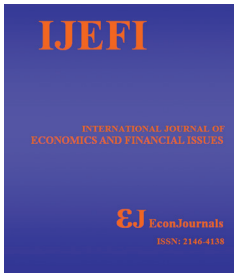

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Asymmetric Flow-performance Relationship: Case of Chinese Equity Funds

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ABSTRACT

This study investigates the relationship of fund flow and fund performance by using the sample of 557 Chinese equity mutual funds for the period of 11-year. We apply fixed effect regression model on unbalanced panel data and find that relationship between fund flow and fund performance is positive. Like previous studies, findings of this study also exhibit the asymmetric flow-performance relationship which implies that investors' response is more sensitive to good past performance as compared to bad past performance. Furthermore, size and age of fund weaken the flow-performance relationship.

Keywords: Fund Flow, Mutual Funds, China, Flow-performance Relationship
JEL Classifications: G23, L14

1. INTRODUCTION

Plenty of research has been done on the mutual fund industry of developed markets like US but there is scarcity of literature on mutual funds of developing economies like China. Mutual fund industry has witnessed a robust growth in China in last 20 years and this big size of mutual fund industry has some impact on financial market. China has developed its financial institutions with the objective that these institutions will improve the efficiency and corporate governance of the companies and help stabilize the financial markets (Firth et al., 2016). The impact of mutual fund industry in China's economy proposes that dependence of fund flow on past performance has implications for risk and return that investors face in stock and bond markets. However, little is known about how this flow-performance relationship works in China and we try to fill this gap in literature and provide new insights into the flow-performance relationship in Chinese mutual fund industry.

Fund flow means the cash inflow and outflow from the mutual funds. In US, the response of mutual fund investors to fund past performance is more sensitive to good performance of funds as compared to bad fund performance (Ippolito, 1992; Sirri and Tufano, 1998; Del Guercio and Tkac, 2002). Therefore, well-performing funds attract superfluous big cash inflows in following time periods whereas worst performing funds undergo little cash outflows (Fant and O'Neal, 2000). There are different explanations for this non-linear flow-performance relationship. One is the transaction cost that halts investors to move cash in and out from the funds (Ippolito, 1992). Second is the cognitive dissonance (Goetzmann and Peles, 1997). Third is the advertisement expense and media involvement (Sirri and Tuffano, 1998). Gruber (1996) asserts that factors like transaction cost, marketing effect and broker advice suppress the response of investors towards worst performance of fund. Fourth is the disposition effect (Shefrin and Statman, 1985). Fifth is the impact by different clientele of investors (Christoffersen and Musto, 2002).

Lynch and Musto (2003) report that investors do not withdraw cash from worst-performing funds because they think that Asset Management Company may change its investment strategy or it can change its fund managers and these changes can give better return in the future. Another reason for lack of response to worst fund performance is that investors keep their money in worst-performing funds as they want to avoid the realization of loss. On the other hand, standard finance theories emphasize that rational

investor move cash into the fund if fund gives good return and move cash out from the fund if the fund gives bad return.

This study examines the relationship of fund flow and fund past performance by using the data of 557 Chinese equity mutual funds for the period from January 2004 to December 2014. We use fixed effect regression on unbalanced panel data and find the positive flow-performance relationship as reported in previous studies. It is further found that flow-performance relationship is asymmetrical as investors of well-performing funds show more sensitivity to funds' past performance as compared to investors of worst-performing funds. This study has its implications for both academics and practitioners. From academic point of view, this study gives understanding of trading behavior of mutual fund investors. Moreover, Asset management companies need to know the investment behavior of investors and overall environment of mutual fund business.

The rest of the paper is organized as follows. Section 2 gives data description. Section 3 explains research methodology and discusses results. Finally, Section 4 concludes.

2. DATA DESCRIPTION

The data is taken from RESSET[1] financial database and only equity funds are studied for the period from January 2004 to December 2014. This study takes only actively managed funds and excludes index funds, qualified domestic institutional investor funds and principal guaranteed funds. Because of these filters, the final sample consists of only 557 Chinese equity funds. Descriptive statistics are given in table I. Raw return (RR) is quarterly raw reported return in RESSET database and this is net of all operating expenses. Benchmark-adjusted return (BAR) is the excess (difference) of quarterly raw return of fund from quarterly market return. Benchmark-adjusted return (BAR) is widely used by practitioners for evaluating the funds' performance (Busse et al., 2010 and Bauer et al. (2009). Market return is the return on China A-share composite stock exchange index. Like Bollen (2007) and Rao et al. (2015) we take Dollar flow as the net flow which is measured as follows:

$$Flow_{i,t} = TNA_{i,t} - TNA_{i,t-1}(1+R_{i,t}) \quad (1)$$

Where $Flow_{i,t}$ is the flow (net flow) of fund i in time t, $TNA_{i,t}$ is the total net assets of fund i in quarter t, $TNA_{i,t-1}$ is the total net assets of fund i in previous quarter ($t-1$), $R_{i,t}$ is the return of fund i in quarter t. *Flow*, % is the percentage net flow which is $Flow_{i,t}/TNA_{i,t-1}$.

3. RESEARCH DESIGN AND DISCUSSION

3.1. Flow-performance Relationship

For fund performance we take two measures. One is the raw reported return given on RESSET database and second is the *AR* which is the excess return of fund from the benchmark market. This *AR* is not risk adjusted. To investigate flow-performance relationship, like Nanda et al. (2004) we run fund fixed effect regression on unbalanced panel data, which is as follows:

Table 1: Descriptive statistics

Stats	*RR*	*BAR*	Flow, RMB (millions)	Flow, %
Mean	0.034	−0.002	−78.9	0.041
Median	0.012	0.002	−62.5	−0.039
Min	−0.807	−0.591	−15.900	−1.086
25th percentile	−0.047	−0.038	−223	−0.102
75th percentile	0.098	0.041	−4.2	−0.009
Max	0.637	0.562	37.300	66.706
SD	0.130	0.077	1.190	1.093
Number of observation	13364	13364	12808	12808

Sample consists of 557 equity funds for the period from January 2004 to December 2014 with 13368 quarterly return observations. Raw return, Benchmark-adjusted return, Flow, RMB (millions) and flow% are reported in this Table 1. Raw return is the quarterly raw reported return taken from RESSET database. Benchmark-adjusted return is the excess quarterly return from the market return. Flow, RMB (millions) is $TNA_{i,t}$ - $TNA_{i,t-1}(1+R_{i,t})$. Flow % is the Flow, RMB (million) divided by $TNA_{i,t-1}$ (total net assets at the end of last quarter). Mean, median, minimum, percentile 25%, percentile 75%, maximum and Standard deviation (SD) are given. BAR: Benchmark-abnormal return, RR: Raw return

$$Flow_{i,t}\,(Flow,\ \%_{i,t}) = \alpha_i + \beta_1 RR_{i,[t-4,t-1]} + \beta_2 \mathrm{Ln}(TNA)_{i,t-1} + \beta_3 \mathrm{Ln}(age)_{i,t-1} + \mu_{i,t} \quad (2)$$

Where $Flow_{i,t}$ ($Flow$, $\%_{i,t}$) is the net flow in RMB, millions (net flow percentage) in fund i in quarter t, $RR_{i,[t-4,t-1]}$ is the *RR* of fund i in previous 4 quarters ($t-4$ to $t-1$), $\mathrm{Ln}(TNA)_{i,t-1}$ is the log of total net assets of fund i in previous quarter i.e. $t-1$, $\mathrm{Ln}(age)_{i,t-1}$ is the log of age of fund i at the end of previous quarter, $t-1$, measured in years, and $\mu_{i,t}$ is the error term. $Flow_{i,t}$ ($Flow$, $\%_{i,t}$) is the independent variable and other variables in Equation (2) are dependent variables. We take the log of *TNA* in order to cater the growth potential of mutual funds as it is hard for big funds to expand (Chavelier and Elison, 1995). As age of fund affects the investor preferences and older funds grow slowly than younger funds, we take the log of funds age in regression equation.

Table 2 presents the results of regression Equation (2). The coefficients on *RR* are positive which show that there is a positive relationship between fund performance and fund flow.Our findings about flow-performance relationship with *RR*. Our finding about this flow-performance relationship is consistent with the findings in previous literature on this topic. For robustness we divide the whole sample period into two time windows: One for 5 years, from 2004 to 2008 and second for 6 years, from 2009 to 2014. In both windows, we find same positive relationship between fund performance and fund flow. This positive flow-performance relationship is significant in our results. Like Shrider (2009), we also find that total net assets and age, both witness negative relationship with fund flow. It implies that larger older funds show comparatively less sensitivity to fund performance. Results of Ln *TNA* and Ln *age* are significant at 1%.

The second measure for observing the performance of mutual funds we have taken is benchmark-adjusted return. We use benchmark-adjusted return (BAR) instead of *RR* in Equation (2) and run the fund fixed effect regression on unbalanced panel data, as follows:

1 www.resset.cn

Table 2: Results of regression Equation 2

Independent variable	Dependent variable					
	Overall		2004-2008		2009-2014	
	Flow (RMB) (millions)	Flow, %	Flow (RMB) (millions)	Flow, %	Flow (RMB) (millions)	Flow, %
RR	560***	0.503***	1.150***	0.971***	21.2	0.184***
	(8.54)	(9.98)	(9.5)	(8.36)	(0.76)	(6.36)
Ln *TNA*	−457***	−0.468***	−991***	−1.016***	−181***	−0.272***
	(−9.49)	(−7.76)	(−7.56)	(−6.43)	(−7.06)	(−5.44)
Ln age	−122***	−0.119***	1.430***	1.247***	−70.4***	−0.095***
	(−4.94)	(−4.05)	(5.94)	(5.36)	(−3.62)	(−3.82)
Constant	9.740***	10.067***	20.000***	20.863***	3.790***	5.874***
	(9.39)	(7.73)	(7.44)	(6.39)	(6.76)	(5.46)
R^2	0.073	0.071	0.098	0.147	0.027	0.014
Number of observation	11139	11139	1698	1698	9440	9440

Relationship between fund flow and fund past performance: Table 2 shows the flow-performance relationship in Chinese equity funds. We run fund fixed effect regression on unbalanced panel data. *Flow RMB* (*Flow%*) is dependent variable and *RR* (raw return: Raw quarterly return in previous four quarters), Ln *TNA*, Ln *age* are independent variables. *Flow(RMB)* is measured in millions and *Flow,%* is the $\text{Flow}_{i,t}$ *(RMB)*/$\text{TNA}_{i,t-1}$. Ln *TNA* is the log transformation of total net assets of fund *i* at the end of previous quarter. Ln *age* is the log transformation of age of fund *i* at the end of previous quarter. Age is measured in years.R2 is presented in last row. t-statistics are presented in parenthesis. ***Indicate the significance at 1% level

Table 3: Results of regression Equation 3

Independent variable	Dependent variable					
	Overall		2004-2008		2009-2014	
	Flow (RMB) (millions)	Flow, %	Flow (RMB) (millions)	Flow, %	Flow (RMB) (millions)	Flow, %
BAR	380***	0.091	−483	−0.912***	399***	0.304***
	(4.43)	(1.22)	(−1.31)	(−3.02)	(8.09)	(6.96)
Ln *TNA*	−436***	−0.445***	−771***	−0.829***	−192***	−0.258***
	(−9.43)	(−7.62)	(−7.03)	(−6.22)	(−7.98)	(−5.34)
Ln *age*	−206***	−0.199***	801***	0.695***	−68.8***	−0.081***
	(−6.65)	(−5.86)	(4.3)	(4.68)	(−3.82)	(−3.29)
Constant	9.440***	9.741***	16.300***	17.730***	4.030***	5.551***
	(9.43)	(7.64)	(7.06)	(6.21)	(7.64)	(5.35)
R^2	0.051	0.052	0.050	0.095	0.042	0.014
Number of observation	11139	11139	1698	1698	9440	9440

Relationship between fund flow and fund past performance: Table 3 shows the flow-performance relationship in Chinese equity funds. We run fund fixed effect regression on unbalanced panel data. *Flow RMB* (*Flow%*) is dependent variable and *BAR* (excess of quarterly return from the market quarterly return, in previous four quarters), Ln *TNA*, Ln *age* are independent variables. *Flow(RMB)* is measured in millions and *Flow%* is the $Flow_{i,t}$ *(RMB)*/$TNA_{i,t-1}$. Ln *TNA* is the log transformation of total net assets of fund *i* at the end of previous quarter. *Lnage* is the log transformation of age of fund *i* at the end of previous quarter. Age is measured in years.R2 is presented in last row. t-statistics are presented in parenthesis. ***Indicate the significance at 1% level

$$Flow_{i,t}\ (Flow,\%_{i,t})=\alpha_i+\beta_1 BAR_{i,[t-4,t-1]}+\beta_2 \text{Ln}(TNA)_{i,t-1}+\beta_3 \text{Ln}(age)_{i,t-1}+\mu_{i,t} \quad (3)$$

Where $Flow_{i,t}$ ($Flow,\%_{i,t}$) is the net flow in RMB, millions (net flow percentage) in fund *i* in quarter *t*, $BAR_{i,[t-4,\ t-1]}$ is the excess return of fund *i* from the benchmark market in previous 4 quarters (*t*−4 to *t*−1), $\text{Ln}(TNA)_{i,t-1}$ is the log of total net assets of fund *i* at the end of previous quarter (i.e. *t*−1), $\text{Ln}(age)_{i,t-1}$ is the log of age of fund *i* at the end of previous quarter (*t*−1), measured in years, and $\mu_{i,t}$ is the error term. $Flow_{i,t}$($Flow,\%_{i,t}$) is the independent variable and other variables in Equation (2) are dependent variables.

Results of regression Equation (3) are presented in Table 3. Like *RR*, Benchmark-adjusted return (BAR) also shows significant positive relationship with the fund net flow. When fund performance increases, the fund net flow sensitivity also increases. The coefficients of total net assets and age show the almost same results as presented in Table 2. It indicates that for older and bigger funds, it is difficult to grow rapidly (Del Guercio and Tkac, 2002).

3.2. Flow-performance Relationship for Good and Bad Funds

In above portion we find that fund flow sensitivity shows positive relationship towards fund performance. Now we want to see whether this fund flow sensitivity shows the same level of response towards all ranges of performance. For this purpose, all funds are divided on the basis of performance in previous four quarters, into two groups: High and low. Two interaction dummy variables are created: One interaction variable is $RR_{i,[t-4,t-1]}$*$High_{i,[t-4,t-1]}$ and second interaction variable is $RR_{i,[t-4,t-1]}$*$Low_{i,[t-4,t-1]}$. Following Jun et al. (2014), we run the following time fixed effect regression model where standard errors are clustered by fund:

$$Flow_{i,t}(Flow,\%_{i,t}) = \alpha_t+\alpha_1 High_{i,[t-4,t-1]}+\beta_1 RR_{i,[t-4,t-1]}*High_{i,[t-4,t-1]}+\beta_2 RR_{i,[t-4,t-1]}*Low_{i,[t-4,t-1]}+\beta_3 \text{Ln}(TNA)_{i,t-1}+\beta_4 \text{Ln}(age)_{i,t-1}+\mu_{i,t} \quad (4)$$

Where $Flow_{i,t}$($Flow,\%_{i,t}$) is the net flow in RMB, millions (net flow percentage) in fund *i* in quarter *t*, $RR_{i,[t-4,t-1]}$ is the *RR* of fund *i* in previous 4 quarters (*t*−4 to *t*−1), $\text{Ln}(TNA)_{i,t-1}$ is the log of total net assets of fund *i* in previous quarter (i.e. *t*−1), $\text{Ln}(age)_{i,t-1}$ is

Table 4: Results of regression Equation 4

Independent variable	Dependent variable					
	Overall		2004-2008		2009-2014	
	Flow (RMB) (millions)	Flow, %	Flow (RMB) (millions)	Flow, %	Flow (RMB) (millions)	Flow, %
RR * *High* (β_1)	2.360***	1.530***	4.010***	2.539***	1.220***	1.168***
	(9.53)	(7.00)	(5.48)	(4.27)	(8.79)	(6.48)
RR * *Low* (β_2)	359***	0.412***	−564	0.894*	198**	0.202***
	(3.59)	(3.58)	(-1.07)	(1.81)	(2.44)	(2.36)
$\beta_1-\beta_2$	2.000***	1.118***	4.580***	1.645**	1.020***	0.966***
(F-test, P value)	(7.77)	(5.13)	(5.18)	(2.27)	(7.39)	(5.13)
Ln *TNA*	−649***	−0.601***	−1.360***	−1.219***	−233***	−0.342***
	(−9.51)	(−7.49)	(−7.76)	(−5.81)	(−8.3)	(−5.43)
Ln *age*	−31.6	−0.085	516	−0.338	49.3**	0.075
	(−0.47)	(−1.01)	(0.91)	(−0.58)	(1.98)	(1.17)
R^2	0.166	0.116	0.184	0.201	0.122	0.027
Number of observation	11139	11139	1698	1698	9440	9440

Test of flow sensitivity to fund performance for high and low performance funds. Table 4 presents the results of time fixed effect regression where standard errors are clustered by fund. *RR* is the raw return of fund *i* in previous four quarters (*t*-4 to *t*-1). The dummy variable high (low) takes the value of 1 if the fund *i* is among the top (bottom) 50% who have performed well (worst) in the previous four quarters (*t*-4 to *t*-1) and 0 otherwise. The coefficients on the interaction variables $RR_{i,[t-4,t-1]}$*$High_{i,[t-4,t-1]}$(β2) and $RR_{i,[t-4,t-1]}$*$Low_{i,[t-4,t-1]}$ (β2) measure flow sensitivity to performance for good (i.e. in the top 50%) and poor performing funds (i.e. in the bottom 50%), respectively. We apply F-test to see the difference (β1-β2) between flow sensitivity for good and bad performance. *Flow (RMB)* is measured in millions and *Flow,%* is the $Flow_{i,t}$ *(RMB)*/$TNA_{i,t-1}$. Ln *TNA* is the log transformation of total net assets of fund *i* at the end of previous quarter. Lnage is the log transformation of age of fund *i* at the end of previous quarter. Age is measured in years.R2 is presented in last row. t-statistics are presented in parenthesis. ***.**.*Indicate the significance at 1%, 5% and 10% level respectively

Table 5: Results of OLS regression model

Independent variable	Dependent variable					
	Overall		2004-2008		2009-2014	
	Flow (RMB) (millions)	Flow, %	Flow (RMB) (millions)	Flow, %	Flow (RMB) (millions)	Flow, %
RR * *High* (β_1)	1.800***	1.179***	3.310***	2.195***	1.080***	0.895***
	(8.87)	(6.64)	(6.78)	(4.79)	(9.36)	(8.6)
RR * *Low* (β_2)	54.8	0.124**	−19.9	0.499**	104*	0.123**
	(1.06)	(2.3)	(−0.1)	(1.95)	(1.85)	(2.03)
$\beta_1-\beta_2$	1.740***	1.055***	3.330***	1.696***	976***	0.772***
	(8.38)	(5.75)	(6.5)	(3.68)	(7.61)	(6.39)
Ln *TNA*	−117***	−0.081***	−387***	−0.422***	−93***	−0.051***
	(−14.75)	(−5.22)	(−6.04)	(−5.07)	(−30.61)	(−3.3)
Ln *age*	56.5***	0.009	−179	−0.366***	42.8***	0.005
	(2.69)	(0.56)	(−1.19)	(−2.69)	(7.03)	(0.55)
R^2	0.123	0.069	0.119	0.127	0.174	0.016
Number of observation	11139	11139	1698	1698	9440	9440

OLS: Ordinary least squares. Test of flow sensitivity to fund performance for high and low performance funds. Table 5 presents the results of time fixed effect OLS regression with robust standard errors. RR is the raw return of fund *i* in previous four quarters (*t*-4 to *t*-1). The dummy variable high (low) takes the value of 1 if the fund *i* is among the top (bottom) 50% who have performed well (worst) in the previous four quarters (*t*-4 to *t*-1) and 0 otherwise. The coefficients on the interaction variables $RR_{i,[t-4,t-1]}$*$High_{i,[t-4,t-1]}$(β2) and $RR_{i,[t-4,t-1]}$*$Low_{i,[t-4,t-1]}$ (β2) measure flow sensitivity to performance for good (i.e. in the top 50%) and poor performing funds (i.e. in the bottom 50%), respectively. We apply F-test to see the difference (β1-β2) between flow sensitivity for good and bad performance. *Flow (RMB)* is measured in millions and *Flow,%* is the $Flow_{i,t}$ *(RMB)*/$TNA_{i,t-1}$. Ln *TNA* is the log transformation of total net assets of fund i at the end of previous quarter. Ln *age* is the log transformation of age of fund *i* at the end of previous quarter. Age is measured in years.R2 is presented in last row. t-statistics are presented in parenthesis. ***.**.*Indicate the significance at 1%, 5% and 10% level respectively

the log of age of fund *i* at the end of previous quarter (i.e. *t*−1), measured in years, and $\mu_{i,t}$ is the error term. *High* takes the value of 1 if the fund *i* is among the top 50% who have performed well in the previous 4 quarters and 0 otherwise. Note that the dummy *Low* variable is not included in the equation to avoid the problem of multicolinearity. Our purpose is to check whether flow sensitivity is same in both good (high) and bad (low) mutual funds. The coefficient $\beta_1-\beta_2$ serves this purpose.. If $\beta_1-\beta_2=0$, it means that there is no difference in fund net flow sensitivity of good and bad funds. But if $\beta_1-\beta_2>0$ then it implies that investors show more response to past performance in well-performing funds than in worst-performing funds, which is convex relationship as reported in prior studies.

Results of regression Equation (4) are reported in Table 4. As our main concern is to see the difference ($\beta_1-\beta_2$) in flow sensitivity to past performance in good funds and bad funds, we use F-test for this purpose and find that null hypothesis ($\beta_1-\beta_2=0$) is rejected. We find that $\beta_1-\beta_2>0$. The difference ($\beta_1-\beta_2$) is significant in our findings. It implies that response to past performance by investors of well-performing funds is more sensitive than the response to past performance by investors of worst-performing funds. Our results are in line with the previous literature that also shows asymmetric flow-performance relationship in mutual funds (Ippolito, 1992 and Goetzmann and Peles, 1997). However, our results are not in line with the findings of Jun et al. (2014) where they show symmetric flow-performance relationship in Chinese equity funds.

We also investigate the asymmetry in fund-flow relationship by applying ordinary least squares (OLS) regression model with robust standard errors. This also serves the purpose of robustness. We use the same Equation (4) and apply OLS regression model, which is as follows:

$$Flow_{i,t}(Flow,\%_{i,t})=\alpha_t+\alpha_1 High_{i,[t-4,t-1]}+\beta_1 RR_{i,[t-4,t-1]}*High_{i,[t-4,t-1]}+\beta_2 RR_{i,[t-4,t-1]}*Low_{i,[t-4,t-1]}+\beta_3 \text{Ln}(TNA)_{i,t-1}+\beta_4 \text{Ln}(age)_{i,t-1}+\mu_{i,t} \quad (5)$$

Where $Flow_{i,t}(Flow,\%_{i,t})$ is the net flow in RMB, millions (net flow percentage) in fund i in quarter t, $RR_{i,[t-4,t-1]}$ is the RR of fund i in previous 4 quarters ($t-4$ to $t-1$), $\text{Ln}(TNA)_{i,t-1}$ is the log of total net assets of fund i in previous quarter (i.e. $t-1$), $\text{Ln}(age)_{i,t-1}$ is the log of age of fund i at the end of previous quarter ($t-1$), measured in years, and $\mu_{i,t}$ is the error term.

Table 5 presents the results of OLS regression model. Findings in Table 5 are similar to previous findings in Table 4. We find asymmetric relationship between fund flow and fund performance. In Table 5, $\beta_1-\beta_2$ s positive and is >0 ($\beta_1-\beta_2>0$) which implies that investors' response to good performance is more sensitive than investors' response to bad performance. This difference ($\beta_1-\beta_2$) in flow sensitivity for good and bad performance is significant at 0.1%. Good performance leads to large cash inflows into well-performing funds whereas bad performance causes little cash outflow from worst-performing funds. For robustness, we also divide the whole sample time period into two time windows. Results in these two time windows are qualitatively same and corroborate our findings in overall time period. Our results are in line with the findings of Ippolito (1992), Sirri and Tufano (1998), and Del Guercio and Tkac (2002), where they also find asymmetric flow-performance relationship in mutual fund industry.

4. CONCLUSION

The non-linearity in flow-performance relationship in mutual funds is one of the acknowledged regularity in finance literature and we re-examine this non-linearity in Chinese mutual fund market. We apply fund fixed effect and time fixed effect regression model on unbalanced panel data by using the sample of 557 Chinese equity funds for the period of 11 years. We find that there is a positive relationship between fund flow and fund past performance. We also find that size and age of fund suppress this flow-performance relationship. It is difficult for bigger and older funds to grow rapidly.

We further find that this positive relationship between fund flow and fund past performance is asymmetric. The response by investors of well-performing funds to past performance is more sensitive than response by investors of worst-performing funds. It implies that mutual funds that have performed well in previous year get disproportionately large cash inflow in the subsequent period whereas those funds that have showed bad performance in last year, experience minimal cash outflow in the subsequent period.

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