



# Order flows, news, and exchange rate volatility

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## Abstract

This paper examines the roles of order flow (reflecting private information) and news (reflecting public information) in explaining exchange rate volatility. Analyzing four months of a bank's high frequency dollar/euro trading, three different kinds of order flow are used in addition to seasonal patterns in explaining volatility. We find that only larger sized order flows from financial customers and banks – indicating informed trading – contribute to explaining volatility, whereas flows from commercial customers do not. The result is robust when we control for news and other measures of market activity. This strengthens the view that exchange rate volatility reflects information processing.

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## 1. Introduction

Volatility of exchange rates is positively linked to the arrival of public information to the market, a stylized fact which has been well documented (Sarno and Taylor, 2003). The main body of evidence in this line of research examines public information flows, such as Melvin and Yin (2000) or Andersen et al. (2003) to name just two. There is increasing evidence, however, that foreign exchange markets may be characterized by an important role of private information, too. The

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prominent empirical measure for the revelation of private information is order flow, i.e. signed transaction volume (Lyons, 2001). So, does the flow of private information into markets – proxied by order flow – create volatility as the flow of public information does? This study is the first, to the best of our knowledge, to directly provide evidence on this issue. We find, indeed, that the arrival of order flow from informed parties is positively linked to exchange rate volatility. This result holds controlling for the usual determinants of volatility in a high frequency setting, i.e. news, calendar effects and intraday activity pattern (Andersen and Bollerslev, 1998).

Our research is motivated by the recent attention given to order flow as a measure to better understand exchange rate dynamics and we are going to examine its potential role in explaining exchange rate volatility. We know from surveys that professionals regard order flow as an important means to understand foreign exchange markets (Goodhart, 1988; Cheung and Chinn, 2001; Gehrig and Menkhoff, 2004). We know that cumulative order flow is related to exchange rate changes (e.g. Evans and Lyons, 2002), we know from high frequency analyses that order flow has permanent price impact (Payne, 2003), and we know that order flow is also related to news (Evans and Lyons, 2004; Dominguez and Panthaki, 2006). All this indicates very clearly that order flow may carry private information into prices and, thus, raises the question whether order flow might also play a significant role in determining exchange rate volatility.

A high frequency analysis of this question should consider that exchange rate volatility is influenced by two further groups of determinants, i.e. institutional forces and the flow of public information. As a flexible and powerful framework to examine volatility we use Andersen and Bollerslev (1998) which is also applied by Cai et al. (2001) or Dominguez and Panthaki (2006). This framework was developed to examine the effect of news on exchange rate volatility, controlling for systematic intraday and interday patterns in volatility. We use this approach and complement it by also considering order flow as a measure of private information.

The joint analysis of public and private information arrival on exchange rate volatility has been conducted in a few papers before, i.e. DeGennaro and Shrieves (1997), Cai et al. (2001) and Bauwens et al. (2005), which we introduce in detail in Section 2. The main innovation of our approach is the fact that we proxy private information by high frequency order flows whereas earlier papers had to rely on different – less advantageous – measures. The reliance on order flows helps to address the identification problem, i.e. the distinction between uninformed liquidity trading and informed trading. Liquidity trading will be more equally distributed on buying and selling, whereas informed trading will be more often on one side of the market only. As Bauwens et al. (2005, p. 1121) write: “Market activity would be ideally measured by the flow of orders between traders and their customers.”

Accordingly, the order flow data we can use is the limiting resource which determines the period of investigation. Our data cover four months dollar/euro trading in 2001 of a bank in Germany. As a particularly interesting feature we have information on interbank as well as financial customers (mutual funds, hedge funds, and insurance companies) and commercial customer (ex- and importers) transactions. The breakdown of order flow into the order flows of several groups has shown that only the order flow of financial institutions and dealers seems to be informative at short-term horizons whereas order flow of non-financial firms is not (Lyons, 2001; Osler et al., 2006). Accordingly, we reach beyond earlier studies and hypothesize that informed order flow will be a stronger determinant of volatility than order flow from uninformed participants.

Our evidence is consistent with the view that private information is a significant determinant of exchange rate volatility. In order to derive this main result we model and empirically confirm the intraday volatility pattern found by Andersen and Bollerslev (1998) for our data. Adding

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