# Exchange Rate Shocks and Capital Flows: High-Frequency Evidence from China*

Peidi Chen† Sihao Chen‡ Wenbin Wu§

May 31, 2026

**Abstract**

This paper provides high-frequency evidence on how exchange-rate policy announcements shape cross-border portfolio flows. We identify daily exchange-rate shocks from high-frequency changes in offshore CNY derivatives around the fixing announcements and examine their effects on foreign investors' stock-level holdings of A-shares via the China-Connect Program. Unexpected RMB depreciation shocks trigger significant foreign equity outflows, while the effect is muted when the Counter-Cyclical Factor (CCF) is active. The evidence points to an information channel. Outflows occur mainly when depreciation shocks coincide with negative equity-market reactions, are strongest when shocks are driven by longer-maturity forward prices, and cluster around Chinese macro announcement dates. We interpret the CCF attenuation as reflecting signal ambiguity: under the CCF, fixing surprises mix currency-basket information with discretionary counter-cyclical adjustment. The findings show that how investors interpret exchange-rate news shapes international portfolio flows.

***Keywords***— Exchange Rate, Capital Flow, RMB Central Parity, Counter-Cyclical Factor, Information Effect

*We thank Robert Czech, Alessandro Dovis, Xiang Fang, Shiyang Huang, Karen Lewis, Yang Liu, Thomas Maurer, Anna Pavlova, Amy Huber Wang, Vivian Yue, Haonan Zhou for helpful comments. The authors have no research support, financial relationships, or other potential conflicts of interest to disclose. All errors are our own.

†Business School, The University of Hong Kong; pdchen@connect.hku.hk.

‡Hong Kong Baptist University; chensihao@hkbu.edu.hk.

§International School of Finance, Fudan University; wenbinwu@fudan.edu.cn.

# 1 Introduction

Exchange rates and capital flows are central objects in international macroeconomics and finance. Their interaction is especially important at high frequency, when exchange rates move quickly in response to news and global investors adjust portfolio positions over short horizons. Yet identifying how exchange-rate movements affect capital flows is difficult. Exchange rates and flows are jointly determined in equilibrium, and both may respond simultaneously to changes in fundamentals, global risk appetite, monetary policy, and market liquidity. As a result, the empirical relationship between exchange rates and capital flows is often hard to interpret causally.

This paper provides high-frequency evidence on how exchange-rate shocks affect cross-border equity flows. We use a setting in which exchange-rate news arrives before equity trading begins and investor portfolio adjustments can be observed at high frequency. Each trading day at 9:15 a.m., the People's Bank of China (PBOC) announces the CNY/USD central parity rate. The announcement occurs before the mainland stock market opens and plays a central role in China's managed exchange-rate regime. We identify exchange-rate shocks from high-frequency changes in offshore CNY derivatives around the fixing announcement. We then examine how these shocks affect foreign investors' holdings of RMB-denominated A-shares through the China-Connect Program over the subsequent trading day.

The setting has two advantages. First, the timing of the fixing announcement allows us to isolate exchange-rate shocks before investors can trade mainland equities. Second, the China-Connect Program provides daily aggregate and stock-level measures of foreign investors' holdings, including both the market value of their positions and the number of shares held. This allows us to distinguish active portfolio rebalancing from passive valuation effects.

We find that unexpected RMB depreciation shocks trigger significant foreign equity outflows from the mainland A-share market. In aggregate, a one-standard-deviation depreciation shock reduces foreign holdings by about 0.04% on a daily basis, roughly one-tenth of the standard deviation of daily flows. In levels, the effect amounts to about RMB 0.63 billion, approximately USD 90 million. At the stock level, depreciation shocks reduce both the market value of foreign holdings and the number of shares held by foreign investors. The response in shares is important: it shows that the result is not merely a valuation effect from lower equity prices or exchange-rate movements, but reflects active selling by foreign investors.

The response is sharply state-dependent. During normal fixing periods, depreciation shocks

generate economically and statistically significant outflows. During periods when the PBOC activates the Counter-Cyclical Factor (CCF) in the formation of the daily central parity rate to dampen RMB depreciation pressure, the response becomes much weaker and statistically insignificant. This pattern suggests that exchange-rate shocks affect foreign portfolio flows not only through the size of the exchange-rate movement, but also through the policy regime under which the movement is observed.

We then investigate the mechanism. The evidence points to an information-based interpretation: exchange-rate shocks may convey information about RMB fundamentals, or about the policy authority's assessment of those fundamentals. First, following the sign-restriction logic of Jarociński and Karadi (2020), we show that the outflow response is concentrated on depreciation shocks that are accompanied by negative equity-market reactions around the fixing announcement. These joint movements suggest that market participants interpret the depreciation surprise as adverse information rather than as a purely mechanical exchange-rate movement. In contrast, depreciation shocks that are not accompanied by negative equity-price reactions do not generate systematic outflows.

We further show that the information driving capital flows is persistent rather than transitory. Our benchmark shock is constructed from high-frequency changes in NDF prices across maturities from one week to one year. Decomposing the shock along the forward curve, we find that outflows are strongest when adverse depreciation shocks are driven by longer-maturity forward prices. In contrast, adverse depreciation shocks driven primarily by short-maturity forward prices have weaker and statistically insignificant effects. This suggests that foreign investors respond most strongly when the fixing shock contains persistent information, rather than when it reflects short-run market noise or near-term liquidity conditions.

We interpret this persistent component as macro-relevant information. To test this interpretation, we examine whether the trading response to exchange-rate shocks changes around Chinese macro announcement dates, when investors are likely to pay more attention to macro fundamentals. We find that foreign investors' response to depreciation shocks becomes stronger on announcement days and on the trading day immediately before the announcement. By contrast, we find no comparable dynamic response around macro announcement dates during CCF periods. This pattern is consistent with the view that investors place more weight on the fixing shock when macro fundamentals are especially salient.

The CCF results clarify how managed exchange-rate regimes shape the transmission of exchange-rate information into portfolio flows. Following Jermann, Wei and Yue (2022), the normal RMB fixing regime can be viewed through a two-pillar structure. Since the previous closing rate is already observed by market participants, high-frequency fixing surprises in normal periods are more tightly linked to innovations in the currency-basket pillar. During CCF periods, however, the observed fixing surprise reflects a mixture of basket-pillar information and discretionary countercyclical adjustment. This additional policy component makes the signal more ambiguous. A depreciation surprise may reflect adverse fundamentals, but it may also reflect the intensity, direction, or limits of exchange-rate management. This ambiguity helps explain why the same type of depreciation surprise generates strong outflows in normal periods but not during CCF periods.

We address several alternative explanations. The baseline results are robust to alternative announcement windows, a pre-announcement placebo window, and an alternative survey-based shock measure constructed from Bloomberg fixing expectations. The results are also robust to additional overnight macro-financial controls, including changes in the U.S. dollar index and commodity prices. These variables have limited power to predict the high-frequency fixing shock, suggesting that the shock is not simply a repackaging of public macro news known before the announcement. Other PBOC policy tools, such as exogenous offshore money-supply shocks from CNH bill roll-offs (Bahaj and Reis, 2024), do not explain our findings. Taken together, the evidence suggests that fixing-induced exchange-rate shocks affect foreign equity flows through the information they convey, and that the CCF weakens this transmission by making the signal more difficult to interpret.

*Related Literature* We contribute to several strands of literature. First, our paper contributes to the literature on the interaction between exchange rates and international capital flows. A large theoretical literature studies how exchange rates, asset prices, and portfolio positions are jointly determined in equilibrium through portfolio balance, risk sharing, intermediary constraints, and global investors' demand for currency risk (Branson and Henderson, 1985; Stockman and Svensson, 1987; Hau and Rey, 2006; Albuquerque, Bauer and Schneider, 2007; Gabaix and Maggiori, 2015; Itskhoki and Mukhin, 2021; Kekre and Lenel, 2024; Gourinchas, Ray and Vayanos, 2025). Recent work also emphasizes the role of global financial conditions and the dollar cycle in shaping international asset prices and capital flows (Rey, 2015; Obstfeld and Zhou, 2022; Goldberg and Krogstrup, 2023; Jiang, Richmond and Zhang, 2025). Empirically, existing work has made sub-

stantial progress in documenting how order flow and institutional portfolio flows affect exchange rates (Evans and Lyons, 2002; Camanho, Hau and Rey, 2022; Rey, Stavrakeva and Tang, 2024). A related literature studies the determinants and consequences of global equity flows (Brennan and Cao, 1997; Portes and Rey, 2005; Coppola et al., 2021). However, identifying the reverse direction — how exchange-rate movements affect capital flows — is challenging because exchange rates and flows are jointly determined and may respond simultaneously to common shocks. We contribute to this literature by using high-frequency fixing-induced exchange-rate shocks and stock-level foreign holdings to estimate how exchange-rate news affects international portfolio rebalancing. Our setting allows us to observe both the exchange-rate shock and the subsequent adjustment in foreign investors' holdings of RMB-denominated equities.

Second, our paper contributes to the literature on information effects of policy announcements. A high-frequency announcement-window literature identifies policy surprises from asset-price changes around scheduled announcements. Recent work on monetary policy emphasizes that such surprises may move asset prices not only by changing the expected policy path, but also by revealing central-bank information about economic fundamentals (Gürkaynak, Sack and Swanson, 2005; Gertler and Karadi, 2015; Nakamura and Steinsson, 2018; Cieslak and Schrimpf, 2019; Jarociński and Karadi, 2020). At the same time, Bauer and Swanson (2023) argue that apparent information effects may partly reflect predictable responses to public information rather than private information revealed by the central bank. We bring this logic to exchange-rate policy announcements. The RMB fixing is not only an input into the managed exchange-rate regime; it is also a public signal observed by global investors before mainland equity trading begins. We show that foreign investors' outflows are concentrated on depreciation shocks accompanied by negative equity-market reactions and on shocks that move longer-maturity forward prices. We further address the concern in Bauer and Swanson (2023) by showing that the baseline effects are robust to rich overnight macro-financial controls and that these variables have limited power to predict the high-frequency fixing shock.

Third, our paper contributes to the literature on foreign exchange intervention and managed exchange-rate regimes. Classic work emphasizes that foreign exchange intervention can affect markets through portfolio-balance and signaling channels (Dominguez and Frankel, 1993), while more recent work studies the design and effectiveness of intervention in economies with financial frictions, limited commitment, or imperfect capital markets (Sarno and Taylor, 2001; Fratzscher

et al., 2019; Cavallino, 2019; Basu et al., 2020; Fanelli and Straub, 2021; Davis, Devereux and Yu, 2023; Ottonello, Perez and Witheridge, 2024). Closely related, Candian, De Leo and Gemmi (2023) emphasize that exchange-rate policy can affect markets by changing the information content of exchange-rate announcements. We provide empirical evidence consistent with this informational role of exchange-rate policy. In normal periods, fixing surprises are more tightly linked to the currency-basket pillar and generate strong foreign equity outflows when they convey adverse information. During CCF periods, the observed fixing surprise combines basket-pillar information with discretionary counter-cyclical adjustment, making the signal more ambiguous and weakening the mapping from exchange-rate news to portfolio rebalancing.

Finally, our paper is related to work on China's financial opening and RMB internationalization. The creation of the offshore RMB market and the gradual opening of the capital account have generated a growing literature on China's distinctive approach to financial liberalization and exchange-rate management (Brunnermeier, Sockin and Xiong, 2017; Song and Xiong, 2018; Jermann, Wei and Yue, 2022; Chen and Qiu, 2023; Bahaj and Reis, 2024). Studies of the China-Connect Program show that foreign participation affects Chinese asset prices, market efficiency, corporate investment, and exposure to global shocks (Ma, Rogers and Zhou, 2019; He, Wang and Zhu, 2023). We contribute by showing that the RMB fixing regime and the China-Connect Program interact. The fixing announcement affects foreign investors' trading of A-shares, while the CCF changes how exchange-rate information is interpreted and translated into capital flows. This interaction highlights that exchange-rate management and capital-account liberalization are not independent policy tools: the information embedded in exchange-rate policy can shape the behavior of foreign investors in newly opened domestic asset markets.

The remainder of the paper is organized as follows. Section 2 describes the institutional background of the China-Connect Program and the RMB fixing regime. Section 3 presents the empirical strategy and data. Section 4 reports the baseline effects of exchange-rate shocks on foreign equity flows. Section 5 investigates the information channel and the role of the CCF. Section 6 concludes.

# 2 Institutional Details

This section provides an overview of the institutional framework underlying China's financial system, focusing on two key components: the China-Connect Program, which facilitates cross-border equity flows, and the mechanism for determining the daily central parity rate of the RMB.

## 2.1 China-Connect Program

The China-Connect Program represents a landmark liberalization of China's stock market, establishing direct investment channels between the mainland and Hong Kong exchanges. On April 19, 2014, the China Securities Regulatory Commission (CSRC) and the Hong Kong Securities and Futures Commission jointly announced the initiative, which officially commenced on November 17, 2014. Initially, qualified stocks on the Shanghai Stock Exchange became accessible to Hong Kong investors with account balances exceeding RMB 500,000. The program expanded to include the Shenzhen Stock Exchange in December 2016.

This reform marks a significant step in financial market opening along two critical dimensions. First, it encompasses a substantial portion of the domestic equity market. As of September 2025, the Shanghai Connect includes 171 exchange-traded funds (ETFs) and 1,392 stocks, representing approximately 60% of all 2,324 listed stocks on the exchange. Second, the program maintains relatively low participation thresholds, enabling both institutional and retail investors to access Chinese A-shares.

The program has experienced remarkable growth since its inception. Figure 1 illustrates the evolution of aggregate capital inflows into the mainland stock market through the China-Connect Program. The upper panel plots the level of total foreign holdings, which expanded substantially from approximately 300 billion RMB at the program's launch to nearly 2 trillion RMB by July 2023. As shown in the bottom panel, the daily average growth is around 0.16%, with its standard deviation at around 0.47%. Currently, over 70% of international investors' holdings of Chinese stocks are channeled through the Connect program,[1] with foreign investors collectively holding approximately 5% of the Shanghai Stock Exchange's total market capitalization.[2] Although this foreign ownership share remains modest in absolute terms, previous research documents its disproportionate impact on domestic market efficiency (Ma, Rogers and Zhou, 2019).

[1] See `https://www.hkex.com.hk/Mutual-Market/Connect-Hub/Stock-Connect?sc_lang=zh-HK`.

[2] https://www.sse.com.cn/aboutus/publication/monthly/overview/

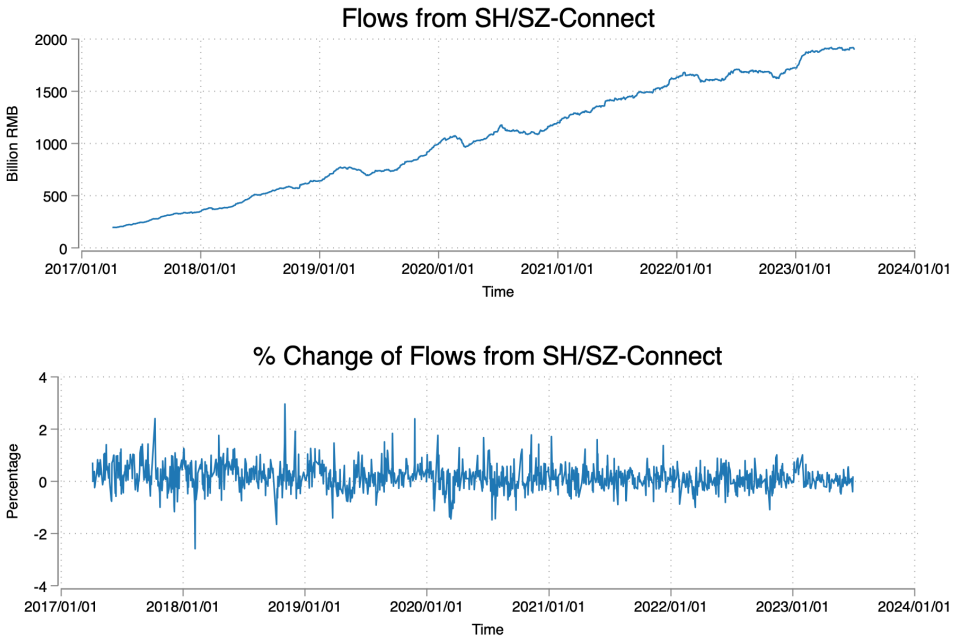



Figure 1: Equity Inflows to Mainland From China-Connect Program

*Notes:* This figure presents the time-series plot of capital inflows to mainland A-share market from China-Connect Program. The upper panel shows the level of capital inflows in unit of billion RMB. The lower panel shows the daily percentage change of flows from the China-Connect Program.

A distinctive feature of the program relevant to our analysis is that international investors trade A-shares denominated in RMB, naturally exposing them to exchange rate fluctuations.[3] Before August 19, 2024, the program disclosed daily holdings data at both aggregate and stock levels, reporting the end-of-day total market value and outstanding shares held by international investors for each eligible A-share. These high-frequency holdings data serve as the key dependent variable in our empirical analysis of how international investors respond to exchange rate movements.

## 2.2 "Two-Pillar" Policy of RMB

The RMB exchange rate regime embodies a distinctive "two-pillar" policy framework designed to manage China's gradual transition toward a market-based exchange rate system.(Brunnermeier, Sockin and Xiong, 2017; Jermann, Wei and Yue, 2022) At the core of this framework is the daily fixing of the central parity rate, announced by the People's Bank of China (PBOC) at 9:15 a.m. before market opening. This central parity rate establishes the reference point from which intraday spot rate fluctuations are permitted within a narrow band.

Following several policy iterations, the PBOC reformed the central parity formation mechanism in late 2015 to enhance transparency. Under the revised framework, the central parity rate $S_{t+1}^{CP}$ comprises two components: the previous closing rate $S_t^{CL}$ plus changes in the currency basket $\bar{S}_{t+1}$:

$$S_{t+1}^{CP} = (S_t^{CL})^{1-\omega}(\bar{S}_{t+1})^{\omega} \tag{1}$$

Jermann, Wei and Yue (2022) successfully decomposed these components, identifying that since February 20, 2017, the "currency basket" pillar can be measured using overnight changes in the CFETS (China Foreign Exchange Trade System) basket index during a 15-hour reference period spanning from 4:30 p.m. the previous day to 7:30 a.m. on the fixing day.

The daily announcement structure of the CNY/USD central parity rate creates a natural experimental setting for identifying exchange rate shocks arising from information revelation embedded in the "nighttime pillar." In Section 3.2, we construct exogenous exchange rate shock measures using derivative price changes around the announcement window. These shocks enable us to examine how international equity flows through the China-Connect Program respond to unexpected

[3]Stocks traded in other currencies are explicitly excluded from the program.

exchange rate movements.

### 2.3 Counter-Cyclical Factor

In May 2017, the PBOC introduced an additional policy innovation known as the Counter-Cyclical Factor (CCF). This discretionary adjustment mechanism, often characterized as an "X factor" by market participants, is activated during periods of significant depreciation pressure to stabilize the exchange rate. While the precise calculation methodology remains opaque, Jermann, Wei and Yue (2022) document that the CCF is empirically highly correlated with components that offset the deviation of the previous closing rate from the daytime component of the basket pillar $S_t^{DT}$. The determination of the central parity rate during the CCF periods is given by:

$$S_{t+1}^{CP} = (S_t^{CL})^{1-\omega_{NT}-\omega_{DT}}(\bar{S}_{t+1}^{NT})^{\omega_{NT}}(\bar{S}_t^{DT})^{\omega_{DT}} \tag{2}$$

The Counter-Cyclical Factor has been activated during two distinct episodes: initially from May 26, 2017, to January 19, 2018, and subsequently from August 24, 2018, to October 27, 2020. The introduction of the CCF increased complexity and this brings different interpretations of the information content of exchange rate announcements. Later in the empirical results, we exploit variation in CCF activation to examine whether the sensitivity of equity flows to exchange rate shocks differs systematically during CCF periods relative to normal times.

## 3 Empirical Strategy

This section describes the empirical strategy, including the econometric specification, the construction of exchange rate shocks, and the measurement of equity flows.

### 3.1 Empirical Model

Our baseline specification is as follows:

$$\Delta Y_t = \alpha + \beta \Delta e_t^s + \boldsymbol{\xi} \boldsymbol{X_t} + \epsilon_t, \tag{3}$$

where $\Delta Y_t$ is the equity inflows to A-share market through the China-Connect Program, and $\Delta e_t^s$ denotes the daily exchange rate shock. $\beta$ measures the sensitivity of capital inflows to A-share market in the following day after the exchange rate shock materializes in the morning. We control for other variables that drive cross-border equity investments in vector $\boldsymbol{X_t}$. $\epsilon_t$ is the error term and $\alpha$ is a constant.

We further separate between the CCF and non-CCF period to test how international investors' responses to the exchange rate shocks differ across these two periods. To be specific, we estimate:

$$\Delta Y_t = \alpha + \beta^C \mathbb{1}_t^{CCF} \Delta e_t^s + \beta^N (1 - \mathbb{1}_t^{CCF}) \Delta e_t^s + \boldsymbol{\xi X_t} + \epsilon_t, \tag{4}$$

here $\mathbb{1}_t^{CCF}$ is the dummy that equals to 1 during the de jure CCF periods(2017/05/26 - 2018/01/19, 2018/08/24 - 2020/10/27). We compare between $\beta^C$ and $\beta^N$ to test if the market trading aggressiveness to the exchange rate shocks differs across CCF and non-CCF time.

## 3.2 Construction of Exchange Rate Shocks

Our benchmark measure of exchange rate shocks exploits high-frequency movements in CNY/USD non-deliverable forward (NDF) prices around the daily central parity announcement. Each trading day at 9:15 a.m., the PBOC announces the central parity rate. Following the identification approach of Nakamura and Steinsson (2018), we assume that no other systematic information is released during the narrow window surrounding the announcement, such that changes in NDF prices within this window are attributable solely to the parity announcement.[4]

Specifically, we define the NDF-based exchange rate shock as:

$$\Delta e_t^{s,NDF} = P_{t,9:25}^{NDF} - P_{t,9:05}^{NDF}, \tag{5}$$

where $P_{t,9:05}^{NDF}$ is the last traded price of the NDF contract before 9:05 a.m., and $P_{t,9:25}^{NDF}$ is the first traded price after 9:25 a.m. To ensure that our shock measure reflects only announcement-induced variation, we exclude days with no NDF trading between 9:25 a.m. and the market opening at 9:30 a.m.

[4]The Chinese stock market opens at 9:30 a.m., with an opening call auction from 9:15 a.m. to 9:25 a.m. However, individual investors only observe the final opening prices after 9:25 a.m., and no stock trading occurs during the auction period. Hence, the NDF price movements in our window are not contaminated by equity market information.

We construct the shock series using prices NDF contracts with maturities of 1 week, 1 month, 2 months, 3 months, 6 months, and 12 months from Bloomberg. To aggregate information across the term structure while reducing dimensionality, we extract the first principal component of these six maturity-specific price changes and use it as our primary exchange rate shock series in the empirical analysis.

Figure 2 plots the constructed shock following Eq (5) throughout our sample periods. The shock has a lower auto-correlation at around 2.7%, and the distribution is fairly close to the normal distribution. The yellow shaded area indicates the CCF periods, and the standard deviations of the shock do not differ too much across the CCF and non-CCF periods.

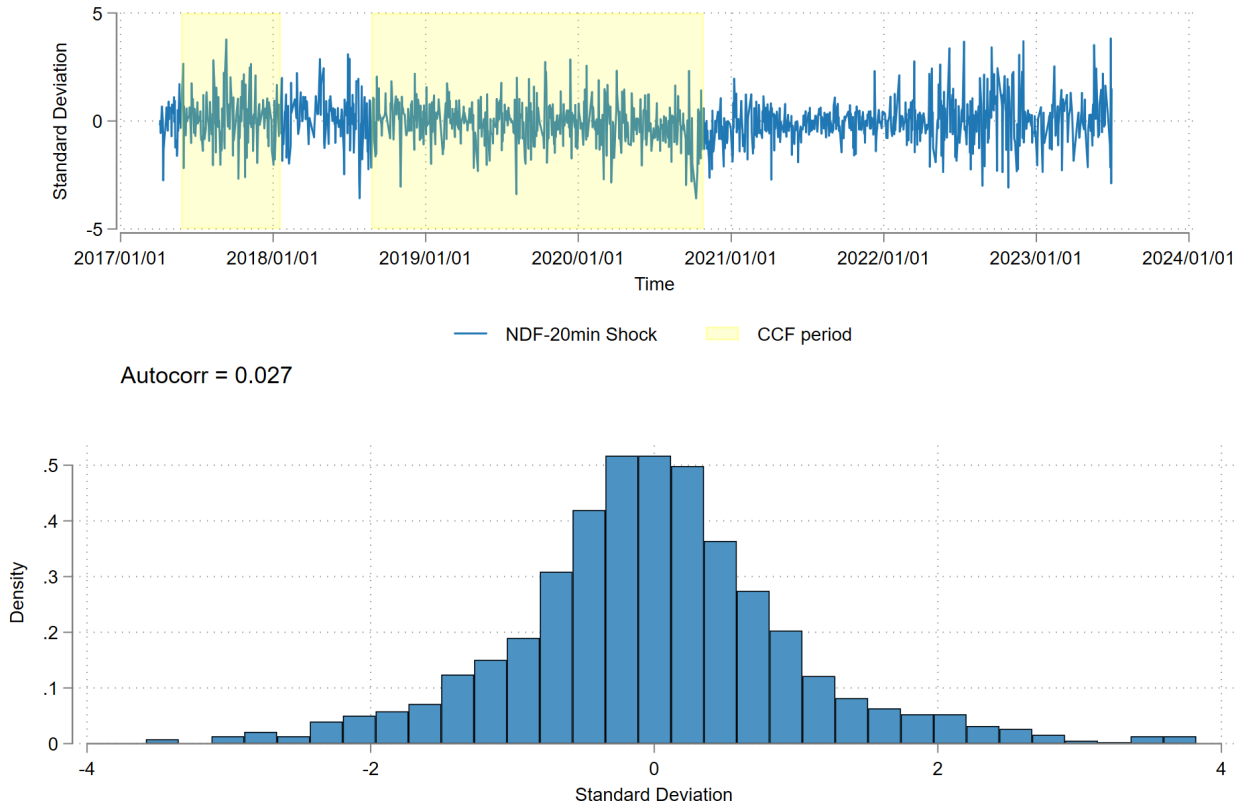



Figure 2: Benchmark Exchange Rate Shock

*Notes:* This figure presents the exchange rate shock after standardization constructed from Section 3.2. The upper panel shows time-series plot of the shock, where the yellow shaded area denotes the periods when Counter-Cyclical Factor is used. The lower panel shows the histogram of the shock.

### 3.3 Equity Flow

We collect equity flow data from WIND. The aggregate market value of stocks held by Hong Kong investors at the end of the day is available at the daily frequency. At the stock level, we can further access the outstanding shares of stocks held through the China-Connect Program. We use the daily change of market value or outstanding shares held by international investors as the key dependent variable.

### 3.4 Other Data

For other controls variables, we control for macro variables including: (i) change of overnight SHIBOR rate; (ii) change of Effective Fed Funds Rate from FRED; (iii) log change of VIX from FRED; (iv) lag change of market CNY/USD exchange rate from Datastream; (v) lag change of CNH/CNY exchange rate from Datastream.[5]

In stock-level regression, we control for other firm-level characteristics that affect tradings, including: (i) lagged one-week stock return; (ii) lagged one-year stock volatility; (iii) lagged one-year stock turnover; (iv) lagged one-month stock value; (v) quarterly change of fund holding ratio; (vi) quarterly change of QFII holding ratio. All these stock-level characteristics, together with daily stock closing prices are from CSMAR. Appendix A documents other details in cleaning the data. The sample period is from 2017/04/01 to 2023/06/30.

## 4 Empirical Results

This section presents the main empirical findings. We first document that an unexpected RMB depreciation shock leads to significant capital outflows from the A-share market. We then show that this effect is substantially weaker during periods when the Counter-Cyclical Factor is active. We show these patterns using both aggregate-level and firm-level data on market values and outstanding shares, providing evidence that the results reflect active portfolio rebalancing rather than passive valuation changes. These results hold under a wide range of robustness checks.

[5]This exchange rate reflects the scarcity of liquidity in Hong Kong. See discussions in (Bahaj and Reis, 2024)

## 4.1 Aggregate Results

We begin by examining how aggregate foreign capital flows into the mainland Chinese stock market respond to exchange rate shocks. Table 1 presents the results from estimating Equation (4) using daily aggregate data.

The findings reveal a clear pattern: an unexpected RMB depreciation induces significant capital outflows. A one-standard-deviation depreciation shock leads to a 0.04% decrease in foreign holdings, a non-negligible magnitude relative to the average daily inflow of 0.16% over the sample period, together with the standard deviation at around 0.46%. In economic terms, this translates to an average daily outflow of approximately 630 million RMB (about 90 million USD).

However, this exchange rate sensitivity is markedly attenuated during CCF activation periods. The point estimate for the CCF interaction term is substantially smaller in magnitude—approximately one-third of the baseline effect, and statistically indistinguishable from zero. This suggests that the CCF mechanism might effectively dampen foreign investors' responses to exchange rate movements.

Table 1: Exchange Rate Shocks and Aggregate Capital Flows

| | Level Change | | | | Percentage Change | | | |
|---|---|---|---|---|---|---|---|---|
| $\Delta e_t^s \times (1 - \mathbb{1}_t^{CCF})$ | $-0.641^{***}$ | $-0.613^{***}$ | $-0.623^{***}$ | $-0.627^{***}$ | $-0.030^{+}$ | $-0.027$ | $-0.037^{**}$ | $-0.037^{**}$ |
| | (0.233) | (0.236) | (0.232) | (0.239) | (0.019) | (0.019) | (0.018) | (0.019) |
| $\Delta e_t^s \times \mathbb{1}_t^{CCF}$ | $-0.022$ | $-0.020$ | $-0.024$ | $-0.028$ | 0.004 | 0.005 | $-0.010$ | $-0.011$ |
| | (0.182) | (0.191) | (0.182) | (0.191) | (0.024) | (0.026) | (0.024) | (0.026) |
| Controls | No | Yes | No | Yes | No | Yes | No | Yes |
| Fixed Effect | No | No | Year | Year | No | No | Year | Year |
| N | 1,341 | 1,279 | 1,341 | 1,279 | 1,320 | 1,260 | 1,320 | 1,260 |
| $R^2$ | 0.01 | 0.05 | 0.02 | 0.05 | 0.00 | 0.05 | 0.05 | 0.08 |

*Notes:* This table reports the relationship between daily exchange rate shocks and aggregate capital flows from the China-Connect Program. The dependent variable is the change in total foreign holdings (in billions of RMB). The main independent variables are interactions of the exchange rate shock, $\Delta e_t^s$, with indicators for non-CCF periods ($1 - \mathbb{1}_t^{CCF}$) and CCF periods ($\mathbb{1}_t^{CCF}$). Control variables include the change in the overnight SHIBOR rate, the log change in the VIX, the change in the U.S. effective federal funds rate, the lagged change in the market exchange rate, and the lagged CNH/CNY spread. The constant term is included but not reported. Robust standard errors are in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1, + p < 0.15.

Figure 3 provides a graphical representation of these findings using a binned scatter plot. The left panel confirms a negative relationship between depreciation shocks and capital flows during normal (non-CCF) periods. In contrast, the right panel shows a flatter relationship during CCF periods, consistent with the attenuated sensitivity reported in the table. The figure also demonstrates that these results are not driven by outliers, as the relationship is stable across the distribution of shock sizes.

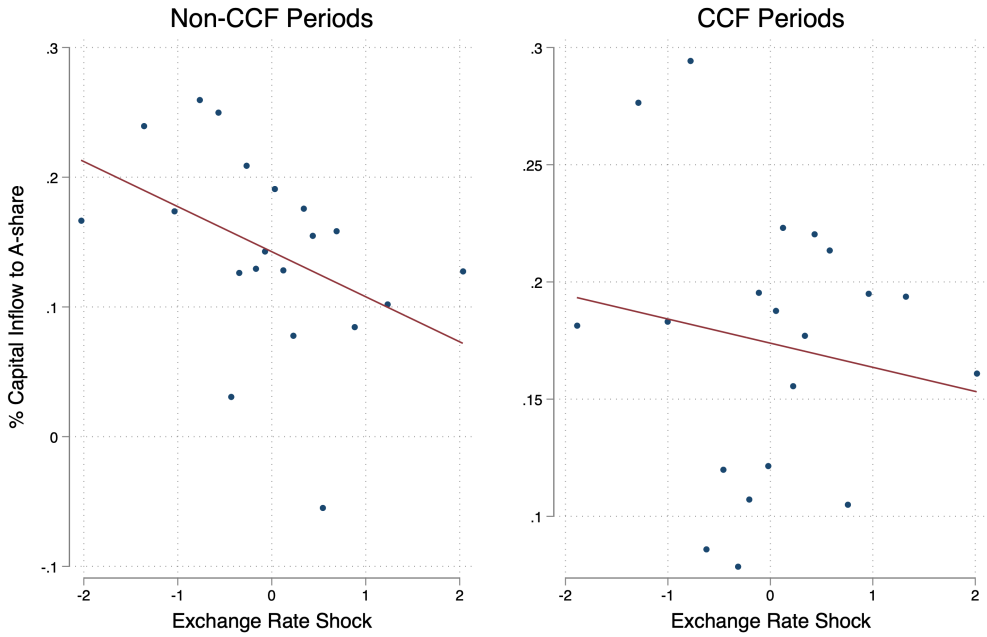



Figure 3: Exchange Rate Shocks and Aggregate Capital Flows

*Notes:* This figure presents a binscatter plot of the relationship between daily exchange rate shocks and the percentage change in aggregate foreign holdings in the A-share market. The sample is divided into 20 equally sized bins based on the shock magnitude. The left panel shows the relationship during non-CCF periods, and the right panel during CCF periods. The solid line represents the linear fit from the binned data.

## 4.2 Firm-Level Results

We next examine whether the aggregate patterns hold at the firm level, where richer controls and more granular analysis are possible. Table 2 presents results from estimating Equations (3) and (4) using the percentage change in the market value of foreign holdings for each stock. All specifications include firm-by-year fixed effects to absorb time-invariant firm characteristics and common yearly shocks, with standard errors double-clustered at the firm and date levels.

The firm-level results strongly corroborate the aggregate findings. A one-standard-deviation unexpected RMB depreciation reduces foreign holdings by approximately 0.16%. Consistent with the aggregate evidence, this effect is concentrated in non-CCF periods (coefficient = $-0.210$, $p < 0.05$), while the coefficient during CCF periods is only about 40% as large and statistically insignificant.

The responses to other control variables align with economic intuition. International investors exhibit momentum trading behavior, significantly increasing their holdings in stocks with positive returns over the previous five trading days. Flows are also more pronounced when the previous day's CNY–CNH spread is larger, suggesting that arbitrageurs may be more willing to hold mainland assets when the onshore renminbi is relatively undervalued.[6] Finally, consistent with the global financial cycle literature (Rey, 2015), foreign capital retrenches from the mainland when the VIX increases.

A potential concern with using market value as the dependent variable is that it conflates active portfolio rebalancing with passive valuation changes. To address this, Table 3 replicates the analysis using the percentage change in the number of outstanding shares held—a pure measure of trading activity.

The results confirm that the observed outflows reflect active selling. Following an unexpected RMB depreciation, the number of shares held by foreign investors declines significantly. The pattern across CCF and non-CCF periods mirrors the market-value results: the effect is pronounced and significant during normal times but attenuated and insignificant during CCF periods. The momentum effect, while still present, is smaller in magnitude for share quantities than for market values, suggesting that part of the market-value momentum reflects price continuation rather than active accumulation.

[6]For example, mainland banks with offshore presence might exploit this valuation gap, as the PBOC successfully manages the long-run peg between CNY and CNH. Bahaj and Reis (2024) provide related discussion.

Table 2: Exchange Rate Shocks and Firm-level Capital Flows – Market Value

| Dependent Variable: % change in market value from SH/SZ connect | | | | |
|---|---|---|---|---|
| $\Delta e_t^s$ | $-0.183^{**}$ | | $-0.159^{**}$ | |
| | (0.074) | | (0.066) | |
| $\Delta e_t^s \times (1 - \mathbb{1}_t^{CCF})$ | | $-0.223^{**}$ | | $-0.210^{**}$ |
| | | (0.096) | | (0.085) |
| $\Delta e_t^s \times \mathbb{1}_t^{CCF}$ | | $-0.132$ | | $-0.085$ |
| | | (0.115) | | (0.104) |
| $Ret_{t-5,t}^i$ | | | $0.235^{***}$ | $0.235^{***}$ |
| | | | (0.009) | (0.009) |
| $CNHCNY_{t-1}$ | | | $0.923^{***}$ | $0.921^{**}$ |
| | | | (0.294) | (0.295) |
| $\Delta VIX_t$ | | | $-1.981^{***}$ | $-1.971^{***}$ |
| | | | (0.757) | (0.755) |
| Other Controls | No | No | Yes | Yes |
| Fixed Effect | Firm×Year | Firm×Year | Firm×Year | Firm×Year |
| N | 1,367,664 | 1,367,664 | 1,176,751 | 1,176,751 |
| $R^2$ | 0.02 | 0.02 | 0.03 | 0.03 |

*Notes:* This table reports firm-level regressions of changes in foreign holdings on exchange rate shocks. The dependent variable is the percentage change in the market value of shares held by Hong Kong investors through the China-Connect Program for each stock $i$ on day $t$. The main independent variables are the exchange rate shock, $\Delta e_t^s$, and its interactions with indicators for non-CCF and CCF periods. All specifications include firm-by-year fixed effects. Standard errors clustered by firm and date are in parentheses. *** p $< 0.01$, ** p $< 0.05$, * p $< 0.1$.

Table 3: Exchange Rate Shocks and Firm-level Capital Flows – Outstanding Shares

| Dependent Variable: % change in outstanding shares from SH/SZ connect | | | | |
|---|---|---|---|---|
| $\Delta e_t^s$ | $-0.116^{***}$ | | $-0.098^{**}$ | |
| | (0.043) | | (0.039) | |
| $\Delta e_t^s \times (1 - \mathbb{1}_t^{CCF})$ | | $-0.128^{**}$ | | $-0.118^{**}$ |
| | | (0.059) | | (0.052) |
| $\Delta e_t^s \times \mathbb{1}_t^{CCF}$ | | $-0.101$ | | $-0.070$ |
| | | (0.063) | | (0.059) |
| $Ret_{t-5,t}^i$ | | | $0.031^{***}$ | $0.031^{***}$ |
| | | | (0.006) | (0.006) |
| $CNHCNY_{t-1}$ | | | $0.475^{***}$ | $0.475^{***}$ |
| | | | (0.170) | (0.171) |
| $\Delta VIX_t$ | | | $-0.871^{**}$ | $-0.867^{**}$ |
| | | | (0.438) | (0.439) |
| Other Controls | No | No | Yes | Yes |
| Fixed Effect | Firm×Year | Firm×Year | Firm×Year | Firm×Year |
| N | 1,367,664 | 1,367,664 | 1,176,751 | 1,176,751 |
| $R^2$ | 0.02 | 0.02 | 0.02 | 0.02 |

*Notes:* This table reports firm-level regressions of changes in foreign holdings on exchange rate shocks. The dependent variable is the percentage change in the outstanding shares held by Hong Kong investors through the China-Connect Program for each stock $i$ on day $t$. The main independent variables are the exchange rate shock, $\Delta e_t^s$, and its interactions with indicators for non-CCF and CCF periods. All specifications include firm-by-year fixed effects. Standard errors clustered by firm and date are in parentheses. *** p $< 0.01$, ** p $< 0.05$, * p $< 0.1$.

Figure 4 provides a graphical summary of the firm-level results, plotting binned averages of the relationship between exchange rate shocks and changes in foreign-held shares. The left panel confirms the negative relationship during non-CCF periods, while the right panel shows a muted response during CCF periods. The central tendency aligns closely with the regression results.

We further examine whether the observed capital flow responses are driven by genuine policy-induced exchange rate shocks rather than by noise in financial markets. As a validation of our identification strategy, Figure 2 shows that the benchmark shock measure is centered around zero, consistent with its capturing unexpected news rather than predictable variation.

To assess whether our results are sensitive to small shocks that might represent noise, we implement a threshold analysis. Specifically, we exclude observations where the exchange rate shock falls between the 40th and 60th percentiles—those most likely to be dominated by non-fundamental noise. These excluded observations are highlighted as white dots in Figure 4. The solid black lines represent linear fits based on the remaining observations (blue dots). The figure shows that the negative relationship during non-CCF periods and the muted response during CCF periods persist even after excluding the smallest shocks, suggesting that our findings are not driven by noise.

We formally test this in Table 4, which reports results from a threshold regression that excludes shocks in the interquartile range. The coefficients remain economically and statistically similar to our baseline estimates in Table 2, confirming that our findings are not an artifact of noise in the shock measure. Taken together, these tests suggest that the observed capital flow responses are driven by meaningful policy-induced exchange rate shocks rather than by random fluctuations in asset prices.

## 4.3 Robustness Check

We next conduct a series of robustness checks to validate our previous findings, including: (i) different fixed effects; (ii) different time windows around announcements to construct exchange rate shocks; (iii) a placebo test and (iv) an alternative measure of exchange rate shocks.

### 4.3.1 Different Time Fixed Effects

Table 5 reports the firm-level results controlling for firm×week fixed effects to control for more granular unobserved variations on the time series. Our previous results remain largely unchanged.

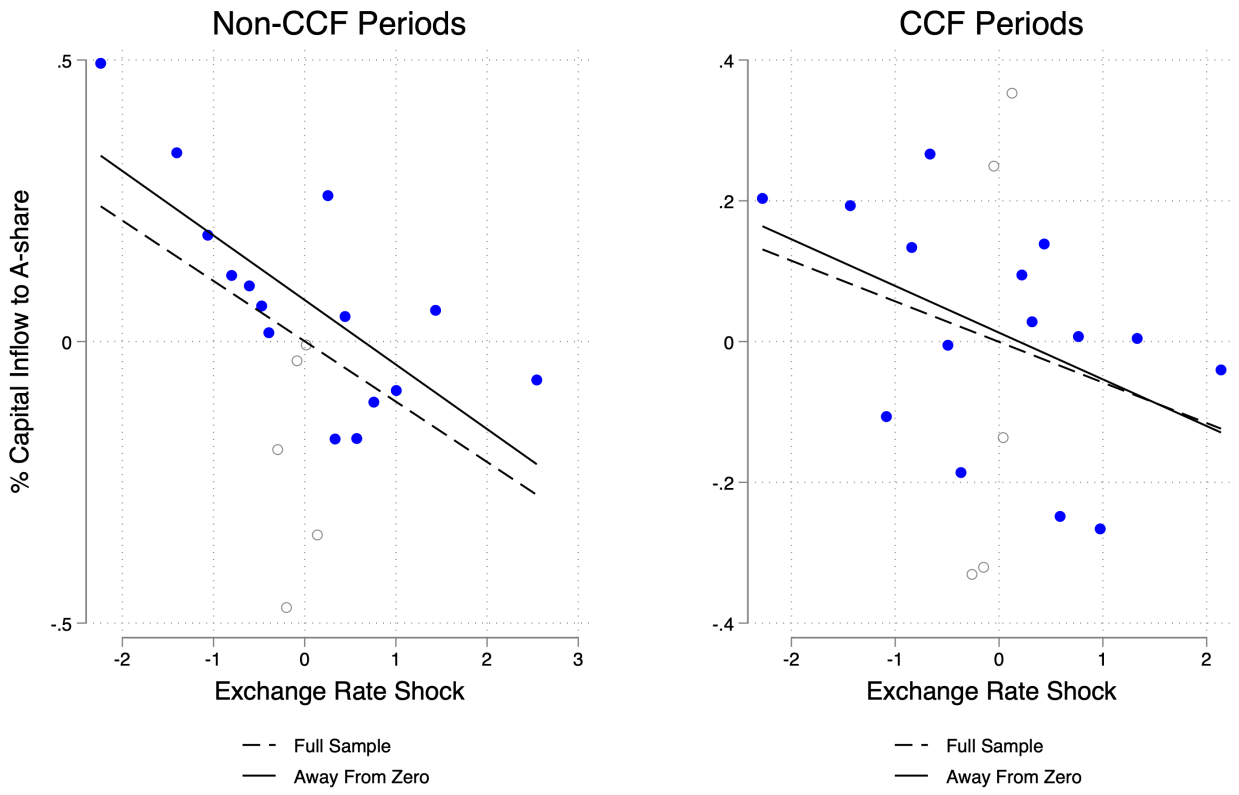



Figure 4: Exchange Rate Shocks and Firm-Level Capital Flows

*Notes:* This figure presents a binscatter plot of the relationship between daily exchange rate shocks and the percentage change in firm-level foreign holding shares in the A-share market. The sample is divided into 20 equally sized bins based on the shock magnitude. Observations with shocks between the 40th and 60th percentiles are shown as white dots, while the remaining observations (i.e., those further from zero) are shown as blue dots. The dashed line represents the linear fit from the full binned data, while the solid line is the fit from the samples away from zero. The left panel shows the relationship during non-CCF periods, and the right panel during CCF periods. The solid line represents the linear fit from the binned data.

Table 4: Exchange Rate Shocks and Firm-level Capital Flows – Threshold Regression

| | Share Holding | | Market Value | |
|---|---|---|---|---|
| $\Delta e_t^s$ | $-0.108^{***}$ | | $-0.179^{***}$ | |
| | (0.039) | | (0.066) | |
| $\Delta e_t^s \times (1 - \mathbb{1}_t^{CCF})$ | | $-0.129^{**}$ | | $-0.230^{***}$ |
| | | (0.052) | | (0.085) |
| $\Delta e_t^s \times \mathbb{1}_t^{CCF}$ | | $-0.077$ | | $-0.106$ |
| | | (0.059) | | (0.103) |
| $Ret_{t-5,t}^i$ | $0.031^{***}$ | $0.031^{***}$ | $0.234^{***}$ | $0.234^{***}$ |
| | (0.006) | (0.006) | (0.010) | (0.010) |
| $CNHCNY_{t-1}$ | $0.470^{***}$ | $0.469^{***}$ | $0.884^{***}$ | $0.882^{***}$ |
| | (0.181) | (0.182) | (0.314) | (0.315) |
| $\Delta VIX_t$ | $-0.946^{*}$ | $-0.940^{*}$ | $-1.926^{**}$ | $-1.912^{**}$ |
| | (0.509) | (0.507) | (0.869) | (0.867) |
| Other Controls | Yes | Yes | Yes | Yes |
| Fixed Effect | Firm×Year | Firm×Year | Firm×Year | Firm×Year |
| N | 945,832 | 945,832 | 945,832 | 945,832 |
| $R^2$ | 0.02 | 0.02 | 0.04 | 0.04 |

*Notes:* This table reports firm-level regressions of changes in foreign holdings on exchange rate shocks. The dependent variable is the percentage change in the outstanding shares held by Hong Kong investors through the China-Connect Program for each stock $i$ on day $t$. The main independent variables are the exchange rate shock, $\Delta e_t^s$, and its interactions with indicators for non-CCF and CCF periods. Exchange rate shocks between their 40th to 60th percentiles are dropped. All specifications include firm-by-year fixed effects. Standard errors clustered by firm and date are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 5: Exchange Rate Shocks and Firm-level Capital Flows

| | Share Holding | | Market Value | |
|---|---|---|---|---|
| $\Delta e_t^s$ | $-0.092^{**}$ | | $-0.158^{**}$ | |
| | (0.039) | | (0.066) | |
| $\Delta e_t^s \times (1 - \mathbb{1}_t^{CCF})$ | | $-0.112^{**}$ | | $-0.233^{***}$ |
| | | (0.055) | | (0.087) |
| $\Delta e_t^s \times \mathbb{1}_t^{CCF}$ | | $-0.062$ | | $-0.041$ |
| | | (0.053) | | (0.097) |
| $Ret_{t-5,t}^i$ | $0.018^{**}$ | $0.018^{**}$ | $0.300^{***}$ | $0.301^{***}$ |
| | (0.008) | (0.008) | (0.014) | (0.014) |
| $CNHCNY_{t-1}$ | 0.302 | 0.300 | $0.880^{**}$ | $0.872^{**}$ |
| | (0.208) | (0.208) | 0.349 | (0.349) |
| $\Delta VIX_t$ | $-0.630$ | $-0.623$ | $-1.540^{**}$ | $-1.514^{**}$ |
| | (0.435) | (0.435) | (0.767) | (0.767) |
| Other Controls | Yes | Yes | Yes | Yes |
| Fixed Effect | Firm×Week | Firm×Week | Firm×Week | Firm×Week |
| N | 1,126,837 | 1,126,837 | 1,126,837 | 1,126,837 |
| $R^2$ | 0.29 | 0.29 | 0.29 | 0.29 |

*Notes:* This table reports firm-level regressions of changes in foreign holdings on exchange rate shocks. The dependent variable is the percentage change in the outstanding shares held by Hong Kong investors through the China-Connect Program for each stock $i$ on day $t$. The main independent variables are the exchange rate shock, $\Delta e_t^s$, and its interactions with indicators for non-CCF and CCF periods. All specifications include firm-by-week fixed effects. Standard errors clustered by firm and date are in parentheses. *** p $< 0.01$, ** p $< 0.05$, * p $< 0.1$.

### 4.3.2 Different Time Window for Exchange Rate Shocks

Our baseline exchange rate shock measure is constructed using NDF price changes from 9:05 a.m. to 9:25 a.m. To ensure that our results are not sensitive to this particular window choice, we construct three alternative shock measures using different intervals around the 9:15 a.m. announcement: (i) 9:10 a.m.–9:25 a.m. (15-minute window); (ii) 9:00 a.m.–9:25 a.m. (25-minute window); and (iii) 8:55 a.m.–9:25 a.m. (30-minute window).

The alternative shock series are highly correlated with our benchmark measure, with correlation coefficients of 0.95, 0.92, and 0.89, respectively. This high degree of correlation suggests that our shock measure is not unduly influenced by the specific window boundaries.

Table 6: Exchange Rate Shocks and Firm-level Capital Flows – 15-min Window

| | Share Holding | | Market Value | |
|---|---|---|---|---|
| $\Delta e_t^s$ | $-0.095^{**}$ | | $-0.156^{**}$ | |
| | (0.037) | | (0.064) | |
| $\Delta e_t^s \times (1 - \mathbb{1}_t^{CCF})$ | | $-0.115^{**}$ | | $-0.213^{**}$ |
| | | (0.049) | | (0.083) |
| $\Delta e_t^s \times \mathbb{1}_t^{CCF}$ | | $-0.068$ | | $-0.082$ |
| | | (0.056) | | (0.100) |
| $Ret_{t-5,t}^i$ | $0.031^{***}$ | $0.031^{***}$ | $0.235^{***}$ | $0.235^{***}$ |
| | (0.006) | (0.006) | (0.009) | (0.009) |
| $CNHCNY_{t-1}$ | $0.442^{***}$ | $0.440^{***}$ | $0.879^{***}$ | $0.874^{***}$ |
| | (0.170) | (0.171) | (0.294) | (0.295) |
| $\Delta VIX_t$ | $-0.819^{*}$ | $-0.823^{*}$ | $-1.823^{**}$ | $-1.835^{**}$ |
| | (0.438) | (0.438) | (0.745) | (0.743) |
| Other Controls | Yes | Yes | Yes | Yes |
| Fixed Effect | Firm×Year | Firm×Year | Firm×Year | Firm×Year |
| N | 1,176,216 | 1,176,216 | 1,176,216 | 1,176,216 |
| $R^2$ | 0.02 | 0.02 | 0.03 | 0.03 |

*Notes:* This table reports firm-level regressions of changes in foreign holdings on exchange rate shocks. The dependent variable is the percentage change in the outstanding shares held by Hong Kong investors through the China-Connect Program for each stock $i$ on day $t$. The main independent variables are the exchange rate shock within the 15-min window, $\Delta e_t^{s,15min}$, and its interactions with indicators for non-CCF and CCF periods. All specifications include firm-by-week fixed effects. Standard errors clustered by firm and date are in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1.

Table 7: Exchange Rate Shocks and Firm-level Capital Flows – 25-min Window

| | Share Holding | | Market Value | |
|---|---|---|---|---|
| $\Delta e_t^s$ | $-0.068^{*}$ | | $-0.112^{*}$ | |
| | (0.039) | | (0.067) | |
| $\Delta e_t^s \times (1 - \mathbb{1}_t^{CCF})$ | | $-0.084$ | | $-0.167^{*}$ |
| | | (0.053) | | (0.090) |
| $\Delta e_t^s \times \mathbb{1}_t^{CCF}$ | | $-0.045$ | | $-0.037$ |
| | | (0.056) | | (0.099) |
| $Ret_{t-5,t}^i$ | $0.030^{***}$ | $0.030^{***}$ | $0.234^{***}$ | $0.234^{***}$ |
| | (0.006) | (0.006) | (0.009) | (0.009) |
| $CNHCNY_{t-1}$ | $0.453^{***}$ | $0.452^{***}$ | $0.879^{***}$ | $0.873^{***}$ |
| | (0.176) | (0.176) | (0.300) | (0.304) |
| $\Delta VIX_t$ | $-0.823^{*}$ | $-0.823^{*}$ | $-1.845^{**}$ | $-1.843^{**}$ |
| | (0.440) | (0.440) | (0.748) | (0.747) |
| Other Controls | Yes | Yes | Yes | Yes |
| Fixed Effect | Firm×Year | Firm×Year | Firm×Year | Firm×Year |
| N | 1,166,774 | 1,166,774 | 1,166,774 | 1,166,774 |
| $R^2$ | 0.02 | 0.02 | 0.03 | 0.03 |

*Notes:* This table reports firm-level regressions of changes in foreign holdings on exchange rate shocks. The dependent variable is the percentage change in the outstanding shares held by Hong Kong investors through the China-Connect Program for each stock $i$ on day $t$. The main independent variables are the exchange rate shock within the 25-min window, $\Delta e_t^{s,25min}$, and its interactions with indicators for non-CCF and CCF periods. All specifications include firm-by-week fixed effects. Standard errors clustered by firm and date are in parentheses. *** p $<$ 0.01, ** p $<$ 0.05, * p $<$ 0.1.

Table 8: Exchange Rate Shocks and Firm-level Capital Flows – 30-min Window

| | Share Holding | | Market Value | |
|---|---|---|---|---|
| $\Delta e_t^s$ | $-0.086^{**}$ | | $-0.139^{**}$ | |
| | (0.038) | | (0.064) | |
| $\Delta e_t^s \times (1 - \mathbb{1}_t^{CCF})$ | | $-0.111^{**}$ | | $-0.193^{**}$ |
| | | (0.051) | | (0.083) |
| $\Delta e_t^s \times \mathbb{1}_t^{CCF}$ | | $-0.053$ | | $-0.065$ |
| | | (0.056) | | (0.098) |
| $Ret_{t-5,t}^i$ | $0.030^{***}$ | $0.030^{***}$ | $0.234^{***}$ | $0.234^{***}$ |
| | (0.006) | (0.006) | (0.009) | (0.009) |
| $CNHCNY_{t-1}$ | $0.467^{***}$ | $0.465^{***}$ | $0.865^{***}$ | $0.860^{***}$ |
| | (0.175) | (0.176) | (0.299) | (0.300) |
| $\Delta VIX_t$ | $-0.825^{*}$ | $-0.823^{*}$ | $-1.885^{**}$ | $-1.880^{**}$ |
| | (0.440) | (0.440) | (0.747) | (0.747) |
| Other Controls | Yes | Yes | Yes | Yes |
| Fixed Effect | Firm×Year | Firm×Year | Firm×Year | Firm×Year |
| N | 1,163,911 | 1,163,911 | 1,163,911 | 1,163,911 |
| $R^2$ | 0.02 | 0.02 | 0.03 | 0.03 |

*Notes:* This table reports firm-level regressions of changes in foreign holdings on exchange rate shocks. The dependent variable is the percentage change in the outstanding shares held by Hong Kong investors through the China-Connect Program for each stock $i$ on day $t$. The main independent variables are the exchange rate shock within the 30-min window, $\Delta e_t^{s,30min}$, and its interactions with indicators for non-CCF and CCF periods. All specifications include firm-by-week fixed effects. Standard errors clustered by firm and date are in parentheses. *** p $<$ 0.01, ** p $<$ 0.05, * p $<$ 0.1.

#### 4.3.3 Placebo Test: Pre-Announcement Window

To further validate that our results capture responses to policy announcements rather than spurious correlations with pre-existing asset price movements, we conduct a placebo test using NDF price changes from a window prior to the announcement. Specifically, we construct a pseudo-shock measure using NDF price changes between 8:10 a.m. and 8:30 a.m.—a period that precedes both the central parity announcement (9:15 a.m.) and the stock market opening (9:30 a.m.). If our baseline results were driven by noise in asset prices rather than information revelation from the policy announcement, we would expect to find similar coefficients using this placebo measure.

Table 9 presents the results. In contrast to our baseline findings, the placebo shock measure shows no statistically significant relationship with subsequent capital flows, regardless of whether we examine share holdings or market value, and regardless of CCF activation status. The coefficients are uniformly small in magnitude and statistically indistinguishable from zero.

This null result provides important validation for our identification strategy: it is specifically the information revealed in the central parity announcement—captured by NDF price changes around the 9:15 a.m. fixing—that drives the capital flow responses we document. Pre-announcement price movements, which do not reflect new policy information, have no predictive power for subsequent trading behavior.

#### 4.3.4 Alternative Shock Measure

As an additional validation of our main results, we construct an alternative measure of exchange rate shocks using directly observed market expectations. Each trading day at 9:05 a.m., Bloomberg surveys approximately 20 analysts from banks, non-bank financial institutions, and corporations regarding their expectations for the upcoming central parity announcement at 9:15 a.m. (Bloomberg ticker: FCCNYFIX). These survey data allow us to construct an expectation-based shock measure as the difference between the realized central parity and the market's prior expectation, following Chen, Jiao and Wu (2025):

$$\Delta e_t^{s,BBG} = S_{t,9:15} - E_{t,9:05} S_{t,9:15} \tag{6}$$

where $S_{t,9:15}$ denotes the announced central parity rate on day $t$, and $E_{t,9:05}[S_{t,9:15}]$ is the

Table 9: Exchange Rate Shocks and Firm-level Capital Flows – Placebo Test

| | Share Holding | | Market Value | |
|---|---|---|---|---|
| $\Delta e_t^s$ | $-0.035$ | | $-0.079$ | |
| | (0.039) | | (0.069) | |
| $\Delta e_t^s \times (1 - \mathbb{1}_t^{CCF})$ | | $-0.041$ | | $-0.047$ |
| | | (0.054) | | (0.094) |
| $\Delta e_t^s \times \mathbb{1}_t^{CCF}$ | | $-0.028$ | | $-0.117$ |
| | | (0.056) | | (0.100) |
| $Ret_{t-5,t}^i$ | $0.030^{***}$ | $0.030^{***}$ | $0.232^{***}$ | $0.232^{***}$ |
| | (0.006) | (0.006) | (0.010) | (0.010) |
| $CNHCNY_{t-1}$ | $0.418^{**}$ | $0.419^{**}$ | $0.880^{**}$ | $0.876^{**}$ |
| | (0.191) | (0.191) | 0.341 | (0.340) |
| $\Delta VIX_t$ | $-0.957^{**}$ | $-0.955^{**}$ | $-1.966^{**}$ | $-1.974^{**}$ |
| | (0.426) | (0.426) | (0.765) | (0.765) |
| Other Controls | Yes | Yes | Yes | Yes |
| Fixed Effect | Firm×Year | Firm×Year | Firm×Year | Firm×Year |
| N | 924,926 | 924,926 | 924,926 | 924,926 |
| $R^2$ | 0.02 | 0.02 | 0.04 | 0.04 |

*Notes:* This table reports firm-level regressions of changes in foreign holdings on exchange rate shocks. The dependent variable is the percentage change in the outstanding shares held by Hong Kong investors through the China-Connect Program for each stock $i$ on day $t$. The main independent variables are the NDF price changes between 8:10 a.m. and 8:30 a.m., $\Delta e_t^{s,pb}$, and its interactions with indicators for non-CCF and CCF periods. All specifications include firm-by-week fixed effects. Standard errors clustered by firm and date are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

cross-sectional mean of analyst expectations elicited at 9:05 a.m. Under the assumption that expectations remain stable over the 10-minute window preceding the announcement, this measure captures the pure information update conveyed by the policy announcement.[7] Rather than relying on asset price movements around the announcement window, it directly measures the unexpected component of the announcement relative to pre-existing market beliefs.

Table 10 presents results from estimating Equation (4) using this survey-based shock measure. The findings strongly corroborate our baseline results. An unexpected RMB depreciation leads to significant reductions in both share holdings and market value of foreign positions. The pattern across CCF regimes also mirrors our earlier findings: the negative response is pronounced during non-CCF periods, while the coefficient during CCF periods is economically smaller and statistically insignificant.

The consistency between our high-frequency NDF-based results and these survey-based results provides reassurance that our findings reflect genuine responses to policy-induced exchange rate shocks, rather than artifacts of a particular identification strategy.

# 5 Mechanisms

In this section, we investigate why depreciation shocks trigger foreign equity outflows and why this response differs sharply between CCF and non-CCF periods. The central interpretation is that fixing-induced exchange-rate shocks contain information about RMB fundamentals, but the clarity of this signal depends on the fixing regime.

A pure valuation channel would predict the opposite of our baseline finding. If an unexpected RMB depreciation simply makes RMB-denominated assets cheaper for foreign investors, it should attract capital inflows into A-shares, or at least should not induce active selling. Instead, Section **??** shows that depreciation surprises reduce both the market value of foreign holdings and the number of shares held through the China-Connect Program. This pattern suggests that investors interpret at least some depreciation surprises as adverse information about RMB fundamentals or about the policy authority's assessment of those fundamentals.

The CCF regime provides an additional way to sharpen this interpretation. Following Jermann, Wei and Yue (2022), the normal fixing regime can be viewed through the two-pillar structure of

[7] We exclude survey data from August 25, 2022 to November 4, 2022, due to a persistent and atypical deviation between expected and realized central parity rates during this period.

Table 10: Survey-based Shocks and Firm-level Capital Flows

| | Share Holding | | Market Value | |
|---|---|---|---|---|
| $\Delta e_t^s$ | $-0.462^{**}$ | | $-0.550^{*}$ | |
| | (0.189) | | (0.318) | |
| $\Delta e_t^{BBG} \times (1 - \mathbb{1}_t^{CCF})$ | | $-0.497^{**}$ | | $-0.692^{*}$ |
| | | (0.252) | | (0.404) |
| $\Delta e_t^{BBG} \times \mathbb{1}_t^{CCF}$ | | $-0.410$ | | $-0.344$ |
| | | (0.276) | | (0.493) |
| $Ret_{t-5,t}^i$ | $0.029^{***}$ | $0.029^{***}$ | $0.235^{***}$ | $0.235^{***}$ |
| | (0.006) | (0.006) | (0.009) | (0.009) |
| $CNHCNY_{t-1}$ | $0.584^{***}$ | $0.585^{***}$ | $0.956^{***}$ | $0.962^{***}$ |
| | (0.207) | (0.207) | (0.349) | (0.350) |
| $\Delta VIX_t$ | $-0.999^{**}$ | $-1.001^{**}$ | $-2.329^{***}$ | $-2.335^{***}$ |
| | (0.490) | (0.490) | (0.849) | (0.848) |
| Other Controls | Yes | Yes | Yes | Yes |
| Fixed Effect | Firm×Year | Firm×Year | Firm×Year | Firm×Year |
| N | 1,061,301 | 1,061,301 | 1,061,301 | 1,061,301 |
| $R^2$ | 0.02 | 0.02 | 0.03 | 0.04 |

*Notes:* This table reports firm-level regressions of changes in foreign holdings on exchange rate shocks. The dependent variable is the percentage change in the outstanding shares held by Hong Kong investors through the China-Connect Program for each stock $i$ on day $t$. The main independent variables are the exchange rate shock constructed by Bloomberg survey data, $\Delta e_t^{BBG}$, and its interactions with indicators for non-CCF and CCF periods. All specifications include firm-by-week fixed effects. Standard errors clustered by firm and date are in parentheses. *** p $< 0.01$, ** p $< 0.05$, * p $< 0.1$.

the RMB fixing mechanism. Since the previous closing rate is already observed by market participants, high-frequency fixing surprises in normal periods are more tightly linked to innovations in the currency-basket pillar. During CCF periods, however, the observed fixing surprise reflects a mixture of basket-pillar information and the discretionary counter-cyclical adjustment. This additional policy component makes the signal more ambiguous: a depreciation surprise may reflect adverse fundamentals, but it may also reflect the intensity, direction, or limits of exchange-rate management. Therefore, the same high-frequency depreciation surprise may lead to weaker portfolio rebalancing under the CCF.

We provide four pieces of evidence consistent with this information-based interpretation. First, following the sign-restriction logic of Jarociński and Karadi (2020), we classify depreciation shocks that coincide with negative equity-price reactions as adverse information shocks. The outflow response is concentrated on these information-shock days and only during normal periods. Second, following the spirit of Cieslak and Schrimpf (2019), we use the forward curve to distinguish transitory exchange-rate movements from persistent exchange-rate news. The outflow response is strongest when depreciation shocks are driven by longer-maturity forward prices. Third, we address the concern that the results reflect omitted public macro-financial news: the baseline effects are robust to additional overnight macro controls, and these variables have limited power to predict the high-frequency exchange-rate shock. Finally, we show that the response is stronger around Chinese macro announcement dates, consistent with the fixing being especially informative when macro fundamentals are salient.

Together, these results suggest that foreign investors do not mechanically sell A-shares after every RMB depreciation. They sell when depreciation surprises are accompanied by adverse equity-market signals, when these surprises contain long-horizon exchange-rate information, and when the fixing regime makes the signal relatively clean.

## 5.1 Equity-Market Comovement and Adverse Information Shocks

We first ask whether investors interpret depreciation shocks as adverse macroeconomic news. To do so, we use the high-frequency response of Chinese equity prices around the fixing announcement as an auxiliary signal. The logic follows Jarociński and Karadi (2020), who distinguish monetary policy shocks from central-bank information shocks using the joint movement of policy surprises and stock prices. In our setting, the relevant distinction is between depreciation shocks

that are merely exchange-rate movements and depreciation shocks that are interpreted as bad news about fundamentals.

Specifically, we classify a fixing shock as an adverse information shock when an unexpected RMB depreciation is accompanied by a decline in SGX FTSE A50 Index futures during the 20-minute announcement window. Conversely, an unexpected RMB appreciation accompanied by an increase in equity prices is classified as a positive information shock. These are the days on which the exchange-rate surprise and the equity-market reaction move in the direction consistent with a common fundamental signal.

Let $\mathbb{1}_t^{Info}$ be an indicator equal to one on information-shock days. We estimate:

$$\begin{aligned}\Delta Y_t^i =&\alpha + \beta^{C,I}\mathbb{1}_t^{CCF} \times \mathbb{1}_t^{Info}\Delta e_t^s + \beta^{C,N}\mathbb{1}_t^{CCF} \times (1 - \mathbb{1}_t^{Info})\Delta e_t^s \\ &+ \beta^{N,I}(1 - \mathbb{1}_t^{CCF}) \times \mathbb{1}_t^{Info}\Delta e_t^s + \beta^{N,N}(1 - \mathbb{1}_t^{CCF}) \times (1 - \mathbb{1}_t^{Info})\Delta e_t^s + \boldsymbol{\xi} \boldsymbol{X_t^i} + \epsilon_t^i. \quad (7)\end{aligned}$$

The dependent variable $\Delta Y_t^i$ is either the percentage change in foreign-held shares or the percentage change in the market value of foreign holdings. The vector $X_t^i$ includes the baseline controls, and all specifications include the fixed effects used in the baseline firm-level regressions.

Table 11 reports the results. The outflow response is concentrated on adverse information-shock days. In the full sample, depreciation shocks classified as information shocks significantly reduce foreign holdings, while non-information shocks have essentially no effect. Once we split the sample by fixing regime, the response is entirely concentrated in normal periods. The coefficient on $\Delta e_t^s \times \mathbb{1}_t^{Info} \times (1 - \mathbb{1}_t^{CCF})$ is negative and statistically significant for both foreign-held shares and market value. In contrast, the corresponding coefficient during CCF periods is small and statistically insignificant. Depreciation shocks that are not classified as information shocks do not generate systematic outflows in either regime.

This pattern supports the information-based interpretation of the baseline findings. Foreign investors do not sell simply because the RMB depreciates. They sell when the depreciation is accompanied by a negative equity-market signal and when the fixing regime makes the signal relatively clean. Under the normal regime, a fixing surprise is more tightly connected to the currency-basket pillar and is therefore more naturally interpreted as information about RMB fundamentals. Under the CCF regime, the same observed fixing surprise mixes basket-pillar information with discretionary counter-cyclical adjustment, making the signal more difficult to interpret. This ambiguity

Table 11: Exchange Rate Shocks and Firm-level Capital Flows – Information Shock

| | Shares | | Market Value | |
|---|---|---|---|---|
| $\Delta e_t^s \times \mathbb{1}_t^{Info}$ | $-0.175^{***}$ | | $-0.287^{**}$ | |
| | (0.067) | | (0.113) | |
| $\Delta e_t^s \times (1 - \mathbb{1}_t^{Info})$ | 0.005 | | 0.028 | |
| | (0.067) | | (0.114) | |
| $\Delta e_t^s \times \mathbb{1}_t^{Info} \times (1 - \mathbb{1}_t^{CCF})$ | | $-0.233^{***}$ | | $-0.416^{***}$ |
| | | (0.076) | | (0.126) |
| $\Delta e_t^s \times \mathbb{1}_t^{Info} \times \mathbb{1}_t^{CCF}$ | | $-0.034$ | | 0.030 |
| | | (0.133) | | (0.233) |
| $\Delta e_t^s \times (1 - \mathbb{1}_t^{Info}) \times (1 - \mathbb{1}_t^{CCF})$ | | 0.035 | | 0.075 |
| | | (0.087) | | (0.152) |
| $\Delta e_t^s \times (1 - \mathbb{1}_t^{Info}) \times \mathbb{1}_t^{CCF}$ | | $-0.048$ | | $-0.055$ |
| | | (0.101) | | (0.156) |
| Other Controls | Yes | Yes | Yes | Yes |
| Fixed Effect | Firm×Year | Firm×Year | Firm×Year | Firm×Year |
| N | 667,886 | 667,886 | 667,886 | 667,886 |
| $R^2$ | 0.02 | 0.02 | 0.04 | 0.04 |

*Notes:* This table reports firm-level regressions of changes in foreign holdings on exchange rate shocks. The dependent variable is the percentage change in foreign-held shares in columns (1)–(2) and the percentage change in the market value of foreign holdings in columns (3)–(4), for each stock $i$ on day $t$. The main independent variables are the exchange rate shock, $\Delta e_t^s$, and its interactions with indicators for non-CCF and CCF periods. $\mathbb{1}_t^{Info}$ indicates dates on which the exchange-rate surprise and the SGX FTSE A50 futures reaction have opposite signs, so that depreciations are accompanied by equity-price declines and appreciations are accompanied by equity-price increases. All specifications include firm-by-year fixed effects. Standard errors clustered by firm and date are in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1.

helps explain why even information-shock days do not generate comparable outflows during CCF periods.

The result also helps distinguish the information channel from a pure valuation channel. If depreciation only made RMB-denominated assets cheaper, foreign investors should increase their A-share positions or at least not systematically sell. Instead, selling appears precisely when depreciation is accompanied by negative equity-price news and when the policy regime leaves the information content of the fixing less ambiguous.

## 5.2 Persistent Exchange-Rate News: Forward-Curve Evidence

The previous subsection shows that outflows are concentrated on depreciation shocks that look like adverse information shocks. We next ask whether this information is transitory or persistent. If a depreciation surprise only reflects short-term market noise or near-term liquidity conditions, it should mainly affect short-maturity forward prices. In contrast, if the shock conveys information about the expected future path of the RMB, it should also move longer-maturity forward prices.

To examine this distinction, we decompose the daily exchange-rate shock using movements across the forward curve. Our benchmark shock is constructed from high-frequency changes in NDF prices at maturities from one week to one year. We now measure the extent to which each day's shock is driven by longer-maturity forward prices, following the spirit of Cieslak and Schrimpf (2019), who use the maturity structure of asset-price responses to distinguish short-run policy news from more persistent information.

In Section 3.2, we construct the exchange-rate shock as the first principal component of high-frequency price changes across six NDF maturities. We treat the 6-month and 1-year contracts as the long-maturity segment of the forward curve. On each date, we compute the contribution of these two contracts to the benchmark exchange-rate shock. Figure 5 shows the distribution of this long-end contribution. We define $\mathbb{1}_t^{Long}$ as an indicator equal to one when the long-end contribution is above its sample median.

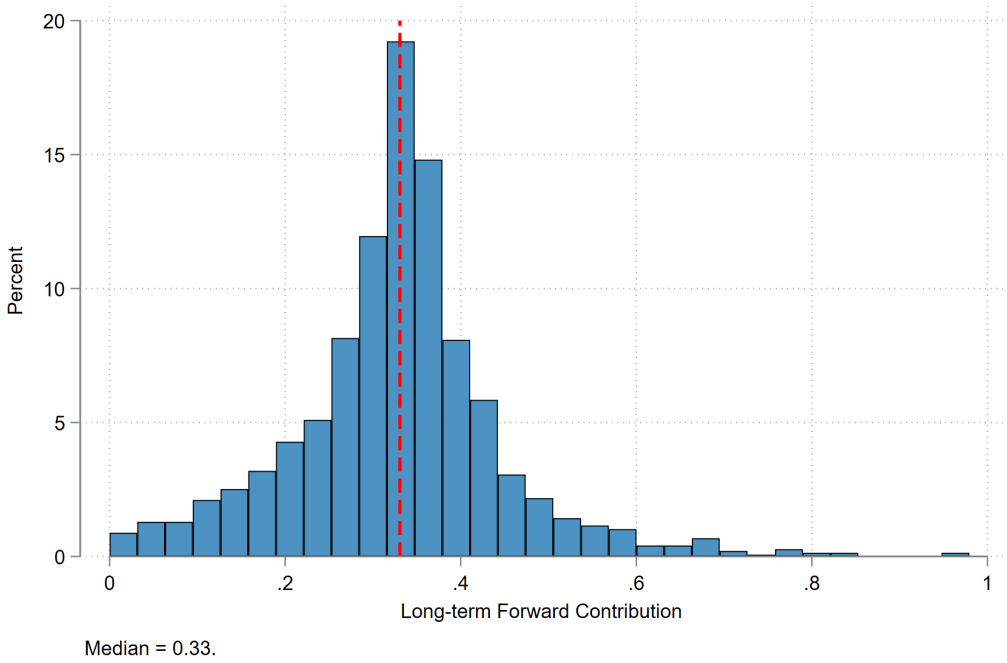



Figure 5: Contribution of Long-term Forward Prices to Exchange Rate Shocks

*Notes:* This figure presents the distribution of contribution of 6M and 1Y CNY/USD contracts' prices changes to the baseline exchange rate shocks.

We estimate:

$$\begin{aligned}\Delta Y_t^i =&\alpha + \beta^{C,I,L}\mathbb{1}_t^{CCF} \times \mathbb{1}_t^{Info} \times \mathbb{1}_t^{Long}\Delta e_t^s + \beta^{C,I,S}\mathbb{1}_t^{CCF} \times \mathbb{1}_t^{Info} \times (1-\mathbb{1}_t^{Long})\Delta e_t^s \\ &+ \beta^{C,N,L}\mathbb{1}_t^{CCF} \times (1-\mathbb{1}_t^{Info}) \times \mathbb{1}_t^{Long}\Delta e_t^s + \beta^{C,N,S}\mathbb{1}_t^{CCF} \times (1-\mathbb{1}_t^{Info}) \times (1-\mathbb{1}_t^{Long})\Delta e_t^s \\ &+ \beta^{N,I,L}(1-\mathbb{1}_t^{CCF}) \times \mathbb{1}_t^{Info} \times \mathbb{1}_t^{Long}\Delta e_t^s + \beta^{N,I,S}(1-\mathbb{1}_t^{CCF}) \times \mathbb{1}_t^{Info} \times (1-\mathbb{1}_t^{Long})\Delta e_t^s \\ &+ \beta^{N,N,L}(1-\mathbb{1}_t^{CCF}) \times (1-\mathbb{1}_t^{Info}) \times \mathbb{1}_t^{Long}\Delta e_t^s + \beta^{N,N,S}(1-\mathbb{1}_t^{CCF}) \times (1-\mathbb{1}_t^{Info}) \times (1-\mathbb{1}_t^{Long})\Delta e_t^s \\ &+ \boldsymbol{\xi}\boldsymbol{X_t^i} + \epsilon_t^i. \end{aligned} \tag{8}$$

The key coefficients are $\beta^{N,I,L}$ and $\beta^{N,I,S}$, which compare long-end-driven and short-end-driven information shocks during normal periods.

Table 12 presents the results. In normal periods, depreciation shocks trigger significant outflows only when they are both adverse information shocks and long-end driven. The coefficient on $\Delta e_t^s \times \mathbb{1}_t^{Info} \times (1-\mathbb{1}_t^{CCF}) \times \mathbb{1}_t^{Long}$ is negative and statistically significant for both shares and market value. By contrast, information shocks driven mainly by the short end of the forward curve have weaker and statistically insignificant effects. Non-information shocks do not generate

Table 12: Exchange Rate Shocks and Firm-level Capital Flows - Long-end-driven News

| | Shares | | Market Value | |
|---|---|---|---|---|
| $\Delta e_t^s \times \mathbb{1}_t^{Info} \times \mathbb{1}^{Long}$ | $-0.227^{***}$ | | $-0.349^{***}$ | |
| | (0.081) | | (0.127) | |
| $\Delta e_t^s \times \mathbb{1}_t^{Info} \times (1 - \mathbb{1}^{Long})$ | $-0.052$ | | $-0.139$ | |
| | (0.112) | | (0.230) | |
| $\Delta e_t^s \times (1 - \mathbb{1}_t^{Info}) \times \mathbb{1}^{Long}$ | 0.005 | | 0.028 | |
| | (0.067) | | (0.114) | |
| $\Delta e_t^s \times (1 - \mathbb{1}_t^{Info}) \times (1 - \mathbb{1}^{Long})$ | 0.081 | | 0.035 | |
| | (0.101) | | (0.181) | |
| $\Delta e_t^s \times \mathbb{1}_t^{Info} \times (1 - \mathbb{1}_t^{CCF}) \times \mathbb{1}^{Long}$ | | $-0.285^{***}$ | | $-0.467^{***}$ |
| | | (0.090) | | (0.140) |
| $\Delta e_t^s \times \mathbb{1}_t^{Info} \times (1 - \mathbb{1}_t^{CCF}) \times (1 - \mathbb{1}^{Long})$ | | $-0.053$ | | $-0.240$ |
| | | (0.126) | | (0.298) |
| $\Delta e_t^s \times \mathbb{1}_t^{Info} \times \mathbb{1}_t^{CCF} \times \mathbb{1}^{Long}$ | | 0.001 | | 0.069 |
| | | (0.104) | | (0.175) |
| $\Delta e_t^s \times \mathbb{1}_t^{Info} \times \mathbb{1}_t^{CCF} \times (1 - \mathbb{1}^{Long})$ | | 0.137 | | 0.096 |
| | | (0.158) | | (0.301) |
| $\Delta e_t^s \times (1 - \mathbb{1}_t^{Info}) \times (1 - \mathbb{1}_t^{CCF}) \times \mathbb{1}^{Long}$ | | $-0.021$ | | 0.078 |
| | | (0.183) | | (0.314) |
| $\Delta e_t^s \times (1 - \mathbb{1}_t^{Info}) \times (1 - \mathbb{1}_t^{CCF}) \times (1 - \mathbb{1}^{Long})$ | | $-0.048$ | | $-0.023$ |
| | | (0.186) | | (0.337) |
| $\Delta e_t^s \times (1 - \mathbb{1}_t^{Info}) \times \mathbb{1}_t^{CCF} \times \mathbb{1}^{Long}$ | | $-0.147$ | | $-0.107$ |
| | | (0.166) | | (0.240) |
| $\Delta e_t^s \times (1 - \mathbb{1}_t^{Info}) \times \mathbb{1}_t^{CCF} \times (1 - \mathbb{1}^{Long})$ | | 0.034 | | $-0.013$ |
| | | (0.127) | | (0.202) |
| Other Controls | Yes | Yes | Yes | Yes |
| Fixed Effect | Firm×Year | Firm×Year | Firm×Year | Firm×Year |
| N | 667,886 | 667,886 | 667,886 | 667,886 |
| $R^2$ | 0.02 | 0.02 | 0.04 | 0.04 |

*Notes:* This table reports firm-level regressions of changes in foreign holdings on exchange rate shocks. The dependent variable is the percentage change in foreign-held shares in columns (1)–(2) and the percentage change in the market value of foreign holdings in columns (3)–(4), for each stock $i$ on day $t$. The main independent variables are the exchange rate shock, $\Delta e_t^s$, and its interactions with indicators for non-CCF and CCF periods. $\mathbb{1}_t^{Info}$ indicates dates on which the exchange-rate surprise and the SGX FTSE A50 futures reaction have opposite signs. $\mathbb{1}_t^{Long}$ indicates dates on which the combined contribution of the 6-month and 1-year NDF contracts to the benchmark exchange-rate shock is above its sample median. All specifications include firm-by-year fixed effects. Standard errors clustered by firm and date are in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1.

systematic outflows.

This evidence strengthens the information interpretation in two ways. First, it shows that investors respond to depreciation surprises that contain persistent exchange-rate news, not merely to short-lived fluctuations in NDF prices. Second, it clarifies why the CCF regime attenuates the flow response. Even when a shock is classified as an information shock and is driven by the long end of the forward curve, the response is muted during CCF periods. This is consistent with the view that the CCF adds an additional policy component to the observed fixing surprise, making the mapping from exchange-rate news to fundamentals less transparent.

## 5.3 Public Macro News and Predictability

A natural concern is that the exchange-rate shocks identified around the fixing announcement may reflect public macroeconomic information rather than information revealed or summarized by the fixing itself. This concern is closely related to Bauer and Swanson (2023)'s critique of central-bank information effects: apparent information effects may arise because policy surprises are predictable from public information or because omitted macro-financial conditions drive both asset prices and subsequent outcomes.

We address this concern in two ways. First, we augment the baseline specification with additional overnight macro-financial controls. The baseline regressions already control for domestic and U.S. interest-rate changes, lagged exchange-rate changes, the CNH/CNY price differential, and changes in the VIX. Here we further add overnight changes in the U.S. dollar index and the Bloomberg Commodity Index, which capture global dollar and commodity-market conditions that may affect both RMB expectations and foreign portfolio flows.

Table 13 reports the results. The coefficient on the exchange-rate shock remains stable after adding these controls. The response is still concentrated in normal periods, while the coefficient during CCF periods remains smaller and statistically insignificant. This stability suggests that the baseline outflow response is not mechanically driven by observable overnight macro-financial developments.

Second, we directly test whether the exchange-rate shock is predictable from observable macro-financial variables:

$$\Delta e_t^s = \alpha + \boldsymbol{\xi}' \boldsymbol{X}_t + u_t. \tag{9}$$

Table 13: Exchange Rate Shocks and Firm-level Capital Flows – More Macro Controls

| | Shares | | Market Value | |
|---|---|---|---|---|
| $\Delta e_t^s$ | $-0.114^{**}$ | | $-0.243^{**}$ | |
| | (0.055) | | (0.093) | |
| $\Delta e_t^s \times (1 - \mathbb{1}_t^{CCF})$ | | $-0.138^{*}$ | | $-0.308^{**}$ |
| | | (0.072) | | (0.123) |
| $\Delta e_t^s \times \mathbb{1}_t^{CCF}$ | | $-0.070$ | | $-0.128$ |
| | | (0.084) | | (0.138) |
| $Ret_{t-5,t}^i$ | $0.023^{***}$ | $0.211^{***}$ | $0.023^{***}$ | $0.211^{***}$ |
| | (0.007) | (0.007) | (0.012) | (0.012) |
| $CNHCNY_{t-1}$ | $0.530^{**}$ | $0.539^{**}$ | 0.775 | $0.799^{*}$ |
| | (0.268) | (0.268) | (0.481) | (0.482) |
| $\Delta VIX_t$ | $-0.015$ | $-0.008$ | $-0.698$ | $-0.681$ |
| | (0.608) | (0.607) | (0.996) | (0.993) |
| Other Controls | Yes | Yes | Yes | Yes |
| More Macro Controls | Yes | Yes | Yes | Yes |
| Fixed Effect | Firm×Year | Firm×Year | Firm×Year | Firm×Year |
| N | 553,201 | 553,201 | 553,201 | 553,201 |
| $R^2$ | 0.03 | 0.03 | 0.05 | 0.05 |

*Notes:* This table reports firm-level regressions of changes in foreign holdings on exchange rate shocks. The dependent variable is the percentage change in foreign-held shares in columns (1)–(2) and the percentage change in the market value of foreign holdings in columns (3)–(4), for each stock $i$ on day $t$. The main independent variables are the exchange rate shock, $\Delta e_t^s$, and its interactions with indicators for non-CCF and CCF periods. We further control for overnight change of Bloomberg commodity index and the overnight change of DXY index. All specifications include firm-by-year fixed effects. Standard errors clustered by firm and date are in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1.

Table 14: Predictability of Exchange Rate Shocks

| | Full sample | | Normal time | | CCF period | |
|---|---|---|---|---|---|---|
| $\Delta DXY_t$ | 0.248** | | 0.330*** | | 0.099 | |
| | (0.103) | | (0.122) | | (0.180) | |
| JWY Nighttime Pillar | | 0.572*** | | 0.494** | | 0.602* |
| | | (0.175) | | (0.212) | | (0.317) |
| JWY Daytime Pillar | | 0.232 | | -0.171 | | 0.977** |
| | | (0.247) | | (0.294) | | (0.405) |
| $\Delta$Commodity$_t$ | 4.205 | 5.442 | 6.398 | 6.273 | 0.114 | 2.429 |
| | (3.905) | (3.887) | (4.140) | (4.250) | (8.738) | (8.199) |
| $\Delta e_{t-1}^{\text{market}}$ | 2.987 | -2.966 | -2.480 | 1.319 | 12.214 | -9.518 |
| | (14.275) | (16.551) | (20.236) | (22.987) | (18.973) | (22.511) |
| $\Delta i_t^{Shibor}$ | 0.106 | 0.089 | 0.294 | 0.253 | -0.141 | -0.106 |
| | (0.141) | (0.139) | (0.194) | (0.199) | (0.199) | (0.190) |
| $\Delta i_t^{FFR}$ | 0.313 | 0.917 | 0.328 | 0.939 | 0.916 | 1.206 |
| | (0.893) | (0.926) | (1.097) | (1.145) | (1.360) | (1.507) |
| $\Delta VIX_t$ | -0.001 | 0.035 | -0.013 | 0.037 | -0.079 | -0.059 |
| | (0.377) | (0.379) | (0.503) | (0.505) | (0.580) | (0.601) |
| $CNHCNY_{t-1}$ | 10.463 | 8.901 | 6.782 | -1.745 | 18.108 | 24.929 |
| | (18.006) | (19.134) | (24.417) | (26.507) | (26.682) | (27.707) |
| N | 1075 | 1051 | 577 | 559 | 498 | 492 |
| $R^2$ | 0.01 | 0.02 | 0.02 | 0.02 | 0.01 | 0.03 |

*Notes:* This table reports exchange rate shock responses to the daily macroeconomic news. Robust standard errors are in parentheses. *** p $<$ 0.01, ** p $<$ 0.05, * p $<$ 0.1.

Table 14 reports the predictability tests. Observable macro-financial variables have limited explanatory power for the high-frequency exchange-rate shock. The $R^2$ remains small across the full sample and across CCF and non-CCF subsamples, and most individual macro-financial predictors are statistically insignificant or economically small. These results suggest that the shock is not simply a repackaging of public macro news known before the fixing announcement.

At the same time, the predictability results are informative about the nature of the fixing signal. The U.S. dollar index has some predictive power, and when we replace it with the currency-basket components in Jermann, Wei and Yue (2022), the nighttime pillar predicts the exchange-rate shock during normal periods. During CCF periods, both nighttime and daytime pillars have predictive power. This pattern is consistent with the interpretation that the shock contains fixing-specific

information. In normal periods, the shock is more closely tied to the basket-pillar component. In CCF periods, the observed surprise reflects both basket-pillar movements and the additional counter-cyclical adjustment, making the information content less transparent.

Overall, this evidence does not imply that macro fundamentals are irrelevant. Rather, it suggests that the fixing shock contains incremental information beyond observable overnight macro-financial conditions. Combined with the previous subsections, the evidence supports the interpretation that investors respond to the information revealed or summarized by the fixing announcement, especially when the fixing regime makes that information easier to interpret.

## 5.4 Macro Announcement Dates and Information Salience

We finally examine when investors respond most aggressively to exchange-rate information. If the fixing announcement is interpreted as a signal about macro fundamentals, its informational content should be especially salient around Chinese macro announcement dates, when investors are already attentive to macroeconomic conditions and policy interpretation.

We test whether the flow response to depreciation shocks is stronger around Chinese macro announcement dates. Let $D_t^{k,x}$ be an indicator equal to one if date $t$ is $k$ trading days away from the closest announcement date of macro variable $x$. We estimate:

$$\begin{aligned}\Delta Y_{i,t} = &\sum_{k=-3}^{5} \beta_{1k} \left(\Delta e_t^s \times D_t^{k,x} \times \mathbb{1}_t^{CCF}\right) + \sum_{k=-3}^{5} \beta_{2k} \left(\Delta e_t^s \times D_t^{k,x} \times (1 - \mathbb{1}_t^{CCF})\right) \\ &+ \sum_{k=-3}^{5} \gamma_{1k} \left(\Delta x_t \times D_t^{k,x} \times \mathbb{1}_t^{CCF}\right) + \sum_{k=-3}^{5} \gamma_{2k} \left(\Delta x_t \times D_t^{k,x} \times (1 - \mathbb{1}_t^{CCF})\right) \\ &+ \delta_1 \Delta e_t^s + \delta_2 \left(\Delta e_t^s \times \mathbb{1}_t^{CCF}\right) + \sum_{k=-3}^{5} \theta_k D_t^{k,x} + \mathbf{X}_{i,t}' \boldsymbol{\lambda} + \alpha_{i,\text{year}(t)} + \varepsilon_{i,t}. \end{aligned} \tag{10}$$

The variable $\Delta x_t$ is the difference between the announced macro variable and the market consensus forecast from WIND. Since major Chinese macro variables are typically released around the middle of each month, we use industrial production growth as the benchmark measure of macro news.

Figure 6 presents the estimates of $\beta_{1k}$ and $\beta_{2k}$. The response to depreciation shocks becomes more negative around industrial-production announcement dates in normal periods, especially on the announcement date and the trading day immediately before the announcement. The pattern is weaker and less systematic during CCF periods.

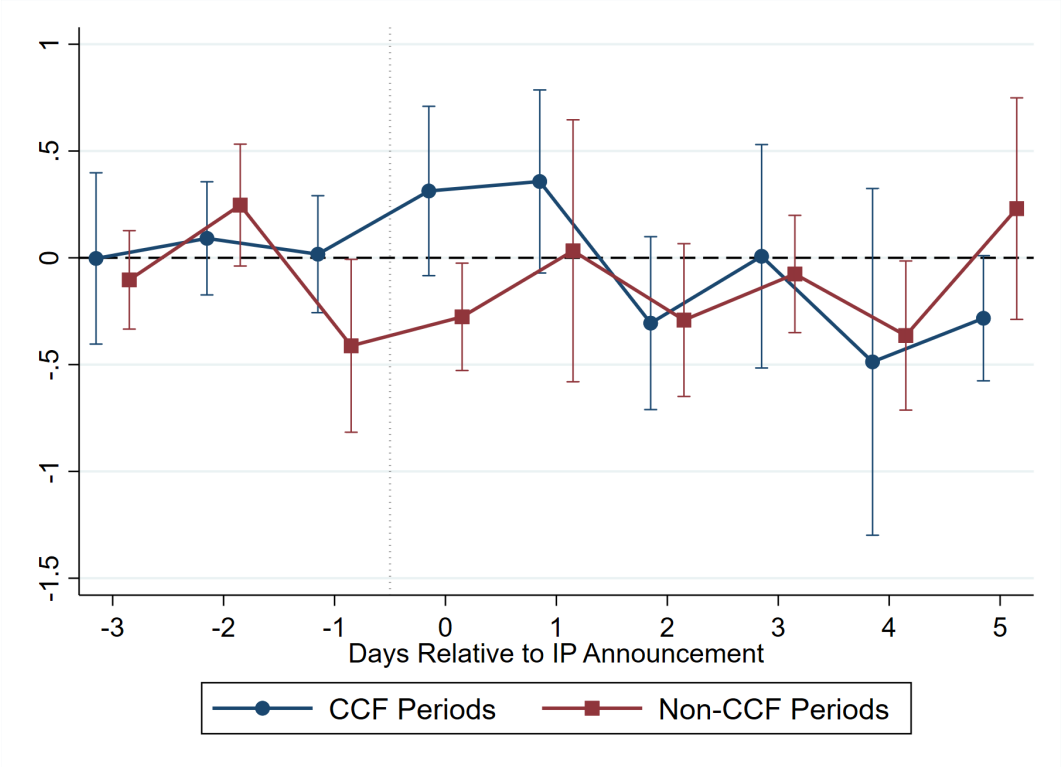



Figure 6: Exchange Rate Shock Pass-through to Capital Flows around IP Growth Announcement Dates

*Notes:* This figure presents dynamic capital flows responses to IP growth announcement dates $\beta_{1k}$ and $\beta_{2k}$ in Eq 10. The red line shows the responses of the normal periods, while the blue line shows the responses during the CCF periods. The 10% confidence intervals are presented for each point estimate.

We interpret this result as suggestive evidence of information salience. Around macro announcement windows, investors pay more attention to signals about Chinese fundamentals. A fixing depreciation surprise is therefore more likely to be interpreted as a macro-relevant signal, especially under the normal regime in which the fixing surprise is more directly linked to the basket pillar. This evidence complements the previous subsection. The stronger response around macro announcement dates does not simply reflect omitted public macro news, since the baseline effect is robust to rich overnight controls and the exchange-rate shock has limited predictability from observable macro-financial variables. Instead, macro announcement windows appear to amplify the portfolio response to fixing-induced exchange-rate information.

## 5.5 Summary

The evidence in this section supports an information-based interpretation of the main results. Foreign investors do not mechanically sell Chinese equities after every RMB depreciation surprise. The selling response is concentrated on days when depreciation shocks are accompanied by negative equity-market reactions, when the shock loads more heavily on longer-maturity forward prices, and when macro fundamentals are especially salient. These patterns suggest that investors respond to depreciation surprises when they are interpreted as adverse, persistent, and macro-relevant information.

The CCF heterogeneity is consistent with the same interpretation. In normal periods, fixing surprises are more tightly connected to the currency-basket pillar and therefore provide a relatively clean signal about RMB fundamentals or the policy authority's assessment of them. During CCF periods, the observed fixing surprise combines basket-pillar information with discretionary counter-cyclical adjustment, making the signal more ambiguous. As a result, belief revisions about the RMB path need not translate into aggressive portfolio rebalancing. This helps explain why depreciation shocks trigger significant foreign equity outflows in normal periods but not during CCF periods. Appendix C formalizes this intuition in a simple illustrative model, showing how a noisier policy signal can weaken investors' portfolio response to exchange-rate news.

# 6 Conclusion

This paper studies how exchange-rate shocks affect cross-border equity flows using China's daily CNY/USD fixing announcements. Combining high-frequency offshore CNY derivative prices with daily stock-level holdings from the China-Connect Program, we show that unexpected RMB depreciation shocks lead foreign investors to reduce their exposure to mainland A-shares. The effect appears in both market values and shares held, indicating active portfolio rebalancing rather than passive valuation changes.

The response is not mechanical. Outflows are concentrated in normal fixing periods and disappear when the Counter-Cyclical Factor (CCF) is active. Mechanism tests point to an information channel: depreciation shocks trigger outflows primarily when they coincide with negative equity-market reactions, load on longer-maturity forward prices, and occur around periods when macro fundamentals are salient. These patterns suggest that foreign investors respond to the information embedded in fixing-induced exchange-rate shocks, rather than to exchange-rate movements alone.

The CCF results highlight the role of policy regimes in shaping this transmission. Under the normal fixing regime, fixing surprises are more tightly linked to the currency-basket pillar and therefore provide a cleaner signal about RMB fundamentals. Under the CCF, the same observed surprise mixes basket-pillar information with discretionary counter-cyclical adjustment, making the signal more ambiguous and weakening the portfolio-flow response. More broadly, our findings suggest that exchange-rate management and capital-account liberalization interact: policy announcements affect not only exchange rates, but also the information environment in which global investors rebalance portfolios.

# References


**Albuquerque, Rui, Gregory H Bauer, and Martin Schneider.** 2007. "International equity flows and returns: a quantitative equilibrium approach." The Review of Economic Studies, 74(1): 1–30.

**Bahaj, Saleem, and Ricardo Reis.** 2024. The anatomy of a peg: lessons from China's parallel currencies. London School of Economics and Political Science.

**Basu, Mr Suman S, Ms Emine Boz, Ms Gita Gopinath, Mr Francisco Roch, and Ms Filiz D Unsal.** 2020. A conceptual model for the integrated policy framework. International Monetary Fund.

**Bauer, Michael D, and Eric T Swanson.** 2023. "An alternative explanation for the "fed information effect"." American Economic Review, 113(3): 664–700.

**Branson, William H, and Dale W Henderson.** 1985. "The specification and influence of asset markets." Handbook of international economics, 2: 749–805.

**Brennan, Michael J, and H Henry Cao.** 1997. "International portfolio investment flows." The Journal of Finance, 52(5): 1851–1880.

**Brunnermeier, Markus K, Michael Sockin, and Wei Xiong.** 2017. "China's gradualistic economic approach and financial markets." American Economic Review, 107(5): 608–613.

**Camanho, Nelson, Harald Hau, and Hélene Rey.** 2022. "Global portfolio rebalancing and exchange rates." The Review of Financial Studies, 35(11): 5228–5274.

**Candian, Giacomo, Pierre De Leo, and Luca Gemmi.** 2023. "Managing expectations with exchange rate policy." Available at SSRN 4719637.

**Cavallino, Paolo.** 2019. "Capital flows and foreign exchange intervention." American Economic Journal: Macroeconomics, 11(2): 127–170.

**Chen, Peidi, Yang Jiao, and Wenbin Wu.** 2025. "Dissecting the International Transmissions of US Monetary Policy." Available at SSRN 5367881.

**Chen, Sihao, and Shi Qiu.** 2023. "The Regime-Switching Policy for the RMB." Available at SSRN 4044671.

**Cieslak, Anna, and Andreas Schrimpf.** 2019. "Non-monetary news in central bank communication." Journal of International Economics, 118: 293–315.

**Coppola, Antonio, Matteo Maggiori, Brent Neiman, and Jesse Schreger.** 2021. "Redrawing the map of global capital flows: The role of cross-border financing and tax havens." The Quarterly Journal of Economics, 136(3): 1499–1556.

**Davis, J Scott, Michael B Devereux, and Changhua Yu.** 2023. "Sudden stops and optimal foreign exchange intervention." Journal of International Economics, 141: 103728.

**Dominguez, Kathryn M, and Jeffrey A Frankel.** 1993. "Does foreign-exchange intervention matter? The portfolio effect." The American Economic Review, 83(5): 1356–1369.

**Evans, Martin DD, and Richard K Lyons.** 2002. "Order flow and exchange rate dynamics." Journal of political economy, 110(1): 170–180.

**Fanelli, Sebastián, and Ludwig Straub.** 2021. "A theory of foreign exchange interventions." The Review of Economic Studies, 88(6): 2857–2885.

**Fratzscher, Marcel, Oliver Gloede, Lukas Menkhoff, Lucio Sarno, and Tobias Stöhr.** 2019. "When is foreign exchange intervention effective? Evidence from 33 countries." American Economic Journal: Macroeconomics, 11(1): 132–156.

**Gabaix, Xavier, and Matteo Maggiori.** 2015. "International liquidity and exchange rate dynamics." The Quarterly Journal of Economics, 130(3): 1369–1420.

**Gertler, Mark, and Peter Karadi.** 2015. "Monetary policy surprises, credit costs, and economic activity." American Economic Journal: Macroeconomics, 7(1): 44–76.

**Goldberg, Linda S, and Signe Krogstrup.** 2023. "International capital flow pressures and global factors." Journal of International Economics, 146: 103749.

**Gourinchas, Pierre-Olivier, Walker Ray, and Dimitri Vayanos.** 2025. "A preferred-habitat model of term premia, exchange rates, and monetary policy spillovers." American Economic Review, 115(11): 3788–3824.

**Gürkaynak, Refet S, Brian Sack, and Eric T Swanson.** 2005. "Do Actions Speak Louder Than Words? The Response of Asset Prices to Monetary Policy Actions and Statements." International Journal of Central Banking.

**Hau, Harald, and Helene Rey.** 2006. "Exchange rates, equity prices, and capital flows." The Review of Financial Studies, 19(1): 273–317.

**He, Zhiguo, Yuehan Wang, and Xiaoquan Zhu.** 2023. "Homemade foreign trading." University of Chicago, Becker Friedman Institute for Economics Working Paper, , (2022-170).

**Itskhoki, Oleg, and Dmitry Mukhin.** 2021. "Exchange rate disconnect in general equilibrium." Journal of Political Economy, 129(8): 2183–2232.

**Jarociński, Marek, and Peter Karadi.** 2020. "Deconstructing monetary policy surprises—the role of information shocks." American Economic Journal: Macroeconomics, 12(2): 1–43.

**Jermann, Urban J, Bin Wei, and Vivian Z Yue.** 2022. "The Two-Pillar Policy for the RMB." The Journal of Finance, 77(6): 3093–3140.

**Jiang, Zhengyang, Robert J Richmond, and Tony Zhang.** 2025. "Understanding the Strength of the Dollar." Journal of Financial Economics, 168: 104052.

**Kekre, Rohan, and Moritz Lenel.** 2024. "The flight to safety and international risk sharing." American Economic Review, 114(6): 1650–1691.

**Ma, Chang, John H Rogers, and Sili Zhou.** 2019. "The effect of the China Connect." Available at SSRN 3432134.

**Nakamura, Emi, and Jón Steinsson.** 2018. "High-frequency identification of monetary non-neutrality: the information effect." The Quarterly Journal of Economics, 133(3): 1283–1330.

**Obstfeld, Maurice, and Haonan Zhou.** 2022. "The global dollar cycle." Brookings papers on economic activity, 2022(2): 361–447.

**Ottonello, Pablo, Diego J Perez, and William Witheridge.** 2024. "The Exchange Rate as an Industrial Policy." National Bureau of Economic Research.

**Portes, Richard, and Helene Rey.** 2005. "The determinants of cross-border equity flows." Journal of international Economics, 65(2): 269–296.

**Rey, Hélène.** 2015. "Dilemma not trilemma: the global financial cycle and monetary policy independence." National Bureau of Economic Research.

**Rey, Hélène, Vania Stavrakeva, and Jenny Tang.** 2024. "Currency centrality in equity markets, exchange rates and global financial cycles." National Bureau of Economic Research.

**Sarno, Lucio, and Mark P Taylor.** 2001. "Official intervention in the foreign exchange market: is it effective and, if so, how does it work?" journal of Economic Literature, 39(3): 839–868.

**Song, Zheng, and Wei Xiong.** 2018. "Risks in China's financial system." Annual review of financial economics, 10(1): 261–286.

**Stockman, Alan C, and Lars EO Svensson.** 1987. "Capital flows, investment, and exchange rates." Journal of Monetary Economics, 19(2): 171–201.

# A Data Appendix

We collect NDF prices from Bloomberg, where we use the intraday price of the CNY-USD forward rate in 5-min ticks. In our baseline measure, we collect the price changes of NDF contracts with maturities at 1 week, 1 month, 2 months, 3 months, 6 months, and 12 months. We collect the open price for 9:25-9:30 tick, and the end price for 9:00-9:25 tick to construct our benchmark shock measure. We winsorize the shock measure at 0.5% at both sides to avoid extreme value of exchange rate shocks.

We collect firm-level outstanding shares held by international investors from China-Connect Program from WIND database. We collect the firm-level market value flow by the product between amount of shares and daily stock closing prices from CSMAR. In our baseline regressions, we exclude the following samples:

1. Stocks that are listed after 2017;
2. Stocks with daily price change $> 10\%$ or $< -10\%$;
3. Samples without change of shares;
4. Samples whose total share amount held by international investors are at bottom 5% of all sample;
5. Winsorize percentage change of share amount at 1% from both sides;
6. After all previous procedures, the stock has less than 50 valid records throughout our sample period.

In regression controlling for lagged 5-day stock returns, we also winsorize it at 1% from both sides.

# B Baseline Results without CNH Bill Roll-off Dates

Table B1: Exchange Rate Shocks and Firm-level Capital Flows – No CNH Bill Roll-off Dates

| | Share Holding | | Market Value | |
|---|---|---|---|---|
| $\Delta e_t^s$ | $-0.096^{**}$ | | $-0.157^{**}$ | |
| | (0.039) | | (0.066) | |
| $\Delta e_t^s \times (1 - \mathbb{1}_t^{CCF})$ | | $-0.115^{**}$ | | $-0.207^{**}$ |
| | | (0.053) | | (0.086) |
| $\Delta e_t^s \times \mathbb{1}_t^{CCF}$ | | $-0.069$ | | $-0.084$ |
| | | (0.059) | | (0.104) |
| $Ret_{t-5,t}^i$ | $0.031^{***}$ | $0.031^{***}$ | $0.235^{***}$ | $0.235^{***}$ |
| | (0.006) | (0.006) | (0.009) | (0.009) |
| $CNHCNY_{t-1}$ | $0.479^{***}$ | $0.478^{***}$ | $0.928^{***}$ | $0.927^{***}$ |
| | (0.171) | (0.171) | (0.295) | (0.295) |
| $\Delta VIX_t$ | $-0.841^{*}$ | $-0.838^{*}$ | $-1.935^{**}$ | $-1.925^{**}$ |
| | (0.438) | (0.438) | (0.757) | (0.756) |
| Other Controls | Yes | Yes | Yes | Yes |
| Fixed Effect | Firm×Year | Firm×Year | Firm×Year | Firm×Year |
| N | 1,171,135 | 1,171,135 | 1,171,135 | 1,171,135 |
| $R^2$ | 0.02 | 0.02 | 0.03 | 0.03 |

*Notes:* This table reports firm-level regressions of changes in foreign holdings on exchange rate shocks. The dependent variable is the percentage change in the outstanding shares held by Hong Kong investors through the China-Connect Program for each stock $i$ on day $t$. The main independent variables are the exchange rate shock, $\Delta e_t^s$, and its interactions with indicators for non-CCF and CCF periods. Nine CNH bill roll-off dates are excluded from the sample: 2019/07/26, 2020/02/10, 2021/02/15, 2021/03/29, 2021/05/18, 2021/06/28, 2021/08/17, 2021/11/16, and 2023/06/22. All specifications include firm-by-year fixed effects. Standard errors clustered by firm and date are in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1.

# C A Simple Illustrative Model

## C.1 Overview

We build a simple signal-extraction model that illustrates how the information content of an exchange-rate policy announcement maps into foreign portfolio rebalancing, and how an active counter-cyclical intervention dampens that mapping. The trader and preference structure follows Jermann, Wei and Yue (2022). To focus on the information channel, we abstract from sterilized intervention, noise traders, and the optimal central-parity rule, and instead introduce two ingredients:

1. Imperfect information: traders do not directly observe the fundamental driving the excess return on RMB-denominated assets, and must learn about it through the daily exchange-rate announcement.

2. Regime-dependent signal precision: under the Counter-Cyclical Factor (CCF), the announced exchange rate is a noisier signal of the fundamental, in the spirit of Brunnermeier, Sockin and Xiong (2017).

## C.2 Setup

### C.2.1 Traders and preferences

There is a unit continuum of foreign investors $i \in [0, 1]$, myopic and two-period lived. Each is born at date $t$ with initial wealth $W$ and chooses a position $X_t^i$ in the RMB-denominated risky asset to maximize CARA utility over terminal wealth:

$$\max_{X_t^i} \ \mathbb{E}\big[-\exp(-\gamma W_{t+1}^i) \,\big|\, \mathcal{F}_t^i\big], \qquad W_{t+1}^i = (1 + i_t)W + X_t^i \pi_{t+1}, \tag{1}$$

where $\gamma > 0$ is absolute risk aversion, $i_t$ is the riskless return, and $\pi_{t+1}$ is the excess return on the RMB-denominated risky asset over $[t, t + 1]$.

### C.2.2 Excess return and fundamentals

We adopt a reduced-form link between the excess return and an underlying RMB fundamental $f_t$:

$$\pi_{t+1} = \theta\, f_t + u_{t+1}, \qquad u_{t+1} \overset{\text{i.i.d.}}{\sim} \mathcal{N}(0, \sigma_u^2), \qquad \theta > 0, \tag{2}$$

with $u_{t+1}$ independent of all date-$t$ random variables. The variable $f_t$ summarizes the strength of RMB fundamentals: a higher $f_t$ raises the expected excess return on holding RMB-denominated assets (e.g. A-shares through the Stock Connect channel) for the foreign investor. Traders share a Gaussian prior

$$f_t \sim \mathcal{N}(0, \sigma_f^2). \tag{3}$$

### C.2.3 Announcement and information structure

At the start of each trading day, the central bank announces the central parity rate before the equity market opens. Let $\Delta e_t^s$ denote the high-frequency depreciation surprise extracted from the announcement window, defined so that a positive value corresponds to an unexpected RMB depreciation. We assume the surprise carries fundamental information contaminated by a policy-driven noise:

$$\Delta e_t^s = -f_t + \nu_t, \qquad \nu_t \mid \mathcal{R}_t \sim \mathcal{N}\big(0, \sigma_\nu^2(\mathcal{R}_t)\big), \tag{4}$$

with $\nu_t$ independent of $f_t$ and $u_{t+1}$. The negative loading on $f_t$ reflects that adverse fundamentals translate into RMB depreciation: a stronger fundamental pushes the announced parity in the appreciation direction, while a weaker fundamental induces a depreciation surprise.

The variance of the policy-driven component depends on the prevailing fixing regime $\mathcal{R}_t \in \{N, C\}$, where $N$ denotes the normal two-pillar regime and $C$ denotes the CCF regime. Following the discussion in Brunnermeier, Sockin and Xiong (2017), we assume

$$0 < \sigma_\nu^2(N) \;\equiv\; \sigma_N^2 \;<\; \sigma_C^2 \;\equiv\; \sigma_\nu^2(C). \tag{5}$$

The CCF augments the basket-pillar fixing rule with a discretionary, counter-cyclical adjustment. From the trader's standpoint, this discretionary component is unobservable, raising the non-fundamental dispersion in the announced parity.

The trader's date-$t$ information set is $\mathcal{F}_t^i = \{\mathcal{R}_t, \Delta e_t^s\}$. Traders know the regime they are in

and observe the announcement surprise, but do not directly observe $f_t$ or $\nu_t$.

## C.3 Bayesian updating

By Gaussian conjugacy, the posterior of $f_t$ given the announcement is normal with mean and variance

$$\mathbb{E}_t[f_t \mid \Delta e_t^s] = -\,K(\mathcal{R}_t)\,\Delta e_t^s, \tag{6}$$

$$\mathrm{Var}_t[f_t \mid \Delta e_t^s] = \big(1 - K(\mathcal{R}_t)\big)\,\sigma_f^2, \tag{7}$$

where the Kalman gain is

$$K(\mathcal{R}_t) = \frac{\sigma_f^2}{\sigma_f^2 + \sigma_\nu^2(\mathcal{R}_t)} \;\in\; (0,1). \tag{8}$$

The negative sign in (6) follows from the negative loading in (4): an unexpected depreciation revises the trader's posterior about RMB fundamentals downward.

Substituting into (2), the trader's conditional moments of the excess return are

$$\mathbb{E}_t[\pi_{t+1}] = -\,\theta\,K(\mathcal{R}_t)\,\Delta e_t^s, \tag{9}$$

$$\mathrm{Var}_t[\pi_{t+1}] = \theta^2\big(1 - K(\mathcal{R}_t)\big)\sigma_f^2 + \sigma_u^2. \tag{10}$$

## C.4 Optimal demand and equilibrium flow

CARA-Gaussian preferences applied to (1) yield the standard mean-variance demand

$$X_t^i = \frac{\mathbb{E}_t[\pi_{t+1}]}{\gamma\,\mathrm{Var}_t[\pi_{t+1}]}. \tag{11}$$

Aggregating across the unit continuum of identical foreign investors, total foreign demand for the RMB-denominated risky asset is

$$Y_t \;\equiv\; \int_0^1 X_t^i\,di \;=\; \frac{-\,\theta\,K(\mathcal{R}_t)\,\Delta e_t^s}{\gamma\big[\theta^2\big(1 - K(\mathcal{R}_t)\big)\sigma_f^2 + \sigma_u^2\big]}. \tag{12}$$

We interpret $Y_t$ as the foreign-investor capital flow into the RMB-denominated risky asset. In our empirical setting, this maps directly to the daily Northbound flow into A-shares through the Stock Connect channel.

## C.5 Capital flow response and the role of the CCF

Differentiating (12) with respect to the announcement surprise yields the regime-dependent flow sensitivity

$$\beta(\mathcal{R}_t) \;\equiv\; \frac{\partial Y_t}{\partial\, \Delta e_t^s} \;=\; \frac{-\,\theta\, K(\mathcal{R}_t)}{\gamma\big[\theta^2\big(1-K(\mathcal{R}_t)\big)\sigma_f^2+\sigma_u^2\big]}. \tag{13}$$

**Sign.** For any regime, $\beta(\mathcal{R}_t) < 0$. An unexpected depreciation ($\Delta e_t^s > 0$) lowers the conditional posterior mean of $f_t$, lowers the conditional expected excess return $\mathbb{E}_t[\pi_{t+1}]$, and shrinks foreign demand for the RMB-denominated asset. The model thus delivers foreign equity outflows in response to unexpected RMB depreciation, consistent with the baseline empirical result in our paper. The mechanism is an information channel rather than a valuation channel: the asset is RMB-denominated, so a contemporaneous mechanical valuation effect from the exchange-rate change is absent.

**Comparative statics across regimes.** Because $\sigma_C^2 > \sigma_N^2$, equation (8) implies

$$K(C) < K(N).$$

Substituting into (13), one can show that the absolute flow sensitivity is strictly increasing in the Kalman gain. Define

$$g(K) \;\equiv\; \frac{K}{\theta^2(1-K)\sigma_f^2+\sigma_u^2}.$$

Differentiating gives

$$g'(K) = \frac{\theta^2\sigma_f^2+\sigma_u^2}{\big[\theta^2(1-K)\sigma_f^2+\sigma_u^2\big]^2} \;>\; 0,$$

so that $|\beta(\mathcal{R})| = (\theta/\gamma)\, g(K(\mathcal{R}))$ is strictly increasing in $K(\mathcal{R})$. Consequently,

$$\big|\beta(C)\big| \;<\; \big|\beta(N)\big|. \tag{14}$$

The dampening operates through two reinforcing channels. First, a smaller Kalman gain shrinks the conditional mean response: traders place less weight on the noisier CCF announcement when forming their posterior about $f_t$, so the posterior expected excess return moves less per unit of announcement surprise. Second, the conditional variance of the excess return is higher under the CCF, since $\big(1-K(C)\big)\sigma_f^2 > \big(1-K(N)\big)\sigma_f^2$. Greater residual fundamental uncertainty raises

the price of risk and shrinks the mean-variance demand for any given conditional mean. Both forces dampen the foreign flow response to the same observed exchange-rate shock.

**Limit cases.** As $\sigma_\nu^2(\mathcal{R}) \to 0$, $K(\mathcal{R}) \to 1$, the announcement becomes a perfectly informative signal of $f_t$, and $\beta(\mathcal{R}) \to -\theta/(\gamma\sigma_u^2)$, which is the maximal flow sensitivity attainable in the model. As $\sigma_\nu^2(\mathcal{R}) \to \infty$, $K(\mathcal{R}) \to 0$, the announcement is uninformative, and $\beta(\mathcal{R}) \to 0$.