17. STOCK CHARACTERISTICS HERDED BY FOREIGN INVESTORS WITH HIGHER ABNORMAL RETURNS IN THE TAIWAN STOCK MARKET[1]

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Abstract

This paper analyses the types of stocks herded by foreign institutional investors (FIIs) with higher positive abnormal returns in the emerging stock markets. Using a panel smooth transition regression (PSTR) model, we demonstrate that the positive price impact of the herd buying patterns of FIIs in Taiwan depends on preferences for higher-turnover stocks, and larger-size stocks. Furthermore, the price impact of FIIs herd buying behavior influenced by stock characteristics is different during bullish and bearish periods. Investors in the emerging market can follow FIIs and purchase stocks that the latter have overbought to improve the portfolio performance.

Keywords: price impact, herding, stock characteristics, FIIs, PSTR
JEL Classification: G11, G14, G21, C21

1. Introduction

The foreign institutional investors (FIIs) are not only more rational than the general investors, but also emphasize long-term strategies more than the domestic institutional investors do in the emerging stock markets. FIIs have more funds and

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better investment capabilities than other institutional investors[6]. Thus, the trading behavior of FIIs usually serves as a point of reference in the investment decisions of other investors. Moreover, based on competition and their lack of familiarity with the target country, some FIIs may collectively follow each other into and out of the same securities. This follow up behavior among the FIIs in the securities market is regarded as 'FII herding'. Because Taiwan's stock market is characterized by smaller firm sizes and higher stock turnover, the impact of FII herding on the subsequent abnormal returns of these stocks is greater than the impact in the developed stock markets. Thus, this study focuses on exploring which types of stocks herded by FIIs are correlated with significant increases in post-herding abnormal returns. It is worthwhile for investors to explore how stock characteristics affect the abnormal returns driven by FII herding in Taiwan's stock market.

The Lakonishok, Shleifer, and Vishny (1992) (LSV, hereafter) herding measure has become a standard in the herding-related literature. Wermers (1999) expanded the LSV measure developed by Lakonishok *et al*. (1992) to generate a buying and selling conditional herding measure. Moreover, the results obtained by Hung, Lu, and Lee (2010) showed that price persistency following buying herding behavior by mutual funds is value-relevant information, but that return reversal following selling herding behavior is non-informational in Taiwan. Nofsinger and Sias (1999) and Wermers (1999) demonstrated that the stocks bought by institutional investors outperformed those sold by them. In addition, the security authorities in Taiwan mainly encourage investors to buy rather than sell stocks. Thus, the price impact of the sale of stocks by institutional investors should be significantly smaller than the price impact of their purchase. Hence, this study only uses the buying herding measure (BHM) to investigate buying herding among FIIs.

Previous studies have investigated the price effects of institutional herding, but they have found different price impacts for herding (Grinblatt, Titman, and Wermer 1995; Nofsinger and Sias, 1999; Wermers, 1999; Dennis and Weston, 2001; Sias, Starks, and Titman, 2002; Sias, 2004)[7]. These different conclusions imply that a few important variables may be ignored in the analyses of price impact of institutional herding. Thus, this paper examines whether post-herding abnormal returns from stocks herded by FIIs are also significantly affected by the characteristics of these stocks. That is, we further analyze whether stock characteristics are another main determinant of stock performance. Previous studies proposed that institutional investors tend to hold large-size stocks (Falkenstein, 1996; Lin and Swanson, 2003; Chiao and Lin, 2004). Lu, Fang, and Nieh (2012) and Lin and Swanson (2003) found that the subsequent performance of foreign investors who exhibit significant herding with large-size stocks is better than that of foreign investors who exhibit herding behaviour for small-size stocks in the Taiwan stock market. Moreover, some scholars have proposed that

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[6] *Chang (2010) found that when FIIs change their weights in particular sectors, the weights of other institutional investors change positively during the same period and later periods.*

[7] *Sias (2004) and Grinblatt, Titman, and Wermer (1995) reported that institutional herding is weakly positively correlated with future returns. However, Dennis and Weston (2001), Chakravarty (2001) and Sias, Starks, and Titman (2002) documented that the returns from institutional herding driven by fads, reputation herding or characteristic herding are significantly reversed.*

institutional investors prefer liquid stocks with a higher turnover (Falkenstein, 1996; Gompers and Metrick, 2001; Hotchkiss and Strickland, 2003). That is, FIIs' herding behavior should be more focused on highly liquid stocks, and the effect of significant herding among FIIs with regard to high-turnover stocks should be superior. Thus, it is important to explore the price impact of FIIs herding behavior with larger-size and higher-liquidity stocks in Taiwan. In addition, the bullish and bearish periods in stock markets are the most universally dynamic environments in the various financial markets faced by institutional investors[8]. Hence, we would like to determine whether the price impact of FIIs herding behavior exists in both bullish and bearish stock markets and whether they exist only in bearish periods due to the investors' quick reactions to negative news in such markets. Furthermore, this study explores whether the price impact of FIIs herding behavior based on stock characteristics is different during bullish and bearish periods.

This paper assumes that the price impact of FIIs' herding behavior may be influenced by firm size or stock turnover and that the influence process could generate a smooth transition among different time series and individual stocks. In other words, the higher or lower regime of stock characteristics attached to an individual company is most likely a dynamic process. To allow for a smooth transition process, this study uses a panel smooth transition regression (PSTR) model to evaluate whether subsequent abnormal returns from FIIs herding behavior are different during high and low regimes when firm size and stock turnover are evaluated separately as transition variables. Because the PSTR model exhibits sufficiency and precision in a continuous function, we avoid the possible shortcoming that the price effects of institutional herding cannot be continually divided, as noted in previous studies by Wermers (1999), Sias, Starks, and Titman (2002) and Sias (2004). Unlike the panel threshold model by Hansen (1999), in which the transitions between the parameter values are abrupt, the PSTR model allows for a smooth transition between the transition variable in different regimes. Hence, we may make contributions in the following issues. First, unlike the existing studies that merely identify the price effects of institutional herding this paper also investigates whether stock characteristics are another main determinant of abnormal stock returns. The more complete integration of the price impact of FIIs herding and stock characteristics in Taiwan may help to improve analyses of subsequent stock performance of institutional herding in the emerging markets. Next, we analyze how the separate stock characteristics modulate the price impact of herding behavior among FIIs. Moreover, one advantage of using the PSTR model may be that this model exhibits precise and efficient estimation using a continuous function and allows for a smooth transition of stock characteristics attached to an individual company in different regimes. Finally, this paper further clarifies whether there are significant differences in the price impact of FII herding behavior for specific stock characteristics during bullish and bearish periods[9].

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[8] Most studies have verified that investors' herding behavior in a bearish market is more significant than it is during a bullish market (McQueen, Pinegar, and Thorley, 1996; Chang, Cheng, and Khorana, 2000; and Gleason, Mathur, and Peterson, 2004).

[9] There is the possibility that stock characteristics can have a different influence on stock performance driven by institutional herding during periods with different market pressure.

The structure of this paper is as follows. Section 2 explains the research design and methodology. Section 3 discusses the empirical results. Section 4 reports the conclusions.

2. Data, Variables and Methodology

2.1 Data Scope

In the Taiwanese stock market, the foreign institutional investors often continuously overbuy or oversell stocks for a longer period than other institutional investors (i.e., up to several days or weeks) to pull stock prices up or down. Thus, this paper uses monthly data instead of daily data to measure the degree of herding behavior among the FIIs and the price impact of their herding. The raw data analyzed in this study are the monthly individual stock returns of companies listed on the Taiwan Stock Exchange Corporation (TSEC), the weighted stock index returns, and the FIIs buying and selling statistics from January 2002 to May 2011. These data were used to derive the abnormal returns for individual stocks and the buy herding measure for FIIs[10]. Moreover, firm size and stock turnover were determined on a monthly basis, and the data for the same periods were obtained. Data were taken from the Taiwan Economic Journal Data Bank. The trading numbers for the FIIs were obtained for each trading day and accumulated to derive the numbers for each month. If the net trading accumulation of a particular stock by one FII during a particular month was positive (negative), then that FII was counted as buying (selling). The stocks listed at the Taiwan Stock Exchange from our sample period included a subset of stocks of 188 firms, and these samples were designed for balanced panels.

2.2 Variable Measures

2.2.1 The BHM

In quantifying the degree of herding in trading numbers among FIIs, this study cites indices from Wermers (1999) to use the buy herding measure ($BHM_{i,t}$) that is higher than the expected ratio of the buying number for FIIs for any given month. However, the study does not consider the price impact of sell herding measure ($SHM_{i,t}$) by FIIs due to evident limitations and information asymmetry in the sale of stocks in the Taiwan stock market. When $BHM_{i,t}$ is significantly greater than 0, the trading behavior related to stock i by FIIs during a given month t indicates a herding tendency towards the buyer when compared with the average trading of all stocks. $BHM_{i,t}$ is presented as follows:

$$BHM_{i,t} = HM_{i,t} \left| p_{i,t} > E\left[p_{i,t} \right] \right. \quad (1)$$

[10] *No data existed on the buying and selling of FIIs prior to 2002, so it is impossible to transform the relevant herding measures.*

$$HM_{i,t} = \left| p_{i,t} - E\left[p_{i,t}\right] \right| - E\left| p_{i,t} - E\left[p_{i,t}\right] \right| \qquad (2)$$

where: $p_{i,t}$ is the share of all FIIs trading the stock i during the month t which are buyers, $p_{i,t} = \frac{B_{i,t}}{B_{i,t} + S_{i,t}}$; and where $E\left[p_{i,t}\right]$ is the expected share of all FIIs which are buyers during t month for all traded stocks.

2.2.2 Abnormal Returns

The abnormal return of an individual stock i for a given month is calculated on the basis of the capital asset pricing model[11]:

$$R^a_{i,t} = \left(r_{i,t-j} - r_{f,t-j}\right) - \beta_i \left(r_{m,t-j} - r_{f,t-j}\right), \quad j=0,\ldots,11. \qquad (3)$$

2.2.3 Measures of Firm Size and Turnover

Firm size is measured using the market value of common shares, i.e., the closing price of stock *i* during month *t* multiplied by the number of shares outstanding. This study defines the average turnover of stock *i* during month *t* as the ratio of the number of shares traded each month to the number of shares outstanding at end of the month.

2.3 Methodology

The correlation between turnover and firm size should be high[12]. To avoid potential collinearity, this paper does not use all of the control variables measured by firm size and turnover in the same model. First, this study separately regressed the abnormal returns ($R^a_{i,t}$) of stock *i* in the current month on FII buying herding ($BHM_{i,t-1}$) for stock *i* in the previous month along with the respective firm size ($Size_{i,t-1}$) and stock turnover ($Turnover_{i,t-1}$) of stock *i* in the previous month in a pooled and panel model[13]:

$$R^a{}_{i,t} = u_i + \beta_1 BHM_{i,t-1} + \beta_2 q_{i,t-1} + \varepsilon_{i,t}\,, \qquad (6)$$

where: $q_{i,t-1}$ represents the control variable (i.e., $Size_{i,t-1}$ or $Turnover_{i,t-1}$).

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[11] *$r_{i,t-j}$ represents the monthly return for an individual stock* i *in the current month and the previous eleven months; $r_{f,t-j}$ represents the risk-free rate in the current month and the previous eleven months, which is the interest rate for a one-month term deposit offered by Taiwan First Bank; and $r_{m,t-j}$ represents the return of TAIEX stock price index in the current month and the previous eleven months.*

[12] *A few studies, such as Lee and Swaminathan (2000), proposed that raw trading volume is likely to be highly correlated with firm size, using turnover as a measure of the trading volume of a stock.*

[13] *The coefficient β_1 represents the extent of the price impact of FIIs buying herding, and the coefficient β_2 represents the extent of the price impact of size or liquidity*

To identify the smooth transition process, this study used a PSTR model to determine whether the extent of the price impact of FIIs buying herding is separately affected by size and turnover for different time series and individual companies. Therefore, this study adopted the PSTR model to revise equation (4) and separately consider size and turnover as transition variables. This generalization yields the following equation:

$$R^{a}_{i,t} = u_i + \beta_0^{'} x_{i,t} + \sum_{j=1}^{r} \beta_j^{'} x_{it} g_j\left(q_{it}^{j};\gamma_j,c_j\right) + \varepsilon_{i,t} \quad (5),$$

where: x_{it} are $BHM_{i,t-1}$ and q_{it} (i.e., $Size_{i,t-1}$ or $Turnover_{i,t-1}$), q_{it} represents the transition variable and $\varepsilon_{i,t}$ represents the errors. The expression $g_j\left(q_{it}^{j};\gamma_j,c_j\right)$ is a continuous and bounded function of q_{it} and is defined as follows:

$$g_j\left(q_{it}^{j};\gamma_j,c_j\right) = \left(1+\exp\left(-\gamma\prod_{j=1}^{m}\left(q_{it}-c_j\right)\right)\right)^{-1}, \quad (6)$$

A smooth parameter γ determines the slope of the transition function, and $\gamma \geq 0$. The transition function in equation (6), with m = 1 or 2, allows for different types of changes in the parameters[14]. Following Gonzalez *et al*. (2005) approach, only if the data-generating process is non-linear will PSTR model be identified. The linearity of PSTR model in equation (5) can be executed by using either $H_0^1 : \beta_j = 0$ or $H_0^2 : \gamma = 0$ and replacing $g_j\left(q_{it}^{j};\gamma_j,c_j\right)$ with its first-order Taylor expansion around $\gamma = 0$. Then, we obtain the following auxiliary regression[15]:

$$R^{a}_{i,t} = u_i + \beta_0^{'*} x_{i,t} + \beta_1^{'*} x_{i,t} q_{i,t} + \ldots + \beta_m^{'*} x_{i,t} q_{i,t}^{m} + \varepsilon^{*}_{i,t} \quad (7),$$

Testing $H_0 : \gamma = 0$ in equation (5) is equivalent to testing $H_0^* : \beta_1^* = \ldots = \beta_m^* = 0$ in equation (7). We perform the LM test of linearity against the non-linear PSTR model by computing the LM and LM_F statistics. The number of transition functions in the model must then be tested[16]. Furthermore, we use the sequence of tests proposed by Granger and Terasvirta (1993) and Terasvirta (1994) to determine the appropriate order m of the transition function in equation (6). Using the auxiliary regression in equation (7), the non-linear PSTR is accepted if $H_0 : \beta_3 = \beta_2 = \beta_1 = 0$ is rejected. By simultaneously testing $H_{03} : \beta_3 = 0$, $H_{02} : \beta_2 = 0$ and $H_{01} : \beta_1 = 0$, we select m = 2 if

[14] *If m = 1, the model allows for a single monotonic smooth transition whose location is controlled by* c_1. *If m = 2, only the Euclidean distance between* q_{it} *and* c_j *affects* Δ_{it}.

[15] *Where the parameter vectors* $\beta_1^*, \ldots, \beta_m^*$ *are multiples of* γ.

[16] *Assuming a PSTR model with* $r = r^*$, *we test* $H_0 : r = r^*$ *against* $H_1 : r = r^* + 1$. *If* H_0 *is rejected,* $H_0 : r = r^* + 1$ *is tested against* $H_1 : r = r^* + 2$. *The testing procedure continues until the initial acceptance of* H_0.

H_{02} is rejected and m=1 if H_{01} or H_{03} is rejected. Finally, we use this procedure to select the type of model.

3. Empirical Results

3.1 Results for the Entire Period

The results of the pooled and panel regressions presented in Appendix [17] consistently indicate that subsequent abnormal returns using firm size and stock turnover are both significantly positive, and that those of FIIs buying herding are all significant even after the respective control variable is taken into account. In summary, the price impact of FIIs buying herding is significant when we consider firm size and stock turnover separately as control variables, and the price impact of FIIs buying herding is larger than the price impact of stock turnover in the Taiwanese stock market.

The empirical results of the linearity test, shown in Tables 1 and 2, provide significant evidence of non-linearity when size and turnover are considered separately as transition variables at the 1% significance levels. Except for the null hypothesis with r = 2, which is not rejected when turnover is regarded as a transition variable, meaning a two transition with three regimes, the null hypothesis with r = 1 is not rejected when firm size is considered. This result indicates that another model will have a single transition with two regimes when size is considered as a transition variable.

Table 1

Number of Regimes and m Selection Using Linearity Test against the PSTR with Size as the Transition Variable in the Entire Sample

Panel A: Number of regimes				
Items	H0: r = 0 vs. H1: at least r = 1		H0: r = 1 vs. H1: at least r = 2	
	Statistic value	p-value	Statistic value	p-value
LM	50.223	0	0.36	0.835
LMF	8.313	0	0.178	0.837
LRT	50.283	0	0.36	0.835
Panel B: The m selection of PSTR model				
Items	F3	F2	F1	Final model
Statistic value	0.353	3.84	4.116	m=1
p-value	0.909	0.001	0	

[17] *Appendix could be downloaded from http://rjef.ipe.ro*

Table 2

Number of Regimes and m Selection Using Linearity Test against the PSTR with Turnover as the Transition Variable in the Entire Sample

Panel A: Number of regimes						
ItEems	H0: r = 0 vs. H1: at least r = 1		H0: r = 1 vs. H1: at least r = 2		H0: r = 2 vs. H1: at least r =3	
	Statistic value	p-value	Statistic value	p-value	Statistic value	p-value
LM	457.911	0	110.69	0	5.336	0.069
LMF	77.296	0	55.125	0	2.644	0.071
LRT	462.964	0	1110.982	0	5.337	0.069

Panel B: The m selection of PSTR model				
Items	F3	F2	F1	Final model
Statistic value	11.672	12.338	52.891	m=1
p-value	0	12.338	0	

Tables 3 and 4 contain the parameter estimates from the single- and two-transition models. The dynamics of the price impact of FIIs buying herding and the respective control variable reach the lower regime separately with a low value for the transition variable (i.e., $size_{i,t-1} < 4.110$ or $turnover_{i,t-1} < 0.321$, and $g_1\left(q^1_{it-1};\gamma_1,c_1\right)\rightarrow 0$). In sharp contrast, the dynamics of the price impact of FIIs buying herding and the respective control variable reach the upper regime separately with a high value for the transition variable (i.e., $size_{i,t-1} > 4.110$ or $turnover_{i,t-1} > 53.631$, and $g_1\left(q^1_{it-1};\gamma_1,c_1\right)\rightarrow 1$). These analytical results show the combined parameters of a lagged measure of FII buying herding, $BHM_{i,t-1}$, and a respective lagged control variable, $q_{i,t-1}$, as a function of the previous firm size and stock turnover, respectively. One should note that our results show that the price impact of FIIs buying herding is different and is affected by the level of the transition variable. The analytical results suggest that the price impact of FIIs buying herding is determined by the various characteristics of stocks on the Taiwanese stock market.

Table 3
Parameter Estimates of the PSTR Model with Size as the Transition Variable

Regressor	Coefficient	T-value
$BHM_{i,t-1}$	0.009	4.159
$BHM_{i,t-1}\ g_1\left(Size^1_{i,t-1};\gamma_1,c_1\right)$	0.016	5.348
$size_{i,t-1}$	0.028	12.299
$size_{i,t-1}\ g_1\left(Size^1_{i,t-1};\gamma_1,c_1\right)$	−0.003	−5.54
Transition Functions		
γ_j	10.283	
c_j	4.11	

Note: 1. Numbers in parentheses indicate the t-statistics.

Table 4
Parameter Estimates of the PSTR Model with Turnover as the Transition Variable

Regressor	Coefficient	T-value
$BHM_{i,t-1}$	−0.043	−4.449
$BHM_{i,t-1}\ g_1\left(Turnover^1_{i,t-1};\gamma_1,c_1\right)$	0.049	4.528
$BHM_{i,t-1}\ g_2\left(Turnover^2_{i,t-1};\gamma_2,c_2\right)$	0.028	2.198
$turnover_{i,t-1}$	−0.024	−8.024
$turnover_{i,t-1}\ g_1\left(Turnover^1_{i,t-1};\gamma_1,c_1\right)$	0.025	8.451
$turnover_{i,t-1}\ g_2\left(Turnover^2_{i,t-1};\gamma_2,c_2\right)$	−0.001	−9.238
Transition Functions		
γ_j	0.95	0.037
c_j	0.321	53.631

More important, when firm size is regarded as a transition variable, the positive price impact of FIIs buying herding is stronger in the upper regime, whereas the positive price impact of firm size is stronger in the lower regime. In other words, the positive price impact of FIIs buying herding is concentrated on large-size stocks. Perhaps the post-herding prices of large-size stocks by FIIs large herding are easily pushed up because FIIs prefer to hold larger-size stocks. Additionally, there is less market value in the market structure of plain-plate emerging stock markets, such as that of Taiwan, which is consistent with the results of Lu, Fang, and Nieh (2012), and Lin and

Swanson (2003). The positive price impact of firm size is concentrated on small-size stocks, which may be a result of the premium on small-size stocks, consistent with the results of Fama and French (1992, 1993). When stock turnover is regarded as a transition variable, the positive price impact of FIIs buying herding is stronger in the upper regime. In other words, the positive price impact of FIIs buying herding focuses on high-turnover stocks, which may be because FIIs general herding behavior is more focused on highly liquid stocks. In addition, except for the positive price impact of stock turnover in the middle regime, turnover has a negative impact on price in the lower regime and more so in the upper regime. The negative price impact of lower turnover may be a function of institutional investors' preference for highly liquid stocks. Thus, the price impact of the lower liquidity stocks with less institutional momentum is negative. However, the negative price impact of higher turnover may result from the liquidity hypothesis that stocks with a higher turnover produce price reversals, consistent with the results of Campbell, Grossman, and Wang (1993), Conrad, Hameed, and Niden (1994), Brennan and Subrahmanyam (1996), Datar, Naik, and Radcliffe (1998), Cooper (1999) and Lee and Swaminathan (2000). Furthermore, by using the nonlinear PSTR model with a continual transition variable, this study overcomes the insufficiency and imprecision of discretely dividing the price effects of institutional herding, which makes our analytical results even more convincing.

3.2 Results for the Bullish and Bearish Periods

This study adopted the determining criterion of Fabozzi and Francis (1979) in stating that in a bullish market, the stock price index will have risen for three consecutive months, whereas in a bearish market, the stock price index will have declined for three consecutive months. Using this method, we divide the entire sample period into bullish and bearish periods. We first use pooled regressions for the bullish and bearish stock periods in Taiwan to test whether the price impacts of FIIs herding behavior and the respective control variable for stock characteristics exist regardless of bullish and bearish periods or whether such impacts are more significant during bearish periods. Appendix 2 presents our results, which indicate that the abnormal returns derived from FIIs buying herding are mostly significantly positive even after the respective control variable is considered, regardless of the analyzed bearish or bullish period.

To analyze further whether the price impacts of FIIs herding and the respective control variable for stock characteristics are different in Taiwan's bullish and bearish markets, this study separately examines the price impacts of FIIs herding behavior and the respective control variable affected by stock characteristics during bullish and bearish periods. We still use the PSTR model to examine the bullish and bearish periods separately. All of the empirical results of the linearity tests for the bullish and bearish periods provide significant evidence of nonlinearity regardless of the transition variable. The results for $size_{i,t-1}$ during the bullish period show m = 2 and m =1, as shown in other tables, which indicates that the former models are fitted with exponential PSTR models, whereas the latter models are fitted with logistic PSTR models. Moreover, the results presented in Appendices 3.1 and 3.2 show that the dynamics of the price impact of FII buying herding and the respective control variable reach the lower regime separately with low values for the transition variables (i.e.,

$\ln size_{i,t-1} < 3.629$ and $turnover_{i,t-1} < 0.356$ during the bullish period and $\ln size_{i,t-1} < 3.998$ and $turnover_{i,t-1} < 0.321$ during the bearish period) and $g\ (q_{it-1};\gamma\ ,c\ ) \rightarrow 0$. In contrast, the dynamics of the price impact of FIIs buying herding and the respective control variable reach the upper regime separately with high values for the transition variable (i.e., $\ln size_{i,t-1} > 3.629$ and $turnover_{i,t-1} > 33.776$ during the bullish period and $\ln size_{i,t-1} > 3.998$ and $turnover_{i,t-1} > 29.846$ during the bearish period), and $g\ (q_{it-1};\gamma\ ,c\ ) \rightarrow 1$. Overall, our results show that the price impact of FIIs buying herding, which is affected by stock characteristics, is different during bullish and bearish periods because the different dynamic environments may affect the incentives for FIIs buying herding behavior based on stock characteristics.

More specifically, when firm size is regarded as a transition variable, the price impact of FIIs buying herding during the bullish period is similar to the effect during the entire period, whereas the opposite is true for the price impact of FIIs buying herding during the bearish period. That is, the positive (negative) price impact of FIIs buying herding focuses on large-size stocks during bullish (bearish) period, possibly because high market liquidity (low market liquidity) promotes price persistence (price reversal) for FIIs herding behavior with large-size stocks during periods with higher (lower) market liquidity. Moreover, when turnover is regarded as a transition variable, the price impact of FIIs buying herding in bullish and bearish periods is similar to the impact during the entire period except for a small difference in the upper regime of the bullish period. In summary, the positive price impact of FIIs buying herding focuses on high-turnover stocks during bullish and bearish periods may result from FIIs preference to herd for more liquid stocks. However, price reversal occurs for the most liquid stocks during the period with the highest market liquidity, possibly as a result of market overreactions based on the liquidity hypothesis.

4. Conclusion

This paper explores which characteristics of the stocks overbought by FIIs in the Taiwanese stock market, as measured using a BHM indicator, yield significantly higher abnormal returns. Our results confirm that the price impact of FIIs buying herding is determined by different stocks characteristics in Taiwan. That is, the positive price impact of FIIs buying herding is focused on high-turnover stocks and large-size stocks. By dividing the entire sample period into bullish and bearish stock periods, our results show that subsequent abnormal returns from FIIs buying herding are most significantly positive after the respective control variables for both the bearish and bullish periods have been added. Furthermore, using a PSTR model, this paper finds that the price impact of FIIs buying herding for stock characteristics is different during bullish and bearish periods. Specifically, the positive price impact of FIIs buying herding focuses on large-size stocks during the bullish period, but on small-size stocks during the bearish period. The positive price impact of FII buying herding is focused on high-turnover stocks during bullish and bearish periods, although a price reversal occurs for the most liquid stocks during bullish period.

Investors in the Taiwanese stock market can follow FIIs and purchase the stocks that the latter buy in bulk to improve the performance of their portfolios. By using a PSTR model with a continuous transition variable, we avoid the insufficiency and imprecision of discretely dividing the price effects of institutional herding, as Wermers (1999), Sias, Starks, and Titman (2002) and Sias (2004) have performed. This paper also contributes to the literature in which the price impact of institutional herding behavior will likely be integrated with studies on stock characteristics.

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