The Pre-Response of Macroeconomic News in RMB Exchange Rate

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Abstract. Macroeconomic news, as a statistical data of economic indicators regularly published to measure national fundamentals, provides basic information for financial asset prices. Based on the RMB exchange rate data from 2011 to 2023 and the macroeconomic news data of China and the United States, this paper uses the dummy variable regression method to study the market reaction of my country's foreign exchange market in the window interval before and after the release of macroeconomic news. The results show that there will be significant abnormal returns in the onshore and offshore RMB markets before the announcement of some macroeconomic news, which comes from the information acquisition behavior of market traders, leading to changes in expectations and reflected in foreign exchange prices. When the market state is characterized by a higher level of uncertainty and higher market attention, this effect will be enhanced.

Keywords: Macroeconomic news; RMB exchange rate; The Pre-Response; Information acquisition

1 Introduction

With the further extension of foreign exchange trading hours and the continuous acceleration of the internationalization of the RMB, macroeconomic news, as an external shock affecting the prices of financial assets, has always attracted widespread attention from domestic and foreign scholars. The impact of macroeconomic news on exchange rates is often unproven and comes from many factors such as market beliefs, the attitude of monetary authorities, and economic conditions (Garcia, 2013; Narayan et al., 2021) [1] [2].

This paper selects 15 Chinese and 37 American macroeconomic news to study the market reaction of the RMB exchange rate to macroeconomic news in China and the United States from 2011 to 2023. Empirical analysis finds that the RMB exchange rate has a significant abnormal return rate within three days before the release of macroeconomic news, and then the abnormal return rate gradually weakens. This phenomenon is called the pre-response phenomenon of macroeconomic news. For this short-term abnormal return, it is closely related to the behavior of market traders. Specifically, when the market state uncertainty level is higher and the market atten-

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tion and information acquisition behavior of traders are higher, this abnormal return will be further enhanced.

The research value of this paper is mainly reflected in two aspects. First, the impact of macroeconomic news in China and the United States on the onshore and offshore RMB exchange rate markets is significant. The daily return of the RMB exchange rate will be abnormal three days before the release of some macroeconomic news. Second, this paper verifies the information acquisition channel of macroeconomic news pre-response based on China's foreign exchange market. Ai et al. (2022) proved that information acquisition solves the uncertainty of uninformed traders to a certain extent, and under the generalized risk-sensitive preference, it reduces the discount rate and leads to asset price increases [3]. Due to information advantages or increased market attention, uninformed traders collect information about the foreign exchange market's reaction to future macroeconomic news before the release of macroeconomic news and learn about it. As this information acquisition behavior increases, market information continues to enter the exchange rate price, causing changes in asset prices.

2 Theoretical Analysis and Research Hypotheses

Ai et al. (2022) constructed a noise rational expectation model that includes endogenous information acquisition and periodic announcements to explain the mystery of pre-response before the US FOMC announcement, and found that endogenous information acquisition and traders' generalized risk-sensitive preferences can explain the pre-response phenomenon. Guo et al. (2023) used the theoretical framework of Ai et al. (2022) to find that the information acquisition channel can explain the reduction of uncertainty and positive risk premium before the announcement of China's monetary policy [4]. The above theoretical framework provides a practical research perspective for the pre-response phenomenon of macroeconomic news in this paper. Kurov et al. (2019) found a large number of informed transactions in the study of the pre-response of stock index futures and Treasury futures before the release of US macroeconomic announcements, and believed that traders had private information about macroeconomic fundamentals, and the pre-response to news announcements may come from a combination of information leakage and excellent predictions containing proprietary data [5].

Regarding the existence of RMB exchange rate pre-response to macroeconomic news, this paper believes that before the release of macroeconomic indicator statistics, institutions have already formed professional forecasts based on past market conditions, and market traders will also collect market-related information and form expectations before the release of macroeconomic news. As various information enters the foreign exchange market through traders, the exchange rate price will change abnormally before the announcement. Since various information in the market enters the exchange rate price through traders, this paper believes that the exchange rate price often over-reacts or under-reacts to market information due to the irrational short-term trading behavior of market traders, thus affecting the pre-response of macroeconomic news.

H1. The pre-response phenomenon of macroeconomic news may be affected by the state of the foreign exchange market.

3 Research Design

3.1 Data Sources and Sample Selection

This paper selects the exchange rate data of onshore RMB (CNY) and offshore RMB (CNH) and macroeconomic news data of China and the United States from 2011 to September 2023.The sample selection mainly takes into account the development of my country's offshore RMB market, and is better compared with the pre-response phenomenon of macroeconomic news in the onshore RMB market.

Regarding the data of macroeconomic news, this paper obtains the announcement data of monthly and quarterly macroeconomic indicators released by China and the United States through the Bloomberg Economic Calendar Database. Specifically, we mainly refer to Andersen et al. (2003), Kurov et al. (2019) and Han et al. (2023) to select US news announcement data, and select Chinese news announcement data accordingly, and determine a total of 37 US news announcements and 15 Chinese news announcements [6] [7]. This paper studies the market reaction of the RMB exchange rate to macroeconomic news by examining the above announcements.

3.2 Model Specification

In order to test the theoretical mechanism and early information model of how pre-announcement information acquisition leads to market uncertainty and changes in expectations being reflected in asset prices in advance, that is, to study the impact of information acquisition behavior and market uncertainty on the pre-response of macroeconomic news before the release of news announcements, the empirical model is as follows:

$$R_t = \beta_0 + \beta_1 S_t + \beta_2 S_t * VIX_t + \beta_3 S_t * Search_t + \beta_4 VIX_t + \beta_5 Search_t + \epsilon_t$$

Among them, S_t represents the time dummy variable for positive or negative pre-response.

4 Empirical Analysis

The sample interval selected in this paper records a total of 4383 daily data, including trading days and non-trading days. This paper divides the period of identifying the pre-response of macroeconomic news into two groups, positive abnormal and negative, see Table 1. Regarding the pre-response of macroeconomic news, the negative abnormal returns are the majority, the number of days is about twice that of the positive group, and the effect size is about 4 basis points.

Table 1. Abnormal returns in CNY and CNH markets

RMB	S	Days	Percent (%)	Abnormal returns (Basic Point)
CNY	Positve	632	14.42	3.590054
	Negative	1303	29.73	-4.287846
CNH	Positve	411	9.38	4.76984
	Negative	1047	23.89	-4.040163

According to the direction of pre-response to macroeconomic news in China and the United States, the two groups were divided into two groups to study the general laws of the pre-response phenomenon of macroeconomic news, see Table 2. The test results show that for the negative pre-response in the onshore RMB market, the increase in RMB information attention or collection behavior can explain this abnormal return, and the offshore RMB market also gives a robust test result. As for the positive pre-response phenomenon, although the direction and convenience of the pre-response are both positive, it is not statistically significant. It may be caused by the small number of sample days for positive pre-response, which is only half of the negative pre-response in the same period. The VIX, an indicator of market uncertainty, can also explain the pre-response phenomenon of macroeconomic news to a certain extent. When the VIX is higher, the pre-response phenomenon will also increase, but most of the statistical results are not significant.

Table 2. Mechanism Test of Pre-response to Macroeconomic News

	CNY		CNH	
	Positive(+)	Negative(-)	Positive(+)	Negative(-)
Sign(±)	3.45913***	-4.31678***	4.65075***	-4.00800***
	(4.04)	(-6.83)	(3.55)	(-4.92)
Sign(±)*VIX	0.03257	-2.64903***	3.32512**	-1.45015
	(0.03)	(-3.21)	(2.19)	(-1.47)
Sign(±)*Search	9.91529	-11.31235**	8.11181	-8.90336*
	(0.83)	(-1.98)	(0.94)	(-1.88)
VIX	1.60150**	2.26715***	1.72696**	2.42472***
	(2.45)	(3.39)	(2.30)	(3.09)
Search	11.58874***	16.23537***	0.37878	3.71848
	(3.88)	(3.67)	(0.17)	(1.49)
_cons	0.04636	1.55353	0.70423	1.71436
	(0.02)	(0.83)	(0.33)	(0.80)
Observations	4375	4375	4375	4375
R^2	0.0366	0.0473	0.0259	0.0272

5 Conclusions

This paper studies the abnormal return of RMB exchange rate before the release of macroeconomic news announcements in China and the United States, that is, the pre-response phenomenon. Through analysis, it is found that the pre-response phenomenon exists in both onshore and offshore RMB markets in my country. It further proves the information acquisition channel of pre-response, that is, market traders change exchange rate expectations by enhancing information acquisition and market attention, which is ultimately reflected in the change of exchange rate prices. The research conclusions of this paper also have important policy and practical significance. Improve the foreign exchange expectation management and policy communication mechanism, clarify the release date of important macroeconomic data announcements, manage and stabilize market expectations, and reduce the market volatility caused by the release of macroeconomic statistics. Strengthen the risk awareness of foreign exchange market participants, improve the effective learning and risk identification capabilities of market traders, and effectively guide market participants to play a decisive role in building an open, diversified, functional, and orderly foreign exchange market.

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