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Currency jumps, cojumps and the role of macro news

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ABSTRACT

This study investigates the impact of macro news on currency jumps and cojumps. The analysis uses intra-day data, sampled at 5-min frequency, for four currencies for the period 2005–2010. Results indicate that currency jumps are a good proxy for news arrival. We find 9–15% of currency jumps can be directly linked to U.S. announcements. Notably, news can explain 22–56% of the 5-min jump returns, and there is evidence that better-than-expected news about the U.S. economy has a negative impact on currency jumps. Cojump statistics suggest close dependencies among European currencies, especially between the euro and the Swiss franc. We also provide evidence on the uncertainty resolution to news.

1. Introduction

This paper identifies severe and discontinuous movements (or “jumps”) in exchange rates and examines their relationship with various macroeconomic news announcements across Europe, Japan, and the U.S. The study is important for two reasons. First, the response of prices to new information

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provides insights into price determination, price discovery, and the microstructure behavior of markets. In this regard researchers often characterize the price series as some continuous-time diffusive process. More recently, however, this characterization has come under heightened scrutiny as empirical observations point to the pervasiveness of severe movements in prices that seemingly violate Gaussian distribution. Such empirical evidence in the currency market would carry important implications for hedging, portfolio allocation and the pricing of derivative securities.

Second, the justification for studying macro news effects is that such events provide a unique window to examine how asset prices are connected to the broader economy. In general, empirical evidence supports the strong role of economic fundamentals in influencing bond and equity prices; however, fundamentals are found to carry far less explanatory power in explaining exchange rate movements. In citing previous research in the currency literature, Evans and Lyons (2008) term this phenomenon as the “news puzzle”, and argue that directional effects are harder to detect in exchange rates since they are likely to be swamped by other factors. Adding to this literature is the long-held view that the model of exchange rate determination that performs best is one in which currency movements are considered random (see Meese and Rogoff, 1983; Adler and Lehmann, 1983; Cumby and Obstfeld, 1984; Froot and Thaler, 1990; Alexander and Thomas, 1987; Gandolfo et al., 1990; Saratis and Stewart, 1995). The failure of fundamental models to explain the behavior of exchange rates led Frankel and Rose (1994) to conclude that: “The case for macroeconomic determinants of exchange rates is in a sorry state … results indicate that no model based on such standard fundamentals like money supplies, real income, interest rates, inflation rates, or current account balances will ever succeed in explaining or predicting a high percentage of the variation in the exchange rate, at least at short-or-medium-term frequencies”.

Given this backdrop the central questions we seek to answer in our study are as follows: if economic fundamentals are not very helpful in explaining currency price movements, can they at least be used to explain dramatic price fluctuations? To what extent do currency jumps and cojumps correspond with macro news and what is the direction of this relationship? Are some types of macro news more influential than others? Finally, what is the speed of market response and jump resolution to news releases?[4] These questions are examined using intra-day U.S. dollar exchange rates for the British pound, euro, Japanese yen and the Swiss franc for the period 2005–2010. In the first step, the study applies the jump detection technique recently proposed by Andersen et al. (2010) to extract jumps in the exchange rates and simultaneous jumps across currencies (also known as “cojumps”). Second, once the precise timing of intra-day currency jumps is identified, cross-tabulation and regression analyses are employed to examine the extent to which these jumps and cojumps can be related to a comprehensive set of U.S. and foreign macro news surprises. Finally, the paper examines the speed of currency market response and resolution to news releases. The persistence in the price response function would be construed as evidence against the efficiency of currency markets.

The remainder of the paper is as follows. Section 2 surveys the relevant literature and further distinguishes the current study. Section 3 introduces the jump identification methodology. The data used in the study is described in Section 4. The empirical findings are discussed in Section 5. Section 6 concludes.

2. Literature review

Several studies examine jump-diffusion processes in asset prices. Andersen and Bollerslev (1998), Andersen et al. (2001a,b) and Barndorff-Nielsen and Shephard (2002) provide a framework for the

[4] Although there may be other factors, such as currency interventions, that may also impact exchange rates our focus on pre-scheduled macro news releases stems from a couple of reasons. First, studies find that macro announcements may be responsible for most of the observed time-of-day and day-of-the-week volatility patterns in forex markets (see for example, Ederington and Lee (1993), p. 1161). Second, to maintain empirical tractability, the reliance on scheduled news announcements as opposed to random news arrival provides a natural and controlled experiment to be able to systematically relate jumps with macro news.