mathematics

MDPI

Article

Does Herding and Anti-Herding Reflect Portfolio Managers' Abilities in Emerging Markets?

Dachen Sheng [1,2,*] and Heather A. Montgomery [2]

[1] International College of Liberal Arts, Yamanashi Gakuin University, 2-4-5 Sakaori, Kofu 400-8575, Yamanashi, Japan
[2] Department of Business & Economics, International Christian University, 3-10-2 Osawa, Mitaka Shi 181-8585, Tokyo, Japan; montgomery@icu.ac.jp
* Correspondence: sheng.dachen@c2c.ac.jp

Abstract: This study investigates the relationship between herding behaviors and the abilities of Chinese mutual fund managers. Adapting existing methodologies to suit the low information disclosure environment of the Chinese market, we measure herding behaviors and managers' abilities. Our analysis goes beyond traditional approaches by examining the contribution of herding outcomes to picking and timing abilities linked with mutual fund flows. Moreover, we extend this investigation to incorporate manager replacements and different market conditions. Our findings reveal that moderate herding is associated with enhanced picking abilities, particularly in bull markets. However, this effect is partly counteracted by positive mutual fund flows, suggesting that managers adjust their strategies in response to fund inflows. Excessive herding in bull markets is linked to reduced timing abilities, although this negative impact is mitigated by high turnover. Conversely, managers with anti-herding skills exhibit lower picking abilities. We observe that managerial replacements are driven by poor performance rather than considerations of current abilities. Nonetheless, under a new manager, herding behavior reflects improved picking abilities, indicating a potential shift in managerial strategies. Overall, our study provides valuable insights into the relationship between herding behaviors and managerial competencies in the Chinese mutual fund industry, highlighting the nuances of decision making in different market contexts.

Keywords: fund manager's ability; herding; anti-herding; manager's career risk; mutual fund flow

MSC: 91-11; 91-10; 91B06

check for updates

Citation: Sheng, D.; Montgomery, H.A. Does Herding and Anti-Herding Reflect Portfolio Managers' Abilities in Emerging Markets? *Mathematics* **2024**, *12*, 1220. https://doi.org/10.3390/math12081220

Academic Editors: Domenico Marino, Piluso Fabio, Jaime Gil Lafuente and Hussein A. Abdou

Received: 1 April 2024
Revised: 15 April 2024
Accepted: 16 April 2024
Published: 18 April 2024

Copyright: © 2024 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (https://creativecommons.org/licenses/by/4.0/).

1. Introduction

Mutual funds manage assets for their clients, and mutual fund managers are required to be professional, knowledgeable, and take responsibility for high ethics levels [1]. These funds can be classified into different categories according to their investment targets and strategies. Many investors choose actively managed funds, relying on mutual fund managers to actively oversee assets in pursuit of returns exceeding the market average [2,3]. Ethical (or even just appropriately incentivized) managers prioritize investors' interests and employ diverse strategies to allocate investments so as to maximize returns. Although strategies may vary in their level of activity, managing both mutual and hedge funds can shift incentives and introduce potential conflicts of interest [4]. Passive strategies, while not limited to index replication, may involve mimicking other managers' allocations, a phenomenon referred to as herding [5].

When investors select mutual funds, they consider factors such as investment targets, risk tolerance, and expected time horizons. Evaluation often includes the historical performance and volatility of the fund manager. Managers demonstrating consistently high performance with low volatility tend to attract larger fund flows [6]. Traditionally, manager performance is gauged by comparing fund returns to benchmarks. Equity funds may focus

on either value or growth stocks, each associated with distinct risks necessitating tailored performance evaluation [7]. Comparisons should be fair, considering managers' similar investment targets and strategies, as direct comparisons between differing funds may be inappropriate.

Managers' personal attributes and professional backgrounds significantly influence fund performance [8–10]. Subpar performance relative to benchmarks or peers can trigger career concerns, impacting managers' risk-taking behavior [11]. Managers may alter investment styles to manipulate performance disclosure, highlighting the importance of ethical conduct advocated by financial regulators [12]. Ethical considerations also influence investors' preferences, such as avoiding industries like tobacco and favoring socially responsible and environmentally sustainable funds [13,14].

Managerial skills are often categorized as stock picking and market timing abilities [15]. Stock picking involves selecting stocks with positive abnormal returns while minimizing exposure to those with negative abnormal returns [16]. Market timing entails entering and exiting the market strategically to capitalize on market cycles [17]. Some managers tactically invest in stocks observed to be favored by peers, leveraging mutual funds' capacity for large investments and agility in reacting to market dynamics [18]. Herding behavior not only impacts mutual fund profitability but also influences market volatility, potentially destabilizing markets [19–21].

The Chinese mutual fund market has experienced significant growth since 2015, intensifying competition among fund managers. While disclosure requirements are improving, transparency still lags behind more established financial markets. Evidence suggests that mutual funds engage in performance window dressing to attract investors [22]. Many managers are now gravitating towards ethical investments, particularly in green finance and healthcare, to support sustainable social development [23]. Given the burgeoning size of managed assets and the push for greater transparency by policymakers, the Chinese market presents an intriguing arena for studying fund managers' decision-making behaviors.

This study contributes to the existing literature in several ways. Firstly, we adapt methods of analyzing herding behavior and managerial abilities to the limited disclosure information available in the Chinese market, focusing on fund-level herding rather than stock-level herding, which is prevalent in most research [24,25]. Secondly, we move beyond the existing studies, which focus on the interaction between herding and profitability to link herding behavior with managerial abilities and we examine how behaviors differ in bear and bull markets. Thirdly, we extend the analysis beyond profitability and career risks to explore manager replacements, shedding light on the influence of past experience and personal characteristics on managerial behavior [26]. Finally, we explore how mutual fund flows impact the relationship between herding behavior and managerial abilities, offering insights into portfolio flow, size, and value-added theories.

2. Literature Review and Hypotheses

Several factors influence fund performance. The value-added theory posits that a manager's market contribution depends on both their skill level and the size of assets under management. While skilled managers can add value, unskilled ones managing large assets may incur losses [27]. Market conditions also shape manager behavior, with strategies differing between bear and bull markets [28]. Cultural and economic variations among investors lead to diverse investment preferences, impacting mutual fund operations and manager behaviors.

Herding characterizes mutual fund managers learning from peers and making similar investment decisions. Information exchange and communication facilitate herding, with managers utilizing various platforms like alumni networks, conferences, firm visits and professional forums [29–31]. Factors such as education [32], gender [33], culture [34], and professional background also influence herding behaviors. Herding may temporarily inflate stock prices but could lead to future crashes [35]. Research suggests that herding behavior is more pronounced in actively traded hedge fund investments [36], and it is

influenced by fund styles and strategies [37]. Interestingly, firm visits may mitigate herding behavior, possibly by confirming information [38].

In our study, we build upon previous research that has employed the heading measure to investigate the causal relationship between institutional trade and fund trade in order to assess the extent of herding [39]. We have made certain adaptations to facilitate the utilization of such measures. Specifically, we employ the percentage change in holdings of the top ten stocks as the dependent variable while considering the percentage change in the institutional ownership of these top ten stocks during the previous quarter as the principal independent variable. Notably, in China, fund disclosures are limited to the top ten positions for each quarter, reflecting a higher level of concentration in fund portfolios where these top positions represent a significant portion of total assets. To aggregate data for each year, we pool together the quarterly top ten positions and subsequently conduct regression analysis to estimate the coefficient of the fund's investment change on these individual stocks in relation to institutional ownership, thereby quantifying the level of herding.

Furthermore, we incorporate several control variables in our analysis. These include the last quarter's return to capture momentum, the natural logarithm of the price-to-book ratio, and the natural logarithm of market capitalization at the end of the last quarter. Equation (1) delineates our methodology along with the variables involved. The resultant coefficient of institutional ownership change serves as our measure of herding level.

$$Trade^{j}_{i,t} = \beta^{j}_{0} + \beta^{j}_{1,t}\Delta IO_{i,t-1} + \beta^{j}_{2,t}MOM_{i,t-1} + \beta^{j}_{3,t}PB_{i,t-1} + \beta^{j}_{4,t}MC_{i,t-1} + \varepsilon^{j}_{i,t} \quad (1)$$

Notations:

Trade: the *i*th stock trade of the jth fund; IO: institutional ownership; MOM: momentum; PB: price to book; MC: market capitalization

Once we have calculated the measure of herding, we categorize the degree of herding by establishing four distinct classifications: excessive herding, moderate herding, moderate anti-herding, and excessive anti-herding. Excessive herding and excessive anti-herding are determined using the 1.5 interquartile range (IQR) to identify outliers, which are then classified into the respective categories. Subsequently, the top quartile, excluding these outliers, is categorized as moderate herding or moderate anti-herding, as appropriate.

2.1. Performance and Herding

Herding and anti-herding behaviors can significantly impact fund performance. Skillful herding managers may yield higher returns, with leaders facing lower costs compared to followers [40]. Intentional herding, driven by profitability beliefs, may better reflect managerial skills [41]. Anti-herding managers, deviating from mainstream practices, may also exhibit significant performance differences [42]. Such behaviors can persistently affect future performance, with contrarian buys contributing positively while contrarian sells may negatively impact returns [43,44].

H1a: *Mutual funds overseen by managers who engage in herding behavior display significant performance distinctions in comparison to other funds.*

H1b: *Mutual funds overseen by managers who engage in anti-herding behavior display significant performance distinctions in comparison to other funds.*

2.2. Behavior and Ability

Managerial decisions and performance are influenced by mutual fund flows, with different strategies exhibiting varying sensitivity to flow changes [45]. Cash inflows and outflows, influenced by the net subscription, may potentially result in dilution effects and performance-related ramifications [46]. Empirical evidence indicates that various fund strategies may exhibit diverse sensitivities to flow performance [47]. Moreover, mutual

fund investors are aware of the strategies employed by fund managers and time their subscriptions accordingly [48,49]. Hence, there exists a necessity to incorporate the interaction term between herding behavior and cash inflow to provide a more comprehensive elucidation of the impact of this interaction on fund performance. Herding behavior may be costlier for later capital, affecting performance [50]. The endogenous reversal causality problem complicates the relationship between performance and net subscription [51]. Picking and timing scores, estimated below in Equations (2) and (3) using sector weights and returns, reflect managerial abilities influenced by herding behaviors.

$$Picking_t^j = \sum_{i=1}^{N^j} (w_{i,t}^j - w_{i,t}^m)\left(R_{t+1}^i - \beta_{i,j} R_{t+1}^m\right) \quad (2)$$

$$Timing_t^j = \sum_{i=1}^{N^j} (w_{i,t}^j - w_{i,t}^m)\left(\beta_{i,j} R_{t+1}^m\right) \quad (3)$$

Notation:

Picking: the estimated stock picking score; timing: the estimated timing score; $w_{i,t}^j$: j fund's ith sector position weight at time t; $w_{i,t}^m$: ith sector's market weight; R_{t+1}^i: return of ith sector in next period; and R_{t+1}^m: market return in the next period.

In the original research upon which Equations (2) and (3) above are based, the picking score is estimated by the weight difference between the jth fund holding of stock i and the ith stock's market weight [52]. The second bracket refers to the difference between the forward period return of stock i and the CAPM beta of stock i multiplied by the market index return. Since Chinese mutual funds do not disclose their full historical position quart-wisely, they disclose their quarterly sector holdings. We use the sector weights out of the total market, and the sector returns to replace the individual stock returns and weights to calculate the picking and timing scores since empirical evidence suggests fund managers also herd at the industry level [53] and on asset class [54]. If herding or anti-herding behaviors enhance either the picking or timing scores without diminishing the other, we characterize such behavior as indicative of managerial ability.

H2a. *Elevated levels of herding behavior are associated with higher fund manager ability.*

H2b. *Elevated levels of anti-herding behavior are associated with higher fund manager ability.*

H3a. *The stock-picking ability of managers who engage in herding behavior is influenced by the net inflow of the mutual fund they manage.*

H3b. *The market timing ability of managers who engage in herding behavior is influenced by the net inflow of the mutual fund they manage.*

2.3. Bull and Bear Market Analysis

Market conditions influence managerial attitudes and behaviors, with sentiment impacting herding and risk-taking [55,56]. Mutual fund flow dynamics differ between bull and bear markets, shaping manager strategies [57]. Attitude shifts in bull and bear markets affect risk-taking behaviors [58]. Managers are more likely to learn from each other in bull markets, while defensive strategies prevail in bear markets [28,59]. Changes in market conditions impact herding behaviors and abilities [60]. Furthermore, during bear markets, redemptions necessitate managers to maintain sufficient cash reserves to preempt any potential liquidity constraints [60]. Conversely, in bull markets, the majority of managers veer away from the index and focus on high-beta stocks in pursuit of amplified returns.

H4a. *Elevated levels of herding behavior indicate special ability in bull markets.*

H4b. *Elevated levels of anti-herding behavior indicate special ability in bull markets.*

2.4. Change Manager

Managerial behavior is closely tied to career considerations, with replacements often leading to improved performance [61,62]. The replacement of mutual fund managers entails a shift in risk dynamics [63], yet the overall level of risk-taking remains relatively unchanged [64]. At larger firms, outsourcing to advisory funds is more common than replacing managers [65]. Managers' social relationships, information resources and communication skills could influence the performance of their investments. Changes in management may alter fund strategies, with high turnover associated with increased picking and timing scores [66]. In the empirical analysis to follow, in instances where a mutual fund is overseen by multiple managers, the departure or replacement of any one of them is considered a change in management.

H5. *A change in manager performance is associated with poor performance.*

H6a: *Following a change in management where the incoming manager engages in herding behavior, such herding positively influences managerial ability.*

H6b: *Following a change in management where the incoming manager adopts anti-herding behavior, such anti-herding positively influences managerial ability.*

2.5. Herding Likelihood

Managers may resort to herding behavior driven by career apprehensions; however, superior historical performance has the potential to attract new subscriptions, thereby diminishing the propensity for herding [67,68]. As elucidated earlier, managers ought to recognize that subsequent cash inflows may entail substantially higher costs for acquiring herded stocks due to short-term price escalations, particularly pronounced during periods of high market sentiment, especially for smaller and growing stocks [69]. Consequently, managers may find it imperative to exercise greater independence in investment decisions rather than relying on the choices of their peers. The influx of net subscriptions can bolster managers' confidence and incentivize risk-taking, fostering a shift towards more autonomous decision making [70].

H7a: *Net inflows into mutual funds decrease the likelihood of herding behavior.*

H7b: *Net inflows into mutual funds increase the likelihood of engaging in anti-herding behavior.*

3. Data

The data for this study were collected from the China East Money database. China's mutual fund industry developed alongside the stock exchange and equity market. Initially, most funds were closed, behaving differently from open mutual funds due to the absence of redemption pressure. Open-end mutual funds emerged after 2000, with rapid industry growth post 2010, particularly in equity-focused funds from around 2015. We focused on equity investment mutual funds classified by the China Securities Regulatory Commission (CSRC), established before 2017, excluding those investing in Hong Kong-listed shares. We included only Class A fee structures for funds with multiple classes, resulting in a final sample of 158 funds. The data spanned quarterly reports from 2018 to 2022, allowing for a period of fund establishment post 2017. Despite the inclusion of the COVID-19 period, continuous market operations and online banking applications mitigated potential impacts.

The herding level, picking, and timing skills were estimated as previously described, with market return calculated using the Chinese Stock Index 300 (CSI 300 index). We also gathered information on fund managers, noting manager replacements within the five-year sample period. Table 1 provides variable abbreviations and treatments. The general statistics reported in Table 2 indicate stronger anti-herding observations compared to excessive herding, with moderate herding and anti-herding groups showing similar levels. The

sample period encompassed both good and bad market periods, with average positive mutual fund flows. Annual fund returns averaged approximately 14%, displaying significant variation, characteristic of emerging markets. Notably, average timing performance was negative, possibly influenced by regulatory position limits requiring Chinese funds to maintain 70% equity assets and no more than 30% cash, even in bear markets, limiting managers' timing abilities compared to markets with fewer restrictions. All empirical analysis was conducted using R.

Table 1. The table shows variable definitions.

Variable	Symbol	Variable Treatment
Excessive herding	Herd	If the herding index belongs to the higher outlier group measured by 1.5 IQR
Excessive anti-herding	Anti-herd	If the herding index belongs to the lower outlier group measured by 1.5 IQR
Moderate herding	HD	The top quarter herding index exclude Herd observations
Moderate anti-herding	ANHD	The bottom quarter herding index exclude the Anti-herd observations
Picking score	Picking	Picking score estimated using method mentioned in Section 2
	Timing	Time score estimated using method mentioned in Section 2
Manager replacement	Change	Dummy variable equals 1 if in that year any manager replacement happened for that fund
Manager replacement happen in last year	Next	Dummy variable, if manager replacement happened last year, it equals 1
Size of the fund	Size	Total assets under management
Expense ratio	Expense	The yearly expense ratio charged by the fund
Asset turnover	Turn	The fund asset turnover rate
Momentum	Mom	The previous year's Sharpe ratio
Mutual fund flow	Flow	The net mutual fund flow in that year
Institutional ownership	Inst	Current institutional ownership percentage
Age of the fund	Age	Current year minus the year of establishment
Current performance	Out	The current year performance of the fund minus the CSI 300 index performance

Table 2. The table shows the general statistics.

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
Herd	790	0.065	0.246	0	0	0	1
Anti-herd	790	0.082	0.275	0	0	0	1
HD	790	0.246	0.431	0	0	0	1
ANHD	790	0.256	0.437	0	0	1	1
Picking	790	33.006	117.895	−339.429	−39.336	103.756	579.775
Timing	790	−7.759	41.006	−187.001	−25.219	17.174	114.441
Change	790	0.182	0.386	0	0	0	1
Size	790	1496.782	2979.912	6.591	249.694	1497.921	34,709.670
Expense	790	0.015	0.001	0.000	0.015	0.015	0.015
Turn	790	284.511	198.398	6.423	136.317	380.970	1343.341
Mom	790	0.497	1.460	−2.487	−0.928	1.869	3.145
Flow	790	15.064	126.697	−89.382	−26.842	9.674	2207.388
Inst	790	18.671	22.855	0.000	0.332	30.735	98.490
Age	790	6.130	2.289	2.005	4.544	7.298	18.356
Out	790	14.080	20.750	−22.640	−0.626	24.612	106.733

4. Methodology

4.1. Performance and Herding

The initial analysis examines the relationship between herding, anti-herding behavior, and fund performance. The difference between fund performance and the China Stock Index 300 (CSI 300) performance serves as a performance indicator. The variables HD (herd)

and ANHD (anti-herding) are the focal points of the tests, with coefficient estimates on those variables indicating the contributions of herding and anti-herding to fund performance. Equations (4) and (5) illustrate these relationships. After estimating Equations (4) and (5), performance is then projected one period ahead to assess how herding and anti-herding behavior impact future fund performance, $Out_{i,t+1}$.

$$\begin{aligned} Out_{i,t} = \beta_0 + \beta_1 HD_{i,t} + \beta_2 Size_{i,t} + \beta_3 Expense_{i,t} + \beta_4 Turn_{i,t} + \\ \beta_5 Flow_{i,t} + \beta_6 Mom_{i,t} + \beta_7 Age_{i,t} + \beta_8 Inst_{i,t} + \sum YEAR + \varepsilon_{i,t} \end{aligned} \tag{4}$$

$$\begin{aligned} Out_{i,t} = \beta_0 + \beta_1 ANHD_{i,t} + \beta_2 Size_{i,t} + \beta_3 Expense_{i,t} + \beta_4 Turn_{i,t} + \\ \beta_5 Flow_{i,t} + \beta_6 Mom_{i,t} + \beta_7 Age_{i,t} + \beta_8 Inst_{i,t} + \sum YEAR + \varepsilon_{i,t} \end{aligned} \tag{5}$$

Notation:

Out: index compared outperformance; HD: moderate herding manager; ANHD: anti-herding manager; Size: total asset under management; Expense: fund expense ratio; Turn: fund's asset turnover; Flow: net fund flow; Mom: momentum; Age; fund age; and Inst: institutional investor percentage.

4.2. Behavior and Ability

As previously mentioned, investors may observe fund performance and subscriptions, potentially leading to endogeneity issues with performance and flow variables. Moreover, managers may choose to follow star managers or make decisions based on their current performance evaluation, leading to potential endogeneity problems with our main variables of interest. To address these challenges, we propose replacing directly observable performance with forward-looking estimated variables of picking and timing. This approach offers several advantages. Forward-looking estimates break the reliance on current performance as a benchmark for addressing herding or anti-herding decision endogeneity. Additionally, the non-directly observable nature of these variables helps prevent endogeneity issues. Equations (6)–(9) represent an empirical test that addresses these concerns, adding interaction terms between the "Turn" and "Flow" terms and the herding and anti-herding behavior terms.

$$\begin{aligned} Picking_{i,t} = \beta_0 + \beta_1 HD_{i,t} + \beta_2 Size_{i,t} + \beta_3 Expense_{i,t} + \beta_4 Turn_{i,t} + \\ \beta_5 Flow_{i,t} + \beta_6 Mom_{i,t} + \beta_7 Age_{i,t} + \beta_8 Inst_{i,t} + \beta_9 [Turn_{i,t} \times HD_{i,t}] + \\ \beta_{10} [Flow_{i,t} \times HD_{i,t}] + \varepsilon_{i,t} \end{aligned} \tag{6}$$

$$\begin{aligned} Timing_{i,t} = \beta_0 + \beta_1 HD_{i,t} + \beta_2 Size_{i,t} + \beta_3 Expense_{i,t} + \beta_4 Turn_{i,t} + \\ \beta_5 Flow_{i,t} + \beta_6 Mom_{i,t} + \beta_7 Age_{i,t} + \beta_8 Inst_{i,t} + \beta_9 [Turn_{i,t} \times HD_{i,t}] + \\ \beta_{10} [Flow_{i,t} \times HD_{i,t}] + \varepsilon_{i,t} \end{aligned} \tag{7}$$

$$\begin{aligned} Picking_{i,t} = \beta_0 + \beta_1 ANHD_{i,t} + \beta_2 Size_{i,t} + \beta_3 Expense_{i,t} + \beta_4 Turn_{i,t} + \\ \beta_5 Flow_{i,t} + \beta_6 Mom_{i,t} + \beta_7 Age_{i,t} + \beta_8 Inst_{i,t} + \beta_9 [Turn_{i,t} \times ANHD_{i,t}] + \\ \beta_{10} [Flow_{i,t} \times ANHD_{i,t}] + \varepsilon_{i,t} \end{aligned} \tag{8}$$

$$\begin{aligned} Timing_{i,t} = \beta_0 \quad & + \beta_1 ANHD_{i,t} + \beta_2 Size_{i,t} + \beta_3 Expense_{i,t} + \beta_4 Turn_{i,t} \\ & + \beta_5 Flow_{i,t} + \beta_6 Mom_{i,t} + \beta_7 Age_{i,t} + \beta_8 Inst_{i,t} \\ & + \beta_9 [Turn_{i,t} \times ANHD_{i,t}] + \beta_{10} [Flow_{i,t} \times ANHD_{i,t}] \\ & + \varepsilon_{i,t} \end{aligned} \tag{9}$$

Notation:

Picking: estimated picking score; Timing: estimated timing score; HD: moderate herding manager, ANHD: anti-herding manager; Size: total asset under management;

Expense: fund expense ratio; Turn: fund's asset turnover; Flow: net fund flow; Mom: momentum; Age; fund age; and Inst: institutional investor percentage.

4.3. Bull and Bear Market Analysis

The next step in the analysis is to divide the sample into bull and bear markets based on the performance of the CSI 300 in each year. If the return is positive, the year is classified as a bull market, and if it is negative, it is considered a bear market. An interesting observation after classifying the subsamples is that the average fund flow of each fund in bear years is greater than that in bull years. This phenomenon suggests that investors tend to overreact. After a sudden market drop, when investors suffer losses, they do not immediately redeem their shares. However, as the market recovers and investors regain their previous losses, they start redeeming their shares. The presence of heterogeneous bull and bear market states allows for a more accurate estimation of behavioral performance. Herding behavior is expected to perform better during a bull market, as investors are more likely to follow the crowd during periods of positive market sentiment. Conversely, during a bear market, when regulations within China typically require a larger portion of assets to be in equities, managers' ability is less likely to be a significant factor.

4.4. Change Manager

Manager replacement and its subsequent consequences are considered next. Equations (10)–(13) depict the relationship between manager replacement and fund performance. The replacement manager term is included in the model, along with the next-year and behavior interaction term. Equations (14)–(17) demonstrate the models after incorporating herding and anti-herding behavior based on the effects of last-year managers' replacement.

Equations (10)–(13) represent the relationship between picking and timing scores and various variables, including herding or anti-herding behavior, fund size, expense ratio, asset turnover, fund flow, and manager change. The coefficients capture the impact of these variables on picking and timing scores.

$$\begin{aligned} Picking_{i,t} = \beta_0 + \beta_1 HD_{i,t} + \beta_2 Size_{i,t} + \beta_3 Expense_{i,t} + \beta_4 Turn_{i,t} + \\ \beta_5 Change_{i,t} + \beta_6 Flow_{i,t} + \beta_7 Mom_{i,t} + \beta_8 Age_{i,t} + \beta_9 Inst_{i,t} + \\ \beta_{10}[Turn_{i,t} \times HD_{i,t}] + \beta_{11}[Flow_{i,t} \times HD_{i,t}] + \varepsilon_{i,t} \end{aligned} \tag{10}$$

$$\begin{aligned} Timing_{i,t} = \beta_0 \quad & +\beta_1 HD_{i,t} + \beta_2 Size_{i,t} + \beta_3 Expense_{i,t} + \beta_4 Turn_{i,t} \\ & +\beta_5 Change_{i,t} + \beta_6 Flow_{i,t} + \beta_8 Mom_{i,t} + \beta_9 Age_{i,t} \\ & +\beta_{10} Inst_{i,t} + \beta_{11}[Turn_{i,t} \times HD_{i,t}] + \beta_{12}[Flow_{i,t} \times HD_{i,t}] \\ & +\varepsilon_{i,t} \end{aligned} \tag{11}$$

$$\begin{aligned} Picking_{i,t} = \beta_0 \quad & +\beta_1 ANHD_{i,t} + \beta_2 Size_{i,t} + \beta_3 Expense_{i,t} + \beta_4 Turn_{i,t} \\ & +\beta_5 Change_{i,t} + \beta_6 Flow_{i,t} + +\beta_7 Mom_{i,t} + \beta_8 Age_{i,t} \\ & +\beta_9 Inst_{i,t} + \beta_{10}[Turn_{i,t} \times ANHD_{i,t}] \\ & +\beta_{11}[Flow_{i,t} \times ANHD_{i,t}] + \varepsilon_{i,t} \end{aligned} \tag{12}$$

$$\begin{aligned} Timing_{i,t} = \beta_0 \quad & +\beta_1 ANHD_{i,t} + \beta_2 Size_{i,t} + \beta_3 Expense_{i,t} + \beta_4 Turn_{i,t} \\ & +\beta_5 Change_{i,t} + \beta_6 Flow_{i,t} + +\beta_7 Mom_{i,t} + \beta_8 Age_{i,t} \\ & +\beta_9 Inst_{i,t} + \beta_{10}[Turn_{i,t} \times ANHD_{i,t}] \\ & +\beta_{11}[Flow_{i,t} \times ANHD_{i,t}] + \varepsilon_{i,t} \end{aligned} \tag{13}$$

In Equations (14)–(17), the previous "Flow" and "Behavior Interactivity" variables are replaced by the manager change dummy, denoted as "Change". Additionally, the

variable "Next" refers to the year after the replacement occurred to reflect the new managers' behavior and strategies. The interaction term between "Change" and "Next" captures the change in behavior after manager replacement and its impact on picking and timing abilities.

$$\begin{aligned} Picking_{i,t} = \beta_0 + \beta_1 HD_{i,t} + \beta_2 Size_{i,t} + \beta_3 Expense_{i,t} + \beta_4 Turn_{i,t} + \\ \beta_5 Change_{i,t} + \beta_6 Flow_{i,t} + \beta_7 Next_{i,t} + \beta_8 Mom_{i,t} + \beta_9 Age_{i,t} + \\ \beta_{10} Inst_{i,t} + \beta_{11}[Turn_{i,t} \times Change_{i,t}] + \beta_{12}[Flow_{i,t} \times HD_{i,t}] + \\ \beta_{13}[Next_{i,t} \times HD_{i,t}] + \varepsilon_{i,t} \end{aligned} \tag{14}$$

$$\begin{aligned} Timing_{i,t} = \beta_0 \quad & + \beta_1 HD_{i,t} + \beta_2 Size_{i,t} + \beta_3 Expense_{i,t} + \beta_4 Turn_{i,t} \\ & + \beta_5 Change_{i,t} + \beta_6 Flow_{i,t} + \beta_7 Next_{i,t} + \beta_8 Mom_{i,t} \\ & + \beta_9 Age_{i,t} + \beta_{10} Inst_{i,t} + \beta_{11}[Turn_{i,t} \times Change_{i,t}] \\ & + \beta_{12}[Flow_{i,t} \times HD_{i,t}] + \beta_{13}[Next_{i,t} \times HD_{i,t}] + \varepsilon_{i,t} \end{aligned} \tag{15}$$

$$\begin{aligned} Picking_{i,t} = \beta_0 \quad & + \beta_1 ANHD_{i,t} + \beta_2 Size_{i,t} + \beta_3 Expense_{i,t} + \beta_4 Turn_{i,t} \\ & + \beta_5 Change_{i,t} + \beta_6 Flow_{i,t} + \beta_7 Next_{i,t} + \beta_8 Mom_{i,t} \\ & + \beta_9 Age_{i,t} + \beta_{10} Inst_{i,t} + \beta_{11}[Turn_{i,t} \times Change_{i,t}] \\ & + \beta_{12}[Flow_{i,t} \times ANHD_{i,t}] + \beta_{13}[Next_{i,t} \times ANHD_{i,t}] + \varepsilon_{i,t} \end{aligned} \tag{16}$$

$$\begin{aligned} Timing_{i,t} = \beta_0 \quad & + \beta_1 ANHD_{i,t} + \beta_2 Size_{i,t} + \beta_3 Expense_{i,t} + \beta_4 Turn_{i,t} \\ & + \beta_5 Change_{i,t} + \beta_6 Flow_{i,t} + \beta_7 Next_{i,t} + \beta_8 Mom_{i,t} \\ & + \beta_9 Age_{i,t} + \beta_{10} Inst_{i,t} + \beta_{11}[Turn_{i,t} \times Change_{i,t}] \\ & + \beta_{12}[Flow_{i,t} \times ANHD_{i,t}] + \beta_{13}[Next_{i,t} \times ANHD_{i,t}] + \varepsilon_{i,t} \end{aligned} \tag{17}$$

Notations:

Picking: estimated picking score; Timing: estimated timing score; HD: moderate herding manager, ANHD: anti-herding manager; Size: total asset under management; Expense: fund expense ratio; Turn: fund's asset turnover; Flow: net fund flow; Mom: momentum; Age; fund age; Inst: institutional investor percentage; Change: dummy variable, if change of manager happens; and Next: time dummy variable, the next year after manager change.

Thus, Equations (10)–(17) provide insights into how manager replacement affects fund performance and how subsequent behavior, such as herding or anti-herding, influences picking and timing abilities under new management.

4.5. Herding Likelihood

In the final tests, logit regression is employed to estimate the likelihood of herding and anti-herding behaviors. Equations (18) and (19) illustrate these relationships. The main parameter of interest is the coefficient estimate on "Flow," representing the net fund flow. Managers need to understand that herding costs increase as they react more slowly. Therefore, the speed of their reaction to fund flows is a crucial factor. If mutual fund inflow increases managers' confidence, they may be more inclined to make independent decisions.

$$\begin{aligned} HD_{i,t} = \beta_0 + \beta_1 Flow_{i,t} + \beta_2 Turn_{i,t} + \beta_3 Size + \beta_4 Expense_{i,t} + \\ \beta_5 Mom_{i,t} + \beta_6 Age + \beta_7 Inst_{i,t} + \varepsilon_{i,t} \end{aligned} \tag{18}$$

$$\begin{aligned} ANHD_{i,t} = \beta_0 + \beta_1 Flow_{i,t} + \beta_2 Turn_{i,t} + \beta_3 Size + \beta_4 Expense_{i,t} + \\ \beta_5 Mom_{i,t} + \beta_6 Age_{i,t} + \beta_7 Inst + \varepsilon_{i,t} \end{aligned} \tag{19}$$

Notations:

HD: moderate herding manager, ANHD: anti-herding manager; Size: total asset under management; Expense: fund expense ratio; Turn: fund's asset turnover; Flow: net fund flow; Mom: momentum; Age; fund age; and Inst: institutional investor percentage.

These equations depict the likelihood of moderate herding (HD) and anti-herding (ANHD) behaviors, respectively. The coefficients capture the impact of various variables such as fund flow, asset turnover, fund size, expense ratio, momentum, fund age, and institutional investor percentage on the likelihood of herding or anti-herding behaviors. The empirical results will provide insights into the factors influencing the likelihood of managers engaging in herding or anti-herding behaviors, which are essential considerations for understanding fund manager decision-making processes.

5. Results

5.1. Performance and Herding

The findings of the empirical analysis investigating the impact of herding and anti-herding behaviors on fund performance, hypotheses H1a and H1b, are presented in Tables 3 and 4. Table 3, which reports the results of an estimation of Equation (3), reveals that while the coefficient estimates on the contribution of herding to performance are mostly positive, herding does not exhibit a statistically significant influence on current or future performance. Conversely, Table 4, which reports the results of an estimation of Equation (4), illustrates that anti-herding behavior generally hurts performance. Excessive anti-herding hurts current performance, and both excessive and moderate anti-herding exhibit a statistically significant adverse effect on future performance.

Table 3. The table shows herding and performance.

	Dependent Variable:			
	Current Performance		**Future Performance**	
	(1)	**(2)**	**(3)**	**(4)**
HD	−0.355		2.041	
	(0.711)		(1.314)	
herd		1.006		1.740
		(1.236)		(2.285)
Size	0.0002 *	0.0002 *	−0.0003 *	−0.0003 *
	(0.0001)	(0.0001)	(0.0002)	(0.0002)
Expense	−299.540	−297.210	475.495	507.456
	(429.861)	(429.746)	(793.887)	(794.821)
Turn	−0.0004	−0.0001	0.002	0.001
	(0.002)	(0.002)	(0.003)	(0.003)
Flow	0.009 ***	0.009 ***	0.003	0.003
	(0.003)	(0.003)	(0.005)	(0.005)
Mom	27.164 ***	27.150 ***	3.449 ***	3.511 ***
	(0.690)	(0.690)	(1.275)	(1.275)
Age	0.054	0.048	−0.097	−0.101
	(0.169)	(0.169)	(0.312)	(0.312)
Inst	−0.061 ***	−0.060 ***	−0.032	−0.034
	(0.014)	(0.014)	(0.026)	(0.026)
Constant	38.475 ***	38.195 ***	12.022	12.335
	(6.619)	(6.618)	(12.225)	(12.240)

Table 3. *Cont.*

	Dependent Variable:			
	Current Performance		Future Performance	
	(1)	(2)	(3)	(4)
Year Control	Y	Y	Y	Y
Observations	790	790	790	790
R^2	0.839	0.839	0.459	0.458
Adjusted R^2	0.837	0.837	0.451	0.450
Residual Std. Error	8.381 (df = 777)	8.378 (df = 777)	15.478 (df = 777)	15.496 (df = 777)
F Statistic	338.345 *** (df = 12; 777)	338.560 *** (df = 12; 777)	55.004 *** (df = 12; 777)	54.722 *** (df = 12; 777)

Note: ***, **, and * denote the statistical significance at the 1%, 5%, and 10% levels; standard errors are shown in parentheses.

Table 4. The table shows anti-herding and performance.

	Dependent Variable:			
	Current Performance		Future Performance	
	(1)	(2)	(3)	(4)
ANHD	−0.669		−3.147 **	
	(0.691)		(1.274)	
Anti-herding		−2.237 **		−5.581 ***
		(1.099)		(2.028)
Size	0.0002 *	0.0002 *	−0.0003*	−0.0003
	(0.0001)	(0.0001)	(0.0002)	(0.0002)
Expense	−327.670	−339.478	382.246	406.671
	(430.344)	(429.090)	(793.257)	(791.831)
Turn	−0.0001	−0.00001	0.002	0.002
	(0.002)	(0.002)	(0.003)	(0.003)
Flow	0.009 ***	0.010 ***	0.003	0.003
	(0.003)	(0.003)	(0.005)	(0.005)
Mom	27.142 ***	27.145 ***	3.466 ***	3.498 ***
	(0.689)	(0.688)	(1.271)	(1.270)
Age	0.059	0.065	−0.064	−0.064
	(0.169)	(0.168)	(0.311)	(0.311)
Inst	−0.060 ***	−0.057 ***	−0.031	−0.027
	(0.014)	(0.014)	(0.026)	(0.026)
Constant	38.804 ***	39.005 ***	14.685	14.222
	(6.628)	(6.607)	(12.218)	(12.192)
Year Control	Y	Y	Y	Y
Observations	790	790	790	790
R^2	0.840	0.840	0.462	0.463
Adjusted R^2	0.837	0.838	0.454	0.455
Residual Std. Error	8.377 (df = 777)	8.360 (df = 777)	15.441 (df = 777)	15.427 (df = 777)
F Statistic	338.702 *** (df = 12; 777)	340.366 *** (df = 12; 777)	55.570 *** (df = 12; 777)	55.796 *** (df = 12; 777)

Note: ***, **, and * denote the statistical significance at the 1%, 5%, and 10% levels; standard errors are shown in parentheses.

This observation suggests that anti-herding may not be an optimal investment strategy, as aligning with the mainstream tends to yield superior outcomes compared to making independent decisions. It is important to note the presence of endogeneity issues, particularly concerning current performance, as herding behavior may be influenced by managers' assessments of their own performance as well as that of benchmark or peer competitors. Future performance, while more reliable, may still be subject to anticipation of momentum effects or preemptive adjustments to mitigate anticipated poor performance. Hence, employing unobservable measures of ability may offer a more accurate evaluation of manager performance.

5.2. Behavior and Ability

The next set of empirical results report the results of the estimation of Equations (6)–(9), which explore the relationship between picking and timing abilities and herding behavior, as in hypotheses H2a, H2b, H3a, and H3b.

Table 5 illustrates the correlation between herding behavior and picking and timing abilities. Both moderate herding and excessive herding exhibit a pattern of higher picking ability but lower timing ability; however, the impact of herding on picking and timing is not statistically significant. Furthermore, we observe a negative interaction between positive mutual fund flows and both excessive and moderate herding behaviors. This implies that when mutual fund flows are substantial, the future cost of purchasing the same stock exceeds the previous cost, as herding behavior may drive up share prices due to concentrated bids. Excessive herding behavior tends to follow mutual fund inflows, and higher turnover can mitigate the potential adverse relationship between herding and timing ability. Excessive herding, coupled with increased turnover, may suggest that the fund frequently changes its investment targets, thereby offsetting the later flow in capital to encounter more expensive bids.

Table 5. The table shows herding and abilities.

	Dependent Variable:			
	Picking		**Timing**	
	(1)	**(2)**	**(3)**	**(4)**
HD	18.602		−1.494	
	(14.920)		(5.526)	
Herd		27.689		−15.651
		(27.176)		(10.044)
Size	0.0003	0.0003	0.0002	0.0003
	(0.001)	(0.001)	(0.001)	(0.001)
Expense	7679.328	8483.325	−621.636	−876.952
	(5520.650)	(5504.644)	(2044.768)	(2034.491)
Turn	−0.022	−0.030	−0.001	−0.002
	(0.023)	(0.020)	(0.008)	(0.008)
Flow	0.004	−0.010	−0.0001	0.002
	(0.033)	(0.032)	(0.012)	(0.012)
Mom	32.099 ***	31.950 ***	−6.972 ***	−6.912 ***
	(2.664)	(2.661)	(0.987)	(0.984)
Age	3.597 **	3.618 **	−0.991	−1.009
	(1.714)	(1.707)	(0.635)	(0.631)

Table 5. *Cont.*

	Dependent Variable:			
	Picking		**Timing**	
	(1)	**(2)**	**(3)**	**(4)**
Inst	−0.246	−0.257	0.087	0.087
	(0.177)	(0.176)	(0.066)	(0.065)
Turn×HD	−0.052		0.005	
	(0.050)		(0.019)	
Flow×HD	−0.219 **		0.040	
	(0.102)		(0.038)	
Turn×Herd		−0.136		0.113 ***
		(0.110)		(0.041)
Flow×Herd		−1.249 ***		0.291 **
		(0.397)		(0.147)
Constant	−111.520	−119.981	9.477	13.343
	(84.013)	(83.755)	(31.117)	(30.956)
Observations	790	790	790	790
R^2	0.176	0.182	0.066	0.077
Adjusted R^2	0.165	0.172	0.054	0.065
Residual Std. Error	107.706 (df = 779)	107.293 (df = 779)	39.893 (df = 779)	39.655 (df = 779)
F Statistic	16.635 *** (df = 10; 779)	17.362 *** (df = 10; 779)	5.464 *** (df = 10; 779)	6.465 *** (df = 10; 779)

Note: ***, **, and * denote the statistical significance at the 1%, 5%, and 10% levels; standard errors are shown in parentheses.

In Table 6, which presents the findings of the analysis of the relationship between anti-herding behavior and picking and timing skills, we observe that both moderate and excessive anti-herding behaviors are linked with diminished picking and timing abilities. However, except for moderate anti-herding behavior, which is associated with negative stock-picking abilities, most of the results are not statistically significant.

Table 6. The table shows anti-herding and abilities.

	Dependent Variable:			
	Picking		**Timing**	
	(1)	**(2)**	**(3)**	**(4)**
ANHD	−31.185 *		−6.589	
	(16.838)		(6.251)	
Anti-herd		−10.280		−14.071
		(27.457)		(10.130)
Size	0.0004	0.0004	0.0002	0.0002
	(0.001)	(0.001)	(0.001)	(0.001)
Expense	6483.331	7442.272	−774.849	−744.827
	(5527.688)	(5534.834)	(2052.010)	(2042.066)
Turn	−0.035	−0.031	−0.004	−0.001
	(0.023)	(0.021)	(0.008)	(0.008)

Table 6. *Cont.*

	Dependent Variable:			
	Picking		**Timing**	
	(1)	**(2)**	**(3)**	**(4)**
Flow	0.007	−0.033	0.009	0.009
	(0.046)	(0.033)	(0.017)	(0.012)
Mom	32.486 ***	32.475 ***	−7.076 ***	−7.078 ***
	(2.653)	(2.663)	(0.985)	(0.983)
Age	3.785 **	3.501 **	−0.981	−1.006
	(1.711)	(1.717)	(0.635)	(0.633)
Inst	−0.247	−0.253	0.087	0.100
	(0.177)	(0.178)	(0.066)	(0.066)
Turn × ANHD	0.013		0.021	
	(0.046)		(0.017)	
Flow × ANHD	−0.036		−0.006	
	(0.061)		(0.023)	
Turn × Anti-herd		−0.037		0.029
		(0.071)		(0.026)
Flow × Anti-herd		0.129		−0.042
		(0.101)		(0.037)
Constant	−82.132	−101.032	12.531	11.534
	(84.338)	(84.180)	(31.308)	(31.058)
Observations	790	790	790	790
R^2	0.180	0.173	0.066	0.069
Adjusted R^2	0.170	0.162	0.054	0.057
Residual Std. Error	107.436 (df = 779)	107.909 (df = 779)	39.883 (df = 779)	39.813 (df = 779)
F Statistic	17.110 *** (df = 10; 779)	16.278 *** (df = 10; 779)	5.506 *** (df = 10; 779)	5.798 *** (df = 10; 779)

Note: ***, **, and * denote the statistical significance at the 1%, 5%, and 10% levels; standard errors are shown in parentheses.

Collectively, these findings imply that, in the broader market context, herding behavior does not necessarily indicate specialized ability, while anti-herding behavior tends to exhibit negative picking skills.

5.3. Bull and Bear Market Analysis

The analysis next explores whether manager behavior is heterogeneous across different market states, as in relation to hypotheses H4a and H4b. Tables 7 and 8 report the herding behaviors in bull and bear markets, respectively; on the other hand, Tables 9 and 10 report the anti-herding behaviors in bull and bear markets, respectively.

In bull markets, moderate herding significantly enhances picking abilities, while excessive herding significantly impairs timing abilities. Given the large mutual fund positions, excessive herding typically requires more time than moderate herding, often resulting in market buys rather than limited-price buys. Liquidating and transitioning to other target stocks may also be prolonged in cases of excessive herding, explaining its adverse impact on timing ability. Moreover, excessive herding with high turnover mitigates its negative effect, providing further evidence of liquidity challenges.

Table 7. The table shows herding and abilities in bull markets.

	Dependent Variable:			
	Picking		**Timing**	
	(1)	**(2)**	**(3)**	**(4)**
HD	54.217 ***		7.841	
	(18.208)		(8.303)	
Herd		41.651		−32.099 **
		(31.468)		(14.200)
Size	0.002	0.002	−0.0002	0.0001
	(0.001)	(0.001)	(0.001)	(0.001)
Expense	9874.800	12,199.390	1845.753	869.286
	(9594.535)	(9646.887)	(4374.910)	(4353.233)
Turn	0.005	−0.020	−0.004	−0.004
	(0.026)	(0.024)	(0.012)	(0.011)
Flow	−0.024	−0.029	0.006	0.006
	(0.032)	(0.032)	(0.015)	(0.014)
Mom	87.541 ***	87.994 ***	−23.703 ***	−24.083 ***
	(5.832)	(5.844)	(2.659)	(2.637)
Age	0.916	0.821	−2.582 **	−2.488 **
	(2.392)	(2.391)	(1.091)	(1.079)
Inst	−0.127	−0.160	0.118	0.107
	(0.206)	(0.205)	(0.094)	(0.093)
Turn×HD	−0.127 **		−0.0001	
	(0.063)		(0.029)	
Flow×HD	−0.245		−0.045	
	(0.180)		(0.082)	
Turn×Herd		−0.200		0.218 ***
		(0.143)		(0.064)
Flow×Herd		−1.193 ***		0.227
		(0.417)		(0.188)
Constant	−244.311 *	−265.883 *	13.909	26.486
	(145.506)	(146.189)	(66.348)	(65.969)
Observations	474	474	474	474
R^2	0.365	0.365	0.154	0.171
Adjusted R^2	0.351	0.351	0.135	0.153
Residual Std. Error (df = 463)	95.934	95.940	43.744	43.294
F Statistic (df = 10; 463)	26.631 ***	26.620 ***	8.403 ***	9.546 ***

Note: ***, **, and * denote the statistical significance at the 1%, 5%, and 10% levels; standard errors are shown in parentheses.

Table 8. The table shows herding and abilities in bear markets.

	Dependent Variable:			
	Picking		**Timing**	
	(1)	**(2)**	**(3)**	**(4)**
HD	−27.146		7.688	
	(21.336)		(5.853)	
Herd		41.527		−13.818
		(47.080)		(12.829)
Size	−0.003	−0.003	0.001	0.001
	(0.003)	(0.003)	(0.001)	(0.001)
Expense	8707.031	8550.566	−1727.387	−1614.967
	(6151.305)	(6052.086)	(1687.404)	(1649.117)
Turn	−0.045	−0.028	0.004	0.001
	(0.035)	(0.030)	(0.010)	(0.008)
Flow	0.019	−0.072	0.0003	0.022
	(0.096)	(0.076)	(0.026)	(0.021)
Mom	2.890	8.853	3.362	1.704
	(15.470)	(15.218)	(4.244)	(4.147)
Age	12.828 ***	13.477 ***	−1.865 ***	−2.101 ***
	(2.257)	(2.229)	(0.619)	(0.607)
Inst	−0.498 *	−0.473 *	0.059	0.053
	(0.288)	(0.280)	(0.079)	(0.076)
Turn×HD	0.034		0.002	
	(0.069)		(0.019)	
Flow×HD	−0.265 *		0.063 *	
	(0.139)		(0.038)	
Turn×Herd		−0.255		0.076 *
		(0.155)		(0.042)
Flow×Herd		−3.403 ***		1.114 ***
		(0.862)		(0.235)
Constant	−173.552 *	−177.398 *	33.732	34.326
	(96.018)	(94.551)	(26.339)	(25.764)
Observations	316	316	316	316
R^2	0.131	0.156	0.069	0.108
Adjusted R^2	0.102	0.129	0.038	0.079
Residual Std. Error (df = 305)	102.749	101.216	28.186	27.580
F Statistic (df = 10; 305)	4.588 ***	5.659 ***	2.253 **	3.706 ***

Note: ***, **, and * denote the statistical significance at the 1%, 5%, and 10% levels; standard errors are shown in parentheses.

Table 9. The table shows anti-herding and abilities in bull markets.

	Dependent Variable:			
	Picking		**Timing**	
	(1)	**(2)**	**(3)**	**(4)**
ANHD	−40.687 **		−6.161	
	(20.126)		(9.282)	
Anti-herd		−19.366		−27.502 *
		(35.658)		(16.180)
Size	0.002	0.002	−0.0002	−0.0001
	(0.001)	(0.001)	(0.001)	(0.001)
Expense	5739.628	5201.919	2260.328	1086.475
	(9512.167)	(9708.601)	(4387.085)	(4405.374)
Turn	−0.019	−0.016	−0.007	−0.004
	(0.026)	(0.024)	(0.012)	(0.011)
Flow	0.025	−0.050	0.019	0.013
	(0.050)	(0.033)	(0.023)	(0.015)
Mom	86.554 ***	88.712 ***	−24.033 ***	−23.836 ***
	(5.777)	(5.841)	(2.664)	(2.650)
Age	1.141	1.281	−2.516 **	−2.572 **
	(2.370)	(2.402)	(1.093)	(1.090)
Inst	−0.173	−0.144	0.130	0.147
	(0.204)	(0.207)	(0.094)	(0.094)
Turn × ANHD	−0.015		0.026	
	(0.054)		(0.025)	
Flow × ANHD	−0.080		−0.018	
	(0.062)		(0.029)	
Turn × Anti-herd		−0.107		0.065
		(0.089)		(0.040)
Flow × Anti-herd		0.155		−0.058
		(0.117)		(0.053)
Constant	−154.966	−160.791	6.188	23.536
	(143.996)	(146.855)	(66.412)	(66.637)
Observations	474	474	474	474
R^2	0.378	0.363	0.152	0.159
Adjusted R^2	0.365	0.349	0.134	0.141
Residual Std. Error (df = 463)	94.925	96.079	43.780	43.597
F Statistic (df = 10; 463)	28.189 ***	26.410 ***	8.312 ***	8.772 ***

Note: ***, **, and * denote the statistical significance at the 1%, 5%, and 10% levels; standard errors are shown in parentheses.

Table 10. The table shows anti-herding and abilities in bear markets.

	Dependent Variable:			
	Picking		**Timing**	
	(1)	**(2)**	**(3)**	**(4)**
ANHD	−11.742		−10.841	
	(24.525)		(6.744)	
Anti-herd		−8.768		1.982
		(36.620)		(10.094)
Size	−0.003	−0.003	0.001	0.001
	(0.003)	(0.003)	(0.001)	(0.001)
Expense	7842.418	8287.431	−1927.034	−1556.496
	(6253.656)	(6192.816)	(1719.657)	(1706.982)
Turn	−0.040	−0.035	−0.004	0.002
	(0.035)	(0.032)	(0.010)	(0.009)
Flow	−0.139	−0.132	0.022	0.038
	(0.086)	(0.085)	(0.024)	(0.023)
Mom	6.596	6.211	3.445	2.658
	(15.592)	(15.529)	(4.288)	(4.280)
Age	12.431 ***	12.621 ***	−1.892 ***	−1.825 ***
	(2.285)	(2.278)	(0.628)	(0.628)
Inst	−0.451	−0.399	0.014	0.027
	(0.289)	(0.286)	(0.080)	(0.079)
Turn × ANHD	0.031		0.023	
	(0.071)		(0.019)	
Flow × ANHD	0.200		0.024	
	(0.147)		(0.040)	
Turn × Anti-herd		0.042		−0.003
		(0.098)		(0.027)
Flow × Anti-herd		0.194		−0.047
		(0.161)		(0.044)
Constant	−159.948	−171.327 *	42.568	32.991
	(99.048)	(96.747)	(27.237)	(26.667)
Observations	316	316	316	316
R^2	0.118	0.117	0.050	0.045
Adjusted R^2	0.089	0.088	0.019	0.014
Residual Std. Error (df = 305)	103.524	103.557	28.467	28.544
F Statistic (df = 10; 305)	4.065 ***	4.042 ***	1.608	1.434

Note: ***, **, and * denote the statistical significance at the 1%, 5%, and 10% levels; standard errors are shown in parentheses.

Conversely, herding behaviors during bear markets do not directly affect picking and timing abilities significantly. The interaction between capital inflow and turnover terms with herding behaviors yields results akin to those in bull markets and previous general herding behaviors. Specifically, if herding occurs, subsequent capital experiences higher bid prices, thus weakening picking performance. However, in bear markets where prices

drop swiftly, the ensuing capital inflow may acquire assets at lower prices, elucidating the improvement in timing ability observed with the "flow" and both moderate and excessive herding interactive terms.

Table 9 presents the results of anti-herding behavior in bull markets, while Table 10 depicts the impact of anti-herding behavior on abilities in bear markets. In bull markets, both moderate and excessive anti-herding exhibit detrimental effects on picking and timing. Specifically, moderate anti-herding significantly undermines picking, whereas excessive anti-herding significantly impairs timing. Conversely, there are no notable findings in bear markets. These results underscore that anti-herding is not a viable strategy to pursue in bull markets.

5.4. Change Manager

The next step in the analysis is to explore the relationship between manager replacement and current fund performance: hypothesis H5. Table 11 presents the findings. Notably, the coefficients associated with manager replacement terms are all negative and statistically significant, indicating that fund performance tends to suffer when manager replacement transpires.

Table 11. The table shows manager replacement and performance.

	Dependent Variable:			
	Out			
	(1)	**(2)**	**(3)**	**(4)**
HD	1.090			
	(1.880)			
Herd		1.859		
		(3.411)		
ANHD			3.185	
			(2.087)	
Anti-herd				3.469
				(3.421)
	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Change	−4.475 **	−4.515 **	−4.887 **	−4.611 **
	(2.235)	(2.218)	(2.198)	(2.214)
Expense	−31.311	−20.834	31.117	−82.584
	(690.117)	(690.215)	(681.969)	(687.894)
Turn	−0.004	−0.004	−0.003	−0.004
	(0.003)	(0.003)	(0.003)	(0.003)
Flow	0.028 ***	0.027 ***	0.046 ***	0.030 ***
	(0.004)	(0.004)	(0.006)	(0.004)
Mom	10.292 ***	10.306 ***	10.359 ***	10.313 ***
	(0.333)	(0.334)	(0.327)	(0.331)
Age	0.195	0.196	0.194	0.187
	(0.215)	(0.214)	(0.211)	(0.214)
Inst	−0.010	−0.010	−0.018	−0.007
	(0.022)	(0.022)	(0.022)	(0.022)

Table 11. *Cont.*

	Dependent Variable:			
	Out			
	(1)	**(2)**	**(3)**	**(4)**
Turn×Change	0.004	0.004	0.004	0.004
	(0.006)	(0.006)	(0.006)	(0.006)
Turn×HD	−0.004			
	(0.006)			
Turn×Herd		−0.016		
		(0.014)		
Flow×HD	−0.005			
	(0.013)			
Flow×Herd		−0.0001		
		(0.050)		
Turn×ANHD			−0.011 *	
			(0.006)	
Turn×Anti-herd				−0.012
				(0.009)
Flow×ANHD			−0.035 ***	
			(0.008)	
Flow×Anit-herd				−0.027 **
				(0.013)
Constant	9.134	9.321	8.260	10.018
	(10.522)	(10.519)	(10.422)	(10.477)
Observations	790	790	790	790
R^2	0.586	0.586	0.598	0.589
Adjusted R^2	0.579	0.580	0.592	0.583
Residual Std. Error (df = 777)	13.457	13.447	13.251	13.404
F Statistic (df = 12; 777)	91.579 ***	91.819 ***	96.493 ***	92.813 ***

Note: ***, **, and * denote the statistical significance at the 1%, 5%, and 10% levels; standard errors are shown in parentheses.

Moving forward, Tables 12 and 13 delve into a more granular analysis by dissecting performance into forward-looking picking and timing abilities. Interestingly, the manager replacement dummy variable is not statistically significant in either of these tables.

In Table 12, the observed picking properties largely mirror those identified in the herding and ability analyses. Specifically, moderate and excessive herding do not directly contribute to picking and timing. Moreover, mutual fund flow continues to interact with herding, negatively impacting picking abilities. However, higher turnover and increased fund flow interact with excessive herding, positively contributing to timing scores. The outcomes related to anti-herding behaviors echo those of the behavior and ability section, with moderate anti-herding significantly impairing the picking ability score.

Subsequently, a closer examination of Table 13 reveals that fund firms exhibit a low tolerance for current performance. Despite the fact that all coefficients pertaining to manager replacement are negative, none attain statistical significance.

Table 12. The table shows managers' herding, replacement, and abilities.

	Dependent Variable:			
	Picking		**Timing**	
	(1)	**(2)**	**(3)**	**(4)**
HD	18.494		−2.398	
	(15.063)		(5.574)	
Herd		27.721		−16.309
		(27.249)		(10.060)
Change	−3.519	−7.162	−7.367	−7.699
	(17.908)	(17.718)	(6.626)	(6.542)
Size	0.0003	0.0002	0.0002	0.0003
	(0.001)	(0.001)	(0.001)	(0.001)
Expense	7622.279	8423.584	−602.208	−855.899
	(5530.058)	(5513.537)	(2046.310)	(2035.619)
Turn	−0.021	−0.032	−0.006	−0.007
	(0.026)	(0.023)	(0.010)	(0.009)
Flow	0.004	−0.010	−0.00000	0.003
	(0.033)	(0.032)	(0.012)	(0.012)
Mom	32.094 ***	31.929 ***	−6.992 ***	−6.937 ***
	(2.668)	(2.665)	(0.987)	(0.984)
Age	3.579 **	3.579 **	−1.036	−1.056 *
	(1.719)	(1.712)	(0.636)	(0.632)
Inst	−0.250	−0.263	0.084	0.085
	(0.178)	(0.177)	(0.066)	(0.065)
Turn×Change	0.0001	0.009	0.022	0.024
	(0.047)	(0.047)	(0.018)	(0.017)
Turn×HD	−0.052		0.008	
	(0.051)		(0.019)	
Turn×Herd		−0.135		0.117 ***
		(0.111)		(0.041)
Flow×HD	−0.218 **		0.041	
	(0.102)		(0.038)	
Flow×Herd		−1.248 ***		0.290 **
		(0.398)		(0.147)
Constant	−109.878	−117.461	11.289	14.987
	(84.315)	(84.024)	(31.200)	(31.022)
Observations	790	790	790	790
R^2	0.176	0.182	0.067	0.079
Adjusted R^2	0.163	0.170	0.053	0.065
Residual Std. Error	107.836 (df = 777)	107.416 (df = 777)	39.903 (df = 777)	39.658 (df = 777)
F Statistic	13.839 *** (df = 12; 777)	14.454 *** (df = 12; 777)	4.684 *** (df = 12; 777)	5.543 *** (df = 12; 777)

Note: ***, **, and * denote the statistical significance at the 1%, 5%, and 10% levels; standard errors are shown in parentheses.

Table 13. The table shows managers' anti-herding, replacement, and replacement abilities.

	Dependent Variable:			
	Picking		**Timing**	
	(1)	**(2)**	**(3)**	**(4)**
ANHD	−30.823 *		−7.176	
	(16.939)		(6.281)	
Anti-herd		−9.557		−14.417
		(27.573)		(10.164)
Change	−4.515	−5.037	−7.598	−6.744
	(17.844)	(17.844)	(6.617)	(6.578)
Size	0.0003	0.0004	0.0001	0.0002
	(0.001)	(0.001)	(0.001)	(0.001)
Expense	6435.898	7382.915	−758.345	−714.205
	(5535.994)	(5544.269)	(2052.827)	(2043.817)
Turn	−0.035	−0.031	−0.010	−0.006
	(0.026)	(0.024)	(0.010)	(0.009)
Flow	0.008	−0.032	0.010	0.010
	(0.046)	(0.033)	(0.017)	(0.012)
Mom	32.478 ***	32.464 ***	−7.106 ***	−7.102 ***
	(2.657)	(2.667)	(0.985)	(0.983)
Age	3.760 **	3.474 **	−1.031	−1.047 *
	(1.717)	(1.722)	(0.637)	(0.635)
Inst	−0.251	−0.258	0.084	0.098
	(0.178)	(0.179)	(0.066)	(0.066)
Turn×Change	0.002	0.003	0.024	0.021
	(0.047)	(0.047)	(0.018)	(0.017)
Turn×ANHD	0.012		0.024	
	(0.047)		(0.017)	
Flow×ANHD	−0.037		−0.007	
	(0.061)		(0.023)	
Turn×Anti-herd		−0.039		0.031
		(0.071)		(0.026)
Flow×Anti-herd		0.128		−0.042
		(0.102)		(0.037)
Constant	−80.483	−99.074	14.371	12.821
	(84.604)	(84.442)	(31.372)	(31.128)
Observations	790	790	790	790
R^2	0.180	0.173	0.068	0.071
Adjusted R^2	0.168	0.160	0.054	0.057
Residual Std. Error	107.564 (df = 777)	108.037 (df = 777)	39.886 (df = 777)	39.826 (df = 777)
F Statistic	14.236 *** (df = 12; 777)	13.547 *** (df = 12; 777)	4.742 *** (df = 12; 777)	4.952 *** (df = 12; 777)

Note: ***, **, and * denote the statistical significance at the 1%, 5%, and 10% levels; standard errors are shown in parentheses.

It is worth noting that underperformance is not a continuous phenomenon. When manager replacement transpires, forward-looking abilities do not significantly deteriorate.

Even in cases where managers remain unchanged, their future performance may not markedly lag behind that of their counterparts, as evidenced by their ability scores.

We are also interested in what happens if the new manager uses herding or anti-herding strategies. Do they increase the picking and timing scores? If the new manager implements herding or anti-herding strategies that truly reflect greater ability, then such behavior indirectly reflects some skills and abilities. Tables 14 and 15 report the results. The variable "Next" is a dummy variable equal to one when it is the following the year right after manager replacement occurs. Interest is the interaction term between "next" and herding and anti-herding behaviors. In Table 14, all of the interaction terms have positive coefficients, and moderate herding significantly contributes to picking. Table 15 shows that even without a significant effect, all the coefficients of the interaction terms have negative coefficients. The results show that if the new manager switches to moderate herding strategies, it will reflect greater picking skills.

Table 14. The table shows new managers' herding behaviors and abilities.

	Dependent Variable:			
	Picking		**Timing**	
	(1)	**(2)**	**(3)**	**(4)**
HD	−0.207		−0.485	
	(9.839)		(3.646)	
Herd		−1.402		5.245
		(17.395)		(6.454)
Size	0.0004	0.0004	0.0001	0.0001
	(0.001)	(0.001)	(0.001)	(0.001)
Change	−6.202	−9.409	−7.429	−6.979
	(17.823)	(17.758)	(6.604)	(6.588)
NEXT	−18.842	−12.302	−2.786	−2.720
	(11.872)	(10.691)	(4.399)	(3.966)
Expense	7626.975	8266.720	−574.980	−674.008
	(5525.053)	(5515.384)	(2047.332)	(2046.181)
Turn	−0.033	−0.038 *	−0.005	−0.004
	(0.023)	(0.023)	(0.009)	(0.009)
Flow	0.001	−0.011	−0.00001	0.003
	(0.033)	(0.032)	(0.012)	(0.012)
Mom	32.235 ***	32.127 ***	−6.976 ***	−7.072 ***
	(2.666)	(2.667)	(0.988)	(0.989)
Age	3.600 **	3.600 **	−1.031	−1.011
	(1.717)	(1.714)	(0.636)	(0.636)
Inst	−0.241	−0.266	0.083	0.086
	(0.178)	(0.177)	(0.066)	(0.066)
Turn×Change	0.007	0.014	0.021	0.020
	(0.047)	(0.047)	(0.017)	(0.017)
Flow×HD	−0.231 **		0.043	
	(0.102)		(0.038)	

Table 14. *Cont.*

	Dependent Variable:			
	Picking		**Timing**	
	(1)	**(2)**	**(3)**	**(4)**
Next×HD	42.697 *		−0.866	
	(25.733)		(9.535)	
Flow×Herd		−1.160 ***		0.253 *
		(0.403)		(0.149)
Next×Herd		39.174		12.153
		(66.223)		(24.568)
Constant	−103.538	−111.467	10.984	11.584
	(84.157)	(84.011)	(31.185)	(31.168)
Observations	790	790	790	790
R^2	0.179	0.183	0.068	0.070
Adjusted R^2	0.165	0.169	0.052	0.054
Residual Std. Error	107.726 (df = 776)	107.484 (df = 776)	39.918 (df = 776)	39.876 (df = 776)
F Statistic	12.998 *** (df = 13; 776)	13.326 *** (df = 13; 776)	4.351 *** (df = 13; 776)	4.487 *** (df = 13; 776)

Note: ***, **, and * denote the statistical significance at the 1%, 5%, and 10% levels; standard errors are shown in parentheses.

Table 15. The table shows new managers' anti-herding behavior and abilities.

	Dependent Variable:			
	Picking		**Timing**	
	(1)	**(2)**	**(3)**	**(4)**
ANHD	−23.184 **		1.076	
	(9.929)		(3.688)	
Anti-herd		−11.783		−4.032
		(16.129)		(5.961)
Change	−5.203	−7.494	−7.249	−6.889
	(17.849)	(17.873)	(6.629)	(6.606)
Next	−3.333	−6.050	−1.525	−2.676
	(12.629)	(11.025)	(4.691)	(4.075)
Size	0.0004	0.001	0.0001	0.0002
	(0.001)	(0.001)	(0.001)	(0.001)
Expense	6809.747	7652.045	−507.339	−696.059
	(5529.498)	(5538.439)	(2053.768)	(2047.049)
Turn	−0.032	−0.036	−0.004	−0.003
	(0.023)	(0.023)	(0.009)	(0.009)
Flow	0.007	−0.033	0.009	0.010
	(0.046)	(0.033)	(0.017)	(0.012)
Mom	32.661 ***	32.872 ***	−7.024 ***	−7.064 ***
	(2.659)	(2.674)	(0.987)	(0.988)

Table 15. *Cont.*

	Dependent Variable:			
	Picking		Timing	
	(1)	(2)	(3)	(4)
Age	3.808 **	3.595 **	−1.014	−1.037
	(1.717)	(1.721)	(0.638)	(0.636)
Inst	−0.254	−0.257	0.083	0.096
	(0.178)	(0.179)	(0.066)	(0.066)
Turn×Change	0.001	0.008	0.021	0.020
	(0.047)	(0.047)	(0.017)	(0.017)
Flow×ANHD	−0.037		−0.009	
	(0.061)		(0.023)	
Next×ANHD	−18.586		−3.935	
	(22.909)		(8.509)	
Flow×Anti-herd		0.127		−0.048
		(0.101)		(0.037)
Next×Anti-herd		−58.067		−0.366
		(37.688)		(13.930)
Constant	−86.630	−101.682	9.132	12.315
	(84.315)	(84.364)	(31.316)	(31.182)
Observations	790	790	790	790
R^2	0.182	0.176	0.067	0.070
Adjusted R^2	0.168	0.163	0.051	0.054
Residual Std. Error	107.542 (df = 776)	107.887 (df = 776)	39.943 (df = 776)	39.876 (df = 776)
F Statistic	13.248 *** (df = 13; 776)	12.782 *** (df = 13; 776)	4.271 *** (df = 13; 776)	4.487 *** (df = 13; 776)

Note: ***, **, and * denote the statistical significance at the 1%, 5%, and 10% levels; standard errors are shown in parentheses.

5.5. Herding Likelihood

The final set of analyses explores the likelihood of herding behavior among fund managers: a test of hypotheses H7a and H7b. The results, reported in Table 16, reveal that a higher fund flow correlates with a reduced likelihood of herding but an increased likelihood of moderate anti-herding. This suggests that managers are cognizant of the fact that herding behaviors inflate stock prices, resulting in subsequent fund flows incurring higher costs. Another possible explanation for the uptick in anti-herding behavior could be the boost in decision confidence among fund managers due to net fund flows, thereby fostering more independent ideas. However, as demonstrated earlier, such independent decisions unfortunately correspond to lower ability and underperformance in the market.

5.6. Summary of Findings and Discussion

The findings presented above underscore the reflection of managerial abilities through both picking and timing dimensions, as evidenced by herding and anti-herding behaviors. Additionally, the results highlight that managers' career risk is more closely linked to current performance rather than their underlying abilities. Table 17 provides a summary of these key findings.

In many emerging markets, such as China, mutual funds often exhibit lower levels of transparency and disclosure compared to more developed markets. While anti-herding funds are reported to outperform herding funds in developed markets like the US, the

opposite holds true in China. This discrepancy can be attributed to differences in market participation. In the US, institutional investors and portfolio managers comprise a significant portion of market participants. These sophisticated investors typically make informed decisions rather than blindly following trends. However, in China, institutional investors represent a smaller fraction of overall trading volume, with the majority being individual investors [71].

Individual investors in China often lack access to comprehensive information and tend to rely on public news and mutual funds for guidance. Consequently, they are more inclined to follow the herd, believing that funds possess superior information. This collective behavior of individual investors exacerbates the impact of fund herding on stock prices, leading herding managers to outperform their anti-herding counterparts [41].

Moreover, the interconnectedness among fund managers in China's finance industry contributes to herding behavior. Given that asset management is highly regarded and typically requires advanced degrees from prestigious Chinese universities, portfolio managers often share investment concepts and strategies during private gatherings. This informal networking provides opportunities for herding behavior to emerge [30]. When numerous fund managers converge on the same stocks, it sends a strong signal to individual investors, prompting them to follow suit, further driving up share prices.

Additionally, China's social culture, characterized by collectivism, reinforces the tendency for individuals to conform to group behavior rather than exercise independent judgment [34]. Lack of professional knowledge further compounds this phenomenon, as individual investors prefer to emulate the actions of others rather than make informed decisions on their own.

Table 16. The table shows behavior likelihood.

	Dependent variable:			
	Herd	**HD**	**Anit-Herd**	**ANHD**
	(1)	**(2)**	**(3)**	**(4)**
Flow	−0.011 ***	−0.003 **	0.001	0.001 *
	(0.004)	(0.001)	(0.001)	(0.001)
Turn	−0.004 ***	−0.003 ***	0.001 **	0.001 **
	(0.001)	(0.001)	(0.001)	(0.0004)
Size	0.00004	−0.00002	0.00005	−0.00001
	(0.00004)	(0.00003)	(0.00004)	(0.00003)
Expense	−81.348	70.526	−141.164	−164.839
	(152.618)	(142.570)	(123.051)	(114.298)
Mom	0.262 **	0.044	−0.061	−0.022
	(0.110)	(0.059)	(0.092)	(0.058)
Age	−0.025	−0.023	−0.039	0.048
	(0.077)	(0.040)	(0.061)	(0.035)
Inst	0.005	−0.005	0.015 ***	0.005
	(0.007)	(0.004)	(0.005)	(0.004)
Constant	−0.831	−1.094	−0.882	0.705
	(2.360)	(2.162)	(1.901)	(1.737)
Observations	790	790	790	790

Note: ***, **, and * denote the statistical significance at the 1%, 5%, and 10% levels; standard errors are shown in parentheses.

Table 17. The table shows a summary of the findings.

Hypotheses	Validation
H1a: Mutual funds overseen by managers who engage in herding behavior display significant performance distinctions in comparison to other funds.	Rejected
H1b: Mutual funds overseen by managers who engage in anti-herding behavior display significant performance distinctions in comparison to other funds.	Supported: anti-herding managers underperform.
H2a. Elevated levels of herding behavior are associated with higher fund manager ability.	Rejected
H2b. Elevated levels of anti-herding behavior are associated with higher fund manager ability.	Supported: moderate anti-herding reflects lower picking ability.
H3a. The stock picking ability of managers who engage in herding behavior is influenced by the net inflow of the mutual fund they manage.	Supported: the fund managers with positive mutual fund flow have lower picking skills if they herd.
H3b. The market timing ability of managers who engage in herding behavior is influenced by the net inflow of the mutual fund they manage.	Rejected.
H4a. Elevated levels of herding behavior indicate special ability in bull markets.	Supported: herding reflects higher picking but lower timing abilities in bull markets.
H4b. Elevated levels of anti-herding behavior indicate special ability in bull markets.	Supported: higher moderate anti-herding shows lower picking ability and higher excessive anti-herding shows lower timing ability in bull markets.
H5. A change in manager performance is associated with poor performance.	Supported: fund firms are more current-performance-focused rather than abilities-focused.
H6a: Following a change in management where the incoming manager engages in herding behavior, such herding positively influences managerial ability.	Supported: the new herding strategies show higher picking ability.
H6b: Following a change in management where the incoming manager adopts anti-herding behavior, such anti-herding positively influences managerial ability.	Rejected.
H7a: Net inflows into mutual funds decrease the likelihood of herding behavior.	Supported: managers have a clear mind about herding and costs of herding relationships.
H7b: Net inflows into mutual funds increase the likelihood of engaging in anti-herding behavior.	Supported: managers are more likely to make independent decisions based on larger fund flow.

6. Conclusions

In conclusion, our research sheds light on the dynamics of herding and anti-herding behaviors in the Chinese mutual fund market, offering insights into their implications for fund performance and managerial decision making.

We find that in the Chinese market context, herding behavior may indicate higher picking skills but lower timing skills, particularly in bull markets. Conversely, anti-herding behaviors generally exhibit lower picking skills. Importantly, our analysis underscores the significance of current performance over inherent abilities when assessing managerial performance, especially in the context of career risk.

Our findings also highlight the influence of mutual fund flows on managerial decision making. Managers may become more inclined towards independent decision making in response to positive fund flows, but this may not necessarily lead to favorable outcomes, as demonstrated by our analyses.

As the Chinese mutual fund industry continues to evolve rapidly, with the emergence of funds with shorter histories and specialized focuses, further research into the impact of sector constraints on herding behaviors and their implications for performance would

be valuable. Additionally, exploring interim trading behaviors and their relationship with performance could provide deeper insights into the abilities reflected by herding behaviors.

Author Contributions: Conceptualization—D.S. and H.A.M.; Methodology—D.S. and H.A.M.; Validation—D.S. and H.A.M.; Formal Analysis—D.S. and H.A.M.; Resources—D.S. and H.A.M.; Writing—Original Draft—D.S. and H.A.M.; Writing—Review and Editing—D.S. and H.A.M. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Data Availability Statement: The data that support the findings of this study are available from the corresponding author upon reasonable request.

Conflicts of Interest: The authors declare no conflicts of interest.

References

1. Renneboog, L.; Ter Horst, J.; Zhang, C. Is ethical money financially smart? Nonfinancial attributes and money flows of socially responsible investment funds. *J. Financ. Intermediation* **2011**, *20*, 562–588. [CrossRef]
2. Müller, S.; Weber, M. Financial literacy and mutual fund investments: Who buys actively managed funds? *Schmalenbach Bus. Rev.* **2010**, *62*, 126–153. [CrossRef]
3. Ivković, Z.; Weisbenner, S. Individual investor mutual fund flows. *J. Financ. Econ.* **2009**, *92*, 223–237. [CrossRef]
4. Del Guercio, D.; Genc, E.; Tran, H. Playing favorites: Conflicts of interest in mutual fund management. *J. Financ. Econ.* **2018**, *128*, 535–557. [CrossRef]
5. Cuthbertson, K.; Nitzsche, D.; O'Sullivan, N. A review of behavioural and management effects in mutual fund performance. *Int. Rev. Financ. Anal.* **2016**, *44*, 162–176. [CrossRef]
6. Cashman, G.D.; Nardari, F.; Deli, D.N.; Villupuram, S.V. Investor behavior in the mutual fund industry: Evidence from gross flows. *J. Econ. Financ.* **2014**, *38*, 541–567. [CrossRef]
7. Lehmann, B.N.; Modest, D.M. Mutual fund performance evaluation: A comparison of benchmarks and benchmark comparisons. *J. Financ.* **1987**, *42*, 233–265. [CrossRef]
8. Andreu, L.; Puetz, A. Choosing two business degrees versus choosing one: What does it tell about mutual fund managers' investment behavior? *J. Bus. Res.* **2017**, *75*, 138–146. [CrossRef]
9. Chevalier, J.; Ellison, G. Are some mutual fund managers better than others? Cross-sectional patterns in behavior and performance. *J. Financ.* **1999**, *54*, 875–899. [CrossRef]
10. Golec, J.H. The effects of mutual fund managers' characteristics on their portfolio performance, risk and fees. *Financ. Serv. Rev.* **1996**, *5*, 133–147. [CrossRef]
11. Kempf, A.; Ruenzi, S.; Thiele, T. Employment risk, compensation incentives, and managerial risk taking: Evidence from the mutual fund industry. *J. Financ. Econ.* **2009**, *92*, 92–108. [CrossRef]
12. Dyakov, T.; Harford, J.; Qiu, B. Better kept in the dark? Portfolio disclosure and agency problems in mutual funds. *J. Financ. Quant. Anal.* **2022**, *57*, 1529–1563. [CrossRef]
13. Li, Z.F.; Patel, S.; Ramani, S. The role of mutual funds in corporate social responsibility. *J. Bus. Ethics* **2021**, *174*, 715–737. [CrossRef]
14. Steen, M.; Moussawi, J.T.; Gjolberg, O. Is there a relationship between Morningstar's ESG ratings and mutual fund performance? *J. Sustain. Financ. Invest.* **2020**, *10*, 349–370. [CrossRef]
15. Daniel, K.; Grinblatt, M.; Titman, S.; Wermers, R. Measuring mutual fund performance with characteristic-based benchmarks. *J. Financ.* **1997**, *52*, 1035–1058. [CrossRef]
16. Wermers, R. Mutual fund performance: An empirical decomposition into stock-picking talent, style, transactions costs, and expenses. *J. Financ.* **2000**, *55*, 1655–1695. [CrossRef]
17. Liao, L.; Zhang, X.; Zhang, Y. Mutual fund managers' timing abilities. *Pac.-Basin Financ. J.* **2017**, *44*, 80–96. [CrossRef]
18. Lu, S.; Li, S.; Chen, N. Robust return efficiency and herding behavior of fund managers. *Financ. Res. Lett.* **2022**, *46*, 102267. [CrossRef]
19. Fei, T.; Liu, X. Herding and market volatility. *Int. Rev. Financ. Anal.* **2021**, *78*, 101880. [CrossRef]
20. Xue, W.; He, Z.; Hu, Y. The destabilizing effect of mutual fund herding: Evidence from China. *Int. Rev. Financ. Anal.* **2023**, *88*, 102611. [CrossRef]
21. Xu, N.; Jiang, X.; Chan, K.C.; Wu, S. Analyst herding and stock price crash risk: Evidence from China. *J. Int. Financ. Manag. Account.* **2017**, *28*, 308–348. [CrossRef]
22. Yu, X.; Liu, J.; Lien, D. A new measure of fund window dressing and its application to Chinese mutual fund market. *Q. Rev. Econ. Financ.* **2023**, *89*, 63–72. [CrossRef]
23. Martí-Ballester, C.P. Analysing the financial performance of sustainable development goals-themed mutual funds in China. *Sustain. Prod. Consum.* **2021**, *27*, 858–872. [CrossRef]
24. Yao, J.; Ma, C.; He, W.P. Investor herding behaviour of Chinese stock market. *Int. Rev. Econ. Financ.* **2014**, *29*, 12–29. [CrossRef]

25. Tan, L.; Chiang, T.C.; Mason, J.R.; Nelling, E. Herding behavior in Chinese stock markets: An examination of A and B shares. *Pac.-Basin Financ. J.* **2008**, *16*, 61–77. [CrossRef]
26. Chen, R.; Gao, Z.; Zhang, X.; Zhu, M. Mutual fund managers' prior work experience and their investment skill. *Financ. Manag.* **2018**, *47*, 3–24. [CrossRef]
27. Berk, J.B.; Van Binsbergen, J.H. Measuring skill in the mutual fund industry. *J. Financ. Econ.* **2015**, *118*, 1–20. [CrossRef]
28. Lee, J.S.; Yen, P.H.; Chan, K.C. Market states and disposition effect: Evidence from Taiwan mutual fund investors. *Appl. Econ.* **2013**, *45*, 1331–1342. [CrossRef]
29. Li, X.; Hou, K. Over-weighting risk factor augmented with mutual fund managers' social networks. *Pac.-Basin Financ. J.* **2023**, *77*, 101914. [CrossRef]
30. Liang, Q.; Liao, J.; Ling, L. Social interactions and mutual fund portfolios: The role of alumni networks in China. *China Financ. Rev. Int.* **2022**, *12*, 433–450. [CrossRef]
31. Shen, Y.; Mao, X.; Liu, Y. Alumni network, mutual fund herding and information spillover: Evidence from China. *Pac.-Basin Financ. J.* **2024**, *83*, 102265. [CrossRef]
32. Gottesman, A.A.; Morey, M.R. Manager education and mutual fund performance. *J. Empir. Financ.* **2006**, *13*, 145–182. [CrossRef]
33. Wang, L.; Wang, Y.; Li, B. The influence of the social networks of fund managers on the herding behavior of SIFs in China. *Humanit. Soc. Sci. Commun.* **2023**, *10*, 181. [CrossRef]
34. Chang, C.H.; Lin, S.J. The effects of national culture and behavioral pitfalls on investors' decision-making: Herding behavior in international stock markets. *Int. Rev. Econ. Financ.* **2015**, *37*, 380–392. [CrossRef]
35. Deng, X.; Hung, S.; Qiao, Z. Mutual fund herding and stock price crashes. *J. Bank. Financ.* **2018**, *94*, 166–184. [CrossRef]
36. Boyson, N.M. Implicit incentives and reputational herding by hedge fund managers. *J. Empir. Financ.* **2010**, *17*, 283–299. [CrossRef]
37. Huang, H.H.; Hung, R.J.; Wang, C.P.; Hsieh, Y.P. Does fund manager herding vary over the business cycle? *Appl. Econ. Lett.* **2010**, *17*, 1531–1535. [CrossRef]
38. Quan, X.; Xiang, C.; Li, D.; Tan, K.J.K. To see is to believe: Corporate site visits and mutual fund herding. *Financ. Manag.* **2023**, *52*, 711–740. [CrossRef]
39. Jiang, H.; Verardo, M. Does herding behavior reveal skill? An analysis of mutual fund performance. *J. Financ.* **2018**, *73*, 2229–2269. [CrossRef]
40. Koch, A. Herd behavior and mutual fund performance. *Manag. Sci.* **2017**, *63*, 3849–3873. [CrossRef]
41. Li, W.; Rhee, G.; Wang, S.S. Differences in herding: Individual vs. institutional investors. *Pac.-Basin Financ. J.* **2017**, *45*, 174–185. [CrossRef]
42. Gupta-Mukherjee, S. When active fund managers deviate from their peers: Implications for fund performance. *J. Bank. Financ.* **2013**, *37*, 1286–1305. [CrossRef]
43. An, L.; Argyle, B. Overselling winners and losers: How mutual fund managers' trading behavior affects asset prices. *J. Financ. Mark.* **2021**, *55*, 100580. [CrossRef]
44. Lee, J.B.T.; Ma, J.; Margaritis, D.; Yang, W. Is anti-herding always a smart choice? Evidence from mutual funds. *Int. Rev. Financ. Anal.* **2023**, *90*, 102824. [CrossRef]
45. Clarke, A.; Cullen, G.; Gasbarro, D. Mutual fund trades: Asymmetric liquidity preferences and fund performance. *J. Financ. Res.* **2007**, *30*, 515–532. [CrossRef]
46. Greene, J.T.; Hodges, C.W. The dilution impact of daily fund flows on open-end mutual funds. *J. Financ. Econ.* **2002**, *65*, 131–158. [CrossRef]
47. Wang, Y.; Watson, J.; Wickramanayake, J. The global financial crisis and the mutual fund flow–performance relationship. *World Econ.* **2018**, *41*, 3172–3193. [CrossRef]
48. Muñoz, F.; Vicente, R. Hindsight effect: What are the actual cash flow timing skills of mutual fund investors? *J. Empir. Financ.* **2018**, *45*, 181–193. [CrossRef]
49. Choi, D.; Kahraman, B.; Mukherjee, A. Learning about mutual fund managers. *J. Financ.* **2016**, *71*, 2809–2860. [CrossRef]
50. Wermers, R. Mutual fund herding and the impact on stock prices. *J. Financ.* **1999**, *54*, 581–622. [CrossRef]
51. Berk, J.B.; Green, R.C. Mutual fund flows and performance in rational markets. *J. Political Econ.* **2004**, *112*, 1269–1295. [CrossRef]
52. Kacperczyk, M.; Nieuwerburgh, S.V.; Veldkamp, L. Time-varying fund manager skill. *J. Financ.* **2014**, *69*, 1455–1484. [CrossRef]
53. Celiker, U.; Chowdhury, J.; Sonaer, G. Do mutual funds herd in industries? *J. Bank. Financ.* **2015**, *52*, 1–16. [CrossRef]
54. Raddatz, C.; Schmukler, S.L. Deconstructing herding: Evidence from pension fund investment behavior. *J. Financ. Serv. Res.* **2013**, *43*, 99–126. [CrossRef]
55. Hudson, Y.; Yan, M.; Zhang, D. Herd behaviour & investor sentiment: Evidence from UK mutual funds. *Int. Rev. Financ. Anal.* **2020**, *71*, 101494. [CrossRef]
56. Liao, T.L.; Huang, C.J.; Wu, C.Y. Do fund managers herd to counter investor sentiment? *J. Bus. Res.* **2011**, *64*, 207–212. [CrossRef]
57. Shrider, D.G. Running from a bear: How poor stock market performance affects the determinants of mutual fund flows. *J. Bus. Financ. Account.* **2009**, *36*, 987–1006. [CrossRef]
58. Popescu, M.; Xu, Z. Market states and mutual fund risk shifting. *Manag. Financ.* **2017**, *43*, 828–838. [CrossRef]
59. D'Arcangelis, A.M.; Rotundo, G. Herding in mutual funds: A complex network approach. *J. Bus. Res.* **2021**, *129*, 679–686. [CrossRef]

60. Lee, C.C.; Chen, M.P.; Hsieh, K.M. Industry herding and market states: Evidence from Chinese stock markets. *Quant. Financ.* **2013**, *13*, 1091–1113. [CrossRef]
61. Clare, A.; Motson, N.; Sapuric, S.; Todorovic, N. What impact does a change of fund manager have on mutual fund performance? *Int. Rev. Financ. Anal.* **2014**, *35*, 167–177. [CrossRef]
62. Ghalke, A.; Kulkarni, S. Mutual fund manager turnover: An empirical investigation of performance. *Int. J. Manag. Financ.* **2022**, *18*, 869–887. [CrossRef]
63. Khorana, A. Performance changes following top management turnover: Evidence from open-end mutual funds. *J. Financ. Quant. Anal.* **2001**, *36*, 371–393. [CrossRef]
64. Andreu, L.; Sarto, J.L.; Serrano, M. Implications of manager replacement: Evidence from the Spanish mutual fund industry. *Appl. Econ.* **2015**, *47*, 1366–1387. [CrossRef]
65. Moreno, D.; Rodriguez, R.; Zambrana, R. Management sub-advising in the mutual fund industry. *J. Financ. Econ.* **2018**, *127*, 567–587. [CrossRef]
66. Chou, D.W.; Huang, P.C.; Lai, C.W. New mutual fund managers: Why do they alter portfolios? *J. Bus. Res.* **2016**, *69*, 2167–2175. [CrossRef]
67. Casavecchia, L. Fund managers' herding and the sensitivity of fund flows to past performance. *Int. Rev. Financ. Anal.* **2016**, *47*, 205–221. [CrossRef]
68. Seok, S.; Cho, H.; Lee, J.E.; Ryu, D. Indirect effects of flow-performance sensitivity on fund performance. *Borsa Istanb. Rev.* **2023**, *23*, S1–S14. [CrossRef]
69. Guo, X.; Gu, C.; Zhang, C.; Li, S. Institutional herding and investor sentiment. *J. Financ. Mark.* **2024**, *68*, 100891. [CrossRef]
70. Chevalier, J.; Ellison, G. Risk taking by mutual funds as a response to incentives. *J. Political Econ.* **1997**, *105*, 1167–1200. [CrossRef]
71. Bailey, W.; Cai, J.; Cheung, Y.L.; Wang, F. Stock returns, order imbalances, and commonality: Evidence on individual, institutional, and proprietary investors in China. *J. Bank. Financ.* **2009**, *33*, 9–19. [CrossRef]

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.