Institutional Investors Herding Behaviour under Analysts Rating

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Abstract: This paper selects 64 quarters of institutional investor data from 2005 to 2020 as a sample, and uses the LSV model to measure the herding behaviour of institutional investors. The static panel model of the effect is used to explore the performance of institutional investors' herd behaviour under good news and bad news, and the impact on the cumulative excess returns of stocks in a certain period of time in the future. The study found that Chinese institutional investors have irrational herd behaviour, and naturally show significant buying herd behaviour when external information is favourable, and show significant selling herd behaviour under bad information. The degree of buying herd behaviour on good news is lower than that of selling herd behaviour on bad news, and as the number of securities analysts tracking stocks in the market increases, the information is more fully exposed.

Keywords: Institutional Investor, Analyst Rating, Herding Behaviour

1. Introduction

In the past 20 years, Chinese institutional investors have grown rapidly and become an important force in the A-share market, forming a diverse institutional investor structure including funds, securities companies, insurance, Qualified Foreign Institutional Investors (QFII), and corporate annuities. , Although institutional investors theoretically have wider information channels, more efficient asset allocation efficiency, faster price signal transmission paths and more mature risk control capabilities than individual investors, but The growth of the institutional investor team has not effectively suppressed the large fluctuations in the stock market, and the stock market still shows great uncertainty, especially when considering external factors such as their own reputation or performance appraisal pressure. Irrational investment behaviour, the most typical of which is the herd effect.

Securities analysts have always been important transmitters of information in the securities market. Some studies have pointed out that while the foundation follows the ratings of external analysts to buy stocks, as the shareholding ratio of the fund increases, external analysts rate the stock favorably. The number will also rise, with a significant positive effect between the two (Mola and Guidolin, 2009), not only that, but the optimistic or pessimistic rating of the former analyst within the analyst group will significantly affect the subsequent two analysts rating, which prompts analysts to herd behavior, and the more concentrated positive information may lead to a certain vulnerability of the bull market (Welch, 2000). Guo et al. (2020) pointed out that the fund's herding behavior is consistent with overweight stocks that are upgraded and underweight stocks that are downgraded, which will have an impact on stock prices in the current quarter (Brown et al., 2014). Jegadeesh and Kim (2010) discussed the impact of different analyst ratings on investment returns and found that the higher the stock turnover rate, stock price momentum and other factors, the higher the analyst's rating, and the analyst rating and the stock's investment return showed a significant performance is a positive correlation. Brown et al. (2014) emphasized that analyst recommendations have a greater impact on changing the behavior of mutual funds when stocks are falling, and considering the risk of reputational damage to holding stocks that are believed to be falling, mutual funds of managers pay more attention to negative stock information.

2. Methodology

2.1 Institutional Herding Behaviour

This paper mainly draws on the methods of Lakonishok (1992) and Wermers (1999) to measure the herding behavior of institutional investors, and adopts the LSV model. The degree of deviation of buyer

power is a measure of the degree of herd, which analyzes the relative trend of institutional investors executing the same trade direction for a stock during the same time period. For example, for a particular stock, half of the institutional investors in the market in a quarter Buying the stock, but at the same time the remaining half of the institutional investors choose to sell the stock, cannot be considered a herding effect on the stock. The specific model is as follows:

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

$$P_{i,t} = \frac{B_{i,t}}{B_{i,t} + S_{i,t}} \tag{2}$$

$$AF_{i,t} = E\left| P_{i,t} - E\left(P_{i,t} \right) \right| \tag{3}$$

Where $P_{i,t}$ is the proportion of institutional investors who bought the stock i in period t, $B_{i,t}$ is the number of institutional investors who bought the stock in period t, and $S_{i,t}$ is the number of institutional investors who sold the stock in period t. According to Wermers (1999)'s classification of herd behavior, this paper distinguishes buying herd behavior and selling herd behavior in the following ways:

$$BHM_{i,t} = HM_{i,t} \left(P_{i,t} > E\left(P_{i,t} \right) \right) \tag{4}$$

$$SHM_{i,t} = HM_{i,t} \left(P_{i,t} < E\left(P_{i,t} \right) \right) \tag{5}$$

In order to more intuitively reflect the herd behavior in different directions, this paper further adjusts the herd behavior in different directions as follows based on the method proposed by Brown et al. (2014):

$$AdjHerd_{i,t} = \begin{cases} BHM_{i,t} - BHM_{min,t}, & HM_{i,t} = BHM_{i,t} \\ -\left(SHM_{i,t} - SHM_{min,t} \right), & HM_{i,t} = SHM_{i,t} \end{cases} \tag{6}$$

After such adjustment, If $AdjHerd_{i,t}$ is greater than 0, it means that buying herd has occurred, which is expressed as $AdjHerd\_Buy_{i,t}$, and if $AdjHerd_{i,t}$ is less than 0, then selling sheep Group behavior is expressed as $AdjHerd\_Sell_{i,t}$.

2.2 Analyst Rating

In this paper, the quarterly data of the comprehensive rating of institutions ($Level_{i,t}$) is selected to represent the stock recommendation rating of external analysts. "Neutral", "Reduce" and "Sell" five levels, which are expressed as $Level_{i,t}$ in this paper. The values are 1, 2, 3, 4 and 5, namely $Level_{i,t}$ equal to 1 indicates that the stock is rated as "buy" by analysts in the quarter, and $Level_{i,t}$ equal to 5 indicates that the stock is rated as "sell".

The number of institutions that released rating information in the selected stock quarter ($Ins\_num_{i,t}$) represents the number of analysts tracking the stock.

2.3 Control Variable and Model

Referring to the studies of Hutton et al. (2009) and Kim et al. (2011), this paper constructs the following control variables: (1) $Turnover_{i,t}$, the turnover rate of stock i in quarter t; (2) $Size_{i,t}$, the size of the listed company, expressed by the natural logarithm of the market value at the end of the current quarter; (3) $BMR_{i,t}$, the book value of the listed company in the t quarter (4) $Debt_{i,t}$, the asset-liability ratio of listed companies in t quarter, using the ratio of total liabilities to total assets; (5) $ROA_{i,t}$, listed companies in t Quarterly return on total assets, that is, the ratio of net profit to total assets. The control variables mainly take into account the transaction cost of the stock, the growth of the listed company and the prudence of stock selection. (6) For the analysis and investment strategy of institutional investors themselves, the stock returns of the previous quarter $Mom\_q_{i,t}$ and the accumulated earnings of the past year $Mom\_y_{i,t}$ were included as control variables. Build the model as follows:

$$Herd_{i,t} = \beta_1 Ins\_num_{i,t} + \gamma \times Control_{i,t} + \alpha_i + \delta_t + \varepsilon_{i,t} \tag{7}$$

3. Data and Descriptive Statistics

This paper selects a total of 64 quarters from the first quarter of 2005 to the fourth quarter of 2020 as

the sample interval. The data measuring the herd behavior of institutional investors, the rating of analysts' recommended stocks, and the number of analysts' tracking are all from the Wind database, while the stock announcements Stock return, turnover ratio, market value size, book-to-market ratio, asset-liability ratio, total asset return and stock historical return data are from the CSMAR database. The reason for choosing to start in 2005 is because Wind database's systematic statistics on changes in institutional investors' shareholdings began in 2005 as early as 2005. In addition, this paper excludes samples with less than 3 institutions trading stocks in a quarter because the small number of institutional investors trading does not meet the definition of herd behavior in this paper; excluding ST stocks and suspended listings Stocks, because such stocks are often uncertain, which is not conducive to reflecting the real situation of the market; also exclude financial industry stocks under the classification of the China Securities Regulatory Commission, because the financial industry has certain particularities, the actual value created by itself is limited, and Most financial industry companies are important institutional investors, which helps to avoid certain endogenous problems.

Table 1: Variable Descriptive Statistics

Variable	Quantity	Min	Median	Mean	Max	STD
$Herd_{i,t}$	76225	0.0001	0.1028	0.1494	0.9039	0.1387
$AdjHerd_{i,t}$	76225	-0.9038	0.0079	-0.0178	0.7157	0.2025
$AdjHerd\_Buy_{i,t}$	39837	0	0.0861	0.1253	0.7157	0.1178
$AdjHerd\_Sell_{i,t}$	36388	-0.9038	-0.1306	-0.1744	0	0.1540
$Ins\_num_{i,t}$	76225	1	2	3	5.458	8
$Turnover_{i,t}$	76225	0.0014	0.3850	0.5485	35.4148	0.5459
$Size_{i,t}$	76225	10.39	13.46	13.56	19.68	1.0413
$BMR_{i,t}$	76225	0.0014	0.6201	0.6210	1.7854	0.2465
$Debt_{i,t}$	76225	-0.0119	0.4287	0.4283	0.9921	0.2051
$ROA_{i,t}$	76225	-1.9816	0.0918	0.0943	1.9778	0.1104
$Mom\_q_{i,t}$	76225	-22.412	0.375	0.520	39.423	0.9082
$Mom\_y_{i,t}$	76225	-55.107	1.4113	1.9626	150.892	3.3561

A total of 127,981 company-quarterly institutional investor herd behavior samples were collected in this paper. After excluding ST, financial and trading institutions with less than 3 companies, this paper finally obtained a total of 76,225 company-quarter samples. The standardized unexpected earnings sample size for behavioral sample matching is 66935, that is, the sample size of institutional investors' herding behavior becomes 66935 when the earnings announcement information is studied. Table 1 show that the maximum value of $Herd_{i,t}$ reaches 0.9039, which means that in a certain stock, if 100 institutional investors change their positions in the stock, 90 of them will increase their positions. hold the stock. On the mean, the herd selling behavior is greater than the buying herd behavior, indicating that the degree of institutional investors selling herd behavior is greater than buying herd behavior, and the mean of both is slightly larger than the median, indicating that there is a certain degree of right deviation. In terms of standard deviation, the cumulative return of stocks in the past year fluctuated the most, reaching 3.3561, indicating that the price changes of different stocks in my country's A-share market are quite different.

4. Empirical Analysis

4.1 Analyst Ratings and Institutional Herding Behaviour

In order to study the performance of the herd behavior of stock institutional investors under the ratings of different levels of external analysts, this paper examines the four ratings of "buy", "overweight", "neutral" and "underweight and sell". Under the sample combination, the adjusted herd behavior of institutional investors in the quarter when the rating was released and in the next three quarters is shown in Table 2.

Table 2: Herding Behavior results under different analyst ratings

$AdjHerd_{i,t}$	$Level_{i,t}$			
	1 (N=26960)	2 (N=41156)	3 (N=7536)	4 and 5(N=546)
T_0	0.0051*** (4.619)	-0.0241*** (-23.988)	-0.0626*** (-22.143)	-0.0584*** (-5.046)
T_1	0.0019** (1.737)	-0.0179*** (-17.501)	-0.0432*** (-14.428)	-0.0522*** (-3.897)
T_2	-0.0034*** (-2.926)	-0.0170*** (-16.504)	-0.0385*** (-12.822)	-0.0608*** (-4.581)
T_3	-0.0074*** (-6.058)	-0.0166*** (-16.00)	-0.0362*** (-11.956)	-0.0606*** (-4.273)

***,**,* denotes that coefficient is significant at 1%, 5%, and 10%, respectively.

For the stock samples rated as "buy" by analysts, in the current rating period, institutional investors showed an adjusted degree of buying herd behavior of 0.51% (in order to improve readability, the empirical results will be used in subsequent articles to improve readability). Multiplied by 100%), the t-value is approximately equal to 4.619 and is significant at 1% confidence. This adjusted buying herd behavior will continue into the next quarter, but the degree of herding behavior has weakened, showing a significant 0.19% at the 1% level in the future period. But in the second quarter of the future, there is a reversal in behavior, manifested by significant herding selling, and the adjusted degree of herding selling increases over time. This shows that institutional investors will buy stocks with a comprehensive rating of buy in the market, but they will not hold them for a long time, but will sell them after holding for nearly a quarter, which may be in the next quarter. The domestic stocks will show significant excess returns, and institutional investors will sell them in order to achieve real returns, which will be discussed in the empirical results of excess returns later.

For stock samples with analysts' comprehensive ratings of "underweight" and "sell", institutional investors have shown a significant sell herd behavior with a 1% confidence level during the rating period and in the next three quarters. In the second quarter in the future, the degree is the largest, reaching -6.08%, and the t value is approximately equal to -4.581, and the degree of herd selling behavior of institutional investors under this sample combination is significantly greater than that of other rating grade samples. , which reflects that at present in my country's A-share market, institutional investors are more sensitive to bad news than good news. According to my own analysis, when faced with bad news, institutional investors will mostly sell stocks with the mentality of "prefer to have it rather than trust it without it" to avoid a greater risk of loss.

4.2 Analyst numbers and Institutional Herding Behaviour

After studying and discussing the analyst rating of stocks, which is a subjective factor of external analysts, this paper further discusses the impact of the objective factor of external analysts, the number of rating analysts, on the herding behavior of institutional investors. The regression results of model (9) are as follows: As shown in Table 3 (t values in parentheses).

First of all, from the perspective of the overall sample, under the model considering individual fixed effects and time fixed effects, the coefficient of the number of rating analysts $Ins\_num_{i,t}$ is -0.16%, the t value is about -11.265, and in It is significant at a confidence level of 1%. Specifically, it means that as the number of analysts analyzing stock ratings increases, the degree of herding behavior of institutional investors reflected in stocks is lower. Then, the overall sample is divided into buying herd samples and selling herd samples according to the direction of herd behavior, and then the model is regressed, and the results are shown in the third and fourth columns of Table 4. The influence coefficient of the number of rating analysts in the behavioral sample is -0.03%, and the influence coefficient of the herd selling behavior is 0.32%, both of which are significant at the level of 1%, indicating that whether the buyer or the seller is herding behavior, the rating analysis The greater the number of teachers, the lower the degree of herd behavior (because $AdjHerd\_Sell_{i,t}$ is distributed between -1 and 0, so the influence coefficient is in a practical sense, which also means that the degree of herd behavior is weakened) .

Table 3: Results of the effect of the number of rating analysts on herding behavior

	$Herd_{i,t}$	$AdjHerd\_Buy_{i,t}$	$AdjHerd\_Sell_{i,t}$
$Ins\_num_{i,t}$	-0.0016***	-0.0003**	0.0032***
	(-11.265)	(-2.143)	(12.943)
$Turnover_{i,t}$	0.0165***	0.0349***	-0.0053***
	(12.926)	(26.753)	(-2.653)
$Debt_{i,t}$	-0.0255***	-0.0284***	0.0259***
	(-4.868)	(-5.479)	(3.356)
$Size_{i,t}$	-0.0351***	-0.0181***	0.0447***
	(-25.927)	(-12.208)	(19.996)
$ROA_{i,t}$	-0.0334***	-0.0096*	0.0542***
	(-6.307)	(-1.651)	(6.642)
$BMR_{i,t}$	0.0267***	0.0164***	-0.0443***
	(5.540)	(3.888)	(-6.979)
$Mom\_q_{i,t}$	0.0014*	0.0033**	-2.2e-5
	(1.806)	(2.017)	(-0.009)
$Mom\_y_{i,t}$	-0.0005**	-0.0008*	0.0003
	(-2.035)	(-1.716)	(0.494)
N	76225	39837	36388
Adj. R-Squared:	-0.0151	-0.0551	-0.0518
F	229.851***	154.647***	207.138***

***,**,* denotes that coefficient is significant at 1%, 5%, and 10%, respectively.

4.3 Robustness Check

Considering that the influence of the number of rating analysts on the herding behavior of institutional investors has a certain time lag effect, and this paper does not discuss the intertemporal relationship between the two in the overall sample, the number of rating analysts is lagged by one period and one lag. Two periods are replaced as explanatory variables into model (10), and the results are shown in Table 4. It can be seen from the results that the impact of the number of analyst ratings with lag one and two periods on the herding behavior of institutional investors remains consistent with the above. The increase in the number of ratings will reduce the degree of herding behavior, and the absolute value of the coefficient of the second lag period is smaller than that of the first period, which means that with the increase of the time span, the degree of this influence will have reduced.

Table 4: Results of the effect of the number of rating analysts lagging on herding behavior

	$Herd_{i,t}$	$AdjHerd\_Buy_{i,t}$	$AdjHerd\_Sell_{i,t}$
$Ins\_num_{i,t-1}$	-0.0016***	-0.0009***	0.0025***
	(-12.319)	(-7.425)	(10.165)
$Ins\_num_{i,t-2}$	-0.0009***	-0.0007***	0.0015***
	(-7.537)	(-5.592)	(5.897)

***,**,* denotes that coefficient is significant at 1%, 5%, and 10%, respectively.

5. Conculusion

This paper studies the impact of external analysts' subjective stock recommendation ratings and the number of objective ratings on the herding behavior of institutional investors, and further explores the impact of institutional investors' herding behavior on the future cumulative excess returns of stocks. The research results show that when the external analyst rating information is positive, institutional investors will show significant buying herd behavior in the short term, but this buying behavior will not last for a long time, and the behavior will appear in the second quarter in the future. Inversion, and when external analyst rating information is bad, institutional investors will show continuous selling herd behavior, and institutional investors are more sensitive to bad information.

The research on the influence of the number of analysts following on the herding behavior of institutional investors shows that whether in the direction of buying or selling, increasing the number of external analysts who follow a stock can effectively reduce the herding behavior of institutional investors. And this impact is mainly reflected in stocks with a composite rating of "buy" and "overweight". After

distinguishing the types of analyst ratings, it is found that with the increase in the number of analysts with ratings of "buy", "overweight" and "neutral", the degree of herding behavior of institutional investors can be significantly reduced, and there is a certain persistence , but not on analysts with an "underweight or sell" rating. This result is in line with the role of external analysts in the market. The greater the number of stocks tracked, the more conducive to the transmission of stock information in the market. Institutional investors rely on more mature information channels to capture information more fully and make more rational decisions. decision-making, but this effect is not significant under bad information and extreme positive information.

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