AUTHOR(S): HOU, T.C-T., MCKNIGHT, P.J. and WEIR, C.

TITLE: The impacts of stock characteristics and regulatory change on mutual fund herding in Taiwan.

YEAR: 2014

Publisher citation: HOU, T.C-T., MCKNIGHT, P.J. and WEIR, C. 2014. The impacts of stock characteristics and regulatory change on mutual fund herding in Taiwan. Applied financial economics [online], 24(3), pages 175-186. Available from: http://dx.doi.org/10.1080/09603107.2013.866201

OpenAIR citation: HOU, T.C-T., MCKNIGHT, P.J. and WEIR, C. 2014. The impacts of stock characteristics and regulatory change on mutual fund herding in Taiwan. Applied financial economics, 24(3), pages 175-186. Held on OpenAIR [online]. Available from: http://openair.rgu.ac.uk

The impacts of stock characteristics and regulatory change on mutual fund herding in Taiwan

Tony Chieh-Tse Hou
Department of Finance,
National Dong Hwa University,
Hualien, Taiwan.

Phillip J. McKnight
University of Wisconsin,
Lubar School of Business,
Milwaukee, WI 53211, United States

Charlie Weir
Aberdeen Business School,
Robert Gordon University,
Aberdeen AB10 7 QE
Scotland, U.K.

Corresponding author
Email: c.weir@rgu.ac.uk
Tel +441224263812
Fax +441224263434

The impacts of stock characteristics and regulatory change on mutual fund herding in Taiwan

Abstract

This paper analyzes the trading activity of Taiwanese open-end equity mutual fund herding behaviour over the period of 1996 to 2008. We find evidence of both directional and directionless herding. We also find that sell-side fund herding leads to price stabilization whereas buy side herding results in, prices adjusting slowly. We find that the abolition of Qualified Foreign Institutional Investor (QFII) has reduced directionless and sell side herding but has had no effect on buy side herding

The impacts of stock characteristics and regulatory change on mutual fund herding in Taiwan

1 Introduction

Herding behaviour may be divided into two categories: intentional herding and unintentional herding. Intentional herding behaviour occurs when investors follow their peers' actions. The theory of information cascade is based on the assumption of information asymmetry among investors. Therefore, if investors herd intentionally, they will follow other investors because they think that the other investors have private information, regardless of its accuracy (Hirshleifer and Teoh, 2003)

In contrast, unintentional herding behaviour occurs when investors follow fundamental stock characteristics such as size, book-to-market ratio, liquidity, and analyst coverage all affect herding behaviour (Hirshleifer and Teoh, 2003; Jiang, 2010). Information-based unintentional herding behaviour may come from momentum trading strategies as fund managers unintentionally follow the trading activities of other fund managers (Barberies and Shleifer, 2003). Further, the widow-dressing effect theory may explain herding behaviour (Lakonishok et al., 1991; Meier and Schaumburg, 2004; Sias, 2006; Elton et al., 2010), as fund managers generally sell loser stocks and use past winners to improve his or her performance prior to the performance report dates.

Scharfstein and Stein (1990) contend that herding behaviour will destabilize stock prices

because herding will create either positive excess demand (net buying) or negative excess demand (net selling) for one particular stock and cause irrational fluctuations in prices. However, the stock will eventually return to its intrinsic value. Therefore, the process actually causes greater price volatility. However, Walter and Weber (2006) argue that the momentum trading strategy will stabilize stock prices due to the market's inefficient reaction to new information. They therefore argue that herding could correct this phenomenon. Chang (2010) found that herding could potentially destabilize stock prices in Taiwan.

This paper analyses the importance of herding behaviour in Taiwanese mutual funds. Taiwan's capital markets are important for a number of reasons. Taiwan's mutual fund industry has grown almost tenfold over the past two decades. There are 526 funds of which 311 are open-end equity funds with a total market value of around US$22.34 billion as reported by Taiwan Securities Investment Trust and Consulting Association (SITCA) in March 2010**.** Ramos (2009) shows that in 2005, the Taiwanese mutual fund market was the 12th largest in the world in terms of industry size. It was the third largest in the Asian countries behind Japan and Korea. In addition, the open-end mutual fund market has experienced significant growth in recent years. For example, the number of funds increased by 267% over the period 1996-2008 and the number of stocks being traded rose by over 100%. The expansion of the mutual fund industry therefore makes it important to assess the way in which it operates.

This paper makes a number of contributions to the herding literature. First, the period

under analysis covers a change in the regulatory regime of Taiwanese financial markets. In the early 1990's the Taiwanese government adopted a more flexible attitude to foreign investors by permitting Qualified Foreign Institutional Investors (QFII) to invest directly in Taiwan's stock market. In 2003 the Taiwanese government decided to further expand the degree of foreign investment by relaxing limitations on foreign investors by abolishing the QFII system. Between 2002, (pre-QFII abolition) and 2006 total trading volume on the TAIFEX has increased nearly 140 percent suggesting that the abolition of the QFII regulation has achieved its goal of increasing the level of foreign participation in the Taiwan financial markets.

Second, much of the literature on institutional herding literature has focused primarily on the US, Lakonishok et al. (1992), Wermers (1999), and Griffin et al. (2003). Other markets that have shown herding characteristics include South Korea, Choe et al. (1999); Poland, Voronkova and Bohl (2005); Germany, Walter and Weber (2006); and the UK, Wylie (2005). The rapidly growing Taiwanese economy with its increasingly important mutual fund sector has received relatively little attention. Hung et al. (2010) find that mutual funds tend to follow their own trades rather than follow those of other funds. This paper uses the Lakonishok et al. (1992) and Wermers (1999) methodologies to analyse herding within a specific time period.

The main results of the paper are as follows. First, we find strong evidence of herding activity and momentum trading by mutual fund managers in Taiwan. Second, we find buy-side herding behaviour seems to destabilise stock prices. Third, consistent with the information

contained in a firm's fundamental characteristics, our results show a stronger tendency in directional herding behaviour with a higher level of buy-side (sell-side) herding in growth (value) stocks. We also find that fund characteristics influence the extent of herding. Thus buy side herding is also affected by the extent of abnormal stock returns, and fund characteristics such as the size of the fund and the age of the fund. Sell side herding is affected by the size of the company, its book to market ratio, stock liquidity, abnormal returns as well as fund size and fund fees. Fourth, we find that the abolition of QFII regulations have not affected the extent of buy side herding but that both directionless and sell side herding are significantly lower in the post-QFII period.

The remainder of the paper is organized as follows: section II explains the data and presents empirical results on herding measures sorted by the firms' characteristics; section III discusses herding and stock return patterns; and section IV discusses the regression results and Section V presents the conclusions.

II Data and Methodology

Data

We use data provided by the Taiwan Economic Journal (TEJ) from January 1996 to December 2008. The TEJ reports mutual fund equity holdings data on a quarterly basis and price information on a monthly basis. To avoid selection bias, all our samples are required to have a minimum of 12 month returns history during the observation period. This gives a sample of

200 open-end equity mutual funds and 1,095 stocks.

Herding measures

We initially use the herding measure proposed by Lakonishok et al. (LSV, 1992). The herding measure for stock *i* during stock-quarter *i,t*, $HM_{i,t}$, is that mutual funds buy or sell stock *i* during *t*. and it is defined as follows:

$$HM_{i,t} = \left| P_{i,t} - P_t \right| - AF_{i,t} \qquad (1)$$

with $P_{i,t} = \frac{B_{i,t}}{B_{i,t} + S_{i,t}}$, $P_t = \frac{\sum_{i=1}^{n} B_t}{n}$

$HM_{i,t}$: directionless herding measure for stock *i* in period *t*.

$P_{i,t}$: is the proportion of all mutual funds trading in stock-quarter *i, t* that are buyers

.P_t : is the proportion of all stock trades by funds that are purchasers during quarter t.

$AF_{i,t}$: is the adjustment factor and captures the random variation of $P_{i,t}$ around its proportion of buyers under the assumption that trades follow a binomial distribution with $B_{i,t}$ and $S_{i,t}$ as possible outcomes..

$$AF_{i,t} = \sum_{B_{i,t}=0}^{N} \left\{ \left[\frac{B_{i,t}}{B_{i,t}+S_{i,t}} - P_t \right] \times \left(C_{B_{i,t}}^{N} \right) \times \left[P_t \right]^{B_{i,t}} \times \left[1 - P_t \right]^{N-B_{i,t}} \right\}$$

$B_{i,t}$($S_{i,t}$): the number of funds that buy (sell) the stock *i* during period *t*.

The original herding measure of LSV is directionless which means it only measures the herding activities without considering whether it comes from the buy or sell side. Wermers (1999) proposes a directional herding measure to correct this disadvantage. Accordingly, our study incorporates Wermers' (1999) herding measure and investigates directional herding behaviour, such as buy-side herding measure (BHM) and sell-side measure (SHM). The directional herding measures are defined as follows:

$$BHM_{i,t} = HM_{i,t} \mid p_{i,t} > p_t \text{, Buy-side herding measure.} \quad (2)$$

$$SHM_{i,t} = HM_{i,t} \mid p_{i,t} < p_t \text{, Sell-side herding measure.} \quad (3)$$

Insert Table 1

Table 1 reports fund managers' buy and sell decisions by year, as well as looking at the QFII and post-QFII periods. The number of fund increases throughout the period from 52 to 191. The percentage of buy decisions fell in the post regulatory change period from 51% to 49%. At the same time, the percentage of sell decisions rose from 49% to 51%. Over the whole period, buys and sells each accounted for 50% of the trades.

Buy and sell side herding

Insert Table 2

Table 2 presents the directionless LSV herding measure (HM), directional buy-side herding (BHM) and sell-side herding (SHM) for each year and all stock-quarters. It shows the herding statistics by the number of funds trading a particular stock. All herding measures are

significantly greater that zero at the 1% level. For all stock-quarters, the directionless HM is 8.43% for stocks traded by at least one fund. This means that, given the alternative hypothesis of zero herding, that is, a 50:50 buy-sell split, 58.4% of mutual funds change their trades to one side of the market and 41.6% change to the other side.

Table 2 also shows, for all stock-periods and for all the numbers of funds trading a stock, the directional BHM is greater than the SHM. This outcome is consistent with Brown et al. (2007) who argue that buy-herding may be greater than sell-herding due to the short sell limitation in the mutual fund industry

Our findings are consistent with the studies of other less mature capital markets. Our overall directionless HM is 8.43% compared with 7.2% found by Choe et al. (1999) for the Korean market, and 11.38% by Lobao and Serra (2002) for the Portuguese market,

Our overall HM numbers are much higher than the mature market herding studies, for example 2.7% by Lakonishok et al. (1992) with a minimum of one fund traded, and 3.4% by Wermers (1999) for the U.S. market, 2.6% by Wylie (2005) for the U.K. market, and 5.59% by Walter and Weber (2006) for the German market with a minimum of 5 funds traded a given stock for that period.

One explanation for this is the information cascade herding theory. It proposes that there is less information efficiency in a less mature capital market, which is consistent with the higher degree of herding behaviour in Taiwan. Another possible explanation may be that there are

more regulatory restrictions in the Taiwanese mutual fund industry than in mature markets.

Similar to previous studies (Lakonishok et al., 1992; Wermers, 1999; Wylie, 2005; Walter and Weber, 2006), we also find the probability of herding rises with the number of fund managers trading that particular stock increases. Moreover, Wermers (1999) points out that if only a small number of managers trade in the same direction, it should not be classified as a herd. Thus, as a robustness test, we impose a number of higher hurdles with up to twenty five funds trading a given stock. We then compute new herding statistics and find an increase in herding as the number of funds increases. These figures are consistent with our initial findings. In our analysis we impose a requirement that at least 5 fund managers trade a given stock on stock-periods when calculating the herding measure.

III Empirical Results

Herding by stock characteristics

Fama and French (1992) have outlined the importance of market premium, size premium and book-to-market premium. Amihud (2002) points out the positive relationship between stock returns and illiquidity. We therefore examine the levels of herding by separating stocks by characteristics, such as size, book-to-market ratio, illiquidity factor, liquidity factor, and stock returns. We also look at whether this occurs more often on the buy-side or sell-side of Taiwanese mutual fund trading.

Stock characteristics consist of SIZE, the natural log of the market value of equity at time

t. Lakonishok et al. (1992) and Froot et al. (1992) argue that herding is more likely for larger stocks because information is more likely to be more widely available. In addition, Wermers (1999) and Hung et al. (2010) find herding amongst smaller stocks. BM is the book to market ratio defined as book to market value of the equity at time t Wermers (1999) and Hung (2010) report that funds sell overvalued shares and buy undervalued shares. We use two measures of information uncertainty. First, ILLIQUIDITY is defined as the absolute value of returns scaled by dollar volume, Amihud (2002) and second, STURN which is the log of the average share turnover during the previous three months. Sias (2004) argues that fund managers will be reluctant to trade in stocks that have lower liquidity or greater information uncertainty. A number of studies have found that funds buy when stock performance has been good and sell when it has been bad, Lakonishok et al. (1992), Grinblatt et al. (1995) and Wermers (1999). We include RET2-3 as a measure of performance. It is defined as the cumulative abnormal returns over the second and third months prior to the current month.

Insert Table 3

Table 3 reports mean herding measures for each of the above stock characteristics. Panel A shows the herding measures sorted by stock size (S). We spilt size into three groups, S1, S2 and S3 which refer to the 30, 40, 30 percentiles respectively by ranking, where S1 stands for the smallest sized stocks and S3 represents the largest sized stocks. For all three types of herding measure, we find that the herding behaviours are statistically significant and different

from zero across all size groups. However, the difference between small and large stocks is not significant for any of the types of herding measure. This result is consistent with Walter and Weber (2006) who report that stock size does not matter in herding in German mutual funds.

In Panel B we sort stocks into three book-to-market ratio (BM) groups, where BM3 contains highest 30% BM stocks, BM1 contains lowest 30% BM stocks, and BM 2 contains middle 40% BM stocks. Panel B shows HM measures are significantly different from zero across all BM groups and BM3 stocks have significantly higher herding than BM1 stocks at the 5% level. For buy-side herding, we find that herding decreases as BM increases with, the difference between BM3 and BM1 being significant at 5%. However, the sell-side herding increases as BM increases with the difference between BM1 and BM3 significant at 1%. We therefore find buy-side fund managers herding behaviour is concentrated more on growth stocks whereas mutual fund managers are more likely to exhibit sell-side herding behaviour in value stocks.

Panel C sorts stocks by the illiquid proxy where ILLIQ1 (ILLIQ3) contains the lowest (highest) 30% stocks. All illiquidity measures are significantly different from zero. However, there are no differences between the most and least illiquid stocks for total and buy herding measures In contrast we find that sell side herding is higher in low illiquidity stocks than in high illiquidity stocks. Consequently, the overall herding measure, HM, has a higher value in low illiquid stocks than in high illiquid stocks.

Panel D displays mean values of the herding measures sort by the second liquidity proxy STURN where STURN1 (STURN3) contains the lowest (highest) 30% of stocks by liquidity. The results show that liquidity does exercise some influence on the behaviour in herding among Taiwan's mutual fund managers. The highest turnover ratio subgroup, STURN3, has the highest herding measure for both directional and directionless herding. The difference between STURN3 and STURN1 is significant for all three herding measures at the 1% level. The results suggest that liquidity is an important factor in determining the herding behaviour of mutual fund managers in Taiwan, and that fund managers prefer to deal in stocks with higher liquidity.

Table 3 Panel E reports the mean herding measure by returns during each three-month formation period, which RET1 represents the lowest 30% of formation period returns and RET3 for the highest 30% of formation period returns. All three herding measures show significant and positive returns for all return levels. The directionless HM shows that the difference between the highest and lowest returns is not statistically significant. However, in the directional herding measures, both BHM and SHM produce significantly different results. The highest returns produce significantly higher buy-side herding whereas with sell side herding, the lowest returns produce the highest herding figure. Our findings therefore indicate that Taiwanese mutual fund managers pursue momentum strategies. The results also offer evidence that there is window dressing, given that Taiwanese fund managers engage in a momentum trading strategy, Grinblatt et al. (1995) and Walter and Weber (2006),.

Regulatory change and the impact on the prior and post returns of institutional herding portfolios

Scharfstein and Stein (1990) contend that herding behaviour will destabilize stock prices because it will push stock prices above their intrinsic value during the formation period. Therefore after the formation period, stock prices will return to their intrinsic values and a negative return will occur. Grinblatt et al. (1995) point out fund managers will put more weight on recent stock performance. Wermers (1999) and Sias (2004) also observe the return continuation patterns from herding behaviour.

Following these arguments, we analyse the prior and post returns of mutual fund herding portfolios in Table 4. P1 (P4) stands for the intense buy (sell) herding portfolio and P2 (P3) light buy (sell) portfolio. For each portfolio we calculate equally weighted buy-and-hold returns of three quarters prior to the formation period, during the three month formation period and for the subsequent four quarters.

Panel A covers the whole period, 1996-2008. Panel B reports results for 1996-2002 and Panel C presents results for 2004-2008. We use 2003 as a break period because the Taiwanese government abolished the QFII system of regulation in October 2003. Panel D compares the herding returns in the QFII and post QFII periods. With the presence of institutional money one would expect that higher quality information about specific securities will be made more readily available to the capital markets via security analysis. Therefore, if herding returns are

lower, and statistically significant post QFII, this will suggest that the regulatory changes will have increased the efficiency of the market,

Insert Table 4

The results in Table 4, Panel A offer some support for the stock price destabilization hypothesis which argues that the buy-herding behaviour will cause a positive return during the formation period whereas sell-herding behaviour will produce a negative return for the same period. However, the price destabilising theory argues that, if prices return to their intrinsic level in the post formation period, we would expect buy side returns to be negative and sell side returns to be positive.

The post formation sell-herding return patterns support the stabilization of stock returns argument because prices do not rise in the post formation period during which returns are positive, but not significantly different from zero in all of the four post formation periods. This implies that, on the sell side, fund herding leads to price stabilisation and that prices adjust quickly, In contrast, we find significant positive returns post buy-side herding for Q_2, Q_3 and Q_4. This suggests that, on the buy-side, new information is slowly impounded in prices as they continue to adjust even post herding.

Table 4 Panel B shows that in the period during which QFII was in force, there were significant, positive gains made intense buy, light buy and intense sell portfolios. It also shows that in the post formation period, there is no evidence of price destabilisation in either the buy

or sell side. As Panel C shows, in the post QFII period, 2004 to 2008, herding is related to future returns only for light buy stocks in Q3 and Q4. Therefore, our general results shown in Panel A, that new buy-side information is more slowly impounded into prices, are driven mainly by the result obtained during the period before the 2003 market reform.

Panel D compares the herding statistics across the two time periods. Thus, for example, we compare the intense buy returns for the QFII period, 1996-2002, with the post-QFII period, 2004-2008. We find that intense buy side herding returns were lower after the market reforms, 7.73% rather than 10.69%, with the difference being significant at the 1% level. There is also a significant fall in the light buy side herding returns post-QFII. Light sell side is also significantly lower but there is no significant difference in the intense sell side figure. Overall, our results suggest that the abolition of QFII in Taiwan has made the market more efficient by reducing the extent of herding returns amongst mutual funds.

Insert Table 5

Table 5 reports summary statistics of the variables used in the regression analysis. Panel A includes summary statistics for fund characteristics. The average total net assets value (TNAV) of all funds in the sample is NT$2081.42 millions. The average fee charged is 1.45% of the net asset value. The average age of the fund is 7.19 years. Panel B provides summary statistics on stocks characteristics in the sample across the testing period. The average market capitalization is NT$45757.64 millions and the average trading volume is 3.15 millions. We

also find the average book-to-market ratio is 0.52 which indicates that the Taiwan stock market contains more growth stocks than value stocks. Moreover, Panel B also reports that the average turnover is 29%, ILLIQ is 0.05, STURN is 3 and the cumulative return over the second through the third months prior to the current month (RET2_3) is 3%. Panel C shows that the average fund managers buy (11.61) and sell (11.54) decisions are very similar.

Insert Table 6

Table 6 reports mean comparison tests for each variable so that we can track differences before and after the regulatory change. Panel A reports the results for fund characteristics. It shows the average TNAV decreased significantly from 2488.09 million in 1996-2003 to 1838.18 millions in 2004-2008. The average fee charges fell but the reduction is not significant. Panel A also shows the average fund age is significantly older in 2004-2008 period than in 1996-2003 period. This suggests that funds with longer history may have positive network externalities.

Panel B shows a significant increase in market value and book to market but a significant fall in share turnover. There are no differences in the mean values of the other stock characteristics. Panel C shows that there were significant increases in the number of buy and sell decisions of fund managers post QFII. This is not unexpected as the number of funds increased throughout the period. Moreover, Panel C also shows that during QFII deregulation, there are more buy decision than sell decision. After QFII abolition, there are more sell

decisions than buy decisions.

IV *Regression Analysis*

In this section we develop the analysis by analysing the factors determining mutual fund herding in Taiwan. We run fixed effects regressions using three dependent variables, the directionless herding measure and the buy, and sell, herding measures. Comparing the directionless herding results with those for buy and sell herding will show the importance of differentiating between the two types of herding. We employ three sets of independent variables: stock characteristics, fund characteristics and the abolition of the QFII regulation in 2003. We use clustered standard errors given that standard errors are likely to be clustered at the stock level.

This gives a general regression model of:

$$HM_{i,t} = f(StockCharacteristics_{i,t}; Meanfundcharacteristics_{i,t}; QFII_t) \quad (1)$$

$$BHM_{i,t} = f(StockCharacteristics_{i,t}; Meanfundcharacteristics_{i,t}; QFII_t) \quad (2)$$

$$SHM_{i,t} = f(StockCharacteristics_{i,t}; Meanfundcharacteristics_{i,t}; QFII_t) \quad (3)$$

Stock characteristics consist of SIZE, BM, STURN, ILLIQ and RET2-3 as defined earlier. We also include a number of variables that control for fund characteristics. Large funds are likely to have more specialised resources and better information than small funds. We therefore expect large funds to exhibit lower levels of herding. Fund size, TNAV, is the log of a fund's total net asset value at time t. Fee income could be a measure of the incentives faced by a fund.

If fee income is high, there will be an incentive to devote resources to the analysis of the market. We would therefore expect less herding the higher the fees. FEES is defined as the amount the fund manager charges at time t. The number of years a fund has been trading may also influence the extent of herding. Younger funds are more likely to follow the buy-sell strategies of older, better known funds because younger funds may be more risk averse and so are more likely to herd. As the fund gets older, the pressure to herd will become less. We measure AGE by the number of years a fund has been trading in time t.

We include a time dummy, QFII, which takes a value 1 post 2003 and 0 pre-2003. 2003 was the year the QFII regulation changed to allow greater openness in Taiwan's capital markets. If the move to market deregulation is effective, we expect a reduction in herding as the market becomes more efficient.

We use the fund mean characteristics in the regressions. For example, if 10 funds buy or sell herd stock i in quarter t, for that stock quarter we calculate the mean fund characteristics, fund age size and fee charges, for these 10 funds. We then weighted those constructed measures by the number of stocks bought/sold.

Insert Table 7

The regression results are reported in Table 7. Models 1 and 2 report the results for directionless herding, (HM). Models 3 and 4 give the results for buy side herding (BHM) and models 5 and 6 show the sell side herding (SHM) results. The results for models 1 and 2 show

that there is a positive, significant relationship between herding and firm size, a finding consistent with Froot et al. (1992). The positive coefficient on BM shows that herding occurs more in undervalued stocks. There is also evidence of higher herding the more liquid the stock. We also find that herding is positively related to recent abnormal returns.

In terms of fund characteristics, we find the herding is negatively associated with the size of the fund but the result is insignificant. As hypothesised we find that herding is negatively related to fund fees. We also find that, contrary to expectations, fund age is positively related to herding suggesting that as funds get older, they may herd more because of greater pressure from younger funds. Older funds may therefore be more concerned with reputation whereas younger funds are less concerned with herding as they try to gain a foothold in the sector.

The QFII dummy is negative and significant and shows that, as hypothesised, the directionless herding measure was significantly lower after the regulation change implying an increase in market efficiency. Specifically, in model 1, the coefficient of QFII dummy is -0.0145 (t-value = -2.09) indicates that the directionless herding measures after the QFII change are significantly lower by 1.45% per quarter relative to the overall mean of 11.56 (see table 2). A similar pattern also identified in model 2.

As models 3 and 4 show, buy side herding is positively related to abnormal returns. We also find a negative relationship between buy side herding and the value of assets in a fund. Larger funds will be able to benefit more from greater expertise and analyst specialisation.

They may therefore be less inclined to herd, particularly if they possess better private information. The fund's fees are also negatively related to buy side herding. This may be because lower fee income creates an incentive to follow the market. Finally, we find that the QFII coefficient is negatively but insignificantly related to buy side herding.

Models 5 and 6 show that sell side herding is positively and significantly related to market value resulting in less herding in smaller stocks. We also report that stocks with lower liquidity experience less herding. There is also evidence that higher fees reduce sell side herding. Consistent with Wermers (1999) we find that sell side herding is more likely to occur in undervalued stocks. We also find that there is a significant and negative relationship between abnormal returns and sell side herding further supporting the argument that poorly performing stocks are sold. There is also evidence that larger funds herd more.

Finally, we find in models 5 and 6 that the QFII coefficient is negative and significantly related to sell side herding. This implies there is significantly less sell side herding after the abolition of QFII. Specifically, in model 5, after controlling for all other variables, sell side herding was reduced by 2.04 per cent per quarter after QFII had been abolished. The similar pattern also identified in model 6, where QFII deregulation produces a negative 2.83 per cent change in sell side herding. This is consistent with the change improving the efficiency of the market in terms of sell side herding. This suggests that funds are becoming more willing to hold stocks when other funds are selling but that buy herding has remained unaffected by the

change in regulations. This implies an asymmetric reduction in information asymmetry such that buy side activities still exhibit herding whereas sell side activity exhibits less herding.

V Conclusions

This paper has analysed the factors affecting directionless, buy and sell herding amongst Taiwanese mutual fund managers and finds herding behaviours among Taiwanese mutual fund managers. We also find buy-side herding is greater than sell-herding, which is consistent with Grinblatt et al. (1995).

We find a higher level of buy-side herding in growth stocks whereas sell-side herding is more common in value stocks. We find that stock liquidity affects herding with more buy side herding in more liquid stocks and more sell side herding in less liquid stocks. We also find that there is more sell side herding in lower abnormal return stocks and that there is more buy side herding in higher abnormal return stocks.

This study also finds that momentum trading is a common strategy that Taiwanese mutual fund managers utilize to pursue short-term profit and window dressing effects. This explains the herding behaviour of Taiwanese mutual fund managers, buying the winners and selling the losers. Our study confirms that the momentum trading pattern could be a factor that shapes the herding behaviour in the Taiwanese mutual fund industry, especially during the portfolio formation period. We find that buy-side herding seems to have a destabilizing effect on stock prices.

We also find that directionless herding activity is significantly lower in the post-QFII period suggesting that the market is operating more efficiently after the change in regulatory conditions. However, we further find that while the regulatory change has had no effect on buy side herding it has resulted in less supply side herding. It may be that there is a difference in the quality of information affecting the two decisions.

Our regression results show that the change in the regulatory framework has lead to an improvement in the efficiency of the market. We also find that stock characteristics such as size, book to market, liquidity and prior returns all affect the degree of herding. Fund characteristics such as fund size, fees and fund age also affect herding. Our results further show that different factors affect buy and sell herding which indicates that differentiating between the two herding directions is important.

In terms of further research, we have utilized quarterly data to identify the importance of a firm's characteristic factors that contribute to herding behaviour in the Taiwanese mutual fund industry. However, as Elton et al. (2010), argue further insights into institutional investors' herding behaviour may be gained by using more frequently published data. Therefore further research based on monthly data may offer additional insights.

References

Amihud Y (2002) Illiquidity and stock market returns: cross section and time series effects, Journal of Financial Markets, 5, 31-56

Barberis, N and Shleifer A (2003) Style Investing, Journal of Financial Economics, 68 161-199.

Brown, N, Wei, K, and Wermers R (2007) Analyst Recommendations, Mutual Fund Herding, and Overreaction in Stock Prices, Unpublished working paper, University of Southern California, University of Texas-Dallas, University of Maryland.

Chang, C. (2010) Herding and the Role of Foreign Institutions in Emerging Equity Markets, *Pacific Basin Finance Journal*, 18, 175–185.

Choe, H, Kho, B, and Stultz R (1999) Do Foreign Investors Destabilize Stock Markets? The Korean Experience in 1997, *Journal of Financial Economics*, 54, 227-64.

Elton, E. J., Gruber, M.J., Blake, C. R. Krasny, Y, and Ozelge S (2010) The Effect of Holdings Data Frequency on Conclusions about Mutual Fund Behaviour, *Journal of Banking and Finance*, 34, 912-922.

Froot, K. A, Scharfstein, D. S. and Stein . J.C (1992) Herd on the Street: Informational Inefficiencies in a Market with Short-term Speculation, *Journal of Finance*, 47, 1461–1184.

Fama, E and French, K (1992) The Cross-Section of Expected Stock Returns. *Journal of*

Finance, 1992, *47*, 427-65.

Grinblatt, M, Titman, S,. and Wermers R (1995) Momentum Investment Strategies, Portfolio Performance, and Herding: A Study of Mutual Fund Behaviour, *American Economic Review* 85, 1088-1105..

Hirshleifer, D, and Teoh, SH (2003) Herd Behaviour and Cascading in Capital Markets: A Review and Synthesis, *European Financial Management*, 9, 25–66.

Hung, W., C. Lu, and L. Cheng (2010). Mutual Fund Herding and its Impact on Stock Returns: Evidence from the Taiwan Stock Market. *Pacific-Basin Finance Journal 18*, 477–493.

Jiang, H. (2010) Institutional investors, intangible information and the book-to-market effect, *Journal of Financial Economics*, 96, 98-126.

Lakonishok, J, Shleifer, A Thaler, R and Vishny R. (1991) Window Dressing by Pension Fund Managers, *American Economic Review*, 81, 227–231.

Lakonishok, J, Shleifer A, and Vishny R. (1992) The Impact of Institutional Trading on Stock Prices, *Journal of Financial Economics*, 32, 23–43.

Lobao, J, and Serra A. P. (2002) Herding Behaviour–Evidence from Portuguese Mutual Funds, Working Paper, University of Porto.

Meier, I, and Schaumburg E (2004) Do Funds Window Dress? Evidence for U.S. Equity Mutual Funds, Unpublished manuscript, Northwestern University.

Ramos, S. (2009) The Size and Structure of the World Mutual Fund Industry' *European*

Financial Management, 15, 145-180.

Scharfstein, D. S. and Stein J. C. (1990) Herd Behaviour and Investment, *American Economic Review,* 80, 465–479.

Sias, R. (2004) Institutional Herding, *Review of Financial Studies*, 17 165-206.

Sias, R. (2006) Window Dressing, Tax-loss Selling and Momentum Profit Seasonality, *Financial Analysts Journal*, 62, 48–54.

Voronkova, S, and Bohl, MT (2005) Institutional Traders' Behaviour in an Emerging Stock Market: Empirical Evidence on Polish Pension Fund Investors, *Journal of Business Finance and Accounting* 32, 1537–1560.

Walter, A. and Weber F. (2006) Herding in the German Mutual Fund Industry, *European Financial Management,* 12, 375 -406.

Wermers, R (1999) Mutual Fund Herding and the Impact on Stock Prices, *Journal of Finance,* 54, 581–622.

Wylie, S (2005) Fund Manager Herding: A Test of the Accuracy of Empirical Results Using U.K. Data, *Journal of Business,* 78, 381–403.

.

Table 1 Fund managers' buy and sell decisions

	Year													QFII deregulation period		Whole period
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	Pre-1996-2003	Post-2004-2008	1996-2008
Number of funds	52	65	92	110	138	147	160	166	170	174	179	190	191			
Buys	4096	4340	5743	6754	8876	10799	13778	14710	14031	13187	15575	17449	17137	65511	80964	146475
	[0.50]	[0.49]	[0.51]	[0.48]	[0.51]	[0.51]	[0.52]	[0.50]	[0.49]	[0.47]	[0.50]	[0.50]	[0.51]	[0.51]	[0.49]	[0.50]
Sells	4128	4541	5574	7320	8530	10418	12682	14767	14551	14916	15525	17222	16598	64087	82685	146772
	[0.50]	[0.51]	[0.49]	[0.52]	[0.49]	[0.49]	[0.48]	[0.50]	[0.51]	[0.53]	[0.50]	[0.50]	[0.49]	[0.49]	[0.51]	[0.50]
Total	8224	8881	11317	14074	17406	21217	26460	29477	28582	28103	31100	34671	33735	129598	163649	293247

This table shows the total number of purchases, sales, and aggregate trades for each year, pre- (1996-2003) and post-QFII deregulation period (2004-2008). The brackets indicate the proportion of buys and sells.

Table 2 Mean herding measures; directionless (HM), buy (BHM) and sell (SHM) (%)

	Number of funds trading in the period				
	$n \geqq 1$	$n \geqq 5$	$n \geqq 10$	$n \geqq 5$	$n \geqq 25$
HM	8.43	11.56	11.95	12.12	12.53
	[293247]	[273612]	[246936]	[221383]	[179222]
BHM	8.78	12.42	0.12.68	12.86	13.05
	[146475]	[137222]	[123828]	[111001]	[89814]
SHM	8.10	10.73	11.25	11.40	12.00
	[146772]	[136390]	[123108]	[110382]	[89408]

The directionless HM are calculated as the average of $HM_{i,t}$ across all stock trading periods by at least the number of funds traded indicated in the row heading. We also report the buy-side (BHM) and sell-side (SHM) herding measures as $HM_{i,t}$ conditions on on $p_{i,t} > p_t$ and $p_{i,t} < p_t$, respectively. The herding measures are computed in each stock-quarter and then averaged over the constituents of each group. The total number of stock-quarters traded in each subgroup is in parentheses.

Table 3 Mean herding measures by stock characteristics: size, book-to-market ratio, illiquidity, liquidity, and formation period returns (HM, BHM, SHM) (%)

Panel A: Mean herding measures by market capitalization				
	Size			
	S1	S2	S3	S1-S3
HM	11.56***	11.02***	11.46***	0.10
	(30.07)	(29.02)	(24.32)	(0.16)
BHM	12.33***	11.84***	11.89***	0.44
	(19.84)	(24.19)	(20.06)	(0.51)
SHM	10.33***	10.30***	10.83***	-0.50
	(20.33)	(21.97)	(19.65)	(-0.67)
Mean Size (NT$bils)	4.17	13.72	130.36	
Median Size (NT$bils)	3.74	12.01	66.76	
Panel B: Mean herding measures by book-to-market ratio				
	Book-to-market ratio			
	BM1	BM2	BM3	BM3-BM1
HM	10.95***	10.84***	12.30***	1.35**
	(33.87)	(26.44)	(25.95)	(2.35)
BHM	12.97***	11.68***	11.17***	-1.80**
	(27.24)	(23.19)	(15.24)	(-2.05)
SHM	8.21***	10.11***	12.48***	4.28***
	(19.14)	(21.59)	(24.27)	(6.39)
Mean BM	0.24	0.46	0.87	
Median BM	0.23	0.45	0.79	
Panel C: Mean herding measures by ILLIQ				
	ILLIQ			
	ILLIQ1	ILLIQ2	ILLIQ3	ILLIQ3-ILLIQ1
HM	11.07***	10.79***	10.77***	-0.30
	(22.30)	(22.71)	(19.81)	(-0.40)
BHM	9.67***	11.17***	11.21***	1.54
	(17.35)	(17.92)	(14.06)	(1.59)
SHM	12.22***	10.48***	9.58***	-2.64***
	(18.50)	(18.84)	(14.25)	(-2.80)
Mean Trading Value (NT$bils)	20.73	4.94	1.74	
Median Trading Value (NT$bils)	12.59	3.22	1.02	
Panel D: Mean herding measures by STURN				
	STURN			

	STURN1	STURN2	STURN3	ST3-ST1
HM	9.15***	11.10***	12.28***	3.13***
	(17.95)	(26.29)	(25.68)	(4.48)
BHM	8.47***	10.94***	12.70***	4.22***
	(12.17)	(17.67)	(19.46)	(4.43)
SHM	8.80***	11.30***	11.69***	2.89***
	(12.48)	(20.34)	(19.42)	(3.12)
Mean Turnover (%)	9.58	25.85	56.26	
Median Turnover (%)	6.98	19.80	46.48	

Panel E: Mean herding measures by raw returns

	Returns			
	RET1	RET2	RET3	RET3-RET1
HM	13.62***	6.46***	13.95***	0.33
	(30.01)	(24.33)	(25.49)	(0.46)
BHM	2.12***	6.44***	16.32***	14.20***
	(3.33)	(19.11)	(29.37)	(16.83)
SHM	15.54***	6.40***	2.17***	-13.37***
	(33.59)	(17.34)	(4.16)	(-19.15)
Mean Return	-0.0572	0.0078	0.1176	
Median Return	-0.0486	0.0097	0.0937	

The values of HM are calculated for all subgroups separately as the average of $HM_{i,t}$ across all stock-periods traded by at least five funds. Also presented are buying herding measure (*BHM*) and selling herding measure (*SHM*), which are values of $HM_{i,t}$ conditional on $p_{i,t} > p_t$ *and* $p_{i,t} < p_t$, respectively. Panel A presents mean values of *HM*, *BHM*, and *SHM* segregated by market capitalization, which the smallest 30% stocks are assigned to S1, the largest 30% are assigned to S3, while the middle 40% are in S2. Similarly, Panel B presents mean values of *HM*, *BHM*, and *SHM* segregated by book-to-market ratio. Panel C presents mean values of *HM*, *BHM*, and *SHM* segregated by illiquidity factor as Amihud (2002) defined. Panel D presents mean values of *HM*, *BHM*, and *SHM* segregated by liquidity factor, which measured as the natural logarithm of the average of share turnover over the prior 3 months. Panel E presents mean values of *HM*, *BHM*, and *SHM* segregated by three-month formation period return. The herding measures are computed in each stock-quarter and then averaged over the constituents of each group. t-statistics are shown in parentheses.

***, significant at 1% ** significant at 5% * significant at 10%

Table 4 Prior and post returns of institutional herding portfolios

Panel A Full sample period 1996 - 2008	Q_{-3}	Q_{-2}	Q_{-1}	Formation period Q_0	Q_1	Q_2	Q_3	Q_4
P1 Intense Buy	0.0403***	0.0464***	0.0621***	0.0982***	0.0072	0.0124*	0.0099*	0.0082*
	(6.71)	(6.87)	(6.83)	(7.20)	(0.84)	(1.80)	(1.91)	(1.73)
P2 Light Buy	0.0384***	0.0389***	0.0390***	0.0386***	0.0125	0.0115*	0.0090*	0.0081*
	(5.73)	(5.55)	(4.82)	(3.67)	(1.40)	(1.88)	(1.90)	(1.94)
P3 Light Sell	0.0270***	0.0244***	0.0190***	0.0004	0.0100	0.0094	0.0058	0.0059
	(5.26)	(4.75)	(2.73)	(0.05)	(1.13)	(1.47)	(1.35)	(1.52)
P4 Intense Sell	0.0151***	0.0086*	-0.0022	-0.0370***	0.0093	0.0069	0.0038	0.0040
	(3.30)	(1.89)	(-0.38)	(-5.02)	(0.89)	(1.03)	(0.83)	(1.01)
Intense Sell – Light Sell	-0.0119*	-0.0158**	-0.0211**	-0.0374***	-0.0007	-0.0025	-0.0021	-0.0019
P4-P3	(-1.74)	(-2.30)	(-2.35)	(-3.29)	(-0.05)	(-0.27)	(-0.33)	(-0.34)
Intense Buy – Light Buy	0.0019	0.0075	0.0231*	0.0596***	-0.0054	0.0009	0.0009	0.001
P1-P2	(0.21)	(0.77)	(1.90)	(3.46)	(-0.43)	(0.10)	(0.13)	(0.01)
Intense Buy – Intense Sell	0.0253***	0.0378***	0.0643***	0.1352***	-0.0022	0.0054	0.0062	0.0041
P1-P4	(3.35)	(4.64)	(5.99)	(8.72)	(-0.16)	(0.57)	(0.90)	(0.67)

Panel B Sub-period 1996 -2002 Pre QFII	Q_{-3}	Q_{-2}	Q_{-1}	Formation period Q_0	Q_1	Q_2	Q_3	Q_4
P1 Intense Buy	0.0403***	0.0459***	0.0672***	0.1069***	0.0075	0.0119*	0.0102**	0.0080*
	(6.93)	(7.07)	(7.35)	(7.69)	(0.78)	(1.78)	(2.04)	(1.79)
P2 Light Buy	0.0396***	0.0424***	0.0439***	0.0448***	0.0138	0.0106*	0.0082*	0.0077*
	(5.91)	(5.91)	(5.32)	(4.22)	(1.51)	(1.85)	(1.77)	(1.90)
P3 Light Sell	0.0251***	0.0239***	0.0210***	0.0017	0.0127	0.0092	0.0063	0.0061
	(4.96)	(4.87)	(3.15)	(0.20)	(1.39)	(1.48)	(1.49)	(1.66)
P4 Intense Sell	0.0123***	0.0055	-0.0041	-0.0382***	0.0118	0.0075	0.0031	0.0042
	(2.95)	(1.36)	(-0.79)	(-5.25)	(1.14)	(1.21)	(0.81)	(1.17)
Intense Buy – Intense Sell	0.0280***	0.0404***	0.0713***	0.1450***	-0.0043	0.0044	0.0071	0.0037
P1-P4	(3.91)	(5.28)	(6.80)	(9.25)	(-0.31)	(0.48)	(1.12)	(0.66)

Panel C Sub-period 2004 – 2008	Q_{-3}	Q_{-2}	Q_{-1}	Formation period Q_0	Q_1	Q_2	Q_3	Q_4

Post QFII								
P1 Intense Buy	0.0412***	0.0447***	0.0499***	0.0773***	-0.0001	0.0078	0.0062	0.0056
	(8.15)	(7.84)	(8.09)	(9.74)	(-0.02)	(1.43)	(1.36)	(1.34)
P2 Light Buy	0.0367***	0.0335***	0.0287***	0.0253***	0.0042	0.0088	0.0074*	0.0069*
	(7.39)	(6.09)	(5.07)	(4.09)	(0.67)	(1.63)	(1.73)	(1.74)
P3 Light Sell	0.0288***	0.0215***	0.0116**	-0.0069	0.0027	0.0076	0.0039	0.0052
	(6.96)	(4.90)	(2.32)	(-1.20)	(0.47)	(1.34)	(0.98)	(1.37)
P4 Intense Sell	0.0194***	0.0107**	-0.0020	-0.0370***	0.0004	0.0031	0.0011	0.0018
	(4.52)	(2.43)	(-0.40)	(-6.77)	(0.07)	(0.55)	(0.25)	(0.49)
Intense Buy – Intense Sell	0.0218***	0.0340***	0.0519***	0.1142***	-0.0006	0.0048	0.0052	0.0039
P1-P4	(3.28)	(4.72)	(6.61)	(11.86)	(-0.06)	(0.61)	(0.83)	(0.69)

Panel D				Formation				
Mean difference between				period				
Pre QFII v Post QFII	Q_{-3}	Q_{-2}	Q_{-1}	Q_0	Q_1	Q_2	Q_3	Q_4
P1	-0.0009	0.0011	0.0173	0.0296***	0.0076	0.0040	0.0040	0.0023
Intense Buy	(-1.24)	(1.45)	(17.16)	(20.26)	(7.22)	(5.11)	(6.28)	(3.94)
P2	0.0030	0.0089	0.0152	0.0195***	0.0097	0.0019	0.0008	0.0008
Light Buy	(3.92)	(10.75)	(16.59	(17.37)	(9.56)	(2.62)	(1.34)	(1.41)
P3	-0.0037	0.0024	0.0095	0.0086***	0.0100	0.0015	0.0024	0.0009
Light Sell	(-6.22)	(3.97)	(12.47	(9.36)	(10.10)	(1.99)	(4.34)	(1.82)
P4	-0.0071	-0.0052	-0.0021	-0.0012	0.0114	0.0045	0.0021	0.0024
Intense Sell	(-12.97)	(-9.52)	(-3.27)	(-1.45)	(10.24)	(5.88)	(3.85)	(4.95)

. The intense buy portfolio is the group with the most institutional buying. The intense sell portfolio is the group with the most institutional selling. The light buy portfolio is the group with the least institutional buying. The light sell portfolio is the group with the least institutional selling. P1 minus P4 represents a zero-investment portfolio, which is long in intense buy-herding portfolio (P1) and short in intense sell-herding portfolio (P4). t-statistics are reported in parentheses.

*** significant at 1% ** significant at 5% * significant at 10%

Table 5 Descriptive statistics

			Percentile		
	Mean	Stdev.	25	50	75
Panel A: Summary statistics for fund characteristics					
TNAV (NT$ mils)	2081.42	1339.97	1238.06	1725.50	2559.25
FEE (%)	0.14	0.01	0.14	0.14	0.15
AGE (year)	7.19	2.78	5.00	7.00	9.20
Panel B: Summary statistics for stock characteristics					
SIZE (NT$ mils)	45757.64	116120.73	5475.50	12054.50	35470.75
BM	0.52	0.33	0.29	0.44	0.66
Vol (mils)	3.15	3.76	1.00	2.00	4.00
Turnover	0.29	0.29	0.09	0.19	0.39
ILLIQ	0.05	0.14	0.01	0.02	0.04
STURN	3.00	0.93	2.36	3.06	3.71
RET 2_3	0.03	0.02	-0.09	0.02	0.15
Panel C: Summary statistics for Fund managers' buy and sell decisions					
Buy	11.61	13.76	3.00	7.00	14.00
Sell	11.54	13.96	3.00	7.00	14.00

Panel A reports average total net assets value (TNAV) of all funds in the database, fee charges, FEE and fund age, AGE. Panel B provides summary statistics of stock characteristics, average market capitalization, SIZE, book-to-market ratio, BM, and trading volume, VOL, share turnover, Turnover, the liquidity measure of Amihud (2002) which takes the absolute value of returns, scaled by dollar volume, ILLIQ, the natural logarithm of the average of share turnover over the prior 3 months, STURN, the cumulative return over the second through the third months prior to the current month, RET2_3. Panel C provides summary statistics of the total number of fund managers' buy and sell decisions. Data are from the Taiwan Economic Journal (TEJ).

Table 6 Mean differences between the pre- and post-QFII deregulation period

	1996-2003 P1	2004-2008 P2	Diff. in means P2 minus P1
Panel A: Summary statistics for fund characteristics			
SIZE (NT$ mils)	2488.09	1838.18	-649.91
	(13.26)***	(13.71)***	(-2.56)***
FEE (%)	0.14	0.15	-0.01
	(88.02)***	(81.30)	(-0.38)
AGE (year)	5.07	9.02	3.95
	(31.23)***	(35.84)***	(13.84)***
Panel B: Summary statistics for stock characteristics			
SIZE (NT$ mils)	42756.36	49835.08	7078.72
	(19.88)***	(34.99)***	(2.46)**
BM	0.46	0.54	0.08
	(18.15)***	(17.17)***	(2.02)**
VOL	2.99	3.15	0.16
	(18.36)***	(14.51)***	(0.60)
Turnover	0.31	0.28	-0.03
	(14.72)***	(15.83)***	(-1.24)
ILLIQ	0.05	0.04	-0.01
	(6.26)***	(8.54) **	(-0.56)
STURN	3.17	2.89	-0.27
	(59.70)***	(52.61)***	(-3.41)***
RET2_3	0.05	0.02	-0.03
	(1.57)	(0.65)	(-0.61)
Panel C: Summary statistics for Fund managers' buy and sell decisions			
Buy	10.13	12.57	2.44
	(19.49)***	(34.34)***	(3.48)***
Sell	9.89	12.78	2.88
	(20.77)***	(43.70)***	(4.59)***

t-statistics are shown in parentheses.*** significant at 1%; * significant at 5%; * significant at 10%

Variables defined Table 5

Table 7 Determinants of the mutual fund herding: fixed effects regressions

Dependent Variable:	Directionless Herding		Buy-side Herding		Sell-side Herding	
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
SIZE	0.0159	0.0157	0.0115	0.0136	0.0251	0.0216
	(1.87)*	(1.80)*	(0.87)	(1.03)	(2.27)**	(1.98)**
BM	0.0264	0.0239	0.0148	0.0172	0.0422	0.0332
	(2.73)***	(2.44)**	(0.94)	(1.12)	(3.09)***	(2.49)**
ILLIQ		0.0096		0.0303		-0.0251
		(0.54)		(0.60)		(-1.12)
STURN	0.0072		-0.0045		0.0211	
	(1.81)*		(-0.71)		(3.92)***	
RET2_3	0.0004	0.0004	0.0011	0.0011	-0.0006	-0.0004
	(3.88)***	(4.62)***	(7.64)***	(7.81)***	(-4.11)***	(-3.19)***
QFII	-0.0145	-0.0169	-0.0089	-0.0072	-0.0204	-0.0283
	(-2.09)**	(-2.50)**	(-0.89)	(-0.74)	(-2.13)**	(-2.99)***
TNAV	-0.0046	-0.0044	-0.0219	-0.0219	0.0107	0.0115
	(-1.11)	(-1.05)	(-2.75)***	(-2.75)***	(1.86)*	(1.98)**
FEE	-0.2159	-0.2156	-0.6534	-0.6428	0.1369	0.1392
	(-2.36)**	(-2.35)**	(-4.44)***	(-4.42)***	(0.99)	(1.00)
AGE	0.0022	0.0023	0.0044	0.0044	0.0011	0.0013
	(2.07)**	(2.10)**	(2.45)**	(2.42)**	(0.79)	(0.93)
Constant	0.0083	0.0299	0.2513	0.2148	-0.2721	-0.1821
	(0.10)	(0.37)	(1.95)*	(1.75)*	(-2.66)***	(-1.84)*
R-squared	0.0080	0.0074	0.0421	0.0423	0.0282	0.0221
Number of observations	5381	5381	2648	2648	2733	2733

SIZE is the nature logarithm of the market value of equity at time t, BM, is the book to market value of the equity at time t, ILLIQ, the liquidity measure of Amihud (2002)

which takes the absolute value of returns, scaled by dollar volume, STURN, the natural logarithm of the average of share turnover over the prior 3 months, RET2_3 the cumulative return over the second through the third months prior to the current month. QFII is a dummy variable that takes the value 1 after the regulation change in 2003 and 0 in the pre 2003 period. TNAV is the nature logarithm of fund total net asset value at time t, FEE is the fund management fee charges at time t. AGE is fund age in time t. All standard errors are adjusted by clustering by stock. t-statistics are shown in parentheses.*** significant at 1%; * significant at 5%; * significant at 10%