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The efficiency of the information processing in the Australian dollar market: Price discovery following scheduled and unscheduled news

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ABSTRACT

We jointly investigate the responses of the Australian dollar (AUD) order flow, realized volatility and trading volume to unscheduled Reuters news headline alerts and scheduled macroeconomic news from Australia, Japan, the Eurozone, the U.K., and the U.S. over the period 2 January 2007 to 31 December 2009. We find that Reuters foreign exchange and fixed income market news headlines are important, and those headlines that arrive during the Australian offshore trading hours matter more. Furthermore, the AUD market responded mostly to Australian and U.S. macroeconomic news which have direct relevance for the exchange rate. We also find that better than expected Japanese and Eurozone macroeconomic news elicited a response in the AUD and also that better than expected news from Australia, U.S. and U.K. matter more. Finally, we find that the volume response to news decreases at a slower rate than the volatility response and that order flows for the AUD respond only to scheduled news.

1. Introduction

A large and well-established literature has considered the determinants of foreign exchange rates and much of the work in this area has focused on the arrival of expected and unexpected 'news' to the market. For the former, expected news is typically thought to take the form of scheduled macroeconomic announcements (see inter alia Ederington & Lee, 1995; Fleming & Remolona, 1997; Andersen & Bollerslev, 1998; Andersen, Bollerslev, Diebold, and Vega, 2003; Love & Payne, 2008; Evans & Lyons, 2008; Berger, Chaboud, & Hjalmarsson, 2009). For the latter, unexpected news comes in the form of foreign exchange relevant information released by news wire services, such as Reuters (see inter alia Bauwens, Omrane, & Giot, 2005; Chang & Taylor, 2003; Dominguez & Panthaki, 2006; Melvin & Yin, 2000). In general, this literature suggests an important role for both expected and unexpected news in explaining exchange rate dynamics.

These are in parallel to the extensive literature on the scheduled news effects in other segments of the financial market, especially stock markets. For example, Flannery and Protopapadakis (2002) report significant correlations between inflation and money growth news and stock market returns in the U.S. More recent additions include, inter alia, the spillover news effects from the U.S. to other stock markets (Kishor & Marfatia, 2013; Singh, Nejadmalayeri, & Lucey, 2013), metal futures market responses (Elder, Miao, & Ramchander, 2012) and joint foreign exchange and stock market responses in the U.S. and in Japan (Mun, 2012).

In addition to the role of news, the seminal work of Evans and Lyons (2002) introduced another, arguably more important, explanatory factor. In this paper, the authors focused on the trading process and found that order flow explains a high proportion of exchange rate variations (e.g. 60% of daily changes in the DM/USD and 40% in the JPY/USD).

Evans and Lyons (2008) link these two branches of research and investigated how the role of order flow in price discovery changes during periods in which scheduled macroeconomic announcements are made. They find that the price discovery via order flow is more intense during these periods. To explain this result, Evans and Lyons (2008) suggest

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that price discovery occurs in two distinct stages: the first occurs as news announcements hit the market and dealers respond by adjusting their quotes according to their perception of the news which leads to ‘jumps’ in the returns data (as documented in studies such as Andersen et al., 2003). In a prolonged second stage, dealers observe the market's reaction to the news — if net selling is observed, the market that believes the quoted price is too high and dealers respond by lowering their quoted price, and vice versa. Dealers continue to re-adjust their quoted price until there is consensus on the interpretation of the news in the market leading to neutral order flows. Thus, this second stage of updating prices helps explain volatility persistence following the release of news (as documented in Berger et al., 2009; Melvin & Yin, 2000).

The evidence of Evans and Lyons (2008) clearly suggests a role for both information arrival and order flows influencing the various moments of exchange rate returns. The purpose of this paper is to provide further evidence of this issue. Unlike the previous research however, this paper will focus exclusively on the Australian currency market. To date, the Australian dollar (AUD hereafter) has received minimal coverage in the microstructure literature. To the best of the authors' knowledge only a handful of publications have focused on the AUD: Hogan and Batten (2005), who find that private information has only fleeting value in the market, and Tan, Stevenson, Frino, and Jarnecic (2006) consider whether cash or futures markets are the venue for price discovery. Clifton and Plumb (2008) report elevated levels of AUD/USD volatility around major Australian and US macroeconomic announcements.

The lack of research into the AUD is an unfortunate oversight as it is a major international currency.[1] Unlike other major currencies however, the AUD possesses a number of unique characteristics, which means that the lessons learned for other currencies may not readily translate into knowledge about the AUD. For example, the majority of trading activity in the AUD (and hence price discovery) occurs outside of the Australian business hours (Clifton and Plumb, 2007). Also, the AUD is heavily influenced by commodity price movements, whose trading is also predominantly during offshore hours for Australia.

In this paper, we aim to contribute to the literature by providing a comprehensive analysis of the process of price discovery in the Australian foreign exchange market in relation to various types of information arrival surrounding the GFC period of Jan 2007 to Dec 2009 where the arrival of information would be more closely monitored. We identify the type and the nature of information arrival that matter for the Australian dollar. The two types of information releases we consider are unscheduled Reuters headline alerts and unexpected components of the scheduled macroeconomic announcements from major economies. For the former, we consider the Reuters headline alerts which are classified under the categories of foreign exchange, money and fixed income market alerts. For the latter, we extract the unexpected components of each macroeconomic announcement from major economies using the consensus forecasts obtained from Bloomberg (see inter alia Balduzzi, Elton, & Green, 2001; Dungey & McKenzie, 2009). The research questions we pose are 1) whether there are information leakages (pre-announcement market activities) and whether there are discernible patterns of post announcement market adjustments across various market activity variables — order flow, trade volume and realized volatility; 2) whether there are significantly different patterns of market responses for unscheduled news during on- and off-shore hours to information arrival and whether market responds differently to different types of unscheduled news; and 3) whether the AUD responds significantly to scheduled news releases (in aggregate and in disaggregated form — better or worse than expected announcements) from not only the U.S. and Australia, but also other major economies such as Japan, the Eurozone, and the U.K.[2]

The results of this paper suggest a number of important findings. First, for pre-announcement market activities, there is no evidence for pre-announcement volatility and volume responses to the scheduled news. However, there is some evidence of market activities prior to unscheduled Reuters news alerts. As for post-announcement responses, volatility and volume responses are contemporaneous to overall (or aggregate) unscheduled news and with a five minute lag to the scheduled news. Only the scheduled news significantly explain order flow. The volume responses to both unscheduled and scheduled news deteriorate at a much slower pace than volatility and appear to lag volatility. This suggests that traders are more active when volatility levels start to calm down. Overall, the evidence confirms that the market responds contemporaneously to unscheduled news as reported by Bauwens et al. (2005) and that macroeconomic news have a persistent effect in the foreign exchange market as established by Love and Payne (2008) and Evans and Lyons (2008).

Second, we find that most of the volume and volatility responses to unscheduled Reuters news are coming from off-shore trading hours. This is consistent with the observed pattern of higher volume of information arrival during those hours. Furthermore, we find that foreign exchange market news alerts news elicit more volatility responses than money and fixed income market alerts.

Third, we find that macroeconomic news from all the major economies in the sample matter in varying degrees, although news from Australia and U.S. matter more. The initial volatility and volume responses to the Australian news are contemporaneous, but there is a five-minute lag for the news from other countries. U.S. news induce the largest volatility response but this reverses fairly quickly, while the response to the Australian news is persistent and falls at a slower rate suggesting that the Australian news stimulates information asymmetry more and is more closely followed by traders. The pattern of volume response is similar but is more sensitive to the Australian news. Considering good and bad news breakdown, we find a better than expected Australian and worse than expected macroeconomic news result in a significant positive order flow (AUD appreciation) and a bad news a negative order flow (a depreciation), which is as expected. The volatility and volume responses are largest with good news and bad news takes longer to be priced in. We find that AUD order flows are not influenced by news from other economies. However, we find, in general, that good news from non-Australian sources are associated with higher market activities in terms of volatility and volume. We conjecture that good news from major economies could be suggestive of unexpectedly good global economic conditions, which would lead to higher levels of global demands for commodities and this would lead to more market activities of commodity price driven currencies such as the AUD.

The results of our investigations provide contributions to the foreign exchange literature. We contribute by providing a better understanding of the price discovery process in the Australian dollar market participants in relation to the volatility and volume responses to news arrival. Our results will be of interest to various types of market participants, including policy makers, who can make optimal decisions regarding their trading strategies in relation to information events in the foreign exchange markets.

[1] The Australian dollar was the fifth most heavily traded currency in the world accounting for 8.6% (out of total 200%) of total daily global turnover and the AUD/USD was the fourth largest currency pair by turnover accounting for 6.8% (out of total of 100%) of global total in April 2013 (Bank for International Settlement triennial central bank survey of foreign exchange and derivatives market activity in 2013, http://www.bis.org/publ/rpfx13.htm).

[2] We also investigated the impact of Chinese macroeconomic news. Although PMI news seems to contribute the to the AUD's volatility and order flows, the number of such announcements were insufficient to draw consistent and concrete conclusion. As such we chose not to report these results. Interested research may obtain the results from the corresponding author.