Fund Flows in the Shadow of Stock Trading Regulation

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Abstract

Trading suspension, a widely adopted regulatory rule, prevents information from being incorporated into stock prices. Using a sample of 3,205 long-lasting suspension events between 2004–2018, we show that mutual funds holding suspended stocks generally fail to adjust for stale prices, generating stale net asset values (NAVs). We find that investors exploit predictable fund performance that realizes quickly after trading resumes: flows positively respond to firm-specific news about suspended stocks in fund portfolios. Portfolio disclosure plays a key informational role in distorting flows. Our findings suggest that regulatory interventions on trading activities can create negative externalities among mutual fund investors.

Keywords: Trading Suspension, Mutual Funds, Fund Flows, Portfolio Disclosure.

JEL classifications: G11, G23, G18, G28.

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1 Introduction

Stock exchanges and regulators around the world generally adopt policy interventions on trading activities to maintain market stability and protect stock investors. A commonly adopted regulatory rule is trading suspension, which temporarily prevents the transaction of individual securities under certain conditions.[1] While this type of regulation effectively restricts investors from trading targeted stocks, in today's complex and interconnected markets, it may also unintentionally affect investors of non-targeted financial assets. Recognizing such spillover effects is important for achieving a better regulatory framework for modern financial markets.

In this paper, we provide evidence for the unintended effects of stock trading suspension on mutual fund investors and their money flows. A primary function of open-ended mutual funds is liquidity transformation (Chernenko and Sunderam, 2016; Ma, Xiao, and Zeng, 2020). When trading suspension prevents direct transactions of a stock, value-relevant information cannot be incorporated into stock prices. However, investors can still purchase and redeem shares of mutual funds that hold the stock. To the extent that the mutual funds are unable to fully adjust their net asset values (NAVs) for changes in the fair values of the suspended stocks, trading suspension generates stale fund NAVs and predictable future NAV changes: Once trading resumes, stock prices and fund NAVs will quickly move towards levels that reflect existing information. Such predictable short-term fund performance potentially affects delegated investment decisions and investor welfare.

A major challenge for empirically detecting this spillover effect is the lack of statistical power. In markets with a large mutual fund sector, trading suspension events are typically short-lived and imposed on small firms, making it difficult to estimate the impact of aggres-

[1]The largest 10 stock exchanges by total market capitalization of listed stocks as of 2019 are NYSE, NASDAQ, Tokyo Stock Exchange, Shanghai Stock Exchange, Hong Kong Stock Exchange, Euronext, London Stock Exchange, Shenzhen Stock Exchange, Toronto Stock Exchange, and Bombay Stock Exchange. All of these exchanges and their regulators have rules for trading halts, trading suspensions, or both.

sive suspension enforcements under consideration.[2] To address this challenge, we create a large sample of economically significant suspension events by exploiting the prevalence and long duration of trading suspension in China. The two Chinese stock exchanges, the Shanghai Stock Exchange (SSE) and the Shenzhen Stock Exchange (SZSE), both implement rules that suspend the trading of individual stocks prior to major corporate events. During the suspension period, firms are required to disclose the progress of the ongoing events, revealing information material to firm valuation.

We combine stock trading suspension events and mutual fund portfolio holdings between 2004–2018 and document that highly-dispersed stock returns following trading resumptions have a substantial impact on fund NAVs. This suggests that mutual funds holding suspended stocks generally fail to adjust for stale stock prices. Observing this fact, we hypothesize that investors' money flows positively respond to firm-specific news about suspended stocks in fund portfolios.[3] To test this hypothesis, we construct an empirical measure to capture the predictable fund performance caused by trading suspension. This measure, called *Resumption Impact*, is based on a suspended stock's weight in the fund portfolio (as observed by investors) and its post-resumption return. Intuitively, a trading resumption has a greater impact on the fund's NAV when the stock's portfolio weight, or the magnitude of its post-resumption return, is larger.

Consistent with our hypothesis, we find statistically and economically significant positive response of flows to the impact of suspended stocks held by mutual funds. On average, a 1% impact on fund NAV during the first week of trading resumption is associated with a 1.1 percentage point increase in net flows during the quarter prior to the resumption. This implies that during trading suspension periods, a group of sophisticated fund investors carefully select funds based on firm-specific news and fund portfolio holdings.

[2]For example, William Galvin, the Secretary of the Commonwealth of Massachusetts, called for a 30-day suspension of GameStop stock in January 2021.

[3]The majority of open-end funds in our sample charge zero or close-to-zero front load and rear load fees.

Our findings uncover a novel channel through which trading regulation redistributes delegated investment payoffs among mutual fund investors. Specifically, flows induced by trading suspension dilute unrealized capital gains and concentrate unrealized losses, both at the expense of long-term fund investors. This stale-NAV channel is operative even in the absence of any flow-induced trading, so it differs from a well-studied flow externality that stems from costly liquidation of underlying assets (Diamond and Dybvig, 1983; Chen, Goldstein, and Jiang, 2010; Goldstein, Jiang, and Ng, 2017).

From a game-theoretic perspective, investors' decisions to exploit good news about a suspended portfolio stock are strategic substitutes, whereas share redemptions in response to bad corporate news are strategic complements. The two types of strategic complementarities can reinforce each other in generating financial fragility. That is, share redemptions not only concentrate the impact of suspended stocks, but also induce the manager to sell other stock holdings. These two forces jointly worsen the payoff to remaining fund shareholders, thus incentivizing them to redeem shares as well. This "double externality" gives rise to additional risk of fund runs and potentially threatens market stability.

When do flows respond more aggressively to news about suspended stocks? Empirically, we find that flows are at least 3-times more sensitive to large positive resumption impact relative to our baseline estimates. This finding suggests that the spillover effect is particularly strong when significant good news about suspended portfolio stocks attract money of outside investors into funds. By contrast, we do not find flows to be significantly more sensitive to bad news. While bad corporate news during suspension periods might affect a fund's NAV more severely because of the aforementioned flow externalities, the absence of a stronger reaction could be explained by limited attention and short-sale constraints. After all, only sophisticated investors who already own fund shares can generate outflows. Consistent with the findings from previous studies on money market mutual fund runs (Schmidt, Timmermann, and Wermers, 2016), we find that flow response is stronger for funds with

higher institutional ownership.

Trading suspension distorts flows because open-end funds transform liquidity for investors and publicly disclose portfolio holdings. To provide further support for the interpretation that the flow response we document is driven by investors' investigation of suspended stocks in disclosed fund portfolios, we develop two placebo tests. These tests exploit the differences in the timing and scope of quarterly, semi-annual, and annual fund disclosure reports. The first test shows that flows do not appear to respond if the suspended stock is held by the fund but does not appear in the most recent portfolio snapshot observable to investors. In the second test, we find that flows do not respond to the impact of non-top-10 stock holdings, which are only disclosed in fund annual reports and published with a delay of up to 90 business days.[4] These findings suggest that mutual fund portfolio disclosure plays a key informational role in the channel through which trading suspension distorts fund flows.

This paper contributes to the literature that studies the regulations of financial trading. Most existing studies examine the direct effects on the markets targeted by such regulations. For example, Subrahmanyam (1994), Lee, Ready, and Seguin (1994), Corwin and Lipson (2000), Christie, Corwin, and Harris (2002) study the effects of trading halts in stock markets. In contrast, this paper focuses on an indirect effect on the investors in the open-end mutual fund market. We show that trading suspension rules induce opportunistic fund investors to purchase and redeem fund shares to exploit stale fund NAVs. Such "informed flows" earn better returns at the cost of buy-and-hold investors. Considering the costly process of investigating firm announcements and fund portfolio holdings, trading suspensions could lead to a net welfare loss among aggregate fund investors. Therefore, our findings call for a better-integrated regulatory framework that takes such policy spillovers into account. The evidence documented here share similar spirits with the "whack-a-mole" game that Cai et al. (2019) refer to in describing the spillover effects of increased stock transaction tax on trading

[4] Section 2 explains mandatory disclosure requirements on Chinese mutual funds.

activities in the warrant market.

Our paper is related to a large literature on investor flows to asset managers as surveyed by Christoffersen, Musto, and Wermers (2014), especially papers that study the flows that exploit stale fund NAVs (Chalmers, Edelen, and Kadlec, 2001, Goetzmann, Ivković, and Rouwenhorst, 2001, Boudoukh et al., 2002, Greene and Hodges, 2002, Zitzewitz, 2006, Choi, Kronlund, and Oh, 2019). In these papers, stale NAVs arise from non-synchronous trading or the illiquid nature of portfolio securities. Our paper differs from existing research by studying a setting in which the staleness of NAVs comes as an unintended consequence of regulatory interventions.

Two existing papers also examine the effects of stock trading suspensions in the Chinese market. Huang et al. (2018) study the determinants of trading suspension and document the trading patterns and performance of stock investors during the 2015 market crash. Liu, Xu, and Zhong (2017) show that trading restrictions can lead to negative contagion during stock market crash episodes because fund managers facing redemption pressure are forced to sell portfolio stocks that are not suspended. The current paper focuses on fund flows as responses to firm-specific news during trading suspension periods, rather than the trading behavior of stock investors or fund managers. We evaluate this economic channel over 14 years of sample period and our results are robust to exclusion of the 2015 market crash period.

The remainder of this paper proceeds as follows. Section 2 summarizes the institutional background of the empirical setting, and Section 3 describes our sample and empirical measures. Section 4 presents the results of the main tests. Section 5 performs additional tests for robustness and Section 6 concludes.

2 Institutional Background

2.1 Stock Trading Suspension

Since the 1990s, trading suspension has been a common policy tool in the Chinese stock market. Regulators require firms whose equity shares are publicly traded on China's Shanghai Stock Exchange (SSE) and Shenzhen Stock Exchange (SZSE) to apply for trading suspension when they prepare for corporate major events. Without any explicit rule for implementation, Chinese public firms can discretionarily apply for trading suspension to prevent information leakage before announcement of such major events. In practice, firms also take advantage of this regulatory policy to stop the trading of their stocks for other purposes.[5]

2.2 Mutual Funds in China

Since its inception in 1998, the Chinese mutual fund industry has experienced fast growth along with the economy. According to the Asset Management Association of China, by the end of June of 2018, size of total assets under management reached 12.7 trillion CNY (approximately 1.8 trillion USD). Similar to mutual funds in the US market, equity shares of publicly traded domestic firms serve as one of the major financial asset classes held by Chinese funds.

The China Securities Regulatory Commission (CSRC) requires mutual funds to publicly disclose their portfolio holdings since 2004. Regulatory rules mandate six reports every year. In each of the four quarterly reports, mutual funds disclose only top-10 stock holdings. By contrast, full portfolio snapshots at the end of June and December are disclosed in the semiannual and annual reports. Timeliness of these reports also differ: the maximum number of days allowed between the end of a quarter and the filing of a quarterly report

[5] See Huang et al. (2018) for more detailed discussion.

is 15 business days, while the corresponding intervals are 60 calendar days and 90 calendar days for semiannual and annual reports, respectively.

3 Data

We combine multiple datasets of mutual fund and stock market information from the China Stock Market & Accounting Research (CSMAR) database. This section describes our sample and empirical measures.

3.1 Mutual Funds

CSMAR provides comprehensive coverage of both operating and defunct mutual funds domiciled in China. We obtain data on fund return, net asset value (NAV), net assets, portfolio holdings, and other information contained in fund quarterly and semi-annual reports. We focus on open-end mutual funds that directly hold stocks and are traded mainly through investors' direct fund share purchase and redemption. Therefore, we drop funds that are classified as exchange-traded funds (ETFs), listed open-end funds (LOFs), or funds of funds (FOFs). We also exclude funds that have more than one share classes.[6] These filters leave us with 2,550 unique funds.

Fund return and NAV are observed at the daily frequency, while net assets are observed at the quarterly frequency. We compute quarterly fund-level flow as

$$Flow_{j,t} = \frac{TNA_{j,t} - TNA_{j,t-1} \times (1 + r_{j,t})}{TNA_{j,t-1} \times (1 + r_{j,t})}, \tag{1}$$

where $TNA_{j,t}$ is the total net assets of fund j at the end of quarter t, and $r_{j,t}$ is the return

[6] In China, such funds are primarily structured funds whose share classes have very different exposure to the fund portfolios (Li, 2017).

earned by fund investors from the end of quarter $(t-1)$ to the end of quarter t. By construction, this flow measure is bounded from below by -1. Following the literature, we trim the flows at 1% and 99% to avoid the influence of extreme net flows on our results. Not trimming these observations would exaggerate the economic magnitude of the effect of funds holding suspended stocks.

Starting from July 2004, funds are required by CSRC to disclose their top-10 stock holdings in their quarterly reports, and full portfolio holdings in semi-annual and annual reports. Therefore, we set our sample period as 2004Q3-2018Q2. We use the top-10 quarterly stock holdings in our main results primarily for the measurement of fund flow. We use the full portfolio holdings in our extended tests. The semi-annual and annual reports also include a decomposition of fund ownership by individual and institutional investor clienteles.

3.2 Stocks

We consider all A Share stocks ever listed on the main board of the Shanghai Stock Exchange (SSE), the main board, the Growth Enterprise Market (GEM) board, or the Small/Medium Enterprise (SME) board of the Shenzhen Stock Exchange (SZSE). This results in 3,636 stocks and they account for more than 95% of equity holdings of sample funds. CSMAR collects all trading suspension incidences from public announcements posted to the stock exchanges. The dataset includes the dates and times of the announcements of trading suspension and subsequent resumption events.

During our sample period, 3,437 out of the 3,636 sample stocks experienced at least one instance of trading suspension. In total, there are 97,934 suspension events. The duration of suspension ranges from 0 to 1,679 trading days. Intraday trading suspension events usually happen during the hour of mandatory corporate disclosure or follow large price volatility. These suspension events are short-lived and are less relevant for the purpose of this study, so

we exclude them from the sample. This filter leaves us with 16,611 stock suspension events. In 5,063 events, the stocks involved are suspended from trading for at least 21 trading days (about one calendar month).

For suspension events with a relatively longer period, the firm typically makes a sequence of public announcements on the progress of the major event. Trading resumption usually follows the announcement of eventual outcome with some lag. Besides, firms typically publicly announce future resumption dates before they happen. This timing feature gives fund investors sufficient time to digest the new information and optimize their investment decisions accordingly.

3.3 Stock and Fund Return Measures

We measure stock returns and mutual fund performance using both raw return and abnormal return adjusted for the exposure to stock market movements. We obtain daily stock returns directly from the CSMAR database, and calculate daily fund return using data on daily NAV, adjusting for fund share splits and distributions. To compute market-adjusted daily abnormal returns for stocks and mutual funds, we estimate the market beta with a rolling regression for each stock- and fund-quarter using 100 non-missing daily returns prior to the beginning of the quarter. For all days in the quarter, we calculate abnormal returns as out-of-sample alphas using these estimated betas and realized market returns. We use the CSI 300 index return as a proxy for the stock market return, and one-year bank deposit interest rate as the risk-free rate. For mutual funds, we additionally control for the return exposure to aggregate bond market return proxied by the CSI Aggregate Bond Index return because a large subset of mutual funds also invest in bonds.

3.4 Resumption Impact

Trading suspension events are typically associated with public announcements of major corporate events, and stock prices often exhibit large variations immediately after trading resumptions. As shown in Panel (a) of Figure 3, post-resumption stock returns are highly volatile with fat tails: absolute abnormal returns during the first 5 trading days exceed 20% in roughly half of events. Panel (b) of Figure 3 presents distribution of post-resumption abnormal returns by the duration of suspension. Consistent with accumulated firm-specific information incorporating into stock prices, firms experiencing more than 20 trading days of suspension exhibit greater return dispersion after trading resumes.

While suspended stocks can not be traded during suspension period and the market prices of these stocks are largely fixed at the pre-suspension levels, NAVs of mutual funds are calculated based on market price of portfolio assets on a daily basis, and investors can purchase and redeem at the NAVs calculated on each trading day. When a fund holds large proportion of stocks that experience trading suspensions, its NAV can be substantially affected by post-resumption stock returns. Investors can potentially profit from short-term stock mispricing due to trading suspension by investing in the mutual funds that hold sizable positions in these stocks based on announced firm-specific information. For this to be feasible, a necessary condition is that resumption impact is large enough to be not washed away by price variations of other portfolio stocks, and the fund does not properly adjust stock valuation during suspension period.

To empirically validate the influence of post-resumption stock returns on fund returns, we construct a fund–stock-level measure to capture the impact of post-resumption stock price variations on fund NAV:

$$RI_{i,j,t}^{(t)} \;=\; Weight_{i,j,t} \times Return_{i,t+1}^{(\tau,\tau+n)}, \tag{2}$$

where $Weight_{i,j,t}$ is fund j's portfolio weight of suspension stock i at the end of quarter t, and $Return_{i,t}^{[\tau,\tau+n]}$ is stock i's return over a n-day horizon from resumption date τ in the next quarter.[7] Specifically, we first select all trading suspension events that last at least one day, and match them by resumption dates to all quarterly fund holding records with at least 1% portfolio weight. To ensure that the stock is certainly held by the fund before resumption, we require that trading suspension must happen before the end of the quarter prior to resumption.[8] Next, we match each resumption date to daily fund share class cumulative NAVs and daily adjusted stock prices to compute both post-resumption returns over $n = 1, 2, 3, 5, 7, 10$, and 15 trading days.

We next examine the correlation between fund returns and the resumption impact measure for trading suspension events in our sample. Figure 4 shows that fund return and stock resumption impact are strongly positively correlated over the 5-day window following stock resumption, with a slope close to one. Table 1 further shows that this correlation holds for the horizon ranging from 1 to 15 trading days, and the correlation is especially strong for cases in which the fund is exposed to large post-resumption stock price variations. For example, the correlation between 5-day fund return and 5-day stock resumption impact is 0.3 for the subsample where the magnitude of resumption impact is greater than 1%. Such events are not rare: there are 3,205 in our sample. The correlation increases as we focus on subsamples with larger resumption impact. The correlation between fund return and stock resumption impact implies that investors can potentially exploit public firm-specific information by investing in funds that hold sizable positions in suspended stocks and benefit from the price movement of such stocks after they resume trading.

[7] Superscript (t) in the resumption impact measure indicates that it is calculated based on portfolio weight at the end of quarter t here.

[8] We only observe stock holdings at the end of quarters. If we also include suspension events that occur after holding snapshot dates, results are qualitatively and quantitatively similar.

3.5 Sample Construction

We construct a panel dataset of fund-quarter observations following the timing convention illustrated in Figure 1. The 15-day delay in quarterly portfolio disclosure implies that investors can only observe stocks held by funds at the end of quarter $t-1$ when making decisions during quarter t. We use the post-resumption stock return realized after quarter t as a *proxy* for investor expectation on future stock price movement conditional on information observed by t. Suppose fund j is perceived to be holding stock i that experiences suspension in quarter t and resumes trading during quarter $t+1$, we match $RI_{i,j,t}$ to fund level variables corresponding to quarter t. To be included in the sample, we require the gap between flow date t and resumption date τ to be no more than 2 months (42 trading days), so that measured flows likely capture investor reactions to firm-specific news during suspension.[9] If more than one portfolio stocks experience trading suspension in a quarter, we aggregate $RI_{i,j,t}$ to the fund level by summing them up to reflect the overall impact on fund NAV. If none of the top-10 stock holdings involves suspension, we assign zero value to this measure for that fund-quarter. Finally, we exclude observations in which a fund manages less than 50 million CNY (approximately 7 million USD) or has an age less than 1 year. This leaves us with a sample of 26,211 fund-quarter observations.

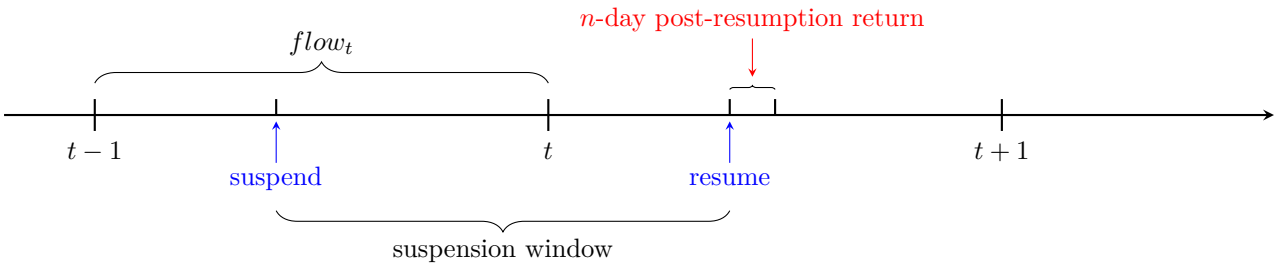


Figure 1: **Timeline.**

[9] Section 5.4 show that our results are qualitatively and quantitatively similar if we change the filter to 1 month or 3 months.

Panel A of Table 2 reports summary statistics of our sample. Potentially due to the fast growth of this industry, overall existing mutual funds experience net money outflows, even though on average they generate 1.51% quarterly market-adjusted abnormal return before fees. An average fund has operated for around 5 years, with slightly more than 2 billion CNY (approximately 300 million USD) assets under management. In Panel B, only observations with at least one portfolio stock suspension events are reported. Resumption impact measured over short time windows has mean and median close to zero, but exhibit large dispersion, especially on the tails. This implies that observations with large exposure to post-resumption stock price jumps are associated with sizable changes on fund NAV once trading resumes. More than half of sample funds, and most of fund families, experience resumption impact at least once. This fact allows us to examine investors' response to complicated information environment under general conditions.

4 Results

4.1 Baseline

We consider the following baseline regression specification to detect whether fund investors respond to firm-specific information of suspended stocks by purchasing or redeeming mutual fund shares:

$$Flow_{j,t} = \beta_1 RI_{j,t}^{(t-1)} + \Gamma' Controls_{j,t-1} + \delta_t + \gamma_j + \varepsilon_{j,t}. \tag{3}$$

The main explanatory variable of interest, $RI_{j,t}^{(t-1)}$, is the fund-level *Resumption Impact* on fund j due to stocks that are perceived to be held by the fund and resume trading in quarter $t+1$. We adopt a superscript $(t-1)$ for this variable because portfolio weights are based on fund portfolio disclosure for the end of quarter $t-1$. RI is intended to capture the anticipated effect of suspended stocks on fund returns. Fund-level control variables include

fund performance, log of fund size, log of fund age, log of fund family size, value-weighted average performance of other funds in the fund family, fund return volatility measured as standard deviation of trailing 12-month fund returns normalized to quarterly terms, purchase fee, redemption fee, and expense ratio. All control variables are lagged by one quarter. In addition, the specification includes fund fixed effects to absorb fund-level time invariant heterogeneities that affect flows, and time fixed effects to account for aggregate time-specific shocks that affect flows to all mutual funds.

Table 3 reports the results of the baseline regression. Column (1) shows that investors do respond to opportunities of trading suspended stocks through purchasing and redeeming mutual fund shares. Controlling for fund performance in the recent past, fund-specific and time-specific constant factors that affect fund flows, *Resumption Impact* due to stock holdings that are expected to resume in the next quarter has a positive and significant influence on flows in the current quarter. The estimated coefficient remains similar in magnitude and significance when additional fund-level control variables are included in the regression, or when abnormal returns are used to measure stock and fund performance. Across all columns, we obtain coefficients on $RI(5d)$ close to 1. This implies that on average, an additional 1% of 5-day fund-level *Resumption Impact* is associated with an additional 1% quarterly fund flow. As an hypothetical example, suppose a fund holds a 10% position in a stock at the end of quarter $t-1$, the stock is suspended at the end of quarter t, and resumes trading in quarter $t+1$. If the stock earns 10% return over the 5 days following resumption, the fund would have experienced 1% higher flow during quarter t compared to an otherwise similar fund whose NAV is not affected by trading resumption of portfolio stocks.

4.2 When is Flow More Responsive to Resumption Impact?

Given the baseline results, a natural question is whether the flow response to *Resumption Impact* is mostly driven by events where the stock suspension events are associated with pos-

itive prospects or those come along with negative prospects. Theoretically, such two types of events differ in both potential responding investors and their incentives. For positive firm news, all investors can choose to invest money into the fund, and the money inflow dilutes existing buy-and-hold fund investors' value because fund NAVs do not reflect the value of suspended stocks in a timely manner. For negative news, only existing fund shareholders can redeem money. The remaining fund investors can be hurt by redeeming investors because the latter group can redeem at NAVs higher than what would reflect the efficient price of suspended stocks in the fund portfolio. This mechanism could potentially amplify the flow-induced trades' market-destabilizing effects, as textitasized by Chen et al. (2010) and Goldstein et al. (2017). Given the important differences between these potential implications, we use several interaction specifications to examine how the flow response depends on *Resumption Impact*.

To do this, we augment the baseline specification with a dummy variable that equals one if *Resumption Impact* is positive and its interaction with the *Resumption Impact*.

$$Flow_{j,t} = \beta_1 RI_{j,t+1} + \beta_2 \mathbf{1}_{\{RI>0\}} + \beta_3 RI_{j,t+1} \times \mathbf{1}_{\{RI>0\}} + \Gamma' Controls_{j,t-1} + \delta_t + \gamma_j + \varepsilon_{j,t}. \tag{4}$$

Moreover, we evaluate whether flows are more sensitive to impactful events by replacing $\mathbf{1}_{\{RI>0\}}$ with dummy variables *Left Tail* and *Right Tail*. These two variables are equal to one if *Resumption Impact* is larger than 3% or smaller than −3%, respectively.

The results of interaction specifications are reported in Table 4. Across all specifications, the coefficients on *Resumption Impact* are positive and statistically significant. The magnitudes are similar to those in the baseline results. For dummy variables *Positive* and *Left Tail*, the coefficients on the interaction term are statistically indistinguishable from zero, suggesting that the sensitivity of flow to suspended stocks associated with positive prospects and impactful negative events are similar to other events. In contrast, for dummy variable

Right Tail, the estimated coefficients are positive, significant and three to six times as large as the baseline estimate. Overall, the results in this table indicate that fund flow responds to both positive and negative *Resumption Impact* with similar magnitudes, but the response is particularly strong to impactful good news.

4.3 Portfolio Disclosure and Flow Responses

We interpret the results above as that investors investigate fund holdings and move money into or out of funds that hold suspended stocks based on firm-specific information announced during trading suspension. To lend further support to this interpretation, we develop two placebo tests that exploit institutional features of Chinese mutual fund stock holdings disclosure rules: the timing of report publication, and the scope of disclosure.

4.3.1 Unobserved Top-10 Holdings

One necessary condition for fund flows to respond to firm-specific information of suspended stocks is that fund investors *perceive* the fund to be holding the relevant stocks. It is important to recognize the most timely public information about fund stock holdings comes from disclosure reports corresponding to the end of the previous quarter.[10] Since investors cannot observe the actual stock holdings at the end of the current quarter, quarterly fund flows should not respond to firm news if the suspended stocks will have an impact on future NAV but were not on the top-10 holdings list at the end of the previous quarter.

To provide supporting evidence for this conjecture, we recalculate *Resumption Impact* using stocks that appear on holdings disclosed for the end of the concurrent quarter, but not on top-10 holdings disclosed for the previous quarter-end. These stock positions are indeed in fund portfolios, but are not observed by investors when they make investment decisions

[10] Quarterly portfolio reports are disclosed within 15 business days from the end of each quarter.

during the current quarter. We use this modified measure to capture the unrealized NAV impact exerted by suspended portfolio stocks that are ex ante unobservable to investors.

Table 5 reports the results of regressing quarterly fund flows on the recalculated *Resumption Impact*. In contrast to our baseline findings, the estimated coefficients on this modified measure become statistically insignificant. These results suggest that flows do not respond to firm-specific news of stock holdings if investors cannot observe them when making investment decisions.

4.3.2 Unobserved Non-Top-10 Holdings

There is another situation in which a fund actually holds suspended stocks that can substantially affect future NAV in predictable ways, but investors cannot observe these holdings. This possibility arises from the fact that only the top-10 stock holdings are disclosed in fund quarterly reports. Although complete portfolio snapshots are available in semi-annual and annual reports, investors can only observe top-10 holdings on time because these two reports are significantly delayed.[11]

The differential timeliness of disclosed top-10 holdings and full portfolios creates an interesting setting for our study. As Table 2 shows, for less-diversified funds, stock positions below top-10 holdings can still materially affect the future NAV if the firms experience major news. Because of the long reporting lags, it is unlikely that investors can observe non-top-10 stock holdings of a fund during Q1. Therefore, while fund flows in Q1 might respond to *Resumption Impact* of stocks in top-10 Q4-end disclosure, there should be no response to *Resumption Impact* of non-top-10 Q4-end holdings.

To empirically examine this conjecture, we calculate *Non-top-10 RI* as the *Resumption Impact* of stocks among the non-top-10 holdings of a fund's portfolio disclosed in its annual report. By construction, *Non-top-10 RI* is equal to 0 for fund-quarters not in Q1. We only

[11] Semi-annual and annual reports have lags of 60 and 90 calendar days, respectively.

use non-top-10 holdings in annual reports because the 90-day reporting lag leaves investors no time to respond in the concurrent quarter and provides a clean setting. Table 6 reports the results of regressions of fund flows on both *RI* and *Non-top-10 RI*. Column (1) repeats the baseline result for comparison. Column (2) shows that *Non-top-10 RI* does not appear to affect flows, presumably because the relevant holdings are not observable to investors while they make investment decisions in the concurrent quarter. Column (3) and (4) exclude fund-quarter observations with non-zero *RI* in quarters other than Q1, and obtain similar results. Column (5) to (7) use abnormal return as return and performance measures and yield similar results.

In sum, these placebo tests highlight the key role of fund portfolio disclosure in facilitating fund investors' informed investment decisions: trading suspension affects fund flows only when the holdings of suspended stocks are publicly reported.

4.4 Do Individual or Institutional Flows Respond More to Resumption Impact?

Prior literature finds that flows from individual investors to mutual funds behave differently from those from institutional investors (Del Guercio and Tkac, 2002, Goyal and Wahal, 2008, Evans and Fahlenbrach, 2012, Schmidt et al., 2016). Institutional investors tend to monitor fund performance more carefully and pay closer attention to fund operations. We might therefore expect institutional flows to respond more strongly to a suspended stock's impact on funds because they are more sophisticated.

We examine the potential heterogeneity in responsiveness to resumption impact between individual flows and institutional flows using decomposed fund ownership data disclosed in fund semi-annual and annual reports. To compare the flow responses from different investor bases, we create a dummy variable *High Institutional Ratio* that equals to one if

the fund has more than 50% assets in the hands of institutional investors according to its disclosure for the most recent half-year-end.[12] We then interact this *High Institutional Ratio* dummy variable with *RI* to augment our baseline specification. Table 7 reports the results of this interaction specification. The coefficient of *RI* is positive and significant, confirming that individual flows respond to trading opportunities on suspended stocks held by funds. More interestingly, the coefficient of the interaction term between *RI* and *High Institutional Ratio* is positive and large compare to the baseline coefficient, albeit marginally statistically significant. The evidence is modest but lends some support to the notion that institutional investors pay closer attention to trading opportunities that exploit stale fund NAVs due to suspended stocks in fund portfolios.

5 Robustness

We report that our main results are not driven by specific time episodes with volatile markets, and are robust to using different sample and variable filters.

5.1 The 2015 Crash Period

In June and July of 2015, the Chinese stock market experienced a dramatic crash. More than a half of all the stocks are in suspension status at the peak of the episode. The focus of our study is not on this period and is broader about the stock and mutual fund markets, though the crash is an important event and has been explored more carefully by other researchers (Huang et al. (2018), Liu et al. (2017)). Nonetheless, one may worry that our findings are driven by these crash period observations. To address this, we repeat our baseline regression in Table 8 by excluding the observations in the two quarters, 2015Q2 and 2015Q3, surrounding the crash period. When using 5-day post-resumption raw returns as

[12] The 50% cutoff roughly corresponds to the 80th percentile of the sample.

proxy for trading opportunities on suspended stocks, column (1) of Table 8 shows that the flow response to positive opportunities is 1.026, comparable to the baseline estimate 1.059 obtained using the full sample. In column (2), we report the results using the subsample that includes only observations during the crash period, and find positive but statistically insignificant coefficient on *5-day Resumption Impact*. Column (3) and (4) repeat the tests using abnormal returns as stock and fund performance measures, and find similar results. These results verify that our main findings are not driven by extreme events in the stock crash period.

5.2 Horizon of Measuring Resumption Impact

For our main specifications, we construct measures of *Resumption Impact* using 5-day stock returns following resumption of trading. We show in Table 9 that perturbing this arbitrary choice of return horizon is not crucial for our main findings.

5.3 Extreme Flow Observations

Table 10 show that our main results are robust to excluding extreme flow observations at different level. The magnitude of coefficient decreased as we exclude more flow observations at the two tails, but the effect remains statistically strong.

5.4 Time Window from Flow Quarter-End to Stock Resumption Date

When calculating *Resumption Impact*, we restrict that the suspended stocks are resumed in the first 2 months (42 trading days) of the next quarter. The purpose is to exclude the stocks that are resumed too distant in the future so that investors in the concurrent quarter are less

likely to be confident about the fair value of the stock and act in the mutual fund market accordingly. At the same time, we want to keep as many valid observations as possible. Nonetheless, we show in Table 11 that our main results are generally robust to changing this filter to 1 month or removing this filter. As expected, the effect is weakened if the time window filter is removed. Notably, the magnitude of the effect is similar to using a 2-month filter. The statistical significance is lower presumably because less valid observations end up with non-zero *Resumption Impact*. Overall, this shows that the 2-month filter is an innocuous empirical compromise and our results are not an artifact of sample selection.

6 Conclusion

Existing research on financial regulations largely focus on the direct effects of regulatory policies on targeted markets and participants. This paper's empirical findings highlight how trading regulations can have unintended consequences in other markets. Trading suspensions prevent stock prices from timely incorporating publicly available information, rendering stock prices stale. Though such stale prices cannot be directly exploited in the stock market, investors can trade mutual funds with stale NAVs due to their inability to adjust for values of holdings of suspended stocks. We show that money flows positively respond to unrealized impact on fund NAVs for mutual funds that hold stocks that experience trading suspensions. These opportunistic investor flows tend to dilute future fund profits and concentrate future fund losses, imposing externalities on long-term fund investors. Thus, the welfare of investors are affected by the trading regulations beyond investors in the stock markets. Our findings prompt policy makers to consider spillover effects of financial regulations as financial markets become increasingly complex.

References

Boudoukh, J., M. Richardson, M. Subrahmanyam, and R. F. Whitelaw (2002). Stale prices and strategies for trading mutual funds. Financial Analysts Journal 58(4), 53–71.

Cai, J., J. He, W. Jiang, and W. Xiong (2019). The whack-a-mole game: Tobin taxes and trading frenzy. The Review of Financial Studies.

Chalmers, J. M., R. M. Edelen, and G. B. Kadlec (2001). On the perils of financial intermediaries setting security prices: the mutual fund wild card option. Journal of Finance 56(6), 2209–2236.

Chen, Q., I. Goldstein, and W. Jiang (2010). Payoff complementarities and financial fragility: Evidence from mutual fund outflows. Journal of Financial Economics 97(2), 239–262.

Chernenko, S. and A. Sunderam (2016). Liquidity transformation in asset management: Evidence from the cash holdings of mutual funds. Technical report, National Bureau of Economic Research.

Choi, J., M. Kronlund, and J. Y. J. Oh (2019). Sitting bucks: Zero returns in fixed income funds. Available at SSRN: https://ssrn.com/abstract=3244862.

Christie, W. G., S. A. Corwin, and J. H. Harris (2002). Nasdaq trading halts: The impact of market mechanisms on prices, trading activity, and execution costs. Journal of Finance 57(3), 1443–1478.

Christoffersen, S. E., D. K. Musto, and R. Wermers (2014). Investor flows to asset managers: Causes and consequences. Annual Review of Financial Economics 6(1), 289–310.

Corwin, S. A. and M. L. Lipson (2000). Order flow and liquidity around nyse trading halts. Journal of Finance 55(4), 1771–1801.

Del Guercio, D. and P. A. Tkac (2002). The determinants of the flow of funds of managed portfolios: Mutual funds vs. pension funds. Journal of Financial and Quantitative Analysis 37(4), 523–557.

Diamond, D. W. and P. H. Dybvig (1983). Bank runs, deposit insurance, and liquidity. Journal of political economy 91(3), 401–419.

Evans, R. B. and R. Fahlenbrach (2012). Institutional investors and mutual fund governance: Evidence from retail–institutional fund twins. Review of Financial Studies 25(12), 3530–3571.

Goetzmann, W. N., Z. Ivković, and K. G. Rouwenhorst (2001). Day trading international mutual funds: Evidence and policy solutions. Journal of Financial and Quantitative Analysis 36(3), 287–309.

Goldstein, I., H. Jiang, and D. T. Ng (2017). Investor flows and fragility in corporate bond funds. Journal of Financial Economics 126(3), 592–613.

Goyal, A. and S. Wahal (2008). The selection and termination of investment management firms by plan sponsors. Journal of Finance 63(4), 1805–1847.

Greene, J. T. and C. W. Hodges (2002). The dilution impact of daily fund flows on open-end mutual funds. Journal of Financial Economics 65(1), 131–158.

Huang, J., D. Shi, Z. Song, and B. Zhao (2018). Discretionary stock trading suspension. Working Paper.

Lee, C. M., M. J. Ready, and P. J. Seguin (1994). Volume, volatility, and new york stock exchange trading halts. Journal of Finance 49, 183–214.

Li, J. J. (2017). An anatomy of arbitrageurs: Evidence from open-end structured funds. Working Paper.

Liu, L. X., J. Xu, and N. Zhong (2017). Trading restriction as a channel of financial contagion-evidence from china's stock market. Working Paper, Peking University.

Ma, Y., K. Xiao, and Y. Zeng (2020). Mutual fund liquidity transformation and reverse flight to liquidity. Available at SSRN 3640861.

Schmidt, L., A. Timmermann, and R. Wermers (2016). Runs on money market mutual funds. American Economic Review 106(9), 2625–57.

Subrahmanyam, A. (1994). Circuit breakers and market volatility: A theoretical perspective. Journal of Finance 49(1), 237–254.

Zitzewitz, E. (2006). How widespread was late trading in mutual funds? American Economic Review 96(2), 284–289.

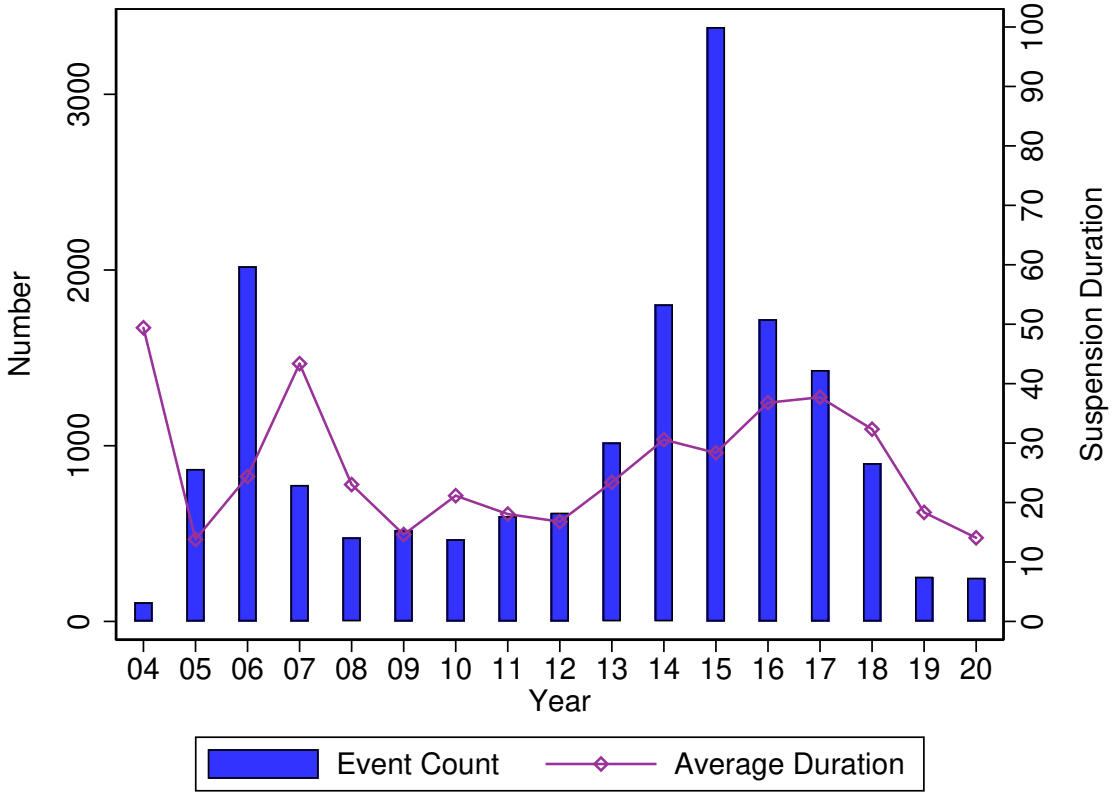
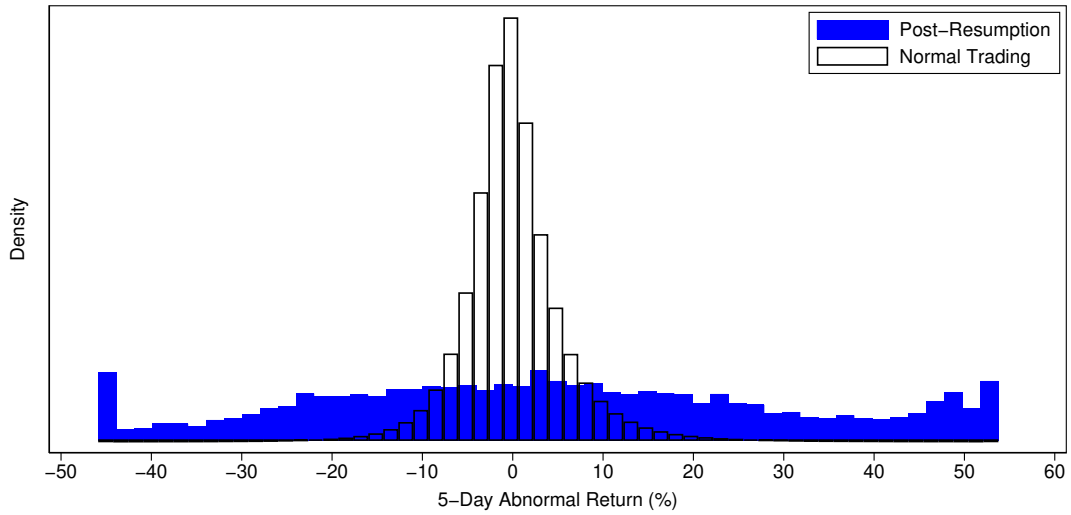
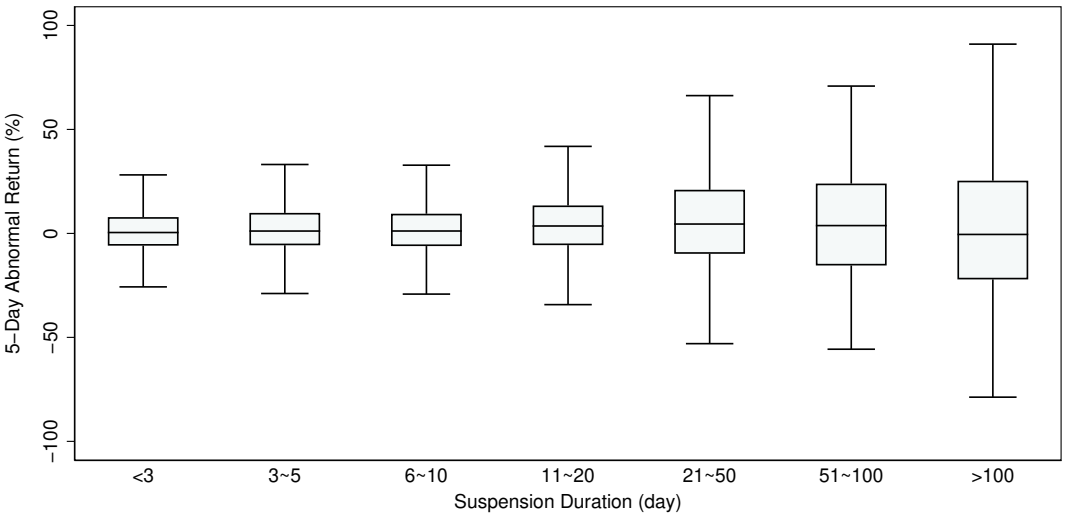


Figure 2: **Trading Suspension Events, 2004–2020.**
This figure shows the number of stock trading suspension events and the average duration (measured as the number of trading days) for each year between 2004–2020.



(a) Post-Resumption v.s. Normal Trading



(b) Post-Resumption Return by Suspension Duration

Figure 3: **Stock Return After Trading Resumption.**
This figure shows 5-day stock abnormal return immediately after trading resumes. Panel (a) presents histograms for 5-day post-resumption windows and 5-day normal trading windows. Abnormal returns are winsorized at the 0.01% and 99.99% levels. Panel (b) presents the distribution of 5-day abnormal return by suspension duration (measured as the number of trading days) group. The height of a box indicates the 25th and 75th percentiles, and the upper/lower hinges indicate adjancent values.

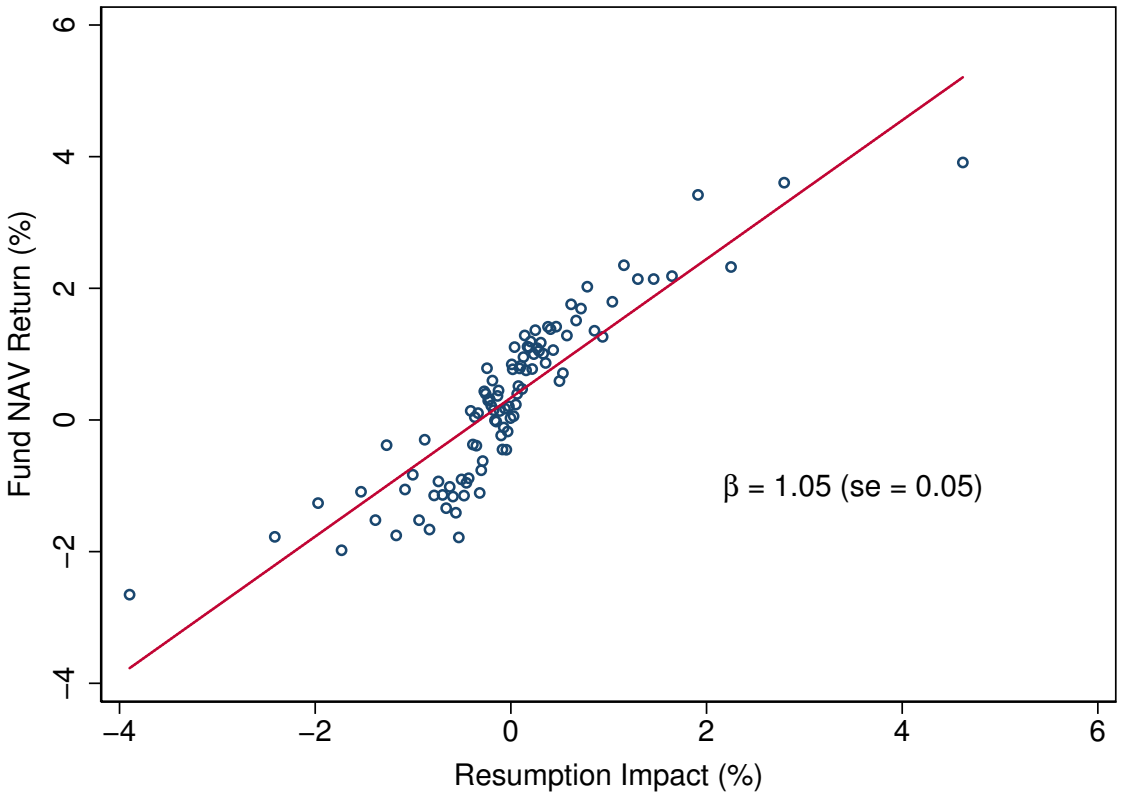


Figure 4: **Resumption Impact and Mutual Fund Return.**
This figure presents a scatter plot that groups 5-day mutual fund NAV return into 100 bins by resumption impact over 5 trading days, for all trading suspension events with at least 1% portfolio weight during 2004Q3-2018Q4. Ordinary least square estimates for slope (β) and heteroskedasticity-robust standard error are reported.

Table 1: **Portfolio Stock's Resumption Impact and Fund NAV Return Following Resumption**

This table reports the correlation between the impact of portfolio stock's post-resumption return and realized fund NAV return. Resumption impact and fund return are based on raw returns and abnormal returns in Panel A and Panel B, respectively.

Panel A: Raw Return					
correlation between		if |5-day resumption impact|			
resumption impact	fund return following resumption	all	$> 1\%$	$> 3\%$	$> 5\%$
1 day	1 day	0.047	0.127	0.257	0.458
3 days	3 days	0.114	0.247	0.321	0.344
5 days	5 days	0.163	0.300	0.428	0.445
7 days	7 days	0.159	0.337	0.486	0.583
10 days	10 days	0.244	0.336	0.465	0.576
15 days	15 days	0.310	0.376	0.478	0.522
	No. events	16,556	3,205	362	64

Panel B: Abnormal Return					
correlation between		if |5-day resumption impact|			
resumption impact	fund return following resumption	all	$> 1\%$	$> 3\%$	$> 5\%$
1 day	1 day	0.115	0.172	0.442	0.632
3 days	3 days	0.119	0.164	0.260	0.384
5 days	5 days	0.157	0.239	0.367	0.438
7 days	7 days	0.194	0.269	0.397	0.525
10 days	10 days	0.192	0.254	0.363	0.467
15 days	15 days	0.218	0.273	0.382	0.403
	No. events	16,556	3,205	362	64

Table 2: **Summary Statistics**

This table reports summary statistics of fund characteristics. Only non-structured open-end mutual funds are included in the sample. The unit of observation is fund-quarter where a fund files a quarterly report. Fund flows and returns are calculated for quarterly intervals. Fund TNA is reported in million CNY. Fund ages are reported in number of years. Fund flows are trimmed at the 1% and 99% levels.

Panel A: All Fund-Quarters										
Variable	N	Mean	Sd	p1	p10	p25	Median	p75	p90	p99
Fund Flow	26,221	-3.5%	24.0%	-53.8%	-23.5%	-10.9%	-4.0%	-0.3%	10.4%	99.9%
Raw Return										
Fund Performance	26,221	2.7%	12.1%	-27.2%	-9.8%	-2.7%	1.4%	6.7%	17.3%	41.1%
Family Performance	26,170	2.0%	9.4%	-21.0%	-7.9%	-2.2%	1.2%	5.0%	14.1%	30.9%
Abnormal Return										
Fund Performance	25,926	1.5%	8.2%	-21.6%	-5.8%	-1.7%	0.7%	4.0%	9.3%	32.4%
Family Performance	25,875	0.9%	5.6%	-17.6%	-3.5%	-1.2%	0.4%	2.6%	6.2%	20.6%
Fund TNA	26,228	2,198	3,569	54	106	266	931	2,593	5,762	16,641
Fund Age	26,228	5.0	3.2	1.3	1.6	2.3	4.1	6.9	9.8	13.9
Fund Return Volatility	26,219	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2
Family TNA	26,228	36,133	35,700	514	4,543	10,325	24,581	48,069	85,114	151,947
Purchase Fee	26,108	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Redemption Fee	26,039	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%
Expense Ratio	26,223	1.5%	0.4%	0.2%	0.8%	1.5%	1.8%	1.8%	1.8%	2.2%
No. Funds	1,837									
No. Families	107									

Panel B: Event Fund-Quarters										
Variable	N	Mean	Sd	p1	p10	p25	Median	p75	p90	p99
Fund Flow	4,588	-4.9%	24.8%	-54.1%	-27.7%	-13.6%	-5.1%	-1.0%	10.7%	101.9%
Raw Return										
RI(3d)	4,497	0.1%	1.1%	-2.9%	-1.1%	-0.5%	0.0%	0.5%	1.2%	3.5%
RI(5d)	4,497	0.0%	1.4%	-3.8%	-1.3%	-0.6%	0.0%	0.5%	1.4%	4.9%
RI(7d)	4,497	0.1%	1.7%	-4.1%	-1.4%	-0.6%	0.0%	0.5%	1.5%	6.3%
RI(10d)	4,497	0.1%	1.9%	-4.6%	-1.4%	-0.6%	-0.1%	0.5%	1.6%	7.1%
Fund Performance	4,588	4.6%	14.6%	-30.5%	-11.5%	-2.9%	2.8%	11.5%	24.2%	45.7%
Family Performance	4,583	3.5%	10.3%	-21.4%	-8.1%	-1.4%	2.2%	9.0%	17.0%	32.6%
Abnormal Return										
RI(3d)	4,539	0.0%	1.1%	-3.2%	-1.2%	-0.5%	0.0%	0.5%	1.1%	3.0%
RI(5d)	4,539	-0.1%	1.4%	-4.2%	-1.5%	-0.6%	0.0%	0.5%	1.2%	3.8%
RI(7d)	4,539	-0.1%	1.6%	-4.9%	-1.6%	-0.7%	-0.1%	0.5%	1.3%	4.7%
RI(10d)	4,539	-0.1%	1.7%	-5.1%	-1.6%	-0.7%	-0.1%	0.4%	1.3%	5.1%
Fund Performance	4,506	2.5%	11.9%	-31.4%	-8.5%	-2.8%	1.5%	6.9%	15.9%	40.9%
Family Performance	4,501	1.4%	7.4%	-23.2%	-4.6%	-1.3%	0.8%	4.0%	9.6%	24.3%
Fund TNA	4,588	1,926	2,775	54	107	270	934	2,442	4,868	13,057
Fund Age	4,588	5.5	3.3	1.3	1.7	2.6	4.8	7.9	10.4	13.6
Fund Return Volatility	4,588	7.3%	4.2%	1.0%	2.9%	4.0%	6.1%	10.2%	13.6%	18.6%
Family TNA	4,588	33,506	33,583	376	3,716	9,130	22,878	44,380	79,264	146,585
Purchase Fee	4,583	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
Redemption Fee	4,570	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%
Expense Ratio	4,588	1.7%	0.2%	0.3%	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%
No. Funds	985									
No. Families	92									

Panel C: Top-10 Holding Positions										
Rank of Holding	N	Mean	Std	p1	p10	p25	Median	p75	p90	p99
1	23,697	5.69%	2.68%	0.06%	1.79%	4.00%	5.69%	7.72%	9.25%	10.63%
2	23,453	4.75%	2.31%	0.04%	1.42%	3.28%	4.78%	6.21%	7.91%	9.71%
3	23,280	4.18%	2.06%	0.03%	1.22%	2.95%	4.19%	5.40%	6.88%	9.27%
4	23,113	3.77%	1.86%	0.03%	1.11%	2.69%	3.78%	4.90%	6.07%	8.73%
5	22,976	3.45%	1.68%	0.02%	1.04%	2.48%	3.45%	4.49%	5.43%	7.98%
6	22,822	3.18%	1.53%	0.02%	0.98%	2.30%	3.18%	4.12%	5.00%	7.28%
7	22,695	2.95%	1.39%	0.01%	0.94%	2.16%	2.99%	3.82%	4.64%	6.54%
8	22,560	2.75%	1.28%	0.01%	0.89%	2.05%	2.83%	3.54%	4.27%	5.86%
9	22,440	2.58%	1.17%	0.01%	0.86%	1.96%	2.66%	3.29%	3.99%	5.31%
10	22,333	2.42%	1.08%	0.01%	0.82%	1.86%	2.50%	3.08%	3.70%	4.92%
Average	23,697	3.52%	1.64%	0.03%	1.01%	2.59%	3.63%	4.61%	5.52%	7.18%
Sum	23,697	34.75%	16.78%	0.15%	8.38%	25.17%	36.14%	45.97%	55.07%	71.48%

Table 3: **Baseline Regression**

This table reports results in baseline specification. The dependent variable is quarterly fund flow, and observations are at fund-quarter level. The variable of interest, *Resumption Impact (5d)*, is holding-weighted sum of 5-trading day post-resumption stock return, calculated based on disclosed top-10 fund portfolio holdings at the quarter end prior to the reference date. In the first two columns, *Resumption Impact (5d)*, *Fund Performance* and *Family Performance* are measured using raw returns. In columns (3)-(4), *Resumption Impact (5d)* is measured using stock-market adjusted abnormal return, and *Fund Performance* and *Family Performance* are measured using stock- and bond-market adjusted abnormal return. The fund itself is excluded when calculating family TNA and performance. All control variables are lagged by one quarter. Standard errors are clustered at fund level, and t-statistics are reported in parentheses. *, **, *** represent 10%, 5%, and 1% level of significance.

	Raw Return		Abnormal Return	
	(1)	(2)	(3)	(4)
Resumption Impact (5d)	1.097***	1.059***	1.205***	1.120***
	(3.575)	(3.585)	(3.858)	(3.703)
Fund Performance	0.327***	0.343***	0.405***	0.426***
	(8.380)	(8.590)	(11.946)	(12.713)
Log TNA		-0.071***		-0.072***
		(-14.425)		(-14.244)
Log Age		-0.003		-0.001
		(-0.358)		(-0.094)
Log Familiy TNA		0.013**		0.014***
		(2.447)		(2.606)
Family Performance		0.219***		0.113*
		(3.738)		(1.852)
Fund Return Volatility		-0.178*		-0.417***
		(-1.655)		(-3.918)
Purchase Fee		-4.702*		-7.356*
		(-1.666)		(-1.929)
Redemption Fee		12.560		3.674
		(0.822)		(0.170)
Expense Ratio		1.757		2.152
		(0.246)		(0.300)
Fund FEs	Yes	Yes	Yes	Yes
Time FEs	Yes	Yes	Yes	Yes
Observations	26,052	25,776	25,757	25,493
R-squared	0.130	0.155	0.132	0.158

Table 4: **When Do Flows Respond More Aggressively?**

This table reports results of modified baseline regressions that include interaction terms. The dependent variable is quarterly fund flow, and observations are at fund-quarter level. Variable *Resumption Impact (5d)*, or $RI(5d)$, is holding-weighted sum of 5-trading day post-resumption stock return, calculated based on disclosed top-10 fund portfolio holdings at the quarter end prior to the reference date. $\mathbf{1}_{RI(5d)>0}$ is an indicator variable that equals one if *Resumption Impact (5d)* is positive. *Left Tail* and *Right Tail* are indicator variables that equal one if $|RI(5d)| > 3\%$ on the corresponding tail of distribution. In Panel A, *RI(5d)*, *Fund Performance* and *Family Performance* are measured using raw returns. In Panel B, *RI(5d)* is measured using stock-market adjusted abnormal return, and *Fund Performance* and *Family Performance* are measured using stock- and bond-market adjusted abnormal return. The fund itself is excluded when calculating family TNA and performance. All control variables are lagged by one quarter. Standard errors are clustered at fund level, and t-statistics are reported in parentheses. *, **, *** represent 10%, 5%, and 1% level of significance.

	Panel A: Raw Return					
	(1)	(2)	(3)	(4)	(5)	(6)
RI (5d)	1.216***	1.323***	0.952**	0.887**	1.068***	1.082***
	(2.861)	(3.145)	(2.573)	(2.486)	(2.828)	(2.936)
Positive	-0.012*	-0.013*				
	(-1.769)	(-1.838)				
RI (5d) * Positive	0.235	-0.000				
	(0.331)	(-0.000)				
Left Tail			-0.107*	-0.094		
			(-1.870)	(-1.623)		
RI (5d) * Left Tail			-1.534	-1.127		
			(-1.386)	(-0.993)		
Right Tail					-0.215***	-0.192***
					(-3.667)	(-3.440)
RI (5d) * Right Tail					3.864***	3.332***
					(2.883)	(2.641)
Control Variables	No	Yes	No	Yes	No	Yes
Fund FEs	Yes	Yes	Yes	Yes	Yes	Yes
Time FEs	Yes	Yes	Yes	Yes	Yes	Yes
Observations	26,052	25,776	26,052	25,776	26,052	25,776
R-squared	0.130	0.156	0.130	0.156	0.130	0.156

	Panel B: Abnormal Return					
	(7)	(8)	(9)	(10)	(11)	(12)
RI (5d)	1.042***	1.051***	1.409***	1.311***	0.966***	0.949***
	(2.646)	(2.694)	(3.673)	(3.553)	(2.834)	(2.846)
Positive	-0.013*	-0.013*				
	(-1.841)	(-1.886)				
RI (5d) * Positive	0.955	0.748				
	(1.212)	(0.990)				
Left Tail			0.113	0.119		
			(1.115)	(1.167)		
RI (5d) * Left Tail			1.561	1.715		
			(0.952)	(1.045)		
Right Tail					-0.297***	-0.288***
					(-3.764)	(-3.962)
RI (5d) * Right Tail					6.800***	6.350***
					(3.492)	(3.569)
Control Variables	No	Yes	No	Yes	No	Yes
Fund FEs	Yes	Yes	Yes	Yes	Yes	Yes
Time FEs	Yes	Yes	Yes	Yes	Yes	Yes
Observations	25,757	25,493	25,757	25,493	25,757	25,493
R-squared	0.132	0.158	0.132	0.158	0.133	0.158

Table 5: **Placebo Test: Unobserved Actual Top-10 Holdings**

This table reports results of placebo tests based on actual top-10 fund holdings that are unobservable to investors. The dependent variable is quarterly fund flow, and observations are at fund-quarter level. The variable of interest, *Resumption Impact (5d)*, is holding-weighted sum of 5-trading day post-resumption stock return, calculated based on disclosed top-10 fund portfolio holdings that appear at the end of the concurrent quarter, but not the end of the previous quarter. In the first two columns, *Resumption Impact (5d)*, *Fund Performance* and *Family Performance* are measured using raw returns. In columns (3)-(4), *Resumption Impact (5d)* is measured using stock-market adjusted abnormal return, and *Fund Performance* and *Family Performance* are measured using stock- and bond-market adjusted abnormal return. The fund itself is excluded when calculating family TNA and performance. All control variables are lagged by one quarter. Standard errors are clustered at fund level, and t-statistics are reported in parentheses. *, **, *** represent 10%, 5%, and 1% level of significance.

	Raw Return		Abnormal Return	
	(1)	(2)	(3)	(4)
Resumption Impact (5d)	-0.649	-0.783	0.182	-0.028
	(-1.097)	(-1.389)	(0.321)	(-0.053)
Fund Performance	0.322***	0.338***	0.397***	0.418***
	(8.250)	(8.467)	(11.602)	(12.434)
Log TNA		-0.071***		-0.072***
		(-14.410)		(-14.227)
Log Age		-0.003		-0.001
		(-0.365)		(-0.092)
Log Family TNA		0.013**		0.014**
		(2.409)		(2.557)
Family Performance		0.216***		0.111*
		(3.685)		(1.811)
Fund Return Volatility		-0.192*		-0.425***
		(-1.778)		(-3.981)
Purchase Fee		-4.842*		-7.599**
		(-1.723)		(-2.012)
Redemption Fee		12.608		3.670
		(0.838)		(0.173)
Expense Ratio		1.732		2.061
		(0.242)		(0.287)
Fund FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Observations	26,052	35 25,776	25,757	25,493
R-squared	0.129	0.155	0.131	0.157

Table 6: **Placebo Test: Unobserved Non-Top-10 Holdings**

This table reports results of placebo tests exploiting the delay of fund disclosure of non-top-10 stock holdings in annual reports. The dependent variable is quarterly fund flow. *RI(5d)* is the 5-day Resumption Impact calculated using the top-10 holdings. *Non-top-10 RI(5d)* is the 5-day Resumption Impact calculated using the non-top-10 holdings disclosed in fund annual reports. Column (1)-(4) measure stock and fund performance using raw return, and column (5)-(8) use abnormal return. Column (1), (2), (5), and (6) include all fund-quarter observations in the baseline sample, while column (3), (4), (7), and (8) exclude fund-quarter observations where *RI(5d)* is non-zero and the quarter is not Q1. All control variables are lagged by one quarter. Standard errors are clustered at fund level, and t-statistics are reported in parentheses. *, **, *** represent 10%, 5%, and 1% level of significance.

	Raw Return				Abnormal Return			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
RI (5d)	1.059***	1.069***	1.325**	1.356**	1.120***	1.114***	1.468**	1.451**
	(3.585)	(3.626)	(2.266)	(2.338)	(3.703)	(3.692)	(2.257)	(2.246)
Non-top-10 RI (5d)		-0.501		-0.580		0.547		0.474
		(-0.483)		(-0.560)		(0.442)		(0.381)
Fund Performance	0.343***	0.343***	0.316***	0.316***	0.426***	0.427***	0.408***	0.409***
	(8.590)	(8.542)	(7.313)	(7.275)	(12.713)	(12.664)	(11.178)	(11.134)
Log TNA	-0.071***	-0.071***	-0.068***	-0.068***	-0.072***	-0.072***	-0.069***	-0.069***
	(-14.425)	(-14.425)	(-13.220)	(-13.220)	(-14.244)	(-14.244)	(-13.156)	(-13.155)
Log Age	-0.003	-0.003	-0.007	-0.007	-0.001	-0.001	-0.005	-0.005
	(-0.358)	(-0.354)	(-0.726)	(-0.721)	(-0.094)	(-0.098)	(-0.481)	(-0.484)
Log Family TNA	0.013**	0.013**	0.012**	0.012**	0.014***	0.014***	0.013**	0.013**
	(2.447)	(2.446)	(2.231)	(2.230)	(2.606)	(2.607)	(2.383)	(2.384)
Family Performance	0.219***	0.219***	0.171***	0.171***	0.113*	0.113*	0.033	0.033
	(3.738)	(3.738)	(2.718)	(2.718)	(1.852)	(1.847)	(0.510)	(0.505)
Fund Return Volatility	-0.178*	-0.180*	-0.145	-0.148	-0.417***	-0.415***	-0.384***	-0.382***
	(-1.655)	(-1.669)	(-1.240)	(-1.259)	(-3.918)	(-3.893)	(-3.324)	(-3.306)
Purchase Fee	-4.702*	-4.708*	-3.533	-3.540	-7.356*	-7.343*	-4.756	-4.747
	(-1.666)	(-1.669)	(-1.197)	(-1.200)	(-1.929)	(-1.923)	(-1.051)	(-1.048)
Redemption Fee	12.560	12.484	9.955	9.856	3.674	3.784	0.933	1.042
	(0.822)	(0.817)	(0.606)	(0.601)	(0.170)	(0.175)	(0.044)	(0.049)
Expense Ratio	1.757	1.748	4.936	4.925	2.152	2.164	5.380	5.390
	(0.246)	(0.245)	(0.649)	(0.647)	(0.300)	(0.301)	(0.706)	(0.708)
Fund FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	25,776	25,776	22,565	22,565	25,493	25,493	22,362	22,362
R-squared	0.155	0.155	0.162	0.162	0.158	0.158	0.165	0.165

Table 7: **Flow Response for Funds with Different Institutional Ratios**

This table reports results on the heterogeneous responsiveness of individual flows and institutional flows to *Resumption Impact*. *High Institutional Ratio* is a dummy variable that equals to 1 if the fund ownership by institutional investors is above 50% according to the most recent disclosure, and 0 otherwise. Definition of other variables are the same as in the baseline specification. Standard errors are clustered at fund level, and t-statistics are reported in parentheses. *, **, *** represent 10%, 5%, and 1% level of significance.

	Raw Return		Abnormal Return	
	(1)	(2)	(3)	(4)
RI	0.815**	0.788**	0.875**	0.808**
	(2.374)	(2.351)	(2.482)	(2.343)
RI × High Inst. Ratio	1.492*	1.317*	1.705**	1.576**
	(1.934)	(1.816)	(2.107)	(2.043)
Fund Performance	0.308***	0.326***	0.394***	0.413***
	(7.844)	(8.136)	(11.200)	(11.967)
Fund Perf. × High Inst. Ratio	0.123**	0.096*	0.064	0.076
	(2.378)	(1.878)	(0.892)	(1.089)
High Institutional Ratio	-0.053***	-0.026***	-0.048***	-0.023***
	(-6.766)	(-3.197)	(-5.868)	(-2.632)
Log TNA		-0.068***		-0.070***
		(-13.755)		(-13.564)
Log Age		-0.004		-0.001
		(-0.380)		(-0.130)
Log Familiy TNA		0.013**		0.014**
		(2.366)		(2.571)
Family Performance		0.215***		0.109*
		(3.669)		(1.781)
Fund Return Volatility		-0.216**		-0.449***
		(-2.023)		(-4.237)
Purchase Fee		-4.588*		-7.251*
		(-1.695)		(-1.898)
Redemption Fee		10.530		1.600
		(0.707)		(0.075)
Expense Ratio		2.078		2.453
		(0.292)		(0.342)
Fund FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Observations	26,052	25,776	25,757	25,493
R-squared	0.133	0.156	0.135	0.158

Table 8: **The 2015 Market Crash Period**

This table shows results of the baseline regression using the sample excluding the 2015 market crash period observations. Crash period observations are fund-quarters observed in 2015Q2 or 2015Q3. The dependent variable is quarterly fund flow. Column (1) and (3) use non-crash-period observations, and column (2) and (4) use only crash-period observations. Standard errors are clustered at fund level, and t-statistics are reported in parentheses. *, **, *** denote 10%, 5%, and 1% level of significance.

	Raw Return		Abnormal Return	
	(1)	(2)	(3)	(4)
Resumption Impact (5d)	1.026***	0.825	1.140***	0.649
	(2.909)	(1.288)	(3.236)	(0.943)
Fund Performance	0.364***	0.409***	0.440***	0.528***
	(8.471)	(3.697)	(12.553)	(4.295)
Log TNA	-0.067***	-0.026***	-0.068***	-0.029***
	(-14.171)	(-3.127)	(-13.955)	(-3.582)
Log Age	0.005	-0.068***	0.007	-0.062***
	(0.524)	(-4.037)	(0.733)	(-3.680)
Log Family TNA	0.012**	0.006	0.013**	0.007
	(2.280)	(0.557)	(2.469)	(0.619)
Family Performance	0.157**	0.483***	0.014	0.650***
	(2.384)	(2.746)	(0.217)	(2.614)
Fund Return Volatility	-0.216**	-0.916***	-0.482***	-0.739**
	(-2.033)	(-2.857)	(-4.543)	(-2.427)
Purchase Fee	-4.665*	-99.646*	-7.144*	-101.260*
	(-1.649)	(-1.722)	(-1.866)	(-1.761)
Redemption Fee	12.076	4.550	2.866	3.730
	(0.764)	(0.514)	(0.131)	(0.429)
Expense Ratio	1.197	0.387	1.618	-0.355
	(0.171)	(0.157)	(0.231)	(-0.140)
Fund FE	Yes	No	Yes	No
Time FE	Yes	Yes	Yes	Yes
Observations	24,380	1,395	24,097	1,395
R-squared	0.159	0.081	0.161	0.085

Table 9: **Robustness: Horizon of Measuring Resumption Impact**

This table shows that our main results are robust to constructing our variable of interest *Resumption Impact* using stock resumption returns over various lengths of time. Column (1), (3), and (5) measures stock and fund performance using raw return, and column (2), (4), (6) uses abnormal return adjusted for exposure to stock and bond market factors. All control variables in the baseline specification are included and their coefficients are suppressed to conserve space. Standard errors are clustered at fund level, and t-statistics are reported in parentheses. *, **, *** denote 10%, 5%, and 1% level of significance.

	n=3		n=7		n=10	
	(1)	(2)	(3)	(4)	(5)	(6)
Resumption Impact (n days)	1.233***	1.343***	1.012***	1.183***	0.914***	1.012***
	(3.372)	(3.631)	(3.910)	(4.436)	(3.735)	(4.002)
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes
Fund FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	25,776	25,493	25,776	25,493	25,776	25,493
R-squared	0.155	0.157	0.156	0.158	0.156	0.158

Table 10: **Robustness: Trimming Extreme Flow Observations**

This table shows that our main results are robust to excluding fund-quarter observations where funds experience extreme flows. Column (1) and (3) use raw return to measure stock return and fund performance, while column (2) and (4) use abnormal return adjusted for exposure to stock and bond market factors. Standard errors are clustered at fund level, and t-statistics are reported in parentheses. *, **, *** denote 10%, 5%, and 1% level of significance.

	Trim at (2.5%, 97.5%)		Trim at (5%, 95%)	
	(1)	(2)	(3)	(4)
Resumption Impact (5d)	0.894***	1.023***	0.735***	0.818***
	(3.937)	(4.534)	(4.607)	(5.115)
Fund Performance	0.210***	0.268***	0.125***	0.161***
	(8.933)	(12.592)	(7.838)	(10.300)
Log TNA	-0.035***	-0.036***	-0.021***	-0.021***
	(-12.948)	(-12.722)	(-10.497)	(-10.257)
Log Age	0.003	0.004	0.005	0.006
	(0.472)	(0.714)	(1.105)	(1.338)
Log Family TNA	0.007**	0.008**	0.005**	0.006***
	(2.283)	(2.455)	(2.534)	(2.631)
Family Performance	0.110***	0.055	0.073***	0.051*
	(2.988)	(1.359)	(2.862)	(1.762)
Fund Return Volatility	0.004	-0.142**	0.130**	0.043
	(0.057)	(-2.044)	(2.566)	(0.849)
Purchase Fee	-3.566**	-4.804**	-2.929**	-5.251**
	(-1.977)	(-2.043)	(-2.290)	(-2.294)
Redemption Fee	5.734	0.975	5.632	5.608
	(0.649)	(0.081)	(1.276)	(0.857)
Expense Ratio	-1.372	-1.029	-1.423	-1.176
	(-0.398)	(-0.298)	(-0.461)	(-0.378)
Fund FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Observations	24,978	24,695	23,649	23,376
R-squared	0.182	0.185	0.209	0.213

Table 11: **Robustness: Time Window from Flow Quarter-End to Stock Resumption Date**

This table shows robustness of our main results to varying time window applied to filter stock resumption events used to calculate *Resumption Impact*. Column (1) and (3) use raw return to measure stock return and fund performance, Column (2) and (4) use abnormal returns. Standard errors are clustered at fund level, and t-statistics are reported in parentheses. *, **, *** denote 10%, 5%, and 1% level of significance.

	w=1 month		w=3 months	
	(1)	(2)	(3)	(4)
Resumption Impact (5d)	1.060***	1.096***	0.629**	0.582*
	(2.990)	(2.894)	(2.143)	(1.916)
Fund Performance	0.343***	0.424***	0.341***	0.422***
	(8.581)	(12.685)	(8.534)	(12.602)
Log TNA	-0.071***	-0.072***	-0.071***	-0.072***
	(-14.416)	(-14.237)	(-14.417)	(-14.234)
Log Age	-0.003	-0.001	-0.003	-0.001
	(-0.368)	(-0.101)	(-0.356)	(-0.091)
Log Family TNA	0.013**	0.014***	0.013**	0.014***
	(2.437)	(2.595)	(2.425)	(2.580)
Log Family Performance	0.219***	0.114*	0.219***	0.112*
	(3.736)	(1.862)	(3.735)	(1.834)
Fund Return Volatility	-0.177*	-0.416***	-0.182*	-0.419***
	(-1.646)	(-3.907)	(-1.686)	(-3.941)
Purchase Fee	-4.693*	-7.346*	-4.729*	-7.449*
	(-1.665)	(-1.930)	(-1.681)	(-1.954)
Redemption Fee	12.568	3.749	12.652	3.792
	(0.826)	(0.175)	(0.839)	(0.178)
Expense Ratio	1.781	2.161	1.712	2.091
	(0.249)	(0.301)	(0.240)	(0.291)
Fund FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Observations	25,776	25,493	25,776	25,493
R-squared	0.155	0.157	0.155	0.157