Information Acquisition, Uncertainty Reduction and Pre-announcement Premium in China*

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Abstract

We examine the stock market returns in an environment in which the dates of the central bank's information supply through public announcements are not prescheduled. We document that positive excess returns are accumulated as early as three days before China's central bank releases the monthly data of monetary aggregates, which may be announced either early or late in a month. In particular, this pre-announcement premium exists only when an announcement arrives late in an announcement cycle. We provide a theoretical framework in which the degree of information acquisition in the market increases as the date approaches the end of an announcement cycle while investors are still waiting for the arrival of an announcement, a hypothesis that receives strong empirical support. We show that the information acquisition channel highlighted in Ai, Bansal, and Han (2022) explains the uncertainty reduction and the positive risk premium before monetary announcements in China.

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1 Introduction

In this paper, we examine how and why stock markets react ex ante to the anticipated central bank announcements on its monetary policy stance. In particular, we study the equity returns in an environment in which the dates of the central bank's information supply through public announcements are *not* prescheduled. Savor and Wilson (2013, 2014) document positive excess returns realized in the U.S. stock market on the prescheduled dates of the Federal Reserve Board (FRB)'s Federal Open Market Committee (FOMC) statement releases.[1] Lucca and Moench (2015) find that the FOMC-related premium accrues over the hours prior to the FRB's announced policy decision and regard this pre-announcement premium as a puzzle due to a lack of data-consistent theories. More importantly, such impacts of central banks' announcements on equity markets are more of an international issue. Brusa, Savor, and Wilson (2019) show that the stock markets of 35 countries exhibit strong reactions to the FOMC announcements, whereas 3 other markets are not at all responsive.

We demonstrate that the variation in the scheduling and timing of announcements is important for identifying the mechanism behind the reactions of the equity market to central bank announcements. Our study is therefore framed within the Chinese context, where the People's Bank of China (PBOC), the country's central bank, announces key statistics measuring its monetary policy stance every month in a *quasi-scheduled* fashion. In other words, the market expects monetary data to be released on a day of each month with the probability of one, but the exact date and time of the announcement arrival is largely unknown ahead of time.[2]

First, we document a sizable pre-announcement premium in China's equity market before the PBOC's announcement releases of monetary data, which is approximately five times as large as the average equity premium in China. The accumulation of positive excess returns can be initialized as early as three days before announcements. Importantly, we find that this pre-announcement premium exists only when an announcement arrives late in a month. In addition, using Bloomberg economists' forecast data, we show that market uncertainty is reduced prior to announcements,

[1] The Federal Reserve Board preschedules the dates of FOMC meetings each year and informs the market of those dates ahead of time. On average, eight FOMC statements are issued in a year immediately after the FOMC meetings.

[2] Chen, Ren, and Zha (2018) show that monetary aggregates such as the growth rate of M2 are very important measures of the monetary policy stance in China.

while positive excess returns are accrued. Our findings for China's markets suggest that the domestic response of the stock market to its own central bank's announcements of monetary policy stance does not rely on the prescheduled nature of such announcements and is not a U.S.-specific phenomenon.

We then lay out our theoretical discussions within the framework of Ai, Bansal, and Han (2022), which rationalizes the pre-announcement premium by featuring endogenous information acquisition among investors. Ai, Bansal, and Han (2022) propose that with generalized risk-sensitive preferences, uninformed investors choose to acquire information ahead of announcements because the information advantages of informed investors over uninformed investors are particularly large during the pre-announcement window. Our paper examines the asset pricing implications of this theoretical framework by highlighting the random timing of quasi-scheduled central bank announcements as instituted in China. We show that investors' perceived probability of seeing an announcement on the next day weakly increases as time evolves. As a result, more uninformed investors find it optimal to acquire extra information when the date is increasingly close to the actual announcement day. Therefore, the degree of information acquisition can increase as the date approaches the end of an announcement cycle while an announcement is still pending. The information acquisition channel as in Ai, Bansal, and Han (2022) then predicts that greater information acquisition as associated with late announcements drives down market uncertainty and boosts equity prices before announcements.

Our paper stresses that the unique Chinese environment with quasi-scheduled central bank announcements helps identify the information acquisition channel. We then test the hypotheses regarding the dynamics of information acquisition in the PBOC's announcement windows. Importantly, we construct measures of the degree of investors' information acquisition using keyword search data from Baidu, Inc., i.e., the largest internet search engine in China.[3] The Baidu search data well capture the intensity of information acquisition driven by less sophisticated individual investors in China (Xu, Xuan, and Zheng, 2021). These proxies therefore best align our empirical

[3]By 2020, it is calculated that the Baidu search engine has maintained an approximately 70% market share in China for queries online according to Statcounter's data (http://gs.statcounter.com/search-engine-market-share/). Statcounter is a company that provides web analytics services by tracking more than 2 million sites globally. It presents real-time calculations of internet traffic conditional on channels and search engines across countries.

evidence with the theoretical framework of Ai, Bansal, and Han (2022) by measuring the information acquisition of uninformed investors. By examining changes in the Baidu keyword search index regarding China's monetary statistics and aggregate credit conditions, we provide strong empirical evidence that information acquisition is significantly increased prior to the PBOC's announcements. Most importantly, while a sizable pre-announcement premium is accrued only for late announcements, investors acquire more information during the same pre-announcement window for late announcements than the case of the market seeing early announcements. We thus conclude that our documented pre-announcement premium in China is consistent with the hypothesis that investors initiate larger efforts to acquire information before announcements in the case of late announcements.

Our theoretical discussions do not rely on a critical assumption of information leakages, which is implicitly or explicitly imposed in a class of models that generate the pre-announcement premium (e.g., Ai and Bansal, 2018; Jiang, Pan, and Qiu, 2019). While the information leakage channel concerns stock prices incorporating the "first moment" of news prior to announcements, our paper highlights the asset pricing implications of changes in the "second moment", i.e., the market uncertainty concerning the to-be-announced policy changes.[4] In addition, our paper is distinguished from the large literature that identifies the impacts of monetary policy shocks on financial markets upon information release (Bernanke and Kuttner, 2005; Nakamura and Steinsson, 2018). Rather, we focus on the ex-ante effects of central bank announcements on stock markets. Our study thus contributes to the literature by exploiting the variation of announcement timing in China and identifies the information acquisition channel through which the equity premium is driven by uncertainty reduction prior to announcements.

Related Literature. Our paper is related to three strands of literature. First, our study is aligned with the empirical works that explore the impacts of macro announcements on equity prices. Savor

[4]However, although we show that our documented pre-announcement premium is not dependent on the expected or unexpected component of the monetary statistics announced ex post, our paper abstracts from establishing that there is no other form of data leakages or informed trading that may partially explain our findings. For example, based on high-frequency trading data, Bernile, Hu, and Tang (2016) and Kurov et al. (2019) find that the U.S. stock market moves in the same direction as the to-be-released data over a very short period of a few minutes before announcements. They find that multiple sources of information delivery, which are not necessarily data leakages, could lead to informed trading prior to announcements.

and Wilson (2013, 2014) find that the U.S. equity market exhibits larger excess returns and Sharpe ratios on days of data releases for inflation, unemployment, and various interest rates. Lucca and Moench (2015) document a pre-announcement premium in response to FOMC statement issuance. Cieslak, Morse, and Vissing-Jorgensen (2019) detect that the equity premium realized before and on the FOMC days is part of a larger premium cycle earned in even weeks starting from the previous FOMC meeting. Our paper is the first to provide empirical evidence on China's stock market in windows of its central bank's announcements of monetary aggregates data. This enriches and extends the existing view that the U.S. Federal Reserve is the unique central bank that matters for its own and other stock markets (Brusa, Savor, and Wilson, 2019).[5] Our paper also emphasizes that the pre-announcement premium does not rely on its prescheduled nature.

Second, our paper builds upon the information-based theory that aims to explain the equity premium driven by macro announcement events. Ai and Bansal (2018) use generalized risk-sensitive preferences and theorize that the probability distortions in investors' preferences help realize positive equity premium on announcement days by affecting the degree of discounting. Jiang, Pan, and Qiu (2019) emphasize informed trading prior to public announcements for delivering the premium. Wachter and Zhu (2021) account for the announcement premium using a model in which investors learn about a latent disaster probability from scheduled announcements. While these theories aim to rationalize the stock returns on announcement days, they have to entertain the possibility that there is some leakage of the central bank's information ex ante to deliver the premium prior to announcements. Ai, Bansal, and Han (2022) carefully document the return and volatility patterns around the FOMC days and propose a rational expectation equilibrium model with both informed and uninformed investors, generalized risk-sensitive preferences, and endogenous information acquisition from noisy signals to jointly account for the pre-announcement premium and return volatility dynamics. Laarits (2019) builds a model in which investors' interpretations of recent stock market performance are signals indicative of the FRB's to-be-announced decision, which helps resolve market uncertainty ex ante. In this paper, we follow Ai, Bansal, and Han (2022) and explore the implications of macro announcements on stock returns given the timing variation of unsched-

[5]In Sections B.4 and B.7 of the Online Appendix, we find that China's equity market had a muted response to the U.S. FOMC news before 2015 but started realizing negative excess returns before and after the FOMC announcements since 2015. In addition, we document that the PBOC's monthly announcements have significant post-announcement impacts on neighboring stock markets, including the Hong Kong, Japan and South Korea.

uled announcements. Our empirical strategy helps identify the information acquisition channel to explain the pre-announcement premium in China for causal inference.

The closest papers related to ours are Hu et al. (2021) and Cocoma (2022). First, along with Lucca and Moench (2015), Martello and Ribeiro (2018), Beckmeyer, Branger, and Grunthaler (2021) and Bauer, Lakdawala, and Mueller (2021), Hu et al. (2021) emphasize the heightening and the subsequent reduction of the posterior variance in the market, i.e., market uncertainty as measured by the VIX index, as the main driver of the pre-FOMC announcement premium. Our paper differs from these works. By exploiting the unique features of China's markets, we show that the cross-event variation of announcement timing gives us the latitude to better identify market uncertainty changes as a result of investors' information acquisition decisions. Second, Cocoma (2022) studies an environment of prescheduled announcements and assumes investors have differences of opinion. The reduction in disagreement prior to announcements lowers the sentiment risk and generates an upward pre-announcement drift. Our paper focuses on the asset pricing implications of randomness in announcement timing. We show that investors' perceived probability of seeing an announcement on the next day weakly increases as time moves closer to the end of an announcement cycle. Following Ai, Bansal, and Han (2022), market uncertainty drops and stock prices jump because more uninformed investors initiate information acquisition when an announcement arrives late in a cycle.

Third, our paper is also related to the literature that studies asset pricing with endogenous information acquisition. In the spirit of Sims (2003), models of investors with limited attention and costly information-processing capacity predict that asset values can be endogenously shifted by the decision of attention optimization, which serves as the microfoundation that determines the information and investment decisions (Peng and Xiong, 2006; Kacperczyk, Nieuwerburgh, and Veldkamp, 2016; Kacperczyk, Nosal, and Stevens, 2019; Kacperczyk, Nosal, and Sundaresan, 2022). Fisher, Martineau, and Sheng (2022) develop a macroeconomic attention index based on news article counts from newspapers featuring macroeconomic news. They show that pre-announcement attention predicts the announcement-related risk premium and changes in the VIX. Our paper highlights that the channel of information-driven uncertainty reduction can be particularly important for delivering the pre-announcement premium in China. Ben-Rephael et al. (2021) show that the CAPM performs better on the FOMC announcement days, and they show that information consumption among investors is the driving force. We differ from Ben-Rephael et al. (2021) in that we regard the information acquisition related to monetary statistics and policy stance measurement as a device to mitigate the risk of holding the market portfolio ex ante, whereas their rationalization is based on the information spillover and cross-learning among individual stocks.

The rest of the paper is structured as follows. We discuss in Section 2 the institutional details in China regarding the roles of the PBOC as a central bank, the routines of the PBOC's periodic announcements and the data sources. Section 3 documents the main empirical findings regarding the pre-announcement premium in China. In Section 4, we provide theoretical discussions of the information acquisition channel to explain the pre-announcement premium associated with late announcements. We document additional empirical facts that are consistent with our hypotheses regarding information acquisition in the announcement windows. Section 5 concludes the paper. In the Appendix, we provide supplementary empirical evidence and proofs. In addition, we have a separate and rich Online Appendix in which we present additional results covering a much wider range of explorations.

2 Institutional Details and Data

2.1 Monetary Policy in China and PBOC Market Communications

The People's Bank of China assumed its role as China's central bank in 1984. The issuance of The PBOC Law of the People's Republic of China in 1995 stipulated that the PBOC is responsible for designing and conducting monetary policy in China. From 1984 to 1997, the PBOC mainly regulated strict quotas on credit and cash supply to specifically counterstrike domestic inflation and to promote economic growth. Launches of stock markets, interbank markets and foreign exchange markets at the same time urgently called for market-based reforms on the PBOC's rigid monetary policy framework.

In 1996, the quantity-based measure of aggregate money supply was officially set as an intermediate target for China's monetary policy, and this is when monetary statistics including M0 (cash in circulation), M1 (narrow measure of monetary aggregates) and M2 (broad measure of monetary aggregates) were being published regularly by the PBOC. In 1998, the PBOC's credit quotas on major national banks were completely abolished, and since then, the PBOC started working with standard tools of monetary policies, including open market operations, reserve requirement management, interest rate adjustments and discount loans, etc., to indirectly achieve the money growth targets.

Entering 2013, shrinkage in foreign reserves and fluctuations of financial markets in China rendered the PBOC to push forward innovative monetary policy practices to better maintain credit market stability and to provide a well-needed stimulus to the real sectors. Since then, the PBOC started carrying out both short-term and medium-term lending facilities, special-purpose loan programs, interest rate channel management, bank note swaps and other tools to optimize market liquidity and loans on initiative. In the midst of the interest rate liberalization process, key interest rates, including DR007, i.e., the 7-day repurchase rate pledged for interest rate bonds by deposit-taking institutions in China's interbank market, and LPR, the loan prime rate, were practically considered important policy targets for money and credit markets, respectively. However, monetary aggregates data such as the growth rate of M2 are still by far one of the most critical gauges of the monetary policy stance in China (Chen, Ren, and Zha, 2018).

Importantly, since 2010, the PBOC has increasingly put efforts into public communications to better guide market expectations and to increase its policy transparency. Important aggregate monetary statistics are published on the PBOC's website every month.[6] Official PBOC research reports and papers, data release and interpretation press conferences, joint conferences with other government agencies, media coverage of PBOC senior officials' views and comments, and regular WeChat news feeds are all forms of central bank communications that the PBOC has adhered in recent years. These actions largely enhanced the market's comprehension of China's macroeconomic performance, upcoming market risks, additional policy necessities, and the specific goals of monetary policy adjustments. All these initiatives are pivotal to ensure the stability and smooth functioning of Chinese financial markets and to ultimately enhance the overall effectiveness of monetary policy in China.

[6]Before 2010, the PBOC's website published monthly monetary statistics by issuing news of descriptive data summaries instead of more concise statistics statements. Since December 2009, the Statistics and Analysis Department of the PBOC formalized the routine of publishing monthly monetary statistics by releasing a short statement every month with a clean title "Financial Statistics Report (Month, Year)". The website of the PBOC was reformatted later in September 2010, with archives of all the monthly statements in the "Statistical Releases" section.

2.2 PBOC Announcements of Monetary Aggregates Data

By announcements, we refer to public news that specifically delivers up-to-date statistics of a macroeconomic variable with regular publication frequency.[7] In this paper, we are primarily interested in the announcements made by the PBOC on China's monetary aggregates data, which are indicative of the stance of China's monetary policy and overall credit condition. Data on the monetary aggregates, including levels and growth rates of M0, M1, and M2, are all published on the website of the PBOC every month in a single announcement statement. Other monetary and financial statistics are also published at the same time in the statement, including the outstanding balances of total loans and deposits, monthly interest rate averages, and balances of interbank loans.[8] To avoid abuse of terminology, we simply label the announcements that publish the most updated monetary aggregates data and other credit statistics as **M2** announcements.[9]

2.3 Data Sources

Our sample ranges from January 2010 to December 2019. We made this choice for three reasons. First, the current routine of the PBOC publishing up-to-date monetary data was not formalized until the end of 2009, when statistics started being promptly published on the PBOC's website in the "Statistical Releases" section. Therefore, the internet, as an information vendor, provides us with good precision to tell on what day and at what time a data point was initially and publicly accessible by the market. Second, we abstract from a period of domestic and international financial market turmoil, economic downturn, and massive policy interventions during 2007-2009.[10] Third, by focusing on recent years but excluding the years of the COVID-19 pandemic thereafter, our

[7] In Section A.1 of the Online Appendix, we compare and summarize the institutional details of a range of macroeconomic announcements made by other important statistical agencies of China along with the FOMC statements issued by the U.S. FRB. Various statistics can be jointly released in a single issue of an announcement statement.

[8] Since November 2012, all these statistics have been published around the same time as the announcement of the balance of total social financing (TSF), even though TSF data are made public via a separate statement. TSF data can be online a few seconds or hours before or after the monetary aggregates data releases.

[9] We also note the PBOC's quarterly publication of China's Monetary Policy Report (MPR). MPR is a comprehensive collection of the PBOC's assessments of the functioning of the credit market, macroeconomic and financial stability, and the necessity for the PBOC to fine tune the monetary policy. Therefore, the MPR is not directly comparable to other major central bank policy statements that specifically publish policy instrument targets or articulate the decision of monetary policy moves, such as the FOMC statement by the U.S. FRB or the Monetary Policy Accounts of the European Central Bank. However, for completeness, we examine China's stock market reactions to these MPR announcements in Section B.5 of the Online Appendix.

[10] China introduced a massive stimulus package of RMB 4 trillion RMB (roughly USD 586 billion) to its economy and provided liquidity support to its financial markets in 2008 and 2009.

sample selection helps isolate the effects of macro announcements during a period in which China was growing market sophistication through rounds of reforms, and the market participants gained increasing familiarity with the delivery process of the PBOC's monetary data.

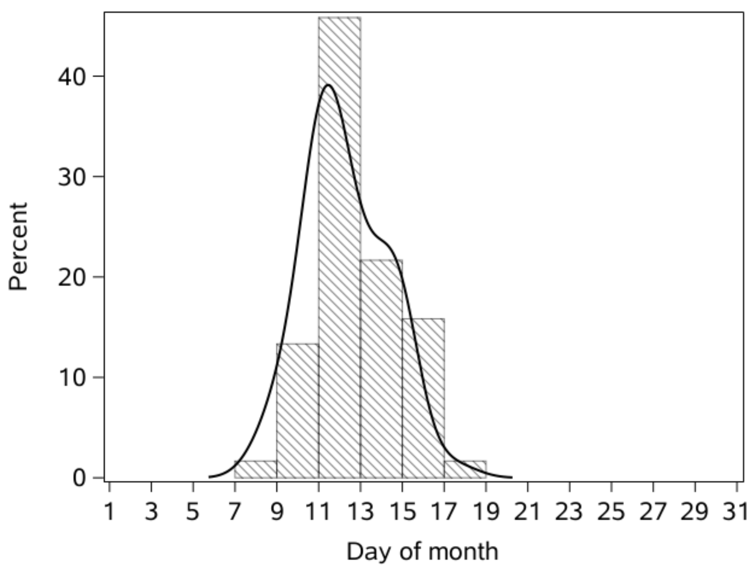
To identify the reactions of the equity market in the PBOC's announcement windows, we extract from the Bloomberg Economic Calendar (BEC) database a list of dates of the PBOC's announcements about monetary aggregates, which we also verified as consistent with the date and timing information published on the PBOC's website. Stock return data are constructed based on daily open and close price series of the Wind A-Share Index. This index incorporates the A-shares of all firms listed on the Shanghai Stock Exchange (SSE) and Shenzhen Stock Exchange (SZSE) and can be considered the most comprehensive measure of the stock performance of China's equity market. We also examine the robustness of our results by taking the SSE Composite Index and the SZSE Component Index separately for regressions. To compute the excess equity returns, we take the 10-year treasury bond daily yield series as the benchmark risk-free rate. The 1-year bank time deposit rate is treated as an alternative measure. All the market index series and the risk-free rate data are downloaded from Wind Data Feed Services.

To measure market uncertainty regarding the monthly monetary statistics, we exploit the forecast data from the Bloomberg economic forecast survey. The Bloomberg database records an unbalanced panel of professional economists regarding their forecasts about various macroeconomic variables. In particular, we focus on the monthly forecasts about the year-over-year (YOY) M2 growth rates that the PBOC releases every month. To construct empirical proxies for the degree of investors' information acquisition, we employ the keyword search index compiled by Baidu, Inc., a leading Chinese search engine conglomerate. A search index regarding a range of keywords related to monetary statistics is used to capture the efforts of acquiring information relevant to the PBOC's policy moves and aggregate credit conditions. The data series of the Baidu search index by the keywords of interest is sourced from Baidu, Inc., with the arranged authorization.

2.4 Data Release Routine: Timing of PBOC Announcements

Our sample covers years from 2010 to 2019 with 120 **M2** announcement events.[11] Figure 1 presents a histogram plot of the day of month distribution of **M2** announcement events.[12] The vertical distance measures the percent of **M2** announcement events with days of data release falling into a 2-day bin. The solid line approximates a probability density function capturing the discrete distribution. The graph shows that approximately 65% of the **M2** announcements in our sample fall between the 11th and 14th days of a month, and the day mode for the PBOC releasing the monetary data is the 11th. Therefore, the PBOC does not maintain a fixed day of month for releasing the monthly monetary statistics. However, investors may still be able to figure out a window of days with the greatest probability of the PBOC data release, for example, the 11th to 14th of a month.

Figure 1: Day of Month Distribution of M2 Announcement Events



Notes: Sample: January 2010 to December 2019. This figure plots the histogram distribution of day of month across all **M2** announcement events in our sample. Each bin spans 2 consecutive calendar days. The vertical distance of the box denotes the percentage (%) of **M2** announcement events with days of data release falling into a 2-day bin. The solid line approximates the kernel density function.

[11] In Section A.2 of the Online Appendix, we provide a summary of announcement days of a wider range of macro announcements made by different statistical agencies. In addition, we show the event tabulation of data co-releases in Section A.5 of the Online Appendix, which checks if another announcement event falls on the same day when the PBOC publishes its monetary data through an **M2** announcement. It can be shown that our identified **M2** announcements are largely independent events.

[12] In Section A.3 of the Online Appendix, we instead plot the histogram of the **M2** announcement days with day realignments to adjust for announcements made after trading hours, which captures the fact that the market has the initial access to the newest data only on the next trading day. A very similar heterogeneity of announcement days across months can be detected.

Importantly, note that the PBOC does not precommunicate with the market regarding the exact day of data releases.[13] However, market participants know with the probability of one that every month, sooner or later, one announcement that publishes up-to-date monetary aggregates data will be made. Hence, we call this PBOC routine of releasing monetary data "quasi-scheduled". We claim that the timing variation of **M2** announcements across months is largely exogenous. This is the important motivating point where we study the relationship of announcement timing and equity premium in an environment of random announcement scheduling.[14]

3 Empirical Evidence: Pre-announcement Premium in China

In this section, we document a pre-announcement drift of China's stock market returns in response to the PBOC's monthly announcements of the monetary aggregates data. We highlight the fact that given China's unique setting with quasi-scheduled central bank announcements, the pre-announcement equity premium arises only when an announcement arrives late in a month. We then show that such pre-announcement premium is not driven by data leakage or by unexpected or exchanged changes in the to-be-announced monetary statistics. In addition, based on Bloomberg economists' forecast data, we find that market uncertainty regarding M2 growth declines over time in each announcement cycle and reaches its bottom prior to announcements.

3.1 Equity Premium Prior to PBOC Announcements

To examine the reactions of China's stock market to **M2** announcements, we first define the day of an announcement as the first trading day on which China's financial markets have access to the PBOC's updated statistics. Then, we examine the stock market returns in announcement

[13] Though the PBOC used to publish a timetable before 2015 at the beginning of each year stating that the monetary aggregates data were scheduled to be released on the 15^{th} of each month, we checked and found that most of the monetary aggregates data were actually released before the 15^{th}. The PBOC stopped this routine in 2015. We plot a similar histogram plot of timing heterogeneity before 2015 in Section A.4 of the Online Appendix. It shows that there was significant timing variation of the *de facto* announcement dates of monetary data.

[14] Some anecdotal evidence from inside the PBOC's monetary policy department suggests to us that the formal approval of releasing monetary statistics every month depends on whether the PBOC's senior officials are timely available to sign off on the data release documents. For example, senior officials' business travel, sickness, and conference and discussion arrangements could all create time conflicts and thus delays in releasing data in a timely manner.

windows by estimating a baseline specification given by

$$Exret_t = \gamma + \sum_{i=-T}^{T} \beta_i \mathbb{I}_{t_{M2}-i} + \beta_x X_t + \upsilon_t \tag{1}$$

where t corresponds to a trading day. $Exret_t$ denotes the daily difference of close-to-close stock returns constructed from the Wind A-Share Market Index and the daily 10-year treasury yields and thus a measure of excess returns. We show that using open-to-close returns and alternative risk-free rates, such as the 1-year bank deposit rate, does not affect our baseline results.

Our explanatory variable $\mathbb{I}_{t_{M2}-i}$ is a dummy variable that equals 1 if day t is the i-th trading day before (after if i is negative) an **M2** announcement. With $i = 0$, $\mathbb{I}_{t_{M2}} = 1$ denotes the **M2** announcement day.[15] In total, we include $2T + 1$ day dummies to capture the duration of the announcement window. Ceteris paribus, the coefficient β_i is interpreted as the mean excess return on the i-th day prior to announcement relative to the average daily excess return outside an announcement window. We further include year, month, and weekday fixed effects in vector X_t to control for the potential seasonality and calendar effects.

Table 1 reports the coefficient estimates of Equation (1). According to the results in Columns (1) to (4), with $T = 5$ for an 11-day **M2** announcement window, we find that most of the coefficient estimates β_i are statistically insignificant except for those related to the dummy variables associated with the three days prior to announcement, namely, $\mathbb{I}_{t_{M2}-1}$, $\mathbb{I}_{t_{M2}-2}$ and $\mathbb{I}_{t_{M2}-3}$. Depending on the specification and the measures, these point estimates with varying standard errors range from 21 to 35 basis points (bps) per day. The largest and most statistically significant daily equity premium is realized on the day before the announcement day, t_{M2-1}. This is robust regardless of whether we take alternative measures of excess returns using the open-to-close market index, the 1-year bank time deposit rate as a proxy for the risk-free rate, or the raw close-to-close stock returns as the dependent variable. Given that the coefficient estimates associated with day dummies on and after the **M2** announcement day are not statistically significant, we thus confirm that China's

[15]The **M2** announcement events in our sample can be further grouped into four categories by the exact time of the data release in a day: (1) before trading hours on weekdays; (2) within trading hours (including the gap hours between the morning and afternoon trading sessions); (3) after trading hours from Monday to Thursday; and (4) between market closure on Friday until 24:00 on Sunday. Correspondingly, by our definition of the announcement day, the day of data release, t, for Announcement Groups (3) and (4) has been adjusted to reflect the fact that the next trading day, $t + 1$, is the first day for the market to internalize the public news for trading. See Section A.2 of the Online Appendix for more details about the breakdown of the announcement events by various timing measures.

equity market accrues a pre-announcement equity premium before the PBOC's release of monthly monetary data.[16] Column (5) presents similar coefficient estimates when focusing on 7-day dummies of announcement windows for $T = 3$, and the results again suggest that the dominant share of the pre-announcement premium is realized on the day before the announcement day.[17]

Given that the coefficient estimates associated with $\mathbb{I}_{t_{M2}-2}$ and $\mathbb{I}_{t_{M2}-3}$ are large in size and may be statistically significant depending on regression specifications and the measures that we use, we proceed to run the following regression to quantify the relative size of the mean daily excess return in a longer pre-announcement window of j days covering trading days between $t_{M2}-1$ and $t_{M2}-j$.

$$Exret_t = \gamma + \theta_j \mathbb{I}_{t_{M2}-j,t_{M2}-1} + \sum_{i=-T}^{0} \beta_i \mathbb{I}_{t_{M2}-i} + \sum_{i=T}^{j+1} \beta_i \mathbb{I}_{t_{M2}-i} + \beta_x X_t + \upsilon_t \quad (2)$$

The dummy variable $\mathbb{I}_{t_{M2}-j,t_{M2}-1} = 1$ denotes those trading days that fall in a j-day window before an **M2** announcement. θ_j can be interpreted as the average daily excess return of those days that fall into the j-day window, relative to that of days outside the announcement windows. The estimation results are summarized in Columns (6) and (7) of Table 1. Both columns suggest that the daily excess return during a 2-day or 3-day window prior to announcements relative to that of a day outside the announcement windows is approximately 25 bps.[18]

[16]In Section A of the Appendix, we quantify that our documented pre-announcement premium is large in both absolute and risk-adjusted terms. We then show in Section B of the Appendix that CAPM in China works better over a few days prior to the PBOC's announcements of monetary aggregates data, and the significantly positive pre-announcement market betas well capture the heightened systemic risk.

[17]In Section B.1 of the Online Appendix, we demonstrate that our estimation results also hold if we directly use the Shenzhen or Shanghai stock exchange market index for constructing returns. However, we note that the size of the pre-announcement premium is somewhat smaller when our sample includes the more recent years of data covering 2018 and 2019. Meanwhile, the weakening of this premium is driven by the performance of those stocks traded on the Shanghai Stock Exchange. Apart from the equity markets, we also explore the performance of other asset markets in China in windows of the PBOC's announcements of monetary aggregates data. The results are collected in Section B.6 of the Online Appendix.

[18]We benefit from a conference discussion of our paper and then check if our documented pre-announcement premium is sensitive to the exclusion of announcement events in 2015 where Chinese stock markets underwent some dramatic fluctuations. We found that if the return observations in 2015 or if those of May, June and July 2015 are removed for regressions of Equations (1) and (2), the coefficient estimates for dummy variable $\mathbb{I}_{t_{M2}-1}$ and for $\mathbb{I}_{t_{M2}-3,t_{M2}-1}$ are still statistically significant but have smaller magnitudes and larger standard errors. Our interpretation of this result is that the 12 PBOC monthly announcements of M2 growth in 2015 were consistently made on a day that was later than or on the 11th of a month, where the 12th was the median day of the month for announcements across events. As we will show that the pre-announcement premium in China exists only when an announcement arrives late in monthly cycles, the exclusion of returns in 2015 naturally discounts our estimates of the *average* daily premium prior to announcements. While our exploration is not well motivated to throw out a selection of a few events or to drop the observations of a complete year, we therefore stick to our full sample and to our baseline regression results.

Table 1: **Wind A-Share Index Returns in Windows of M2 Announcements**

VARIABLES	(1) Exret	(2) Open-Close	(3) Bank Rate	(4) Raw Returns	(5) Exret	(6) Exret	(7) Exret
$\mathbb{I}_{t_{M2}-5}$	0.09	0.14	0.09	0.09		0.09	0.09
	(0.16)	(0.12)	(0.16)	(0.16)		(0.16)	(0.16)
$\mathbb{I}_{t_{M2}-4}$	-0.02	0.07	-0.02	-0.02		-0.02	-0.02
	(0.15)	(0.13)	(0.15)	(0.15)		(0.15)	(0.15)
$\mathbb{I}_{t_{M2}-3}$	0.21	0.26*	0.21	0.21	0.18	0.21	
	(0.16)	(0.16)	(0.16)	(0.16)	(0.16)	(0.16)	
$\mathbb{I}_{t_{M2}-2}$	0.22+	0.21*	0.22+	0.22+	0.20		
	(0.14)	(0.12)	(0.14)	(0.14)	(0.14)		
$\mathbb{I}_{t_{M2}-1}$	0.31**	0.35***	0.31**	0.31**	0.28**		
	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)		
$\mathbb{I}_{t_{M2}-2,t_{M2}-1}$						0.26**	
						(0.10)	
$\mathbb{I}_{t_{M2}-3,t_{M2}-1}$							0.25***
							(0.09)
$\mathbb{I}_{t_{M2}}$	0.16	0.06	0.16	0.16	0.13	0.16	0.16
	(0.14)	(0.13)	(0.14)	(0.14)	(0.13)	(0.14)	(0.14)
$\mathbb{I}_{t_{M2}+1}$	-0.08	-0.05	-0.08	-0.08	-0.10	-0.08	-0.08
	(0.14)	(0.14)	(0.14)	(0.14)	(0.14)	(0.14)	(0.14)
$\mathbb{I}_{t_{M2}+2}$	0.01	0.02	0.01	0.01	-0.02	0.01	0.01
	(0.16)	(0.15)	(0.16)	(0.16)	(0.16)	(0.16)	(0.16)
$\mathbb{I}_{t_{M2}+3}$	-0.10	-0.11	-0.10	-0.10	-0.12	-0.10	-0.10
	(0.15)	(0.14)	(0.15)	(0.15)	(0.15)	(0.15)	(0.15)
$\mathbb{I}_{t_{M2}+4}$	0.16	0.14	0.16	0.16		0.16	0.16
	(0.15)	(0.13)	(0.15)	(0.15)		(0.15)	(0.15)
$\mathbb{I}_{t_{M2}+5}$	0.11	0.11	0.11	0.11		0.11	0.11
	(0.16)	(0.15)	(0.16)	(0.16)		(0.16)	(0.16)
Constant	-0.18	0.01	-0.18	-0.17	-0.16	-0.18	-0.18
	(0.17)	(0.16)	(0.17)	(0.17)	(0.17)	(0.17)	(0.17)
Year/Month/Weekday Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,431	2,431	2,431	2,431	2,431	2,431	2,431
R^2	0.02	0.02	0.02	0.02	0.02	0.02	0.02

Notes: Sample: January 2010 to December 2019. Columns (1) to (5) report the regression results of Equation (1) for various specifications taking different measures. Columns (6) and (7) present the estimation results of Equation (2). The dependent variable is the close-to-close excess return constructed from the Wind A-Share Index for all columns except for Columns (2) and (4). Column (2) considers the open-to-close excess returns and Column (4) directly takes the raw close-to-close market returns as the dependent variable. Announcement dummy $\mathbb{I}_{t_{M2}-i}$ equals 1 if it is the i-th trading day before (after if i is negative) an **M2** announcement. Excess returns of the first trading day are aligned to the day on which the stock market first has access to the monetary statistics as indicated by the dummy variable $\mathbb{I}_{t_{M2}} = 1$ when $i = 0$, i.e., the announcement day. Dummy variable $\mathbb{I}_{t_{M2}-j,t_{M2}-1}$ equals 1 when a trading day t falls in a j-trading-day window before the **M2** announcement day. ***, **, *, and + denote statistical significance at the 1%, 5%, 10%, and 15% levels, respectively. Robust standard errors are in parentheses.

3.2 Timing of Announcements and the Pre-announcement Premium

Given that the central bank's announcements of key monetary statistics in China are quasi-scheduled, there is significant timing variation of the announcement days across announcement events. In this subsection, we explore the impacts of announcement timing on the presence and size of the pre-announcement premium.

Specifically, we divide the daily excess returns into two groups: returns in months in which the PBOC's announcements of monetary data are made earlier than a cutoff day (early group), and returns in months with announcements made on or after that day (late group). To ensure the robustness of the results, we select different cutoff days ranging from the 11^{th} to 14^{th} day of a month and estimate the specification of Equation (1) based on a restricted subsample of return data for each group. Therefore, given a cutoff day of month, the total number of daily return observations summing over the early and late groups is fixed at 2431, which is the total size of our baseline sample of return data shown in Table 1.

Table 2 reports the estimation results by highlighting the group differences. In Panel A, estimations are based on returns in months with the PBOC announcements made relatively early. The results from Columns (1) to (4) of Panel A all suggest that no significant excess returns can be earned over the 1-day or 3-day windows before announcements. Conversely, the results in Columns (1) to (4) of Panel B find that for those announcements made relatively late in a month, the coefficient estimates associated with the day dummies in 1-day or 3-day pre-announcement windows are significantly positive and large. In addition, the coefficient estimates associated with day dummies on and after the **M2** announcement day are insignificant regardless of the announcement groups, which is consistent with the estimation results in Table 1. Therefore, it is safe to conclude that the daily relative excess return of 25 bps over an average 3-day window prior to announcements is largely associated with those late announcement events.[19] We thus document that the existence and accumulations of the pre-announcement premium in China depend on the timing of the PBOC's announcement arrival in monthly cycles. The pre-announcement equity premium exists only when a PBOC announcement arrives late in a month.[20]

3.3 Premium Not Driven by the Announcement Content

We then provide evidence showing that our documented equity premium as accrued before the PBOC's **M2** announcements is unconditional. That is, the pre-announcement premium is not driven by unexpected or expected changes in the to-be-announced monetary statistics.

First, it is possible that the Chinese market may react to the statistics prior to announcements

[19]In Section B.9 of the Online Appendix, we show in an interaction regression setting with a dummy variable of the early group interacting with pre-announcement day dummies that the pre-announcement premium is mostly driven by late arrivals of announcements.

[20]We show in Section C of the Appendix that early or late arrivals of **M2** announcements are not correlated with the contents of announcements ex post. In addition, the announcement timing exhibits no serial correlations over time, and the day of announcement in a month is not predictable using a wide class of variables.

Table 2: Pre-announcement Premium: Early vs. Late M2 Announcements

	Panel A				Panel B			
VARIABLES	(1) $< 11^{th}$	(2) $< 12^{th}$	(3) $< 13^{th}$	(4) $< 14^{th}$	(1) $\geq 11^{th}$	(2) $\geq 12^{th}$	(3) $\geq 13^{th}$	(4) $\geq 14^{th}$
$\mathbb{I}_{t_{M2}-5}$	-0.06	0.23	-0.02	-0.01	0.12	0.00	0.33	0.39
	(0.38)	(0.24)	(0.19)	(0.18)	(0.17)	(0.22)	(0.28)	(0.31)
$\mathbb{I}_{t_{M2}-4}$	0.22	0.18	-0.03	0.05	-0.06	-0.14	0.04	-0.16
	(0.30)	(0.20)	(0.16)	(0.15)	(0.17)	(0.21)	(0.29)	(0.36)
$\mathbb{I}_{t_{M2}-3}$	-0.04	0.15	0.13	0.25	0.26+	0.25	0.33	0.10
	(0.50)	(0.25)	(0.19)	(0.18)	(0.17)	(0.22)	(0.30)	(0.37)
$\mathbb{I}_{t_{M2}-2}$	-0.03	0.07	0.04	0.17	0.28*	0.33*	0.49*	0.38
	(0.23)	(0.19)	(0.16)	(0.15)	(0.16)	(0.20)	(0.26)	(0.32)
$\mathbb{I}_{t_{M2}-1}$	-0.28	-0.02	0.10	0.15	0.41***	0.52***	0.63***	0.73**
	(0.38)	(0.24)	(0.18)	(0.15)	(0.14)	(0.15)	(0.22)	(0.28)
$\mathbb{I}_{t_{M2}}$	0.33	0.29	0.23	0.20	0.13	0.07	0.08	0.06
	(0.35)	(0.22)	(0.17)	(0.15)	(0.14)	(0.16)	(0.21)	(0.27)
$\mathbb{I}_{t_{M2}+1}$	0.13	-0.24	-0.10	-0.13	-0.12	0.04	-0.02	0.07
	(0.42)	(0.25)	(0.19)	(0.17)	(0.15)	(0.16)	(0.23)	(0.27)
$\mathbb{I}_{t_{M2}+2}$	0.02	0.07	-0.11	-0.05	0.01	-0.03	0.20	0.15
	(0.33)	(0.28)	(0.21)	(0.18)	(0.18)	(0.19)	(0.25)	(0.33)
$\mathbb{I}_{t_{M2}+3}$	-0.25	-0.02	-0.12	-0.03	-0.06	-0.14	-0.05	-0.22
	(0.27)	(0.23)	(0.17)	(0.16)	(0.17)	(0.20)	(0.27)	(0.33)
$\mathbb{I}_{t_{M2}+4}$	0.11	-0.05	0.02	0.07	0.18	0.31+	0.39*	0.43+
	(0.34)	(0.25)	(0.20)	(0.18)	(0.17)	(0.19)	(0.23)	(0.28)
$\mathbb{I}_{t_{M2}+5}$	-0.21	-0.01	-0.03	0.06	0.16	0.18	0.37+	0.24
	(0.32)	(0.30)	(0.21)	(0.19)	(0.18)	(0.17)	(0.23)	(0.28)
Constant	0.12	0.11	0.12	0.16	-0.32*	-0.29	-0.20	-0.49
	(0.54)	(0.28)	(0.19)	(0.19)	(0.19)	(0.24)	(0.29)	(0.36)
Year/Month/Weekday Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	369	993	1,512	1,751	2,062	1,438	919	680
R^2	0.07	0.03	0.02	0.02	0.02	0.04	0.06	0.06

Notes: Sample: January 2010 to December 2019. This table reports dummy variable regression results of Equation (1). The dependent variable is the excess return constructed from the Wind A-Share Index. Announcement day dummy $\mathbb{I}_{t_{M2}-i}$ equals one if the i-th trading day is before (or after if i is negative) an **M2** announcement. We align the return data of the first trading day that the equity market has access to the news to the dummy variable $\mathbb{I}_{t_{M2}} = 1$ when $i = 0$. Each column summarizes the estimation results based on a restricted sample of returns. Regression results with daily excess returns in a month where the PBOC's M2 announcement arrived earlier than a cutoff day of month, e.g., 11^{th}, 12^{th}, 13^{th} and 14^{th}, are shown in Panel A (early group). By contrast, regression results with daily excess returns in a month where the PBOC's M2 announcement arrived on or after a cutoff day of month are shown in Panel B (late group). ***, **, *, and + denote significance at the 1%, 5%, 10%, and 15% levels, respectively. Robust standard errors are in parentheses.

if there is data leakage to some extent. Second, it may be true that the stock market investors could have well anticipated the directional changes in monetary aggregates ex-ante. If these are the potential drivers, the stock market would respond before the PBOC releases the data. Hence, both explanations predict that the pre-announcement premium is conditional on the directional changes in the actual data released or on the expected and unexpected changes of the data.

To check the validity of these explanations, we use three different proxies to characterize the data content of an **M2** announcement and then we perform regression analysis. That is, the monthly change in the YOY M2 growth rate, $\Delta g_{M2,m} = g_{M2,m} - g_{M2,m-1}$, serves as our baseline measure. We then decompose $\Delta g_{M2,m}$ into two components, which are taken as additional proxies. The decomposition is given by $\Delta g_{M2,m} = \epsilon_{M2,m} + \mathbb{E}[\Delta g_{M2,m}]$, whereby the first part captures the "unexpected" changes of money growth and the second part reflects the expected changes. Specifically, the unexpected changes to M2 growth rates can be calculated as $\epsilon_{M2,m} = \Delta g_{M2,m} - \mathbb{E}[g_{M2,m}] = g_{M2,m} - \bar{g}_{M2,m}$, where $\bar{g}_{M2,m}$ denotes the market-expected M2 growth rate as proxied by the median forecast of the Bloomberg economic forecast survey. The expectation of the M2 growth changes can be written as the difference of the surveyed forecast of the M2 growth rate and the realized M2 growth of the previous month $\mathbb{E}[\Delta g_{M2,m}] = \bar{g}_{M2,m} - g_{M2,m-1}$. We then estimate the following specification to examine whether the pre-announcement premium is dependent on the sign and the magnitude of the to-be-announced statistics.

$$Exret_t = \gamma + \beta_1 \mathbb{I}_{t_{M2}-j,t_{M2}-1} + \beta_2 \mathbb{I}_{t_{M2}-j,t_{M2}-1} \cdot Content_{t_{M2}} + \beta_3 Content_{t_{M2}} + \beta_x X_t + \upsilon_t \qquad (3)$$

We take $j = 3$ by focusing on the return reactions during the 3-day window prior to announcements. $Content_{t_{M2}}$ denotes the content of monthly announcements and is measured by $\Delta g_{M2,m}$, $\epsilon_{M2,m}$, or $\mathbb{E}[\Delta g_{M2,m}]$. Positive or negative measures of the content can be considered as an extra expansion or tightening in monetary aggregates and overall credit conditions. The coefficient associated with the interaction term β_2 gives the estimate of additional gain or loss, if any, due to changes in the announcement content.

We summarize the estimation results in Table 3. The coefficient estimates across Columns (2) to (4) all suggest that our identified pre-announcement premium is robust to different measures of the announcement content. The relative daily excess returns of 3-day windows prior to announcements are consistently approximately 25 bps. In addition, the coefficient estimates related to the interaction term are statistically insignificant across all columns. This implies that the size of the pre-announcement premium is not affected by the total, unexpected or expected changes in the M2 growth to be announced in that month. Precisely, if the market indeed reacts to some leaked data ex ante, we expect to see that the actual monetary aggregates changes, $\Delta g_{M2,m}$, or the preleaked "unexpected" component of monetary changes, $\epsilon_{M2,m}$, helps explain the size of the pre-announcement premium. However, this argument is not supported by the estimation results in Columns (2) and (3). Moreover, if the market responds to the monetary expansion or tightening in expectation, $\mathbb{E}[\Delta g_{M2,m}]$, the coefficient estimate related to the interaction term should have been significant. This again is at odds with our findings in Column (4).

Further, one may be concerned if the pre-announcement premium is instead driven by those statistics other than the M2 growth but are co-released in the same PBOC announcement. For example, the M1 growth measures, total outstanding loan balance (loan) and deposit balance (deposit) are all released at the same time along with the M2 data. In addition, the balance of total social financing (TSF), which recently has been considered another key measure of the monetary policy stance in China, is also published some time very close to the **M2** announcement, albeit in a separate statement on the same day.[21] Columns (5) to (8) of Table 3 present coefficient estimates related to the interaction term between the dummy variable, $\mathbb{I}_{t_{M2}-3,t_{M2}-1}$, and a measure of statistics other than the M2 growth rate. These statistics are taken into the regressions as monthly differences in YOY growth rates: $\Delta g_{M1,m}$, $\Delta g_{Loan,m}$, $\Delta g_{Deposit,m}$, and $\Delta g_{TSF,m}$. Again, our estimation results find that none of these data measures determines the magnitude of the equity premium prior to **M2** announcements.

3.4 Market Uncertainty Declines Before Announcements

We further document that the mean forecast uncertainty about the M2 growth rate, a direct measure of market uncertainty before the PBOC announces the data, declines over time within an announcement cycle.[22] In addition, we find that significant reductions in market uncertainty are realized prior to announcements. That is, the pre-announcement equity premium is accrued while market uncertainty is lowered.

Specifically, we exploit the panel data from the Bloomberg economic forecast survey covering a selection of economists' monthly forecasts regarding the monthly YOY growth rate of M2 in China. We delete economist forecasters who made fewer than six forecasts and apply winsorization at the 1- and 99-percentile cutoffs of the point forecast distribution. Our final forecast sample is

[21] The outstanding balance of the TSF data were published only as quarterly statistics before 2016, and the monthly flow TSF data has been published monthly since 2012. Not until January 2016 did the balance of the TSF and the YOY growth rates start being published monthly. We check whether the YOY TSF growth rates released in monthly **M2** announcement windows affect our results since 2016. There are thus fewer return observations for regressions involving monthly TSF announcement events.

[22] Due to data limitation, the otherwise standard measure of market uncertainty, the option-implied volatility index in China, which has been tracking the market exchanges for only a very short period of approximately two years, does not span our entire sample coverage of years from 2010 to 2019.

Table 3: **Pre-announcement Premium: Data Released in the M2 Announcements**

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$\mathbb{I}_{t_{M2}-3,t_{M2}-1}$	0.25***	0.26***	0.26***	0.25***	0.24***	0.25**	0.24**	0.16
	(0.09)	(0.10)	(0.10)	(0.10)	(0.09)	(0.10)	(0.10)	(0.15)
$\mathbb{I}_{t_{M2}-3,t_{M2}-1} \cdot \Delta g_{M2,m}$		0.08						
		(0.12)						
$\mathbb{I}_{t_{M2}-3,t_{M2}-1} \cdot \epsilon_{g_{M2,m}}$			0.11					
			(0.15)					
$\mathbb{I}_{t_{M2}-3,t_{M2}-1} \cdot \mathbb{E}[\Delta g_{M2,m}]$				0.03				
				(0.15)				
$\mathbb{I}_{t_{M2}-3,t_{M2}-1} \cdot \Delta g_{M1,m}$					-0.01			
					(0.03)			
$\mathbb{I}_{t_{M2}-3,t_{M2}-1} \cdot \Delta g_{Loan,m}$						-0.01		
						(0.11)		
$\mathbb{I}_{t_{M2}-3,t_{M2}-1} \cdot \Delta g_{Deposit,m}$							-0.04	
							(0.08)	
$\mathbb{I}_{t_{M2}-3,t_{M2}-1} \cdot \Delta g_{TSF,m}$								0.03
								(0.05)
Year / Month / Weekday Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other Anns Window Ctrls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Level Term Ctrls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,431	2,431	2,431	2,431	2,431	2,431	2,431	1,152
R^2	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03

Notes: Sample: January 2010 to December 2019. This table reports the dummy variable regression results of Equation (3). The dependent variable is the close-to-close excess returns constructed from the Wind A-Share Index. "Other Anns Window Ctrls": controls for the remaining day dummies in the announcement window of length of $2T+1$ for $T=5$. "Level Term Ctrls": includes the term of monetary statistics itself in a regression. Announcement dummy $\mathbb{I}_{t_{M2}-3,t_{M2}-1}$ equals 1 if a trading day falls in the 3-day window before the announcement. ***, **, *, and + denote significance at the 1%, 5%, 10%, and 15% levels, respectively. Robust standard errors are in parentheses.

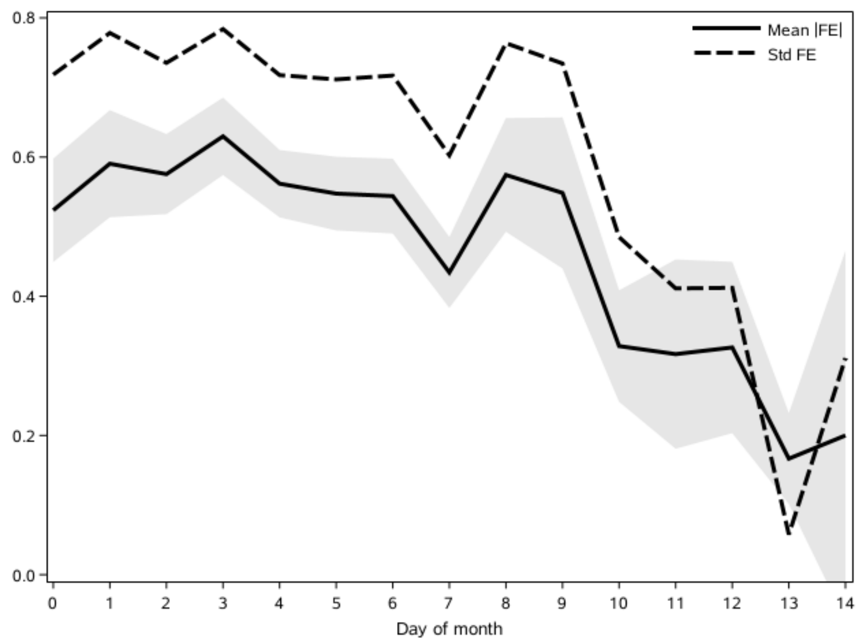
registered with 86 economists and their 2675 point forecasts.[23] First, we construct two proxies to measure the day-of-month market uncertainty across all monthly cycles and across forecasting economists regarding the monetary statistics before announcements: (1) the dispersion of forecast errors in a day of month, as measured by their daily standard deviation; and (2) the average daily absolute forecast errors. We plot in Figure 2 the two measures of market uncertainty against the days on which point forecasts are collected in a month.[24] The figure suggests that regardless of measures, market uncertainty is high when forecasts are made earlier in a month. In addition, market uncertainty decreases with the day of forecasts within an average monthly announcement cycle. Importantly, a significant portion of prior uncertainty, as measured by more than 67% of mean absolute forecast errors and up to 87% of dispersion of forecast errors, is reduced as time

[23] Occasionally, an economist may make a forecast earlier than the corresponding announcement cycle. For example, a forecast regarding an M2 number for the month of May may be made in April even before April's announcement. We thus delete those forecasts that are ahead of their associated announcement cycles. For more detailed information on the dates of forecasts in our sample, see Section A.6 of the Online Appendix.

[24] A forecast can be made as early as on days of the previous month. We therefore pool all the forecasts made in the previous month for calculating the two measures and denote the values of market uncertainty on day $t = 0$.

moves forward, by which the date of forecasts is getting closer to a late announcement day. Such evidence is also suggestive that the market uncertainty during the pre-announcement window can be further lower for those late announcements, before which the economists also made late point forecasts.

Figure 2: Market Uncertainty about the M2 Growth Prior to Announcements



Notes: Sample: January 2010 to December 2019. This figure plots the daily standard deviation of forecast errors regarding the YOY M2 growth across the Bloomberg-surveyed forecasting economists (dashed line, i.e., Std FE) and the average daily absolute forecast errors across all forecasts and forecasters on each day (solid line, i.e., Mean |FE|) along the day of the month on the horizontal axis. Values at $t = 0$ are calculated based on forecasts made on days in the previous month. The darker shaded area captures the 90% confidence band centering the mean absolute forecast errors.

Next, based on controlled regressions, we further identify uncertainty reduction in a short window prior to **M2** announcements. Let $\bar{g}_{i,t,m}$ denote economist i's forecast made on day t regarding the M2 growth to be announced in month m, $g_{M2,m}$. $FE_{i,t,m} = \bar{g}_{i,t,m} - g_{M2,m}$ captures economist i's forecast error recorded on day t. We then estimate the following specification:

$$|FE_{i,t,m}| = \alpha + \gamma \mathbb{I}_{t_{M2,m}-j,t_{M2,m}-1} + \zeta_i + year_t + month_t + \upsilon_{i,t,m} \quad (4)$$

The dependent variable is economist i's absolute forecast error, which measures the forecast imprecision of a forecasting individual. Dummy variable $\mathbb{I}_{t_{M2,m}-j,t_{M2,m}-1}$ equals 1 if the forecast day

t falls in the j trading-day window before an announcement is made on day $t_{M2,m}$ in month m.[25] Given that few forecasts are made in the 1-day or 2-day windows before announcements, we thus focus on longer durations of 3 and 5 days before announcements with $j = 3, 5$. ζ_i, $year_t$ and $month_t$ capture the forecasting economist, year and month fixed-effect controls, respectively. While the forecasts are effectively made before announcements, the coefficient estimate of γ measures the average size of economists' imprecision of forecasts, i.e., the average uncertainty about M2 growth across economists within the pre-announcement windows relative to that on an average day earlier than the pre-announcement windows.

The estimation results of Equation (4) are listed in Table 4. Regardless of the control variables, the coefficient estimates associated with term $\mathbb{I}_{t_{M2,m}-j,t_{M2,m}-1}$ for a 3-day and 5-day pre-announcement window across columns all suggest that the average forecast uncertainty across forecasters is significantly lowered over days before the PBOC's announcements of the M2 data. However, adding all the forecaster, year and month fixed effects somewhat dampens the statistical significance of the coefficient estimates for γ. This can be partially explained by the fact that some economists are more active in submitting forecasts to Bloomberg in certain years and months. High correlations between the fixed effect controls thus enlarge the standard errors of the estimates. In summary, the market uncertainty declines before the M2 announcements, and the average individuals' forecast uncertainty in the pre-announcement windows is significantly lower than that over earlier days outside the announcement windows.[26]

4 Timing of Announcements and Information Acquisition: Theoretical Discussion and Additional Evidence

In this section, we lay out our theoretical discussions within the framework of Ai, Bansal, and Han (2022), which rationalizes the pre-announcement premium based on endogenous information

[25] Forecasts are not always collected and recorded on weekdays. To be consistent throughout our paper, we focus on the j-trading day window before announcements and realign the point forecasts made in weekends to the next trading day.

[26] There is very little timing variation in the forecasts of each economist over monthly cycles. That is, forecasters tend to make forecasts on some fixed days of certain months. Therefore, the forecaster fixed effects almost completely mask the timing variation needed to differentiate the forecast uncertainty driven by the timing of announcements within a month. It is thus not implementable to directly identify the potential dependence of individuals' forecast uncertainty on the timing of announcements, given our current data structure of the forecasts.

Table 4: Individuals' Forecast Uncertainty Prior to Announcements

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$\mathbb{I}_{t_{M2,m}-3,t_{M2,m}-1}$	-0.10***	-0.05**	-0.09***	-0.05*				
	(0.03)	(0.02)	(0.03)	(0.03)				
$\mathbb{I}_{t_{M2,m}-5,t_{M2,m}-1}$					-0.04**	-0.04***	-0.04**	-0.03*
					(0.02)	(0.01)	(0.02)	(0.02)
Constant	0.55***	0.69***	0.39***	0.54***	0.56***	0.70***	0.39***	0.54***
	(0.02)	(0.05)	(0.01)	(0.06)	(0.02)	(0.05)	(0.01)	(0.06)
Year FE		Yes		Yes		Yes		Yes
month FE		Yes		Yes		Yes		Yes
Forecaster FE			Yes	Yes			Yes	Yes
Observations	2,675	2,675	2,675	2,675	2,675	2,675	2,675	2,675
R^2	0.00	0.29	0.11	0.32	0.00	0.29	0.11	0.32

Notes: Sample: January 2010 to December 2019. This table reports the regression results of Equation (4). The dependent variable is the absolute forecast error of each forecasting economist.
Announcement dummy $\mathbb{I}_{t_{M2,m}-j,t_{M2,m}-1}$ equals 1 if the forecast day t falls in the j trading-day window before a monthly announcement made on day $t_{M2,m}$ of month m. ***, **, *, and + denote significance at the 1%, 5%, 10%, and 15% levels, respectively. Standard errors are clustered at the forecaster's level.

acquisition among investors. Ai, Bansal, and Han (2022) propose that with generalized risk-sensitive preferences, uninformed investors choose to acquire information ahead of announcements because the information advantages of informed investors over uninformed investors are particularly large during the pre-announcement window. As uncertainty resolves, positive risk premium of the market portfolio can be realized shortly before announcements. In the following, we examine the asset pricing implications given that macro announcements are not prescheduled. While we keep our discussions as close as possible to those in Ai, Bansal, and Han (2022), we refer the readers to the paper for greater details on model construction and theoretical predictions.

We demonstrate that the degree of information acquisition is larger as the date approaches the end of an announcement cycle when an announcement is still pending. Increased efforts to acquire information can be driven by uninformed investors who find it optimal to acquire extra information when the date is increasingly closer to the announcement arrival. It directly follows that greater information acquisition, as associated with late arrivals of announcements, delivers larger equity premium before announcements. We then discuss two hypotheses to be tested, which relate the degree of information acquisition to the timing of PBOC announcements. We show that our hypotheses have strong empirical support in the Chinese data.

4.1 Quasi-scheduled Announcements

We first introduce the environment with quasi-scheduled announcements. Analytically, we demonstrate that market investors upon entering another day without seeing an announcement become increasingly certain that an announcement will soon arrive over the next few days.

Let t denote a day. In each announcement cycle, the central bank makes an announcement regarding its key monetary policy instrument, for example, the balance of monetary aggregates in China for the PBOC.[27] We examine an *average* announcement cycle consisting of N days, which is defined to capture the duration between the first and the last day on which an announcement can be feasibly made.[28] We use $t^A \in \{1, 2, ..., N\}$ to denote the announcement day associated with an average announcement cycle. In the following, we give the formal definition of the quasi-scheduled announcements, which are exemplified by the PBOC's monthly announcements of the monetary aggregates data.

Definition 1 (Quasi-scheduled Announcements) *Announcements are quasi-scheduled if within an average announcement cycle spanning N days, (1) an announcement will fall on any day with some probability such that $Prob(t^A = i) \geq 0$ for $i \in \{1, ..., N\}$, and (2) an announcement is to be made with the probability of one in each cycle such that $\sum_{i=1}^{N} Prob(t^A = i) = 1$.*

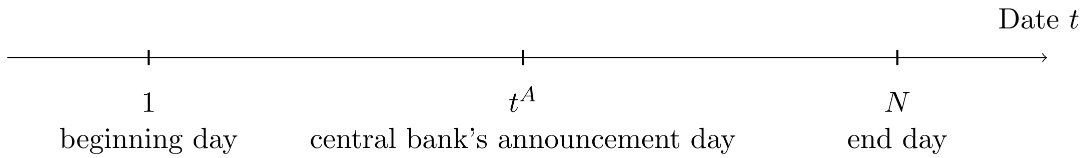
For illustrative purposes, we therefore draw a timeline in Figure 3 to recapitulate the environment with quasi-scheduled announcements. The central bank's announcement would necessarily fall on a day with timing randomness but will be bounded by the first and the last day of each cycle.

With quasi-scheduled announcements, we first show that conditional on no announcement made by the beginning of day t, investors' perceived probability of an announcement arrival on day $t+1$ and the following days is weakly increasing as time t moves toward the end of an announcement

[27]Another example is the target federal funds rate as determined during the FOMC meetings for the U.S. Federal Reserve Board.

[28]For instance, an announcement cycle for Chinese **M2** announcements is a calendar month because the PBOC announces monthly monetary statistics on the monthly basis. The data may be released on a day between the first and the last day of a month. By contrast, an announcement cycle for the U.S. FOMC announcements can be as long as approximately 40 to 50 days, which measures the day gaps between the previous and the ensuing FOMC meeting date. We show in Section C of the Appendix that the timing of Chinese **M2** announcement arrivals each month is not serially correlated. This suggests that studying an average announcement cycle is without the loss of generality.

Figure 3: Timeline of an Average Announcement Cycle



cycle. The following lemma summarizes this result, which is a defining characteristic of this announcement environment.

Lemma 1 *If announcements are quasi-scheduled, the investors' perceived probability of the announcement arrival on days* $n \in [t+1, N]$*, conditional on no announcement made up to day* t*,* $Prob(t^A = n|\{t^A \neq i\}_{i=1}^{i=t})$*, is nondecreasing as date* t *moves toward the end day of an announcement cycle. With positive prior probability of an announcement arrival on day* n *such that* $Prob(t^A = n) > 0$*, the posterior probability* $Prob(t^A = n|\{t^A \neq i\}_{i=1}^{i=t})$ *strictly increases with day* t*.*

We show the proof of Lemma 1 in Section E of the Appendix. Intuitively, as time evolves, the day options left for accommodating an announcement arrival in that cycle are increasingly fewer. That is, by definition, the feasible set of announcement arrivals, i.e., $[t+1, N]$, shrinks as t goes toward the end of the cycle given that no announcement is made up to day t. Therefore, if any day yet to come has a positive prior probability of being an announcement day, investors rationally update their prior view and carry a larger perceived probability of seeing an announcement arrival on that day.

4.2 Timing of Announcements and Information Acquisition

Following Ai, Bansal, and Han (2022), we assume that there are two different types of investors demanding this risky asset, informed and uninformed. Informed investors with greater sophistication can observe a noisy signal about the latent monetary policy stance every day without paying any cost for extracting information. Importantly, this imperfectly observed latent policy variable affects the payoff of the risky asset traded in the financial market. By contrast, uninformed investors have to pay an information cost and then obtain access to these signals, although they can still learn from the equilibrium asset price to partially back out the fundamentals. In particular, they would acquire informative signals if and only if the benefit of extra learning outweighs the information cost. Given a unit measure of investors, $\omega \in (0,1)$ denotes the fraction of uninformed investors, whereas a fraction $1-\omega$ of investors are informed.

For simplicity, based on abstracted benefit-cost analysis, we impose the optimal decision for information acquisition among uninformed investors in the following:

$$\iota_t = \begin{cases} 1 \quad if \quad \hat{t}^A - t \leq \epsilon \\ 0 \quad if \quad \hat{t}^A - t > \epsilon \end{cases} \tag{5}$$

where $\epsilon \in \mathbb{Z}^+$. According to Equations (5), with ι_t an indicator variable, an uninformed investor finds it optimal to acquire extra information and to observe the noisy signal ($\iota_t = 1$) on a day if her *perceived* day of announcement, $\hat{t}^A$, is close enough to day t, i.e., $\hat{t}^A$, falling within a window of ϵ days before day t. Otherwise, if an uninformed investor perceives $\hat{t}^A$ is still far away, she would stay uninformed ($\iota_t = 0$).[29]

Our imposed decision rule for acquiring extra information among uninformed investors can be optimal for the following reasons. First, as highlighted in Ai, Bansal, and Han (2022), prior uncertainty about the unknown latent variable can accumulate without observing the noisy signals. Therefore, the benefit of acquiring extra information can be increasingly large as time moves closer to the end of an announcement cycle as long as an announcement is still pending. Second, given a constant cost of acquiring information, acquiring information would be optimal among uninformed investors once the benefit surpasses this cost as time evolves. Third, in reality, when more market research and outstanding information are produced over time, uninformed investors may find it cheaper to access this extra information. As a result, the cost of acquiring information can be increasingly lowered as well.

Finally, let λ_t denote the actual mass of uninformed investors who are acquiring extra information other than the asset price.[30] Conditional on the fact that no announcement has been made up to day t, we can characterize the average mass of uninformed investors who are acquiring extra

[29]Instead of being positive integers, ϵ can be any arbitrary positive number, and our result still holds unconditionally. For example, for $\epsilon \in (0,1)$, the interpretation would be that this perceived pre-announcement window is as long as a few hours.

[30]For simplicity, our discussions focus on the extensive margin of investors who are acquiring extra information, i.e., the mass of investors, and abstracts from examining the intensive margin of information acquisition, i.e., the intensity of information flow through information acquisition.

signals on day t as follows:

$$\begin{aligned}\lambda_t &= \omega \cdot Prob(t^A - t \leq \epsilon | \{t^A \neq i\}_{i=1}^{i=t}) \\ &= \omega \cdot \sum_{y=1}^{\epsilon} Prob(t^A = t + y | \{t^A \neq i\}_{i=1}^{i=t})\end{aligned} \tag{6}$$

According to Equation (6), the mass of uninformed investors who are acquiring information on day t increases with the subjective probability $Prob(t^A - t \leq \epsilon | \{i \neq t^A\}_{i=1}^{i=t})$. Importantly, note that for an environment with prescheduled announcements, Ai, Bansal, and Han (2022) show that the optimal decision rule for the uninformed investors is to wait until a certain day to start acquiring information all the way until the announcement is made. Therefore, all the uninformed investors start to acquire information at the same time because they believe that the announcement is imminent with absolute certainty. However, with the quasi-scheduled announcements as in our illustration, investors are uncertain about whether they are standing in the pre-announcement window. Hence, the average mass of the uninformed investors acquiring information depends on the subjective probability of announcement arrivals.[31]

In particular, this subjective probability reflects how likely the uninformed investors perceive the announcement day to be close enough from day t. By Lemma 1, $\frac{\mathrm{d}\lambda_t}{\mathrm{d}t} \geq 0$ and the sign of this derivative would be positive when the prior probability of seeing an announcement on any day from $t+1$ to $t+\epsilon$ is strictly positive. This reflects the fact that as time t approaches the end of the cycle, investors know it is increasingly likely to see the arrival of an announcement in the next few days. As a result, more uninformed investors would acquire information as time evolves before the announcement. It then implies that greater information acquisition is associated with late arrivals of announcements.

In summary, we conclude that in an environment with quasi-scheduled announcements, the degree of information acquisition among uninformed investors in the pre-announcement windows should increase as time approaches the end of an announcement cycle. As a result, the degree of information acquisition during the pre-announcement period is larger for late announcements than

[31]Specifically, in the environment when all announcements are prescheduled and the announcement dates are known to investors, $\lambda_t = \omega$ when $t^A - t \leq \epsilon$ and $\lambda_t = 0$ otherwise. Therefore, all uninformed investors would acquire information starting on day $t = t^A - \epsilon$. This is the case as assumed in Ai, Bansal, and Han (2022).

that for early announcements.

4.3 Additional Evidence on Information Acquisition

According to Ai, Bansal, and Han (2022), a model with uninformed investors having generalized risk-sensitive preferences would generate a reduction in uncertainty through information acquisition, which then delivers the realization of risk premium prior to macro announcements. As we have discussed, the degree of information acquisition increases as time evolves. Considering the random timing of the PBOC announcement arrivals in China, we then lay out the following hypotheses to be tested in the data.[32] Specifically, we test the precondition as required by the model with generalized risk-sensitive preferences and endogenous information acquisition if macro announcements are instead quasi-scheduled.

Hypothesis 1 *Increased information acquisition is observed prior to the PBOC announcements.*

Hypothesis 2 *Greater information acquisition prior to announcements is associated with late arrivals of PBOC announcement events.*

To test Hypotheses 1 and 2 and to better align the empirics with our theoretical discussion, we proceed to examine the degree of information acquisition more specifically associated with uninformed investors. In addition, according to Ai, Bansal, and Han (2022), the information acquired by uninformed investors is largely public information that is already known to informed investors and incorporated into stock prices. Our measures of the intensity of information acquisition are therefore constructed based on the Baidu keyword search index, which are reflective of the efforts of acquiring information among less informed individual investors accessing public information. Therefore, our empirical proxies can be the best among very few alternatives for the Chinese markets.

[32] Ai, Bansal, and Han (2022) also predict that as uninformed investors are internalizing the information that has been incorporated into the market prices of the risky asset, their information acquisition efforts ex ante reduce the noises in stock prices and lead to lowered return volatility. We show in Section D of the Appendix that the volatility of realized returns on China's markets before the PBOC announcements is significantly reduced, and this is even lower when an announcement arrives late in a month.

4.3.1 Information Acquisition Prior to Announcements

We first evaluate Hypothesis 1 and examine the intensity of acquiring information related to monetary statistics in the PBOC's announcement windows. We take the daily Baidu keyword search index as the empirical proxy for capturing the degree of investors' information acquisition. Precisely, our baseline measure takes the detrended averages of a number of search index series associated with a set of keywords in Chinese, i.e., "M2 growth", "money supply" and "total social financing", which correspond in exact form to the announced statistics. We first compute the simple averages of the considered search index series for different keywords, $index_t^{raw}$, and then apply normalization by removing the 30-day moving-average trend, $trend_t$. The exact normalization follows that $index_t^{norm} = log(\frac{1+index_t^{raw}}{1+trend_t})$. In addition, we construct a more generally defined composite measure as the alternative proxy, which extends the scope of keywords by including additional search terms such as "monetary policy", "financial institutions", "liquidity of assets" and "economic fundamentals".

Specifically, we run the estimation of the following specification:

$$Info_t = \gamma + \sum_{i=-T}^{T} \psi_i \mathbb{I}_{t_{M2}-i} + \psi_x X_t + \upsilon_t \tag{7}$$

$Info_t$ denotes our empirical measure of the degree of information acquisition constructed from Baidu keyword search index. The coefficient ψ_i indicates the intensity of information acquisition on the i^{th} trading day prior to (after if i is negative) the **M2** announcements relative to that of a day outside the announcement windows. With $i = 0$, $\mathbb{I}_{t_{M2}} = 1$ indicates the announcement day on which the equity market has the initial access to the announced monetary statistics.

Table 5 summarizes the estimation results. Looking at the results in Column (1), we find that all the coefficient estimates associated with the day dummy variables are significantly positive. These findings still hold when we consider the search index capturing a broader set of terms according to the numbers in Column (2). That is, greater efforts of acquiring information are observed over those days centering the PBOC's announcements for releasing monetary aggregates data, whereas the search intensity is lowered outside the announcement windows. In addition, the coefficient estimates for days on and after the announcements reflect that the degree of information acquisition peaks on the announcement day t_{M2} and gradually declines afterward. Therefore, such evidence suggests that our measure of information acquisition indeed captures the dynamics of the information intensity.

Importantly, it shows that the coefficient estimates associated with the 1-day dummy before announcements $\mathbb{I}_{t_{M2}-1}$ appear to be the largest among all estimates prior to announcements. This pattern is well aligned with that for our documented pre-announcement premium. To ensure the robustness of the results, we present the estimation results in Columns (3) and (4) based on a specification by taking the 3-day pre-announcement dummy $\mathbb{I}_{t_{M2}-3,t_{M2}-1}$ to replace the three dummies $\mathbb{I}_{t_{M2}-3}, \mathbb{I}_{t_{M2}-2}$ and $\mathbb{I}_{t_{M2}-1}$. The results show that the coefficient estimate for the 3-day pre-announcement window dummy is statistically positive and is the largest among all estimates for the pre-announcement day dummies. We thus reject the null of Hypothesis 1.

Our first set of empirical results suggests that information acquisition is increased while positive excess returns are accrued before the **M2** announcements. Our evidence is therefore consistent with the information acquisition channel in theory by which market uncertainty is reduced driven by greater efforts of acquiring information among less informed investors.

4.3.2 Timing of Announcements and Information Acquisition

We then examine Hypothesis 2 and look for the dependence of the intensity of information acquisition on the timing of announcement arrivals. We provide evidence showing that the degree of information acquisition prior to announcements is larger for late announcements than the case of the market seeing early announcements. We again divide the daily measures of the search index into two groups by the timing of the **M2** announcement in monthly announcement cycles: the search index for months with announcements made earlier than a cutoff day of a month (early group), and those for months with announcements made on or after a cutoff day of a month (late group). By selecting different cutoff days from 11^{th} to 14^{th}, we estimate the specification of Equation (7) based on the subsamples of proxies for information acquisition in each group.

Table 6 reports the estimation results by taking the detrended search index covering the baseline set of keyword searches.[33] First, by looking at coefficient estimates based on subsamples of search index in months with early announcements in Panel A, most of the estimates are significantly pos-

[33] For the results based on estimations using the composite index covering a broader set of term searches, see Section B.10 of the Online Appendix.

Table 5: Increased Information Acquisition Prior to M2 Announcements

VARIABLES	(1) Base	(2) Composite	(3) Base	(4) Composite
$\mathbb{I}_{t_{M2}-5}$	0.07***	0.08***	0.07***	0.08***
	(0.02)	(0.01)	(0.02)	(0.01)
$\mathbb{I}_{t_{M2}-4}$	0.09***	0.08***	0.09***	0.08***
	(0.02)	(0.01)	(0.02)	(0.01)
$\mathbb{I}_{t_{M2}-3}$	0.07***	0.10***		
	(0.02)	(0.01)		
$\mathbb{I}_{t_{M2}-2}$	0.09***	0.09***		
	(0.02)	(0.01)		
$\mathbb{I}_{t_{M2}-1}$	0.28***	0.15***		
	(0.02)	(0.01)		
$\mathbb{I}_{t_{M2}-3,t_{M2}-1}$			0.14***	0.12***
			(0.01)	(0.01)
$\mathbb{I}_{t_{M2}}$	0.42***	0.20***	0.42***	0.20***
	(0.02)	(0.01)	(0.02)	(0.01)
$\mathbb{I}_{t_{M2}+1}$	0.27***	0.14***	0.27***	0.14***
	(0.02)	(0.01)	(0.02)	(0.01)
$\mathbb{I}_{t_{M2}+2}$	0.19***	0.13***	0.19***	0.13***
	(0.02)	(0.01)	(0.02)	(0.01)
$\mathbb{I}_{t_{M2}+3}$	0.17***	0.13***	0.17***	0.13***
	(0.02)	(0.01)	(0.02)	(0.01)
$\mathbb{I}_{t_{M2}+4}$	0.13***	0.11***	0.13***	0.11***
	(0.01)	(0.01)	(0.01)	(0.01)
$\mathbb{I}_{t_{M2}+5}$	0.10***	0.09***	0.10***	0.09***
	(0.02)	(0.01)	(0.02)	(0.01)
Constant	-0.13***	-0.17***	-0.13***	-0.17***
	(0.02)	(0.02)	(0.02)	(0.02)
Year / Month / Weekday Dummies	Yes	Yes	Yes	Yes
Observations	3,652	3,652	3,652	3,652
R^2	0.26	0.33	0.25	0.33

Notes: Sample: January 2010 to December 2019. This table reports the regression results of Equation (7) in columns (1) and (2), and of a specification in which the three day dummies are replaced by a joint 3-day pre-announcement dummy $\mathbb{I}_{t_{M2}-3,t_{M2}-1}$ in columns (3) and (4). Dummy $\mathbb{I}_{t_{M2}-3,t_{M2}-1}$ equals one if a trading day falls in a 3-day window before an **M2** announcement. The dependent variable is the Baidu keywords-based search index. There are 3652 observations of daily search index recorded on both trading and non-trading days for our sample years. For non-trading days, the announcement day dummies are coded as zeros. We consider search intensity with respect to "M2 growth", "money supply" and "total social financing" (Base Measure), and more generally to include all terms of "M2 growth", "money supply", "total social financing", "monetary policy", "financial institutions", "liquidity of assets" and "economic fundamentals" (Composite Measure). Announcement day dummy $\mathbb{I}_{t_{M2}-i}$ equals one if the i-th trading day is before (or after if i is negative) an **M2** announcement. We first compute simple averages of the considered search index series for different key words, $index_t^{raw}$, and then apply the normalization by removing the 30-day moving-average trend, $trend_t$. The exact normalization follows that: $index_t^{norm} = log(\frac{1+index_t^{raw}}{1+trend_t})$. ***, **, *, and + denote significance at the 1%, 5%, 10%, and 15% levels, respectively. Robust standard errors are in parentheses.

itive. Information acquisition is increased in the PBOC's announcement windows relative to that of non-announcement days even if we focus only on those monthly announcement cycles with early announcements. Moving to Panel B, with estimation results associated with late announcement groups, the coefficient estimates associated with $\mathbb{I}_{t_{M2}-2}$ and $\mathbb{I}_{t_{M2}-1}$ are particularly larger than their coefficient counterparts for the early announcement groups. First, accounting for the tight standard errors estimated for these coefficients, the estimates based on subsamples of search index in months with announcements made on or after $12^{th}, 13^{th}$ and 14^{th} are significantly larger than those for announcements before these days. Second, we compute the Wald statistic by calculating the differences in the coefficient estimates related to term $\mathbb{I}_{t_{M2}-1}$ between the early and late groups for each cutoff day. The Wald statistic follows an approximate χ^2 distribution, and we find the coefficients for the early groups are significantly smaller than those of the late groups at the significance level of 5%.[34] Therefore, we document that the measured degree of information acquisition among investors for learning about the monetary data is further heightened before announcements when an announcement arrives late in a month. Consistent with our theoretical discussion, there is no significant pre-announcement premium for early announcements because the information acquisition by uninformed investors is not strong enough when the perceived probability of an announcement arrival is low, and there is likely not much accumulated uncertainty yet and thus uncertainty reduction needed for generating the pre-announcement premium. Such evidence highlights the fact that both the existence of equity premium and the intensity of information acquisition depend on the timing of the PBOC's announcement arrival in monthly cycles.

In summary, we provide additional evidence depicting the dynamics of information acquisition centering on the days of the PBOC's announcements of monetary statistics. These findings suggest that the information acquisition channel, as highlighted in Ai, Bansal, and Han (2022), can be an important channel to account for the pre-announcement premium in China. We emphasize the fact that the uniqueness of institutional details in China's market helps identify this channel given quasi-scheduled announcements. This lends additional credence to our theoretical discussion featuring endogenous information acquisition for rationalizing the pre-announcement premium.

5 Conclusion

By studying China, this paper examines stock market returns in an environment in which the dates of the central bank's information supply through public announcements are not prescheduled. That is, investors do not know the exact day of the central bank's announcement, but they are well informed that some data will be released, sooner or later, with absolute certainty. We document that large and positive excess returns are accrued on China's equity market in response to its central

[34] In addition, in Section B.11 of the Online Appendix, we show in an interaction regression setting with a dummy variable of the early group interacting with pre-announcement day dummies that the degree of information acquisition is further increased for late arrivals of announcements.

Table 6: Information Acquisition: Early vs. Late M2 Announcements

	Panel A				Panel B			
VARIABLES	(1) $< 11^{th}$	(2) $< 12^{th}$	(3) $< 13^{th}$	(4) $< 14^{th}$	(1) $\geq 11^{th}$	(2) $\geq 12^{th}$	(3) $\geq 13^{th}$	(4) $\geq 14^{th}$
$\mathbb{I}_{t_{M2}-5}$	0.00	0.05**	0.05**	0.07***	0.08***	0.09***	0.10***	0.08***
	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)
$\mathbb{I}_{t_{M2}-4}$	0.19**	0.08**	0.07**	0.07***	0.07***	0.09***	0.11***	0.12***
	(0.08)	(0.04)	(0.03)	(0.03)	(0.02)	(0.02)	(0.02)	(0.03)
$\mathbb{I}_{t_{M2}-3}$	0.14***	0.05*	0.05**	0.07***	0.06***	0.09***	0.11***	0.09**
	(0.05)	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.04)
$\mathbb{I}_{t_{M2}-2}$	0.07	0.03	0.04*	0.07***	0.09***	0.12***	0.15***	0.13***
	(0.06)	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)
$\mathbb{I}_{t_{M2}-1}$	0.18***	0.12***	0.21***	0.25***	0.29***	0.37***	0.37***	0.35***
	(0.04)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.04)	(0.04)
$\mathbb{I}_{t_{M2}}$	0.37***	0.35***	0.35***	0.39***	0.43***	0.47***	0.52***	0.50***
	(0.05)	(0.03)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.03)
$\mathbb{I}_{t_{M2}+1}$	0.22***	0.21***	0.22***	0.24***	0.27***	0.30***	0.34***	0.32***
	(0.05)	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)
$\mathbb{I}_{t_{M2}+2}$	0.17***	0.14***	0.15***	0.18***	0.19***	0.22***	0.25***	0.22***
	(0.04)	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)
$\mathbb{I}_{t_{M2}+3}$	0.16***	0.11***	0.12***	0.15***	0.17***	0.20***	0.23***	0.21***
	(0.05)	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)
$\mathbb{I}_{t_{M2}+4}$	0.11***	0.09***	0.11***	0.12***	0.14***	0.16***	0.17***	0.15***
	(0.04)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)
$\mathbb{I}_{t_{M2}+5}$	0.12***	0.07**	0.07***	0.08***	0.10***	0.13***	0.15***	0.15***
	(0.04)	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Constant	-0.30***	-0.09**	-0.05*	-0.06**	-0.05**	-0.06**	-0.06*	-0.07+
	(0.06)	(0.04)	(0.03)	(0.03)	(0.02)	(0.03)	(0.03)	(0.05)
Year/Month/Weekday Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	551	1,464	2,226	2,591	3,101	2,188	1,426	1,061
R^2	0.28	0.22	0.24	0.25	0.27	0.31	0.33	0.33
Late - Early: $\mathbb{I}_{t_{M2}-1}$ (Wald Test: χ^2 *Stat.*)					5.00[0.03]	35.2 [0.00]	11.3 [0.00]	4.19 [0.04]

Notes: Sample: January 2010 to December 2019. This table reports dummy variable regression results of Equation (7). The dependent variable is the detrended Baidu keywords-based search index with respect to a few terms about the monetary statistics announced each month: "M2 growth", "money supply" and "total social financing". Daily search index are recorded on both trading and non-trading days for our sample years. The total sum of observations of the early and the late groups for a given cutoff is thus fixed at 3652. Announcement day dummy $\mathbb{I}_{t_{M2}-i}$ equals one if the i-th trading day is before (or after if i is negative) an **M2** announcement. For non-trading days, the announcement day dummies are coded as zeros. We first compute simple averages of the considered search index series for different key words, $index_t^{raw}$, and then apply the normalization by removing the 30-day moving-average trend, $trend_t$. The exact normalization follows that: $index_t^{norm} = log(\frac{1+index_t^{raw}}{1+trend_t})$. Each column summarizes the estimation results based on a restricted sample that includes data of trading days for a selected number of months. Regression results with the daily measure of search index in a month where the PBOC's M2 announcement arrived earlier than a cutoff day of month, e.g. $11^{th}, 12^{th}, 13^{th}$ and 14^{th} are shown in Panel A (early group). By contrast, regression results based on daily search index in a month with the announcements arriving on or after one the cutoff day of month are shown in Panel B (late group). Year, month, and weekday dummies are included. The actual date and time information of the PBOC's announcements is used for dividing the event sample into two groups. ***, **, *, and + denote significance at the 1%, 5%, 10%, and 15% levels, respectively. Robust standard errors are in parentheses. P-values of the wald-statistic are reported in the brackets besides the statistics.

bank's monthly announcements of measures of monetary aggregates, which may arrive early or late in a month. For the period of 2010 to 2019, on average, the A-share market in China realized an excess return of 25 bps per day in the 3-day window prior to the day of the announcement. More importantly, we find that the pre-announcement premium exists only when an announcement arrives late in monthly cycles. In particular, the pre-announcement equity premium is accrued while market uncertainty is lowered.

By featuring randomness in the timing of announcement arrivals, we rationalize the pre-announcement premium in China within the analytical framework of Ai, Bansal, and Han (2022), which highlights the information acquisition channel as an important driver. We show that the degree of information acquisition is larger as the date approaches the end of an announcement cycle when an announcement is pending. Greater information acquisition can be driven by uninformed investors who find it optimal to acquire extra information when the date is increasingly closer to the announcement arrival. It then follows that information acquisition, as associated with late announcements, mitigates market uncertainty and generates the accumulation of equity premium before announcements. Finally, we provide strong empirical evidence showing that the efforts of information acquisition are heightened before announcements, and the intensity of acquiring information among investors is larger when announcements arrive late.

Ultimately, we stress that our documented pre-announcement premium in China itself is uniquely important for understanding asset pricing in general. In particular, our paper contributes to a broader span of literature. First, we examine an environment of quasi-scheduled central bank announcements, which implies that investors' perceived likelihood of seeing an announcement in the next few days weakly increases as time evolves. Our setting of discussions nests a special case when announcements are perfectly scheduled. For example, given that the FOMC's announcements in the U.S. are prescheduled, the perceived likelihood of seeing an announcement and undergoing policy shocks on the next day is zero in theory, as long as the date is prior to the FOMC day. However, this probability would quickly turn to one on the day immediately before the FOMC day, when investors know for sure that an FOMC announcement is to be made tomorrow. Therefore, increasing information acquisition ex ante can be optimal, and the reduction of market uncertainty can be realized one day before the FOMC statement is released. Second, we show in the Online Appendix a full range of U.S.-based evidence that is perfectly consistent with the information acquisition channel.[35] We therefore regard our paper as one of the important works that exploit the random timing of quasi-scheduled announcements to highlight the information acquisition channel for explaining the general phenomenon of the pre-announcement premium.

[35] In Section C of the Online Appendix, we find the following: first, the pre-FOMC equity premium and uncertainty reduction in the U.S. stock markets coexist. Second, the pre-FOMC premium in the U.S. is associated only with the FOMC announcement events that realized sizable reductions in market uncertainty ex ante. Third, based on the Google search index, we show that larger pre-FOMC equity premium is associated with larger efforts of acquiring information in the market to learn about the Fed and the FOMC decisions before the FOMC statement release.

References

Ai, H. and Bansal, R. (2018): Risk preferences and the macroeconomic announcement premium, *Econometrica* 86, 1383–1430.

Ai, H., Bansal, R., and Han, J. L. (2022): Information acquisition and the pre-announcement drift, Working paper.

Bauer, M. D., Lakdawala, A., and Mueller, P. (2021): Market-based monetary policy uncertainty, *The Economic Journal* 132, 1290–1308.

Beckmeyer, H., Branger, N., and Grunthaler, T. (2021): Fed tails: FOMC announcements and stock market uncertainty, Working paper.

Ben-Rephael, A., Carlin, B. I., Da, Z., and Israelsen, R. D. (2021): Information consumption and asset pricing, *The Journal of Finance* 76, 357–394.

Bernanke, B. S. and Kuttner, K. N. (2005): What explains the stock market's reaction to federal reserve policy?, *Journal of Finance* 60, 1221–1257.

Bernile, G., Hu, J., and Tang, Y. (2016): Can information be locked up? Informed trading ahead of macro-news announcements, *Journal of Financial Economics* 121, 496–520.

Brusa, F., Savor, P., and Wilson, M. (2019): One central bank to rule them all, *Review of Finance* 24, 263–304.

Chen, K., Ren, J., and Zha, T. (2018): The nexus of monetary policy and shadow banking in china, *American Economic Review* 108, 3891–3936.

Cieslak, A., Morse, A., and Vissing-Jorgensen, A. (2019): Stock returns over the FOMC cycle, *The Journal of Finance* 74, 2201–2248.

Cocoma, P. (2022): Explaining the pre-announcement drift, Working paper.

Fisher, A., Martineau, C., and Sheng, J. (2022): Macroeconomic attention and announcement risk premia, *The Review of Financial Studies* , Forthcoming.

Hu, G. X., Pan, J., Wang, J., and Zhu, H. (2021): Premium for heightened uncertainty: Explaining pre-announcement market returns, *Journal of Financial Economics* , Forthcoming.

Jiang, G., Pan, G., and Qiu, Z. (2019): Pre-announcement premium, Working paper.

Kacperczyk, M., Nieuwerburgh, S. V., and Veldkamp, L. (2016): A rational theory of mutual funds' attention allocation, *Econometrica* 84, 571–626.

Kacperczyk, M., Nosal, J., and Stevens, L. (2019): Investor sophistication and capital income inequality, *Journal of Monetary Economics* 107, 18–31.

Kacperczyk, M., Nosal, J., and Sundaresan, S. (2022): Market power and price informativeness, Working paper.

Kurov, A., Sancetta, A., Strasser, G., and Wolfe, M. H. (2019): Price drift before U.S. macroeconomic news: Private information about public announcements?, *Journal of Financial and Quantitative Analysis* 54, 449–479.

Laarits, T. (2019): Pre-announcement risk, Working paper.

Lucca, D. O. and Moench, E. (2015): The pre-FOMC announcement drift, *The Journal of Finance* 70, 329–371.

Martello, V. and Ribeiro, R. (2018): Pre-FOMC announcement relief, Working paper.

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

Peng, L. and Xiong, W. (2006): Investor attention, overconfidence and category learning, *Journal of Financial Economics* 80, 563–602.

Savor, P. and Wilson, M. (2013): How much do investors care about macroeconomic risk? Evidence from scheduled economic announcements, *Journal of Financial and Quantitative Analysis* 48, 343–375.

Savor, P. and Wilson, M. (2014): Asset pricing: A tale of two days, *Journal of Financial Economics* 113, 171–201.

Savor, P. and Wilson, M. (2016): Earnings announcements and systematic risk, *The Journal of Finance* 71, 83–138.

Sims, C. A. (2003): Implications of rational inattention, *Journal of Monetary Economics* 50, 665–690.

Wachter, J. A. and Zhu, Y. (2021): A model of two days: Discrete news and asset prices, *The Review of Financial Studies* 35, 2246–2307.

Xu, Y., Xuan, Y., and Zheng, G. (2021): Internet searching and stock price crash risk: Evidence from a quasi-natural experiment, *Journal of Financial Economics* 141, 255–275.

Appendix

A Magnitude of the Pre-announcement Premium and Trading Returns

We evaluate how quantitatively important our documented pre-announcement premium is in both absolute and risk-adjusted terms. In particular, the mean daily excess return of a 3-day window prior to **M2** announcements is compared with the size of total risk premium in China's equity market. Table A.1.T summarizes the results. Based on close-to-close daily excess returns, the first row in Panel A of Table A.1.T finds that the average daily excess return of the Wind A-Share Market Index is about 0.6 bps, which can be aggregated up to an annual return of approximately 1.49%. This is the size of total equity premium in China over our sample years. By contrast, the daily excess returns averaged over all 3-day pre-announcement windows is about 20 bps, which is then annualized up to 7.11% using a factor of 36 (3 days of duration for 12 monthly **M2** announcements). Therefore, in annual terms, the monetary pre-announcement premium in China scales the total equity premium of Chinese equity market by a multiple close to 5. The Sharpe ratio of 3-day holding return on the Wind A-Share Index prior to the **M2** announcements for 12 times a year is about 0.78. This number is very large, more than thirteen times of the mean Sharpe ratio of 0.06 derived from the buy-and-hold strategy on the stock market index of China in a year. Panel B of Table A.1.T shows that our documented pre-announcement premium accounts for a sizable fraction of 43% of China's total equity premium based on open-to-close returns. The relative Sharpe ratio associated with the pre-announcement windows is 1.15. We thus highlight the importance of studying such strong reactions of Chinese equity markets prior to the PBOC's monetary announcements.

Table A.1.T: Pre-announcement Premium and China's Total Equity Premium

		A. Close-to-close Returns			B. Open-to-close Returns		
	No.Obs	Daily average	Annualized	S.R.	Daily average	Annualized	S.R.
Market Total	2431	0.6 bps	1.49%	0.06	10.51 bps	26.28%	1.16
Pre-announcement 3 Days	360	19.74 bps	7.11%	0.78	31.3 bps	11.27%	1.33
Relative Scale			4.76	13.14		0.43	1.15

Notes: This table presents excess returns of the Wind A-Share Market Index earned in 3-day pre-M2 windows as compared to China's total equity premium. "Market Total" presents returns earned in all trading days of the sample range: January 2010 to December 2019. Columns "Annualized" denote cumulative annual excess returns, assuming there are 250 trading days in a calendar year. "S.R." denotes the annualized Sharpe ratio of excess returns. Row label "Pre-announcement 3 Days" presents the returns earned in 3-day pre-M2 announcement windows. Given there are 12 3-day pre-announcement windows per year, we annualize the pre-announcement excess returns by a factor of 36, and the Sharpe ratio is also annualized, which is the daily number multiplied by $\sqrt{36}$. "Relative Scale" scales the returns earned in the 3-day pre-M2 announcement windows by those earned over all trading days. Panel A summarizes the results based on close-to-close returns and Panel B lists the results based on open-to-close returns.

Important to note that when the announcement date is not pre-scheduled and is unknown ex-ante, the trading strategy over a precise duration of days before announcement is not implementable. Nonetheless, we are still able to examine the range of excess returns derived from implementing various feasible buy-and-hold trading strategies. In particular, we compute the holding period excess returns when an investor could purchase the market index at market close some days prior to announcements and hold until selling at the market close on the first trading day right after the announcement, i.e. the announcement day. We pick a few starting days for the holding period as these days are less likely to be the announcement days given the histogram plot in Figure 1. We then calculate the excess returns by allowing for the starting day of a buy-and-hold strategy to vary while fixing the selling day on the announcement day t_{M2}. Table A.2.T summarizes the results of our calculations. Each row of this table denotes our return calculations associated with a particular trading strategy. Across rows, we find that investors could have earned a significantly positive and large equity premium annually ranging from 7.79% to 9.28% by implementing a trading strategy before **M2** announcements every month. Our calculated excess returns outsize the total risk premium in China by a multiple of more than 5, which is well consistent with our findings in Table A.1.T. In addition, we find the annualized Sharpe ratio in the 3-day pre-announcement windows is comparable to that of the market according to Table A.1.T.

Table A.2.T: Trading Strategy and the Size of Pre-announcement Premium

Strategy	Daily Premium (%)	*t.stat*	Average No. of Holding Days in a Year	Annualized Premium (%)	S.R.
$7^{th} - t_{M2}$	0.13	[2.07]	63	8.11	0.65
$8^{th} - t_{M2}$	0.16	[2.39]	55	8.70	0.75
$9^{th} - t_{M2}$	0.20	[2.82]	47	9.28	0.89
$10^{th} - t_{M2}$	0.20	[2.66]	39	7.79	0.84

Notes: Sample: January 2010 to December 2019. This table reports the excess returns realized over a period of buying the Wind A-Share Market Index at market close on i^{th}(for $i = 7, 8, 9, 10$) day of a month until selling at the market close on the first trading day after an announcement is made for that month. "S.R." denotes the annualized Sharpe ratio of excess returns.

B M2 Announcements and Excess Returns: a CAPM Test

We then delve deeper into the cross-section and examine the excess returns of individual stocks within the PBOC's **M2** announcement windows.

Here we provide important evidence from the Chinese markets to shed light on the relationship between the market beta and the average stock returns. In specific, we work with 25 portfolios sorted by size and book-to-market (BM) ratio, and 10 additional beta-sorted portfolios. These 35 portfolios are then taken as the test assets for doing the CAPM test.[36] For a quick overview, we first plot in Figure B.1.F the average excess returns of the 25 size and BM sorted portfolios and 10 beta-sorted portfolios against their market betas conditional on two different samples of daily returns, i.e. the 3-day windows before **M2** announcements, and all days excluding the 3-day pre-announcement windows. The figure shows that based on returns over the 3-day pre-announcement windows, the fitted Security Market Line (SML) has a slope that is strongly positive and statistically significant. This suggests that greater market betas, by capturing larger systemic risk, compensates investors with greater risk premium during days prior to PBOC's monetary announcements. By contrast, over all other days, the fitted SML gives a slightly negative relation between the average excess returns and market betas. Note that the returns on and after the announcement days are grouped into the comparison sample, but this arrangement does not help deliver a positive and significant SML. In sum, CAPM works better in China over those days before PBOC's **M2** announcements relative to other days.

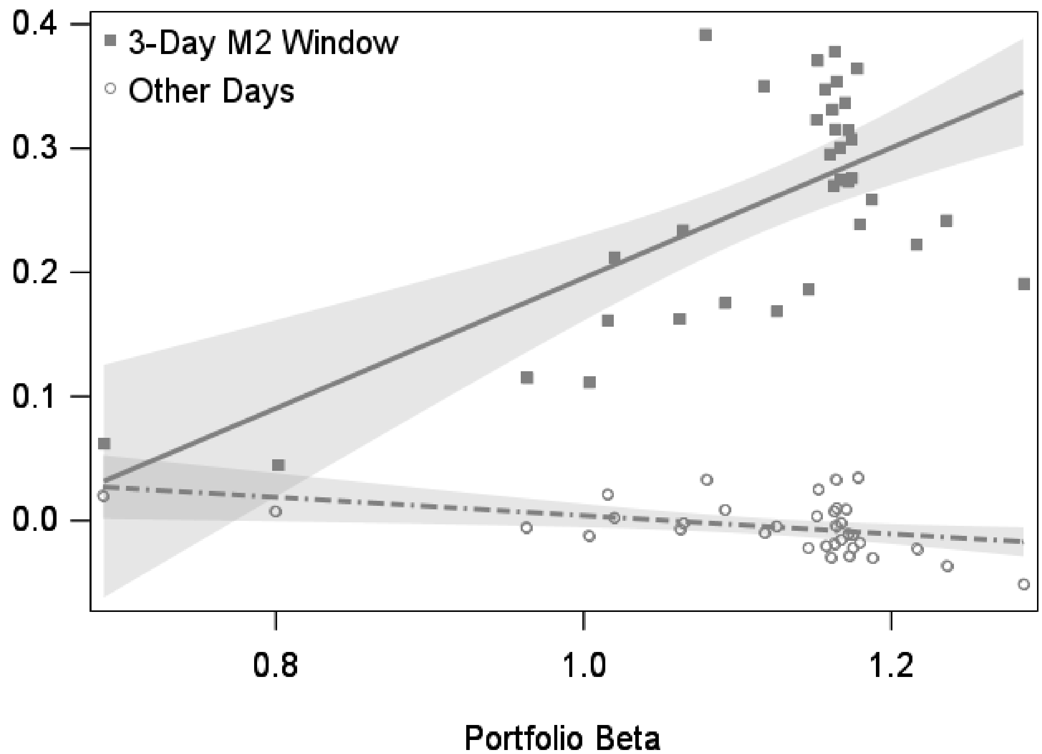
Further, we apply the standard two-step procedure to explicitly test the holding of CAPM and to identify the relationship between market betas of the sorted portfolios and their average excess returns. First, we compute the time-varying value-weighted portfolio market betas $\hat{\beta}_{j,t}$, which are estimated based on daily returns of portfolio j rolling the one-year windows. In the second stage, we adopt the Fama-MacBeth procedure and estimate the coefficients of interest separately for days before, on, or after the **M2** announcements, along with those for days that fall outside the 7-day announcement windows (3 days before and after the announcements). Specifically, we run the regressions specified as follows:

$$R_{j,t+1} - R_{f,t+1} = \gamma_0 + \gamma_1 \hat{\beta}_{j,t} \tag{B.1.E}$$

where $\hat{\beta}_{j,t}$ denotes the portfolio j's stock market beta estimated from the first-stage regressions. $R_{j,t+1} - R_{f,t+1}$ captures the excess returns on the portfolio. Then we estimate the slope coefficients

[36] In terms of sorting, each year, we first assign Chinese A-share stocks to five quintiles by the size of market capitalization as of end of June, and then break the stocks of each size quintile into five sub-portfolios per the book-to-market ratio also by the end of June. Such sorting gives us 25 portfolios. As for the beta-sorted portfolios, we estimate the stock market betas for all stocks using five-year rolling windows of monthly returns, and then sort stocks into ten deciles by the magnitude of the market beta. These beta portfolios are rebalanced every month.

Figure B.1.F: M2 Announcements: Security Market Lines in China



Notes: This figure plots the average daily excess returns in percent (%) against the market beta for 25 Fama French Size-BM portfolios and 10 beta-sorted portfolios based on two different samples, i.e. the 3-day windows before the Chinese **M2** announcements (3-day pre-M2 Window), and all days excluding the 3-day pre-announcement windows (Other Days). The implied OLS-based estimates of the Security Market Line (SML) for two different groups of excess returns are plotted. The sample data covers a period from January 2010 to December 2019. The dark shaded areas mark the 95% confidence band around the fitted SML.

γ_1 so as to pin down the exact relationship between excess returns and the market betas. In particular, we are interested in the slope differences across different samples of daily returns, by which we examine the dependence of the holding of CAPM on whether the days are before, on or after the announcements, or when days fall completely outside the announcement windows.

Table B.3.T reports the regression results. According to Panel A, we see that for the 25 size and BM sorted portfolios, the relationship between excess returns and market betas is negative and insignificant during those days that fall outside the announcement windows. The estimation gives a slope of the SML equal to -17 bps of market risk premium and a t-statistic of -1.47. The intercept equals 12 bps and is also insignificant. Conversely, across the samples of pre-announcement windows of length 1, 2, and 3 days, we see there is a consistently positive slope of the SML. In particular, estimations based on days of the 3-day pre-announcement window find a SML with slope of 49 bps, with a t-statistic of 2.3. The intercept is -26 bps, with a t-statistic of -1.46. In addition, row t_{M2} shows that on the announcement days, the slope of the implied SML is 64 bps and insignificant, and the intercept is also not significantly different from zero. As for the period of 3-day window after the announcement, the slope and intercept of the SML are insignificant. It shows that these results are exactly consistent with the message derived from Figure B.1.F. That is, the positive relationship between excess returns and the market beta in Chinese markets is pronounced during the days prior to the PBOC's announcements for releasing the aggregate monetary statistics.

Panel B of the table reports the results when additional 10 beta-sorted portfolios are included for estimations. Our key results are robust. Over days outside the announcement windows, the slope of fitted SML is still negative, whereas the slope of the implied SML is positive over the pre-announcement windows of varied lengths, with the strongest positive number of 48 bps as market risk premium, with a t-statistic of 2.44 for the 2-day pre-announcement window. Again, the SML estimated based on returns on and after the **M2** announcement are indifferent from that based on estimations of returns over non-announcement days, having an insignificantly negative slope and insignificant intercept.

In sum, our results suggest that the market beta is after all an important measure of the systematic risk in China's equity market. That is, entering into a window of forthcoming monetary announcement with timing uncertainty, when investors in Chinese stock markets are also uncertain about the to-be-released data, investors demand higher risk premium for holding the market portfolio. Cross-sectionally, investors require higher risk premium for holding large-beta stocks. Therefore, the fact the CAPM works better during the pre-announcement days in China resonate well with our empirical results. That is, investors are compensated for bearing beta risk exactly when aggregate risk premium is high.

Important to note that our findings are consistent with other important studies on the U.S. markets. Savor and Wilson (2014) show that the market beta of U.S. stocks is strongly and positively correlated with the average returns on major macro announcement days, i.e. when there are public news announcements about the U.S. inflation, unemployment, and the FOMC decisions. However, the market betas become unrelated to the mean returns on non-announcement days whereby the implied market risk premium turns negative. This result suggests that the CAPM works better on announcement days in the U.S. markets, and the market beta is indeed an important measure of the systematic risk. The existing work that examines the impacts of the macro and firm-level announcements on the functioning of CAPM is mostly focused on the U.S. markets (Savor and Wilson, 2014, 2016). For example, Lucca and Moench (2015) also show that the single market factor model provides a good description of the cross-section of the FOMC-day returns. Our findings complement the literature and show that CAPM works better in Chinese markets before PBOC's monthly monetary announcements.

Table B.3.T: CAPM Test: Excess Returns and Market Betas

Panel A: 25 Fama-French Size and BM sorted portfolios			
Sample of Day Coverages	Intercept	Slope Coefficient	Avg. R^2
$[t_{M2}-3, t_{M2}-1]$	-0.26	0.49	0.25
	[-1.46]	[2.3]	
$[t_{M2}-2, t_{M2}-1]$	-0.52	0.75	0.25
	[-2.21]	[2.73]	
$t_{M2}-1$	-0.49	0.64	0.27
	[-1.37]	[1.57]	
t_{M2}	0.00	0.64	0.23
	[0.02]	[-0.22]	
$[t_{M2}+1, t_{M2}+3]$	0.02	-0.09	0.23
	[0.1]	[-0.44]	
Non-announcement Days	0.12	-0.17	0.24
	[1.05]	[-1.47]	
Panel B: 25 Fama-French Size and BM sorted portfolios, and 10 beta-sorted portfolios			
Sample of Day Coverages	Intercept	Slope Coefficient	Avg. R^2
$[t_{M2}-3, t_{M2}-1]$	-0.12	0.33	0.23
	[-0.92]	[2.08]	
$[t_{M2}-2, t_{M2}-1]$	-0.26	0.48	0.23
	[-1.63]	[2.44]	
$t_{M2}-1$	-0.19	0.34	0.24
	[-0.81]	[1.17]	
t_{M2}	0.04	0.34	0.22
	[0.18]	[-0.36]	
$[t_{M2}+1, t_{M2}+3]$	0.16	-0.22	0.22
	[1.25]	[-1.33]	
Non-announcement Days	0.13	-0.19	0.22
	[1.72]	[-2.14]	

Notes: The table reports estimates from Fama-MacBeth regressions of daily excess returns on market betas of various portfolios of Equation (B.1.E). Panel A shows results for 25 Fama-French portfolios sorted by the market value and book-to-market ratio. Panel B has the results based on 25 Fama-French portfolios, book-to-market sorted portfolios and the 10 beta-sorted portfolios. The sample coverage ranges from January 2010 to December 2019. The t-statistics are reported in brackets.

C Announcement Timing: Additional Tests

Our documented pre-announcement premium exists only when a PBOC's announcement of monetary statistics arrives late in a month. Here, we examine if the announcement delays are indicative of monetary expansion, which could have triggered positive excess returns. More generally, we check if the announcement delays are associated with directional changes in other co-released statistics. We also explore whether the announcement timing in monthly cycles exhibits serial correlations over time, i.e. the self-predictability of announcement timing. These questions are particularly important because if the data to be released can be predicted ahead of time, our claims for causal inference based on random timing of PBOC's announcement scheduling would be much weakened.

C.1 Announcement Delays and News Predictability

First, we examine if the M2 announcement timing associated with a given monthly announcement cycle m, as measured by the day of month on which a PBOC's announcement is made i.e. $Day_{M2,m}$, is correlated with our measure of the monetary statistics announced for that month, i.e. the monthly changes of M2 year-over-year growth rate, $\Delta g_{M2,m}$. In addition, we use a dummy variable to capture the announcement timing, i.e. $Delay_{M2,m}$ which equals 1 if an announcement is made after the 12th of a month. Thus, across the **M2** announcement events, we estimate two regression models as specified below:

$$\Delta g_{M2,m} = \alpha + \gamma Day_{M2,m} + \zeta X + e_m \tag{C.2.E}$$

$$\Delta g_{M2,m} = \alpha + \gamma Delay_{M2,m} + \zeta X + e_m \tag{C.3.E}$$

In the covariate vector X, we include the day-of-month associated with the announcement made in the previous month $Day_{M2,m-1}$. Alternatively, the dummy indicator whether or not the previous announcement was made after the 12th day of that month $Delay_{M2,m-1}$ is included in X. In addition, a range of monetary statistics including monthly changes in the growth rates of M2, M1, the outstanding balance of bank loan, the deposit balance, CPI, VAI, and exports for the previous announcement cycle are all considered as extra controls. The year dummies are included in regressions for some specifications as well.

Table C.4.T summarizes the estimation results. First, we see that regardless of control variables, neither measure of the announcement timing, $Day_{M2,m}$ or $Delay_{M2,m}$, is correlated with the M2 growth statistics announced for that month. Second, across columns, changes in M2 growth published in the previous month is the only proxy that partially helps predict the newest M2 growth number. This association is negative, which indicates that increased money growth for the previous month tends to be followed by a slow down of monetary growth in the ensuing month.

Hence, the announced monetary statistics is not correlated to when an announcement is made in monthly cycles. Our empirical evidence rejects the claim that the pre-announcement premium associated with late announcements is because announcement delays are signalling monetary expansions.

Table C.4.T: Announcement Timing: Predictability of News Content

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
$Day_{M2,m}$	-0.05		-0.06			
	(0.04)		(0.04)			
$Day_{M2,m-1}$		0.01	-0.01			
		(0.04)	(0.04)			
$Delay_{M2,m}$				-0.16		-0.15
				(0.15)		(0.18)
$Delay_{M2,m-1}$					0.07	-0.04
					(0.15)	(0.17)
$\Delta g_{M2,m-1}$			-0.36**			-0.36**
			(0.16)			(0.16)
$\Delta g_{loan,m-1}$			0.23			0.24
			(0.17)			(0.18)
$\Delta g_{deposit,m-1}$			0.12			0.11
			(0.11)			(0.11)
$\Delta g_{M1,m-1}$			-0.02			-0.02
			(0.04)			(0.04)
$\Delta g_{CPI,m-1}$			0.05			0.07
			(0.24)			(0.25)
$\Delta g_{VAI,m-1}$			0.02			0.03
			(0.03)			(0.03)
$\Delta g_{export,m-1}$			0.00			0.00
			(0.01)			(0.01)
Year Dummies			Yes			Yes
Observations	120	120	120	120	120	120
R^2	0.02	0.00	0.22	0.01	0.00	0.21

Notes: Sample: January 2010 to December 2019. The table reports the regression results regarding coefficient estimates per Equations (C.2.E) and (C.3.E). ***, **, *, and + denote significance at the 1%, 5%, 10%, and 15% levels, respectively. Robust standard errors are in parentheses.

C.2 Serial Correlation

Then, we explore whether or not the timing of the PBOC's announcements exhibits serial correlations over monthly cycles. In particular, we run regressions of the following specification:

$$Day_{M2,m} = \alpha + \phi Day_{M2,m-1} + \zeta X + e_m \tag{C.4.E}$$

where the dependent variable is the day-of-month associated with an **M2** announcement event m. The key regressor of interest is the day-of-month associated with the PBOC's announcement made in the previous month, $Day_{M2,m-1}$. If there are serial correlations of announcement timing over months, the coefficient estimate ϕ would be statistically positive or negative, which suggests that the timing of announcement arrivals of previous months is carried into the following months. The year, month and weekday dummies are incrementally included as additional controls across specifications. Table C.5.T collects the estimation results. In column (1), the coefficient estimate suggests that the announcement timing of a given month is not related to the announcement arrival of the subsequent month. This result is robust across columns (2) and (3) as we further control for the potential seasonality of announcement timing by including year, month and weekday fixed effects dummies. Thus, we find little evidence to support the argument that the timing of PBOC's announcement for releasing aggregate monetary data is serially correlated over months. This also implies that it's reasonable to focus on an average announcement cycle, i.e. a month, for our theoretical discussions.

Table C.5.T: Announcement Timing: Serial Correlation

VARIABLES	(1)	(2)	(3)
$Day_{M2,m-1}$	0.11	-0.10	-0.06
	(0.09)	(0.12)	(0.12)
Year Dummies		Yes	Yes
Month Dummies		Yes	Yes
Weekday Dummies			Yes
Observations	120	120	120
R^2	0.01	0.61	0.66

Notes: Sample: January 2010 to December 2019. The table displays the regression results regarding coefficient estimates per Equation (C.4.E). ***, **, *, and + denote significance at the 1%, 5%, 10%, and 15% levels, respectively. Robust standard errors are in parentheses.

D Return Volatility Prior to Announcements

In a regression setting, we document that the stock return volatility in China is lower prior to PBOC's announcements of monetary aggregates data. For lack of the high frequency data for the complete set of stocks under Wind A Index, we therefore examine the return volatility as captured by the standard deviation of 5-minute returns on the realized Shanghai Stock Exchange Index (SSE) and Shenzhen Stock Exchange Index (SZSE) separately.

We estimate the following specification, with $\mathbb{I}_{t_{M2}-1} = 1$ and $\mathbb{I}_{t_{M2}-3,t_{M2}-1} = 1$ indicating the day that falls into a 1-day or 3-day pre-announcement window respectively:

$$Ret\_Vol_t = \gamma + \sum_{i=-T}^{T} \beta_i \mathbb{I}_{t_{M2}-i} + \beta_x X_t + \upsilon_t \tag{D.5.E}$$

$$Ret\_Vol_t = \gamma + \theta \mathbb{I}_{t_{M2}-3,t_{M2}-1} + \sum_{i=-T}^{0} \beta_i \mathbb{I}_{t_{M2}-i} + \sum_{i=4}^{T} \beta_i \mathbb{I}_{t_{M2}-i} + \beta_x X_t + \upsilon_t \tag{D.6.E}$$

Accordingly, we are interested in the coefficient estimates associated with the terms $\mathbb{I}_{t_{M2}-1}$ and $\mathbb{I}_{t_{M2}-3,t_{M2}-1}$. Table D.6.T presents the estimation results of Equations (D.5.E) and (D.6.E). We find that the realized return volatility is lower during 1-day and 3-day windows before the **M2** announcements than that of an average day outside the announcement windows. In addition, it is interesting to see that the return volatility of both stock exchanges in China is low on and one day after the announcements.

The above empirical findings related to return volatility are well consistent with the mechanism discussed in our main text. The information acquisition model of Ai, Bansal, and Han (2022) assumes that the information acquired by the uninformed investors is the information that is already known to informed investors and has been incorporated into the equilibrium stock prices. In addition, the information acquisition by uninformed investors gradually eliminate noises in stock prices and therefore is associated with a lower volatility of realized stock returns. With the random timing of the quasi-scheduled announcements, investors perceive an increasing likelihood of seeing the announcement arrivals on the following days. There are more uninformed investors acquiring information as time evolves, which leads to reduced return volatility for late announcements.

Next, we examine the potential dependence of the return volatility on the timing of announcement arrivals. In particular, we show that the pre-announcement return volatility is further reduced when an announcement arrives late in a month. This timing pattern exactly echoes what we found for our documented pre-announcement premium. Similarly, we divide the sample of return volatility data into two groups by months: months with announcements made earlier than, and months with announcements made on and after a cutoff day. We estimate the specification of Equation (D.5.E) using a restricted sample from each group.

Panel A and Panel B in Table D.7.T report the estimation results for the return volatility

Table D.6.T: **Stock Return Volatility in Windows of M2 Announcements**

VARIABLES	(1) SSE	(2) SZSE	(3) SSE	(4) SZSE
$\mathbb{I}_{t_{M2}-5}$	0.04	-0.01	0.04	-0.01
	(0.08)	(0.07)	(0.08)	(0.07)
$\mathbb{I}_{t_{M2}-4}$	0.04	0.03	0.04	0.03
	(0.06)	(0.07)	(0.06)	(0.07)
$\mathbb{I}_{t_{M2}-3}$	-0.05	-0.08+		
	(0.05)	(0.05)		
$\mathbb{I}_{t_{M2}-2}$	-0.06	-0.08		
	(0.06)	(0.06)		
$\mathbb{I}_{t_{M2}-1}$	-0.13***	-0.17***		
	(0.04)	(0.05)		
$\mathbb{I}_{t_{M2}-3,t_{M2}-1}$			-0.08**	-0.11***
			(0.03)	(0.04)
$\mathbb{I}_{t_{M2}}$	-0.09*	-0.12**	-0.09*	-0.12**
	(0.05)	(0.05)	(0.05)	(0.05)
$\mathbb{I}_{t_{M2}+1}$	-0.06	-0.09	-0.06	-0.09
	(0.06)	(0.06)	(0.06)	(0.06)
$\mathbb{I}_{t_{M2}+2}$	-0.08*	-0.09*	-0.08*	-0.09*
	(0.04)	(0.05)	(0.04)	(0.05)
$\mathbb{I}_{t_{M2}+3}$	-0.03	-0.04	-0.03	-0.04
	(0.05)	(0.05)	(0.05)	(0.05)
$\mathbb{I}_{t_{M2}+4}$	-0.07+	-0.09+	-0.07	-0.09+
	(0.05)	(0.06)	(0.05)	(0.06)
$\mathbb{I}_{t_{M2}+5}$	-0.10*	-0.10**	-0.10*	-0.10**
	(0.05)	(0.05)	(0.05)	(0.05)
Constant	1.06***	1.40***	1.06***	1.40***
	(0.06)	(0.07)	(0.06)	(0.07)
Year/Month/Weekday Dummies	Yes	Yes	Yes	Yes
Observations	2,431	2,431	2,431	2,431
R^2	0.31	0.28	0.31	0.28

Notes: Sample: January 2010 to December 2019. This table reports dummy variable regression results of Equations (D.5.E) and (D.6.E) for different specifications. The dependent variable for column (1) and column (3) is the daily stock return volatility on Shanghai Stock Exchange Market Index (SSE), as measured by the standard deviation of 5-minute returns on the market index. The dependent variable for column (2) and column (4) is the daily stock return volatility on Shenzhen Stock Exchange Market Index (SZSE), as measured by the standard deviation of 5-minute returns on the market index. The announcement day dummy $\mathbb{I}_{t_{M2}-1}$ equals one for the trading days in a 1-day window before an **M2** announcement. The announcement day dummy $\mathbb{I}_{t_{M2}-3,t_{M2}-1}$ equals one for the trading days in a 3-day window before an **M2** announcement. "Year/Month/Weekday Dummies": controls for the year, month, and weekday effects. ***, **, *, and + denote significance at the 1%, 5%, 10%, and 15% levels, respectively. Robust standard errors are in parentheses.

associated with Shanghai and Shenzhen stock exchange respectively. We see that regardless of the stock exchange, the coefficient estimates for pre-announcement day dummies associated with late announcement groups are significantly negative and larger in absolute size. These findings suggest that the size of the pre-announcement return volatility also depends on the timing of the PBOC's announcement in monthly cycles.

Table D.7.T: Stock Return Volatility: Early vs. Late Announcements

Panel A: SSE Composite Index

VARIABLES	(1) $< 11^{th}$	(2) $< 12^{th}$	(3) $< 13^{th}$	(4) $< 14^{th}$	(1) $\geq 11^{th}$	(2) $\geq 12^{th}$	(3) $\geq 13^{th}$	(4) $\geq 14^{th}$
$\mathbb{I}_{t_{M2}-5}$	-0.08	-0.01	0.01	0.02	0.06	0.07	0.09	0.08
	(0.07)	(0.07)	(0.07)	(0.06)	(0.09)	(0.12)	(0.16)	(0.20)
$\mathbb{I}_{t_{M2}-4}$	-0.11*	-0.05	0.02	0.01	0.07	0.10	0.08	0.11
	(0.06)	(0.07)	(0.08)	(0.07)	(0.07)	(0.09)	(0.09)	(0.10)
$\mathbb{I}_{t_{M2}-3}$	-0.05	-0.11*	-0.03	-0.06	-0.05	-0.01	-0.08	-0.04
	(0.08)	(0.06)	(0.06)	(0.06)	(0.06)	(0.07)	(0.09)	(0.10)
$\mathbb{I}_{t_{M2}-2}$	0.06	-0.10	-0.06	-0.07	-0.09	-0.03	-0.06	-0.05
	(0.12)	(0.08)	(0.07)	(0.06)	(0.06)	(0.08)	(0.10)	(0.12)
$\mathbb{I}_{t_{M2}-1}$	-0.02	-0.11*	-0.09*	-0.11**	-0.15***	-0.14**	-0.19**	-0.17*
	(0.05)	(0.07)	(0.05)	(0.05)	(0.05)	(0.06)	(0.08)	(0.09)
$\mathbb{I}_{t_{M2}}$	-0.04	-0.10	-0.07	-0.09*	-0.10*	-0.09	-0.12	-0.10
	(0.07)	(0.07)	(0.06)	(0.05)	(0.05)	(0.06)	(0.09)	(0.10)
$\mathbb{I}_{t_{M2}+1}$	-0.00	-0.12+	-0.10+	-0.09+	-0.07	-0.02	0.01	0.02
	(0.13)	(0.08)	(0.07)	(0.06)	(0.06)	(0.08)	(0.11)	(0.12)
$\mathbb{I}_{t_{M2}+2}$	-0.02	-0.13**	-0.08	-0.07	-0.10*	-0.05	-0.10	-0.12+
	(0.07)	(0.06)	(0.06)	(0.05)	(0.05)	(0.06)	(0.07)	(0.07)
$\mathbb{I}_{t_{M2}+3}$	-0.08	-0.12*	-0.06	-0.05	-0.03	0.02	0.01	0.01
	(0.07)	(0.07)	(0.06)	(0.05)	(0.05)	(0.06)	(0.08)	(0.10)
$\mathbb{I}_{t_{M2}+4}$	0.06	-0.08	-0.09	-0.08	-0.10*	-0.07	-0.05	-0.07
	(0.15)	(0.08)	(0.06)	(0.06)	(0.05)	(0.06)	(0.09)	(0.10)
$\mathbb{I}_{t_{M2}+5}$	-0.07	-0.11+	-0.09	-0.08	-0.10*	-0.08	-0.10	-0.14+
	(0.07)	(0.07)	(0.07)	(0.06)	(0.06)	(0.06)	(0.08)	(0.09)
Year/Month/Weekday Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	369	993	1,512	1,751	2,062	1,438	919	680
R-squared	0.33	0.43	0.29	0.28	0.32	0.31	0.40	0.45

Panel B: SZSE Component Index

VARIABLES	(1) $< 11^{th}$	(2) $< 12^{th}$	(3) $< 13^{th}$	(4) $< 14^{th}$	(1) $\geq 11^{th}$	(2) $\geq 12^{th}$	(3) $\geq 13^{th}$	(4) $\geq 14^{th}$
$\mathbb{I}_{t_{M2}-5}$	-0.10	-0.00	0.01	0.01	0.01	-0.01	-0.04	-0.05
	(0.08)	(0.08)	(0.07)	(0.07)	(0.08)	(0.10)	(0.13)	(0.15)
$\mathbb{I}_{t_{M2}-4}$	-0.17**	-0.05	0.05	0.04	0.06	0.07	-0.02	-0.03
	(0.08)	(0.08)	(0.10)	(0.09)	(0.08)	(0.10)	(0.10)	(0.12)
$\mathbb{I}_{t_{M2}-3}$	-0.10	-0.12+	-0.04	-0.06	-0.08	-0.06	-0.16**	-0.14+
	(0.10)	(0.08)	(0.07)	(0.06)	(0.06)	(0.07)	(0.08)	(0.09)
$\mathbb{I}_{t_{M2}-2}$	-0.00	-0.13+	-0.07	-0.08	-0.09+	-0.04	-0.09	-0.07
	(0.14)	(0.09)	(0.07)	(0.07)	(0.07)	(0.08)	(0.10)	(0.12)
$\mathbb{I}_{t_{M2}-1}$	-0.03	-0.16*	-0.11*	-0.14**	-0.20***	-0.18***	-0.26***	-0.24**
	(0.08)	(0.08)	(0.06)	(0.06)	(0.05)	(0.06)	(0.08)	(0.09)
$\mathbb{I}_{t_{M2}}$	0.00	-0.09	-0.06	-0.08	-0.14**	-0.13**	-0.20**	-0.21**
	(0.09)	(0.08)	(0.06)	(0.06)	(0.05)	(0.06)	(0.08)	(0.10)
$\mathbb{I}_{t_{M2}+1}$	-0.05	-0.17*	-0.12+	-0.11+	-0.09	-0.03	-0.04	-0.05
	(0.17)	(0.10)	(0.08)	(0.07)	(0.07)	(0.08)	(0.11)	(0.12)
$\mathbb{I}_{t_{M2}+2}$	-0.04	-0.15**	-0.09	-0.07	-0.10*	-0.05	-0.10	-0.14
	(0.07)	(0.06)	(0.06)	(0.06)	(0.06)	(0.07)	(0.09)	(0.11)
$\mathbb{I}_{t_{M2}+3}$	-0.10	-0.12+	-0.05	-0.05	-0.03	0.02	-0.03	-0.02
	(0.08)	(0.08)	(0.06)	(0.06)	(0.06)	(0.07)	(0.09)	(0.11)
$\mathbb{I}_{t_{M2}+4}$	-0.02	-0.10	-0.11+	-0.08	-0.10+	-0.07	-0.05	-0.10
	(0.13)	(0.08)	(0.07)	(0.06)	(0.06)	(0.08)	(0.11)	(0.12)
$\mathbb{I}_{t_{M2}+5}$	-0.10	-0.13+	-0.10+	-0.09+	-0.10*	-0.08	-0.11	-0.14
	(0.08)	(0.08)	(0.07)	(0.06)	(0.06)	(0.06)	(0.09)	(0.11)
Year/Month/Weekday Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	369	993	1,512	1,751	2,062	1,438	919	680
R-squared	0.37	0.38	0.26	0.24	0.29	0.27	0.37	0.43

Notes: Sample: January 2010 to December 2019. This table reports dummy variable regression results of Equations (D.5.E). The dependent variable is the daily return volatility measures based on realized returns on Shanghai (Panel A) and Shenzhen (Panel B) Stock Exchange market index. Announcement day dummy $\mathbb{I}_{t_{M2}-i}$ equals one if the i-th trading day is before (or after if i is negative) an **M2** announcement. We align the return data of the first trading day that the equity market has access to the news to the dummy variable $\mathbb{I}_{t_{M2}} = 1$ when $i = 0$. Each column summarizes the estimation results based on a restricted sample that includes only trading days outside all **M2** announcement windows of 11 days and windows of those selected announcement events that fall into the early or the late group. The actual date and time information of the PBOC's announcements is used for dividing the event sample. Year, month, and weekday dummies along with the remaining day dummies of the announcement window of length of $2T + 1$ as $T = 5$ are included. ***, **, *, and + denote significance at the 1%, 5%, 10%, and 15% levels, respectively. Robust standard errors are in parentheses.

E Proof of Lemma 1

Before entering an announcement cycle, suppose investors are endowed with some prior probability distribution believing that an announcement would fall on a day $i \in \{1, ..., N\}$ with probability $Prob(t^A = i) \geq 0$. $\sum_{i=1}^{N} Prob(t^A = i) = 1$ follows from the fact that an announcement is to be made with the probability of one in each cycle. Conditional on no announcement made from day 1 up to day t, by the Bayes' Rule, the investors' posterior probability for seeing an announcement on a day $n \geq t+1$ can be expressed as $Prob(t^A = n|\{t^A \neq i\}_{i=1}^{i=t}) = \frac{Prob(t^A=n)Prob(\{t^A \neq i\}_{i=1}^{i=t}|n=t^A)}{Prob(\{t^A \neq i\}_{i=1}^{i=t})} = \frac{Prob(t^A=n)}{Prob(\{i \neq t^A\}_{i=1}^{i=t})}$.

Denote the cumulative probability density function associated with the prior distribution using $G(t) = Prob(t^A \leq t)$. We can rewrite $Prob(t^A = n|\{t^A \neq i\}_{i=1}^{i=t}) = \frac{Prob(t^A=n)}{1-G(t)}$. As time t evolves, larger $G(t)$ in the denominator strictly increases this ratio, as long as the prior probability for day n being the announcement day $Prob(t^A = n)$ is positive. In sum, with $Prob(t^A = n) \geq 0$ for $n \geq t+1$, $Prob(t^A = n|\{t^A \neq i\}_{i=1}^{i=t})$ is weakly increasing in day t.