first quarter of 2002 until the fourth quarter of 2006.
Panel B. Firm Level Variables	
Panel B.1 Ownership Characteristics	
Active Share Measure	The weighted average of the proportion of the portfolios of institutional investors in firm *j* that deviates from the benchmark index. 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. We use as weights the number of shares held by each investor *i* in firm *j* as a proportion of the shares held by 13F investors in firm *j*.
Average Trading Performance Sensitivity 1	The average of the investor level Trading Performance Sensitivity for all the investors holding stocks in firm *j* using as weights the number of shares held by each investor *i* in firm *j* as a proportion of the shares held by 13F investors in firm *j* in the second quarter of 2008.
Average Trading Performance Sensitivity 1-Mutual Funds	We first calculate Trading Performance Sensitivity using only mutual funds. Instead of net trading in quarter *t+1*, we use mutual funds' inflows in quarter *t+1*. We average the investor level correlations for all mutual funds holding stocks in firm *j* using as weights the number of shares held by each mutual fund *i* in firm *j* as a proportion of the shares held by 13F investors in firm *j* in the second quarter of 2008.
Average Trading Performance Sensitivity 2	The average of the investor level Trading Performance Sensitivity where the latter is computed only over quarters from 1990 to 2006 during which the S&P 500 Index return is in the bottom decile. We average the investor level correlations for all the investors holding stocks in firm *j* using as weights the number of shares held by each investor *i* in firm *j* as a proportion of the shares held by 13F investors in firm *j* in the second quarter of 2008.
Average Trading Performance Sensitivity 2-Mutual Funds	This correlation measure is calculated as Trading Performance Sensitivity using only mutual funds computed only over quarters from 1990 to 2006 during which the S&P 500 Index return is in the bottom decile. Instead of net trading in quarter *t+1*, we use mutual funds' inflows in quarter *t+1*. We average the investor level correlations for all mutual funds holding stocks in firm *j* using as weights the number of shares held by each mutual fund *i* in firm *j* as a proportion of the shares held by 13F investors in firm *j* in the second quarter of 2008.
Change in Portfolio Value	The change in the portfolio value of the investors in each firm computed as $\sum_i w_{i,j,dec07} \sum_j \mathrm{N}_{j,i}(p_{j,feb08} - p_{j,dec07})$ where $w_{i,j}$ is the number of shares held by each investor *i* in firm *j* as a proportion of the shares held by 13F investors.
Hedge Funds Flows	Constructed as Pressure_1 in Coval and Stafford (2007, p. 489, eq. 4). We take the difference between severe inflows and severe outflows experienced by the hedge funds holding a stock in a given quarter, divided by the average trading volume of the stock during the prior quarter. Severe flows are those below/above the 10th/90th percentile of flows experienced by hedge funds. Hedge fund flows are obtained from Lipper TASS. For the main event, we consider the flows during the third and the fourth quarter of 2008 for the drop period and during the fourth quarter of 2008 and the first quarter of 2009 for the reversal period.
Hedge Fund Ownership	The percentage of the shares held by hedge funds at the end of quarter *t*-1.
Insider Ownership	The percentage of the shares held by insiders (founders, CEOs, etc.) in the second quarter of 2008.
Institutional Ownership	The percentage of the shares held by 13F investors at the end of the second quarter of 2008.
IT1	The weighted average of the churn ratios of firm *j*'s investors computed as follows: $IT_{j,t} = \sum_{i=1}^{S}\left(\sum_{m=4}^{M+4}\frac{CR_{i,t-m}}{M}\right)*w_{i,j,t}$, where for each 13F institutional investor *i* holding stocks of firm *j*, we first calculate the investor *i* churn ratio, $CR_{i,t}$, and then take the mean over a number M of quarters preceding *t*. $w_{i,j,t}$ is the number of shares held by investor *i* in firm *j* at quarter *t* as a proportion of the shares held by 13F institutional investors. For example, for our main event, we average the churn ratios of each investor *i* from the first quarter of 2002 till the second quarter of 2007 and measure $w_{i,j,t}$ in the second quarter of 2008.

IT1-Hedge Funds	The weighted average of the churn ratios of *only* the hedge funds in firm *j*. Churn ratios and weights are defined as in IT1.
IT1-Mutual Funds	The weighted average of the churn ratios of *only* the mutual funds in firm *j*. Churn ratios and weights are defined as in IT1.
IT1-Mutual Funds and Hedge Funds	The weighted average of the churn ratios of *only* the mutual funds and hedge funds in firm *j*. Churn ratios and weights are defined as in IT1.
IT1-Total	The weighted average of the churn ratios, defined as in IT1 but using as weights the proportion of stocks held by investor *i* in firm *j* with respect to firm's *j* total shares outstanding in quarter *t*.
IT2	The minimum of the absolute values of buys and sells made by institutional investor *i* during quarter *t* divided by the total holdings at the end of quarter *t*-1, with buys and sells being measured using end-of-quarter *t-1* prices (like in Wermers (2000) and Brunnermeier and Nagel (2004)). We average this churn ratio measure across the investors holding stocks in a firm using as weight the shares held by each institutional investor as a proportion of the total shares outstanding in the second quarter of 2008.
IT3	Using data available from B. Bushee's website (http://acct3.wharton.upenn.edu/faculty/bushee/), we identify transient investors. IT3 is then defined as the total number of shares held by transient institutional investors in the second quarter of 2008 as a proportion of the total number of shares outstanding.
Mutual Funds Flows	This variable is constructed as Pressure_1 in Coval and Stafford (2007, p. 489, eq. 4). We take the difference between severe inflows and severe outflows experienced by the mutual funds holding a stock in a given quarter and then divide this difference by the average trading volume of the stock from the prior quarter. Severe flows are those below/above the 10th/90th percentile of flows experienced by mutual funds. Mutual funds' flows are from CRSP Mutual Funds. For the main event, we consider the flows during the third and the fourth quarter of 2008 for the drop period and during the fourth quarter of 2008 and the first quarter of 2009 for the reversal period.
Mutual Fund Ownership	The percentage of the shares held by mutual funds at the end of quarter *t*-1.
Net Dollar Sales (Firm Level)	The total net (dollar) sales (total dollar sales less total dollar purchases) made by all 13F institutions for each firm during quarter *t* as a percentage of the market capitalization of the same firm at the end of quarter *t-1*.
Other 13F Investors Ownership	The percentage ownership of all institutional investors but mutual funds and hedge funds at the end of quarter *t*-1.
Ownership Concentration	The Herfindal index of the institutional investors' ownership in each firm in the second quarter of 2008
Panel B.2 Firm Characteristics	
Bid-Ask Spread	The average difference between bid and ask quotes divided by the daily price. This variable is calculated as the average bid-ask spread over the month of December in the year before each event.
Debt Maturity	Long-term debt maturing in 2008 divided by the firm total long-term debt.
Firm Size	The natural logarithm of total assets as of the month of December in the year before each event.
Leverage	The book value of debt divided by the book value of total assets as of December of the year before each event.
Market Cap	The company's shares outstanding (in million) multiplied by market price as of the end of the month of December in the year before each event.
Market-to-Book	The market value of equity divided by the book value of common equity. In Table 3 we use the Market-to-Book in quarter *t-1*. In Tables 6 to 8, this variable is calculated as of the end of the month of December in the year before the each event.
Past Stock Returns	The firm's stock returns, computed in quarter *t-1* in Tables 2 and 3 and over the 180 days before each event in Tables 6 to 8.
Return on Assets	The net income at time *t* divided by total assets at time *t-1*, where *t* is the year before each event.
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.
Share Turnover	The quarterly average of the daily turnover in quarter *t-1*.
Stock Return Volatility	The standard deviation of daily stock returns during quarter *t-1*.
Panel C. Other Variables	
Industry Turmoil	A dummy variable that takes a value of 1 if the industry return is below the 10th percentile and the turmoil dummy is equal to zero, and zero otherwise
Market Return	The return on the S&P500 in quarter *t*.
Market Return Volatility	The standard deviation of the S&P500 daily returns during quarter *t*.
Turmoil	A dummy variable that takes a value of 1 during the quarters when market-wide shocks are experienced and zero otherwise. To define episodes of market turmoil, we use the VIX index, a measure of implied volatility in the S&P500 index options and the S&P500 index. We require that the S&P500 monthly returns fall in the bottom fifth percentile and the VIX changes are above the 95th percentile.

Table 1: Descriptive Statistics – Investors' Portfolio Level

This table describes the main characteristics of 13F institutional investors' portfolios (Panel A), and the main characteristics of the firms held by 13F institutional investors (Panel B) over the period from 1986 to 2009. The churn ratio for hedge funds is measured over the period from 1994 to 2009 since Lipper Tass starts providing reliable information about hedge funds from 1994. Managerial turnover and Manager Long Term Compensation are measured for the period from 2003 to 2009 and have yearly frequency. All remaining variables are quarterly. All variables are defined in the Appendix.

	N	Mean	SD	P05	Median	P95
Panel A: Institutional Investors						
Churn Ratio	168,785	0.35	0.32	0.04	0.25	1.35
Churn Ratio –Mutual Funds	48,547	0.34	0.28	0.19	0.28	1.41
Churn Ratio –Hedge Funds	19,506	0.42	0.20	0.23	0.43	1.52
Churn Ratio – Independent Investment Advisors	61,375	0.37	0.32	0.16	0.28	1.27
Churn Ratio – Investment Companies	4,023	0.43	0.31	0.27	0.44	1.64
Churn Ratio – Insurance Companies	4,544	0.21	0.15	0.06	0.20	0.39
Churn Ratio – Pension Funds	8,005	0.19	0.12	0.04	0.16	0.35
Churn Ratio – Bank Trusts	9,020	0.39	0.31	0.20	0.35	1.44
Churn Ratio – University and Foundation Endowments	2,701	0.16	0.12	0.02	0.18	0.32
Churn Ratio – Miscellaneous Investors	11,064	0.12	0.20	0.04	0.10	0.74
Net Dollar Sales (Investor Level)	168,785	-6.21%	9.70%	-18.15%	-2.41%	20.09%
Fund Flows	94,107	0.98%	9.11%	-15.18%	0.21%	14.90%
Momentum Strategy	168,785	0.72	1.05	0.08	0.67	1.48
Managerial Turnover	2,905	8.16%	5.97%	0%	7.68%	19.02%
Manager Long Term Compensation	1,729	60.21%	19.82%	39.87%	52.88%	85.19%
Percentage Ownership	168,785	0.25%	0.46%	0.01%	0.20%	0.78%
Portfolio Size	168,785	1,807	6,090	29	410	7,568
Portfolio Weight	168,785	2.80%	13.11%	0.10%	1.07%	15.42%
Number of Stocks	168,785	148	211	10	61	892
Panel B: Firm Characteristics						
IT1	452,081	0.25	0.10	0.15	0.24	0.43
IT1-Mutual Funds	389,110	0.19	0.09	0.08	0.18	0.38
IT1-Hedge Funds	262,107	0.10	0.06	0.06	0.11	0.22
Net Dollar Sales (Firm Level)	452,081	-1.35%	2.04%	-2.16%	-0.75%	2.10%
Mutual Fund Flows	385,722	0.71	5.18	-3.10	0.34	2.86
Hedge Fund Flows	262,107	0.29	3.90	-1.49	0.18	2.05
Mutual Fund Ownership	328,110	19.06%	14.32%	2.81%	18.16%	41.07%
Hedge Fund Ownership	262,107	3.53%	5.21%	0.00%	4.71%	9.08%
Other 13F Investors Ownership	452,081	19.20%	15.09%	2.27%	16.02%	52.88%
Past Stock Return	452,081	1.05%	4.92%	-32.78%	0.08%	40.34%
Stock Return Volatility	452,081	3.88%	9.68%	0.84%	2.72%	9.18%
Share Turnover	452,081	0.51%	0.54%	0.04%	0.50%	1.92%
Firm Size	452,081	2,270	12,307	38	285	5,081
Leverage	452,081	20.02%	21.74%	0.00%	15.80%	58.43%
Return on Assets	452,081	1.48%	8.98%	-22.19%	1.91%	14.08%

Table 2: The Determinants of Investor Horizon

This table relates the churn ratio of investor *i* at the end of quarter *t* to characteristics of investor *i* at the end of that quarter. In columns 1 and 2, we ran Fama-MacBeth (1973) quarterly cross-sectional regressions. In columns 3, 4 and 5 we ran Fama-MacBeth yearly cross-sectional regressions, because the new independent variables we introduce vary only across years. All variables are defined in the Appendix. All models include the constant term, but the coefficient is not reported. P-values are in parentheses. * indicates significance at 1% (***), 5% (**), 10% (*).

	(1)	(2)	(3)	(4)	(5)
Liabilities Structure					
Trading Performance Sensitivity	0.794***	0.851***	1.038***	1.297***	1.102***
	(0.006)	(0.000)	(0.000)	(0.000)	(0.000)
Organizational Structure					
Hedge Funds	0.245***				
	(0.000)				
Mutual Funds	0.162***				
	(0.000)				
Independent Investor Advisors	0.209***				
	(0.000)				
Investment Companies	0.261***				
	(0.000)				
Insurance Companies	0.107***				
	(0.000)				
Pension Funds	0.088***				
	(0.000)				
Bank Trust	0.190***				
	(0.000)				
University and Foundation Endowments	0.075**				
	(0.030)				
Trading Strategy					
Small Growth		0.122***			
		(0.000)			
Large Value		-0.049***			
		(0.005)			
Small Value		-0.025**			
		(0.019)			
Momentum Strategy		0.277**			
		(0.048)			
Ownership and Managerial Characteristics					
Presence of Founder			-0.217**		
			(0.034)		
Managerial Turnover				1.198**	
				(0.042)	
Manager Long-Term Compensation					-0.582*
					(0.079)
N	125,088	125,088	6,084	2,905	1,729
R^2	0.402	0.447	0.251	0.201	0.152

Table 3: Investor Horizons and Selling Pressure – End of the Month Prices

This table presents regressions for net (dollar) sales at the investor level (Panel A) and the firm level (Panel B). The dependent variable in Panel A is the net (dollar) sales (total dollar sales less total dollar purchases) made by investor *i* during quarter *t* as a percentage of the total dollar holdings of investor *i* at the end of quarter *t-1*. The sample includes all 13F institutions in columns 1 to 5, only mutual funds in columns 6, and only mutual funds and hedge funds in column 7. The dependent variable in Panel B is the total net (dollar) sales (total dollar sales less total dollar purchases) made by the institutional investors in firm *j* during quarter *t* as a percentage of the market capitalization of firm *j* at the end of quarter *t*-1. We aggregate the sales of all 13F institutions in columns 1 to 5, the sales of mutual funds in column 6 and the sales of mutual funds and hedge funds in column 7. The sample period is 1986-2009. The variable 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 were above the 95th percentile during the same period. The variable Industry Turmoil is a dummy variable that takes the value of 1 in a quarter when the industry returns are in the bottom decile of the distribution. Events of market turmoil, as defined for the variable Turmoil, are excluded from the definition of the variable Industry Turmoil. Stock characteristics are quarterly and measured at the end of quarter *t-1*, while firms' characteristics are measured at the end of year *t-1*. In Panel B, we include also the following control variables without reporting the coefficients: Past Stock Return, Stock Return Volatility, Share Turnover, Market-to-Book Ratio, Past Stock Return X Turmoil, Stock Return Volatility X Turmoil, Share Turnover X Turmoil, Market-to-Book Ratio X Turmoil, Past Stock Return X IT1, Stock Return Volatility X IT1, Share Turnover X IT1, Market-to-Book Ratio X IT1, Firm Size, Leverage, and Return on Assets. All variables are defined in the Appendix. The coefficients of these variables are reported in the Internet Appendix. All models are estimated by ordinary least squares and include the constant term, but the coefficient is not reported. Standard errors are White-corrected for heteroskedasticity and clustered at the calendar quarter and institutional investor (firm) level in Panel A (B). P-values are in parentheses. * indicates significance at 1% (***), 5% (**), 10% (*).

Panel A: Selling Pressure at the Institutional Investor Level

	All 13F Institutional Investors					Mutual Funds	Mutual Funds & Hedge Funds
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Churn Ratio X Turmoil	6.850**	5.749**	4.708**	4.359**	3.905**	4.058**	4.537**
	(0.040)	(0.031)	(0.03)	(0.024)	(0.032)	(0.028)	(0.035)
Turmoil	5.218**	3.233**	3.702**	1.700**	1.385**	1.390**	1.544**
	(0.040)	(0.042)	(0.034)	(0.040)	(0.035)	(0.024)	(0.041)
Churn Ratio X Industry Turmoil			3.482**				
			(0.041)				
Industry Turmoil			3.805**				
			(0.032)				
Churn Ratio	-2.913*	-2.652*	-2.546*	-2.529*	-2.735*	-2.758*	-3.128*
	(0.056)	(0.064)	(0.067)	(0.060)	(0.066)	(0.060)	(0.067)
Fund Flows Quarter T						-0.162**	-0.130*
						(0.049)	(0.056)
Fund Flows Quarter T X Turmoil						-0.297**	-0.317**
						(0.012)	(0.011)
Fund Flows Quarter T+1						-0.061	-0.071
						(0.175)	(0.199)
Fund Flows Quarter T+1 X Turmoil						-0.104*	-0.144*
						(0.076)	(0.060)
Fund Flows Quarter T+2						-0.023	-0.049
						(0.200)	(0.212)
Fund Flows Quarter T+2 X Turmoil						-0.026	-0.081
						(0.107)	(0.151)
Market Characteristics							
Market Return				-0.158**	-0.160**	-0.182**	-0.191**
				(0.031)	(0.031)	(0.039)	(0.019)
Market Return Volatility				-0.090	-0.074	-0.089	-0.091
				(0.749)	(0.800)	(0.780)	(0.775)
Investors' Portfolio Characteristics							
Portfolio Size					-0.158	-0.175	-0.176
					(0.297)	(0.206)	(0.215)
Time Fixed Effects	NO	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR
Manager Fixed Effects	YES	YES	YES	YES	YES	YES	YES
N	168,785	168,785	168,785	168,785	168,785	67,292	94,107
Adjusted R^2	0.1205	0.1506	0.1172	0.1608	0.167	0.1301	0.1375

Panel B: Selling Pressure at the Stock Level

	All 13F Institutional Investors						Mutual Funds	Mutual Funds & Hedge Funds
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
IT1 x Turmoil	1.972**	2.405**	2.239**	2.388**	2.159**	1.987**		
	(0.033)	(0.022)	(0.021)	(0.025)	(0.027)	(0.035)		
Turmoil	1.242**	1.099**	1.103**	0.949**	0.915**	0.908**	1.491***	1.372***
	(0.020)	(0.032)	(0.034)	(0.036)	(0.035)	(0.035)	(0.001)	(0.001)
IT1 x Industry Turmoil			1.809**					
			(0.046)					
Industry Turmoil			0.829*					
			(0.052)					
IT1	-1.756**	-2.071**	-1.587**	-2.010**	-1.812**	-1.574**		
	(0.029)	(0.036)	(0.043)	(0.038)	(0.038)	(0.038)		
IT1-Mutual Funds x Turmoil							2.971**	
							(0.031)	
IT1-Mutual Funds							-2.686**	
							(0.025)	
IT1-Mutual Funds and Hedge Funds x Turmoil								3.821**
								(0.019)
IT1-Mutual Funds and Hedge Funds								-2.654*
								(0.057)
Stock Characteristics								
Past Stock Return X Turmoil X IT1					0.103**	0.110**		
					(0.032)	(0.036)		
Stock Return Volatility X Turmoil X IT1					0.074	0.065		
					(0.187)	(0.195)		
Share Turnover X Turmoil X IT1					0.049	0.042		
					(0.101)	(0.119)		
Market-to-Book Ratio X Turmoil X IT1					0.141**	0.126**		
					(0.032)	(0.043)		
Fund Flows								
Mutual Fund Flows at T X Turmoil						-0.410*	-0.683**	-0.507**
						(0.078)	(0.041)	(0.045)
Mutual Fund Flows at T						-0.065**	-0.075**	-0.079**
						(0.044)	(0.021)	(0.047)
Hedge Fund Flows at T X Turmoil								-0.491**
								(0.040)
Hedge Fund Flows at T								-0.071*
								(0.068)
Mutual Fund Flows at T+1 X Turmoil						-0.270*	-0.372*	-0.318*
						(0.092)	(0.070)	(0.079)
Mutual Fund Flows at T+1						-0.043*	-0.047*	0.043
						(0.078)	(0.072)	(0.815)
Hedge Fund Flows at T+1 X Turmoil								-0.29
								(0.202)
Hedge Fund Flows at T+1								-0.051
								(0.308)
Mutual Fund Flows at T+2 X Turmoil						-0.114	-0.127	-0.132
						(0.124)	(0.216)	(0.197)
Mutual Fund Flows at T+2						0.019	0.021	0.019
						(0.192)	(0.240)	(0.253)
Hedge Fund Flows at T+2 X Turmoil								-0.149
								(0.357)
Hedge Fund Flows at T+2								0.021
								(0.295)
Market Characteristics								
Market Return		-0.052***	-0.037**	-0.048**	-0.044**	-0.039**	-0.061***	-0.067***
		(0.009)	(0.015)	(0.011)	(0.020)	(0.023)	(0.002)	(0.002)
Market Return Volatility		-0.232**	-0.192**	-0.210**	-0.195**	-0.189**	-0.228***	-0.245***
		(0.014)	(0.018)	(0.015)	(0.022)	(0.023)	(0.003)	(0.003)
Other Control Variables Included	NO	NO	NO	YES	YES	YES	YES	YES
Time Fixed Effects	NO	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR
Firm Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES
N	452,081	452,081	452,081	452,081	452,081	385,722	385,722	262,107
Adjusted R^2	0.139	0.138	0.141	0.159	0.161	0.191	0.138	0.14

Table 4: Investor Horizons and Cash Holdings during Lehman Brothers' Bankruptcy

This table presents OLS regressions for the change in the cash holdings of mutual funds around the Lehman's bankruptcy event. For each mutual fund, the dependent variable is the change between the fund's average cash positions in the third and fourth quarter of 2008 and its average cash positions in the first and second quarter 2008. Regressions include controls for fund size, measured as the total net assets under management at *t-1*, and for fund flows in the third quarter of 2008 (quarter *t*), fourth quarter of 2008 (*t+1*) and first quarter of 2009 (*t+2*). All variables are defined in the Appendix and are winsorized at the 5% level. All models 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% (*).

	(1)	(2)	(3)	(4)	(5)
Churn Ratio	1.638***	1.661***	1.623***	1.646***	1.581***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Fund Flows Quarter T		-0.002		-0.003	-0.017*
		(0.633)		(0.528)	(0.099)
Fund Flows Quarter T+1					-0.020
					(0.350)
Fund Flows Quarter T+2					-0.0005
					(0.722)
Investors' Portfolio Characteristics					
Fund Size			-0.007	-0.009	-0.011
			(0.379)	(0.327)	(0.170)
N	2,261	2,247	2,261	2,247	2,126
Adjusted R^2	0.017	0.019	0.021	0.021	0.026

Table 5: Descriptive Statistics – Firm Level

This table presents descriptive statistics on the characteristics of the stocks held by institutional investors for the whole sample and for high and low IT stocks, respectively. We consider only the cross-section of firms used in the main event. We divide the sample in terciles using firm investor turnover (IT1). A firm is classified as mostly held by long horizon investors (Low IT Firm) if it belongs to the first tercile. A firm is classified as mostly held by short horizon investors (High IT Firm) if it belongs to the third tercile. We also report the Wilcoxon test for the difference in the medians of the various variables between low and high IT firms. All variables are described in Appendix and are winsorized at the 5% level. N represents the number of firms in the sample.

		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													
IT1	3,415	0.25	0.07	0.15	0.25	0.37	0.32	0.31	0.06	0.18	0.19	0.03	(0.000)
IT1-Total	3,415	0.20	0.06	0.11	0.20	0.29	0.24	0.24	0.05	0.14	0.14	0.03	(0.000)
IT1-Mutual Funds	2,212	0.17	0.04	0.10	0.17	0.24	0.21	0.20	0.04	0.12	0.13	0.02	(0.000)
IT1-Hedge Funds	2,331	0.07	0.02	0.04	0.06	0.09	0.08	0.08	0.02	0.05	0.05	0.01	(0.000)
IT1-Mutual Funds and Hedge Funds	2,344	0.23	0.06	0.14	0.23	0.34	0.29	0.28	0.05	0.17	0.18	0.03	(0.000)
IT2	3,413	0.05	0.04	0.00	0.05	0.12	0.07	0.07	0.05	0.02	0.02	0.02	(0.000)
IT3	3,365	0.14	0.11	0.00	0.11	0.34	0.20	0.20	0.13	0.0004	0.00	0.01	(0.000)
Change in Portfolio Value	3,415	-5.06%	8.72%	-19.46%	-2.13%	-0.02%	-4.98%	-2.90%	7.89%	-3.28%	-0.72%	7.54%	(0.000)
Active Share Measure	3,462	26.07%	3.83%	19.86%	26.42%	31.15%	25.87%	26.35%	3.78%	25.80%	26.02%	4.46%	(0.476)
Mutual Funds Flows (Drop)	2,736	-3.00	8.98	-9.90	-1.68	0.64	-2.84	-1.69	5.14	-3.40	-1.24	12.75	(0.000)
Mutual Funds Flows (Reversal)	2,736	-2.46	21.55	-7.00	-1.08	1.09	-3.35	-1.23	32.38	-2.45	-0.56	13.19	(0.000)
Hedge Funds Flows (Drop)	2,736	-1.18	7.51	-6.20	-0.64	1.78	-1.42	-0.67	3.51	-0.91	-0.36	11.01	(0.041)
Hedge Funds Flows (Reversal)	2,736	-0.35	17.57	-3.47	-0.35	1.06	0.28	-0.41	25.64	-0.19	-0.14	11.26	(0.000)
Institutional Ownership	3,415	49.71%	31.39%	2.61%	52.80%	90.11%	52.69%	56.97%	32.34%	30.65%	26.58%	23.99%	(0.000)
Mutual Funds Ownership	3,302	23.98%	13.82%	2.00%	25.48%	47.13%	25.37%	27.29%	14.42%	16.58%	15.78%	11.15%	(0.000)
Hedge Funds Ownership	3,302	6.58%	4.58%	0.44%	6.17%	14.42%	7.42%	7.25%	5.00%	3.89%	3.22%	3.08%	(0.000)
Insider Ownership	2,854	16.31%	14.98%	2.03%	10.76%	48.70%	14.19%	9.20%	14.03%	20.69%	14.26%	17.47%	(0.000)
Ownership Concentration	3,405	6.45%	11.08%	0.99%	2.67%	24.19%	5.94%	2.66%	9.94%	9.95%	5.00%	14.38%	(0.000)
Average Trading Performance Sensitivity 1	3406	-0.04	0.12	-0.17	-0.08	0.18	0.03	-0.01	0.13	-0.08	-0.10	0.09	(0.000)
Average Trading Performance Sensitivity 2	3406	0.02	0.12	-0.15	-0.01	0.20	0.07	0.11	0.12	-0.06	-0.07	0.09	(0.000)
Average Trading Performance Sensitivity 1-Mutual Funds	3406	0.01	0.11	-0.13	-0.03	0.24	0.07	0.01	0.13	-0.04	-0.03	0.07	(0.041)
Average Trading Performance Sensitivity 2-Mutual Funds	3406	0.04	0.12	-0.14	0.00	0.21	0.09	0.13	0.12	-0.04	-0.03	0.09	(0.000)
Stock Characteristics													
Market Cap	3,468	1,060	1,850	37	382	4,480	811	385	1,220	856	202	1,850	(0.000)
Market-to-Book	2,770	2.20	1.59	0.52	1.72	5.78	2.50	2.00	1.76	1.88	1.49	1.39	(0.000)
Bid-Ask Spread	3,458	0.50%	0.65%	0.10%	0.26%	1.74%	0.45%	0.25%	0.57%	0.76%	0.46%	0.85%	(0.000)
Past Stock Returns	3,116	-12.21%	20.01%	-49.08%	-9.88%	20.14%	-14.21%	-11.83%	20.43%	-11.19%	-7.94%	18.17%	(0.004)
Return Stock Volatility	3,469	1.62%	0.43%	0.72%	1.70%	2.19%	1.68%	1.81%	0.47%	1.51%	1.55%	0.43%	(0.000)
Firm Characteristics													
Firm Size	2,955	5,122	53,850	32	653	10,226	1,451	483	3,163	5,391	622	66,192	(0.057)
Return on Assets	2,704	2.14%	9.78%	-17.78%	3.11%	14.20%	0.92%	3.08%	11.60%	1.89%	1.49%	8.29%	(0.345)
Debt Maturity	1,798	16.57%	24.66%	0.00%	4.74%	76.08%	19.27%	4.16%	28.68%	16.84%	6.69%	22.50%	(0.554)
S&P Rating	3,415	0.05	0.22	0.00	0.00	1.00	0.05	0.00	0.21	0.04	0.00	0.19	(0.313)
Leverage	2,814	18.40%	17.28%	0.00%	14.77%	52.33%	18.00%	13.22%	18.32%	17.47%	14.30%	15.71%	(0.181)

Table 6: Multivariate Analysis of Price Drops

This table presents OLS regression for the drop period. The dependent variable is the cumulative abnormal returns of firm *j* during the drop period (between week -10 and week +8). In Panel A, we use investor turnover (IT1) to capture institutional investors' horizons and present alternative measures of cumulative abnormal returns that rely on different benchmark models. The benchmark models used to obtained the cumulative abnormal returns are: The market model (MCAR) in columns 1 to 4, the Fama and French four factors model (FFCAR) in column 5, a multifactor model that includes the market return and changes in the VIX index (VIXAdjCAR) in column 6, a multifactor model that includes the market return and Pastor and Stambaugh's (2003) market-wide liquidity factor (LiqAdjCAR) in column 7. In columns 1 to 7, the benchmark models are estimated from the beginning of 2003 until the end of the first quarter of 2008. In column 8, we estimate the market model during the event window. We refer to the associated cumulative abnormal returns as MCARin. In Panel B, we use MCAR as dependent variable and explore the robustness of the results to alternatives measures of investors' horizons: IT1-Mutual Funds (calculated as IT1 but considering only the mutual funds holding stocks in a firm), IT1-hedge funds (calculated as IT1 but considering only the hedge funds holding stocks in a firm), IT1-Mutual Funds and Hedge Funds (calculated as IT1 but considering only the mutual funds and the hedge funds holding stocks in a firm), IT1-Total (calculated as IT1 but using as weights the proportion of the shares held by each investor with respect to the firm total number of shares outstanding), IT2 (calculated following Wermers (2000) and Brunnermeier and Nagel (2004)), IT3 (the portion of total number of shares outstanding held by transient investors as defined by Bushee (1998)). Detailed variable definitions are in the Appendix. Abnormal returns are winsorized at the 1% level. All models 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]

	MCAR				FFCAR	VixAdjCAR	LiqAdjCAR	MCARin
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
IT1	-0.752***	-0.624***	-0.490**	-0.488**	-0.706***	-0.619***	-0.547**	-0.781***
	(0.000)	(0.000)	(0.016)	(0.015)	(0.000)	(0.000)	(0.018)	(0.000)
Change in Portfolio Value		0.497***	0.645***	0.369***	0.568***	0.441***	0.418***	0.493***
		(0.000)	(0.000)	(0.003)	(0.000)	(0.001)	(0.004)	(0.000)
Active Share Measure		-0.283	-0.301	0.261	-0.172	-0.407	-0.015	-0.375
		(0.329)	(0.421)	(0.445)	(0.560)	(0.178)	(0.966)	(0.143)
Mutual Funds Flows		1.964*	-1.180	2.109*	1.550	2.013*	3.510***	1.476
		(0.070)	(0.740)	(0.076)	(0.187)	(0.054)	(0.002)	(0.137)
Hedge Funds Flows		3.422***	12.580***	3.633***	2.903**	4.187***	5.054***	2.951***
		(0.002)	(0.008)	(0.003)	(0.017)	(0.000)	(0.000)	(0.005)
Institutional Ownership		-0.150***	-0.192***	-0.053	-0.150***	-0.077	-0.240***	-0.028
		(0.003)	(0.003)	(0.394)	(0.005)	(0.126)	(0.000)	(0.514)
Insider Ownership		0.096	0.107	0.123	0.109*	0.109*	0.065	0.060
		(0.110)	(0.172)	(0.129)	(0.086)	(0.079)	(0.405)	(0.273)
Ownership Concentration		0.251**	0.407***	0.040	0.160	0.101	0.250*	-0.240**
		(0.035)	(0.005)	(0.876)	(0.288)	(0.428)	(0.063)	(0.046)
Stock Characteristics								
Market-to-Book	0.003	0.003	-0.006	0.001	0.004	0.007	0.014	0.008
	(0.645)	(0.665)	(0.604)	(0.862)	(0.585)	(0.357)	(0.150)	(0.143)
Past Stock Returns	-0.092**	-0.123***	-0.130**	-0.187***	-0.087*	-0.141***	-0.088	-0.118***
	(0.028)	(0.006)	(0.028)	(0.000)	(0.067)	(0.004)	(0.140)	(0.002)
Stock Return Volatility	-28.288***	-26.671***	-26.281***	-35.775***	-25.932***	-1.400	-22.506***	12.974***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.696)	(0.000)	(0.000)
Bid Ask Spread	2.532	-4.700*	-4.953*	-4.859	-4.450*	-10.648***	-6.749*	-12.071***
	(0.141)	(0.070)	(0.072)	(0.183)	(0.063)	(0.000)	(0.077)	(0.000)
Firm Characteristics								
Firm Size	0.011	0.033***	0.045***	-0.010	0.041***	0.054***	0.037***	0.074***
	(0.193)	(0.001)	(0.000)	(0.442)	(0.000)	(0.000)	(0.007)	(0.000)
Debt Maturity			0.080*					
			(0.087)					
S&P Rating	0.043	0.056	0.061	0.085*	0.079*	0.049	0.033	0.094***
	(0.303)	(0.180)	(0.159)	(0.078)	(0.065)	(0.274)	(0.557)	(0.003)
Leverage	-0.463***	-0.454***	-0.443***	-0.256***	-0.455***	-0.463***	-0.616***	-0.115**
	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.014)
Return on Assets	0.043	0.060	-0.098	0.097	0.078	0.104	0.077	0.026
	(0.674)	(0.583)	(0.552)	(0.392)	(0.500)	(0.360)	(0.585)	(0.788)
Industry Dummies	YES	YES	YES	YES	YES	YES	YES	YES
Non-Financial Firms Only	NO	NO	NO	YES	NO	NO	NO	NO
N	2,151	1,890	1,140	1,404	1,890	1,890	1,890	1,890
Adjusted R^2	0.258	0.269	0.331	0.196	0.265	0.183	0.194	0.263

Panel B: Other Measures of Horizon - Cross-Sectional Regressions – Window [-10,+8]

	MCAR					
	(1)	(2)	(3)	(4)	(5)	(6)
IT1-Mutual Funds	-0.924***					
	(0.000)					
IT1-Hedge Funds		-2.508***				
		(0.000)				
IT1-Mutual Funds and Hedge Funds			-0.607***			
			(0.001)			
IT1-Total				-0.910***		
				(0.000)		
IT2					-0.888**	
					(0.028)	
IT3						-0.314***
						(0.005)
Change in Portfolio Value	0.519***	0.537***	0.531***	0.500***	0.520***	0.515***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Active Share Measure	-0.305	-0.303	-0.271	-0.260	-0.255	-0.315
	(0.309)	(0.308)	(0.366)	(0.370)	(0.377)	(0.285)
Mutual Funds Flows	0.635		1.723	1.928*	1.858*	2.214**
	(0.510)		(0.109)	(0.076)	(0.084)	(0.048)
Hedge Funds Flows		2.164***	2.992***	3.365***	3.347***	3.715***
		(0.007)	(0.007)	(0.003)	(0.003)	(0.001)
Institutional Ownership				-0.081	-0.125**	-0.141***
				(0.174)	(0.036)	(0.008)
Mutual Funds Ownership	-0.274***		-0.155			
	(0.006)		(0.164)			
Hedge Funds Ownership		-0.932***	-0.693**			
		(0.000)	(0.019)			
Insider Ownership	0.136**	0.142**	0.128**	0.096	0.096	0.094
	(0.028)	(0.019)	(0.037)	(0.112)	(0.110)	(0.122)
Ownership Concentration	0.224*	0.246*	0.207	0.242**	0.254**	0.196
	(0.082)	(0.051)	(0.107)	(0.046)	(0.033)	(0.178)
Stock Characteristics						
Market-to-Book	0.004	0.003	0.002	0.003	0.004	0.005
	(0.594)	(0.678)	(0.777)	(0.682)	(0.550)	(0.450)
Past Stock Returns	-0.098**	-0.097**	-0.102**	-0.121***	-0.105**	-0.120***
	(0.030)	(0.032)	(0.025)	(0.007)	(0.019)	(0.008)
Stock Return Volatility	-26.984***	-26.925***	-26.620***	-26.554***	-27.075***	-26.583***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Bid Ask Spread	-3.106	-3.463	-3.722	-4.896*	-4.502*	-4.474
	(0.266)	(0.210)	(0.184)	(0.059)	(0.082)	(0.102)
Firm Characteristics						
Firm Size	0.036***	0.032***	0.033***	0.034***	0.038***	0.038***
	(0.001)	(0.002)	(0.002)	(0.001)	(0.000)	(0.000)
S&P Rating	0.037	0.047	0.044	0.058	0.058	0.056
	(0.369)	(0.266)	(0.295)	(0.164)	(0.161)	(0.181)
Leverage	-0.466***	-0.457***	-0.456***	-0.456***	-0.458***	-0.457***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Return on Assets	0.049	0.037	0.041	0.059	0.075	0.090
	(0.659)	(0.741)	(0.709)	(0.590)	(0.488)	(0.406)
Industry Dummies	YES	YES	YES	YES	YES	YES
N	1,858	1,858	1,858	1,890	1,890	1,870
Adjusted R^2	0.262	0.267	0.267	0.268	0.265	0.263

Table 7: Multivariate Analysis of Price Reversal

This table presents OLS regression for the reversal period. The dependent variable is the cumulative abnormal returns of firm *j* during the reversal period (between week +9 and week +25). In Panel A, we use investor turnover (IT1) to capture institutional investors' horizons and present alternative measures of cumulative abnormal returns that rely on different benchmark models. The benchmark models used to obtained the cumulative abnormal returns are: The market model (MCAR) in columns 1 to 4, the Fama and French four factors model (FFCAR) in column 5, a multifactor model that includes the market return and changes in the VIX index (VIXAdjCAR) in column 6, a multifactor model that includes the market return and Pastor and Stambaugh's (2003) market-wide liquidity factor (LiqAdjCAR) in column 7. In columns 1 to 7, the benchmark models are estimated from the beginning of 2003 until the end of the first quarter of 2008. In column 8, we estimate the market model during the event window. We refer to the associated cumulative abnormal returns as MCARin. In Panel B, we use MCAR as dependent variable and explore the robustness of the results to alternatives measures of investors' horizons: IT1-Mutual Funds (calculated as IT1 but considering only the mutual funds holding stocks in a firm), IT1-hedge funds (calculated as IT1 but considering only the hedge funds holding stocks in a firm), IT1-Mutual Funds and Hedge Funds (calculated as IT1 but considering only the mutual funds and the hedge funds holding stocks in a firm), IT1-Total (calculated as IT1 but using as weights the proportion of the shares held by each investor with respect to the firm total number of shares outstanding), IT2 (calculated following Wermers (2000) and Brunnermeier and Nagel (2004)), IT3 (the portion of total number of shares outstanding held by transient investors as defined by Bushee (1998)). Detailed variable definitions are in the Appendix. Abnormal returns are winsorized at the 1% level. All models are estimated by ordinary least squares and 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]

	MCAR				FFCAR	VixAdjCAR	LiqAdjCAR	MCARin
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
IT1	0.545***	0.822***	0.972***	0.858***	0.787***	0.800***	0.896***	0.458***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)
Change in Portfolio Value		-0.168	-0.107	-0.028	-0.078	-0.164	-0.230	-0.155
		(0.156)	(0.466)	(0.826)	(0.495)	(0.155)	(0.135)	(0.183)
Active Share Measure		0.434	0.668*	0.204	0.471	0.481*	-0.001	0.252
		(0.144)	(0.092)	(0.556)	(0.145)	(0.094)	(0.998)	(0.295)
Mutual Funds Flows		2.299**	12.580	2.610***	1.482	2.240**	2.171**	1.524
		(0.019)	(0.124)	(0.009)	(0.207)	(0.046)	(0.034)	(0.188)
Hedge Funds Flows		2.918**	-10.585	3.473***	2.128	2.881**	3.306***	2.035
		(0.017)	(0.452)	(0.005)	(0.142)	(0.039)	(0.010)	(0.154)
Institutional Ownership		-0.173***	-0.098	-0.351***	-0.144**	-0.180***	-0.130**	-0.066
		(0.001)	(0.170)	(0.000)	(0.019)	(0.001)	(0.044)	(0.130)
Insider Ownership		0.041	0.118	0.035	0.124*	0.065	0.001	0.060
		(0.547)	(0.188)	(0.683)	(0.087)	(0.316)	(0.984)	(0.276)
Ownership Concentration		0.253*	0.388**	-0.004	0.280**	0.180	0.258	-0.005
		(0.074)	(0.032)	(0.989)	(0.041)	(0.105)	(0.142)	(0.965)
Stock Characteristics								
Market-to-Book	0.015**	0.010	0.020*	0.010	-0.001	0.011	0.010	0.017**
	(0.016)	(0.186)	(0.078)	(0.187)	(0.931)	(0.143)	(0.347)	(0.011)
Past Stock Returns	-0.087**	-0.102**	-0.075	-0.181***	-0.126***	-0.138***	-0.320***	0.024
	(0.043)	(0.024)	(0.225)	(0.000)	(0.009)	(0.003)	(0.000)	(0.532)
Stock Return Volatility	-19.592***	-18.180***	-18.644***	-17.440***	-19.244***	-17.252***	-13.937***	3.641
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.204)
Bid Ask Spread	5.399***	0.127	2.670	-1.245	1.088	-0.564	-0.397	-1.023
	(0.002)	(0.968)	(0.482)	(0.739)	(0.711)	(0.846)	(0.925)	(0.666)
Firm Characteristics								
Firm Size	-0.002	-0.002	-0.011	0.029**	0.006	-0.003	-0.014	0.013
	(0.824)	(0.840)	(0.438)	(0.031)	(0.609)	(0.779)	(0.309)	(0.173)
Debt Maturity			-0.107**					
			(0.031)					
S&P Rating	-0.115***	-0.106**	-0.084**	-0.153***	-0.118***	-0.113***	-0.038	-0.130***
	(0.003)	(0.012)	(0.050)	(0.001)	(0.008)	(0.010)	(0.563)	(0.000)
Leverage	-0.057	-0.041	-0.088	-0.065	-0.023	-0.019	0.209***	-0.036
	(0.281)	(0.470)	(0.254)	(0.372)	(0.700)	(0.739)	(0.004)	(0.458)
Return on Assets	0.075	0.064	-0.161	0.041	0.138	0.127	-0.294**	0.274**
	(0.527)	(0.606)	(0.410)	(0.747)	(0.330)	(0.295)	(0.033)	(0.020)
Industry Dummies	YES	YES	YES	YES	YES	YES	YES	YES
Non-Financial Firms Only	NO	NO	NO	YES	NO	NO	NO	NO
N	2,135	1,890	1,140	1,404	1,890	1,890	1,890	1,890
Adjusted R^2	0.091	0.104	0.139	0.133	0.096	0.108	0.111	0.095

Panel B: Other Measures of Horizon - Cross-Sectional Regressions – Window [+9,+25]

	MCAR					
	(1)	(2)	(3)	(4)	(5)	(6)
IT1-Mutual Funds	1.118***					
	(0.000)					
IT1-Hedge Funds		2.998***				
		(0.000)				
IT1-Mutual Funds and Hedge Funds			0.871***			
			(0.000)			
IT1-Total				1.271***		
				(0.000)		
IT2					1.947***	
					(0.000)	
IT3						0.600***
						(0.000)
Change in Portfolio Value	-0.142	-0.137	-0.136	-0.171	-0.200*	-0.183
	(0.239)	(0.249)	(0.258)	(0.144)	(0.094)	(0.118)
Active Share Measure	0.447	0.460	0.490	0.404	0.396	0.472
	(0.150)	(0.139)	(0.107)	(0.175)	(0.182)	(0.116)
Mutual Funds Flows	0.147		2.667***	2.329**	2.417**	1.932**
	(0.608)		(0.008)	(0.020)	(0.014)	(0.048)
Hedge Funds Flows		0.265	3.364***	2.971**	3.074**	2.540**
		(0.123)	(0.007)	(0.017)	(0.012)	(0.036)
Institutional Ownership				-0.274***	-0.274***	-0.226***
				(0.000)	(0.000)	(0.000)
Mutual Funds Ownership	-0.230**		-0.114			
	(0.022)		(0.299)			
Hedge Funds Ownership		-0.602**	-0.511*			
		(0.023)	(0.085)			
Insider Ownership	0.084	0.084	0.077	0.042	0.046	0.029
	(0.212)	(0.209)	(0.251)	(0.541)	(0.495)	(0.667)
Ownership Concentration	0.279**	0.268*	0.261*	0.266*	0.248*	0.189
	(0.039)	(0.050)	(0.055)	(0.061)	(0.084)	(0.220)
Stock Characteristics						
Market-to-Book	0.010	0.009	0.008	0.010	0.006	0.005
	(0.164)	(0.237)	(0.251)	(0.175)	(0.385)	(0.476)
Past Stock Returns	-0.107**	-0.100**	-0.110**	-0.103**	-0.130***	-0.105**
	(0.019)	(0.028)	(0.016)	(0.022)	(0.004)	(0.020)
Stock Return Volatility	-18.937***	-18.922***	-18.730***	-18.464***	-18.582***	-19.541***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Bid Ask Spread	-0.421	-0.753	-0.793	0.435	0.050	1.210
	(0.886)	(0.798)	(0.787)	(0.889)	(0.987)	(0.707)
Firm Characteristics						
Firm Size	-0.008	-0.009	-0.010	-0.003	-0.010	-0.008
	(0.484)	(0.431)	(0.351)	(0.783)	(0.382)	(0.461)
S&P Rating	-0.102**	-0.094**	-0.095**	-0.109***	-0.114***	-0.108***
	(0.015)	(0.026)	(0.023)	(0.008)	(0.006)	(0.009)
Leverage	-0.054	-0.047	-0.045	-0.040	-0.041	-0.033
	(0.341)	(0.416)	(0.428)	(0.486)	(0.471)	(0.564)
Return on Assets	0.084	0.087	0.078	0.068	0.055	0.017
	(0.503)	(0.488)	(0.538)	(0.581)	(0.655)	(0.891)
Industry Dummies	YES	YES	YES	YES	YES	YES
N	1,858	1,858	1,858	1,890	1,890	1,870
Adjusted R^2	0.098	0.099	0.103	0.105	0.103	0.106

Table 8: Exploiting the Exogenous Variation in Investor Turnover

This table presents instrumental variable estimates. We use Average Trading Performance Sensitivity 1 and Average Trading Performance Sensitivity 2 as instruments for investor turnover (IT1) and Average Trading Performance Sensitivity 1- Mutual Funds and Average Trading Performance Sensitivity 2- Mutual Funds as instruments for the measure of investor turnover computed using only mutual funds (IT1-Mutual Funds). Columns 1 and 2 present the first stage for IT1 and IT1-Mutual funds, respectively. Columns 3 and 4 show results for the price drop period (between week -10 and week +8), while columns 5 and 6 show results for the price reversal period (between week +9 and week +25). Variable definitions are in the Appendix. Abnormal returns are winsorized at the 1% 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% (*).

	Drop- Window [-10,+8]				Reversal - Window [+9,+25]	
	First Stage		Second Stage		Second Stage	
	IT1	IT1 Mutual Funds	MCAR		MCAR	
	(1)	(2)	(3)	(4)	(5)	(6)
Average Trading Performance Sensitivity 1	0.081***					
	(0.000)					
Average Trading Performance Sensitivity 2	0.177***					
	(0.000)					
Average Trading Performance Sensitivity 1-Mutual Funds		0.054***				
		(0.000)				
Average Trading Performance Sensitivity 2-Mutual Funds		0.111***				
		(0.000)				
IT1			-1.587***		1.671***	
			(0.001)		(0.000)	
IT1-Mutual Funds				-2.234***		1.638**
				(0.002)		(0.017)
Change in Portfolio Value	-0.049***	-0.052***	0.640***	0.677***	-0.320**	-0.268*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.030)	(0.076)
Active Share Measure	-0.004	-0.002	-0.265	-0.274	0.030	-0.030
	(0.940)	(0.956)	(0.454)	(0.451)	(0.934)	(0.936)
Mutual Funds Flows	0.096	-0.019	3.671***	1.704	1.677	-0.255
	(0.576)	(0.792)	(0.000)	(0.221)	(0.111)	(0.444)
Hedge Funds Flows	0.118		5.026***		2.658**	
	(0.525)		(0.000)		(0.044)	
Institutional Ownership	0.034***		-0.210***		-0.155**	
	(0.000)		(0.001)		(0.025)	
Mutual Funds Ownership		0.082***		-0.373***		-0.030
		(0.000)		(0.004)		(0.825)
Insider Ownership	-0.001	-0.005	0.084	0.131*	-0.006	0.042
	(0.925)	(0.457)	(0.239)	(0.082)	(0.930)	(0.576)
Ownership Concentration	-0.041**	-0.023*	0.334***	0.331**	0.290*	0.375**
	(0.028)	(0.067)	(0.009)	(0.021)	(0.089)	(0.040)
Stock Characteristics						
Market-to-Book	0.002**	0.001	0.016*	0.016*	0.011	0.013
	(0.048)	(0.275)	(0.079)	(0.080)	(0.294)	(0.228)
Past Stock Returns	-0.014**	-0.007*	-0.102*	-0.072	-0.316***	-0.327***
	(0.012)	(0.077)	(0.073)	(0.204)	(0.000)	(0.000)
Stock Return Volatility	1.836***	0.643**	-38.528***	-39.738***	-13.021***	-12.523***
	(0.000)	(0.049)	(0.000)	(0.000)	(0.002)	(0.003)
Bid Ask Spread	-0.584	-0.535**	-7.376*	-5.712	-1.331	-1.660
	(0.132)	(0.048)	(0.061)	(0.195)	(0.741)	(0.680)
Firm Characteristics						
Firm Size	-0.007***	-0.007***	0.038***	0.042***	-0.026**	-0.031**
	(0.000)	(0.000)	(0.002)	(0.002)	(0.038)	(0.019)
S&P Rating	0.003	0.001	0.039	0.028	-0.056	-0.036
	(0.496)	(0.708)	(0.477)	(0.614)	(0.375)	(0.556)
Leverage	0.011	0.009*	-0.610***	-0.629***	0.231***	0.238***
	(0.128)	(0.093)	(0.000)	(0.000)	(0.001)	(0.001)
Return on Assets	-0.055***	-0.058***	-0.113	-0.152	-0.198	-0.218
	(0.000)	(0.000)	(0.409)	(0.284)	(0.142)	(0.112)
N	1,890	1,858	1,890	1,858	1,890	1,858
Adjusted R^2	0.409	0.402	0.194	0.186	0.064	0.072
Test of Excluded Instruments			92.27	120.58	92.47	119.87
			(0.000)	(0.000)	(0.000)	(0.000)
Sargan's Over-identifying Restrictions Test			2.679	2.873	3.745	2.485
			(0.102)	(0.090)	(0.053)	(0.115)

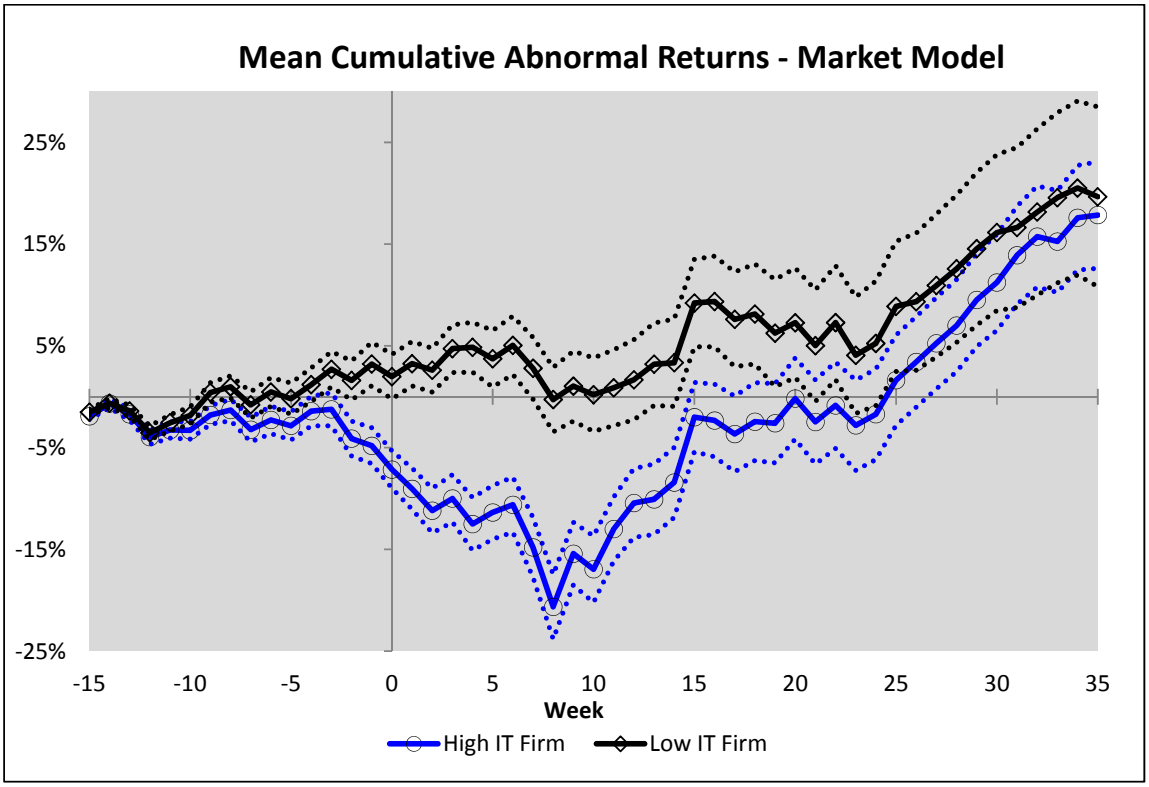
Table 9: CARs and Investor Turnover during Other Major Market Shocks

This table presents cross-sectional regressions for cumulative abnormal returns 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 and ends in the week of March 4th 1988. For the 1998 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 2007 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 in 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 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 in the Appendix. Abnormal returns are winsorized at the 1% level. All regressions are estimated by ordinary least squares and 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)
IT1	-0.021**	0.030*	-0.251***	0.253***	-0.190***	0.153***	-0.163***	0.110***
	(0.017)	(0.060)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Stock Characteristics								
Market-to-Book	0.000	0.001***	0.000	-0.001*	-0.000	0.0004***	0.000	0.00004*
	(0.138)	(0.008)	(0.230)	(0.087)	(0.400)	(0.001)	(0.273)	(0.073)
Past Stock Returns	0.768	0.679	1.992**	0.156	-1.814***	-1.271	-0.378	1.441***
	(0.287)	(0.600)	(0.032)	(0.839)	(0.007)	(0.191)	(0.389)	(0.000)
Stock Return Volatility	-0.224*	-0.667***	-2.171***	0.946***	-0.303**	-0.324	-0.574***	-0.123
	(0.071)	(0.003)	(0.000)	(0.000)	(0.050)	(0.151)	(0.000)	(0.136)
Bid Ask Spread	0.461**	1.050***	1.287***	-0.684***	-6.518***	2.837***	0.513	1.138***
	(0.012)	(0.001)	(0.000)	(0.001)	(0.000)	(0.002)	(0.114)	(0.000)
Firm Characteristics								
Firm Size	0.009***	-0.012***	0.021***	-0.013***	-0.001	0.006***	0.004**	-0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.636)	(0.009)	(0.023)	(0.313)
Leverage	-0.115***	-0.004	-0.154***	-0.013	-0.054***	-0.039**	-0.025*	-0.022**
	(0.000)	(0.888)	(0.000)	(0.591)	(0.000)	(0.036)	(0.050)	(0.034)
Return on Assets	0.145***	-0.050	0.079*	-0.191***	-0.046**	-0.020	0.066***	0.011
	(0.000)	(0.432)	(0.076)	(0.000)	(0.028)	(0.509)	(0.002)	(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	0.223	0.040	0.114	0.146	0.124	0.109	0.079	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 long trading horizons, and (ii) stocks mostly held by institutional investors with short trading horizons. The market model is estimated using weekly returns from the beginning of 2003 until the end of the first quarter of 2008. We divide the entire sample in terciles using firms' investor turnover (IT1). A firm is classified as held by long-term institutional investors (Low IT Firm) if it belongs to the first tercile. A firm is classified as 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 on Monday September 15, 2008. For both stocks mostly held by short-term investors and stocks mostly held by long-term investors we also report the 5% confidence intervals (dotted line). Abnormal returns are winsorized at the 1% level.



Internet Appendix Not for Publication

Table 1a -Correlation Matrix

This table 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. * indicates significance at 10% or less. All variables are described in the paper's Appendix.

	Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Ownership Characteristics							
(1)	IT1	1						
(2)	Change in Portfolio Value	-0.0729*	1					
(3)	Active Share Measure	-0.0069	-0.2081*	1				
(4)	Mutual Funds Flows (Drop)	0.0071	-0.0462	-0.0013	1			
(5)	Mutual Funds Flows (Reversal)	-0.0204	-0.0170	0.0007	0.4377*	1		
(6)	Hedge Funds Flows (Drop)	-0.0102	-0.0013	0.0100	-0.7492*	-0.3890*	1	
(7)	Hedge Funds Flows (Reversal)	0.0180	0.0089	-0.0022	-0.3583*	-0.9704*	0.4424*	1
(8)	Trading Performance Sensitivity 1	0.3540*	-0.0306	-0.0903*	0.0226	0.0095	-0.008	-0.0086
(9)	Trading Performance Sensitivity 2	0.4114*	0.0135	-0.1455*	0.0387	0.0157	-0.0068	-0.0183
(10)	Trading Performance Sensitivity 1- Mutual Funds	0.3373*	0.0034	-0.1191*	0.0376	0.0189	-0.0067	-0.0112
(11)	Trading Performance Sensitivity 2- Mutual Funds	0.3869*	0.0409	-0.1694*	0.0529	0.0257	-0.0078	-0.0239
(12)	Institutional Ownership	0.2234*	-0.4061*	0.1899*	0.004	-0.0203	-0.0069	0.0092
(13)	Mutual Funds Ownership	0.2386*	-0.3526*	0.1550*	-0.0567	-0.0504	0.0309	0.0371
(14)	Hedge Funds Ownership	0.3195*	-0.2719*	0.0793*	-0.0261	-0.0381	-0.0022	0.0269
(15)	Insider Ownership	-0.1500*	0.1424*	-0.0994*	-0.0228	0.0031	0.0264	-0.0001
(16)	Ownership Concentration	-0.1072*	0.2298*	-0.1244*	-0.0713*	-0.0409	0.0431	0.0393
Stocks' Characteristics								
(17)	Market Cap	-0.0154	-0.7007*	0.2636*	0.0513	0.0217	0.0218	-0.0114
(18)	Market-to-Book	0.1688*	-0.1908*	0.0274	0.0495	0.0278	-0.018	-0.0202
(19)	Bid-Ask Spread	-0.1591*	0.2525*	-0.1673*	-0.1256*	-0.0515	0.0582	0.0401
(20)	Past Stock Returns	-0.0665	-0.0229	0.0259	0.0804*	0.064	0.0097	-0.0437
(21)	Stock Return Volatility	0.1428*	-0.0500	-0.0410	-0.0488	-0.0191	-0.0047	0.0088
Firms' Characteristics								
(22)	Firm Size	-0.0191	-0.1109*	0.0063	0.0047	0.0049	-0.0047	-0.0038
(23)	Return on Assets	-0.0773*	-0.0715*	0.0402	0.0367	0.0188	0.036	-0.0064
(24)	Debt Maturity	0.0537	0.0658	-0.1018*	-0.0427	-0.0372	-0.0137	0.0267
(25)	S&P Rating	0.0089	-0.1586*	0.0403	-0.0024	0.0021	0.0126	-0.0046
(26)	Leverage	-0.0155	-0.1180*	0.1458*	0.0628	0.0322	-0.0221	-0.0252

Correlation Matrix - Continued

	Variable	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Ownership Characteristics (continued)										
(8)	Average Trading Performance Sensitivity 1	1								
(9)	Average Trading Performance Sensitivity 2	0.7481*	1							
(10)	Average Trading Performance Sensitivity 1- Mutual Funds	0.9371*	0.6673*	1						
(11)	Average Trading Performance Sensitivity 2- Mutual Funds	0.6805*	0.9498*	0.7020*	1					
(12)	Institutional Ownership	0.3010*	0.4849*	0.3655*	0.5448*	1				
(13)	Mutual Fund Ownership	0.2958*	0.4537*	0.3028*	0.4708*	0.8485*	1			
(14)	Hedge Fund Ownership	0.3363*	0.4629*	0.3835*	0.5042*	0.6093*	0.5411*	1		
(15)	Insider Ownership	-0.1380*	-0.1894*	-0.1373*	-0.1934*	-0.2850*	-0.2528*	-0.0738	1	
(16)	Ownership Concentration	-0.0479	-0.1402*	-0.1161*	-0.1910*	-0.4847*	-0.4689*	-0.2977*	0.1327*	1
Stocks' Characteristics										
(17)	Market Cap	0.0139	0.0801*	0.0401	0.1063*	0.3495*	0.2354*	0.0646	-0.1416*	-0.2255*
(18)	Market-to-Book	0.0395	0.0491	0.0683	0.0686	0.0847*	0.0655	0.0578	-0.0312	-0.1106*
(19)	Bid-Ask Spread	-0.0596	-0.1518*	-0.1239*	-0.2004*	-0.4399*	-0.4528*	-0.2629*	0.2412*	0.5716*
(10)	Past Stock Returns	-0.0301	-0.038	-0.0434	-0.0477	-0.0415	0.0404	0.0196	-0.0364	-0.0341
(21)	Stock Return Volatility	0.1335*	0.2083*	0.1839*	0.2435*	0.3612*	0.1342*	0.1971*	0.1112*	-0.0837*
Firms' Characteristics										
(22)	Firm Size	-0.0005	-0.0063	-0.0098	-0.0129	0.0524	0.0467	0.0142	-0.0718*	-0.0055
(23)	Return on Assets	0.0153	0.0730*	0.0041	0.0713*	0.1633*	0.1281*	0.08	-0.0568	-0.0263
(24)	Debt Maturity	0.0309	-0.012	0.0184	-0.0309	-0.1085*	-0.0724	-0.0172	0.0677	0.0473
(25)	S&P Rating	0.0449	0.0628*	0.0649*	0.0782*	0.1466*	0.0926*	0.0668	-0.0634	-0.0333
(26)	Leverage	0.0461	0.0708*	0.0494	0.0777*	0.1448*	0.1143*	0.0394	-0.0594	-0.0036

Correlation Matrix- Continued

	Variable	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)
Stocks' Characteristics											
(17)	Market Cap	1									
(18)	Market-to-Book	-0.2255*	1								
(19)	Bid-Ask Spread	-0.1106*	0.1849*	1							
(20)	Past Stock Returns	0.5716*	-0.2912*	-0.1550*	1						
(21)	Stock Return Volatility	-0.0341	0.1315*	0.0989*	-0.1319*	1					
Firms' Characteristics											
(22)	Firm Size	-0.0296	0.1188*	-0.0744*	-0.0495	0.0188	-0.0678	1			
(23)	Return on Assets	-0.0998*	0.1993*	0.0578	-0.1744*	0.1763*	-0.1953*	0.002	1		
(24)	Debt Maturity	0.0617	-0.1042*	0.0721	0.1157*	-0.0416	0.1484*	0.0221	-0.1172*	1	
(25)	S&P Rating	-0.0911*	0.1686*	-0.0914*	-0.1024*	0	0.0103	0.1581*	0.0008	-0.1175*	1
(26)	Leverage	-0.0664	0.1575*	-0.0935*	-0.1053*	0.0078	-0.2179*	0.0399	0.0188	-0.3391*	0.1870*

Table 2a - Drops and Reversals across Firms with Different Characteristics

This table compares the mean market model cumulative abnormal returns of high and low IT stocks over the drop and reversal periods. We divide the entire sample in terciles using firms' IT1. A firm is classified as mostly held by long-term institutional investors (Low IT Firm) if it belongs to the first tercile. A firm is classified as mostly 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 firm and stock characteristics (1 indicates the lowest quintile; 5 indicates the highest quintile). We sort firms in quintiles based on their share turnover, volatility, past returns, size, book-to-market and ownership concentration. Stock characteristics are measured at the end of the year 2007 while ownership concentration is measured at the end of the 2Q of the year 2008. Stock characteristics and ownership concentration are described in the paper's Appendix. We report the result of a test for the difference of the mean between high and low IT firms. Abnormal returns are winsorized at the 1% level. * indicates significance at 1% (***), 5% (**), 10% (*).

		Bid-Ask Spread			Stock Return Volatility			Past Stock 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	-29.40%	9.34%	-38.73%***	8.60%	18.48%	-9.88%***	-19.77%	-5.91%	-13.85%***
	2	-18.01%	8.04%	-26.05%***	-17.39%	12.48%	-29.87%***	-18.81%	6.59%	-25.39%***
[-10,8]	3	-16.94%	8.63%	-25.57%***	-11.92%	7.63%	-19.54%***	-8.16%	9.15%	-17.31%***
	4	-24.38%	5.07%	-29.46%***	-26.17%	-4.07%	-22.10%***	2.73%	12.16%	-9.43%***
	5	-11.47%	3.23%	-14.70%***	-40.86%	-24.44%	-16.42%***	-27.77%	5.90%	-33.67%***
Reversal										
	1	14.77%	0.11%	14.66%***	43.24%	25.60%	17.64%***	41.35%	10.24%	31.11%***
	2	12.76%	-0.45%	13.22%***	26.35%	4.09%	22.26%***	12.22%	4.15%	8.07%*
[9, 25]	3	26.20%	12.02%	14.18%***	15.13%	-0.18%	15.31%***	23.70%	11.53%	12.17%***
	4	32.91%	15.67%	17.24%***	25.49%	0.56%	24.93%***	21.57%	17.88%	3.69%
	5	37.46%	12.49%	24.97%***	16.47%	17.63%	-1.16%	14.58%	3.48%	11.11%***

		Book-to-Market			Firm Size			Ownership Concentration		
		(1)	(2)	(3)	(4)	(5)	(6)			
Drop		High IT Firms	Low IT Firms	(1)-(2)	High IT Firms	Low IT Firms	(4)-(5)	High IT Firms	Low IT Firms	(4)-(5)
	1	-29.42%	-7.30%	-22.12%***	-5.29%	0.92%	-6.21%	-24.81%	-0.77%	-24.04%***
	2	-29.92%	9.76%	-39.68%***	-22.08%	9.74%	-31.82%***	-24.88%	5.81%	-30.69%***
[-10,8]	3	-24.26%	7.93%	-32.20%***	-16.79%	8.77%	-37.49%***	-33.90%	10.64%	-19.57%***
	4	-22.23%	15.74%	-37.98%***	-24.91%	12.57%	-33.52%***	-14.56%	5.00%	-7.79%***
	5	-20.29%	-2.79%	-17.50%***	-31.91%	1.61%	-33.52%***	-3.50%	4.29%	-7.79%*
Reversal										
	1	23.10%	10.46%	12.64%**	28.24%	14.33%	13.91%***	11.34%	-1.75%	13.09%***
	2	16.18%	5.94%	10.24%**	34.98%	16.72%	18.26%***	14.49%	-2.73%	17.22%***
[9, 25]	3	15.57%	-0.78%	16.35%**	24.21%	5.75%	18.46%***	25.55%	0.74%	24.81%***
	4	23.87%	3.18%	20.69%***	15.36%	-2.32%	17.68%***	32.71%	15.04%	17.66%***
	5	18.67%	7.10%	11.58%**	19.01%	7.04%	11.96%***	40.31%	19.12%	21.19%***

Table 3a: Investor Horizons and Selling Pressure at the Stock Level – Other Control Variables

This table completes Panel B of Table 3, which presents regressions for net (dollar) sales at the firm level. The dependent variable in Panel B is the total net (dollar) sales (total dollar sales less total dollar purchases) made by the institutional investors in firm *j* during quarter *t* as a percentage of the market capitalization of firm *j* at the end of quarter *t*-1. We aggregate the sales of all 13F institutions in columns 1 to 5, the sales of mutual funds in column 6 and the sales of mutual funds and hedge funds in column 7. The sample period is 1986-2009. Stock characteristics are quarterly and measured at the end of quarter *t-1*, while firms' characteristics are measured at the end of year *t-1*. All variables are defined in the Appendix. All models are estimated by ordinary least squares and include the constant term, but the coefficient is not reported. Standard errors are White-corrected for heteroskedasticity and clustered at the calendar quarter and firm level. P-values are in parentheses. * indicates significance at 1% (***), 5% (**), 10% (*).

	All 13F Institutional Investors						Mutual Funds	Mutual Funds & Hedge Funds
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Stock Characteristics								
Past Stock Return					0.223**	0.231**	0.359**	0.370**
					(0.019)	(0.021)	(0.015)	(0.014)
Stock Return Volatility					-0.098	-0.082	0.122	0.148
					(0.149)	(0.151)	(0.184)	(0.168)
Share Turnover					0.048	0.047	-0.052	-0.058
					(0.131)	(0.130)	(0.131)	(0.119)
Market-to-Book Ratio					0.124*	0.111*	-0.148**	-0.150**
					(0.074)	(0.094)	(0.040)	(0.041)
Past Stock Return X Turmoil					0.184**	0.175**		
					(0.021)	(0.022)		
Stock Return Volatility X Turmoil					0.120*	0.113		
					(0.078)	(0.111)		
Share Turnover X Turmoil					0.107*	0.093*		
					(0.065)	(0.073)		
Market-to-Book Ratio X Turmoil					0.204**	0.182**		
					(0.023)	(0.033)		
Past Stock Return X IT1					0.520**	0.492**		
					(0.039)	(0.041)		
Stock Return Volatility X IT1					0.287	0.285		
					(0.125)	(0.137)		
Share Turnover X IT1					-0.158	-0.165		
					(0.159)	(0.140)		
Market-to-Book Ratio X IT1					-0.341*	-0.316*		
					(0.092)	(0.097)		
Firm Characteristics								
Firm Size				-0.025	-0.032	-0.023	-0.039	-0.041
				(0.614)	(0.581)	(0.624)	(0.689)	(0.715)
Leverage				-0.001	-0.001	-0.001	-0.001	-0.001
				(0.419)	(0.398)	(0.487)	(0.527)	(0.508)
Return on Assets				0.028*	0.026*	0.018*	-0.025*	-0.026
				(0.070)	(0.084)	(0.090)	(0.091)	(0.085)
Time Fixed Effects	NO	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR	YEAR
Firm Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES
N	452,081	452,081	452,081	452,081	452,081	385,722	385,722	262,107
Adjusted R^2	0.139	0.138	0.141	0.159	0.161	0.191	0.138	0.14

Table 4a: Multivariate Analysis of Price Drops

The dependent variable is the cumulative abnormal returns of firm *j* during the drop period (between week -10 and week +8). We use IT1 to capture institutional investors' horizons. The benchmark models used to obtained the cumulative abnormal returns are: The market model (MCAR) in columns 1, the Fama and French four factors (FFCARin) in column 2, a multifactor model that includes the market return and changes in the VIX index (VIXAdjCARin) in column 3, a multifactor model that includes the market return and Pastor and Stambaugh's (2003) market-wide liquidity factor (LiqAdjCARin) in column 4. In column 1, the benchmark models are estimated from the beginning of 2003 until the end of the first quarter of 2008. In columns 2 to 4, we estimate the benchmark models are estimated during the event window. Finally, in column 5, the abnormal returns are calculated using the deviation of each firm's return from the relevant size and book-to-market portfolio (FFCARport). Variable definitions are found in the Appendix. Abnormal returns are winsorized at the 1% level. All models are estimated by ordinary least squares and 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% (*).

	MCAR	FFCARin	VixAdjCARin	LiqAdjCARin	FFCARport
	(1)	(2)	(3)	(4)	(5)
IT1	-0.654***	-0.700***	-0.750***	-0.501***	-0.623***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Change in Portfolio Value		0.422***	0.425***	0.282***	0.373***
		(0.000)	(0.000)	(0.000)	(0.001)
Active Share Measure		-0.318	-0.413	-0.085	-0.310
		(0.204)	(0.109)	(0.689)	(0.228)
Mutual Fund Flows	2.065*	1.068	1.390	1.355	0.574
	(0.056)	(0.195)	(0.147)	(0.114)	(0.517)
Hedge Fund Flows	3.319***	2.364***	2.574**	2.621***	2.698***
	(0.003)	(0.008)	(0.011)	(0.004)	(0.004)
Institutional Ownership	-0.170***	-0.032	-0.037	-0.030	-0.115**
	(0.001)	(0.426)	(0.375)	(0.400)	(0.014)
Insider Ownership	0.107*	0.028	0.042	0.013	0.086
	(0.075)	(0.611)	(0.434)	(0.776)	(0.118)
Ownership Concentration	0.246**	-0.289***	-0.242**	-0.147	0.100
	(0.034)	(0.007)	(0.049)	(0.184)	(0.342)
Stock Characteristics					
Market-to-Book	-0.007	0.005	0.003	0.003	0.053***
	(0.308)	(0.382)	(0.585)	(0.576)	(0.000)
Past Stock Returns	-0.116***	-0.104***	-0.106***	-0.104***	0.069*
	(0.010)	(0.008)	(0.007)	(0.002)	(0.089)
Stock Return Volatility	-25.499***	13.042***	13.267***	5.734**	-13.224***
	(0.000)	(0.000)	(0.000)	(0.014)	(0.000)
Bid Ask Spread	-5.639**	-11.427***	-10.837***	-6.724***	-4.510**
	(0.027)	(0.000)	(0.000)	(0.000)	(0.023)
Firm Characteristics					
Firm Size	0.013	0.068***	0.073***	0.054***	0.040***
	(0.154)	(0.000)	(0.000)	(0.000)	(0.000)
Debt Maturity					
S&P Rating	0.050	0.074**	0.070**	0.100***	0.077**
	(0.233)	(0.013)	(0.019)	(0.000)	(0.026)
Leverage	-0.442***	-0.104**	-0.161***	-0.157***	-0.476***
	(0.000)	(0.031)	(0.001)	(0.000)	(0.000)
Return on Assets	0.078	0.044	0.033	0.073	0.207**
	(0.474)	(0.636)	(0.747)	(0.378)	(0.037)
Industry Dummies	YES	YES	YES	YES	YES
Non-Financial Firms Only	NO	NO	NO	NO	NO
N	1,893	1,890	1,890	1,890	1,890
Adjusted R^2	0.260	0.253	0.253	0.185	0.234

Table 5a: Multivariate Analysis of Price Reversal

The dependent variable is the cumulative abnormal returns of firm *j* during the reversal period (between week +9 and week +25). We use IT1 to capture institutional investors' horizons. The benchmark models used to obtained the cumulative abnormal returns are: The benchmark models used to obtained the cumulative abnormal returns are: The market model (MCAR) in columns 1, the Fama and French four factors (FFCARin) in column 2, a multifactor model that includes the market return and changes in the VIX index (VIXAdjCARin) in column 3, a multifactor model that includes the market return and Pastor and Stambaugh's (2003) market-wide liquidity factor (LiqAdjCARin) in column 4. In column 1, the benchmark models are estimated from the beginning of 2003 until the end of the first quarter of 2008. In columns 2 to 4, we estimate the benchmark models are estimated during the event window. Finally, in column 5, the abnormal returns are calculated using the deviation of each firm's return from the relevant size and book-to-market portfolio (FFCARport). Variable definitions are found in the Appendix. Abnormal returns are winsorized at the 1% level. All models are estimated by ordinary least squares and 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% (*).

	MCAR	FFCARin	VixAdjCARin	LiqAdjCARin	FFCARport
	(1)	(2)	(3)	(4)	(5)
IT1	0.837***	0.416***	0.433***	0.394***	0.486***
	(0.000)	(0.001)	(0.001)	(0.003)	(0.000)
Change in Portfolio Value		-0.160	-0.164	-0.109	-0.190*
		(0.135)	(0.125)	(0.339)	(0.093)
Active Share Measure		0.438*	0.127	0.198	0.586**
		(0.055)	(0.573)	(0.410)	(0.016)
Mutual Funds Flows	2.226**	1.479	1.221	1.789	1.409
	(0.019)	(0.212)	(0.273)	(0.114)	(0.264)
Hedge Funds Flows	2.828**	1.790	1.714	2.317*	1.793
	(0.017)	(0.222)	(0.213)	(0.097)	(0.250)
Institutional Ownership	-0.165***	-0.069*	-0.077*	-0.061	-0.040
	(0.002)	(0.089)	(0.062)	(0.149)	(0.371)
Insider Ownership	0.033	0.000	0.045	0.062	-0.031
	(0.629)	(0.995)	(0.391)	(0.261)	(0.583)
Ownership Concentration	0.249*	-0.090	0.037	0.020	0.041
	(0.073)	(0.351)	(0.783)	(0.856)	(0.664)
Stock Characteristics					
Market-to-Book	0.015**	0.013**	0.012*	0.019***	-0.002
	(0.027)	(0.049)	(0.055)	(0.004)	(0.772)
Past Stock Returns	-0.105**	0.020	0.001	0.024	-0.039
	(0.019)	(0.601)	(0.970)	(0.545)	(0.313)
Stock Return Volatility	-18.472***	4.953*	2.845	5.642**	11.771***
	(0.000)	(0.070)	(0.308)	(0.046)	(0.000)
Bid Ask Spread	0.840	-1.396	0.462	-2.419	-1.832
	(0.777)	(0.505)	(0.834)	(0.307)	(0.455)
Firm Characteristics					
Firm Size	0.007	0.008	0.015*	0.020**	0.006
	(0.436)	(0.391)	(0.078)	(0.029)	(0.536)
Debt Maturity					
S&P Rating	-0.106**	-0.127***	-0.143***	-0.132***	-0.120***
	(0.011)	(0.000)	(0.000)	(0.000)	(0.000)
Leverage	-0.042	-0.061	-0.079	-0.049	0.075
	(0.458)	(0.207)	(0.101)	(0.326)	(0.140)
Return on Assets	0.066	0.189*	0.278***	0.260**	0.134
	(0.601)	(0.073)	(0.007)	(0.026)	(0.189)
Industry Dummies	YES	YES	YES	YES	YES
Non-Financial Firms Only	NO	NO	NO	NO	NO
N	1,893	1,890	1,890	1,890	1,890
Adjusted R^2	0.102	0.095	0.092	0.098	0.114

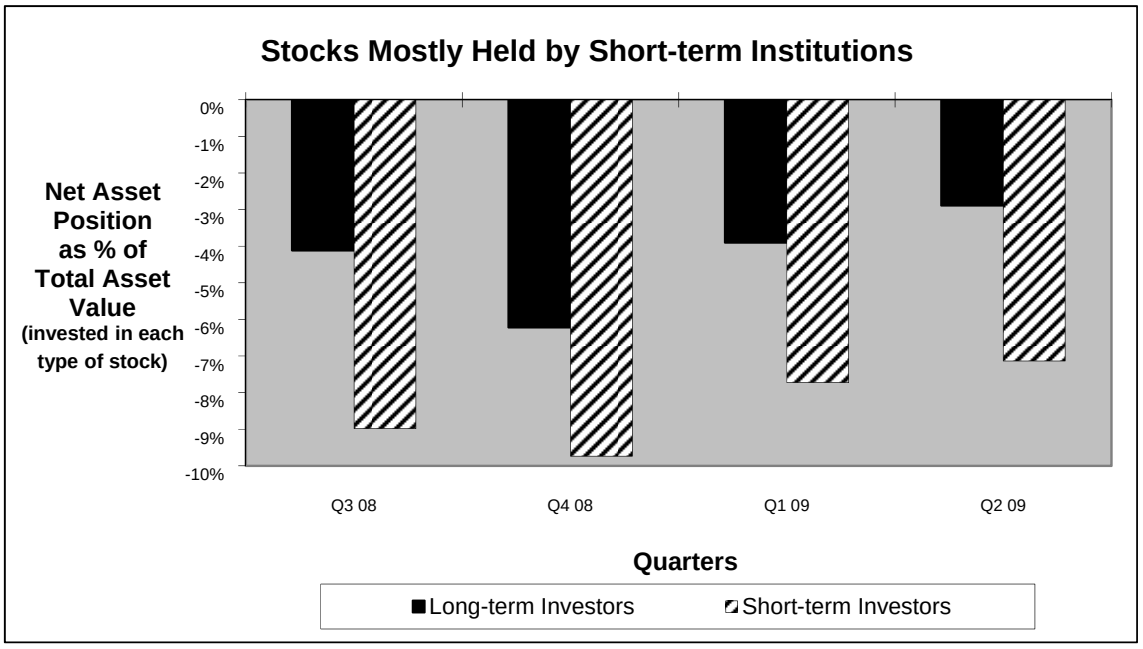
Table 6a: Panel Analysis of Price Drop and Reversal

The dependent variable is the abnormal return of firm *j* in week *t*, where *t* varies in the interval between week -10 and week +8 for the drop period, and between week +9 and week +25 for the reversal period. Abnormal returns are computed using the market model in columns 1, 2, 4 and 5 and a multifactor model that includes the market return and Pastor and Stambaugh's (2003) market-wide liquidity factor in columns 3 and 6. In all cases, benchmark returns are estimated using weekly returns from the beginning of 2003 until the end of the first quarter of 2008. In these specifications, we control for firms characteristics measured at the end of the year 2007 and we include controls for contemporaneous time-varying stocks characteristics. Variable definitions are found in the Appendix. Market-to-Book and Bid-Ask Spread are computed weekly using the market value of equity divided by the book value of common equity as of the end of each week and the average of the daily bid-ask spread during the week. We also control for Past Stock Returns over 1 Day, 5 Days, 15 Days and 30 Days. Abnormal returns are winsorized at the 1% level. All models are estimated by ordinary least squares and include the constant term, but the coefficient is not reported. Standard errors are White-corrected for heteroskedasticity and clustered at the firm level. P-values are in parentheses. * indicates significance at 1% (***), 5% (**), 10% (*).

	Drop- Window [-10,+8]			Reversal - Window [+9,+25]		
	Market Model Abnormal Returns		Liquidity Adj. Abnormal Returns	Market Model Abnormal Returns		Liquidity Adj. Abnormal Returns
	(1)	(2)	(3)	(4)	(5)	(6)
IT1	-0.039***	-0.038***	-0.036***	0.049***	0.049***	0.050***
	(0.000)	(0.000)	(0.006)	(0.000)	(0.000)	(0.000)
Change in Portfolio Value	0.028***	0.020***	0.020**	-0.015*	-0.001	-0.014
	(0.000)	(0.003)	(0.012)	(0.066)	(0.865)	(0.141)
Active Share Measure	-0.012	0.017	0.002	0.046**	0.024	0.046**
	(0.436)	(0.359)	(0.910)	(0.018)	(0.305)	(0.046)
Mutual Funds Flows	0.130**	0.116*	0.185***	0.105	0.150	0.111
	(0.036)	(0.092)	(0.004)	(0.207)	(0.108)	(0.220)
Hedge Funds Flows	0.179***	0.158**	0.238***	0.163	0.233**	0.220*
	(0.006)	(0.029)	(0.000)	(0.115)	(0.045)	(0.052)
Institutional Ownership	-0.009***	-0.004	-0.014***	-0.014***	-0.025***	-0.013***
	(0.001)	(0.273)	(0.000)	(0.000)	(0.000)	(0.002)
Insider Ownership	0.004	0.007*	0.002	-0.000	-0.000	-0.002
	(0.178)	(0.090)	(0.571)	(0.917)	(0.958)	(0.648)
Ownership Concentration	0.013**	0.006	0.018**	0.022**	0.006	0.014
	(0.043)	(0.670)	(0.024)	(0.025)	(0.779)	(0.242)
Stock Characteristics						
Market-to-Book Weekly	0.000	0.000	0.001	0.001	0.001*	0.001*
	(0.491)	(0.790)	(0.138)	(0.185)	(0.063)	(0.078)
Past Stock Returns	-0.004	-0.008***	-0.002	-0.006*	-0.012***	-0.011***
	(0.149)	(0.010)	(0.449)	(0.064)	(0.000)	(0.003)
Past Stock Returns over 1 Day	-0.262***	-0.101**	-0.337***	-0.354***	-0.324***	-0.484***
	(0.000)	(0.025)	(0.000)	(0.000)	(0.000)	(0.000)
Past Stock Returns over 5 Days	0.002	-0.023	-0.004	0.040***	0.027**	0.041***
	(0.850)	(0.114)	(0.800)	(0.000)	(0.038)	(0.007)
Past Stock Returns over 15 Days	-0.004	0.005	-0.010	-0.029***	-0.027***	-0.037***
	(0.556)	(0.518)	(0.223)	(0.000)	(0.000)	(0.000)
Past Stock Returns over 30 Days	0.013***	0.008	0.023***	-0.017***	-0.020***	-0.032***
	(0.005)	(0.132)	(0.000)	(0.000)	(0.000)	(0.000)
Stock Return Volatility Weekly	-0.155***	-0.161***	-0.061	-0.094**	-0.106**	-0.079*
	(0.000)	(0.000)	(0.200)	(0.011)	(0.017)	(0.097)
Bid-Ask Spread Weekly	0.041	-0.034	-0.042	-0.015	-0.004	0.049
	(0.359)	(0.627)	(0.451)	(0.736)	(0.943)	(0.353)
Firm Characteristics						
Firm Size	0.003***	0.001*	0.003***	0.000	0.003***	0.000
	(0.000)	(0.092)	(0.000)	(0.922)	(0.001)	(0.967)
S&P Rating	0.003	0.004	0.001	-0.006**	-0.009***	-0.007*
	(0.128)	(0.141)	(0.774)	(0.046)	(0.003)	(0.056)
Leverage	-0.025***	-0.013***	-0.033***	0.002	0.000	0.007
	(0.000)	(0.002)	(0.000)	(0.597)	(0.965)	(0.131)
Return on Assets	0.014**	0.018***	0.014*	0.009	0.007	0.008
	(0.027)	(0.006)	(0.076)	(0.269)	(0.392)	(0.369)
Time Dummies	YES	YES	YES	YES	YES	YES
Industry Dummies	YES	YES	YES	YES	YES	YES
Non-Financial Firms Only	NO	YES	NO	NO	YES	NO
N	32,531	24,062	33,073	29,677	21,941	30,260
R^2	0.078	0.065	0.070	0.045	0.047	0.055

Figure 1a
Sales in Firms with High and Low Investor Turnover

This figure shows the trading behavior of long horizon institutional investors and short horizon institutional investors in (a) stocks mostly held by short horizon investors and (b) stocks mostly held by long horizon investors. We first sort stocks on the basis of their investor turnover (IT1) and, second, investors on the basis of the churn ratio of their portfolios. We divide the entire sample in terciles using firms' IT1. A firm is classified as mostly held by long horizon institutional investors (Low IT Firm) if it belongs to the first tercile. A firm is classified as mostly held by short horizon institutional investors (High IT Firm) if it belongs to the third tercile. 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.



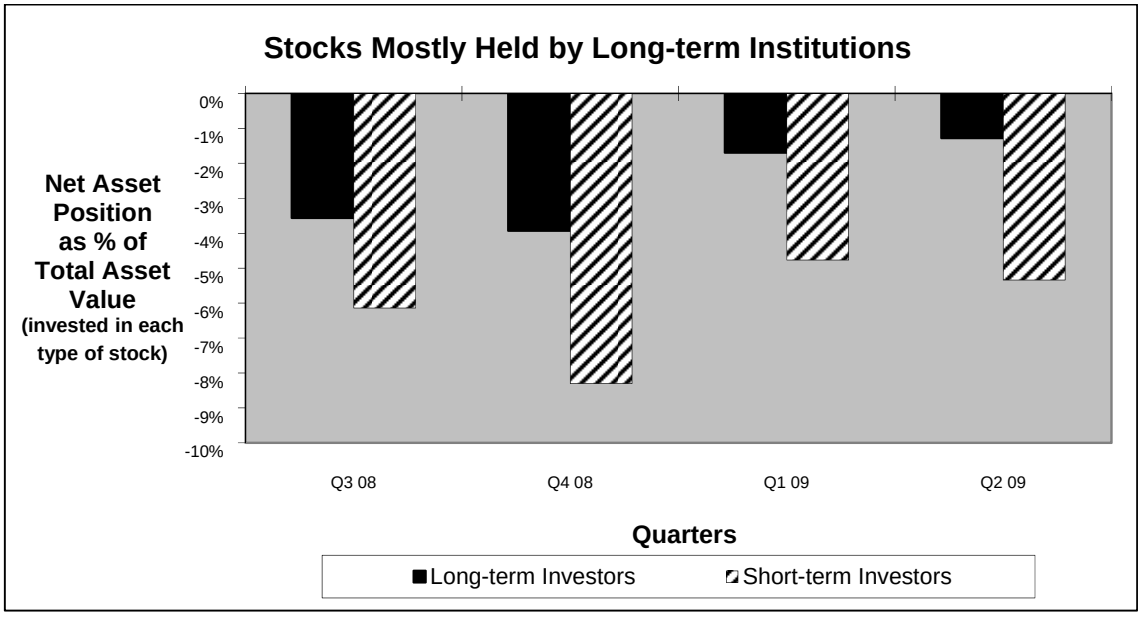


Figure 2.a
Other Large Market Declines

This figure reports the means cumulative abnormal returns (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 IT1 in the last quarter of 1986; for the Russian default, we measure IT1 in the last quarter of 1997; for the Quant crisis, we measure IT1 in the last quarter of 2006 and for the bailout of Bear Stearns, we measure IT1 in the last quarter of 2007. For each crisis, using IT1, we divide the entire sample in terciles and classify a firm as mostly held by long horizon institutional investors (Low IT Firm) if it belongs to the first tercile. A firm is classified as mostly held by short horizon institutional investors (High IT Firm) if it belongs to the third tercile.