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China's intervention in the central parity rate: A Bayesian Tobit analysis

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ABSTRACT

This paper investigates China's daily foreign exchange intervention through the setting and adjustment of the central parity rate, using daily data from July 22, 2005 to July 22, 2013. Applying a Bayes Tobit model, we find evidence that China's daily price intervention decision is driven by market developments regarding the Chinese currency, international currency movements and macroeconomic conditions. The results further suggest that the objectives of China's daily price intervention change not only over time, but also between high and low interventions.

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1. Introduction

Daily intervention is applied by some monetary authorities, such as Germany (Almekinders and Eijffinger, 1994, 1996), Russia (Tullio and Natarov, 1999) and Pakistan (Shah et al., 2009), in the most of trading days. China is also the country which applies the intervention in the most of trading days. Official daily intervention in the foreign exchange market has been a distinctive feature of China's exchange rate policy. As in other emerging market economies, the primary motivation of China's daily intervention is to align the exchange rate to fundamentals as suggested in the 1985 Plaza Accord (Baillie and Osterberg, 1997), and to stabilize the disorderly foreign exchange market (Szakmary and Mathur, 1997; Disyatat and Galati, 2007; Pontines and Rajan, 2011). However, despite its critical importance, little is understood about the country's intervention operation. This hampers keeping China's exchange rate policy and its global repercussions in perspective, and hence calls for research attention.

In the new managed floating rate regime, the central parity rate plays a key role. On every business day, this rate is published by the authorities before the market opening. It then remains valid for the day and all market transactions are based upon it. This rate also provides an anchor for the system. In addition, the central parity rate is a policy indicator. In the process of setting the parity rate, the central bank takes into account current and expected economic conditions. Through setting the parity rate at different levels, the central bank may affect the benchmark for transactions in the marketplace, anchoring stability of the Chinese foreign exchange market and transmitting policy signals to market participants.

This study is motivated to examine China's intervention in the central parity rate (the Daily Price intervention) because of its primary importance in the nation's intervention nexus; such research will help to achieve a better understanding of China's exchange rate policy, which is increasingly exhibiting global influences. To this end, the first important dimension concerns understanding the determinants of such intervention. The first challenge is to model a reaction function based on a non-linear relationship, because intervention in the central parity rate does not increase or decrease in approximately the same magnitude. Literature has shown that Tobit models are appropriate when the research interest lies in the magnitude of intervention rather than the probability (Humpage, 1999; Brandner and Grech, 2005). However, given the fact that threshold varies depending on individual characteristics (Omori and Miyawaki, 2010; Nakayama et al., 2010), we combine the Tobit analysis with covariate dependent thresholds. This paper begins by using the Bayes Tobit model as the reaction function.

The work contributes to the literature in several ways. First, we develop a Daily Intervention Index that is constructed by comparing the daily central parity rate to the fair value CNY/USD rate in the IFV approach. Analysis based on this index, the current research unearths evidence on how the foundation of China's exchange rate regime, i.e. the parity exchange rate is managed by the authorities. This sheds critical lights on the properties and frequency of Chinese official intervention and hence helps promote a better understanding of the Chinese exchange rate policy which has growing global importance.

Then, the findings by this research confirms the significant effects of three determinants underlying the process of China's setting of the central parity rate reveals the true nature of the Chinese exchange rate regime. These three determining factors include the RMB price in previous trading sessions (proxied by the market makers' offer rate), international currency movements (proxied by the Broad Dollar Index compiled by America's Federal Reserves) and macro conditions of the economic environment (proxied by the yield curve spread between China and the USA). For practical purposes, with knowledge of these factors international investors and policy observers in the Chinese financial market can gauge possible changes and their future trend of China's central parity as the benchmark exchange rate changes. Finally, for the traders who are involved in China currency business, a better understanding of how and when China's intervention operations may happen can help them design a better informed trading strategy.

In terms of policy implications, this research shows that China's intervention can be effective under some conditions. This means that it is possible for the Chinese government to operate a middle way between the free floating and the fixed exchange rate system. In turn, China to some extent can manage to mitigate the effects of the monetary policy trilemma. This is important to understand fundamental policy development in China.

The results from the Bayes Tobit models show that, generally, these factors have significant effects on China's Daily Price intervention in the whole sample. Results for the whole sample suggest that China follows a leaning-against-the-wind policy, and conditions of domestic economy and foreign market can impact Daily Price intervention. Furthermore, coefficients on the determinants are found to be time-varying across different subsamples, and between high and low intervention. The evidence indicates that China's Daily Price intervention has multi-facets. With regard to high intervention, the policy objective during all the subsample time periods relates to market exchange rate condition. For low intervention, the policy objective ranges from restraining the domestic economy from overheating before the financial crisis, to a focus on market exchange rate conditions during and after the financial crisis.

The rest of this chapter is organized as follows. Section 2 describes measurement of China's Daily Price intervention and the data deployed in the study. Section 3 estimates the Bayes Tobit models. Section 4 reports the estimation results. Section 5 presents the main findings of the study.