Online Appendix to

Wealth Redistribution in Bubbles and Crashes

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1. Additional Data Descriptions

1.1. Additional Summary Statistics

In Panel B of Table 1, we examine portfolio style tilts of households in different wealth groups. Specifically, for each of the four household groups, we conduct a regression of its initial portfolio weights in stocks, measured at the beginning of July 2014, on a set of stock characteristics, including market beta, market capitalization, and the book-to-market ratio, all estimated prior to the beginning of our sample.[1] The results are in line with prior findings (e.g., Campbell, Ramadorai, and Ranish, 2019): relative to large investors (top 0.5%), small investors (bottom 85%) in normal times hold stocks with larger beta, smaller size, and higher book-to-market ratios. It is worth noting that despite the statistically-significant difference in their preferences for various stock characteristics, the four household groups are holding virtually identical portfolios at the beginning of our sample: a) the R-squared in Panel B is small for all household groups; b) pairwise correlations in buy-and-hold returns of the four groups (who also have similar portfolio volatilities) are above 99%.

Panel C of Table 1 shows the pairwise correlations in trading, defined as weekly trading in individual stocks divided by the number of shares tradable, of each household group as well as that of professional money managers (mutual funds plus hedge funds), averaged across our sample period. Two interesting observations are worth pointing out. First, trading by the wealthiest household group correlates strongly and negatively with that of the bottom two household groups, with correlation coefficients of -0.27 and -0.26. Second, the correlations in trading between professional money managers and the bottom three household groups are -0.26, -0.28, -0.26, respectively, while that between professional money managers and the top household group is a statistically insignificant -0.03. Put differently, while professional money managers and wealthy households potentially follow different signals, they both trade against poor households.

[1] For our main results, stock betas are calculated using monthly returns in the three years prior to July 2014 and are kept constant throughout the entire sample. For robustness, we also compute betas using a) monthly returns in rolling windows of 36 months, b) daily returns (regressed on concurrent and three lags of market returns) in rolling windows of three months, c) the average ratio of stock returns over market returns in the 10 days with the largest market declines (following Acharya et al., 2017). All our results are virtually unchanged.

1.2. Equity Wealth and Total Net Wealth

In this subsection, we use data from the 2014 survey of the China Family Panel Studies (CFPS), as well as Piketty, Yang, and Zucman's (PYZ, 2018) estimates of the wealth distribution in China, to provide an approximate mapping between the distribution of equity wealth held by Chinese households and that of their total net wealth. CFPS surveys around 9000 households (in the nationally representative sample) with a wide range of characteristics following a similar methodology to the one used by the Consumer Finance Survey in the US. It contains information about households' stock market participation decisions as well as their investments in risky financial assets. PYZ (2018) combine information from the CFPS survey and the annual HuRun ranking of the wealthiest individuals in China to provide estimates of various cutoffs on the wealth distribution.

The first three columns of Table 1 Panel D present the stock market participation rates for various brackets of household wealth. As can be seen from Column 1, the market participation rate in China increases monotonically with households' net worth; it ranges from 1.4% for households in the bottom 50% of the wealth distribution to over 14% for households in the top 10%. We then calculate the fraction of equity investors in China that are from each wealth bracket as follows:

$$\%Stock\ \ Investors_b = \frac{Participation\ \ Rate_b * Fraction\ \ of\ \ Households_b}{\sum_b Participation\ \ Rate_b * Fraction\ \ of\ \ Households_b}. (A1)$$

The results are shown in Columns 2 and 3. For instance, 16.2% of all stock investors are from the bottom 50% of the wealth distribution (16.2% = 1.4%*50%/sum across all wealth buckets), and 33.6% from the top 10% of the wealth distribution. Two facts are worth pointing out here. First, stock market participants are drawn from the whole distribution of household wealth. For example, nearly half of stock investors are from the bottom 80% of the wealth distribution. Second, given the positive correlation between equity wealth and total net worth, the 0.5% threshold in the equity wealth distribution (the focus of this paper) corresponds roughly to the 0.1% cutoff in the total wealth distribution.[2]

[2] According to the World Inequality Database, the total private wealth in China at the end of 2014 was 274.66T RMB, out of which 38.18T RMB (or 13.9%) was owned by the top 0.1%. A back-of-the-envelope calculation suggests that a 250B RMB stock market wealth increase would raise the wealth share of the top 0.1% from 13.9% to 14.0%. Given that the ultra-wealthy typically invest in a wide range of assets (ownership stakes in private firms, real estate, for instance), our result has broader implications for wealth inequality: a similar mechanism – that the ultra-wealthy gain a windfall in extremely volatile periods – in these other markets can play an even larger role in explaining the rise of wealth concentration.

In the next three columns, we construct an approximate mapping between households' total wealth and their equity wealth. We start by taking estimates of the wealth distribution from Piketty, Yang, and Zucman (2018), as reported in Column 4. Next, we calculate the average fraction of total wealth invested in risky financial assets for households with positive risky-asset holdings in each wealth bracket using the CFPS data (reported in Column 5).[3] Finally, we multiply each threshold in the wealth distribution (Column 4) by the corresponding risky-financial-asset weight (Column 5) to impute the value of risky financial holdings at those thresholds. As can be seen in Column 6, the minimum equity holdings for households in the top 0.01% of the wealth distribution are about 7M RMB, similar in magnitude to the top 0.5% cutoff (at 10M RMB) in the equity wealth distribution.

2. Potential Interpretations of Our Findings

In this section, we entertain a number of additional explanations for our trading and return patterns through the lens of a simple, stylized portfolio-choice model.

2.1. A Simple Portfolio Choice Model

Consider an investor (household) i with total financial wealth $W_{i,t}$, and a power utility function with risk aversion γ_i. There exists one risky asset (e.g., the stock market index), whose return in the next period follows a log-normal distribution, with a (subjective) expectation of $\mathrm{E}_{i,t}\left(R_{i,t+1}\right)$, and a conditional variance of σ_t^2. (Implicitly, we assume that investors do not disagree about the market variance, which can be precisely measured.) The risk-free rate in the economy is R_f. The myopic demand for the risky asset can be approximated by (see Campbell and Viceira, 2002):

$$D_{i,t} = \frac{\mathrm{E}_{i,t}\left(R_{i,t+1}\right) - R_f}{\gamma_i \sigma_t^2} \; W_{i,t}. \qquad (A2)$$

It is clear from the above expression that the amount of capital allocated to the risky

[3] The CFPS survey does not collect information on the value of equity holdings; instead, it includes the investment value in all financial products (including stocks, mutual funds, bonds, other derivatives, etc.). Stocks holdings are by far the most common form of household financial investment reported in the survey, and for more than half of the survey respondents are the only form of financial investment. The estimated fraction is very similar if we restrict our sample to households that invest only in stocks.

asset is determined by a number of factors: i) the investor's total financial wealth ($W_{i,t}$), ii) her risk aversion (γ_i), iii) her subjective expectation of future returns ($\mathrm{E}_{i,t}(R_{i,t+1})$), and iv) the conditional variance of the asset (σ_t^2). Changes in allocation (either inflows or outflows) are therefore driven by changes in one or more of these factors.

2.2. Capital Flows and Flow-Generated Gains at the Market Level

We start by examining the determinants of capital flows into and out of the market by various household groups. To this end, we run a time-series regression of weekly capital flows by each household group on lagged market returns at various horizons: weekly returns over the past four weeks, as well as monthly returns in the past six months. We scale the dependent variable—weekly market-level capital flows of each household group—by the group's average portfolio value at the beginning and end of the same week, so the dependent variable represents a percentage change.

As can be seen from Table A7, most of the coefficients on past market returns are statistically insignificant, except the one on market returns in the previous week; in other words, there is no clear pattern of trend chasing by any of the four household groups. We further divide households accounts into those that exist before July 2014 and those that are opened after July 2014 (as reported in Table A8) and observe similar patterns: there is some evidence that small new entrants tend to chase very short-term market returns in their capital allocation decisions.

2.3. Changes in Financial Wealth – Rebalancing Trades

One of the most natural reasons that investors move in and out of the stock market is portfolio rebalancing. As market prices fluctuate, an investor's portfolio weight in risky assets may deviate from her optimal weight. Moreover, since investors have unequal exposures to non-equity markets (e.g., human capital, real estate), which are differentially correlated with the equity market, investors face different rebalancing needs. To illustrate, imagine an investor whose other investment (e.g., human capital) is weakly correlated with the stock market, an increase in stock market value thus leads to an overweight in stock investment and an incentive to downsize her stock portfolio. On the other hand, for an investor whose other investment (e.g., own business) is strongly correlated with the

stock market and who also borrows to finance her investment, a rise in market value leads to a smaller exposure to the stock market and therefore an incentive to increase her stock holdings.

To a first order approximation, such rebalance-motivated trades are proportional to recent market movements (e.g., market returns in the previous day or week):

$$Reb\_flow_{j,t} = W_{j,t} - W_{j,t-1}(1 + r_{j,t}) = W_{j,t-1} r_{j,t} (\alpha_j - 1), \qquad \text{(A3)}$$

where $W_{j,t}$ is investor j's investment in the stock market in period t, $r_{j,t}$ is investor j's portfolio return in period t, and $\alpha_j - 1$ is investor j's time-invariant propensity to rebalance (which depends on her exposures to the equity market through her other investment). Equivalently, the law of motion of an investor's investment in the stock market can be expressed as:

$$W_{j,t} = W_{j,0}(1 + r_{j,1}\alpha_j)(1 + r_{j,2}\alpha_j) \ldots (1 + r_{j,t}\alpha_j). \qquad \text{(A4)}$$

We estimate α_j for each household group using daily $W_{j,t}$ and $r_{j,t}$ from the entire 18-month period. (The results are similar if we instead estimate Equation (A4) using weekly or monthly data.)

As can be seen in the top panel of Figure A4, rebalance-motivated trades can account for a small fraction of the flow pattern we observe. For example, for the ultra-wealthy group, their actual flows into (out of) the stock market in the early stage of the bubble (crash) are substantially larger than what can be explained by rebalancing trades. The two curves then run parallel to each other in the later stage of both the bubble and crash periods. For the bottom group of households, a bigger part of their trading in the early stage of the bubble/crash period can be explained by rebalancing motives. The bottom panel of Figure A4 shows the gains and losses resulting from such rebalance-motivated trades. Over our entire sample period, rebalance-motivated trades can account for around 10% of the 100B RMB wealth redistribution at the market level between the bottom 85% and top 0.5% households shown in the previous section.

More generally, Equations (A3) and (A4) apply to any feedback trading strategy that is a linear function of realized portfolio returns—including simple trend-following strategies and linear forms of margin-induced trading (e.g., to lever down after negative returns and lever up after positive returns to maintain a constant leverage ratio). Our estimation exercise thus implies that these simple linear strategies are unlikely to be

driving our documented wealth redistribution between the poor and ultrawealthy.

2.4. Variation in Risk Aversion

In order for heterogeneous risk aversion to explain our results, we need the risk aversion of the ultra-wealthy to *decrease* relative to other market participants during the boom period—so that they buy risky assets from other market participants in the boom; we then need the risk aversion of the ultra-wealthy to *increase* relative to the rest during the bust period—so that the former sell risky assets to the latter. While this particular pattern of time-varying risk aversion is not entirely implausible, we do not see strong reasons to believe that risk aversion of these two groups should vary in this fashion during the boom-bust cycle. Moreover, even if risk-aversion varies in this particular way, the corresponding flow pattern will be similar to the one described in the previous subsection; flows will be a simple function of realized portfolio returns, and we have already shown that such a flow pattern is unable to account for our documented wealth redistribution.

3. The Government Bailout

Shortly after the initial market meltdown, the government initiated a large-scale bailout program of the stock market. On July 4, 2015, the chairman of the China Securities Regulatory Commission (CSRC) convened an emergency meeting to devise a detailed plan to stabilize the stock market. The following Monday, July 6th, government-controlled trading accounts (the so-called "national team") started to purchase stocks in large quantities.[4]

To analyze the impact of the government bailout on household groups' gains and losses, we sort all stocks in our sample into three subsets – those that were heavily bought by state-owned corporations in the government bailout (high bailout), those that were

[4] Government bailouts are not unique to China. During the Global Financial Crisis, for example, the US and European governments and central banks bailed out a number of key sectors, including the financial, auto, and airline industries. Then again in the COVID crisis, governments and central banks around the world pumped trillions of dollars into the economy; the Fed, for example, bought hundreds of billions of dollars worth of corporate bonds in March and April of 2020. Some recent studies (e.g., Greenwald, Leombroni, Lustig, and Nieuwerburgh, 2021) indeed argue that central banks' persistent easing monetary policies may have contributed to the widening wealth gap in developed countries. If government bailouts/interventions have become a common practice during economic and financial crises in both developed and developing countries, it is perhaps useful to know the size of wealth redistribution in financial crises with the presence of government bailouts.

lightly bought (low bailout), and those that were not bought at all (no bailout). The idea is that if the government bailout was largely responsible for the gains and losses experienced by different household groups, we expect the gains/losses to concentrate in the set of high bailout stocks.[5]

As shown in Table A9 Panel A, the national team bought close to 500 stocks in July, 2015; their bailout effort focused primarily on large-cap stocks, which made up a larger fraction of the Shanghai Composite Index. Panel B of the same table shows that household groups WG1 to WG4 experienced similar gains and losses across the three subsets of stocks. For example, WG1 lost 75B RMB and WG4 gained 116B in the no-bailout stock sample; for comparison, WG1 lost 117B RMB and WG4 gained 90B in the high-bailout sample. In Panel D, we further compare the percentage gains and losses (relative to the household group's initial holdings in these stocks at the beginning of our sample) of WG1 to WG4. For the no-bailout stock sample, WG1 lost 30% of their initial holdings and WG4 gained nearly 50%. In comparison, for the high-bailout sample, WG1 lost 31% of their initial holdings and WG4 gained 15%. Appendix Figure A5 plots household groups' gains and losses across the three subsets of stocks.

In a further, perhaps cleaner test, we examine the wealth redistribution across household groups before the government bailout. As shown in Table A9 Panel E, between July 1st, 2014 and July 3rd, 2015, WG1 experienced a total loss of 204B RMB and WG4 a total gain of 237B RMB. These figures are quantitively similar to those reported in Table 2 for the whole sample period. In sum, these results suggest that our documented wealth redistribution pattern is unlikely to be entirely driven by the government bailout.

[5] An important caveat is that even stocks in the no-bailout group may be indirectly affected by the government bailout program due to, for example, general investor sentiment or aggregate market movements. All we are arguing here is that the direct impact of government purchases on affected stocks is stronger than the indirect, spillover effect on no-bailout stocks.

Figure A1. Shanghai Composite Index from January 2012 to December 2015

This figure shows the Shanghai Composite Index over both a calm period (January 2012 to June 2014) and a bubble-crash episode (July 2014 to December 2015).

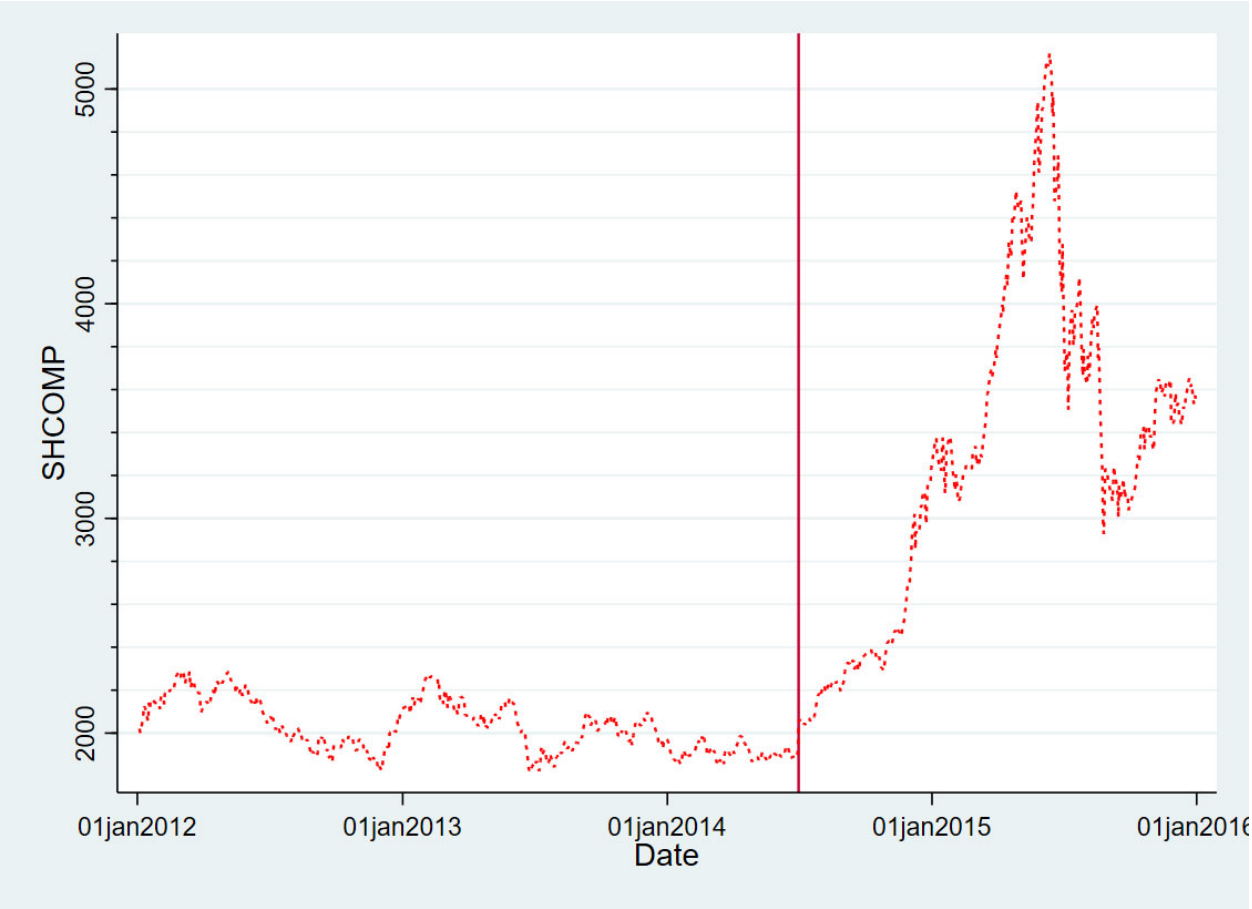


Figure A2. Flow-Generated Gains in the Bubble-Crash Period by Investor Sectors

This figure shows cumulative flow-generated gains by different investor sectors—households, institutions, and corporations—from July 2014 to December 2015. The top figure shows the total cumulative flow-generated gains of each investor sector, calculated as multiplying its daily flows to a stock with the subsequent stock return (till the day in question) and then summing this up over all days till the day in question and across all stocks in the portfolio (see equation (5)). The bottom figure shows the *market-level* cumulative flow-generated gains of each investor sector, calculated as multiplying its daily flows to the market with the subsequent market return (till the day in question) and then summing this up over all days till the day in question (see equations (7)). Capital gains are in billions of RMB.

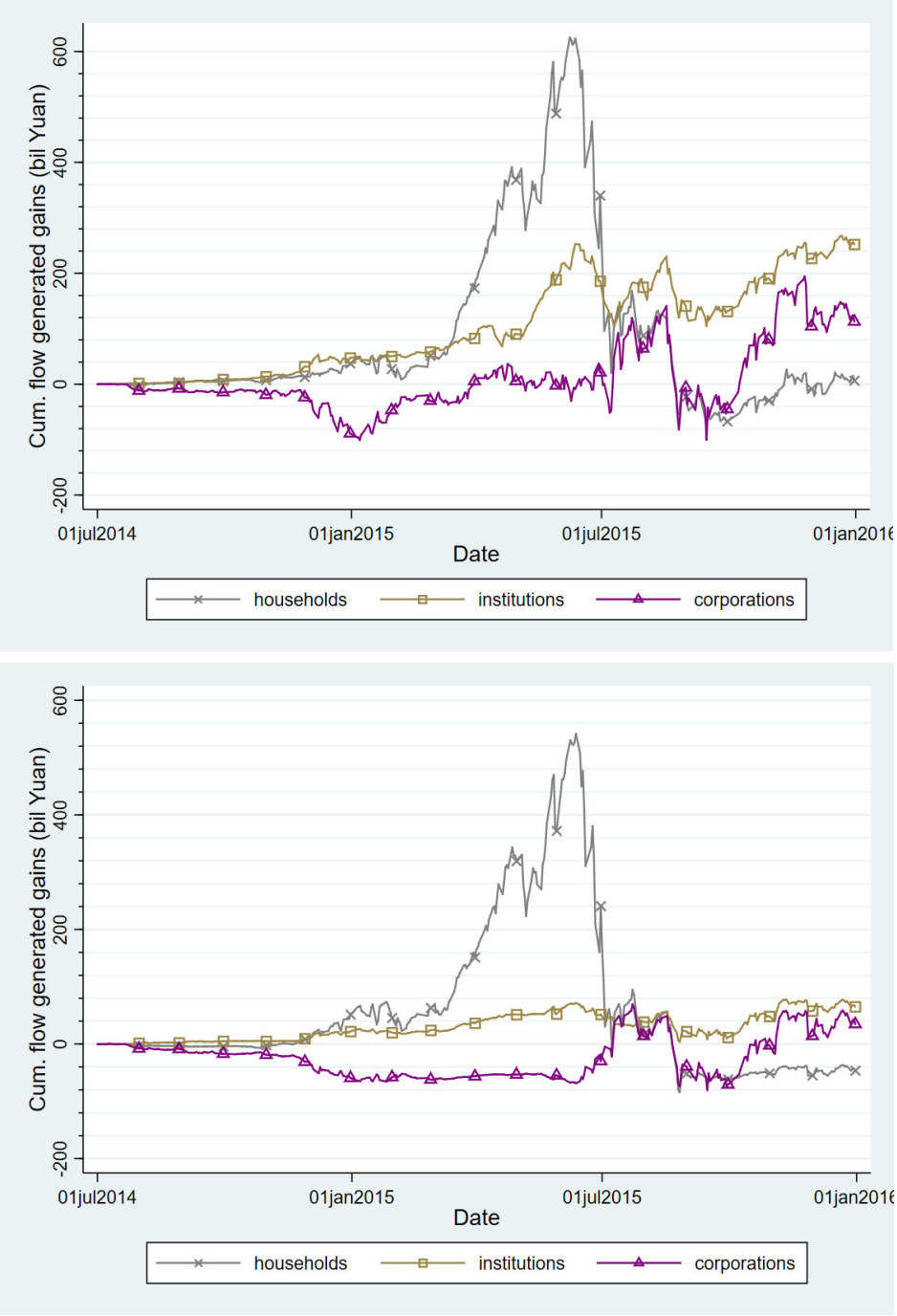


Figure A3. Imputed Portfolio Leverage and Portfolio Beta in the Bubble-Crash Period

This figure shows the imputed leverage ratio (against the left axis) and average beta of stock holdings (against the right axis) of the top and bottom household wealth groups in the bubble-crash period. Households are classified into four groups according to their total account value (equity holdings in both Shanghai and Shenzhen Stock Exchanges + cash value), with cutoffs at RMB 500K, 3M, and 10M. WG1 includes investors with account value less than 500K, and WG4 includes investors with account value greater than 10M. The levered portfolio is constructed by assuming a) every household group starts with 100% invested in the stock market (i.e., stock wealth equals the total financial wealth as of July 1, 2014), and then either borrow at the risk free rate to fund further investment into stocks or save the proceeds from selling stocks in risk-free assets; b) every RMB invested in or divested from the stock market tracks the market index. The portfolio beta of each household group is calculated as the value-weighted average beta across all holdings in the household group's portfolio. We then adjust the portfolio beta by subtracting the capital-weighted average beta of the entire household sector to make it more comparable over time.

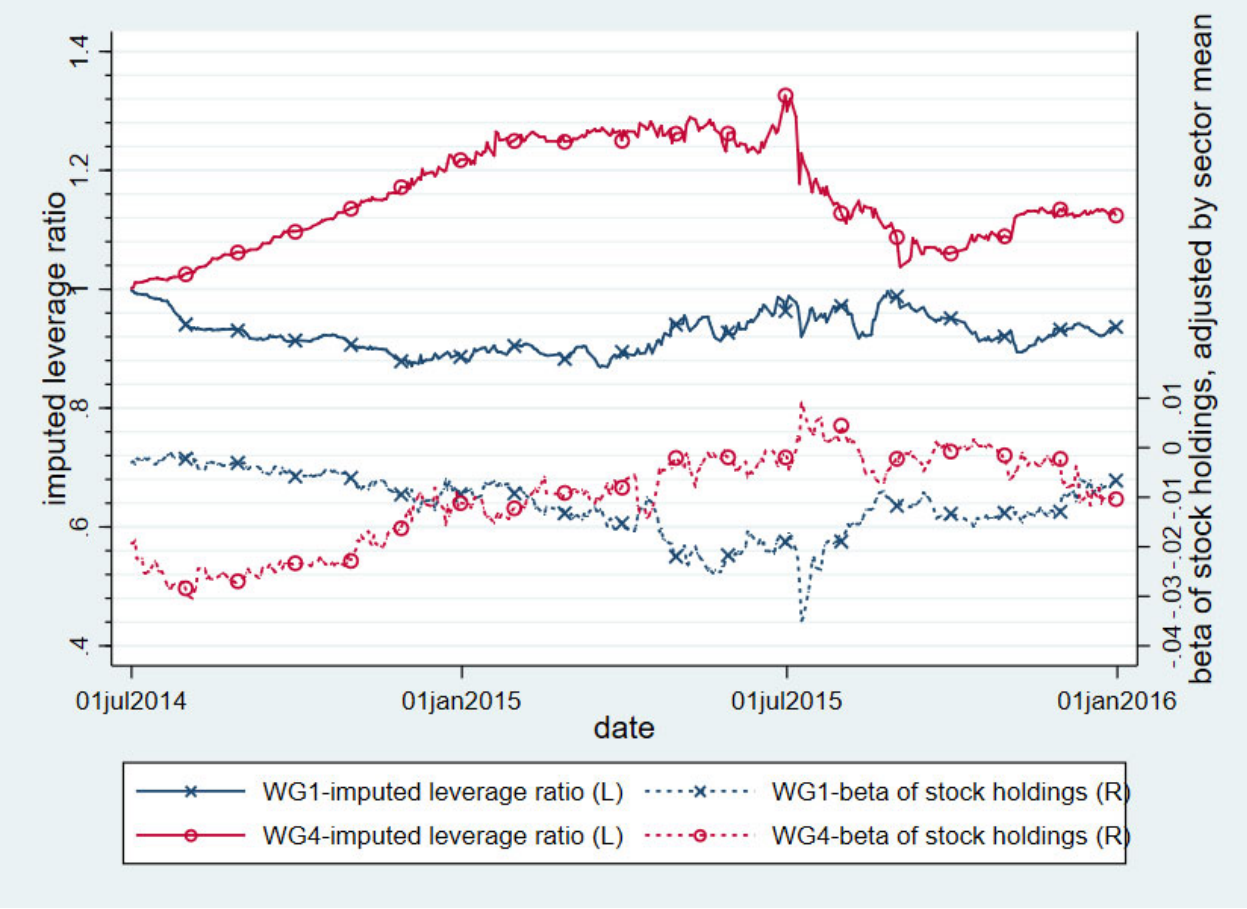


Figure A4. Rebalance-Motivated Flows and Flow-Generated Gains

The top figure shows cumulative rebalance-motivated capital flows (in dotted lines), as well as the actual cumulative flows (in solid lines), of the top and bottom household wealth groups. The bottom figure shows cumulative rebalance-flow-generated gains at the market level (in dotted lines), as well as the actual cumulative flow-generated gains at the market level (in solid lines), of the two top and bottom household groups. WG1 includes investors with account value less than 500K and WG4 includes investors with account value greater than 10M. Rebalance-motivated flows are calculated using equations (A3) and (A4). We then calculate the rebalance-flow-generated gains of each household group by multiplying its daily rebalance-flows to the market with the subsequent market return (till the day in question), and then summing this up over all days till the day in question. Capital flows and capital gains are in billions of RMB, and are plotted against the left y-axis. The Shanghai Composite Index is plotted against the right y-axis.

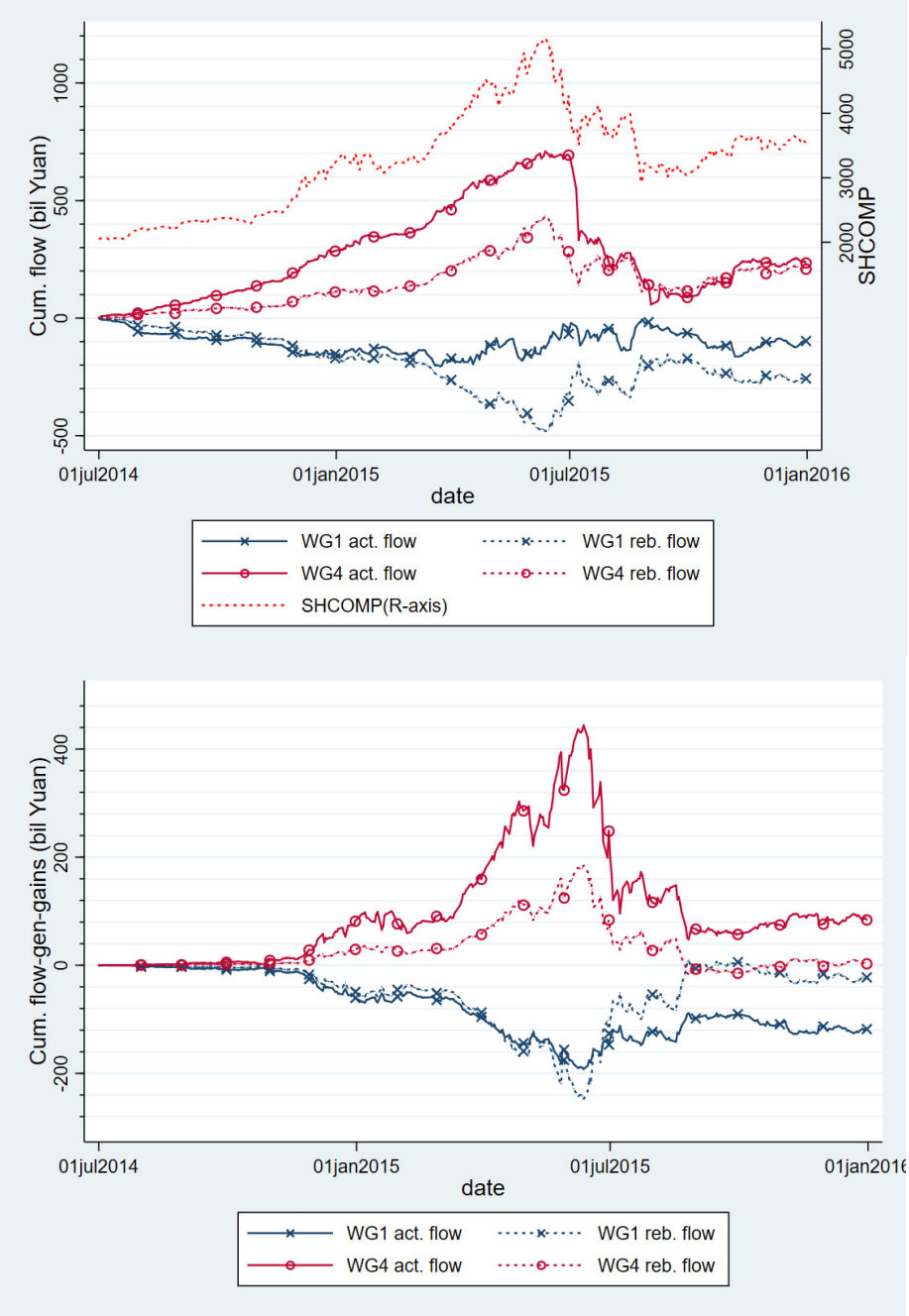
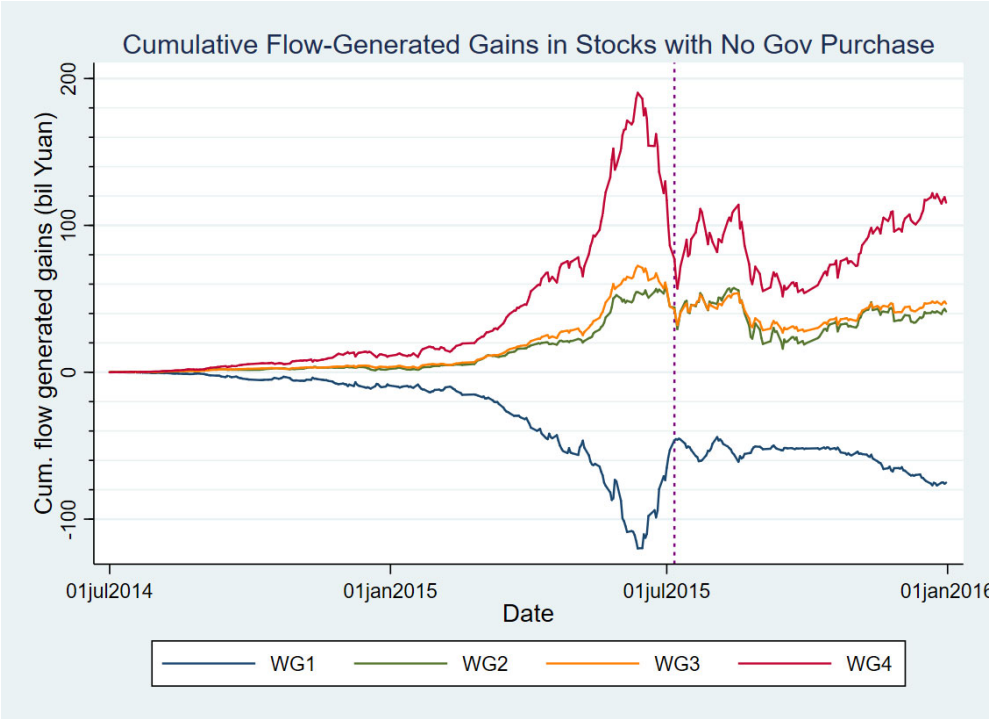
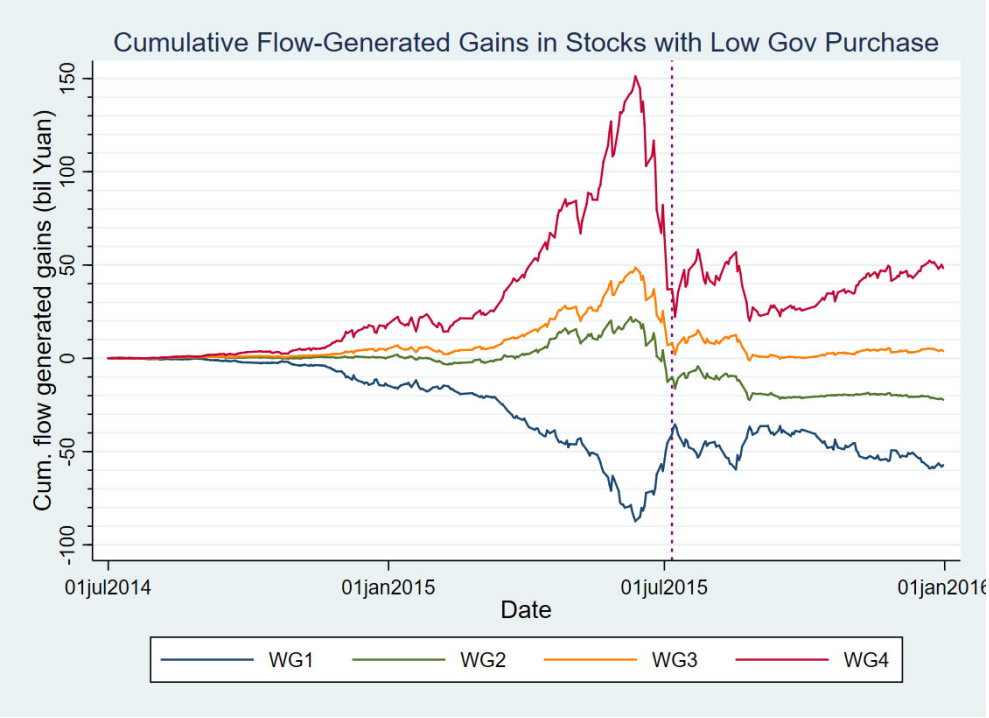


Figure A5. Flow-Generated Gains of Households in the Bubble-Crash Period: by Stocks that Receive Different Levels of Government Bailout

This figure shows cumulative flow-generated gains by different household groups in three groups of stocks that receive different levels of government bailout, respectively. We classify all stocks into three groups based on government purchase during July 6th – 9th, 2015, which results in a total flow of roughly 800B RMB. Among the 496 stocks that receive government bailout, we divide them into a high group and low group according to the magnitude of government flow as a percentage of the firm's total tradable market capitalization. The vertical line denotes the day of July 6th, 2015, the beginning of government purchase program. Households are classified into four groups according to their total account value (equity holdings in both Shanghai and Shenzhen Stock Exchanges + cash value), with cutoffs at RMB 500K, 3M, and 10M. WG1 includes investors with account value less than 500K, and WG4 includes investors with account value greater than 10M. We calculate the cumulative flow-generated gains of each household group by multiplying daily flows to a stock with the subsequent stock return (till the day in question), and then summing this up over all days till the day in question and across all stocks in the household portfolio (see equation (5)). Capital gains are in billions of RMB.




Cumulative Flow-Generated Gains in Stocks with Low Gov Purchase
Cum. flow generated gains (bil Yuan)
150
100
50
0
-50
-100
01jul2014
01jan2015
01jul2015
01jan2016
Date
WG1
WG2
WG3
WG4

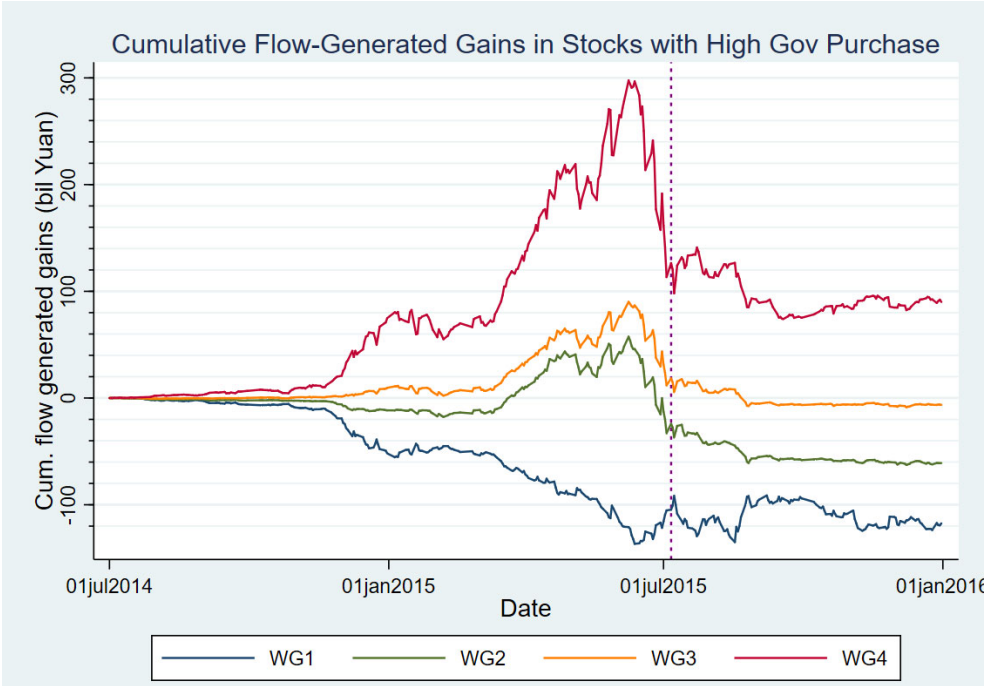

Cumulative Flow-Generated Gains in Stocks with High Gov Purchase
Cum. flow generated gains (bil Yuan)
300
200
100
0
-100
01jul2014
01jan2015
01jul2015
01jan2016
Date
WG1
WG2
WG3
WG4

Table A1: Extreme Market Movements in Developing Economies

This table shows a partial list of extreme stock market movements in some of the largest developing economies between 2004 and 2019.

Turkey	2004-2007	up 150% then down 60%
Mexico	2004-2009	up 210% then down 40%
Russia	2005-2008	up 200% then down 70%
India	2005-2009	up 230% then down 60%
South Africa	2005-2009	up 140% then down 40%
China	2006-2008	up 300% then down 70%
Indonesia	2006-2008	up 60% then down 50%
Malaysia	2006-2008	up 60% then down 40%
Brazil	2006-2009	up 120% then down 30%
Egypt	2006-2009	up 150% then down 70%
Russia	2008-2013	up 200% then down 30%
India	2009-2011	up 140% then down 30%
Egypt	2009-2011	up 110% then down 50%
China	2014-2015	up 150% then down 40%
Argentina	2015-2019	up 250% then down 40%
Turkey	2016-2018	up 60% then down 20%
Egypt	2016-2018	up 130% then down 30%

Table A2. Summary of Capital Flows and Flow-Generated Gains: Existing Accounts vs. New Entrants

This table reports capital flows (Panel A) and flow-generated gains (Panel B) of various household wealth groups in the bubble-crash period. Panels A1 and B1 show the results for existing accounts (those that exist before 201407) in each household wealth group, while Panels A2 and B2 report the results for new entrants (those that are opened after 201407). Within the household sector, investors are classified into four groups according to their total account value (equity holdings in both Shanghai and Shenzhen Stock Exchanges + cash value); WG1 to WG4 include investors whose total account value fall into the brackets of <500K, 500K-3M, 3M-10M, and >10M, respectively. Both capital flows and flow-generated gains are in billions of RMB.

	WG1	WG2	WG3	WG4
Panel A1. Capital flows -- of accounts that exist before July 2014				
boom period (140701-150612)				
flow into the market	-481	-195	-63	126
adjusted flow into the market	-303	-21	36	288
bust period (150612-151231)				
flow into the market	-56	-160	-176	-435
adjusted flow into the market	184	74	-42	-216
the entire period (140701-151231)				
flow into the market	-537	-355	-238	-309
adjusted flow into the market	-120	53	-7	73
Panel A2. Capital flows -- of accounts opened after July 2014				
boom period (140701-150612)				
flow into the market	352	475	345	583
adjusted flow into the market	-156	-24	62	118
bust period (150612-151231)				
flow into the market	88	23	-21	-38
adjusted flow into the market	73	8	-29	-52
the entire period (140701-151231)				
flow into the market	440	498	324	544
adjusted flow into the market	-83	-15	33	66
Panel B1. Flow-generated gains -- of accounts that exist before July 2014				
flow-gen gains (total)	-161	7	44	180
adj-flow-gen gains (total)	-181	-13	33	162
flow-gen gains at the market level	-72	-3	18	71
adj-flow-gen gains at the market level	-76	-7	16	68
Panel B2. Flow-generated gains -- of accounts opened after July 2014				
flow-gen gains (total)	-89	-48	0	74
adj-flow-gen gains (total)	-71	-30	11	90
flow-gen gains at the market level	-46	-25	-2	13
adj-flow-gen gains at the market level	-28	-8	7	29

Table A3. Market Timing by Existing Accounts vs. New Entrants: A Portfolio Approach

This table reports regression results of daily returns to a levered portfolio in the stock market held by different household wealth groups on contemporaneous market returns in the bubble-crash period. Specifically, the levered portfolio is constructed by assuming a) every household group starts with 100% invested in the stock market (i.e., stock wealth equals the total financial wealth as of July 1, 2014) and then either borrow at the risk free rate to fund further investment into stocks or save the proceeds from selling stocks in risk free assets; b) every RMB invested in or divested from the stock market tracks the market index. Within the household sector, investors are classified into four groups according to their total account value (equity holdings in both Shanghai and Shenzhen Stock Exchanges + cash value); WG1 to WG4 include investors whose total account value fall into the brackets of <500K, 500K-3M, 3M-10M, and >10M, respectively. Panels A and B present the results for accounts that exist before July 2014 and those that are opened after July 2014, respectively. T-statistics, shown in brackets, are computed based on standard errors with Newey-West adjustments of four lags. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)
	Levered portfolio return: $\omega_{stock}MktRet_t+(1-\omega_{stock})R_{f,t}$				
	WG1	WG2	WG3	WG4	WG4-WG1
Panel A. Accounts that exist before July 2014					
$MktRet_t$	0.75632***	0.89014***	0.89328***	0.95746***	0.20114***
	[105.00]	[124.75]	[78.72]	[69.16]	[25.39]
Alpha	0.00013	0.00010	0.00019*	0.00023*	0.00011
	[1.63]	[1.29]	[1.65]	[1.74]	[1.41]
No. Obs.	370	370	370	370	370
Adj. R^2	0.992	0.995	0.988	0.986	0.910
Panel B. Accounts opened after July 2014					
$MktRet_t$	1.38595***	1.44607***	1.51026***	1.49429***	0.10834***
	[61.19]	[68.48]	[73.76]	[85.78]	[12.36]
Alpha	-0.00079***	-0.00070***	-0.00064***	-0.00055***	0.00024***
	[-3.40]	[-3.18]	[-2.93]	[-2.83]	[2.81]
No. Obs.	370	370	370	370	370
Adj. R^2	0.979	0.982	0.983	0.986	0.711

Table A4. Sensitivity of Flows to Stock Characteristics

This table shows regression results where the dependent variable is the stock-level capital flows of different household wealth groups in the bubble-crash period. The weekly stock-level flow of each household group is calculated as the capital flow to a given stock in a given week, normalized by the average portfolio value of that investor group at the beginning and end of the same week. The set of independent variables include market beta, firm size (size), book-to-market ratio (bm), a dummy variable indicating whether a stock is marginable (margin), and past returns at different horizons (over the past one, two, three, four weeks, as well as 2-to-6 months and 7-to-12 months). Within the household sector, investors are classified into four groups according to their total account value (equity holdings in both Shanghai and Shenzhen Stock Exchanges + cash value); WG1 to WG4 include investors whose total account value fall into the brackets of <500K, 500K-3M, 3M-10M, and >10M, respectively. Panel A shows the results for the boom period, and Panel B presents the results for the bust period. T-statistics, shown in brackets, are computed based on standard errors with Newey-West adjustments of four lags. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Boom period (140701-150612)					
	(1)	(2)	(3)	(4)	(5)
	Weekly flows × 10000				
	WG1	WG2	WG3	WG4	WG4-WG1
Beta	-0.055**	-0.024	0.007	0.053***	0.108***
	[-2.30]	[-0.86]	[0.31]	[4.18]	[3.61]
Size	0.018	0.091***	0.119***	0.159***	0.141*
	[0.43]	[2.77]	[3.93]	[3.25]	[1.77]
BM	-0.071	-0.043	-0.001	0.075**	0.146
	[-1.22]	[-1.21]	[-0.03]	[2.06]	[1.67]
Margin	-0.049*	-0.062**	-0.053*	-0.053	-0.004
	[-1.89]	[-2.25]	[-1.75]	[-1.39]	[-0.08]
Ret_{-1w}	1.113**	0.866***	0.232	-1.509***	-2.622***
	[2.27]	[3.22]	[1.08]	[-6.18]	[-3.91]
Ret_{-2w}	0.866***	0.742***	0.204	-0.539***	-1.405***
	[2.95]	[3.69]	[1.27]	[-3.64]	[-3.75]
Ret_{-3w}	0.788***	0.649***	0.244**	-0.360*	-1.147***
	[5.10]	[4.92]	[2.17]	[-1.88]	[-5.01]
Ret_{-4w}	0.730***	0.590***	0.169	-0.430***	-1.160***
	[4.47]	[4.34]	[1.57]	[-3.44]	[-4.80]
$Ret_{-2m, -6m}$	0.141***	0.092***	-0.008	-0.147***	-0.288***
	[4.22]	[4.83]	[-0.47]	[-6.77]	[-5.82]
$Ret_{-7m, -12m}$	0.075**	0.068**	0.038*	-0.025	-0.100**
	[2.18]	[2.45]	[1.96]	[-1.32]	[-2.53]
No. Obs.	41,086	41,086	41,086	41,086	41,086
Adj. R^2	0.119	0.113	0.084	0.065	0.097
No. Weeks	49	49	49	49	49

Panel B. Bust period (150612-151231)					
	(1)	(2)	(3)	(4)	(5)
	Weekly flows × 10000				
	WG1	WG2	WG3	WG4	WG4-WG1
Beta	0.069**	0.025	-0.009	-0.041	-0.110**
	[2.28]	[1.29]	[-0.51]	[-1.46]	[-2.07]
Size	-0.071	-0.125	-0.179*	-0.243	-0.172
	[-1.13]	[-1.61]	[-1.76]	[-1.70]	[-1.60]
BM	-0.160**	-0.161***	-0.155***	-0.200	-0.041
	[-2.55]	[-3.28]	[-3.72]	[-1.65]	[-0.27]
Margin	0.075*	0.092**	0.101***	0.055	-0.020
	[1.89]	[2.37]	[2.78]	[0.84]	[-0.32]
Ret_{-1w}	1.530***	0.757***	-0.038	-2.094***	-3.625***
	[4.56]	[3.73]	[-0.16]	[-6.23]	[-6.20]
Ret_{-2w}	0.707***	0.541***	0.267*	-0.239	-0.945*
	[3.54]	[5.21]	[2.03]	[-0.73]	[-2.00]
Ret_{-3w}	0.559***	0.381***	0.168*	-0.461*	-1.020***
	[5.96]	[4.85]	[2.03]	[-1.93]	[-4.04]
Ret_{-4w}	0.413***	0.331***	0.260***	-0.339*	-0.752***
	[3.45]	[3.62]	[2.84]	[-2.03]	[-2.76]
$Ret_{-2m, -6m}$	0.131**	0.115**	0.102	-0.071	-0.202**
	[2.68]	[2.12]	[1.57]	[-1.05]	[-2.31]
$Ret_{-7m, -12m}$	-0.015	0.005	0.027	0.050	0.065
	[-0.48]	[0.19]	[1.04]	[1.00]	[0.98]
No. Obs.	22,438	22,438	22,438	22,438	22,438
Adj. R^2	0.156	0.153	0.126	0.114	0.129
No. Weeks	29	29	29	29	29

Table A5. Return Predictability of Flows by Investor Sectors

This table analyzes the return predictability of trading by different investor sectors in the bubble-crash period. Panels A and B report Fama-MacBeth regression results where the dependent variable is the future one-week stock return. The main independent variable of interest, *Flow*, is calculated as the stock-level capital flow in a given week, scaled by the average portfolio value of that investor group at the beginning and end of the same week. For ease of comparison, we normalize *Flow* by its standard deviation for each investor group. Panel A shows univariate regression results, and Panel B further controls for a battery of stock characteristics, including beta, firm size (size), book-to-market ratio (bm), a dummy variable indicating whether a stock is marginable (margin), and past returns at different horizons (over the past one, two, three, four weeks, as well as 2-to-6 months and 7-to-12 months). Within the household sector, investors are classified into four groups according to their total account value (equity holdings in both Shanghai and Shenzhen Stock Exchanges + cash value); WG1 to WG4 include investors whose total account value fall into the brackets of <500K, 500K-3M, 3M-10M, and >10M, respectively. T-statistics, shown in brackets, are computed based on standard errors with Newey-West adjustments of four lags. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Return predictability of flows: univariate FM regression

	(1)	(2)	(3)	(4)	(5)	(6)
			Ret_{1w}			
	WG1	WG2	WG3	WG4	Inst.	Corp.
Flow	-0.394***	-0.259***	-0.022	0.397***	0.264**	-0.074
	[-4.40]	[-3.83]	[-0.28]	[5.45]	[2.52]	[-0.69]
Adj-R^2	0.013	0.014	0.013	0.011	0.010	0.009
No. Weeks	78	78	78	78	78	78

Panel B. Return predictability of flows: FM regression with controls

	(1)	(2)	(3)	(4)	(5)	(6)
			Ret_{1w}			
	WG1	WG2	WG3	WG4	Inst.	Corp.
Flow	-0.564***	-0.433***	-0.143***	0.338***	0.228***	-0.023
	[-9.71]	[-8.98]	[-2.91]	[8.81]	[5.29]	[-0.61]
Beta	-0.156	-0.147	-0.142	-0.147	-0.151	-0.145
	[-0.97]	[-0.91]	[-0.88]	[-0.90]	[-0.93]	[-0.88]
Size	-0.128	-0.112	-0.122	-0.141	-0.130	-0.144
	[-0.60]	[-0.53]	[-0.58]	[-0.64]	[-0.61]	[-0.68]
BM	0.398	0.432	0.452	0.421	0.460	0.460
	[0.90]	[0.98]	[1.03]	[0.96]	[1.04]	[1.04]
Margin	-0.096	-0.097	-0.096	-0.096	-0.091	-0.084
	[-1.10]	[-1.10]	[-1.10]	[-1.11]	[-1.01]	[-0.98]
Past Returns	Yes	Yes	Yes	Yes	Yes	Yes
Adj-R^2	0.143	0.141	0.138	0.139	0.138	0.136
No. Weeks	78	78	78	78	78	78

Table A6. Predicting Earnings Announcement Returns

This table reports regression of quarterly earnings announcement returns on household group flows in the bubble-crash period. Earnings announcement returns are calculated as the cumulative abnormal return in a three-day window around the announcement day; we employ the Fama French 3-factor model to calculate abnormal returns. The main independent variable of interest, *Flow*, is calculated as the stock-level capital flow in a 5-day window from *t*-7 to *t*-3 (where *t* is the earnings announcement day), scaled by the average portfolio value of that investor group at the beginning and end of the same week. We further control for a battery of stock characteristics, including beta, firm size (size), book-to-market ratio (bm), a dummy variable indicating whether a stock is marginable (margin), and past returns at different horizons (over the past one, two, three, four weeks, as well as 2-to-6 months and 7-to-12 months). Within the household sector, investors are classified into four groups according to their total account value (equity holdings in both Shanghai and Shenzhen Stock Exchanges + cash value); WG1 to WG4 include investors whose total account value fall into the brackets of <500K, 500K-3M, 3M-10M, and >10M, respectively. All regressions include quarter fix effects. T-statistics, shown in brackets, are computed with standard errors clustered at the quarter level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)
	CAR - Fama French 3-factor Model				
	WG1	WG2	WG3	WG4	WG4-WG1
$Flow_{[-7,-3]}$	-0.516**	-0.464***	-0.265***	0.355**	0.871**
	[-2.99]	[-4.75]	[-4.99]	[2.66]	[3.01]
Beta	-0.031	-0.013	-0.014	-0.045	-0.014
	[-0.23]	[-0.10]	[-0.10]	[-0.32]	[-0.60]
Size	0.135	0.136	0.105	0.070	-0.065**
	[1.14]	[1.27]	[1.04]	[0.64]	[-3.58]
BM	0.830	0.845	0.839	0.913*	0.083
	[1.86]	[1.89]	[1.89]	[2.08]	[1.39]
Margin	-0.243	-0.234	-0.237	-0.275	-0.032
	[-1.44]	[-1.33]	[-1.46]	[-1.94]	[-0.96]
Past Returns	Yes	Yes	Yes	Yes	
No. Obs.	4,618	4,618	4,618	4,618	
Adj. R^2	0.026	0.024	0.019	0.021	

Table A7. Sensitivity of Flows to Lagged Market Returns

This table shows regression results where the dependent variable is the market-level capital flows of different household wealth groups in the bubble-crash period. The weekly flow of each household group is calculated as the aggregate capital flow to the market in a given week, normalized by the average portfolio value of that investor group at the beginning and end of the same week. The set of independent variables include past market returns at various horizons, over the past one, two, three, four weeks, as well as the past two to six months. Within the household sector, investors are classified into four groups according to their total account value (equity holdings in both Shanghai and Shenzhen Stock Exchanges + cash value); WG1 to WG4 include investors whose total account value fall into the brackets of <500K, 500K-3M, 3M-10M, and >10M, respectively. T-statistics, shown in brackets, are computed based on standard errors with Newey-West adjustments of four lags. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)
	Weekly flows at the market level				
	WG1	WG2	WG3	WG4	WG4-WG1
$Mret_{-1w}$	0.135***	0.105***	0.105***	0.106*	-0.029
	[2.89]	[3.85]	[2.92]	[1.88]	[-0.34]
$Mret_{-2w}$	0.025	0.066	0.091	0.098	0.073
	[0.28]	[0.72]	[0.91]	[0.83]	[0.84]
$Mret_{-3w}$	-0.062	-0.005	0.028	0.085	0.147*
	[-0.99]	[-0.10]	[0.47]	[1.23]	[1.73]
$Mret_{-4w}$	0.028	0.037	0.027	0.011	-0.017
	[0.62]	[0.77]	[0.40]	[0.12]	[-0.20]
$Mret_{-1m, -2m}$	0.016	0.014	0.012	0.002	-0.014
	[0.53]	[0.78]	[0.71]	[0.08]	[-0.38]
$Mret_{-2m, -3m}$	0.015	0.009	-0.003	-0.024	-0.039
	[0.53]	[0.51]	[-0.11]	[-0.74]	[-0.81]
$Mret_{-3m, -4m}$	0.000	-0.010	-0.025	-0.031	-0.031
	[0.01]	[-0.70]	[-1.13]	[-0.84]	[-0.60]
$Mret_{-4m, -5m}$	0.005	-0.011	-0.023	-0.026	-0.032
	[0.23]	[-1.11]	[-1.47]	[-1.02]	[-0.71]
$Mret_{-5m, -6m}$	0.003	0.005	0.007	0.015	0.012
	[0.10]	[0.34]	[0.39]	[0.55]	[0.26]
No. Obs.	78	78	78	78	78
Adj. R^2	0.133	0.185	0.207	0.180	0.110

Table A8. Sensitivity of Flows to Lagged Market Returns: Existing Accounts vs. New Entrants

This table shows regression results where the dependent variable is the market-level capital flows of different household wealth groups in the bubble-crash period. Panels A and B present the results for accounts that exist before July 2014 and those that are opened after July 2014, respectively. The weekly flow of each household group is calculated as the aggregate capital flow to the market in a given week, normalized by the average portfolio value of that investor group at the beginning and end of the same week. The set of independent variables include past market returns at various horizons, over the past one, two, three, four weeks, as well as the past two to six months. Within the household sector, investors are classified into four groups according to their total account value (equity holdings in both Shanghai and Shenzhen Stock Exchanges + cash value); WG1 to WG4 include investors whose total account value fall into the brackets of <500K, 500K-3M, 3M-10M, and >10M, respectively. T-statistics, shown in brackets, are computed based on standard errors with Newey-West adjustments of four lags. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Accounts that exist before July 2014					
	(1)	(2)	(3)	(4)	(5)
	Weekly flows at the market level				
	WG1	WG2	WG3	WG4	WG4-WG1
$Mret_{-1w}$	0.080**	0.055**	0.050*	0.046	-0.034
	[2.02]	[2.05]	[1.91]	[1.10]	[-0.49]
$Mret_{-2w}$	0.015	0.041	0.057	0.067	0.053
	[0.19]	[0.54]	[0.72]	[0.79]	[0.85]
$Mret_{-3w}$	-0.054	-0.017	0.006	0.055	0.109
	[-1.13]	[-0.49]	[0.17]	[1.11]	[1.51]
$Mret_{-4w}$	0.001	0.019	0.011	-0.005	-0.006
	[0.03]	[0.60]	[0.25]	[-0.08]	[-0.11]
$Mret_{-1m, -2m}$	-0.001	0.001	-0.001	-0.004	-0.004
	[-0.03]	[0.04]	[-0.07]	[-0.32]	[-0.11]
$Mret_{-2m, -3m}$	0.003	0.005	-0.004	-0.022	-0.025
	[0.18]	[0.40]	[-0.25]	[-0.89]	[-0.74]
$Mret_{-3m, -4m}$	-0.005	-0.012	-0.026*	-0.029	-0.023
	[-0.27]	[-0.99]	[-1.86]	[-1.03]	[-0.58]
$Mret_{-4m, -5m}$	-0.007	-0.017**	-0.026***	-0.026	-0.019
	[-0.44]	[-2.06]	[-2.67]	[-1.36]	[-0.58]
$Mret_{-5m, -6m}$	-0.011	-0.005	-0.000	0.008	0.019
	[-0.43]	[-0.31]	[-0.03]	[0.42]	[0.50]
No. Obs.	78	78	78	78	78
Adj. R^2	0.085	0.106	0.186	0.170	0.095

Panel B. Accounts opened after July 2014					
	(1)	(2)	(3)	(4)	(5)
	Weekly flows at the market level				
	WG1	WG2	WG3	WG4	WG4-WG1
$Mret_{-1w}$	0.508***	0.383**	0.332*	0.311	-0.196**
	[3.31]	[2.25]	[1.81]	[1.64]	[-2.16]
$Mret_{-2w}$	-0.020	0.086	0.103	0.083	0.102
	[-0.05]	[0.31]	[0.39]	[0.32]	[0.63]
$Mret_{-3w}$	0.094	0.140	0.157	0.197	0.103
	[0.41]	[0.68]	[0.76]	[0.99]	[1.06]
$Mret_{-4w}$	0.149	0.076	0.042	0.023	-0.126
	[0.60]	[0.35]	[0.20]	[0.11]	[-0.99]
$Mret_{-1m, -2m}$	-0.058	-0.064	-0.075	-0.090	-0.032
	[-0.33]	[-0.42]	[-0.50]	[-0.62]	[-0.66]
$Mret_{-2m, -3m}$	-0.188	-0.172	-0.174	-0.187	0.001
	[-0.73]	[-0.75]	[-0.77]	[-0.85]	[0.01]
$Mret_{-3m, -4m}$	0.075	0.038	0.017	0.006	-0.069
	[0.41]	[0.23]	[0.11]	[0.04]	[-0.98]
$Mret_{-4m, -5m}$	-0.169	-0.215	-0.235	-0.241	-0.072
	[-0.60]	[-0.84]	[-0.94]	[-0.97]	[-0.92]
$Mret_{-5m, -6m}$	-0.214	-0.226	-0.232	-0.209	0.005
	[-0.91]	[-0.93]	[-0.93]	[-0.87]	[0.11]
No. Obs.	78	78	78	78	78
Adj. R^2	0.037	0.053	0.060	0.065	0.043

Table A9. Flow-Generated Gains and Government Bailout

This table analyzes flow-generated gains of different groups of investors and the impact of government bailout. We classify stocks into three groups – stocks that receive no government bailout, low government bailout, and high government bailout – based on government purchase during July 6^{th} – 9^{th}, 2015, which results in a total flow of roughly 800B RMB. Among the 496 stocks that receive government bailout, we further sort them into two groups according to the magnitude of government flow as a percentage of the firm's total tradable market capitalization. Panel A reports the number of stocks and total initial capitalization for the three groups of stocks. Panel B reports flow-generated gains of different groups of investors during the bubble-crash episode in these stocks. Panel C shows the value of initial holdings of different groups of investors in the three groups of stocks. Panel D reports flow-generated gains as a percentage of initial holdings. Within the household sector, investors are classified into four groups according to their total account value (equity holdings in both Shanghai and Shenzhen Stock Exchanges + cash value); Finally, Panel E reports the flow-generate gains (in all stocks) of different groups of investors before the government bailout. WG1 to WG4 include investors whose total account value fall into the brackets of <500K, 500K-3M, 3M-10M, and >10M, respectively.

Panel A. Stock characteristics						
	# Stocks	Total initial mktcap (B)				
no bailout	607	1742.4				
low bailout	248	6399.6				
high bailout	248	5300.9				
Panel B. Flow-gen gains (B)						
	WG1	WG2	WG3	WG4	Inst.	Corp.
no bailout	-75	41	47	116	111	30
low bailout	-57	-22	4	48	42	66
high bailout	-117	-61	-6	90	99	17
Panel C. Initial holdings (B)						
	WG1	WG2	WG3	WG4	Inst.	Corp.
no bailout	250	246	139	229	135	743
low bailout	254	239	128	216	422	5140
high bailout	375	385	224	362	939	3015
Panel D. Gains as % of initial holdings						
	WG1	WG2	WG3	WG4	Inst.	Corp.
no bailout	-30%	17%	34%	50%	82%	4%
low bailout	-23%	-9%	3%	22%	10%	1%
high bailout	-31%	-16%	-3%	25%	11%	1%
Panel E. Flow-gen gains (B) before government bailout (2014/7/1 - 2015/7/3)						
	WG1	WG2	WG3	WG4	Inst.	Corp.
flow-gen gains (total)	-204	-1	64	237	149	0
flow-gen gains at the market level	-121	-6	36	120	44	-4