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Foreign exchange market intervention and price discovery ☆

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ABSTRACT

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This paper studies the role of foreign exchange market intervention in the price discovery process of the USD–JPY market. Using the tick-by-tick bid and ask quotes from the Electronic Broking Services (EBS), we find that Japanese official intervention affects the relative contributions of bid and ask quotes to price discovery of the USD–JPY exchange rate. The empirical results show that bid quotes usually respond to information more promptly than ask quotes, as measured by information share on a daily basis. The asymmetry in price-discovery efficacy of bid and ask quotes, however, declines in magnitude on days in which Japanese monetary authorities intervene in the USD–JPY market. *J. Japanese Int. Economies* **38** (2015) 214–227. Department of Finance, College of Business, Chung Yuan Christian University, 200 Chung Pei Rd., Chungli, Taoyuan 32023, Taiwan; Department of Finance, School of Management, National Central University, 300 Jhongda Rd., Jhongli, Taoyuan 32001, Taiwan.

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1. Introduction

This paper empirically studies whether and how the asymmetry in informational efficiency of bid and ask quotes relates to foreign exchange (FX) market interventions conducted by Japanese monetary authorities in the USD–JPY market. We use the tick-by-tick data of bid and ask quotes in the USD–JPY spot market provided by the Electronic Broking Services (EBS) to measure the relative contribution of bid and ask quotes to price discovery in FX markets.[2] As the price discovery is the process by which market participants incorporate information into prices, an asymmetry in responses of bid and ask quotes to price-relevant information uncovers the relative efficacy of price discovery between groups of buyers and sellers.

In FX markets, the central bank or monetary authority is one of the most influential participants. The occasional interventions by monetary authorities attempt to move the exchange rate to a target value. FX interventions may affect returns or volatility in exchange rates and trading activities in the FX market through a portfolio-balance channel or a signaling channel (Bhattacharya and Weller, 1997; Montgomery and Popper, 2001; Park and Song, 2008; Fatum, 2009; Kim and Le, 2010; Takagi, 2014).[3] Previous studies have generally concluded that FX interventions affect exchange rates, but are inconclusive about what monetary authorities can actually achieve and how their intervention operations affect trading activities in FX markets (Vitale, 2011).

Recently, Marsh (2011) uses the customer order flow data during August 2002–February 2006 to study the effect of intervention by Japanese monetary authorities on trading activities in the USD–JPY market,[4] and finds that financial customers are more likely to be net buyers of JPY on days in which Japanese authorities officially intervene. The evidence that FX market interventions matter in the FX market microstructure inspires us to further study how FX interventions affect the informational efficiency of exchange rates.

As documented in Marsh (2011) and Takagi (2014), Japanese official interventions are active in managing the USD–JPY exchange rate. In practice, interventions are instigated by the Ministry of Finance (MOF) and executed by the Bank of Japan (BOJ). Between June 1995 and December 2002, Japanese official interventions were infrequent but large in scale. Starting in January 2003, Japanese monetary authorities intervene the USD–JPY market frequently with relatively large scale (at the amount of 272 billion JPY per day). The increased frequency of FX market interventions leading to the depreciation in JPY has made interventions during 2003–2004 to be the largest intervention scheme seen to date in JPY or any other currency.[5] Fig. 1 shows that the scale of Japanese official interventions in the USD–JPY market reached a new high in 2003, with the total net buying of $177 billion to limit the appreciation of JPY. Japanese official's heavy intervention continued during January to March 2004, but then stopped after March 17, 2004. During April 2004 to August 2010, Japanese monetary authorities do not have any intervention on USD–JPY rate, but FX intervention reappears infrequently after September 2010.

[2] The EBS provides an electronic limit-order market for currency trading. As Ito and Hashimoto (2006) note, the EBS has a larger market share in the EUR–USD and USD–JPY, compared with the Reuters Dealing 3000 or 2000-2. Before the introduction of electronic broking system, there is no centralized marketplace for currency trading and trades take place in the different location globally. Since the trading platform of the D3000 (or D2000-2) was introduced by Reuters in April 1992, and the EBS launched it in September 1993, the presence of electronic brokers in the interdealer foreign exchange market has changed the mechanisms for FX spot trading significantly. Limit orders are submitted to the electronic broking system connected by a worldwide network and are matched automatically. The electronic broking systems bring in a more centralized and transparent marketplace for spot rate trading. On the EBS trading platform, dealers can see the best bid, ask, and deal prices, as well as the signs of all trades. Because dealers perceive pre-trade information on the EBS screen, they may control their inventory positions more easily and avoid trading with informed traders.

[3] Takagi (2014) provides a complete survey of recent studies on the effectiveness of FX intervention operations in Japan.

[4] Takagi (2014) documents that most FX intervention decisions in Japan are made by a small group of top officials of MOF (Ministry of Finance), while the Bank of Japan (BOJ) executes the trading. Therefore, it is more appropriate to regard FX market intervention in Japan to be jointly operated by monetary authorities (referring to the MOF and the BOJ collectively), rather than calling central bank intervention.

[5] For more detail, see the data archive of FX intervention operations at the MOF's website (http://www.mof.go.jp/).