Leaving the (fund) gate ajar: investor protection or marketing ploy?

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Abstract

Using a sample of domestic equity funds in China, we explore mutual funds that impose discretionary inflow restrictions (gates) on investors. Consistent with scarcity marketing, we show funds that only open to small purchases attract extra capital flows and more retail investors. Contrary to manager's claim, we find no clear evidence that managers impose inflow gates to preserve fund performance or maintain their optimal portfolios. Rather, funds exhibit significant risk shifting behavior when the gate is in place. Overall, we suggest that leaving the fund gate ajar to investors is more of a marketing ploy than a genuine form of investor protection.

Key words: mutual funds; inflow gate; fund flow restrictions; scarcity marketing; retail investors; emerging fund market

JEL Classification: G11, G23

1. Introduction

This study explores for the first time mutual funds that impose discretionary inflow restrictions (gates) on investors. Over 2006–2016, more than half of domestic equity funds in China imposed varying inflow gates, with the daily purchase cap per investor ranging from zero (closed gate) to more than RMB 100 million (USD 16 million) (partly-closed gate).[1] This is somewhat puzzling given that managers are competing for greater fund flows. Utilizing a sample of 692 inflow restriction events announced by Chinese equity funds in the 2006–2016 period, we present evidence suggesting that managers impose inflow gates for marketing purposes.

Consistent with anecdotes that funds leave the gate ajar to lure more capital flows,[2] our main finding is, despite their lackluster future returns, funds that only allow for small purchases attract 14% extra quarterly flows. Strikingly, these funds experience an average increase of 43% in the number of investors and a 6.8% rise in retail investor ownership. In addition, closed gates stem fund inflows but retain existing investors, resulting in few net redemptions. Our results are robust to controlling for a rich set of fund characteristics and matched sample analyses. We thus suggest that inflow gates play a marketing role in influencing investors' capital allocation decisions and the effect is substantial.

Our setting differs from "hard" closures in the US in which funds completely stop inflows for years. Prior studies find that US managers close a fund to either divert flows to sibling funds (Zhao, 2004; Chen et al., 2012) or increase management fees in closed funds (Bris et al., 2007).

[1] An inflow gate is the maximum amount of fund assets that an investor is allowed to purchase in a trading day during the inflow restriction period; see examples of inflow gate announcements in Appendix 1. On September 8, 2020, Huashang Hongli Youxuan Equity Fund announced an inflow gate, a daily purchase limit of RMB 100,000 (approximately USD 16,000) per investor, effective from the announcement date.

[2] "A growing number of funds announcing inflow restrictions: size control or hunger marketing?" (in Chinese) March 7, 2014. *Yicai Financial*.

Of particular interest in our setting are partly-closed gates that seem to restrict fund inflows but remain open. We find that, instead of closing a fund to benefit siblings, Chinese managers leaving the fund gate ajar have put the spotlight on themselves to attract uninformed investors.

This effect is particularly applicable to China's market that is dominated by retail investors (e.g., Leippold et al., 2021). Having experienced purchase restrictions on the housing market and new car plates, individuals in China often exhibit impulse buying due to the fear of missing out on scarce products. Fund managers likely exploit such behavioral bias and impose inflow restrictions to increase investors' "anticipatory regret" (i.e., buy now or lose), creating a buying frenzy for a fund. Our results are largely consistent with the scarcity principle in marketing (e.g., Lynn, 1991; Eisend, 2008).

Our results are also consistent with retail investors being naïve and typically responding to attention-grabbing and easy-to-process signals (e.g., Barber and Odean, 2008; Ben-David et al., 2019). Mutual funds in China make public announcements when imposing inflow gates, and these announcements are also sent to investors through instant messages or mobile push notifications. Additionally, funds with inflow gates are often named in news articles as being "good buys".[3] Quite the contrary, fund "hard" closures in the US are rarely announced publicly to avoid generating additional investments (Smaby and Fizel, 1995). As such, an announcement or media mention of an inflow gate greatly increases the salience of fund past returns and scarcity, making a fund more visible and more likely to be chosen. Therefore, inflow gates potentially serve as an appealing marketing tool to attract retail investors, who rely heavily on eye-catching signals to simplify their decisions in choosing among thousands of funds (e.g., Roussanov et al., 2021).

[3] "Superior performance! Purchase limits on 18 funds with the tightest daily cap at RMB 1000." (in Chinese) August 29, 2019. *China Fund*.

We consider and rule out several alternative explanations for managers' motives of imposing inflow gates. First, we find no clear evidence supporting managers' claim that inflow restrictions protect investor interests. Despite their superior past returns, inflow-restricted funds' style- and size-adjusted returns decline dramatically subsequent to restrictions, and their future risk-adjusted return is not statistically different from matched peers. The finding that inflow gates do not preserve fund performance is consistent with results for fund hard closures (e.g., Bris et al., 2007).

Second, we find little evidence that managers impose inflow gates to maintain their optimal portfolios. Rather, partly-closed funds significantly shift their asset allocations by bearing greater market risk and leaning toward growth stocks, resulting in negative risk-adjusted returns when the gate is in place. They continue to increase their idiosyncratic risk during post-restriction periods. This is a strong indication of managers' inferior ability or agency issues (Huang et al., 2011). As expected, closed gates help reduce funds' exposure to market liquidity risk.

Third, restricting a fund's inflows does not divert investors' attention to sibling funds in our sample (Zhao, 2004; Chen et al., 2012). This may not be surprising as partly-closed funds remain open to purchases. Investors' fear of missing out on a scarce product (i.e., a quality fund that is currently in short supply) often incentivizes them to buy (Verhallen and Robben, 1994), leading to a boost in fund sales.

Our inferences are supported by further evidence showing that inflow gates become increasingly popular among small funds that strive for survival. Utilizing a new policy in China that requires small-size funds to disclose a "warning" about a possible liquidation since 2014, we find that small funds are more likely to employ inflow gates to stay afloat after the new disclosure policy. This evidence corroborates the marketing role of inflow gates.

To the best of our knowledge, our study provides the first look at discretionary inflow gates in mutual funds. We make several contributions to the literature. First, we add to the literature examining fund marketing, which is arguably as important as performance in mutual funds (Roussanov et al., 2021). Prior studies conclude that fund investors behave in a simple and naïve fashion (Choi and Robertson, 2020). This trading bias is often exploited by managers to promote fund products via attention-grabbing tactics, e.g., fund advertising (Jain and Wu, 2000; Phillips et al., 2016), fund recommendations in the press (Reuter and Zitzewitz, 2006), and media coverage (Solomon et al., 2014; Kaniel and Parham, 2017). We extend this line of studies by identifying an implicit marketing tool in mutual funds—making a fund scarce through a purchase limit—that is found to be effective in promoting fund sales, particularly in a market dominated by retail investors.

Second, our work complements earlier research on mutual fund flow restrictions (Zhao, 2004; Bris et al., 2007; Chen et al., 2012). Prior studies question the motives of fund hard closures, which constitute only a tiny fraction of the mutual fund population in the US and are rarely announced publicly. Our setting differs in that inflow gates are frequently imposed and have varying caps, as well as that funds intentionally notify investors of the purchase limits once imposed. This marketing-like effort, combined with the evidence of funds' risk-taking behavior and a larger investor base brought about by inflow restrictions, implies that inflow gates are more of a marketing ploy than a genuine form of investor protection. Our findings are important in understanding how investors' trading bias (e.g., the fear of missing out) shapes fund managers' marketing strategies.

Third, our results have broad regulatory implications. Managers are allowed to restrict fund inflows when accepting new purchase orders would have an unfavorable impact on existing investors' interests. However, we suggest that managers may impose inflow gates at their

discretion for the purpose of promoting business while claiming to protect investor interests. Coincidentally, some institutional investors in China have recently called for tighter regulation on the discretionary use of inflow gates, which, they argue, would negatively impact the development of the fund industry in the long run.[4] Given that global asset management companies are already tapping into the world's largest retail investor base,[5] our findings are of interest to fund investors, asset managers, and policy makers alike.

Finally, we add to the nascent research that explores the increasingly important emerging fund market. Recent studies show that in China's mutual fund market, managers routinely deviate from their stated investment objectives (Chua and Tam, 2020), engage in portfolio pumping (Li and Wu, 2019; Shackleton et al., 2020), and allocate more capital to listed firms that are socially connected with fund managers (Chen et al., 2021; Gao et al., 2021). In our study, we highlight that Chinese managers employ scarcity marketing to drive up fund flows. We suggest further research consider the potential impact of discretionary inflow gates on the behavior of both fund managers and investors.

The remainder of this paper proceeds as follows. Section 2 introduces the background of discretionary inflow gates in China's mutual fund market and our main hypothesis. Section 3 presents the characteristics of the sample funds. Section 4 discusses our empirical results. Section 5 reports extensions to our main analyses and Section 6 concludes the paper.

[4] "Discretionary fund inflow restrictions cause controversy and the industry calls for tighter regulation." (in Chinese) September 23, 2019. *China Fund*.
[5] Lim, D. and Xie, S., "BlackRock Gets Go-Ahead for a Mutual-Fund Business in China." August 29, 2020. *The Wall Street Journal*.

2. Discretionary inflow gates in China's fund market

2.1. Institutional background

Prior studies show that mutual funds respond to constraints imposed by asset growth by altering investment behavior, such as increasing ownership shares (Pollet and Wilson, 2008), trading less, and holding more-liquid stocks (Pástor et al., 2020). An important assumption in this line of literature is that fund managers accept and invest all the money that investors are willing to allocate to them (Berk and Green, 2004). In this study, we explore a distinctive response to asset growth in China's mutual fund market: the use of discretionary inflow gates.

China's fund market provides a good setting for examining fund behavior in response to rapid asset growth. Owing to its exponential growth, China is en-route to becoming the world's second largest fund market, with the country's mutual fund assets predicted to grow five-fold by 2025.[6] In addition, China has the world's largest retail investor base that offers great fundraising opportunities for asset managers. However, it seems to be difficult for asset managers in China to satisfy investors' demand, as they frequently impose purchase limits on fund assets. For example, in 2006 and 2007, about 65% of all domestic equity funds imposed at least one inflow restriction that claimed to prevent investor purchase requests. Despite the prevalence of inflow restrictions in the largest emerging fund market, there is a lack of empirical evidence on how effective these inflow gates are in managing fund flows or maintaining fund performance. Our study aims to fill this gap in the literature.

Inflow gates in China's fund market have several unique features. First, inflow gates have varying scales of restrictions, which may reflect different managerial objectives. For example,

[6] Flood, C., "China's fund industry predicted to grow fivefold by 2025." April 8, 2018. *Financial Times.*

when closing a fund completely, a manager expresses a concern about a rapid capital influx or large fund size. In contrast, imposing a partly-closed gate (e.g., a daily purchase limit of RMB 100,000 per investor) may suggest that fund inflow or size is less of a concern for the manager, as the fund remains open to purchases. Hence, it is an empirical question as to how partly-closed gates cap fund inflows. The restriction is to set a purchase cap per investor, not to limit the total number of (new) investors. When a large number of new investors invest, even each with a small purchase, fund flows still increase. Also, the purchase cap is imposed on a daily basis. Investors may split their purchases over several days and the fund size continues to grow. Therefore, the motivations and effects of imposing party-closed gates remain unclear.

Second, the duration of inflow restriction is relatively short in China's fund market. The median duration of fund inflow gates in our sample is 27 days, as opposed to a median value of 20 months for fund hard closures in the US (Chen et al., 2012). Around 25% of inflow gates in our sample lasted for less than a week. Such a short restriction period also raises questions about the effectiveness of an inflow gate in protecting investor interests in the long run.

Last, our setting provides an empirical advantage in that we have sufficient observations on inflow restriction events with exact dates available. More than half of domestic equity funds in China announced at least one inflow restriction between 2006 and 2016, which resulted in a total of 692 events. As a comparison, the sample of fund closures examined in prior US studies includes 228 events over 1995–2004 (Chen et al., 2012) and 140 events over 1993–2004 (Bris et al., 2007). The relatively small US sample is due to the fact that fund closures in the US only account for a mere 1%–2% of equity funds and such closures rarely make public announcements. Therefore, this setting enables us to better examine the impact of inflow restrictions on fund flows and performance.

2.2. Hypotheses

We consider two basic propositions. First, the *investor protection* hypothesis posits that inflow gates protect investor interests. This is the most popular reason why funds restrict inflows. By cooling off accelerating fund flows or preventing funds from growing too big, inflow gates should enable funds to preserve their good performance or optimal portfolios. This reason seems legitimate given the empirical evidence that large fund size or liquidity-motivated trading erodes fund returns (e.g., Edelen, 1999; Chen et al., 2004; Yan, 2008; Zhu, 2018; Song, 2020).

However, the investor protection hypothesis seems at odds with fund managers' incentive to maximize their compensation that is predominantly tied to fund size (Ibert et al., 2018). Rents are only collected through fund flows in China as management fees are fixed (e.g., Jun et al., 2017; Chua and Tam, 2020). It is hard to imagine that, in a market absent sufficient external monitoring, fund managers are willing to protect investor interests at the expense of higher rents arising from higher inflows (e.g., Gao et al., 2021). Since anecdotes suggest that funds cap inflows to lure more investor purchases, we consider the *marketing ploy* hypothesis, which posits that funds restricting inflows aim to differentiate themselves from peers and attract extra flows.

There are two main reasons why the *marketing ploy* hypothesis makes sense. First, the scarcity principle in marketing suggests that announcing "limited availability" of a commodity (e.g., "a limited supply" or "only a few left in stock") often draws public attention and attracts more customers (Lynn, 1991; Eisend, 2008). Imposing a purchase limit on a fund would work likewise in promoting the fund product, because the implicit message is that a fund with both superior (past) performance and good stewardship is currently in short supply. Hence, the clear threat of "Buy now or lose" often creates a buying frenzy for a scarce product (Verhallen and Robben, 1994; Stock and Balachander, 2005).

Second, due to limited resources or cognitive skills, individual investors only consider a limited set of attention-grabbing options rather than wading through all available investment choices when making buying decisions (Barber and Odean, 2008). As a result, any signal (i.e., an announcement of a purchase restriction) that increases the visibility of a fund would lead investors to consider the fund (Kaniel and Parham, 2017; Akbas and Genc, 2020).

As the levels of inflow restrictions may reflect different managerial objectives, we categorize all inflow gates into three groups based on the purchase limit in each event: (1) *closed gate*, when a fund is completely closed to all investors, implying the manager's concern over an influx of fund flows or a rapidly growing size; (2) *narrow gate*, when the daily investment cap is set below or at RMB 100,000 (USD 16,000), signaling that the fund is only open to small purchases or small investors; and (3) *wide gate*, when the daily purchase cap is set above RMB 100,000 (e.g., RMB 10 million or USD 1.6 million), aiming to prevent large purchase requests.[7]

We expect narrow gates to have the most pronounced marketing effect. A more restrictive gate (i.e., a purchase cap of RMB 1,000, compared to a cap of RMB 1 million) signals that a fund has almost reached its maximum capacity and, more importantly, the fund is likely to shut the door soon. The signal of "Hurry! Buy now" highlights the time-limited investment opportunities in the fund, enhancing investors' purchase willingness (e.g., Aggarwal and Vaidyanathan, 2003). Additionally, individuals in major Chinese cities have experienced purchase restrictions on the housing market and new car plates. Therefore, due to "anticipatory regret" (i.e., the attractive investment opportunity available currently may be unavailable later), investors often view purchase restrictions on a fund as a signal of "Don't miss out!" and jump into the fund. Taken

[7] Funds announcing inflow gates do not specify which type of investors they intend to restrict. However, given that the average fundholding per investor in our sample is RMB 58,000 (USD 9,220), a daily limit of RMB 100,000 or less is a reasonable cut-off for narrow inflow gates, as it is too low for institutional investors to squeeze in.

together, we conjecture that partly-closed gates are used to drive up fund flows, from unsophisticated investors in particular. We test our main hypotheses in Section 4.

3. Data

We obtain a dataset on inflow restriction events in China's mutual fund market between 2006 and 2016 from Wind Information Co. (WIND).[8] Following prior studies (Bris et al., 2007; Chen et al., 2012), we restrict our analysis to domestic equity open-end mutual funds by excluding index, bond, and international funds. We exclude funds with an operating history of fewer than two years to mitigate incubation bias (Evans, 2010). The final sample consists of 495 unique equity funds, with 260 of them invoking at least one inflow restriction from January 2006 to December 2016. We also source fund characteristics from WIND. We next summarize the sample of inflow restriction events and characteristics of inflow-restricted funds.

3.1. Descriptive statistics of inflow gates

Figure 1 presents the monthly proportion of aggregate fund-day observations with inflow restrictions, together with the Shanghai Stock Exchange (SSE) Composite Index over the period 2006−2016. Generally, months with large proportions of inflow restrictions coincide with rebounds in China's stock market. As Table 1 Panel A shows, over 60% of equity funds in 2006 and 2007 announced at least one inflow restriction event. This is unsurprising, as the SSE Index increased by 237% in these two years and there were only a few hundred domestic equity open-end funds operating. Another spike of inflow restrictions occurred in early 2015 when the SSE index gained 84% in less than six months from the fourth quarter of 2014. The feverish fund

[8] WIND is a leading data vendor of financial and economic information in China, with complete data on stock, bonds, funds, derivatives, indices, and the macro-economy. Although fund inflow restrictions in China are all publicly announced, the compiled data were not available in most mutual fund databases in China until early 2017 when WIND first collated such information.

purchase requests in the first half of 2015 triggered some 110 inflow gates, accounting for 16% of the total sample events. In comparison, only seven inflow restriction events occurred during the 2012 bear market. Overall, 52.5% of all domestic equity funds imposed at least one inflow restriction, a total of 692 events, during the sample period.

[Insert Figure 1 here]

[Insert Table 1 here]

Figure 2 depicts the frequency of purchase caps among all inflow restriction events. The daily purchase limits vary considerably, ranging from zero to more than RMB 100 million (USD 16 million) per investor. Of all events, roughly 46% (54%) completely (partly) close the gate to all investors, with the median daily purchase limit at RMB 50,000 (USD 8,000).

[Insert Figure 2 here]

We report the stated reasons for inflow restrictions in Table 1 Panel B. The stated reasons for three-quarters of all restriction events are to "control fund size", "maintain fund performance" or "protect investor interests and smooth the operation of the fund". The remaining events are due to "heavy-weight stock suspended" (16.9%) and "fund dividend distribution" (8.1%). We note that since 2009, funds have started to state the same reason of "investor protection" for limiting investor purchases. This standard reason accounts for an overwhelming 93% of all inflow gates between 2009 and 2016 (untabulated). Interestingly, all narrow-gate funds claim that purchase restrictions are to protect investor interests. This suggests the need to explore more of the underlying motives for placing such restrictive purchase caps on investors.

Table 1 Panel C presents the duration of inflow restriction events by gate categories. The median duration of all inflow restriction events is 27 calendar days, with the bottom (top) decile

at 3 (186) days. As a comparison, the median duration of fund closures in the US is 20 months, and the minimum value is one month (Chen et al., 2012). This leads to a question as to whether a restriction that only lasts for a few days would serve as an effective tool to cap fund inflows.

3.2. Characteristics of inflow-restricted funds

Table 2 reports mean and median characteristics of inflow-restricted funds and all domestic equity funds in China. The unit of observation is a fund-quarter. Columns (1) – (3) show fund-quarters in which a closed, narrow, and wide gate are observed, respectively. Column (4) includes all fund-quarters with no inflow restrictions, and column (5) summarizes the full sample. On average, fund-quarters with inflow restrictions are larger in size, deliver higher past returns, and exhibit greater fund flows than fund-quarters with no inflow restrictions. For example, the average total net assets (TNA) of closed-gate funds is RMB 9.8 billion (USD 1.6 billion), which is three times the average fund size of the full sample. In addition, funds with closed gates exhibit an average implied fund flow of 79% (45%) in the flow-restriction event quarter (prior quarter). This compares with an average of 0.12% implied flows for fund-quarters without inflow restrictions. As expected, inflow-restricted funds all have higher past returns. The average 1-quarter lag raw return of inflow-restricted fund-quarters is in excess of 10.5%, while that of non-restricted fund-quarters is 3.5%. The descriptive statistics in Table 2 indicate that funds limit investor purchases when they experience excessive cash inflows and superior past performance.

[Insert Table 2 here]

Our comparison of fund characteristics among three gate categories also reveals interesting patterns. The mean (median) TNA of closed-gate funds is almost three times the mean (median) size of narrow- or wide-gate funds. Similarly, the total number of investors in closed-gate funds has a median value of 248,170, as opposed to 105,640 and 58,520 in funds with narrow and wide

gates, respectively. The average number of stocks in closed-gate funds is 95, which is 1.5 times the number of stocks held in funds of other gate categories. This implies that size is of a concern for those funds closing the gate. Moreover, narrow-gate funds differ from others by having the lowest average fundholding of 15,470 units (RMB 27,560) per client, which is only one-third (half) of the full sample average. Narrow-gate funds also have a relatively higher top-10 stock weight (47.3%) than the sample average (40%). Overall, partly-closed funds differ from closed funds or other non-restricted funds in observable characteristics.

4. Empirical analysis

4.1. Fund performance around inflow restriction events

We first test the *investor protection* hypothesis, which posits that preventing investor purchases enables fund managers to maintain their superior past performance. To do this, we examine style- and size-adjusted excess returns of inflow-restricted funds around the event quarter t (when the inflow gate is in place) from quarter $t - 1$ to quarter $t + 4$ (e.g., Aiken et al., 2015). Style- and size-adjusted excess return is measured as the difference between the raw return of an inflow-restricted fund and the benchmark return. We calculate the benchmark return at the beginning of each event quarter as the equal-weighted return of funds that are in the same style (value, growth, or blend, according to WIND classifications), size quintile, and lagged within-style return quintile (e.g., Chen et al., 2012; Covachev, 2019).

Table 3 shows that, despite their significant excess returns, inflow-restricted funds' subsequent returns decline drastically following inflow restrictions. For example, the excess return of narrow-gate funds drops from a statistically significant 3.56% in the quarter before, to a statistically insignificant 0.63% over the year after the inflow restriction. Similar patterns are

observed in all inflow-restricted funds, with a relative drop of 66%–90% in performance from the year before to the year after the event quarter.

[Insert Table 3 here]

Figure 3 better illustrates these results. Inflow-restricted funds all outperform benchmarks before the event quarter, although closed-gate funds already experience a slight drop in their excess returns. This pre-event performance deterioration could be a result of diseconomies of scale, which prompts fund managers to close the funds. However, doing so does not seem to help. Both closed- and wide-gate funds' excess returns decrease to almost zero in one quarter following the imposition of inflow restrictions. Interestingly, narrow-gate funds have the highest performance jump in the quarter prior to the restriction, while their subsequent returns post the biggest fall. In short, despite their superior past performance, inflow-restricted funds all end up with future returns that are comparable with their style- and size-adjusted benchmarks in the ensuing year. Our results echo the US evidence that closed funds do not earn excess returns after closing (Smaby and Fizel, 1995; Bris et al., 2007; Covachev, 2019).

[Insert Figure 3 here]

Since inflow gates in our setting are imposed on a daily basis, measuring fund performance by calendar quarters might not be able to capture some abrupt performance shocks that lead to inflow restrictions. We therefore present in Internet Appendix Figure IA1 a more granular analysis of fund daily excess returns using a short-term event window [–60, 60], namely 60 trading days before and after the gate is in place. Benchmark funds are as defined in Table 3, except the benchmark return in Figure IA1 is measured for each trading day. Similar to Figure 3, Figure IA1 shows an overall decrease in the benchmark-adjusted return of inflow-restricted funds after

restrictions. The most striking series is that demonstrated by narrow-gate funds. Their annualized excess return reaches an exceptional level at 60% in a few days before the restriction, but subsequently decreases considerably once the restriction starts, and further deteriorates to close to zero in two weeks after inflow restrictions.

We note that our results in Table 3 could be influenced by benchmark funds that are vastly different from inflow-restricted funds in the sample. In addition to fund style, size, and past performance that are used to define benchmark funds, other fund characteristics may also affect both a manager's decision to enact an inflow gate and a fund's subsequent performance. We thus compare the performance of inflow-restricted funds with matched funds, which have similar ex-ante observable fund characteristics but do not impose inflow gates.

We select control funds using a propensity score matching (PSM) approach (e.g., Hong, 2014; Aiken et al., 2015). Specifically, we first obtain the propensity score by estimating a logistic regression model using observable fund characteristics to predict the probability of imposing an inflow gate z (a closed, narrow, or wide gate) in quarter t. Next, for each inflow-restricted or treated fund, we select a control fund from the same event quarter that has the closest propensity score. The control fund is then 1:1 matched with the treated fund in each event quarter on ex-ante fund characteristics, including lagged and contemporaneous fund returns, fund flows, fund size, fund age, fund's ownership in underlying stocks, top-10 stock weight, cash holdings, the number of stocks, and fund styles (see Appendix 2 for a discussion of the determinants of imposing inflow gates).[9] Based on the matched sample, any subsequent performance difference between inflow-

[9] Overall, funds with higher purchase demands and highly concentrated portfolios are more likely to restrict investor purchases. Other factors are associated with the varying tightness of inflow restrictions. For example, funds with a higher level of cash reserves and a larger number of stocks tend to impose a closed gate. Compared to other gate categories, narrow gates seem to have the least legitimate reasons for restrictions (except for the common drivers). The use of narrow gates is not associated with fund size, age, or cash holdings.

restricted funds and their matched peers is associated with the treatment effect of inflow restrictions (Aiken et al., 2015). We present in Table 4 the comparison of quarterly risk-adjusted returns (from the Fama-French (1993) three-factor model) between inflow-restricted funds and matched funds over four quarters subsequent to inflow restriction events. For completeness, we also report fund returns in event quarter t and quarter $t - 1$.

[Insert Table 4 here]

As shown in Table 4, regardless of the gate category, there is no significant difference in risk-adjusted returns between inflow-restricted funds and their matched funds from quarter $t + 1$ to $t + 4$. Moreover, among the three gate categories, narrow-gate funds have the lowest post-restriction return, ranging from –0.22% to 0.35%. This is far lower than the average risk-adjusted return of no-gate funds (0.78%) or all equity funds (0.88%). To further visualize the results, we present cumulative risk-adjusted returns of inflow-restricted funds from quarter $t - 4$ to $t + 4$ in Internet Appendix Figure IA2. The lines covering quarter t to $t + 4$ are much flatter than that during the pre-restriction period, suggesting that investors in the inflow-restricted funds earn little once restrictions start. In sum, the finding that inflow-restricted funds deliver mediocre future returns does not lend support to managers' claim that inflow restrictions preserve fund performance.

4.2. Fund risk shifting behavior during the inflow restriction period

The performance deterioration in inflow-restricted funds as documented in Section 4.1 is somewhat expected, because superior fund performance does not persist (e.g., Bollen and Busse, 2005). Like the often-cited phrase in mutual fund sales — "past performance does not guarantee future results." In addition to maintaining fund good performance, sticking with existing (optimal) investment strategies may be an alternative explanation as to why managers restrict inflows. It is perceivable that, after a period of achieving high excess returns, an equity mutual fund tends to

hold its "winner" portfolio going forward, even though outperformance may not continue (Covachev, 2019). Under certain circumstances, fund managers may have difficulties adding existing favorable stocks to their portfolios (Pollet and Wilson, 2008), or managers may not be able to find further attractive investment opportunities (Simutin, 2014). As such, restricting fund inflows should enable managers to continue with their existing investment strategies. If these claims are true, then we would expect fund managers not to significantly change their investment allocations during the inflow-restriction period. We next verify this potential explanation.

Taking advantage of daily observations on inflow restrictions, we regress fund daily excess return on the Fama-French (1993) three factors (mkt, smb, hml) plus the Amihud (2002) market-wide illiquidity factor (liq) (Model 1) or the Carhart (1997) momentum factor (umd) (Model 2), as well as their respective interaction terms with the inflow gate categorical variable as follows:

$$Daily\ Excess\ Return_{i,t} = a + \beta_1 mkt_t + \beta_2 smb_t + \beta_3 hml_t + \beta_4 liq_t\ (or\ umd_t) +$$
$$\boldsymbol{\lambda_1^z} Gate_{i,t}^z \times mkt_t + \boldsymbol{\lambda_2^z} Gate_{i,t}^z \times smb_t + \boldsymbol{\lambda_3^z} Gate_{i,t}^z \times hml_t + \boldsymbol{\lambda_4^z} Gate_{i,t}^z \times liq_t\ (or\ umd_t) +$$
$$\delta \times Gate_{i,t}^z + e_{i,t}\ , \qquad (1)$$

in which $Daily\ Excess\ Return_{i,t}$ is fund i's return in day t in excess of the risk-free rate.[10] $Gate_{i,t}^z$ is a categorical variable taking values of z = 0, 1, 2, or 3 if fund i imposes no restriction, a closed gate (the fund is not open to any purchases), a narrow gate (daily purchase cap per investor set below or at RMB 100,000), or a wide gate (daily purchase cap set above RMB 100,000), respectively, on day t. Of particular interest are the coefficients $\boldsymbol{\lambda^z}$, which capture changes in fund

[10] The risk-free rate is the daily interest rate on the one-year official deposit rate (e.g., Chen et al., 2018). The Fama-French (1993) three factors and the Carhart (1997) momentum factor are sourced from the China Asset Management Academy. The market-wide illiquidity factor is calculated based on Amihud (2002). A summary of daily risk factor measures for the Chinese market over the period 2006–2016 is reported in Internet Appendix Table IA1. The average market daily excess return (MKT) is 0.09%, suggesting a relatively large risk premium of 21.4% per year in China's stock market. The average daily return on the size factor (SMB) and value factor (HML) is 0.09% and –0.01%, respectively, implying a significant return premium for small firms and the dominance of growth stocks in China's stock market. The momentum factor is also associated with a negative daily return of –0.02%.

portfolio allocations or risk exposures when an inflow gate *z* is in place. We include fund fixed effects in equation (1) and report our regression results in Table 5.

[Insert Table 5 here]

We find strong evidence of risk shifting behavior in narrow-gate funds. The coefficients on the interaction term, *Narrow gate* × *MKT* (*Narrow gate* × *HML)*, in Models 1 and 2 are all positive (negative) and statistically significant at the 1% level. These results suggest that, instead of maintaining their prior portfolio allocations, narrow-gate funds shift their risk exposures drastically by bearing greater market risk and tilting toward growth stocks when the gate is in place. In other words, narrow-gate funds tend to pursue a more aggressive investment strategy during inflow-restriction periods. This is in contrast to managers' claim that an inflow gate is invoked to "ensure the smooth operation of the fund".

The results in Table 5 offer further observations. As expected, a closed gate helps a fund effectively reduce its market liquidity risk exposure. The coefficient on *Closed gate* × *LIQ* in Model 1 is negative and significant at the 1% level. We also find weak evidence in Model 1 that wide-gate funds change their investment allocations, but that is not the case in Model 2.

It might be argued that narrow-gate funds tilting toward a riskier strategy may not be harmful to investors. Risk shifting could be an indication of managers' ability in selecting stocks and timing the market. In addition, if investors are compensated by risk shifting, then investors are not necessarily hurt. However, the negative coefficients on *Narrow gate* in Table 5 show that managers' behavior of risk shifting actually lead to negative risk-adjusted returns during restriction periods. This is consistent with Huang et al. (2011) that risk shifters are likely motivated by agency issues and perform poorly.

Our inferences are supported by further evidence showing that narrow-gate funds continue to increase their idiosyncratic risk around inflow restrictions (see Internet Appendix Table IA2). Although all inflow-restricted funds increase risk-taking one quarter before restrictions start, narrow-gate funds continue to take extra risk from the event quarter t to quarter $t + 3$. These results are primarily driven by an increase in narrow-gate funds' idiosyncratic risk levels. In comparison, the increased risk-taking behavior disappears in both closed funds and wide-gate funds during post-restriction periods.

Collectively, our results in Section 4.2 provide strong evidence suggesting that narrow-gate funds take extra risk around inflow restrictions. Our interpretation is that narrow-gate funds persistently pursue risky strategies that increase volatility. Again, these strategies do not necessarily protect investor interests but are more consistent with agency issues (i.e., the gambling behavior of fund managers). We thus rule out the possibility that fund managers impose inflow gates in order to maintain their optimal portfolios or to "smooth the operation of the fund".

4.3. Inflow gate, future fund flows, and investor base

Having documented inflow-restricted funds' mediocre future returns, we now test the *marketing ploy* hypothesis. We posit that inflow gates—in particular, partly-closed gates—serve as a driver of fund flows by "advertising" both the quality (i.e., good past performance and stewardship) and scarcity of the fund (i.e., in short supply). This empirical prediction is based upon the well-documented effect of fund advertising or media coverage on fund flows. For example, Jain and Wu (2000) show that advertising attracts larger future flows into a fund, even though the superior performance of advertised funds does not persist in the post-advertisement period. Similarly, Reuter and Zitzewitz (2006) find that investors often respond to mutual fund recommendations, although these recommendations do not predict future returns. Kaniel and

Parham (2017) show that funds appearing in the media receive substantial extra flows, compared to funds with similar performance rankings but which lack public visibility. In a similar vein, if no superior future performance but greater fund flows are observed in inflow-restricted funds, then the results would support our *marketing ploy* hypothesis.

To examine the impact of inflow gates on future fund flows, we employ a regression framework given by the following equation:

$$Fund\ flow_{i,t+1} = \alpha + \beta^{z} Gate_{i,t}^{z} + \delta \mathbf{F} + \varepsilon_{i,t}, \quad (2)$$

where *Fund flow* is measured two ways: (1) *Netflow in units (%)*, which is defined as net purchase/redemption of fund units divided by the total fund units at the beginning of a given quarter; and (2) *Implied fund flow (%)*, which is a commonly used fund flow measure (e.g., Sirri and Tufano, 1998). We use the categorical variable approach to investigate whether different restriction levels work differently to stem or attract future fund flows. The categorical variable $Gate_{i,t}^{z}$ takes the values of z = 0, 1, 2, or 3 if fund *i* imposes no restriction, a closed gate, a narrow gate, or a wide gate, respectively, in quarter *t*. **F** is a vector of fund characteristics, including fund raw returns/alphas, lagged fund flows, fund age, and fund size. Variable definitions are detailed in Table 2. Of particular interest is the coefficient β^{z}. A significantly positive (negative) β^{z} suggests that fund gate z attracts (stems) fund flows, controlling for fund characteristics. We estimate equation (2) with both time (year-quarter) and fund fixed effects. Standard errors are clustered at both the fund and time level. Regression results are presented in Table 6, with *Netflow in units (%)* as the dependent variable in columns (1) and (3) and *Implied fund flow (%)* as the dependent variable in columns (2) and (4).

[Insert Table 6 here]

Consistent with the *marketing ploy* hypothesis, we find that partly-closed gates are associated with *greater* subsequent fund flows. Specifically, the results in columns (1) and (2) in Table 6 show that narrow gates are associated with 23% more net purchases of fund units or 14% more money in the quarter subsequent to inflow restrictions, controlling for fund characteristics. So do wide-gate funds but to a lesser extent. We also follow Jain and Wu (2000) and include lagged flows and risk-adjusted returns in columns (3) and (4). The coefficients on *Narrow gate* and the corresponding *t*-statistics are similar to those in columns (1) and (2). In addition, the negative but insignificant coefficients on *Closed gate* across columns (1) – (4) suggest that closed gates not only stem fund purchases, but also encourage existing investors to stay in the closed funds, resulting in few net redemptions. Our results are robust to using fund performance rank (Li and Wu, 2019) and an alternative calculation of implied fund flows (Bris et al., 2007).[11] We continue to obtain similar results after including additional controls that may affect fund flows, e.g., future fund return (Jain and Wu, 2000), 5-star fund (Ben-David et al., 2019; Evans and Sun, 2021), fund return volatility (Huang et al., 2011), and the MAX effect (i.e., a fund's extremely positive return, see Akbas and Genc, 2020).[12] None of these controls materially change the impact of partly-closed gates on fund flows. Overall, we show that funds leaving a gate ajar to small investors experience greater future fund flows, controlling for other key determinants of fund flows.

We next explore the source of increased fund flows brought about by partly-closed gates. We aim to answer two questions: Do inflow gates attract new money from existing investors or

[11] See Internet Appendix Table IA3. In our main tests, *Implied fund flow (%)* over period t is defined as $\frac{TNA_{i,t}-TNA_{i,t-1}\times(1+RET_{i,t})}{TNA_{i,t-1}} \times 100$ (Sirri and Tufano, 1998). We also calculate implied fund flow as $\frac{TNA_{i,t}-TNA_{i,t-1}\times(1+RET_{i,t})}{TNA_{i,t-1}\times(1+RET_{i,t})} \times 100$ (Bris et al., 2007) and our results remain the same. Following Li and Wu (2019), we use *Performance rank* as a proxy for fund return and our inferences are unchanged. *Performance rank* is the decile performance rank based on fund raw returns among all equity funds over a given period, ranging from 0 (worst) to 1 (best).

[12] See Internet Appendix Table IA5.

new investors? Are the greater fund flows coming from retail or institutional investors? Exploiting the detailed disclosure of investor bases in China's mutual funds, we examine whether and how inflow gates impact fund investor bases. We adapt the baseline model in equation (2) by using *Investor base*$_{i,t+1}$ as the dependent variable, which is measured in different ways: *Ln(Number of investors)*, *Ln(Average fundholding in units)*, and *Retail investor ownership (%)*.[13] The coefficients on the categorical variable *Gate*^{z} indicate whether inflow gate category *z* attracts new investors, changes the average fundholding, or increases retail investor ownership. Table 7 reports our regression results.

[Insert Table 7 here]

As predicted, we find that announcing a narrow inflow gate has the most pronounced marketing effect. In column (1), we report results from regressing the natural logarithm of the total number of fund investors on different gate categories and control variables. The significantly positive coefficient on *Narrow gate* (coef. = 0.36, *t*-stat. = 6.54) suggests that a narrow inflow gate is associated with a 43% increase in the future number of investors. Since the average number of investors in domestic equity funds is around 148,000, such a huge increase is clearly driven by new retail clients. In turn, we document in column (2) a significant drop in the average fundholding after a narrow gate is enacted. Narrow gates are associated with a 27% drop in the average fundholding per investor, equivalent to a decrease of RMB 12,760 (USD 2,028) in the average holding asset. These results are consistent with narrow gates leading to a substantial increase in

[13] Note that information on fund investor bases (the total number of investors, average fundholding in units, and retail investor ownership) is disclosed semi-annually. The dependent variable $Investor\ base_{i,t+1}$ is the next available reported number after inflow restriction events in quarter *t*.

new retail investors with small purchases, which dilute the average fundholding.[14] Column (3) presents further evidence to support the view that narrow gates are associated with a larger retail client base. The average retail investor ownership in narrow-gate funds increases by 6.8% following the inflow restriction (*t*-stat = 4.11). In contrast, neither a closed gate nor wide gate results in any significant change in the investor base. Our results in Table 7 continue to hold after including a rich set of controls (e.g., fund performance rank/risk-adjusted returns, fund future return, 5-star fund, fund return volatility, and the MAX effect).[15] In sum, we find evidence supporting the *marketing ploy* hypothesis; that is, funds that only allow for small purchases expand their retail investor base substantially.

A follow-up question we investigate is: why do narrow-gate funds target retail clients? A plausible explanation is that retail investors exhibit behavior that is generally considered unsophisticated (Song, 2020). Due to limited resources, time, and cognitive skills, retail investors only consider a list of attention-grabbing options rather than doing due diligence over all possible choices (Barber and Odean, 2008). Hence, managers' marketing effort with any eye-catching signals (i.e., a signal of scarcity via a purchase cap on fund assets) can influence investors' consideration set in choosing among thousands of funds (e.g., Akbas and Genc, 2020; Choi and Robertson, 2020). Importantly, once retail investors put money in a fund, they are fairly insensitive to poor performance (Chevalier and Ellison, 1997; Sirri and Tufano, 1998). As a result, the money from retail investors tends to be "sticky" to the fund (Sialm et al., 2015), leading to a long-term marketing effect of signaling scarcity. To verify this explanation, we regress cumulative fund flows

[14] If the greater fund flows brought about by narrow gates are all from existing investors, then we would expect the coefficient on *Narrow gate* in column (1) to be insignificant because the total number of investors does not change, and we also expect the coefficients on *Narrow gate* in column (2) to be positive as the average fund holding would dramatically increase. Therefore, the results in Table 7 suggest that the greater fund flows are mainly from a larger number of new retail investors, rather than existing investors.

[15] See Internet Appendix Tables IA4 and IA5.

from quarter $t + 1$ to $t + n$ (n = 2, 3, 4) on $Gate_{i,t}^{z}$ and fund characteristics. We report these results in Internet Appendix Table IA6.

We find that narrow gates are associated with noticeably higher fund flows for as long as one year after the inflow restriction. Specifically, narrow-gate funds attract 74% more cumulative fund flows over the four quarters subsequent to the restriction event (t-stat = 3.10). This long-lasting marketing effect of narrow gates is consistent with the argument that funds leave the gate partly closed to attract naïve clients, who are less likely to withdraw from the fund even if its performance declines subsequently (e.g., Huang et al., 2007; Barberis and Xiong, 2009). Therefore, the expansion of retail (sticky) clients, brought about by scarcity marketing, results in enhanced fund flows lasting for as long as one year.

One concern with respect to the validity of our results in Tables 6 and 7 is that inflow-restricted funds and non-restricted funds may be intrinsically different. To address this concern, we construct three matched samples. We match inflow-restricted and non-restricted funds using three matching methods: nearest neighbor propensity score matching (PSM), Kernel PSM, and Entropy balancing.[16] The covariates used in the three matching methods are the same as the determinants of imposing inflow gates in Appendix 2. Matching procedures and summary statistics of matched samples are reported in Internet Appendix Table IA7. We re-estimate the baseline models in Tables 6 and 7 using the three matched samples, and report regression results in Internet

[16] The nearest neighbor PSM is often utilized in hedge fund studies examining share redemption restrictions (e.g., Hong, 2014; Aiken et al., 2015). Kernel-based matching is used when there is no sufficient number of potential controls from which to draw a matched cohort (Becker and Ichino, 2002). The Entropy balancing approach is a multivariate reweighting method that focuses directly on achieving covariate balance (Hainmueller, 2012). This produces a sample in which the means and variances of all selected control variables are the same in both the treatment and control groups.

Appendix Table IA8. The coefficients on *Narrow gate* and the corresponding *t*-statistics are all consistent with our main results. Therefore, our inferences are robust to matched sample analyses.

We note a possible explanation for our results is that an increased retail investor base could be an unintended consequence of imposing narrow gates on investors. When restricting investor purchases, fund managers may have good intentions to protect investor interests, but the outcome turns out to be unanticipated (i.e., extra fund flows and more retail investors). If this were true, then we would expect narrow-gate funds to completely shut the door after 'good-steward' managers observe such 'unanticipated' outcomes, as managers are able to observe the changes in the number of fund investors and fund daily flows. However, in our sample events, few narrow gates turn to closed gates subsequently. Therefore, we suggest that leaving the fund gate ajar to investors appears to be an intentional marketing ploy.[17]

4.4. Inflow gate and family spillover effect

Prior studies suggest that fund houses may stop investor purchases in a particular fund to divert investors' attention to other sibling funds (e.g., Zhao, 2004). We test this potential motive and find no family spillover effects in our setting. The enactment of inflow gates has little impact on sibling funds' flows and investor bases.

Specifically, we first identify inflow restriction activities at the family (fund house) level. We construct an indicator variable, *Family closed (narrow or wide) gate*, which equals one if a non-restricted fund's family imposes at least one closed (narrow or wide) inflow gate on other family equity funds in a given quarter, and zero otherwise. Then, we regress non-restricted funds'

[17] We note that there are several potential channels through which inflow restrictions work to enhance fund flows (e.g., public announcements, news articles related to inflow restriction, or instant messages/notifications sent to investors). However, because investor account-level data and daily fund flows are unavailable, we are not able to test the effectiveness of these channels individually. Thus, analyses of these issues are left for future research.

flows/investor bases on the family-level inflow restriction activities, controlling for fund- and family-level characteristics. The coefficients on *Family closed gate* and *Family narrow gate* are statistically insignificant across all model specifications, suggesting that a potential spillover on other family funds is not a primary driver for managers' decision to impose a closed or narrow gate (see Internet Appendix Table IA9).

It has also been suggested that, since mutual funds in China are largely managed by solo in-house managers (Chen et al., 2018), a manager may limit the purchase of a fund with an aim of diverting investor attention to their other open funds, thereby leading to a higher total compensation for the individual manager. Although this is not common among our observations, we empirically examine this possibility and find little supporting evidence (see Internet Appendix Table IA10).[18] This is unsurprising because partly-closed funds still allow for small purchases and they do not limit the number of investors. Therefore, funds imposing a purchase limit seem to have put the spotlight on themselves, rather than benefiting other funds in the same house or under the same manager. Overall, we suggest that family- or manager-level spillover is not a key motive for managers imposing inflow gates.

5. Extensions

5.1. Inflow gate and small-size funds

In this section, we examine the motive of small funds imposing inflow gates. One interesting observation in our setting is that nearly 12.5% of all inflow-restricted fund-quarter observations have their fund size ranked in the bottom quintile. The proportion of small-size funds among all inflow-restricted fund-quarters increased from 3% in 2013 to 9% in 2014 and to 19% in 2016

[18] Our analysis in Table IA10 is similar to Table IA9, except that we identify inflow restrictions at the manager level. Our results remain unchanged when using manager fixed effects.

(untabulated). This trend seems counterintuitive. Funds with a small size are far from reaching their capacity and less likely to restrict inflows. Even if their past performance is superior, small funds should be pleased to see more investor purchases and subsequent growth. Considering our empirical evidence presented in Section 4, we argue that the *marketing ploy* hypothesis is a reasonable explanation for the increasingly popular use of inflow gates among small-size funds, which face growing competition in the market and strive for survival.

To test this explanation, we exploit a new disclosure policy on small-size funds since 2014. Specifically, China Securities Regulatory Commission (CSRC) (CRSC [2014] No.104) requires a fund to disclose in its financial reports if (1) the fund size is below RMB 50 million (USD 7.8 million) for 20 consecutive business days, or if (2) the number of investors is fewer than 200 for 20 consecutive business days. If either of the two fund conditions lasts for at least 60 consecutive trading days, then the fund has to file with CSRC a planned solution (e.g., merge with other funds or liquidate). In other words, such disclosure indicates a high probability of fund liquidation. The required disclosure is also accompanied by a heading with a very negative tone: "*Warning about fund size or number of fund investors*". Therefore, we expect that after this disclosure policy, small-size funds have strong motivations to avoid disclosing this "warning" that may lead to further redemption runs.

To avoid reporting a "warning" about a possible liquidation, fund managers likely use inflow gates as a means to attract investors. This is backed by two main reasons. First, strengthening marketing efforts is indeed mentioned in the financial reports of some mini-size funds as a way to avoid liquidation. For example, the Wanjia SSE 50 ETF reported a warning about its fund size being below RMB 50 million for at least 60 consecutive trading days in its fourth quarter financial report in 2016. The fund added that it would greatly increase marketing efforts to solve the size

problem. Second, in order to increase fund assets, fund managers need to attract capital inflows and avoid capital outflows. As mutual fund redemption gates have almost never been observed in practice, managers have to consider other available tools to attract fund flows and help funds survive. Importantly, we present strong evidence in Section 4.3 suggesting that partly-closed gates drive fund flows and closed gates retain existing investors. For these reasons, we expect a significant increase in the likelihood of small-size funds imposing inflow gates after CSRC's new disclosure rules.

We estimate a difference-in-difference model using linear probability regression and a sample of fund-quarter observations covering two years before and after the effective date of CRSC [2014] No.104:

$$Inflow\ gate_{i,t} = a\ + \beta Treat_{i,t} + \gamma Treat_{i,t} \times Post_t + \delta Controls + FE + e_{i,t}, \qquad (3)$$

where the dependent variable $Inflow\ gate_{i,t}$ is an indicator variable that equals 1 if fund *i* imposed at least one inflow gate in quarter *t*, and 0 otherwise. $Treat$ is an indicator variable that equals 1 if (1) the fund is close to the alert threshold as indicated by the beginning-of-quarter fund size being lower than RMB 60 million or the number of investors being fewer than 300, and 0 otherwise (Model 1); or if (2) the beginning-of-quarter fund size is ranked in the bottom quintile among all equity funds, and 0 otherwise (Model 2). *Post* is an indicator variable that equals 1 for quarters ending on or after the third quarter in 2014 when CSRC [2014] No. 104 became effective, and 0 otherwise. In addition to including fund- and family-level characteristics, we also include fund and time (year-quarter) fixed effects; therefore, $Post_t$ is omitted in equation (3). The coefficient of interest is γ on *Treat* × *Post*, which captures the change in the probability of small funds using inflow gates following CSRC [2014] No. 104. Table 8 presents our regression results.

Consistent with our prediction, small-size funds are more likely to use inflow gates after the CSRC [2014] No. 104 took effect. The coefficients on *Treat* × *Post* are positive and statistically significant at the 5% level in both models. Again, our results in Table 8 further corroborate the marketing role of inflow gates.

[Insert Table 8 here]

5.2. Potential costs of using inflow gates for marketing

If imposing a purchase limit helps a fund attract retail investors and future flows, then a natural question emerges: why don't all well performing funds do so? A plausible explanation is, like other marketing efforts, attracting and keeping retail investors is not costless. A substantial expansion of a retail investor base would lead to a larger amount of distribution costs or sales commissions being charged at the fund level.

Mutual funds in China rely heavily on agents, notably banks, to distribute fund products to investors. According to the Asset Management Association of China (AMAC), mutual fund distribution via agents in 2010 accounted for 69% of total sales in China's fund sector. Hence, fund sales agencies have a great bargaining power to charge funds a high commission (on average, 21% of a fund's management fee).[19] For some small and young funds, it is not uncommon for sales and trailer commissions to make up as much as 50% or higher of their management fees.[20] More importantly, unlike the US fund distribution fee (12b-1 fee) that is levied on fund assets, fund sales commission in China is a pure cost to the fund, as it is paid by the fund from its fund management fees received. Note that retail investors typically purchase fund products via agents, but that is not

[19] The amount of fund distribution costs in China's mutual fund sector was RMB 12.85 billion (USD 2 billion) in 2018, accounting for 21% of total fund management fees. Source: *AMAC* (in Chinese).
[20] For example, in early 2020, roughly 852 mutual funds in China were charged sales commissions of 50% or higher of fund management fees, with the highest rate at 100%. Source: *Sina Finance* (in Chinese).

the case for institutional investors. If narrow-gate funds attract more retail investors, then the benefits arising from greater fund flows could be partly offset by a larger amount of fund distribution costs.

The aim of this section is to shed light on the fund-level cost associated with the use of inflow gates. To do so, we first report annualized fund distribution costs in both RMB (in millions) and as a percentage of fund management fees in Table 9 Panel A. On average, domestic equity funds in China pay RMB 8 million (USD 1.2 million) or 22% out of their fund management fees per year to sales agencies or distributors. We then regress *Fund distribution cost (%)*$_{t+1}$ on different gate categories and fund characteristics. Results are reported in Table 9 Panel B.[21] As shown in column (1), in general, funds with poorer past performance, lower fund flows, a shorter operating history, and more retail clients are associated with a higher distribution cost. The intuition is that these funds are more likely to spend effort on marketing and distribution, and more retail clients often lead to higher commissions.

We next include the inflow gate categorical variable in column (2) and obtain a positive coefficient on *Narrow gate* (coef. = 1.78, *t*-stat = 2.10). The coefficient estimate suggests that the use of narrow inflow gates is associated with a relative increase of 9% or an additional RMB 0.9 million (USD 0.14 million) in annual distribution costs at the fund level. Similarly, wide gates are also related to an increase in fund distribution fees, although the economic magnitude is relatively small. The overall results are unchanged when we add family-level controls in column (3).

[Insert Table 9 here]

[21] Note that the number of observations in Table 9 is less than that of the full sample. This is because fund distribution costs were not disclosed in fund financial reports until the end of 2008.

Our results in Table 9 point to a non-trivial cost of using narrow gates as a marketing tool. Although partly-closed gates attract more fund flows from new retail investors, if a majority of these retail investors purchase fund units via agents, then a significant portion of the benefits (on average, 22% of management fees) from greater fund inflows is transferred to sales agents. Therefore, attracting more retail investors through a narrow gate may not be desirable for all well performing funds.[22]

5.3. The duration and seasonality of inflow gates

In our main tests, we group inflow gates based on their daily purchase caps, not the duration of restrictions. One might ask whether the duration of a narrow inflow gate matters in attracting fund investors and flows. To answer this question, we regress future fund flows and investor base on *Narrow gate*, its interaction term with *Gate duration*, as well as other controls. *Gate duration* equals 1 if a narrow gate lasts for an entire calendar quarter, and 0 otherwise. We obtain insignificant coefficients on *Narrow gate* × *Gate duration* across all model specifications (see Internet Appendix Table IA11 Panel A). This evidence suggests that the scarcity marketing of narrow gates is mainly driven by a signaling effect, which may not be influenced by the duration of inflow restrictions. However, we interpret this result cautiously because our test is confined by the availability of fund flow data, which are reported on a quarterly basis in China's market.

[22] Another potential explanation for our results in Section 5.2 is that fund managers impose inflow gates and, at the same time, pay higher commissions to sales agencies, so they may assist managers with the scarcity marketing of the fund. This is consistent with highly compensated intermediaries (i.e., fund advisors, brokers) helping portfolio managers exploit naïve customers (Stoughton et al., 2011; Christoffersen et al., 2013). However, we tend to rule out this explanation for two main reasons. First, fund distribution fee rates are often predetermined in the prior year or when sales agreements are signed. Since most inflow restriction events only last for a few days, it is unlikely that funds change their sales commission rates just for a specific period of time. Second, it would be extremely costly to renegotiate a new commission rate and re-sign agreements with all agents within a few days. For example, a domestic equity fund, the Nanfang Lianghua Growth fund, had 197 sales agencies in early 2020. Therefore, we argue that the higher distribution cost associated with the use of narrow gates is more likely to be caused by the expansion of retail investors, rather than by fund managers paying a higher commission rate to agencies around inflow restriction events.

The literature also documents that a certain behavior of fund investors or managers exhibits seasonal patterns. For example, Kamstra et al. (2017) show fund investors' preference for safe mutual funds in autumn and risky funds in spring. Li and Wu (2019) and Shackleton et al. (2020) find that fund managers in China pump portfolios at year-ends. We thus look at the distribution of calendar quarters in which inflow restrictions are put in place. However, the seasonality of inflow restrictions is not observed in our sample. As shown in the Internet Appendix Table IA11 Panel B, managers' impositions of inflow restrictions are almost evenly distributed over a year.

6. Conclusion

Utilizing a sample of Chinese equity funds, we explore the discretionary use of inflow restrictions in mutual funds. We show that funds leaving the gate partly-closed to investors attract greater future fund flows and a larger retail investor clientele, despite the absence of future outperformance. Our findings are consistent with anecdotal evidence that funds restrict investor purchases for marketing purposes. This is particularly appliable to China's fund market that is dominated by retail investors.

We rule out other alternative motives for restricting fund inflows. Contrary to managers' "investor protection" claim, we find no clear evidence that funds impose inflow gates to maintain superior past performance or existing investment strategies. Rather, narrow-gate funds implement a riskier investment strategy once restrictions start. Further, there is little family spillover effect by restricting a fund's inflows. Overall, our findings are important in understanding how fund investors' trading bias shapes managers' marketing strategies.

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Figure 1. Inflow gates and Shanghai Composite Index

This figure presents the monthly proportion of fund-day observations with inflow gates in our sample, together with the Shanghai Stock Exchange (SSE) Composite Index over the period 2006−2016. The full sample includes 495 unique equity funds. The solid line represents the proportion of aggregated fund-day observations with inflow restrictions in each month. The dotted line is the SSE Composite index.

Figure 2. Histogram of daily purchase cap in inflow restriction events

This figure depicts the distribution of daily purchase caps in our sample of inflow restrictions. Daily purchase cap is the maximum amount of fund assets (in thousands RMB) that an investor is allowed to purchase in a trading day during the restriction period.

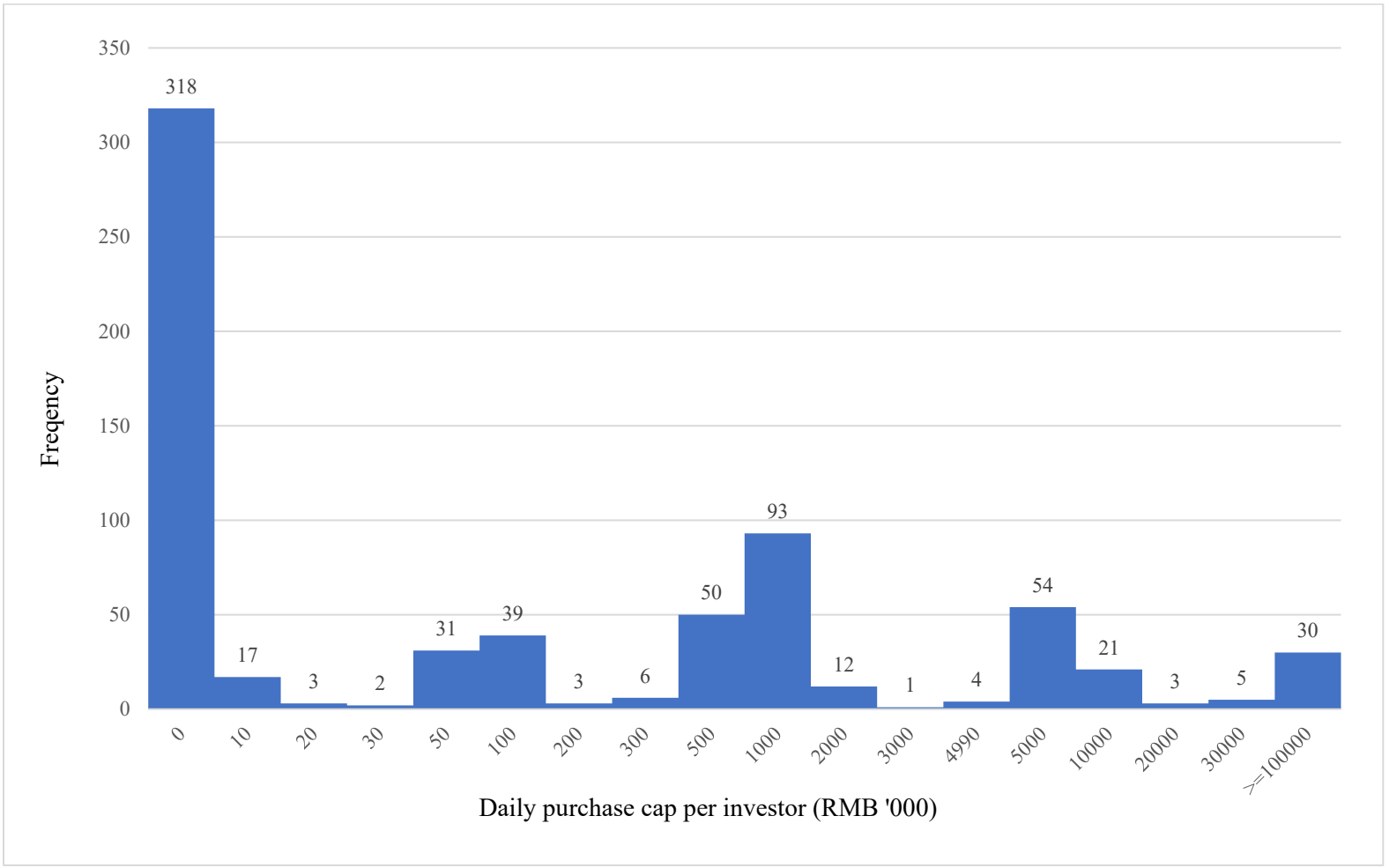

Figure 3. Fund quarterly excess returns around inflow restrictions

This figure plots excess returns of inflow-restricted funds around the restriction event quarter *t* (when the gate is in place) from quarter *t–4* to *t+4*. Excess return is style- and size-adjusted return, calculated as the difference between the raw return of an inflow-restricted fund and benchmark return. We measure the benchmark return at the beginning of each event quarter as the equal-weighted return of all funds that are in the same style, size quintile, and lagged within-style return quintile.

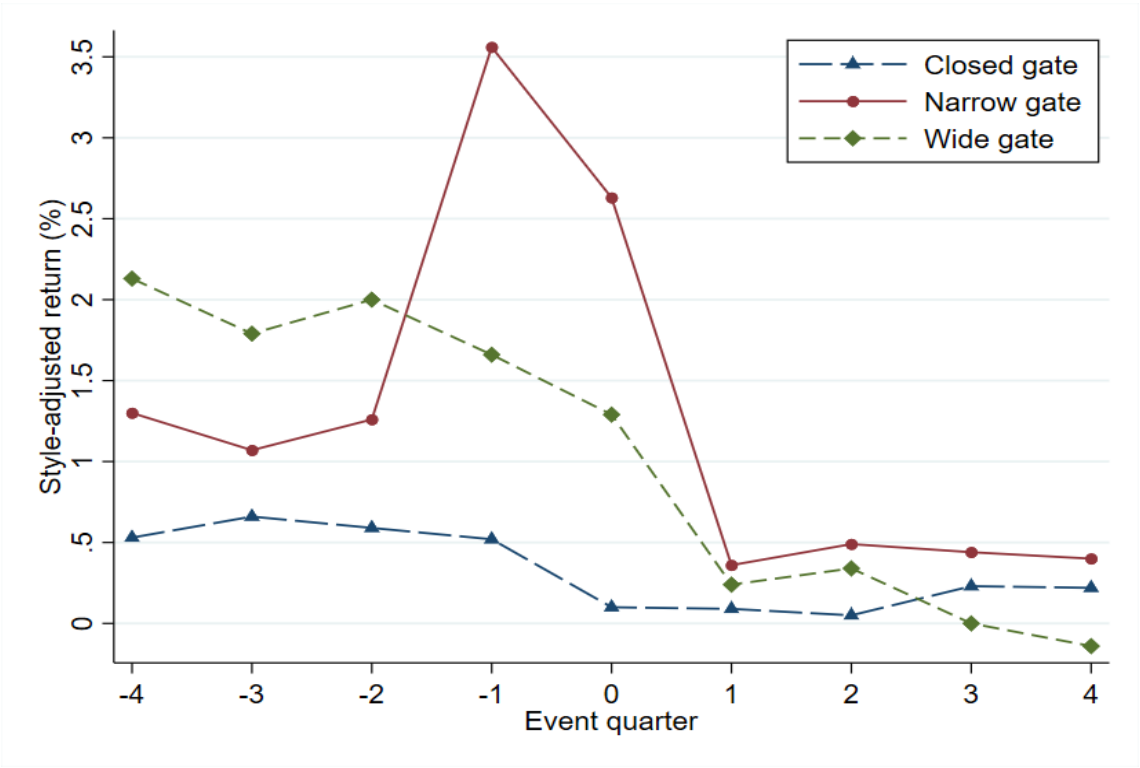

Table 1. Descriptive statistics of inflow restriction events

This table summarizes our sample inflow restriction events. Panel A reports the number of domestic equity funds in operation, the frequency of inflow restriction events, and changes in the SSE index by year over the sample period 2006–2016. Panel B lists the stated reasons for inflow restrictions, and Panel C reports the duration of inflow gates (in days), segmented by gate categories. All inflow gates are categorized into three groups based on the daily purchase limit per investor in each event: (1) *closed gate*, when a fund is completely closed to all investors; (2) *narrow gate*, when the daily investment cap is set below or at RMB 100,000 (USD 16,000); and (3) *wide gate*, when the daily purchase cap is set above RMB 100,000 (USD 16,000).

Panel A. Frequency of inflow restriction events by year

Year	# of equity funds	# of events	# of funds with at least one event	% of funds with at least one event	% change in SSE index
2006	95	125	67	70.5	114.5
2007	163	151	99	60.7	57.3
2008	197	14	13	6.6	–54.6
2009	236	19	16	6.8	50.2
2010	288	59	36	12.5	–8.6
2011	338	48	11	3.3	–21.1
2012	394	25	7	1.8	4.0
2013	427	33	29	6.8	–14.8
2014	468	65	46	9.8	57.9
2015	495	110	70	14.1	–14.7
2016	495	43	33	6.7	15.4
All	495	692	260	52.5	

Panel B. Stated reasons for restricting fund inflows

	Total		*Closed gate* (*Daily purchase cap = 0*)		*Narrow gate* (*0 < Daily purchase cap ≤ RMB 100,000*)		*Wide gate* (*Daily purchase cap >RMB 100,000*)	
Stated Reasons	N	Percent	N	Percent	N	Percent	N	Percent
1. To protect investor interests and smooth the operation of the fund/control fund size/maintain fund performance	519	75.0	229	72.0	92	100	198	70.2
2. Heavy-weight stock suspended	117	16.9	54	17.0	0	0	63	22.3
3. Fund dividend distribution	56	8.1	35	11.0	0	0	21	7.4
Total	692	100	318	100	92	100	282	100.0

Panel C. Duration of inflow gate (in calendar days)

	# of events	Mean	p10	Median	p90
Closed gate (*Daily purchase cap = 0*)	318	80	3	25	130
Narrow gate (*0 < Daily purchase cap ≤ RMB 100,000*)	92	101	11	36	230
Wide gate (*Daily purchase cap >RMB 100,000*)	282	83	1	21	236
Total	692	84	3	27	186

Table 2. Fund characteristics of inflow restricted funds

This table reports the mean and median value of various characteristics of inflow-restricted funds and of the full sample. The unit of observation is a fund-quarter. Columns (1) – (3) report fund-quarters in which a closed, narrow, and wide gate are observed, respectively. Column (4) includes all fund-quarters with no inflow restrictions, and column (5) summarizes the full sample. *TNA* is a fund's total net assets measured in millions of RMB. *Fund age (years)* is the number of years from a fund's inception day to the reporting quarter. *Netflow in units (%)* over quarter *t* is calculated as $\frac{Net\ purchase/redempion\ units_{i,t}}{Total\ fund\ units_{i,t-1}} \times 100$. *Implied fund flow (%)* is calculated as $\frac{TNA_{i,t}-TNA_{i,t-1}\times(1+RET_{i,t})}{TNA_{i,t-1}} \times 100$, following Sirri and Tufano (1998). *Fund raw return (%)* is quarterly fund raw return. *Number of investors (in '000)* is the total number of investors (in thousands) in a fund. *Ownership by retail investors (%)* is the proportion of total net assets in a fund owned by retail investors. *Average fundholding in units or RMB ('000)* is the average number of fund units or RMB value (in thousands) held by fund investors. *Top-10 weight (%)* is the total weight of the ten largest stocks position. *Stock holding concentration* is the value-weighted ratio of a fund's holding in individual stocks relative to the total market value of those stocks. *Number of stocks* is the total number of stocks in a fund's equity portfolio. *Cash holdings (%)* is cash reserve as a percentage of total net assets in a fund. *Alpha (%)* is a compound return based on monthly risk-adjusted returns estimated as the intercept term plus the monthly residual from the Fama-French (1993) three factor model regressions.

	(1) Closed gate *(Daily purchase cap = 0)*		(2) Narrow gate *(0 < Daily purchase cap ≤ RMB 100,000)*		(3) Wide gate *(Daily purchase cap > RMB 100,000)*		(4) No gate		(5) All groups	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
TNA (in RMB million)	9851.24	7708.82	3546.86	2939.47	3839.92	2758.90	2915.08	1616.74	3166.43	1730.78
Fund age (years)	3.40	3.01	4.65	3.84	4.20	3.52	4.73	4.26	4.67	4.17
1-quarter lag fund flow in units (%)	95.46	–2.77	28.93	–2.23	15.02	–2.04	4.60	–3.54	8.02	–3.47
Fund flow in units (%)	156.19	–2.48	25.23	–2.38	47.38	–0.66	2.55	–3.43	9.01	–3.35
1-quarter lag implied fund flow (%)	45.21	–3.67	41.13	–2.36	13.05	–2.98	0.92	–3.89	3.14	–3.85
Implied fund flow (%)	78.91	–2.99	33.29	–2.04	32.51	–2.02	0.12	–3.75	3.99	–3.69
1-quarter lag fund raw return (%)	10.68	5.69	15.77	12.57	10.54	8.92	3.45	1.71	4.05	1.99
Fund raw return (%)	8.46	5.69	6.21	5.59	9.96	6.00	3.25	1.35	3.66	1.57
Number of investors (in '000)	492.75	248.17	156.55	105.64	129.32	58.52	137.09	54.88	148.05	57.16
Ownership by retail investors (%)	83.89	95.26	78.54	84.47	69.08	75.82	82.12	90.70	81.71	90.47
Average fundholding in units (in '000)	31.09	21.87	15.47	12.36	37.33	23.47	46.30	23.00	45.18	22.88
Average fundholding in RMB (in '000)	44.38	29.41	27.56	23.32	73.59	33.87	58.17	25.54	57.88	25.82
Top-10 weight (%)	37.32	36.06	47.33	45.33	42.52	42.71	39.93	39.12	40.02	39.21
Stock holding concentration	1.73	1.40	1.44	1.17	1.56	1.19	0.82	0.53	0.88	0.57
Number of stocks	95.43	73.00	62.03	50.00	63.39	51.00	63.40	50.00	64.37	51.00
Cash holdings (%)	11.67	9.26	10.31	8.77	10.13	7.88	11.72	9.76	11.65	9.66
Alpha (%)	2.41	1.75	1.88	1.31	1.96	1.78	0.78	0.41	0.88	0.50
# fund-quarters	410	410	155	155	428	428	12286	12286	13279	13279

Table 3. Fund performance around inflow restriction events

This table presents style- and size-adjusted excess returns of inflow-restricted funds around inflow restriction events. Panel A reports the average quarterly excess returns of inflow-restricted funds around the restriction event quarter *t* (when a gate is in place) from quarter *t*–1 to quarter *t*+4. Panel B reports cross-sectional means of time-series quarterly average excess returns in the year before and after the event quarter *t*. Excess return is defined as a fund's raw return minus the benchmark return. We calculate the benchmark return at the beginning of each quarter as the equal-weighted return of funds that are in the same style, size quintile, and lagged within-style return quintile. The *t*-statistics (in parentheses) reported in Panel A and in the first two columns of Panel B are for testing the null hypothesis that the excess return is zero. The *t*-statistics (in parentheses) reported in column (3) of Panel B are for testing the difference in excess returns before and after the event quarter. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively.

Panel A. Style-adjusted returns of inflow-restricted funds around the event quarter (%)

Gate status in quarter *t*	*t–1*	*t*	*t+1*	*t+2*	*t+3*	*t+4*
1.Closed gate	0.52**	0.10	0.09	0.05	0.23	0.22
	(2.09)	(0.43)	(0.40)	(0.23)	(1.17)	(1.13)
2.Narrow gate	3.56***	2.63***	0.36	0.49	0.44	0.40
	(4.74)	(4.25)	(0.72)	(1.03)	(1.11)	(0.93)
3.Wide gate	1.66***	1.29***	0.24	0.34	-0.00	-0.14
	(5.74)	(4.32)	(0.95)	(1.38)	(-0.01)	(-0.53)

Panel B. Time-series averages (%) of style-adjusted returns in the year before and after the event quarter

Gate status in quarter *t*	(1) Year before	(2) Year after	(3) Δ change in performance (2) – (1)	(4) % change in performance (2) – (1)
1.Closed gate	0.64***	0.16	-0.48***	–75.0%
	(11.61)	(1.27)	(-2.78)	
2.Narrow gate	1.87***	0.63	-1.24***	–66.3%
	(6.58)	(1.60)	(-3.18)	
3.Wide gate	1.97***	0.19	-1.78***	–90.4%
	(4.40)	(1.33)	(-8.60)	

Table 4. Fund performance around inflow restriction events (matched sample)

This table compares risk-adjusted returns of inflow-restricted funds with control funds around the restriction event quarter *t* (when a gate is in place) from quarter *t*–1 to quarter *t*+4. We select control funds using a propensity score matching (PSM) approach. We first estimate a logistic model to predict the probability of an inflow gate with gate status *z* (a closed, narrow, and wide gate) in quarter *t*. We next match each inflow-restricted fund in the event quarter with a control fund that has the closest predicted probability but does not impose an inflow gate. The control fund is then 1:1 matched with an inflow-restricted fund on ex-ante observable fund characteristics, including lagged and contemporaneous fund returns, fund flows, fund size, fund age, fund's position in underlying stocks, top-10 stock weight, cash holdings, the number of stocks, and fund styles (see Appendix 2 for a discussion of the determinants of inflow gates). We report mean quarterly risk-adjusted returns of closed-gate funds (narrow- and wide-gate funds) versus control funds from quarter *t* – 1 to *t* + 4 in Panel A (Panels B and C, respectively). Risk-adjusted returns are calculated using the Fama-French (1993) three-factor model. *t*-statistics (in parentheses) are for testing the difference in returns between inflow-restricted funds and their matched control funds. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively.

Panel A. Closed gate

	Quarterly risk-adjusted return		
Quarter	(1) No gate	(2) Closed gate	Diff. (1) – (2) *t*-stat
t – 1	2.01	2.55	-0.54
			(-1.14)
t	2.88	2.68	0.20
			(0.40)
t + 1	1.89	2.42	-0.54
			(-1.18)
t + 2	1.60	1.87	-0.27
			(-0.56)
t + 3	1.19	1.68	-0.49
			(-1.04)
t + 4	1.08	1.01	0.07
			(0.17)

Panel B. Narrow gate

	Quarterly risk-adjusted return		
Quarter	(1) No gate	(2) Narrow gate	Diff. (1) – (2) *t*-stat
t – 1	1.27	2.10	-0.83
			(-1.06)
t	0.35	0.66	-0.31
			(-1.52)
t + 1	0.41	0.35	0.06
			(0.07)
t + 2	-1.09	-0.22	-0.86
			(-0.99)
t + 3	-0.05	0.04	-0.09
			(-0.13)
t + 4	-0.06	0.13	-0.20
			(-0.25)

Panel C. Wide gate

	Quarterly risk-adjusted return		
Quarter	(1) No gate	(2) Wide gate	Diff. (1) – (2) *t*-stat
t – 1	1.04	1.83	-0.80*
			(-1.75)
t	1.54	1.42	0.12
			(0.23)
t + 1	0.58	0.90	-0.32
			(-0.65)
t + 2	1.09	1.22	-0.13
			(-0.29)
t + 3	0.33	0.44	-0.11
			(-0.24)
t + 4	1.17	0.73	0.44
			(1.09)

Table 5. Fund risk shifting during the inflow restriction period

This table presents results from regressing fund daily excess returns on the Fama-French (1993) three factors (mkt, smb, hml) plus the Amihud (2002) market-wide illiquidity factor (liq) (Model 1) or the Carhart (1997) momentum factor (umd) (Model 2) and their respective interactions with the inflow gate categorical variable. The model is specified as follows: $Daily\ Excess\ Return_{i,t} = a + \beta_1 mkt_t + \beta_2 smb_t + \beta_3 hml_t + \beta_4 liq_t\ (or\ umd_t) + \lambda_1^z Gate_{i,t}^z \times mkt_t + \lambda_2^z Gate_{i,t}^z \times smb_t + \lambda_3^z Gate_{i,t}^z \times hml_t + \lambda_4^z Gate_{i,t}^z \times liq_t\ (or\ umd_t) + \delta Gate_{i,t}^z + e_{i,t}$. *Daily excess return*$_{i,t}$ is fund *i*'s return in day *t* in excess of the risk-free rate. $Gate_{i,t}^z$ is a categorical variable and takes the values of $z = 0$, 1, 2, or 3 if fund *i* imposes no inflow gate, a closed gate (daily purchase cap = 0), a narrow gate (daily purchase cap set below or at 100,000 RMB), or a wide gate (daily purchase cap set above 100,000 RMB), respectively, in day *t*. Fund fixed effects are included and standard errors are clustered at the fund-level. *t*-statistics are reported in parentheses. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively.

	Model 1		Model 2	
	Coef.	*t*-stat	Coef.	*t*-stat
MKT	59.943***	(63.69)	59.171***	(63.03)
1.Closed gate # MKT	-1.268	(-0.43)	-1.261	(-0.42)
2.Narrow gate # MKT	**13.079*** **	**(4.98)**	**12.902*** **	**(4.74)**
3.Wide gate # MKT	5.184*	(1.69)	4.546	(1.46)
SMB	0.214	(0.29)	-1.562**	(-2.24)
1.Closed gate # SMB	-13.492***	(-3.85)	-11.221***	(-3.34)
2.Narrow gate # SMB	4.669	(0.98)	4.079	(0.80)
3.Wide gate # SMB	2.296	(0.52)	1.143	(0.24)
HML	-38.886***	(-42.37)	-35.054***	(-38.45)
1.Closed gate # HML	1.177	(0.21)	0.978	(0.17)
2.Narrow gate # HML	**-34.397*** **	**(-4.75)**	**-37.008*** **	**(-5.05)**
3.Wide gate # HML	-12.212*	(-1.69)	-12.006	(-1.60)
LIQ	0.071***	(15.34)		
1.Closed gate # LIQ	-0.060***	(-4.22)		
2.Narrow gate # LIQ	0.251	(1.08)		
3.Wide gate # LIQ	0.0862	(1.31)		
UMD			11.640***	(31.34)
1.Closed gate # UMD			-1.697	(-0.80)
2.Narrow gate # UMD			-4.929	(-1.00)
3.Wide gate # UMD			0.634	(0.21)
1.Closed gate	0.010	(1.17)	0.004	(0.47)
2.Narrow gate	**-0.050***	**(-1.84)**	**-0.034***	**(-1.65)**
3.Wide gate	0.003	(0.26)	0.014	(1.26)
Constant	-0.004***	(-2.68)	0.008***	(7.22)
Fund fixed effect	Yes		Yes	
Adj-R^2	0.72		0.73	
N	863,369		863,369	

Table 6. Inflow gate and future fund flows

This table reports results from regressions of future fund flows on different gate categories and fund characteristics. The basic regression model is $Fund\ flow_{i,t+1} = \alpha + \beta^z Gate^z_{i,t} + \lambda \mathbf{X} + \varepsilon_{i,t}$. Fund flow is measured two ways: *Net flow in units (%)* and *Implied net flow (%)*. $Gate^z_{i,t}$ is a categorical variable and takes the values of z = 0, 1, 2, or 3 if fund i imposes no inflow gate, a closed gate (daily purchase cap = 0), a narrow gate (daily purchase cap set below or at 100,000 RMB), or a wide gate (daily purchase cap set above 100,000 RMB), respectively, in quarter t. β^z is the coefficient corresponding to gate category z. **X** is a vector of fund-level control variables. Variable definitions are as detailed in Table 2. We include time (year-quarter) and fund fixed effects. Standard errors are clustered by fund and year-quarter. Regression intercepts and fixed effects are combined together and omitted from the table for brevity. *t*-statistics are reported in parentheses. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively.

	Dependent variable: Fund flow$_{t+1}$			
	(1)	(2)	(3)	(4)
	Net flow in units (%)	Implied fund flow (%)	Net flow in units (%)	Implied fund flow (%)
1.Closed gate	-24.080*	-5.617	-13.693	-3.859
	(-1.72)	(-0.60)	(-1.01)	(-0.41)
2.Narrow gate	**22.993*****	**14.289****	**26.288*****	**17.099*****
	(3.63)	**(2.51)**	**(3.94)**	**(2.92)**
3.Wide gate	25.883**	14.323*	26.458**	14.553*
	(1.99)	(1.86)	(2.01)	(1.86)
Ln(TNA)	-46.201***	-34.166***	-43.513***	-33.138***
	(-6.46)	(-8.15)	(-6.62)	(-8.45)
Fund age$_t$	6.235***	6.269***	5.083***	5.092***
	(6.09)	(7.48)	(5.23)	(6.23)
Fund return$_t$	1.134***	0.942***		
	(5.00)	(6.17)		
Flow$_t$			-0.065***	-0.035**
			(-3.76)	(-2.56)
Flow$_{t-1}$			-0.049***	-0.031**
			(-2.94)	(-2.24)
Alpha$_t$			1.325***	1.159***
			(4.67)	(5.87)
Alpha$_{t-1}$			0.910***	0.706***
			(3.63)	(3.94)
Time fixed effect	Yes	Yes	Yes	Yes
Fund fixed effect	Yes	Yes	Yes	Yes
Adj-R^2	0.10	0.10	0.11	0.10
N	13279	13279	13279	13279

Table 7. Inflow gate and future investor base

This table reports results from regressions of fund investor bases on different gate categories and fund characteristics. The basic regression model is $Investor\ base_{i,t+1} = \alpha + \beta^{z} Gate_{i,t}^{z} + \lambda \mathbf{X} + \varepsilon_{i,t}$. Three measures of investor base are used: *Ln(Total number of investors)*, *Ln(Average fundholding in units)*, and *Retail investor ownership (%)*. $Gate_{i,t}^{z}$ is a categorical variable and takes the values of z = 0, 1, 2, or 3 if fund *i* imposes no inflow gate, a closed gate (daily purchase cap = 0), a narrow gate (daily purchase cap set below or at 100,000 RMB), or a wide gate (daily purchase cap set above 100,000 RMB), respectively, in quarter *t*. **X** is a vector of fund-level control variables. All variables are as defined in Table 2. We include time (year-quarter) and fund fixed effects. Standard errors are clustered by fund and year-quarter. Regression intercepts and fixed effects are combined together and omitted from the table for brevity. *t*-statistics are reported in parentheses. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively.

	Dependent variable: Investor base$_{t+1}$		
	(1) Ln(Total number of investors)	(2) Ln(Average holdings in units)	(3) Ownership of retail investor (%)
1.Closed gate	0.005	0.008	-0.515
	(0.13)	(0.41)	(-0.69)
2.Narrow gate	**0.360*****	**-0.320*****	**6.812*****
	(6.54)	**(-6.26)**	**(4.11)**
3.Wide gate	0.031	-0.025	0.987
	(0.78)	(-0.89)	(1.16)
Ln(TNA)	0.590***	-0.025***	-3.098***
	(43.21)	(-2.69)	(-9.79)
Fund return$_{t}$	0.003***	0.004***	-0.251***
	(3.83)	(6.78)	(-10.59)
Fund return$_{t-1}$	0.002**	0.003***	-0.210***
	(2.33)	(5.56)	(-8.88)
Fund age	0.136***	–0.110***	3.239***
	(8.31)	(–11.88)	(9.81)
Time fixed effect	Yes	Yes	Yes
Fund fixed effect	Yes	Yes	Yes
Adj-R^2	0.92	0.62	0.55
N	13279	13279	13279

Table 8. Inflow gate and small-size funds

This table reports the linear probability regression results of equation (3): $Inflow\ gate_{i,t} = a + \beta_1 Treat_{i,t} + \gamma Treat_{i,t} \times Post_t + \delta Controls + \varepsilon_{i,t}$. The dependent variable, *Inflow gate*$_{i,t}$, is an indicator variable that equals 1 if fund *i* imposed at least one inflow gate in quarter *t*, and 0 otherwise. *Treat* is an indicator variable that equals 1 if (1) the fund is close to the alert threshold as indicated by the beginning-of-quarter fund size being lower than RMB 60 million or the number of investors being fewer than 300, and 0 otherwise (Model 1); or if (2) the beginning-of-quarter fund size is ranked at the bottom quintile among all equity funds, and 0 otherwise (Model 2). *Post* is an indicator variable that equals 1 for quarters ending on or after the third quarter in 2014 when CSRC [2014] No. 104 took effect. Fund-level controls are as defined in Table 2. Family-level control variables include *Ln(Family TNA)*, which is the natural logarithm of total net assets of all other equity funds in the fund family (excluding fund *i*) to which fund *i* belongs, and *Family performance*, which is the asset-weighted average of fund raw returns of all other equity funds in the family (excluding fund *i*). We include fund and time (year-quarter) fixed effects in the regressions, so $Post_t$ in equation (3) is omitted. *t*-statistics are reported in parentheses. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively.

Dependent variable: Inflow gate (0, 1)

	Model 1	Model 2
Treat	0.010	0.026
	(0.60)	(1.36)
Treat × Post	**0.042****	**0.029****
	(2.13)	**(2.10)**
Fund return	0.002***	0.002***
	(4.18)	(4.08)
Fund age	-0.004	-0.004
	(-1.13)	(-0.88)
Implied fund flow	0.000*	0.000*
	(1.86)	(1.89)
Ln(TNA)	0.021**	0.027***
	(2.47)	(2.70)
Stock shareholding concentration	0.024**	0.023**
	(2.57)	(2.51)
Top ten weight	0.001**	0.001**
	(2.13)	(2.14)
Cash holdings	0.000	0.000
	(0.51)	(0.48)
Number of stocks	0.000	0.000
	(1.15)	(1.29)
Ln(Family TNA)	0.004	0.004
	(0.47)	(0.52)
Family performance	0.002***	0.002***
	(3.36)	(3.25)
Time fixed effect	Yes	Yes
Fund fixed effect	Yes	Yes
Adj-R^2	0.28	0.28
N	8606	8606

Table 9. Inflow gate and fund distribution cost

This table reports fund distribution costs of equity funds in China's fund market. Panel A reports annualized fund distribution costs of our sample funds at the fund level as a percentage of fund management fees and in millions RMB, segmented by inflow gate categories. Panel B presents results from regressing *Fund distribution cost (%)*$_{t+1}$ on inflow gate categories $Gate^{z}_{i,t}$, controlling for fund and family characteristics. $Gate^{z}_{i,t}$ is a categorical variable and takes the values of z = 0, 1, 2, or 3 if fund i imposes no inflow gate, a closed gate (daily purchase cap = 0), a narrow gate (daily purchase cap set below or at 100,000 RMB), or a wide gate (daily purchase cap set above 100,000 RMB), respectively, in quarter t. Fund-level (family-level) controls are defined as in Table 2 (Table 8). We include time (year-quarter) and fund fixed effects in the regressions. Regression intercepts and fixed effects are combined together and omitted from the table for brevity. t-statistics are reported in parentheses. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively.

Panel A. Descriptive statistics of fund distribution costs

	(1) Closed gate *(Daily purchase cap = 0)*		(2) Narrow gate *(0 < Daily purchase cap ≤ RMB 100,000)*		(3) Wide gate *(Daily purchase cap > RMB 100,000)*		(4) No gate		(5) All groups	
	mean	median	mean	median	mean	median	mean	median	mean	median
Distribution cost/Fund Mag. Fee (%)	18.93	16.01	22.21	20.20	19.18	16.52	21.91	19.17	21.78	19.04
Distribution cost (in million RMB)	28.22	20.34	10.26	6.16	10.08	6.70	7.60	3.66	8.06	3.84

Panel B. Determinants of fund distribution costs

	(1) *Fund distribution cost (%) $_{t+1}$*	(2) *Fund distribution cost (%) $_{t+1}$*	(3) *Fund distribution cost (%) $_{t+1}$*
1.Closed gate$_t$		-0.164	-0.158
		(-0.26)	(-0.25)
2.Narrow gate$_t$		**1.779****	**1.704****
		(2.10)	**(2.04)**
3.Wide gate$_t$		1.042*	1.070**
		(1.94)	(1.99)
Ln(TNA)$_t$	0.249	0.198	0.136
	(0.81)	(0.64)	(0.46)
Fund age$_t$	-2.585***	-2.585***	-2.577***
	(-20.93)	(-20.68)	(-20.45)
Fund implied flow$_t$	-0.006***	-0.006***	-0.006***
	(-2.91)	(-2.92)	(-2.90)
Fund implied flow$_{t-1}$	-0.002	-0.002*	-0.002
	(-1.60)	(-1.78)	(-1.58)
Fund return$_t$	-0.061***	-0.063***	-0.063***
	(-4.14)	(-4.31)	(-4.30)
Fund return$_{t-1}$	-0.041***	-0.044***	-0.044***
	(-3.67)	(-3.95)	(-3.95)
Retail investor (%)$_t$	0.123***	0.123***	0.123***
	(9.27)	(9.29)	(9.27)
Ln(Family TNA)$_t$			0.250*
			(1.83)
Family performance$_t$			0.012
			(0.66)
Time fixed effect	Yes	Yes	Yes
Fund fixed effect	Yes	Yes	Yes
Adj-R^2	0.59	0.59	0.59
N	12181	12181	12079

Appendix 1. Examples of inflow gate announcements

1. Public announcement of an inflow gate

Fund Name		Huashang Hongli Youxuan Equity Fund
Fund Code		100026
Fund management company		Huashang Fund Management
Inflow gate	Inflow gate start date	2020-09-08
	Daily purchase cap per investor (RMB)	100,000
	Reason for restricting inflows	To ensure the smooth operation of the fund and to protect the interests of fund investors.
Announcement date		2020-09-08

2. Notification of inflow gate through instant messages

The screenshot below is a notification of an inflow gate announcement sent to investors by an instant message. It was sent by China Southern Asset Management (CSAM) Company on November 25, 2019 to the existing investors of CSAM Gaotie mutual fund, which imposed an inflow gate with daily investment cap of RMB 1 million per investor, starting from November 27, 2019.

Appendix 2. Determinants of inflow gates

As an exploratory study of inflow restrictions in mutual funds, we investigate the determinants of fund managers' decision to restrict investor inflows in Appendix 2. Drawing upon the supply-demand framework in economics, we assume that the primary forces influencing fund managers' decision to restrict inflows are (1) high demand for the fund, and (2) high cost of supplying fund units. From the demand side, when actual or expected purchase requests from investors are high, a fund manager may impose an inflow gate to prevent the fund from growing too big or too fast. Hence, we include observed fund flows as a proxy for realized demand and fund performance for expected purchases.

From the supply side, a fund's asset composition could determine its ability to expand the fund size or sell fund units to investors. First, funds with concentrated portfolios are more likely to restrict inflows. Highly concentrated portfolios are often associated with better performance (e.g., Kacperczyk et al., 2005), so they may benefit from stemming an influx of investors' money that could erode fund returns. Importantly, due to regulatory constraints in China, funds with concentrated portfolios have difficulties in expanding their optimal allocations by investing in existing favorable stocks. The so-called "double ten-percent" rule in China requires that both an individual fund's position and the aggregate positions of all funds within a fund company in a single listed stock cannot exceed 10% of the total issued shares of that listed stock.[23] We thus expect that funds with more concentrated portfolios, which are captured by the fund's stock concentration ratio and top-10 stock weight, are more likely to impose inflow gates due to managers' concern over return dilution and/or regulatory constraints.

Second, fund managers may restrict investor purchases because they are not able to generate new investment ideas after the existing opportunities in the market have been fully

[23] The "double ten-percent" rule was applicable during our sample period from 2006 to 2016. In 2017, CSRC revised the rule of stock holdings in mutual funds by requiring that the aggregate holdings in a particular listed stock by all mutual funds in a fund company cannot exceed 15% of the *total tradable shares* of that listed stock.

exploited. This is, in fact, one of the possible scenarios listed in mutual fund prospectuses for the use of inflow gates. When there is a lack of investment opportunities, fund managers tend to restrict inflows in order to stick with their existing investment strategies rather than adding unfavorable stocks. Prior studies show that a large cash reserve in a fund suggests that the manager is less willing to invest and awaiting better investment opportunities (Simutin, 2013). Therefore, we include the total number of underlying stocks and cash position as proxies for fund managers' ability or willingness to exploit additional investment opportunities. We also include fund age to capture a fund's experience in dealing with large fund flows. Variables are defined as in Table 2.

We use logistic regression models to examine the determinants of inflow restriction. We first model the probability of an equity fund *i* imposing at least one inflow restriction in quarter *t* as a function of various fund characteristics. We also include time (year-quarter), fund style, and fund family indicators. Results are reported in Table A1 Panel A.

Consistent with the descriptive evidence in Table 2, the results in Table A1 Panel A show that, overall, funds with higher purchase demands, a larger size, and a shorter operating history are more likely to impose an inflow restriction. As expected, we also find that highly concentrated portfolios (i.e., significant-sized positions in underlying holdings or a large proportion of assets allocated to top-10 stocks) are positively associated with the use of inflow gates.

[Insert Table A1 here]

In order to explore managers' choice of different restriction levels, we next estimate the following multinomial logistic regression model with a categorical dependent variable $Gate^z$, which captures different inflow restriction levels:

$$Gate_{i,t}^{z} = \alpha + \beta^{z}\mathbf{X} + \varepsilon_{i,t}, \quad \text{(A1)}$$

in which $Gate_{i,t}^{z}$ equals 0, 1, 2 or 3 if fund *i* imposes no restriction, a closed gate, a narrow gate or a wide gate, respectively, in quarter *t*. **X** is a vector of lagged fund characteristics. Regression results of equation (A1) are presented in Table A1 Panel B.

There are some common drivers of inflow restrictions, e.g., large fund flows and high top-10 stock weight. We also identify other factors associated with the varying tightness of inflow gates. For example, results in column (1) show that funds with a deteriorating performance, a higher level of cash reserve, and a larger number of stocks tend to impose a closed gate. This is consistent with the view that managers of closed-gate funds are concerned over diseconomies of scale and/or lack of investment opportunities in the market. Results in column (3) suggest that funds with a larger fund size, a shorter operating history, and highly concentrated portfolios are more likely to enact wide inflow gates. Compared to other gate categories, narrow-gate funds seem to have the least legitimate reasons (except for the common drivers) to limit investor inflows. As per the results shown in column (2), the decision to impose a narrow gate is not related to predictors like fund size (which indicates whether the fund will achieve its maximum capacity), fund age (which serves as a proxy for managers' experience in dealing with large inflows), or cash reserve (which implies managers' willingness to invest). This finding raises doubt over managers' intention to impose a narrow gate. Overall, our results in Table A1 suggest that, in general, mutual funds are more likely to restrict inflows when facing an imbalance between concentrated demand and the cost of immediate fund supply.

Table A1. Determinants of inflow gates

This table presents logistic regression results for determinants of imposing inflow gates (Panel A) and determinants of choosing different gate categories (Panel B). In Panel A, the dependent variable takes the value of one if an equity fund announces at least one inflow restriction event in a given quarter, and zero otherwise. In Panel B, a multinomial logistic regression is performed. The dependent variable in a given quarter is a categorical variable, which takes values of 0, 1, 2, or 3 if a fund imposes no inflow gate, a closed gate, a narrow gate, or a wide gate, respectively, in a given quarter. All variables are as defined in Table 2. Time (year-quarter), fund style, and fund family indicators are included. *t*-statistics are reported in parentheses. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively.

Panel A. Logistic regression

	Dependent variable: Inflow gate (0, 1)	
	(1)	(2)
Fund return $_{t-1}$	0.0460***	0.0445***
	(6.57)	(6.54)
Fund return $_{t}$	0.0349***	0.0330***
	(5.29)	(5.17)
Implied fund flow	0.0008**	0.0012**
	(2.14)	(2.50)
Ln(TNA)	0.2932***	0.1271
	(3.32)	(1.39)
Fund Age	-0.0907*	-0.0775
	(-1.91)	(-1.57)
Stock concentration		0.2423***
		(3.02)
Top ten weight		0.0269***
		(3.69)
Cash holdings		0.0006
		(0.07)
Number of stocks		0.0033*
		(1.84)
Constant	-7.4036***	-5.7319***
	(-4.27)	(-3.25)
Time indicators	Yes	Yes
Fund family indicators	Yes	Yes
Fund style indicators	Yes	Yes
Pseduo-R^2	0.22	0.24
N	12780	12780

Panel B. Multinomial logistic regression

	Dependent variable: Inflow gate (0,1,2,3)		
Reference category: No inflow gate	(1) Closed gate (Daily purchase cap = 0)	(2) Narrow gate (0 < Daily purchase cap ≤ RMB 100,000)	(3) Wide gate (Daily purchase cap > RMB 100,000)
Fund return $_{t-1}$	0.0057	0.0744***	0.0555***
	(0.58)	(6.33)	(6.86)
Fund return $_{t}$	-0.0183*	0.0643***	0.0498***
	(-1.76)	(5.52)	(6.08)
Implied fund flow	0.0011***	0.0021***	0.0011**
	(3.05)	(3.64)	(2.33)
Ln(TNA)	0.1299	-0.0742	0.1283*
	(1.64)	(-0.65)	(1.83)
Fund Age	-0.0491	0.0052	-0.0987***
	(-1.41)	(0.11)	(-3.76)
Stock concentration	0.0681	0.1526	0.4530***
	(0.97)	(1.41)	(7.40)
Top ten weight	0.0266***	0.0495***	0.0137**
	(3.62)	(4.94)	(2.17)
Cash holdings	0.0221**	-0.0149	-0.0136
	(2.54)	(-0.99)	(-1.54)
Number of stocks	0.0063***	0.0041*	-0.0021
	(6.45)	(1.80)	(-1.23)
Constant	-22.1694	-28.6923	-8.3856***
	(-0.01)	(-0.00)	(-4.54)
Time indicators	Yes		
Fund family indicators	Yes		
Fund style indicators	Yes		
Pseduo-R^2	0.32		
N	13279		