Does Investment Horizon Matter? Disentangling the Effect of Institutional Herding on Stock Prices[*]

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ABSTRACT

This study finds that, over short horizons, herding by short-term institutions promotes price discovery. In contrast, herding by long-term institutions drives stock prices away from fundamentals over the same periods. Furthermore, while the positive predictability of short-term institutional herding for stock prices is more pronounced for small stocks and stocks with high growth opportunities, the negative association between long-term institutional herding and stock prices is stronger for stocks whose valuations are highly uncertain and subjective. Finally, we show that the destabilizing effect of institutional herding persistence documented in the recent literature is entirely driven by persistent herding by long-term institutions.

JEL classification: G11; G12; G14; G20

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Introduction

A large body of empirical literature shows that institutional investors exhibit a tendency to herd, that is, they buy or sell the same stocks during the same time period.[1] These studies also show that stock prices continue in the same direction as herding over the subsequent one to three quarters. For example, Wermers (1999) shows that stocks bought in herds by mutual funds outperform those sold in herds by mutual funds during that quarter and over the subsequent three quarters. Sias (2004) finds a positive correlation between the direction of institutional herding and future stock returns over the following four quarters. These findings are consistent with the notion that institutional herding enhances market efficiency by speeding up price discovery.

We extend the existing literature by disentangling the effect of institutional herding on future stock prices across different groups of institutions. In particular, previous studies document differences in the level of informed trading among institutional investors with different investment horizons. These studies show that institutions with short investment horizons tend to be better informed than those with long investment horizons. For example, Yan and Zhang (2009) find that changes in short-term institutional ownership (i.e., institutions with high portfolio turnover) predict future stock returns and are positively associated with future earnings surprises. In contrast, changes in long-term institutional ownership (i.e., institutions with lower portfolio turnover) are not related to future stock returns or earnings surprises. Their interpretation is that short-term institutions trade aggressively to profit from their informational advantage. If the level of informed trading varies between institutions with short- and long-term investment horizons, then their herding could have a different effect on future stock prices.

[1] Lakonishok, Shleifer, and Vishny (1992), Wermers (1999), and Sias (2004). Broadly, the theoretical literature offers two reasons why institutions could herd. First, they trade based on the new information (Froot, Scharfstein, and Stein, 1992; Hirshleifer, Subrahmanyam, and Titman, 1994). Second, institutions could herd for reasons unrelated to information, such as the reputational risk or preferences for specific stock characteristics (Scharfstein and Stein, 1990; Banerjee, 1992; Falkenstein, 1996; Bikhchandani and Sharma, 2001).

Specifically, if short-term institutions trade based on information, we would expect herding by these institutions to promote price discovery. Conversely, if long-term institutions trade for reasons unrelated to new information, their herding could potentially drive prices away from fundamentals. We examine the above hypothesis by disentangling the effect of herding between short-term and long-term institutions.

Following Yan and Zhang (2009), we classify institutional investors as short- or long-term on the basis of their portfolio turnover over the past four quarters. To disentangle the effects of short- and long-term institutional herding, we construct the herding metric of Lakonishok, Shleifer, and Vishny (1992) for short- and long-term institutions separately. This measure reflects the tendency of a given subgroup of institutions (short- versus long-term institutions) to buy or sell the same stocks during the same period.

We find that herding by all institutions, both short- and long-term, is persistent, and the persistence in institutional herding is mainly driven by long-term institutions. As noted by Hirshleifer, Subrahmanyam, and Titman (1994), the sequential nature of information arrival leads investors to herd, since the trades of early informed investors (i.e., leaders) lead those of the late informed (i.e., followers). If short-term institutions are better informed than long-term institutions, long-term institutional herding would be positively correlated with the lagged herding measures of short-term institutions. We show a strong positive relation of long-term institutional herding with short-term institutional herding over the previous quarters. In contrast, we find no evidence that short-term institutional herding is positively correlated with the previous quarter's long-term institutional herding.

We begin by examining the price impact of herding by all institutions as a group. We compute quarterly abnormal returns using the characteristic-matched benchmark of Daniel, Grinblatt, Titman, and Wermers (1997). This analysis shows there is no significant difference between a portfolio of stocks that institutions buy in herds and the portfolio of stocks that institutions sell in herds during the subsequent quarter following the portfolio formation period (a price stabilizing effect the subsequent quarter). However, a return reversal follows this effect over the next two to four quarters. More specifically, after stock returns are adjusted for certain stock characteristics, the price-stabilizing effect of herding by all institutions does not persist over one- to three-quarter horizons. This finding challenges the conclusion of earlier studies (Wermers, 1999; Sias, 2004).[2]

Next, we examine the price effects of short- and long-term institutional herding, respectively. Our results show that the stabilizing effect of institutional herding reported in the previous literature is mainly driven by short-term institutional herding. Contrary to the results of earlier studies, the strong return reversal following long-term institutional herding is evidence that herding by these institutions tends to drive stock prices away from their equilibrium values. This finding alters the perception of institutional herding as solely benefiting price discovery over short horizons. Fama–MacBeth (1973) cross-sectional regressions confirm the differential price impact of short- and long-term institutional herding, even after controlling for the change in breadth, institutional demand, and various stock characteristics. In addition, our results hold for different sub-periods, and are robust to the use of alternative methodologies for the investment horizon of institutional. Further, the informational advantage of short-term institutional herding is stronger for smaller firms and firms with more growth opportunities. In contrast, the return reversal observed following long-term institutional herding is particularly pronounced for firms

[2] Wermers (1999) examines the effect of herding by mutual funds and future stock returns adjusted for size portfolios. Sias (2004) examines the correlation between institutional herding and future stock (raw) returns. Due to the high correlation between institutional herding and stock characteristics, that is, size as well as book-to-market ratio and momentum, Daniel, Grinblatt, Titman, and Wermers (1997) provide a stronger test for the price impact of institutional herding.

whose valuations are highly uncertain and subjective. We extend our analysis and show that the size and capitalization/valuation style of institutional investors play an additional role in the differential price impact of short- and long-term institutional herding.

One important implication of our paper is the price impact of short- and long-term institutional herding on stock prices over longer horizons. More specifically, Dasgupta, Prat, and Verardo (2011a) show a destabilizing effect of persistence in institutional herding on future stock prices over horizons up to two years. This finding opens up a new debate and leads to a lack of consensus among studies that examine the impact of institutional herding on stock prices over short- and long-horizons. We re-examine the price impact of persistent short- and long-term institutional herding and show that the destabilizing effect of institutional herding persistence documented by Dasgupta, Prat, and Verardo (2011a) is entirely driven by persistent herding by long-term institutions. Overall, our findings complement the literature and further help resolve the current debate over the price impact of institutional herding across different holding periods.

2. Data and methodology

We obtain from Thomson Financial the quarterly institutional holdings for all common stocks traded on the NYSE, AMEX, and Nasdaq from 1981 to 2012, for a total of 128 quarters. The institutional ownership for each stock is defined as the number of shares held by institutional investors divided by the stock's total number of shares outstanding. We exclude observations with total institutional ownership greater than 100%. Data on stock returns, share prices, number of shares outstanding, and price adjustment factors for all NYSE/AMEX/Nasdaq stocks are obtained from the CRSP. The data on the book value of equity and cash dividends are from Compustat.

2.1 Classification of short- versus long-term institutions

We use the same approach as Yan and Zhang (2009) to classify institutions as short or long term on the basis of their average portfolio turnover over the past four quarters. Specifically, each quarter, we calculate the aggregate buys and sells for each institution:

$$CR_{k,t}^{buy} = \sum_{\substack{i=1 \\ S_{k,i,t} > S_{k,i,t-1}}}^{N_k} |S_{k,i,t}P_{i,t} - S_{k,i,t-1}P_{i,t-1} - S_{k,i,t-1}\Delta P_{i,t}| \quad (1)$$

$$CR_{k,t}^{sell} = \sum_{\substack{i=1 \\ S_{k,i,t} \leq S_{k,i,t-1}}}^{N_k} |S_{k,i,t}P_{i,t} - S_{k,i,t-1}P_{i,t-1} - S_{k,i,t-1}\Delta P_{i,t}| \quad (2)$$

where $P_{i,t}$ ($P_{i,t-1}$) is the share price for stock i; $S_{k,i,t}$ ($S_{k,i,t-1}$) is the number of shares of stock *i* held by investor *k* at the end of quarter *t* (*t* - 1), with stock splits and stock dividends adjusted with the CRSP price adjustment factor; and $CR_{k,t}^{buy}$ ($CR_{k,t}^{sell}$) represents institution *k*'s aggregate purchase (sale) during quarter *t*. Then we define institution *k*'s churn rate as

$$CR_{k,t} \equiv \frac{\min\left(CR_{k,t}^{buy}, CR_{k,t}^{sell}\right)}{\sum_{i=1}^{N_k} \frac{S_{k,i,t}P_{i,t} + S_{k,i,t-1}P_{i,t-1}}{2}} \quad (3)$$

Finally, the average churn rate over the past four quarters is computed as follows:

$$Average\ CR_{k,t} = \frac{1}{4}\sum_{j=0}^{3} CR_{k,t-j} \quad (4)$$

Based on $Average\ CR_{k,t}$, we group all institutions into three terciles each quarter. Institutions ranked in the top (bottom) tercile with the highest (lowest) average churn rates are classified as short-term (long-term) institutions.

2.2 Measuring herding

2.2.1 Herding measure

Herding is defined by Lakonishok, Shleifer, and Vishny (1992) as the average tendency of a group of institutional investors to buy (or sell) particular stocks at the same time, relative to what would be expected if institutions traded independently. In line with Lakonishok, Shleifer, and Vishny (1992), for each stock and each quarter, we compute the herding measure (HM_{it}) as

$$HM_{it} = |p_{it} - \bar{p}_{it}| - AF_{it} \quad (5)$$

where p_{it} is the number of institutions buying stock *i*, relative to the total number of institutions trading stock *i* in quarter *t*. We define an institution as a buyer (seller) of stock *i* if it holds more (fewer) split-adjusted shares at the end of quarter *t* than at the beginning. The term $\bar{p}_{it}$ denotes the expected p_{it}, as represented by the average p_{it} across all stocks during the quarter *t*. The expression AF_{it} is an adjustment factor that accounts for random variation around the expected proportion of institutional buyers under the null hypothesis of independent trading by institutional investors. To ensure this measure reasonably captures the concept of a herd, we require each stock in our sample to be traded by at least five institutions during any quarter.[3]

We follow the approach described by Wermers (1999) and Brown, Wei, and Wermers (2014) to distinguish herding between the buy and sell sides. We first measure herding conditional based on whether a stock has a higher or lower proportion of buys than the average stock and then define the buy herding measure ($BHM_{it} = HM_{it}|p_{it} > \bar{p}_{it}$) and the sell herding measure ($SHM_{it} = HM_{it}|p_{it} < \bar{p}_{it}$). Finally, we construct the adjusted herding measure, denoted $ADJHERD$, which combines the buy and sell herding measures. Specifically, for each quarter and within each group of buy herding (or sell herding) stock, we subtract the minimum value of BHM (or SHM) from each stock's BHM_{it} (or SHM_{it}). We set $ADJHERD$ equal to the differenced BHM_{it} if the stock is a buy herding stock and equal to -1 times the differenced SHM_{it} if the stock is a sell herding stock during the quarter. A high (low) $ADJHERD$ measure indicates that the stock is heavily bought (sold) by a herd of institutions.

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[3] See Lakonishok, Shleifer, and Vishny (1992) and Wermers (1999) for more detail. Varying the number of institutions that trade a stock for this restriction does not alter the main findings of this study.

2.2.2 Disentangling short- and long-term institutional herding

To disentangle the effects of short- and long-term institutional herding, we compute the herding measure, in line with Lakonishok, Shleifer, and Vishny (1992) for short- and long-term institutions separately, which gauges the tendency of a subgroup of institutions to trade together in the same direction. The LSV herding measure for short- and long-term institutions in stock *i* in quarter *t* can be expressed as

$$HM_{it}^{ST\ (LT)} = \left|p_{it}^{ST\ (LT)} - \bar{p}_{it}^{ST\ (LT)}\right| - AF_{it}^{ST\ (LT)} \quad (6)$$

where p_{it}^{ST} (p_{it}^{LT}) is the proportion of short- (long-) term institutions buying stock *i*, relative to the total number of short-term (long-) institutions trading that stock in quarter *t*. Both $E[p_{it}^{ST}]$ ($E[p_{it}^{LT}]$) and AF_{it}^{ST} (AF_{it}^{LT}) are recomputed for short- (long-) term institutions. The terms BHM_{it}^{ST} (BHM_{it}^{LT}), SHM_{it}^{ST} (SHM_{it}^{LT}), and $ADJHERD_{it}^{ST}$ ($ADJHERD_{it}^{LT}$) are constructed similarly to the way described above for short- (long-) term institutions. The terms $ADJHERD_{it}^{ST}$ ($ADJHERD_{it}^{LT}$) represents the adjusted herding measure based on short- (long-) term institutions.

3. Results

3.1 Descriptive statistics

3.1.1 Portfolio and legal/style characteristics of short- and long-term institutions

We group each stock listed on the CRSP into respective quintiles according to the market value of equity (*Size*) at the end of June, with break points based on NYSE stocks only; the book-to-market ratio (*B/M*); and its prior 12-month return (*Momentum*). Using quintile information, we compute the value-weighted *Size*, *B/M*, and *Momentum* ranks for each institution in each quarter. For example, an institution holding stocks with the largest (smallest) size quintile would have *Size Rank* = 5 (*Size Rank* = 1). Table 1 reports the time-series mean and median of these characteristics for the full sample of institutions and separately for short- and long-term institutions. Panel A shows that, on average, institutional investors as a whole tend to hold larger stocks (*Size Rank* = 3.66) and stocks with higher book-to-market ratios (*B/M Rank* = 2.75) in their portfolios. Further, the portfolio holdings of an average institution are slightly tilted toward momentum stocks (*Mom Rank* = 3.23).

Panel A also reveals similarities and differences in portfolio holdings between short- and long-term institutions. For example, portfolio holdings of both short- and long-term institutions are tilted toward growth stocks. On the other hand, compared to long-term institutions, short-term institutions prefer smaller stocks in their portfolios. One potential explanation of this difference could be the differential informational advantage between short- and long-term institutional investors. In Section 4.1, we further investigate the information content of short- and long-term institutional herding for stocks that face more uncertainty and are more difficult to value. Furthermore, short-term institutions, on average, prefer stocks with higher momentum. This finding suggests that, relative to long-term institutions, short-term institutions follow more active strategies in their portfolio holdings. Finally, the average holding period of short- (long-) term institutions is 1.2 years (8.3 years), implied by a quarterly portfolio turnover (*Average Churn*) of 21% (3%).

[TABLE 1 ABOUT HERE]

Each type of institution (e.g., bank trusts, investment companies) is governed by different fiduciary responsibility laws, follows different investment practices, and faces different competitive pressures. Panel B (Panel C) of Table 1 presents the time-series mean of the percentage of the legal type (capitalization/valuation style) composition for the full sample of institutions and separately for short- and long-term institutions.[4] Both the legal type and the

[4] We thank Brian Bushee for providing the legal type and capitalization/style classification data used in this paper (http://acct3.wharton.upenn.edu/faculty/bushee/IIvars.html#typ). Abarbanell, Bushee, and Raedy (2003) classify

capitalization/valuation style relate to institutions' investment horizons, as expected. For example, in Panel B, short-term institutions are dominated by independent investment advisors (76.9%), while long-term institutions are composed of banks (29.9%), independent investment advisors (45.2%), and other institutions (13.7%). In Panel C, small-value (large-value) and small-growth (large-growth) institutions constitute 72.7% (74.0%) of all short-term (long-term) institutions. This analysis highlights substantial variation in investment horizons within legal types and capitalization/valuation styles.

3.1.2 Stock characteristics and institutional herding

Table 2 reports the time-series mean, median, maximum, minimum, and standard deviation of cross-sectional averages of herding ownership and change in ownership from 1981 to 2012. Panel A shows the average level of herding for all institutions is 1.07%. Next we differentiate institutions according to their investment horizons. While we find herding among both short-term (HM^{ST} = 0.78%) and long-term institutions (HM^{LT} = 0.43%), the average changes in short- and long-term institutional ownership are 0.35% and 0.31%, respectively.

[TABLE 2 ABOUT HERE]

Finally, Panel B of Table 2 reports the time-series mean of cross-sectional correlations between the herding measures and institutional demand variables. Both short-term ($ADJHERD^{ST}$) and long-term ($ADJHERD^{LT}$) institutional herding measures are highly correlated with the overall herding measure ($ADJHERD$), even though the correlation coefficient between $ADJHERD^{ST}$ and $ADJHERD^{LT}$ is only about 0.14. This finding suggests that any differential price impact between short- and long-term institutions could not be captured by the herding measure based on the full sample of institutions. Furthermore, low correlation between

institutional investors into four different classes: first, based on whether they are growth or value oriented and, within each of those classes, whether they invest mostly in small or large stocks.

institutional demand and institutional herding measures suggests that these variables represent different signals about future stock valuation.

3.2 Determinants of short- and long-term institutional herding

We investigate the determinants of herding for all institutions as a group and separately for short- and long-term institutions. We estimate the following regression during each quarter:

$$ADJHERD_{i,t} = \alpha + \beta_1 ADJHERD_{i.t-k} + \beta_2 Control_{i,t} + \varepsilon_{i,t} \quad (7)$$

where the dependent variable, $ADJHERD$ ($ADJHERD^{ST}$ and $ADJHERD^{LT}$), indicates herding by all institutions (short- and long-term institutions). Hirshleifer, Subrahmanyam, and Titman (1994) show theoretically the sequential nature of information arrival leads traders to trade aggressively when they receive new information earlier than other investors. As a result, traders who receive new information later (i.e., followers) appear to follow the early informed (i.e., leaders), since the trades of the former are positively correlated with those of the latter. If short-term institutions are indeed better informed than long-term institutions, we should expect short-term institutional herding to lead long-term institutional herding and the persistence in institutional herding to be weaker (stronger) among short-term (long-term) institutions.

To address these questions, we include lagged herding measures for all institutions and short- and long-term institutions in equation (7). The term $ADJHERD_{t-k}$ denotes all institutional herding, with k varying from one to four. Following previous studies (Wermers, 1999; Sias, 2004; Brown, Wei, and Wermers, 2014), we include size, the book to market, the prior four quarters' stock returns, stock return volatility ($RET\ VOL$), share turnover ($TURNOVER$), the per-share stock price (PRC), and index change dummy ($S\&P500^{add\_drop}$). The Appendix defines all control variables. Table 3 reports Fama-MacBeth *t*-statistics using the Newey and West (1987) autocorrelation and heteroskedasticity consistent standard errors.

[TABLE 3 ABOUT HERE]

Column (1) shows that overall institutional herding exhibits strong persistence up to four quarters. However, persistence in institutional herding seems to be driven by long-term institutions. Compared to the coefficients of short-term institutional herding in column (2), those of long-term institutional herding in the previous four quarters are positive and significant, as shown in column (5). More importantly, a strong positive relation between long-term institutional herding and short-term institutional herding over the previous quarters in columns (6) and (7) is consistent with the notion that short-term institutions receive information earlier than long-term institutions. In contrast, while one-quarter-lagged long-term institutional herding is positively associated with short-term institutional herding in column (3), after controlling for contemporaneous long-term institutional herding, we find no positive relation between short-term institutional herding and lagged long-term institutional herding in column (4). Although not reported in detail for brevity, our results further show that both short- and long-term institutional herding are significantly relate to stock characteristics such as size, the book-to-market ratio, and the prior stock returns (Wermers, 1999; Sias, 2004).

3.3 Portfolio analysis: Institutional herding and abnormal stock returns

Previous literature shows that institutional trading often has an impact on stock prices (e.g., Wermers, 1999; Sias, 2004; Sias, Starks, and Titman, 2006; Coval and Stafford, 2007). If institutional investors trade in the same direction due to new information, we expect such trading behavior to move stock prices closer to their true values (i.e., a permanent price impact). This is what the literature shows for the effect of institutional herding on future stock prices. On the other hand, if institutional herding is at least partly driven by reasons unrelated to new information, such as incentives to conform or institutions' preferences for certain stock characteristics, we expect large-scale institutional trading to cause temporary price pressure, leading to a reversal in returns over subsequent quarters.

Since institutional herding strongly relates to stock characteristics such as firm size, the book-to-market ratio, and prior 12-month stock returns, as shown in the previous section, following the approach of Daniel, Grinblatt, Titman, and Wermers (1997), we construct 125 value-weighted quarterly rebalanced characteristics benchmark portfolios. We construct these portfolios from the CRSP universe by sorting stocks on size based on NYSE cutoffs, the book to market, and, finally, prior 12-month stock returns. The characteristic-adjusted abnormal return for each stock is the difference between a stock return and its benchmark portfolio return over a particular quarter.

Within each quarter, we rank stocks traded by at least five institutions into quintile portfolios based on adjusted herding measures for all institutions as a group and separately for short- and long-term institutions. The top (bottom) quintile identifies extreme buy (sell) herding, the portfolio of stocks that institutions heavily buy (sell) in herds. Using the characteristic-matched benchmark of Daniel, Grinblatt, Titman, and Wermers (1997), we compute the characteristics-adjusted abnormal returns for each of these five portfolios for the quarter in which the herding occurs, and in the following four quarters. We report cumulative abnormal returns over the following two quarters and the following four quarters. To avoid overlapping returns and the accompanying positive serial correlation in returns, we employ a calendar-time methodology following Jegadeesh and Titman (1993). Table 4 presents the relation between the time-series average of characteristic-adjusted portfolio returns and herding by all institutions as a group (Panel A) and for short-term (long-term) institutions in Panel B (Panel C).[5]

[5] For brevity, we only report the portfolio results of the extreme buy and sell portfolios (Quintile 5 and 1) and the difference in abnormal returns between these extreme portfolios. Although not reported, the difference in abnormal

[TABLE 4 ABOUT HERE]

Both panels in Table 4 show that, not surprisingly, the contemporaneous abnormal stock returns positively relate to the direction of herding. Regarding the effect of institutional herding on future stock prices, Panel A reveals that, over quarter $t + 1$, the difference in abnormal return between the extreme buy herding portfolio and the extreme sell herding portfolio for all institutions as a group is 0.30% (t-statistic = 1.14). The lack of return reversals in these portfolios suggests that the herding behavior by all institutions as a group seems to have a stabilizing effect on stock prices over the subsequent quarter. However, beginning from quarter $t + 2$, we find a significant return reversal. Both cumulative and calendar-time abnormal returns confirm stabilizing effect return continuation following the herding quarter t and the subsequent return reversal of stocks heavily bought or sold by institutions in herds from quarters $t + 2$ to $t + 4$. These results challenge the conclusion of earlier studies that document a price-stabilizing effect of institutional herding persists over the one- to three-quarter horizon following herding quarter t (Wermers, 1999; Sias, 2004).

We turn to the effect of short- and long-term institutional herding on future stock prices. Panel B of Table 4 shows that the portfolio of stocks heavily bought by short-term institutional herds outperforms the portfolio of stocks heavily sold by short-term institutional herds by an average of 1.60% (t-statistic = 7.15) over the subsequent quarter. Further, unlike in the previous analysis, this effect persists over three quarters. In sharp contrast, Panel C shows the contemporaneous price impact of long-term institutional herding is temporary. Over the subsequent quarter, the difference in abnormal returns between portfolios heavily bought by

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returns between the extreme buy and extreme sell herding portfolios is positive and significant over the quarters preceding portfolio formation, consistent with prior studies on positive feedback trading (Grinblatt, Titman, and Wermers, 1995; Nofsinger and Sias, 1999; Sias, 2007; Puckett and Yan, 2010).

long-term institutional herds and heavily sold by long-term institutional herds is -1.06% (*t*-statistic = -3.57). More importantly, the return reversal following long-term institutional herding is significant through the end of the fourth quarter. Finally, although not reported in the table, the return patterns following medium-term institutional herding is similar to those following herding by all institutions as a group in Panel A.

Table 4 summarizes the evidence thus far showing it is consistent with the notion that short-term institutional investors are better informed. Specifically, the lack of return reversal following short-term institutional herding suggests that herding by these institutions aids market efficiency by pushing prices toward their intrinsic values. On the other hand, the strong reversal following long-term institutional herding is evidence that long-term institutions herd for reasons unrelated to information, pushing prices away from their fundamentals. This result alters the current view of herding as solely benefiting price discovery over short holding periods. In addition, our findings suggest that the stabilizing effect of institutional herding shown by previous literature appears to be driven by short-term institutions.

3.4 Cross-sectional results

We test our findings in a multivariate model and estimate the cross-sectional regressions of future stock returns on institutional herding measures constructed for all institutions and short- and long-term institutions, past returns, and a number of stock characteristics. For each stock, we implement the following regression model:

$$Ret_{i,t+1:t+k} = \alpha + \beta_1 ADJHERD_{i,t} + \beta_2 ADJHERD_{i,t}^{ST\ (LT)} + \beta_3 Con\ trol_{i,t} + \varepsilon_{i,t} \qquad (8)$$

where the dependent variable, $Ret_{t:t+k}$, is the raw return for stock i, cumulated over quarters $t+1$ to $t+k$, with k varying from one to four. The explanatory variables $ADJHERD$,

$ADJHERD^{ST}$, and $ADJHERD^{LT}$ are herding measures for all institutions as a group and separately for short- and long-term institutions.

Chen, Hong, and Stein (2002) show that reduction of the number of mutual funds that hold a long position in the stock (i.e., change in breadth) predicts lower returns. Following their study, we define $BREADTH_t^{ST}$ ($BREADTH_t^{LT}$) as the ratio of the number of short-term (long-term) institutional investors to the total number of institutional investors in the sample for that quarter. The change in breadth of short-term (long-term) institutional investors, denoted $\Delta BREADTH_t^{ST}$ ($\Delta BREADTH_t^{LT}$), is the difference between breadths at quarter *t* and quarter *t* - 1. Yan and Zhang (2009) report that short-term institutional demand predicts future stock returns. In contrast, long-term institutional demand is not related to future stock returns. Following their study, we introduce institutional demand variables in our cross-sectional regression test. In particular, ΔSIO (ΔLIO) is the change in short-term (long-term) institutional ownership during quarter *t* and SIO_{t-1} (LIO_{t-1}) is short-term (long-term) institutional ownership at the end of quarter *t* – 1. Although not reported in detail, as control variables we include market capitalization ($Size$), book-to-market value (B/M), the prior month returns (Ret_t and $Ret_{t-3,t-1}$), firm age (AGE), dividend yield (D/P), stock price (PRC), average monthly turnover ($TURNOVER$), stock return volatility (RET VOL), and dummy variable for S&P 500 index membership ($\text{DUM}^{S\&P500}$). In Table 5, we estimate the above regressions using the Fama-MacBeth (1973) procedure, with *t*-statistics adjusted for heteroskedasticity and autocorrelation following Newey and West (1987).

[TABLE 5 ABOUT HERE]

In column (1) of Table 5, the coefficient of $ADJHERD$ is positively related to the one-quarter-ahead stock returns. However, this relation becomes negative for the four-quarter-ahead stock return. Similar to our earlier analysis, these results suggest that the subsequent return continuation is brief and followed by return reversals thorough quarter $t + 2$ to quarter $t + 4$. In column (2), the results, once again, highlight the stark differences between the effects of short- and long-term institutional herding on future stock prices. While short-term institutional herding is positively related to both one- and four-quarter-ahead stock returns, long-term institutional herding is negatively associated with future stock prices over the same periods.

Column (3) of Table 5 examines the relation between the future stock returns and the breadth of short- and long-term institutions. Consistent with Chen, Hong, and Stein (2002), the change in breadth of short-term institutional investors predicts future stock returns. However, we do not find any association between the change in breadth of long-term institutions and future stock returns. Furthermore, column (4) confirms the findings of Yan and Zhang (2009). That is, short-term institutional demand (ΔSIO) forecasts both one- and four-quarter-ahead stock returns. On the other hand, long-term institutional demand does not have any predictive power for future stock returns. Even after controlling for the change in short- and long-term institutional breadth and demand variables, column (5) show that the positive (negative) return predictability of short-term (long-term) institutional herding remains significant for both one- and four-quarter-ahead stock return, respectively. Further, the herding measure for short-term institutions subsumes the predictive power of the short-term demand variable for one- and four-quarter-ahead stock returns. Consistent with Bennett, Sias, and Starks (2003), Starks, and Titman (2006) and Brown, Wei, and Wermers (2014), this finding suggests that the information revealed by institutional herding provides a stronger proxy for the level of informed (as well as uninformed) institutional trading than institutional demand variables.

Previous literature shows that short-term institutions are overly concerned with information about near-term performance and trade frequently to exploit short-term trading profits (Porter, 1992; Bushee, 1998, 2001), while long-term institutions monitor firms and exert influence on management to improve performance over longer horizons (Smith, 1996; Gaspar, Massa, and Matos, 2005; Chen, Hartford, and Li, 2007). Institutional investors' choice between near-term profits and long-run value also suggests that due to short-term institutional investors' focus on measures of short-term performance, the impact of their herding could be more relevant for shorter holding period returns. Alternatively, the strong positive association between short-term institutional herding and short-horizon stock performance could represent positive feedback by institutional trading that could be followed by return reversal over longer horizons. On the other hand, long-term institutions could herd due to new information that affects firm value over longer horizons. As a result, the short-run (stabilizing) destabilizing effect of short-term (long-term) institutional herding could revert over longer horizons. To address these questions, Table 6 shows the results when we re-estimate our main regression, replacing the dependent variable by four- or eight-quarter holding period returns starting one year after the current quarter.

[TABLE 6 ABOUT HERE]

In column (1) of Table 6, the coefficient estimates reveal that the institutional herding measure for all institutions as a group predicts return reversal over four quarters and eight quarters following one year from the herding quarter. However, the price impact of short-term institutional herding is not informative at longer horizons, in columns (2) and (3). This finding indicates that short-term institutions are better at collecting and processing short-term information. More importantly, we find no evidence short-term institutional herding has a price-destabilizing effect over longer horizons. In contrast, the coefficients of $ADJHERD^{LT}$ remain negative and significant in all specifications. This result suggests that long-term institutions' herding is not driven by their superior informational advantage over long horizons and the price-destabilizing effect of long-term institutional herding holds for longer horizons.

Finally, our findings provide new perspectives, not only for academic researchers but also for finance practitioners. For example, over the period between March 31, 2010 and June 30, 2010, short-term institutions exhibited buy-side herding behavior for Whole Foods Market Inc. (ticker symbol WFM). At the end of the second quarter of 2010, while 61 short-term institutions increased their holdings on Whole Foods Market, only 44 short-term institutions reduced their positions on this stock ($ADJHERD^{ST}$ = 0.52). In contrast, while 43 long-term institutions were on the buy side for Whole Foods Market, 55 long-term institutions decreased their positions over the same period ($ADJHERD^{LT}$ = -0.23). For the quarter ended September 2010, Whole Foods Market reported earnings of $0.33 a share up from $0.20 a share a year earlier. Whole Foods Market reinstated quarterly cash dividends of $0.10 on December 8, 2010. Figure 1 shows the stock prices of Whole Foods Market over two years, six months before and after the event period of June 30, 2010 -June 30, 2011. As Figure 1 indicates, the stock price of Whole Foods Market increased by 40.44% between June 30, 2010 and June 30, 2011. [6]

[FIGURE 1 ABOUT HERE]

4. Robustness checks and implications

4.1 Information content of short- and long-term institutional herding: Small, growth, and high-tech firms

Previous literature posits that if short-term institutional herding is based on information, we should expect the positive relation between short-term institutional herding and future stock

[6] For more information about Whole Foods Markets events, see http://www.wholefoodsmarket.com/company-info/investor-relations/financial-press-releases#2010

returns to be stronger for firms that face more uncertainty and are more difficult to value, such as small stocks and growth stocks (Wermers, 1999; Sias, 2004; Yan and Zhang, 2009). Conversely, if long-term institutional herding is due to reasons unrelated to new information, then the destabilizing effect of long-term institutional herding on stock prices should be more pronounced for these stocks. Following these studies, each quarter we sort all sample stocks into deciles on the basis of the market value of equity (*Size*) and the book-to-market ratio (*B/M*). Each quarter we construct $\text{Dummy}^{\text{Small}}$ ($\text{Dummy}^{\text{Growth}}$), which is the dummy variable for stocks whose market capitalization (book-to-market ratio) is in the bottom decile. In addition, institutional herding could be more informative for firms operating in industries where technological innovation, R&D, and patents play primary role in firms' future performance.[7] Thus, we construct a dummy variable for firms in four high-tech industries ($\text{Dummy}^{\text{Tech}}$). In subsequent tests as shown in Table 7, we interact short- and long-term institutional herding variables with $\text{Dummy}^{\text{Small}}$, $\text{Dummy}^{\text{Growth}}$, and $\text{Dummy}^{\text{Tech}}$.

[TABLE 7 ABOUT HERE]

Table 7 presents evidence that the informational advantage of short-term institutional herding is stronger for smaller firms and firms with more growth opportunities in columns (1) and (2). However, Table 7, Column 3 shows no evidence that short-term institutional investors have any additional informational advantage for high-tech firms. When we turn to the impact of long-term institutional herding on small stocks, growth firms, and high-tech companies in columns (1) through (3), respectively, the coefficients of the interaction terms between long-term institutional herding and small, growth, and high-tech firm dummies are both negative and significant for four-quarter-ahead stock returns. In summary, consistent with our predictions, the

[7] Aerospace and defense (Standard Industrial Classification, or SIC, codes 372 and 376), computers and office machinery (SIC code 357), pharmaceuticals (SIC code 283), and electronics and communications (SIC code 36).

results in Table 7 show that while the price impact of short-term institutional herding is stronger for small and growth stocks, the destabilizing effect of long-term institutional herding is more pronounced for firms whose valuations are highly uncertain and subjective.

4.2 Short- and long-term institutional herding: Multiple institutional characteristics

So far, our findings rely on a single characteristic of institutional investors; that is, the investment horizon. In the following subsections, we extend our analysis and further investigate whether the size and capitalization/valuation style of an institutional investor matter for our findings.

4.2.1 Institution size

Relative to small institutional investors, large institutions could benefit from more resources for security research, lower trading costs, and brokerage commissions. This leads to the prediction that the price-stabilizing effect of herding by institutions could be more pronounced among larger institutional investors. Alternatively, due to their large equity positions, larger-scale trading by large institutional investors could temporarily cause stock prices to deviate from fundamentals, leading to a price reversal over subsequent quarters. This, in turn, suggests that the destabilizing effect of institutional herding manifests itself in large institutions. To test these hypotheses, we classify all institutions as a group and short- and long-term institutional investors institutions separately as large (small) institutions if the dollar value of their equity positions is larger (lower) than the cross-sectional median. We reconstruct our herding measures similarly to the way described in Section 2.2.1.

[TABLE 8 ABOUT HERE]

Column (1) of Table 8 shows that for one-quarter-ahead stock returns, the positive return predictability of herding by institutions, as a group presented in Table 5, is driven by small institutional investors. This positive association between small institutional herding and future stock returns does not revert over four-quarter-stock returns. More specifically, the coefficient of $ADJHERD_t^{SMALL}$ for four-quarter-ahead stock returns remains positive and significant. In contrast, we find no evidence that large institutional herding positively predicts one-quarter-ahead stock returns in column (1). However, for four-quarter-ahead returns, the negative coefficient of $ADJHERD_t^{LARGE}$ suggests a price-destabilizing effect of herding by large institutions. In columns (2) and (3), the coefficients of both large and small short-term institutional herding are strongly positive and similar in magnitude for one-quarter-ahead returns. More importantly, Table 8 reports that the price-destabilizing effect of long-term institutional herding is mainly driven by large long-term institutional herding, as shown in columns (2) and (3).

4.2.2 Institutional capitalization/valuation styles

Our earlier results show that institutional investors differ in their past preferences for value versus growth and large versus small market capitalization. Differences in institutions' preferences for a specific capitalization/valuation style suggest that the return predictability associated with short- and long-term institutional herding could also vary across herding by institutional investors with different capitalization/valuation styles. For example, due to institutions' preferences for stocks that face more uncertainty, herding by institutional investors with a small-growth style is more likely to be informative than herding by those with a large-value style. In this subsection, we investigate the price impact of herding with different style preferences. Following Abarbanell, Bushee, and Raedy's (2003) capitalization/valuation categorizations of institutional investors, we classify all institutions as a group and separately for short- and long-term institutions into their respective capitalization/valuation categories. We reconstruct our herding measures similarly to the way described in Section 2.2.1.

[TABLE 9 ABOUT HERE]

Table 9 reveals that the price impact of institutional herding varies across herding by institutions with different capitalization/valuation style preferences. For example, column 1 shows herding by all institutions with a small-value, small-growth style positively associates with one- and four-quarter-ahead stock returns. In contrast, the coefficient of $ADJHERD_t^{LVA}$ is significant and negative for both one- and four-quarter-ahead stock returns in column (1). However, we find no significant relation between herding by all institutions with large-growth styles. Once again, columns (2) and (3) in Table 9 highlight that, for each capitalization/variation category, herding by short-term institutions has a price-stabilizing effect for future stock prices. However, the positive predictability of short-term institutional herding for future stock prices is particularly pronounced for herding by short-term institutions with small-value and small-growth styles. On the other hand, the return reversal following long-term institutional herding reported in our earlier results seems to be explained by the herding behavior of long-term institutions with large-value, large-growth styles and with small-value styles. In columns (2) and (3), the significant and negative coefficients of $ADJHERD_t^{LT-LGR}$, $ADJHERD_t^{LT-LVA}$, and $ADJHERD_t^{LT-SVA}$ indicate return reversal following herding by long-term institutions with large-value, large-growth, and small-value style categories for one- and four-quarter-ahead stock returns. Overall, while our main conclusion remains intact, these results highlight that in addition to investment horizons, size and the capitalization/valuation styles of institutional investors play an important role in the price impact of institutional herding.

4.3 Quintile classifications of institutional investors, alternative proxies for institutions' investment horizons, and sub-period analysis.

To investigate the robustness of our results to different institutional classifications of investment horizons, within each quarter we group all institutions into quintiles based on average churn rates. Similar to the tercile analysis, institutions ranked in the top quintile with the highest average churn rates are classified as short-term, while institutions ranked in the bottom quintile with the lowest average churn rates are classified as long-term institutions. We construct herding measures similarly to the way described in Section 2.2.2. In addition, the measure of institutional investors' investment horizons in our earlier analysis is based on that of Yan and Zhang (2009). For robustness, we also employ Gaspar, Massa, and Matos's (2005) portfolio turnover ratio and Bushee's (1998, 2001) transient (short-term)/non-transient (long-term) institutional investor classification. Although not reported, the results are qualitatively similar to those presented in Tables 4 and 5. Our sample period includes financial crises such as the market crash of 1987, the 2000–2002 dot-com bubble, and the financial turmoil of 2007–2009. We also investigate whether the price impact of short- and long-term institutional herding differs during the financial crises periods. Our findings suggest that the differential price impact of short- and long-term institutional herding reported earlier is not explained by financial crises periods. For brevity, the results are not tabulated and are available from author upon request.

4.4 Implications of short- and long-term institutional herding over longer horizons

A further question of interest is the implications of short- and long-term institutional herding on stock prices over longer horizons. Specifically, Dasgupta, Prat, and Verardo (2011a, 2011b) find that stocks persistently sold by institutional investors outperform those persistently bought by institutions over a long horizon. This result opens up a new debate on the price impact of institutional herding. We follow an approach similar to that of Dasgupta, Prat, and Verardo (2011a) and estimate the following regression during each quarter:

$$Ret_{i,t:t+k} = \alpha + \beta_1 Persist_{i,t}^{All} + \beta_2 Persist_{i,t}^{ST} + \beta_3 Persist_{i,t}^{LT} + Control_{i,t} + \varepsilon_{i,t} \qquad (9)$$

where the dependent variable $Ret_{i,t+1:t+k}$ is the raw return for stock *i* in the subsequent quarter (k = 1) or cumulated over eight quarters (k = 8). Dasgupta, Prat, and Verardo (2011a) examine the relation between persistent institutional herding and long-horizon stock returns (cumulated over eight quarters). The explanatory variable $Persist_{i,t}^{All}$ is overall institutional herding persistence based on the adjusted herding measure for all institutions as a group, measured by the number of consecutive quarters in which institutions buy or sell for a given stock. A value of -5 (5) indicates that $ADJHERD$ is negative (positive) for five or more consecutive quarters for a given stock. Similarly, $Persist_{i,t}^{ST}$ ($Persist_{i,t}^{LT}$) is persistent short-term (long-term) institutional herding based on $ADJHERD^{ST}$ ($ADJHERD^{LT}$).

[TABLE 10 ABOUT HERE]

Table 10 verifies the long-horizon price-destabilizing effect of persistent institutional herding reported by Dasgupta, Prat, and Verardo (2011a). As shown in columns (1) and (2), persistent institutional herding ($Persist_{i,t}^{All}$) is negatively associated with eight-quarter-ahead stock returns. On the other hand, there is no relation between institutional herding persistence and one-quarter-ahead stock returns. Consistent with our earlier results, columns (3) and (4) of Table 10 show that persistence in short-term institutional herding is positively related to one-quarter-ahead future stock returns, while long-term institutional herding persistence is negatively associated with one-quarter-ahead stock returns. When we turn to the source of the negative predictability of overall institutional herding persistence for eight-quarter-ahead stock returns, specifications (3) and (4) suggest that the negative association reported by Dasgupta, Prat, and

Verardo (2011a) is entirely due to persistent herding by long-term institutions. On the other hand, we find no evidence on the relation between persistent short-term institutional herding and future stock prices.

5. Conclusion

Motivated by the heterogeneity in the level of informed trading among institutions with different investment horizons, we analyze the price impact of short- and long-term institutional herding. Our findings present several interesting results. First, the price-stabilizing effect of institutional herding reported in the literature is driven mainly by short-term institutional herding. Second and more importantly, the strong return reversal following herding by long-term institutional investors provides new evidence that their herding has a destabilizing effect on stock prices over a short horizon. This finding alters the perception of institutional herding as solely benefiting price discovery over short horizons. Third, our results are not explained by the preferences of these institutions for particular stock characteristics, including size, the book to market, and past returns. In addition, institutional herding represents a stronger signal about stock valuation than institutional demand.

Our results reveal that the differential price impact of short- and long-term institutional herding holds for different holding periods. Our findings suggest that long-term institutional investors do not have a long-term informational advantage. Our results are robust to the use of alternative methodologies for the investment horizons of institutional investors and are not driven by financial crises periods. We find that the informational advantage (return reversal) of short-term (long-term) institutional herding is stronger for smaller firms and firms with more growth opportunities. An important implication of our findings is the price impact of institutional herding over longer horizons. The destabilizing effect of institutional herding persistence over horizons of up to two years reported by Dasgupta, Prat, and Verardo (2011a) is entirely driven by the persistent herding of long-term institutions. Overall, our findings complement the literature and further help resolve the current debate over the price impact of institutional herding across different holding periods.

Appendix: Variable Definitions

$Size$:	The logarithm of market capitalization at the beginning of quarter *t*
B/M:	The logarithm of the book-to-market value of equity as of the previous December.
Ret_t:	The raw return of the stock during quarter *t*
Ret_{t-1}:	The raw return of the stock during quarter *t* - 1
$Ret_{t-3,t-1}$:	The raw return over the quarters [*t* - 3, *t* - 1]
$Ret_{t-4:t-2}$:	The raw return of the quarters [*t* - 4, *t* - 2]
$Ret_{t-15:t}$:	The past four years of returns measured up to quarter *t*
$Ret_{t-15:-4}$:	Three years of returns skipping a year before quarter *t*
IO:	Institutional ownership
$RET\ VOL$:	The logarithm of the standard deviation of monthly returns over the previous two years
$TURNOVER$:	Volume divided by shares outstanding for the month prior to the beginning of the quarter
PRC:	The per-share stock price at the beginning of the quarter *t*.
$S\&P500^{add\_drop}$:	S&P 500 addition or drop: A dummy variable which takes a value one if the stock was added to the index, -1 if it was dropped from the index, and zero otherwise.
AGE :	The logarithm of the number of months since stock *i*'s returns first appear in the CRSP file
D/P:	The dividend yield for stock *i* for the year that ended before the most recent June 30, divided by the stock price as of December 31
PRC:	The price per share at the end of quarter *t* - 1
$\text{DUM}^{S\&P500}$:	The dummy variable for S&P500 index membership

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Table 1

Portfolio and legal/style characteristics of All institutional investors and short-yerm and long-term institutional investors

This table reports descriptive statistics for all institutional investors and short-term and long-term institutional investors. An institutional investor is classified as a *short-term* (*long-term*) investor if its past four quarters of turnover ranks in the top (bottom) tercile. Panel A reports the time-series mean and median of the quarterly cross-sectional averages for all institutions' and for short-term and long-term institutions' portfolio characteristics. The variable *Number of Security* denotes the number of stocks held by an institution and *MV of Portfolio* is the market value of an institution's portfolio. Stocks listed in the CRSP are grouped into respective quintiles according to their market value of equity at the end of June, with break points based on NYSE stocks only, the book-to-market value, and the prior 12-month return. Using quintile information, we compute *Size Rank*, *B/M Rank*, and *Mom Rank* as value-weighted size, book-to-market, and prior 12-month quintiles, respectively; *Average Churn* denotes an institution portfolio's turnover; and *N* denotes the number of institutions. Panels B and C present the time-series mean of the percentage of institutions that belong to a particular legal/style classification. The term *BNK* stands for bank trusts, *INS* for insurance companies, and *INV* for investment companies; *IIA* denotes an independent investment advisor and *OTHER* includes corporate (private) pension funds, public pension funds, university and foundation endowments, and miscellaneous. Institutional investor style classifications are obtained from Abarbanell, Bushee, and Raedy (2003), who partition institutions into four capitalization/valuation dimensions, where LVA, LGR, SVA, and SGR denote large-capitalization value, large-capitalization growth, small-capitalization value, and small-capitalization growth institutions, respectively. The sample period is from 1981:Q1 to 2012:Q4.

Panel A: Time-series statistics of the cross-sectional averages of institutions' portfolio characteristics

	All institutions		Short-term institutions		Long-term institutions	
	Mean	Median	Mean	Median	Mean	Median
Number of securities	256	255	226	230	262	273
MV of portfolio ($million)	2,985	3,073	1,706	1,563	3,335	3,203
Size rank	3.66	3.69	3.33	3.32	3.97	4.05
B/M rank	2.75	2.69	2.77	2.69	2.71	2.65
Mom rank	3.23	3.32	3.32	3.44	3.17	3.25
Average churn	0.09	0.09	0.17	0.16	0.02	0.02
N	1,358	1,170	453	390	452	390

Panel B: Legal type composition percentage of institutional investors: Time-series mean of the cross-sectional averages

	BNK	INS	INV	IIA	Other
All institutions (%)	18.08	6.02	4.35	61.36	9.27
Short-term institutions (%)	6.86	5.28	5.85	76.91	7.20
Long-term institutions (%)	29.96	6.97	3.28	45.28	13.74

Panel C: Capitalization/valuation style composition percentage of institutional investors: Time-series mean of the cross-sectional averages

	LVA	LGR	SVA	SGR
All institutions (%)	27.40	24.22	21.28	26.25
Short-term institutions (%)	11.56	14.89	27.78	44.98
Long-term institutions (%)	41.35	32.66	13.26	11.36

Table 2

Stock characteristics and institutional herding measures

This table reports descriptive statistics of stock characteristics and institutional herding measures. Panel A presents the time-series mean, median, minimum, maximum, and standard deviation of the quarterly cross-sectional averages for stock characteristics. An institutional investor is classified as a *short-term* (*long-term*) investor if its past four quarters of turnover rates rank in the top (bottom) tercile. The term HM (HM^{ST} and HM^{LT}) is an unsigned herding measure for all institutions (short- and long-term institutions); $ADJHERD$ ($ADJHERD^{ST}$ and $ADJHERD^{LT}$) combines buy herding and sell herding measures for all institutions (short- and long-term institutions); IO (SIO and LIO) is total institutional ownership (short- and long-term institutional ownership) at the end of quarter *t*; ΔSIO (ΔLIO) denotes change in short-term (long-term) institutional ownership; *MKTCAP* is market capitalization at the end of quarter *t*; *B/M* is the book-to-market value; Ret_t denotes the return over quarter *t*; $Ret_{t-3:t-1}$ denotes the three-quarter-lagged return preceding the beginning of quarter *t*; and *N* denotes the number of stocks. The sample period is from 1981:Q1 to 2012:Q4.

Panel A: Time-series statistics of cross-sectional averages for institutional herding measures, institutional ownership, change in institutional ownership, and stock characteristics

	Mean	Median	Min	Max	Std. dev.
All institutions					
HM (%)	1.07	0.88	-1.70	4.09	1.21
$ADJHERD$	-0.06	-0.03	-0.14	0.25	0.08
IO (%)	39.09	37.05	24.69	54.88	9.42
ΔIO (%)	1.61	1.57	-1.31	6.08	1.08
Short-term institutions					
HM^{ST} (%)	0.78	0.55	-3.66	1.66	1.27
$ADJHERD^{ST}$	-0.52	-0.09	-0.19	0.17	0.09
SIO (%)	11.21	10.83	7.08	19.20	2.16
ΔSIO (%)	0.35	0.28	-1.71	6.63	1.06
Long-term institutions					
HM^{LT} (%)	0.43	0.20	-8.58	5.62	2.87
$ADJHERD^{LT}$	0.46	0.03	-0.13	0.31	0.08
LIO (%)	11.88	11.59	5.35	20.05	3.68
ΔLIO (%)	0.31	0.24	-4.07	3.91	1.10
Stock characteristics					
MKTCAP ($millions)	2,011	1,474	568	4,675	1,258
B/M	0.77	0.75	0.51	1.40	0.20
Ret_t (%)	4.00	3.74	-30.75	39.44	12.30
$Ret_{t-3:t-1}$ (%)	9.07	8.73	-36.39	78.66	18.63
PRC ($)	21.83	21.80	12.33	31.42	3.30
N	3,724	3,805	1,590	5,549	933

Panel B: Time-series mean of cross-sectional correlations between herding and institutional demand measures

	$ADJHERD$	$ADJHERD^{ST}$	$ADJHERD^{LT}$	ΔIO	ΔSIO	ΔLIO
$ADJHERD$	1.00					
$ADJHERD^{ST}$	0.60	1.00				
$ADJHERD^{LT}$	0.61	0.14	1.00			
ΔIO	0.36	0.33	0.21	1.00		
ΔSIO	0.25	0.36	0.08	0.56	1.00	
ΔLIO	0.10	0.03	0.15	0.31	0.03	1.00

Table 3

Determinants of institutional herding

This table reports the results of cross-sectional regressions of all institutional herding and short-term and long-term institutional herding on lagged institutional herding and other stock characteristics. The term $ADJHERD_{t-i}$ is a lagged value of adjusted herding measure for all institutions as a group, with *i* varying from zero (contemporaneous) to four; $ADJHERD^{ST}_{t-i}$ ($ADJHERD^{LT}_{t-i}$) is a lagged value of adjusted short-term institutions (long-term institutions), with *i* varying from zero (contemporaneous) to four. All the regressions include unreported control variables. All controls are defined in the Appendix. This table presents time-series average regression coefficients and Fama–MacBeth *t*-statistics (in parentheses) adjusted following Newey–West (1987). The sample period is from 1981:Q1 to 2012:Q4.

	$ADJHERD_t$	$ADJHERD^{ST}_t$			$ADJHERD^{LT}_t$		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$ADJHERD_{t-1}$	0.159***						
	(48.78)						
$ADJHERD_{t-2}$	0.089***						
	(31.02)						
$ADJHERD_{t-3}$	0.059***						
	(22.13)						
$ADJHERD_{t-4}$	0.052***						
	(19.35)						
$ADJHERD^{ST}_t$							0.062***
							(13.86)
$ADJHERD^{ST}_{t-1}$		0.067***	0.066***	0.064***		0.022***	0.018***
		(7.93)	(7.81)	(7.55)		(8.20)	(6.67)
$ADJHERD^{ST}_{t-2}$		0.018***	0.018***	0.016***		0.021***	0.020***
		(5.76)	(5.60)	(5.21)		(8.24)	(8.11)
$ADJHERD^{ST}_{t-3}$		0.002	0.002	0.000		0.020***	0.020***
		(0.99)	(0.80)	(0.21)		(7.93)	(8.11)
$ADJHERD^{ST}_{t-4}$		-0.009***	-0.010***	-0.011***		0.017***	0.018***
		(-4.22)	(-4.79)	(-5.31)		(7.86)	(8.17)
$ADJHERD^{LT}_t$				0.069***			
				(14.35)			
$ADJHERD^{LT}_{t-1}$			0.008***	-0.004*	0.181***	0.177***	0.176***
			(3.13)	(-1.72)	(29.23)	(28.88)	(28.97)
$ADJHERD^{LT}_{t-2}$			0.001	-0.007**	0.117***	0.114***	0.114***
			(0.57)	(-2.60)	(30.93)	(29.70)	(29.53)
$ADJHERD^{LT}_{t-3}$			0.004	-0.002	0.082***	0.081***	0.080***
			(1.37)	(-0.81)	(18.55)	(17.58)	(17.65)
$ADJHERD^{LT}_{t-4}$			0.004	-0.000	0.070***	0.069***	0.069***
			(1.60)	(-0.18)	(16.02)	(15.92)	(15.79)
Unreported Controls	$SIZE$, B/M, Ret_{t-1}, $Ret_{t-4:t-2}$, PRC, $TURNOVER$, $RET\ VOL$, $S\&P500^{add\_drop}$						
$Avg. N$	2,854	2,854	2,854	2,854	2,854	2,854	2,854
$Adj.\ R^2$	0.175	0.096	0.098	0.102	0.192	0.195	0.199

*, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 4

Institutional herding and abnormal stock returns

This table reports quarterly, cumulative, and calendar-time abnormal returns (in percent) for all institutions herding sorted portfolios and short-term and long-term institutional herding sorted portfolios. An institutional investor is classified as a *short-term* (*long-term*) institution if its past four quarters of turnover ranks in the top (bottom, middle) tercile. The quarterly abnormal returns of stocks in each quintile are calculated by subtracting the return of the matching size, book-to-market equity, and prior one-year returns using 5 x 5 x 5 value-weighted quarterly rebalanced DGTW portfolios. Panel A (Panels B and C) reports the effects of all institutional herding (short- and long-term) on stock prices. Each quarter t, all stocks traded by at least five institutional investors (short- and long-term institutional investors) are sorted according to their adjusted herding measure(s) $ADJHERD$ ($ADJHERD^{ST}$ *and* $ADJHERD^{LT}$). This procedure results in five portfolios Q1 to Q5, where Q1 denotes *extreme sell herding* and includes the portfolio of stocks heavily sold by institutional investors in herds and Q5 denotes *extreme buy herding* and includes those stocks heavily bought by institutional investors in herds. The sample period is from 1981:Q1 to 2012:Q4.

Panel A: Price impact of all institutional herding with stocks traded by at least five institutional investors

	Abnormal returns					Cumulative abnormal returns		Calendar abnormal returns	
	Quarter (0)	Quarter (+1)	Quarter (+2)	Quarter (+3)	Quarter (+4)	Quarter (+1,+2)	Quarter (+1,+4)	Quarter (+1,+2)	Quarter (+1,+4)
Q5	7.78	0.39	-0.29	-0.63	-0.87	0.06	-1.12	0.05	-0.33
(extreme buy)	(14.95)	(2.13)	(-2.15)	(-3.97)	(-5.34)	(0.26)	(-2.59)	(0.84)	(-2.60)
Q1	-4.73	0.08	0.39	0.69	0.80	0.08	2.13	0.23	0.48
(extreme sell)	(-16.62)	(0.53)	(2.69)	(4.41)	(4.98)	(0.53)	(3.46)	(1.72)	(3.69)
Difference:	12.51	0.30	-0.68	-1.32	-1.67	-0.02	-3.25	-0.18	-0.82
Q5 - Q1	(16.86)	(1.14)	(-3.26)	(-5.17)	(-6.47)	(-0.72)	(-4.28)	(-0.87)	(-4.15)

Panel B: Price impact of short-term institutional herding with stocks traded by at least five short-term institutional investors

	Abnormal returns					Cumulative abnormal returns		Calendar abnormal returns	
	Quarter (0)	Quarter (+1)	Quarter (+2)	Quarter (+3)	Quarter (+4)	Quarter (+1,+2)	Quarter (+1,+4)	Quarter (+1,+2)	Quarter (+1,+4)
Q5	10.22	1.06	0.02	-0.21	-0.46	0.96	0.32	0.52	0.10
(extreme buy)	(17.17)	(6.14)	(0.12)	(-1.39)	(-2.79)	(4.20)	(0.83)	(4.24)	(1.11)
Q1	-6.08	-0.54	0.05	-0.03	0.44	-0.52	-0.19	-0.19	0.03
(extreme sell)	(-18.10)	(-3.67)	(0.37)	(-0.27)	(2.93)	(-2.70)	(-0.44)	(-1.93)	(0.38)
Difference:	16.31	1.60	-0.03	-0.18	-0.91	1.43	0.57	0.71	0.07
Q5 - Q1	(19.16)	(7.15)	(-0.18)	(-0.91)	(-3.69)	(7.30)	(1.75)	(5.14)	(0.79)

Panel C: Price impact of long-term institutional herding with stocks traded by at least five long-term institutional investors.

	Abnormal returns					Cumulative abnormal returns		Calendar abnormal returns	
	Quarter (0)	Quarter (+1)	Quarter (+2)	Quarter (+3)	Quarter (+4)	Quarter (+1,+2)	Quarter (+1,+4)	Quarter (+1,+2)	Quarter (+1,+4)
Q5	3.17	-0.46	-0.37	-0.53	-0.54	-1.00	-2.12	-0.42	-0.48
(extreme buy)	(9.69)	(-2.59)	(-2.49)	(-2.97)	(-2.97)	(-3.71)	(-4.73)	(-2.87)	(-3.41)
Q1	-1.32	0.61	0.47	0.69	0.53	0.99	2.09	0.54	0.57
(extreme sell)	(-6.10)	(3.84)	(2.93)	(4.31)	(3.08)	(2.59)	(4.37)	(3.66)	(3.95)
Difference:	4.48	-1.06	-0.84	-1.23	-1.07	-1.99	-4.21	-0.96	-1.06
Q5 - Q1	(8.80)	(-3.57)	(-3.17)	(-4.05)	(-3.77)	(-3.58)	(-5.25)	(-3.65)	(-4.07)

Table 5

Cross-sectional regressions of stock returns on herding measures

This table reports the results of cross-sectional regressions of one- or four-quarter-ahead returns on institutional herding and other stock characteristics. The term $Ret_{t:t+1}$ ($Ret_{t:t+4}$) is the one-quarter-ahead (four-quarter-ahead) stock return; $ADJHERD_t$ is the adjusted herding measure that considers all institutions as a group; $ADJHERD_t^{ST}$ ($ADJHERD_t^{LT}$) is the adjusted herding measure constructed for short-term (long-term) institutions; $\Delta BREADTH_t^{ST}$ ($\Delta BREADTH_t^{LT}$) is the change in breadth of short-term (long-term) institutional ownership for a stock; ΔSIO_t (ΔLIO_t) is change in short-term (long-term) institutional ownership; SIO_{t-1} (LIO_{t-1}) is one-quarter-lagged short-term (long-term) institutional holding. All the regressions include unreported control variables. All controls are defined in the Appendix. This table presents time-series average regression coefficients and Fama–MacBeth *t*-statistics (in parentheses) adjusted following Newey–West (1987). The sample period is from 1981:Q1 to 2012:Q4.

	$Ret_{t:t+1}$					$Ret_{t:t+4}$				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
$ADJHERD_t$	0.006**				0.008***	-0.010*				0.008
	(2.24)				(3.35)	(-1.72)				(1.44)
$ADJHERD_t^{ST}$		0.012***			0.009***		0.011***			0.007**
		(6.98)			(5.91)		(2.94)			(2.01)
$ADJHERD_t^{LT}$		-0.007***			-0.012***		-0.033***			-0.039***
		(-3.08)			(-5.61)		(-4.08)			(-4.76)
$\Delta BREADTH_t^{ST}$			0.667***		0.050			1.103**		0.934*
			(3.42)		(0.27)			(2.36)		(1.78)
$\Delta BREADTH_t^{LT}$			-0.215		0.301*			-0.336		1.312**
			(-1.06)		(1.76)			(-0.65)		(2.34)
ΔSIO_t				0.038**	0.003				0.092**	0.055
				(2.14)	(0.21)				(1.99)	(1.13)
ΔLIO_t				-0.019	-0.012				-0.030	-0.001
				(-1.24)	(-0.82)				(-0.68)	(-0.03)
SIO_{t-1}				0.047***	0.048***				0.107**	0.111**
				(3.54)	(3.60)				(2.17)	(2.23)
LIO_{t-1}				0.015*	0.015*				0.052*	0.043
				(1.74)	(1.80)				(1.79)	(1.54)
Unreported Controls	$SIZE$, B/M, Ret_t, $Ret_{t-3:t-1}$, AGE, D/P, PRC, $TURNOVER$, and $DUM^{S\&P500}$									
$Avg.N$	2,854	2,854	2,854	2,854	2,854	2,680	2,680	2,680	2,680	2,680
$Adj.\ R^2$	0.077	0.077	0.077	0.079	0.081	0.077	0.077	0.077	0.079	0.080

*, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 6

Short- and long-term institutional herding for different holding horizons

This table reports the results of cross-sectional regressions of four- or eight-quarter cumulative returns beginning one year from the report date on institutional herding and other stock characteristics. The terms $Ret_{t+4:t+8}$ ($Ret_{t+4:t+12}$) is the four-quarter-ahead (eight-quarter-ahead) stock return starting one year after the current quarter; $ADJHERD$ is the adjusted herding measure that considers all institutions as a group; and $ADJHERD^{ST}$($ADJHERD^{LT}$) is the adjusted herding measure constructed for short-term (long-term) institutions. All the regressions include unreported control variables. All controls are defined in the Appendix. This table presents time-series average regression coefficients and Fama–MacBeth *t*-statistics adjusted following Newey–West (1987). The sample period is from 1981:Q1 to 2012:Q4.

	$Ret_{t+4:t+8}$			$Ret_{t+4:t+12}$		
	(1)	(2)	(3)	(1)	(2)	(3)
$ADJHERD$	-0.016***		-0.012**	-0.032***		-0.017**
	(-3.33)		(-2.02)	(-3.63)		(-2.01)
$ADJHERD^{ST}$		0.000	0.005		-0.008	0.002
		(0.00)	(0.94)		(-1.55)	(0.34)
$ADJHERD^{LT}$		-0.019***	-0.012**		-0.029***	-0.023**
		(-3.51)	(-2.33)		(-3.36)	(-2.23)
$Unreported\ Controls$	$SIZE$, B/M, Ret_t, $Ret_{t-3:t-1}$, AGE, D/P, PRC, $TURNOVER$, and $DUM^{S\&P500}$					
$Avg.N$	2,737	2,737	2,737	2,536	2,536	2,536
$Adj.\ R^2$	0.055	0.055	0.057	0.049	0.049	0.049

*, **, and *** indicates statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 7

Cross-sectional regressions of stock returns on herding measures: small, growth, and high-tech stocks

This table reports the results of cross-sectional regressions of one-quarter-ahead or four-quarter-ahead returns on institutional herding and other stock characteristics. The term $Ret_{t:t+1}$ ($Ret_{t:t+4}$) is the one- (four-) quarter-ahead stock return; $ADJHERD$ is an adjusted herding measure that considers all institutions as a group; $ADJHERD^{ST}$($ADJHERD^{LT}$) is an adjusted herding measure constructed for short-term (long-term) institutions. For the definitions of all the other variables, see Table 5. The variable $Dummy^{Small}$ ($Dummy^{Growth}$) is the dummy variable for stocks whose market capitalization (B/M) is in the bottom decile; $Dummy^{Tech}$ is the dummy variable for firms in four high-tech industries: aerospace and defense (SIC codes 372 and 376), computers and office machinery (SIC code 357), pharmaceuticals (SIC code 283), and electronics and communications (SIC code 36). All the regressions include unreported control variables. All controls are defined in the Appendix. This table presents time-series average regression coefficients and Fama–MacBeth t-statistics (in parentheses) adjusted following Newey–West (1987). The sample period is from 1981:Q1 to 2012:Q4.

	$Ret_{t:t+1}$				$Ret_{t:t+4}$			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Dum^{Small}	0.005			0.004	0.040**			0.045**
	(1.41)			(1.06)	(2.43)			(2.20)
Dum^{Growth}		-0.003		-0.005*		-0.001		-0.004
		(-1.19)		(-1.71)		(-0.11)		(-0.42)
Dum^{Tech}			0.007	0.007			0.003	0.003
			(1.23)	(1.24)			(1.03)	(1.00)
$ADJHERD_t^{ST}$	0.013***	0.012***	0.012***	0.009***	0.014***	0.010**	0.016***	0.014***
	(7.43)	(6.75)	(6.99)	(4.79)	(3.97)	(2.61)	(4.25)	(3.79)
$ADJHERD_t^{ST} * Dum^{Small}$	0.007**			0.009**	0.040**			0.057**
	(2.08)			(2.24)	(2.52)			(2.66)
$ADJHERD_t^{ST} * Dum^{Growth}$		0.009**		0.006*		0.017***		0.012**
		(2.36)		(1.88)		(2.88)		(2.07)
$ADJHERD_t^{ST} * Dum^{Tech}$			-0.002	-0.001			0.005	0.006
			(-0.53)	(-0.13)			(0.44)	(0.47)
$ADJHERD_t^{LT}$	-0.006***	-0.007***	-0.006***	-0.009***	-0.026***	-0.031***	-0.031***	-0.025***
	(-2.73)	(-2.72)	(-2.77)	(-4.31)	(-3.98)	(-3.68)	(-3.88)	(-3.95)
$ADJHERD_t^{LT} * Dum^{Small}$	-0.007			-0.011	-0.061**			-0.085**
	(-1.00)			(-1.31)	(-2.37)			(-2.44)
$ADJHERD_t^{LT} * Dum^{Growth}$		-0.006		-0.003		-0.026***		-0.029*
		(-1.40)		(-0.46)		(-2.62)		(-1.72)
$ADJHERD_t^{LT} * Dum^{Tech}$			-0.006	-0.003			-0.034***	-0.028**
			(-1.46)	(-0.77)			(-3.08)	(-2.25)
$Unreported\ Controls$	$SIZE$, B/M, Ret_t, $Ret_{t-3:t-1}$, AGE, D/P, PRC, $TURNOVER$, and $DUM^{S\&P500}$							
$Avg. N$	2,854	2,854	2,854	2,854	2,680	2,680	2,680	2,680
$Adj.\ R^2$	0.079	0.079	0.080	0.084	0.080	0.078	0.082	0.086

*, **, *** indicates statistical significance at the 10%, 5%, and 1% level respectively.

Table 8

Cross-sectional regressions of Ssock returns on herding measures, multiple characteristics: institution size

This table reports the results of cross-sectional regressions of one- or four-quarter-ahead returns on institutional herding and other stock characteristics. The term $Ret_{t:t+1}$ ($Ret_{t:t+4}$) is the one-quarter-ahead (four-quarter-ahead) stock return; $ADJHERD_t^{LARGE}$ ($ADJHERD_t^{SMALL}$) is the adjusted herding measure constructed for all institutions as a group whose dollar value of equity position is larger (smaller) than the cross-sectional median. Similarly, $ADJHERD_t^{ST-LARGE}$ ($ADJHERD_t^{ST-SMALL}$) is the adjusted herding measure constructed for short-term institutions whose dollar value of equity position is larger (smaller) than the cross-sectional median. The term $ADJHERD_t^{LT-LARGE}$ ($ADJHERD_t^{LT-SMALL}$) is the adjusted herding measure constructed for long-term institutions whose dollar value of equity position is larger (smaller) than the cross-sectional median. All the regressions include unreported control variables. All controls are defined in the Appendix. This table presents time-series average regression coefficients and Fama–MacBeth *t*-statistics (in parentheses) adjusted following Newey–West (1987). The sample period is from 1981:Q1 to 2012:Q4.

	$Ret_{t:t+1}$			$Ret_{t:t+4}$		
	(1)	(2)	(3)	(1)	(2)	(3)
$ADJHERD_t^{LARGE}$	0.003		0.007***	-0.017**		0.005
	(1.21)		(3.10)	(-2.30)		(0.74)
$ADJHERD_t^{SMALL}$	0.010***		0.003**	0.013***		0.004
	(7.18)		(2.23)	(4.18)		(1.35)
$ADJHERD_t^{ST-LARGE}$		0.010***	0.007***		0.007*	0.005
		(6.69)	(4.41)		(1.89)	(1.21)
$ADJHERD_t^{ST-SMALL}$		0.009***	0.008***		0.013***	0.012***
		(7.19)	(4.60)		(4.30)	(2.65)
$ADJHERD_t^{LT-LARGE}$		-0.009***	-0.013***		-0.037***	-0.040***
		(-3.92)	(-6.04)		(-4.40)	(-4.67)
$ADJHERD_t^{LT-SMALL}$		0.003	-0.001		0.006	-0.001
		(1.34)	(-0.60)		(1.54)	(-0.19)
$Unreported\ Controls$	$SIZE$, B/M, Ret_t, $Ret_{t-3:t-1}$, AGE, D/P, PRC, $TURNOVER$, and $DUM^{S\&P500}$					
$Avg.N$	2,845	2,845	2,845	2,672	2,672	2,672
$Adj.\ R^2$	0.078	0.079	0.079	0.078	0.078	0.078

*, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 9

Cross-sectional regressions of stock returns on herding measures, multiple characteristics: institution capitalization/valuation style

This table reports the results of cross-sectional regressions of one- or four-quarter-ahead returns on institutional herding and other stock characteristics. The term $Ret_{t:t+1}$ ($Ret_{t:t+4}$) is the one-quarter-ahead (four-quarter-ahead) stock return; $ADJHERD_t^{LVA}$ ($ADJHERD_t^{LGR}$, $ADJHERD_t^{SVA}$, $ADJHERD_t^{SGR}$) is the adjusted herding measure constructed for all institutions as a group whose capitalization/valuation style classification is large-value (large-growth, small-value, small-growth) stocks, based on Abarbanell, Bushee, and Raedy (2003). Similarly, $ADJHERD_t^{ST-LVA}$ ($ADJHERD_t^{ST-LGR}$, $ADJHERD_t^{ST-SVA}$, $ADJHERD_t^{ST-SGR}$) is the adjusted herding measure constructed for short-term institutions whose capitalization/valuation style classification is large-value (large-growth, small-value, small-growth) stocks. The term $ADJHERD_t^{LT-LVA}$ ($ADJHERD_t^{LT-LGR}$, $ADJHERD_t^{LT-SVA}$, $ADJHERD_t^{LT-SGR}$) is the adjusted herding measure constructed for long-term institutions whose capitalization/valuation style classification is large-value (large-growth, small-value, small-growth) stocks. All the regressions include unreported control variables. All controls are defined in the Appendix. This table presents time-series average regression coefficients and Fama–MacBeth *t*-statistics (in parentheses) adjusted following Newey–West (1987). The sample period is from 1981:Q1 to 2012:Q4.

	$Ret_{t:t+1}$			$Ret_{t:t+4}$		
	(1)	(2)	(3)	(1)	(2)	(3)
$ADJHERD_t^{LVA}$	-0.007***		-0.004*	-0.023***		-0.009*
	(-3.29)		(-1.73)	(-4.80)		(-1.81)
$ADJHERD_t^{LGR}$	0.002		0.003	-0.009		0.003
	(1.34)		(1.07)	(-1.58)		(0.49)
$ADJHERD_t^{SVA}$	0.007***		0.005**	-0.001		-0.003
	(3.70)		(2.14)	(-0.14)		(-0.49)
$ADJHERD_t^{SGR}$	0.008***		0.004***	0.012***		0.002
	(7.07)		(2.19)	(4.31)		(0.42)
$ADJHERD_t^{ST-LVA}$		-0.001	0.000		0.007	-0.004
		(-0.44)	(0.25)		(-1.17)	(-1.26)
$ADJHERD_t^{ST-LGR}$		0.001	-0.001		0.000	-0.001
		(0.87)	(-1.06)		(0.09)	(-0.25)
$ADJHERD_t^{ST-SVA}$		0.008***	0.004***		0.006*	0.008**
		(6.97)	(2.97)		(1.96)	(2.04)
$ADJHERD_t^{ST-SGR}$		0.011***	0.008***		0.017***	0.016**
		(6.22)	(3.94)		(4.33)	(2.31)
$ADJHERD_t^{LT-LVA}$		-0.007***	-0.005**		-0.026***	-0.019***
		(-3.19)	(-2.00)		(-4.48)	(-3.18)
$ADJHERD_t^{LT-LGR}$		-0.003**	-0.007***		-0.017***	-0.017***
		(-2.30)	(-3.45)		(-3.22)	(-3.47)
$ADJHERD_t^{LT-SVA}$		-0.004**	-0.002		-0.009*	-0.008*
		(-2.06)	(-0.81)		(-1.69)	(-1.67)
$ADJHERD_t^{LT-SGR}$		-0.000	-0.002		0.014	0.013
		(-0.22)	(-1.14)		(1.59)	(1.39)
$Unreported\ Controls$	$SIZE$, B/M, Ret_t, $Ret_{t-3:t-1}$, AGE, D/P, PRC, $TURNOVER$, and $DUM^{S\&P500}$					
$Avg. N$	2,845	2,845	2,845	2,672	2,672	2,672
$Adj.\ R^2$	0.079	0.079	0.080	0.079	0.079	0.079

*, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 10

Cross-sectional regressions of stock returns and persistent institutional herding

This table reports the results of cross-sectional regressions of one- or eight-quarter-ahead returns on persistent institutional herding, stock characteristics, and control variables. The term $Ret_{t:t+1}$ is the one-quarter-ahead stock return; $Ret_{t:t+8}$ is the eight-quarter-ahead stock return; $Persist^{ALL}$ is persistent institutional herding based on $ADJHERD$ constructed for all institutions as a group; and $Persist^{ST}$ and $Persist^{LT}$ are persistent short- and long-term institutional herding based on $ADJHERD^{ST}$ and $ADJHERD^{LT}$, respectively. Persistent herding measures vary between -5 and 5. A value of -5 (5) indicates a negative (positive) $ADJHERD$ ($ADJHERD^{ST}, ADJHERD^{LT}$) for five or more consecutive quarters; $Ret_{t-15:t}$ is past returns during the four years up to quarter *t*; and $Ret_{t-15:t-4}$ is past returns during three years, skipping a year before quarter *t*. All controls are defined in the Appendix. This table presents time-series average regression coefficients and Fama–MacBeth *t*-statistics (in parentheses) adjusted following Newey–West (1987). The sample period is from 1981:Q1 to 2012:Q4.

	$Ret_{t:t+1}$				$Ret_{t:t+8}$			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
$Persist^{ALL}$	-0.001	-0.001			-0.010***	-0.011***		
	(-1.30)	(-1.17)			(-3.26)	(-3.17)		
$Persist^{ST}$			0.001**	0.001**			-0.003	-0.004
			(2.10)	(2.12)			(-1.47)	(-1.61)
$Persist^{LT}$			-0.002***	-0.002***			-0.009***	-0.010***
			(-3.43)	(-2.90)			(-3.92)	(-3.75)
$Size$	-0.003	-0.003	-0.003	-0.003	-0.015	-0.016	-0.017	-0.018
	(-1.37)	(-1.28)	(-1.57)	(-1.48)	(-1.44)	(-1.44)	(-1.55)	(-1.55)
B/M	0.005	0.004	0.004	0.004	0.054***	0.056***	0.053***	0.056***
	(1.48)	(1.26)	(1.35)	(1.19)	(2.74)	(2.84)	(2.73)	(2.84)
$TURNOVER$	-0.005*	-0.005	-0.005*	-0.004	-0.015	-0.017	-0.014	-0.015
	(-1.81)	(-1.66)	(-1.74)	(-1.63)	(-0.79)	(-0.85)	(-0.71)	(-0.78)
IO	0.016**	0.015**	0.015**	0.014**	0.043	0.039	0.043	0.040
	(2.49)	(2.33)	(2.38)	(2.23)	(1.23)	(1.12)	(1.23)	(1.13)
$Ret_{t-15:t}$	-0.002		-0.002		-0.011		-0.012	
	(-0.89)		(-0.84)		(-1.30)		(-1.32)	
$Ret_{t-15:t-4}$		-0.002		-0.001		-0.004		-0.003
		(-1.27)		(-0.86)		(-0.62)		(-0.52)
$Intercept$	0.053***	0.055***	0.056***	0.059***	0.399***	0.411***	0.408***	0.421***
	(3.03)	(3.06)	(3.22)	(3.23)	(4.62)	(4.60)	(4.70)	(4.67)
$Avg.\ N$	2,408	2,408	2,408	2,408	2,113	2,113	2,113	2,113
$Adj. R^2$	0.048	0.045	0.049	0.046	0.048	0.047	0.049	0.048

*, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

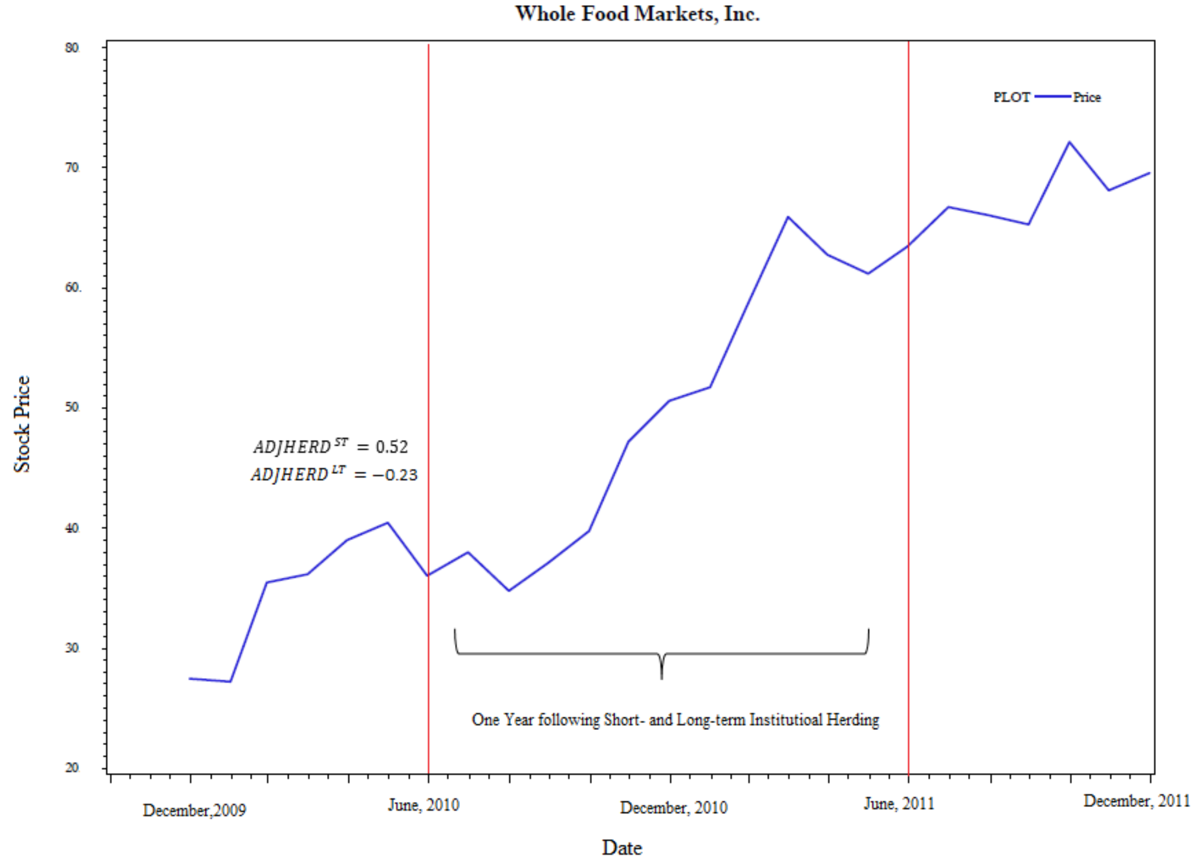

Figure 1.

The stock price of Whole Foods Markets between December 31, 2009 and December 31, 2011.