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Cross-border scheduled macroeconomic news impacts: Evidence from high-frequency Asia Pacific currencies

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Keywords: Scheduled macroeconomic announcements; Foreign exchange rates; Speed of news impact; Persistence of news impact.

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Cross-border scheduled macroeconomic news impacts: Evidence from high-frequency Asia-Pacific currencies

Abstract:

The current study utilizes a comprehensive set of influential scheduled macroeconomic announcements released from various developed and emerging markets to investigate the speed and persistence of news impacts on major Asia-Pacific currencies sampled at high frequencies. A richly varied set of findings emerge. In general, we document that the responses to economic news released domestically and from the U.S. are rapid, and there is some evidence of persistency concerning U.S. economic news and news related to the China's purchasing manager index. The currency reactions to asymmetric economic news surprises and the states of the U.S. economy are heterogeneous. Finally, we show that macroeconomic announcements have contributed to the sudden increase in realized volatility and trading volumes of the currencies around the time of announcements.

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1. INTRODUCTION

Examining asset price reactions to regularly scheduled macroeconomic announcements is crucial to understanding the effect of information flows on price formation and discovery processes. To gain insights into this issue, a plethora of research has studied foreign exchange rates sampled at high frequencies (e.g., Almeida et al., 1998; Andersen et al., 2003, 2007; Faust et al., 2007). These studies predominantly investigate the impacts of macroeconomic announcements released from advanced economies (such as U.S., German and Japan) on frequently traded, developed-market currencies of the German Deutschemark (DEM), Euro, British Pound (GBP) and Japanese Yen (YEN).

Using a comprehensive set of influential scheduled macroeconomic announcements emanating from various advanced and emerging economies, the current study adds to the literature by analyzing the *speed* and *persistence* of news impacts on price changes, realized volatilities and trading volumes of major Asia-Pacific currencies sampled at high frequencies. Three major aspects set our study apart along important dimensions.

First, unlike most previous work, we focus on five currencies with distinctive characteristics, namely Australian Dollar (AUD), Hong Kong Dollar (HKD), New Zealand Dollar (NZD), Singapore Dollar (SGD) and YEN.[1] These currencies are of especial interest for a variety of reasons. The AUD and NZD are widely regarded as popular target currencies for carry trade (Fung et al., 2013), and they are susceptible to the global market demand for commodities (Chen and Rogoff, 2003). Asset managers are keen on HKD and SGD, primarily because the scale of their corresponding open economies is small, and they have close geographical proximity and economic ties to the increasingly influential markets of

[1] All the currencies are quoted per unit of the U.S. Dollar (USD). In our initial experiment, we also explored a broader set of emerging market currencies, ranging from Chinese Renminbi, Indonesian Rupiah, Korean Won, Malaysian Ringgit, Taiwanese Dollar, to Thai Baht. However, the price quotes of these foreign exchange markets are relatively stale considering the high sampling frequency and the sample period that we examine.

China and Japan. In addition, these four foreign exchange markets, together with YEN, are some of the most actively traded currencies in the global market.[2]

Second, the recent availability of high-frequency data for NZD, SGD and HKD is opportune. This is where most prior work, which considers similar currency data sets, utilizes daily or intraday data but with the price impact measured over a relatively long time interval.[3] Early studies that use data sampled at coarser frequencies tend to yield mixed findings. For instance, Simpson et al. (2005) report that only ten out of 23 periodic U.S. macroeconomic announcements significantly affect the *daily* DEM, GBP and YEN. Andersen et al. (2007) demonstrate that the significant responses of frequently traded currencies such as DEM and GBP to U.S. macroeconomic announcements tend to dissipate almost instantaneously within 5 to 15 minutes post news release (see also Faust et al., 2007).[4] However, is this what happens to the commodity and small-open economy currencies considered in the current study? The answer to this question is mostly a 'yes', as we reveal shortly below.

Third, we study the impacts of scheduled macroeconomic announcements released from various advanced economies of U.S., Japan, Hong Kong, Australia and New Zealand, and the emerging economy of China.[5] To our knowledge, the speed and persistence of reactions to the cross-border macroeconomic announcements released from these countries on major Asia-Pacific currencies sampled at high frequencies have not been explored extensively elsewhere. Regulators and asset managers constantly pay close attention to

[2] The Bank of International Settlement 2013 triennial survey ranks these five currencies among the top fifteen currencies in terms of average daily global foreign exchange turnover (http://www.bis.org/publ/rpfx13fx.pdf).
[3] For example, Clifton and Plumb (2008) investigate the macroeconomic announcement impacts on the AUD hourly rate changes, whereas we consider the maximum of 10-minute currency rate changes.
[4] Andersen et al. (2007) also note the failure of most prior studies to find a significant link between asset market returns sampled at coarser frequencies and unanticipated macroeconomic announcements to subsequent day-to-day asset price changes or fluctuations following the announcements.
[5] Most prior studies with an Asia-Pacific focus tend to examine the impacts of the U.S. or domestic macroeconomic announcements on financial markets other than the foreign exchange (e.g., Mookerjee and Yu, 1997; Kim and In, 2002; Kim 2003).

announcements emanating from U.S., China and Japan, as they are important trading partners for all the countries whose exchange rates are considered in the current study. [6]

The results reveal a richly varied set of findings. We show that unanticipated macroeconomic announcements or news surprises (i.e., the standardized difference between the realized and expected news information), in general, are augmented immediately in the foreign exchange markets that we consider. This finding is consistent with the efficient market paradigm of an extremely rapid exchange rate discovery process. Across the three large and influential economies of U.S., China and Japan, we find that foreign exchange rates in general react significantly to the U.S. economic news, whereas their reactions to the Chinese and Japanese news are somewhat weaker or even insignificant. A recent study by Brusa et al. (2015) reveals that global investors tend to react to the U.S. Federal Open Market Committee's (FOMC) decisions more than the decisions made by other major central banks. Our study reinforces this finding. It is also consistent with the traditional stereotype that the U.S. is a 'Big Brother' who exerts a dominant role in affecting the global financial market returns.

We also demonstrate that the exchange rate responses are heterogeneous with respect to macroeconomic announcements released domestically and internationally.[7] For example, the commodity currencies of AUD and NZD respond instantaneously and substantially to unemployment and inflation reports released domestically more than to those emanating from foreign economies. In contrast, an unexpected (foreign) U.S. unemployment rate asserts a more instantaneous response on YEN than the domestic Japanese unemployment rate figures.

[6] The World Bank recently ranks these currencies as the top three global economies in terms of Gross Domestic Product (http://databank.worldbank.org/data/download/GDP.pdf). Although Australia is crucial to most Asia-Pacific economies in terms of export and import flows, we conjecture that any significant Australian announcement effects are confined to the localized AUD, and/or to the neighboring NZD, as the Australian economy is relatively small compared to U.S., China and Japan.

[7] The current study assumes that all scheduled macroeconomic news released from the country on its currency is domestic announcements, whereas U.S. macroeconomic announcements, in particular, are regarded as international (i.e., foreign) news.

We subsequently extend the symmetric regression model so that the currency reactions are conditioned to unexpectedly positive and negative news. In the context of the current study, surprisingly positive (negative) news refer to higher-than-expected (lower-than-expected) news.[8] Barberis et al. (1998) develop a parsimonious model of investor sentiment to demonstrate that 'bad' news surprises tend to generate more future uncertainties than 'good' news surprises. Nonetheless, the theoretical findings on foreign exchange rate reactions to the second-order news surprise are inconclusive (e.g., Faust et al., 2007; Fatum et al., 2012). In line with these inconclusive findings, the current study shows, for example, that YEN depreciates significantly in response to surprisingly positive news regarding the U.S. Federal Funds rate (US-FED), whereas AUD depreciates significantly to negative news concerning the U.S. Institute for Supply Management (US-ISM). Also, the AUD appreciation to surprisingly positive news concerning the Mainland China's purchasing manager index (CH-PMI) is greater in magnitude than the currency depreciation to negative CH-PMI news.

We then scrutinize whether the impact of macroeconomic news surprises persists. Our results show that they do, particularly in response to unanticipated U.S. macroeconomic announcements and CH-PMI news. For non-U.S. economic announcements, we find that AUD appreciates persistently and significantly following unanticipated CH-PMI news. There is also some evidence of a difference in the persistence in price reaction to asymmetric news surprises. AUD, NZD and SGD, for example, depreciate and react more persistently in response to unexpectedly positive US-NFP news compared to negative news.

[8] In the context of foreign exchange rates, a higher-than-expected (positive) news surprise can be construed as either 'good' or 'bad' news. The same argument applies to lower-than-expected (negative) news. For example, Faust et al. (2007) develop a simple framework to show that lower-than-expected inflation announcements, which are typically perceived as 'good' news to the stock market, could have contrasting effects on the value of USD. In particular, they argue that a lower-than-expected U.S. inflation figure may signal a weak economic demand. This leads to a fall in U.S. interest rates compared to foreign interest rates, and hence, USD depreciates. Alternatively, if a negative inflation news surprise is evidence of better-than-expected productivity growth, the announcement is interpreted as 'good' news, resulting in a rise in U.S. interest rates and accordingly, USD appreciates. Therefore, we refrain from using the terms 'good' or 'bad' news surprises for the remainder of the paper.

We end the study with two further analyses. The first concerns whether U.S. economic conditions affect the speed of news reactions of the foreign exchange markets.[9] One notable finding is that during economic recessions, unexpected US-FED news is associated with a significant appreciation of YEN relative to USD, whereas no significant YEN reaction to the US-FED news is observed during economic expansion periods. The second analysis is on the reactions of the exchange rate realized volatility and trading volumes in close proximity of the macroeconomic announcements.[10] In many cases, there is a sharp increase in the realized volatilities and trading volumes immediately before and at the time of the news announcements. These findings are broadly consistent with heightening uncertainty and greater trading activities among market participants who have divergent opinions on economic news announcements.

We organize the remainder of the study as follows. Section 2 describes the data sets. Section 3 analyzes the speed of news reactions in response to the first-order and second-order news surprises. Section 4 details the findings related to the persistence of news impacts. Section 5 reports the two further analyses discussed above. Finally, Section 6 provides the summary.

2. DATA

2.1. Foreign exchange markets

We obtain tick-by-tick bid and ask quotes for AUD, HKD, NZD, SGD and YEN from the Thomson Reuters Tick History (TRTH) database accessed through the Securities Industry Research Centre of Asia Pacific (SIRCA). As noted earlier, these currencies are specifically chosen because they have sufficient and reliable data over the long sample period from 1998

[9] Andersen et al. (2007) provide some empirical evidence of asymmetric news responses of Euro and GBP across different business cycles. Fatum et al. (2012) reach a similar conclusion for YEN. The current study provides a significant extension to the literature by examining the state dependent news reactions of various Asia-Pacific currencies.

[10] We thank an anonymous referee for suggesting the analyses.

to 2013. We then average the tick-by-tick bid and ask quotes to obtain mid quotes, and the mid quotes are then interpolated to obtain minute-by-minute exchange rate changes.

2.2. Scheduled macroeconomic variables

We examine the high-frequency currency reactions to scheduled macroeconomic announcements emanating from the U.S., Mainland China and Hong Kong from the Greater China region, Japan, as well as Australia and New Zealand from the Australasian region. We restrict our analyses to several influential variables that recent work has found to significantly affect asset returns in general, and high-frequency exchange rates in particular (e.g., Faust et al., 2007). As we discuss shortly, the selected variables provide a comprehensive description of the macro-economy in the countries they represent.

2.2.1. U.S.

We investigate a set of six key scheduled macroeconomic announcements: the Federal funds (US-FED) target rate, seasonally adjusted consumer price index (US-CPI), producer price index (US-PPI) and unemployment rate (US-UMP), changes in nonfarm payroll (US-NFP) and the Institute for Supply Management manufacturing index (US-ISM). The US-FED is one of the most closely watched announcements, and it serves as a critical indication of monetary policy (Bernanke and Kuttner, 2005). Andersen et al. (2003) show that the US-CPI and US-PPI inflationary indicators are two important macroeconomic news affecting DEM and GBP. We conjecture that their influences are likely to span to the Asia-Pacific currencies. The US-UMP measures real activity, whereas Andersen and Bollerslev (1998) and Andersen et al. (2003) refer US-NFP as the 'king of all announcements' because of the sensitivity of most asset prices to its news release. Finally, the forward-looking US-ISM is crucial because it describes the perceived state of the U.S. economy.

2.2.2. Mainland China

We examine the effect of the consumer price index (CH-CPI), manufacturing purchasing manager index (CH-PMI), producer price index (CH-PPI) and trade balance (CH-TB). The CH-PMI is equivalent to the US-ISM as it tracks the Chinese domestic activity in the factories and workshops sector. Baum et al. (2015) report that the CH-PMI plays a key role in affecting the price movements of various futures markets.

2.2.3. Hong Kong

We study five important variables that are commonly used to gauge the Hong Kong economy: the consumer price index (HK-CPI), export statistics (HK-EXP), import statistics (HK-IMP), retail trade (HK-RT) and unemployment rate (HK-UMP).

2.2.4. Japan

We consider six key variables: the consumer price index at the national level (JP-CPI), industrial production index (JP-IP), money supply M2 estimates (JP-MS), retail trade (JP-RT), trade balance (JP-TB) and unemployment rate (JP-UMP). Vrugt (2009), among others, demonstrates that these announcements generally exert a significant influence on the daily volatilities of Asia-Pacific asset market returns. Our study complements theirs, but we examine the reactions of a broader set of Asia-Pacific currencies within very close (high-frequency) proximity of the economic announcements.

2.2.5. Australia

We investigate four variables: the consumer price index (AU-CPI), Gross Domestic Product (AU-GDP), trade balance (AU-TB) and unemployment rate (AU-UMP). Kim (1998) and Daniel et al. (2014) show that these variables typically have significant impacts on daily and intraday changes in AUD, albeit using relatively outdated or shorter time periods.

2.2.6. New Zealand

Following prior literature (e.g., Coleman and Karagedikli, 2012), we investigate the consumer price index (NZ-CPI), export statistics (NZ-EXP), Gross Domestic Product (NZ-GDP), import statistics (NZ-IMP) and unemployment rate (NZ-UMP).

2.3. News surprises

Except for the US-FED, we assemble the data regarding real-time macroeconomic variables as first reported and the market's expectations of these variables from Bloomberg. Following prior related literature (Balduzzi et al., 2001; Andersen et al., 2003, 2007; Baum et al., 2015), we construct the news surprises as:

$$S_{k,t} = \frac{A_{k,t} - F_{k,t}}{\sigma_k}, \qquad (1)$$

where $A_{k,t}$ refers to the actual announcement of economic variable k realized on day t and $F_{k,t}$ is the consensus market expectation obtained as the median professional survey forecast from Bloomberg. The news forecast error ($A_{k,t} - F_{k,t}$) in Eq. (1) is standardized by its time-series standard deviation (σ_k) to facilitate the comparison of different macroeconomic variables quoted in different units of measurement.

For the US-FED news surprises, we follow recent literature (e.g., Faust et al., 2007) and define the unstandardized news forecast errors on day t using the now standard decomposition method proposed by Kuttner (2001):

$$A_{\mathrm{FED},t} - F_{\mathrm{FED},t} = \frac{D}{D-d}\left(f_t^0 - f_{t-1}^0\right), \qquad (2)$$

where f_t^0 is the Federal Funds rate implied in the current-month Federal Funds futures contract, d is the day of the current FOMC meeting, D is the number of days in the month, and the scaling factor $D/(D–d)$ accounts for the timing of the FOMC announcement within a given month.[11] Note that FED announcements span a narrower sample period until June 30,

[11] We obtain FED news surprises from Kenneth Kuttner's personal website (http://econ.williams.edu/people/knk1).

2008. After that, the FED rate has been constant at approximately 15 basis points (bps), and the FOMC has no longer reported a point target rate until the end of the sample period.

Table 1 reports the descriptive statistics for the respective macroeconomic variables, including the sample estimation period as dictated by the data availability of consensus forecasts, typical official announcement time (specified in Greenwich Mean Time or GMT) and number of observations. It must be noted that our empirical analyses rely on the news announcement time-stamps instead of the official announcement time, because the news could be announced several minutes prior to or after the official release time. For example, the US-FED official news release was typically scheduled at 14:15 Eastern Standard Time (EST), which is equivalent to 19:15GMT (without daylight saving), but it was actually announced at 19:12GMT on February 3, 1998. We gather the news announcement time-stamps from Bloomberg, and cross-check the time-stamps with those used in prior related studies (e.g., Lucca and Moench, 2015).

Two further remarks are in order. First, some macroeconomic announcements are made on illiquid days (e.g., public holidays) when even the normally ultra-high frequently traded YEN would suffer from stale price quotes. Therefore, as with Baum et al. (2015), we remove observations that coincide with these days from the final analysis.[12] Second, our general sample period is relatively long and recent, covering the period between 1998 and 2013. This substantially expands upon prior studies that examine the reactions of similar currency data sets using a shorter sample period.[13] Our recent sample period also coincides with accelerated information technology growth, thus substantially extending previous studies that typically scrutinize the foreign exchange rate reactions using outdated sample periods.[14] It is probable

[12] A prime example is the CH-PMI. There are 51 monthly CH-PMI observations sampled between October 2009 and December 2013 (see Table 1), and 16 of them fall on public holidays and other illiquid days in Japan. This results in only 35 observations used in the final analysis to examine the YEN reaction.
[13] Daniel et al. (2014), for instance, analyze the AUD five-minute news reactions between 2007 and 2009.
[14] For example, Andersen et al. (2003, 2007) and Faust et al. (2007) examine the currency–macroeconomic news effect prior to 2003.

that the ubiquity of news collected is delivered and impounded in the foreign exchange rate more quickly in recent times, an important issue that is addressed in Section 3.1.[15]

Table 1 also tabulates the sample mean and standard deviation of the unstandardized news forecast errors ($A_{k,t} - F_{k,t}$). Unreported *t*-test statistics show that mean estimates of the standardized news surprises of Eq. (1) are generally not significantly different from zero, thus corroborating prior findings (e.g., Balduzzi et al., 2001) regarding the unbiasedness of the news forecasts. Although we study a total of 30 announcements, Tables 2 and 3 below only report the regression findings for some notable variables which are marked with asterisks (*) in the first column of Table 1 to conserve space. The regression results for other announcements, which are somewhat weaker and, in general, qualitatively similar to those reported herein, are reported in the Online Appendix.

3. SPEED OF NEWS REACTIONS

3.1. First-order (symmetric) effects

We begin by examining the speed of reactions to symmetric macroeconomic announcement surprises. Almeida et al. (1998) and Andersen et al. (2007) find that analysis involving data sampled at coarser (daily) frequency tends to generate an insignificant relationship between the developed-market currencies of DEM, GBP and YEN, and U.S. macroeconomics announcements. With this in mind, we focus exclusively on intervals in close proximity to the news announcements. We estimate the following generalized hybrid model developed by Almeida et al. (1998), Balduzzi et al. (2001) and Kilian and Vega (2011):

$$\frac{p_{i,t,\tau_1} - p_{i,t,\tau_2}}{p_{i,t,\tau_2}} = \alpha_i + \beta_{i,k} S_{k,t} + e_{i,t}, \qquad (3)$$

[15] The empirical finding by Oberlechner and Hocking (2004, p. 407) that "… recent developments in technology have profoundly changed the nature of reporting and the role of news media in the foreign exchange market. Traders rate the speed of news and its anticipated impact on other market participants as more important …" further supports our intuition.

where $p_{i,t,\tau_1(\tau_2)}$ refers to the rate of currency *i* at τ_1 (τ_2) minutes before or after the scheduled announcement on day *t*, α_i is the regression intercept and $\beta_{i,k}$ is the coefficient response to $S_{k,t}$, which is the standardized surprise of news variable *k* as constructed in Eq. (1). A positive (negative) estimate of $\beta_{i,k}$ implies a depreciation (appreciation) of currency *i* relative to the USD in reaction to $S_{k,t}$. To investigate the speed of news reactions, we fix τ_1 = +5 minutes and vary τ_2 between –5 and +4 minutes, each with an increment of one minute.[16] To study the foreign exchange rate reactions pertaining to the persistency effect, we set $\tau_2 = 0$ and fix τ_1 at some key points of {+5, …, +180} minutes (see also Almeida et al., 2001). Section 3 analyzes the findings pertaining to speed of news reactions, whereas Section 4 discusses the findings on persistency effect.

It is probable that the standard errors of Eq. (3) suffer from small sample bias, as the regression estimation could have as few as 35 observations (see footnote 12). In reviewing the work by Inoue and Kilian (2005), Kilian and Vega (2011) note that the conventional asymptotic Student *t*-test tends to reject the null hypothesis of no predictability more often than it should when the same regression model is tested using different regressors. To alleviate these concerns on any Type 1 spurious rejection error, we follow the recommendation of Kilian and Vega (2011) and perform an extensive Monte-Carlo simulation exercise to assess the statistical inferences of the regression coefficient estimates. The Online Appendix details the simulation procedure.

Panel I of Table 2 reports the estimated $\beta_{i,k}$ (in bps). The coefficient estimates are highlighted in bold if their corresponding *t*-statistics are greater than the two-sided Monte-Carlo simulated critical values at the 5% significance level. The general finding is that changes in Asia-Pacific foreign exchange rates are swift in their response to unanticipated

[16] Following Almeida et al. (1998) and Faust et al. (2007), we repeated the analysis on the speed of news impact by fixing τ_1 = +15 minutes and reached a similar qualitative finding. In the current study, we use a narrower event window and fix τ_1 = +5 minutes to adequately detect significant (if any) speed of news impacts. We are grateful to an anonymous referee for alluding to this issue.

U.S. macroeconomic news content, with the exchange rate changes reacting rapidly within +/– 1 minute of the news release. For example, Panel I reveals that the commodity currency of AUD (NZD) depreciates significantly by nearly 8 bps (9 bps) when measured over the [–5, +5] event window surrounding unexpected US-FED news. The effect is short-lived, however, as $\hat{\beta}_{\text{AUD,US-FED}}$ ($\hat{\beta}_{\text{NZD,US-FED}}$) immediately exhibits a noticeable drop in magnitude to –2.6 bps (3.7 bps) at $\tau_2 = 0$. The latter estimated coefficients are not significant, and they remain at that low level thereafter. We also observe a similar sharp reversal pattern when YEN is regressed on US-ISM, US-NFP and US-UMP, and when AUD is regressed on the US-NFP.[17]

There is little evidence suggesting the delay of currency reactions in response to non-U.S. macroeconomic variables. For example, Panel I shows that, over the period spanning from τ_2 = –5 to –1, the CH-PMI macroeconomic announcement is associated with a significant appreciation of AUD, NZD and SGD, but there is no significant price reaction from τ_2=0 onwards.

Another striking finding concerns the relative influence of macroeconomic announcements released from the three largest global economies: U.S., China and Japan. While all the currencies tend to show some evidence of reacting significantly to U.S. macroeconomic surprises (in particular the US-FED) immediately before or at announcement time, their reactions to Japanese and Chinese macroeconomic surprises (except the CN-PMI) are weaker and mainly insignificant over the event windows considered. In a related study, Brusa et al. (2015) show that global investors typically react to the U.S. FOMC decisions more than to decisions made by other major central banks. Therefore, the findings in the

[17] The US-NFP and US-UMP statistics are always released jointly in the U.S. Employment Report. Similarly, the CH-PPI and CH-CPI are always reported concurrently. To mitigate concerns related to the omitted variable bias problem, we perform robustness tests by loading both the US-NFP and the US-UMP (the CH-PPI and the CH-CPI) simultaneously in the following multiple regression:

$$\frac{p_{i,t,\tau_1} - p_{i,t,\tau_2}}{p_{i,t,\tau_2}} = \alpha_i + \sum_{k}^{2} \beta_{i,k} S_{k,t} + e_{i,t},$$

where k = {US-UMP, US-NFP} ({CH-PPI, CH-CPI}). The qualitative findings from the multiple regressions (available upon request) are similar to the individual regression results reported herein.

study of Brusa et al. (2015), together with ours, suggest that the U.S. still plays the predominant role in affecting worldwide financial market returns.

Finally, Table 2 reveals a dichotomous exchange rate reaction to domestic and international macroeconomic news. For instance, AUD (NZD) responds mostly instantaneously, and with greater magnitude, to the domestic AU-CPI, AU-GDP and AU-UMP (NZ-CPI, NZD-GDP and NZ-UMP) news surprises compared to those emanating from foreign economies. On the other hand, the immediate reaction of YEN is more apparent in response to foreign US-UMP news than to domestic JP-UMP announcements. We also observe a distinct depreciation (appreciation) in NZD as soon as the AU-UMP (AU-GDP) news is disclosed between τ_2= –5 and τ_2= –1 in neighboring Australia. This finding is indicative of the importance of Australia as a major and a close trading partner for New Zealand exporters and importers.[18]

3.2. Second-order (asymmetric) effects

This section investigates an extension of Eq. (3), which only captures the symmetric news impact, by conditioning it to the sign of the news surprises:

$$\frac{p_{i,t,\tau_1} - p_{i,t,\tau_2}}{p_{i,t,\tau_2}} = \alpha_i + \beta_{i,k}^{+} S_{k,t} I_{k,t}^{+} + \beta_{i,k}^{-} \left| S_{k,t} \right| I_{k,t}^{-} + e_{i,t}, \qquad (4)$$

where $I_{k,t}^{+}$ ($I_{k,t}^{-}$) = 1 if there is a positive (negative) surprise of news variable *k* on day *t* and 0 otherwise. Eq. (4) examines whether the speed, and persistence, of news reactions on foreign exchange rate changes differs in an asymmetric manner between positive and negative news surprises. A positive $\beta_{i,k}^{+}$ ($\beta_{i,k}^{-}$) suggests that currency *i* depreciates relative to USD in

[18] In unreported robustness test, we repeated the analysis by fixing τ_1 = +1 and varying τ_2 between –2 and 0. The results are qualitatively similar to the measurement periods used here (i.e., τ_1= +5 and τ_2 is varied between –5 and +4). One notable exception is the reaction of YEN to US-FED announcement over the [–2, +1] window, where the currency appreciates by a small (but statistically significant) magnitude of nearly 4 bps.

response to positive (negative) news surprises, whereas a negative $\beta_{i,k}^{+}$ ($\beta_{i,k}^{-}$) indicates that currency *i* appreciates relative to USD in response to positive (negative) news surprises.

Panel I of Table 3 reports the results in a similar table formatting to that shown in Table 2, except that the light (shaded) cells in Table 3 tabulate the coefficient estimates concerning the reactions to positive (negative) news surprises. The panel reports some evidence of differences in the magnitude of the absolute exchange rate reaction to surprisingly positive and negative U.S. economic news. For example, when measured over the [–1, +5] ([0, +5]) interval, YEN depreciates significantly by 14.3 bps (23.5 bps) in response to a unit of standardized positive US-FED news. In contrast, when measured over the same time interval, the reaction of YEN to negative US-FED news is statistically insignificant. Between [–5, +5] and [–1, +5] windows, the price reaction of YEN to US-ISM news is significant, but the magnitude of reaction is smaller for positive news compared to negative news (a currency depreciation of around 7 bps versus an appreciation of nearly 10–11 bps). Similarly, the depreciation of YEN is greater in magnitude to positive US-NFP news compared to negative US-NFP news.[19]

In addition, we find that negative US-CPI news surprises elicit a significant price appreciation on AUD, NZD and SGD when measured over the event windows from [–5, +5] to [–1, +5], compared to a marginal change in the value of these currencies in response to unexpectedly positive US-CPI news. Negative US-CPI news surprise suggests that the U.S. Fed may decrease interest rates, thus creating demand for the commodity currencies of AUD and NZD. Lastly, negative US-ISM news elicits a significant depreciation in AUD. Untabulated Wald test statistics show that the null hypothesis of H_0: $\beta_{i,k}^{+} + \beta_{i,k}^{-} = 0$ are rejected at the 5% significance level for the impact of the US-FED announcement on YEN, and the

[19] There is also some evidence that the speed of the reaction of NZD to US-FED is slightly faster for positive news surprises.

US-ISM announcement on AUD.[20] Overall, our findings suggest weak evidence of asymmetric impact on the magnitude of the foreign exchange rate reactions to unexpectedly positive and negative macroeconomic news announcements emanating from U.S.[21]

For non-U.S. macroeconomic announcements, we document some evidence of differences in the speed of reactions to positive and negative news surprises. The first notable observation is the impact that surprisingly positive and negative CH-PMI news has on AUD and NZD (see Panel I of Table 3). Measured over the [–5, +5] to [–2, +5] intervals, AUD appreciates significantly by 12–14 bps in response to positive CH-PMI news surprises, whereas a significant AUD depreciation of 8.2 bps is observed in response to negative CH-PMI news surprise only when measured using the [–4, +5] window. Over the [–5, +5] to [–2, 5] ([0, +5]) intervals, a unit of standardized negative CH-PMI news surprise is significantly associated with 6.5–8.0 bps (4.8 bps) depreciation of NZD. Other evidence suggestive of asymmetric foreign exchange rate reactions to non-U.S. scheduled macroeconomic news is the AUD, which appreciates by 18.2 bps over the [–5, +5] interval in response to surprisingly positive AU-GDP news. The magnitude of this estimate, however, is smaller relative to the 26.5 bps AUD depreciation in response to unexpectedly negative AU-GDP news.

Panel I of Table 3 further reveals that both carry-trade AUD and NZD currencies appreciate (depreciate) in response to positive (negative) AU-CPI and NZ-CPI surprises, respectively. This finding is consistent with an unexpectedly high (low) inflation rate

[20] The null hypothesis for the Wald test (which relies on the heteroskedasticity-corrected variance-covariance estimates obtained from the actual regression) is specified as $\beta_{i,k}^{+} + \beta_{i,k}^{-} = 0$, since Eq. (4) uses the absolute value of negative news surprises. Therefore, we expect the estimated coefficients of $\beta_{i,k}^{+}$ and $\beta_{i,k}^{-}$ in response to positive and negative news, respectively, to have opposite signs.

[21] As noted previously, unexpected positive and negative CPI announcements may be construed as good and bad news for a foreign currency (e.g., Faust et al., 2007). We could not, however, find any clustering evidence of positive or negative news announcements that may help in explaining our findings. Also, note that the coefficient estimates of $\beta_{i,\text{US–CPI}}^{+}$ and $\beta_{i,\text{US–CPI}}^{-}$ tabulated in Table 3 tend to be much greater in magnitude than the coefficient estimates of $\beta_{i,\text{US–CPI}}$ reported in Table 2. This is because Eq. (4) uses the absolute value of negative news surprises, but our results show that both unexpected positive and (absolute) negative US-CPI news surprises affect the foreign exchange rate changes in the same direction.

signaling that the Reserve Banks of the respective countries will raise (decrease) domestic interest rates and thereby increase (decrease) the attractiveness of the carry trade in AUD and NZD. We also find that over the intervals spanning from [–5, +5] to [–1, +5], AUD depreciates (appreciates) by circa 14 bps (11 bps) to surprisingly positive (negative) AU-UMP news. Also, when measured from $\tau_2 = -5$ to $\tau_2 = -1$, an unexpectedly positive NZ-UMP number (which is typically deemed as 'bad' news for the local economy) is associated with a statistically and economically significant NZD depreciation of 46–37 bps. This sizable estimate dwarfs the 10 bps appreciation in the value of NZD in response to surprisingly negative NZ-UMP news. Between $\tau_2 = -5$ and $\tau_2 = -1$, $\beta^{+}_{\text{NZD,NZ-UMP}} + \beta^{-}_{\text{NZD,NZ-UMP}}$ sums from 17–36 bps, which are statistically significant (the *p*-values of the untabulated Wald tests are less than 0.05).

We offer two different explanations for our finding. Consider the case of Australian unemployment news. On the one hand, a higher-than-expected Australian unemployment rate, which is deemed as 'bad' news to the stock market, may signal a downward revision to the real economic growth in Australia. This results in a decreased demand for (and, hence, the value of) AUD relative to USD. On the other hand, if the Reserve Bank of Australia (RBA) decreases the domestic real interest rates in response to unexpected decrease in real economic growth, then a drop in real interest rates will exert downward pressure on the value of AUD.[22]

Finally, Panel I of Table 3 results show that positive (negative) AU-GDP and NZ-GDP news are associated with significant appreciation (depreciation) of AUD and NZD, respectively, when measured over the [–5, +5] to [–1, +5] windows, with the magnitude of the price impact greater for negative news. Interestingly, unexpected negative AU-UMP news is also associated with NZD appreciation relative to USD, which again underlies the spillover

[22] Gruen and Wilkinson (1994) report that an increase in both trade, and the differential between Australian and global interest rates, are associated with an appreciation in the value of AUD.

effects of the larger Australian economy on its New Zealand neighboring country with a smaller economy.

4. PERSISTENCE OF NEWS IMPACTS

4.1. First-order (symmetric) effects

Panel II of Table 2 reports the results pertaining to the persistence of symmetric news impact where, as noted previously, τ_2 of Eq. (3) is fixed at 0 and τ_1 is varied between +5 and +180 minutes. The panel provides some evidence of a significant persistent effect in reaction to unanticipated news emanating from the U.S. For example, SGD shows a persistent price depreciation of 10 bps up to +180 minutes post US-FED news release. There is also evidence of some persistence in the respective values of AUD, NZD and YEN in reaction to unexpected US-ISM announcements.

For most non-U.S. macroeconomic announcements, however, the evidence of a long-run news effect is not so clear-cut. There are some notable exceptions, nonetheless. For instance, AUD appreciates persistently and significantly by approximately 11 bps +180 minutes subsequent to CH-PMI news surprises.[23] The panel also reveals persistent AUD and NZD reactions in response to unanticipated domestic news surprises. For example, AUD appreciates, significantly and persistently, by approximately 7 bps +180 minutes following the announcement of unexpected news related to the AU-GDP.

Consider now the issue of persistence in reaction to domestic versus cross-border economic news.[24] Panel II of Table 2 reveals some interesting and strong persistent cross-border currency reactions in response to macroeconomic news surprises. A notable example is the impact of U.S. unemployment news, where a unit of standardized US-UMP news surprise is associated with persistent and significant price appreciations in AUD and NZD

[23] The International Monetary Fund's Direction of Trade Statistics shows that China is the largest export market for Australian firms. As such, the finding here probably reflects the heavy reliance of the Australian economy on the insatiable demand of the Mainland Chinese for Australian iron ore and other commodity products.

[24] To further address this issue, we plot the relevant CPI and UMP news impacts based on Eq. (3), with τ_1 varying between +5 and +180 minutes in the Online Appendix.

(SGD) up to +180 (+90) minutes post-announcement. A unit of standardized NZ-UMP unexpected news is also associated with a persistent and significant NZD depreciation of approximately 11 bps over the [0, +180] interval. Interestingly, the AU-UMP unexpected news does not yield a significant long-run impact on its domestic AUD currency; instead it generates persistent and significant appreciation in the value of NZD by about 5 bps over the [0, +180] interval. An unanticipated rise in the Australian unemployment rate (i.e., 'bad' economic news from Australia) may have a positive effect on NZD if it yields either one of the following consequences: a reduction in the number of New Zealand residents migrating to and seeking employment in Australia, or a migration of labor from Australia to search for (better) employment opportunities in New Zealand.[25]

Consider now the inflationary CPI news impact. Panel II of Table 2 demonstrates that US-CPI news surprise does not deliver a significant long-run impact on any of the currencies we consider. However, the results show that a unit of standardized NZD-CPI news surprise is associated with a persistent and significant NZD appreciation of approximately 5 bps over the [0, +60] interval but no significant effect on AUD, as one would have expected. In contrast, a unit of standardized AUD-CPI news surprise has an insignificant persistency effect on its localized AUD currency, but it yields a significant and consistent depreciation in the value of NZD by approximately 3–8 bps between $\tau_1 = +5$ and $\tau_1 = +180$. A possible explanation is that AUD and NZD carry-trade investors tend to sell NZD, on the one hand, and buy AUD, on the other, in anticipation that the RBA will increase interest rates in response to higher-than-expected Australian inflation rate. The selling pressure yields a falling value in NZD, but any increase in the value of AUD is more muted given the sizable Australian economy relative to New Zealand's.

4.2. Second-order (asymmetric) effects

[25] Australia and New Zealand share close economic, politic and social ties, making it relatively easy for residents from both countries to work in either country.

Panel II of Table 3 contains the persistent results for the differential effect of positive and negative news. YEN shows a greater magnitude in the persistence and price depreciation in response to unexpectedly positive US-FED news compared to its price appreciation in response to unexpectedly negative news. Moreover, untabulated Wald test for differences in the magnitude of the price reaction rejects the null hypothesis that $\beta^{+}_{\text{YEN, US-FED}} + \beta^{-}_{\text{YEN, US-FED}} = 0$ at the 5% significance level for most of the τ_1s. Another notable finding concerns the persistency effects attributed to positive and negative US-NFP news surprises. In particular, there appears to be persistent and significant depreciations in the values of AUD, NZD and SGD by approximately 17 bps, 24 bps and 7 bps, respectively, up to +180 minutes following the release of unexpectedly positive US-NFP figures. On the other hand (apart from the NZD), their respective persistent reactions to negative US-NFP news surprise are mainly economically and statistically insignificant.

We now turn our attention to CH-PMI, a variable which Baum et al. (2015) show to play a crucial role in affecting the price movements of various futures markets. Our results show that the differential information content of CH-PMI has a contrasting news persistency effect, particularly on the commodity currencies of AUD and NZD. Panel II of Table 3 reveals that AUD (NZD) depreciates, persistently and significantly, by approximately 10 bps (7 bps) +120 minutes (+60 minutes) after the release of unanticipatedly negative CH-PMI news. In contrast, their respective price reactions to unexpectedly positive CH-PMI news are more muted and mostly insignificant. Noting that Australia and New Zealand have significant trading relationships with China, our finding suggests that AUD and NZD are impacted by the persistence of lower-than-expected CH-PMI news more than by higher-than-expected CH-PMI figures. The Wald test (not shown) for the null hypothesis that $\beta^{+}_{\text{NZD},CH-PMI}$ + $\beta^{-}_{\text{NZD},CH-PMI} = 0$ is significant at the 10% level for τ_1s $\leq +30$.

5. FURTHER ANALYSES

5.1. State-dependent analysis

This sub-section addresses the concern whether the states of the U.S. economy play a role in affecting the Asia-Pacific currency reactions to news announcements. We measure the states of the U.S. economy using the widely adopted National Bureau of Economic Research (NBER) business cycle recession indicator. We conjecture that investors tend to have more divergent opinions during recessionary periods and hence, the foreign exchange markets generally take a longer time to fully react to macroeconomic news surprises.

To test our hypothesis, we extend Eq. (3) as:

$$\frac{p_{i,t,\tau_1} - p_{i,t,\tau_2}}{p_{i,t,\tau_2}} = \alpha_i + \beta^e_{i,k} S_{k,t}(1 - D_t) + \beta^c_{i,k} S_{k,t} D_t + e_{i,t}, \qquad (5)$$

where D_t = 1 if the NBER business cycle indicator suggests a recessionary period and 0 otherwise, and $\beta^e_{i,k}$ ($\beta^c_{i,k}$) measures the news impacts during periods associated with economic expansion (contraction).

Figure 1 plots the estimated coefficients of $\beta^e_{i,k}$ (blue) and $\beta^c_{i,k}$ (purple) for US-FED, US-CPI, US-NFP and US-UMP. We focus on these news variables because Section 3 shows that they have discernible speed of news reactions across three (or more) currencies. Consider first the reactions of the foreign exchange rates to the US-FED announcement. The most notable observation concerns YEN, where only the coefficients on $\beta^c_{i,k}$ are negative and significant when measured over the [–5, +5] to [–2, +5] intervals. That is, unexpected US-FED news during recessions is associated with an appreciation of YEN relative to USD. We posit that an unexpected increase (decrease) in U.S. interest rates during recessionary economic conditions may signal the Fed's view that the recessionary state is improving (worsening). This is particularly good (bad) news for Japan as one of the largest world economies, and YEN appreciates (depreciates) accordingly. Moreover, the price reaction of YEN is notwithstanding an increase (decrease) in U.S. interest rates is more typically

associated with an increase (decrease) in the value of USD. Unreported Wald tests show that the differences in the magnitudes of the price reaction of YEN between the two contrasting U.S. economic states are significant when measured over the [–5, +5] to [–1, +5] intervals.

The results are also striking for the US-NFP news on AUD, NZD and SGD. Figure 1 reveals that when measured over the [–5, +5] to [–1, +5] intervals, the estimated $\beta_{i,k}^{e}$ coefficients for all these currencies are positive and significant. Unexpected US-NFP news during economic upturns is associated with a significant depreciation of these currencies relative to USD. We posit that, during economic expansions, an unexpected increase (decrease) in the US-NFP signals the Fed may increase (decrease) interest rates and accordingly, the demand for USD increases (decreases).[26] In contrast, for YEN, we observe positive coefficients on both $\beta_{i,k}^{e}$ and $\beta_{i,k}^{c}$. YEN therefore depreciates (appreciates) against USD in response to unexpectedly positive (negative) US-NFP news surprise during both states of the economy. Figure 1 also shows an asymmetric price reaction to the impact of US-UMP news during different U.S. economic states on NZD and SGD. During economic contractions, the estimated $\beta_{i,k}^{c}$ are negative and mostly significant over the [–5, +5] to [–5, –1] intervals. An unexpected increase (decrease) in the US-UMP during recessions represents good (bad) news for NZD and SGD currencies, with NZD and SGD appreciating (depreciating) against USD. [27]

For the US-CPI macroeconomic announcement, we find no discernible news impact on all the currencies during both economic states. The estimated $\beta_{i,k}^{e}$ and $\beta_{i,k}^{c}$ are not significant. This is notwithstanding the notion that during economic expansionary states, unexpected inflation figures may be bad news in inflation targeting countries as interest rates are

[26] Wald tests for differences in the magnitude of the coefficients to the US-NFP announcement between the two contrasting states are significant when measured over the [–1, +5] and [0, +5] periods for AUD and NZD.

[27] Wald tests for the difference in the magnitude between the coefficients on $\hat{\beta}_{i,k}^{G}$ and $\hat{\beta}_{i,k}^{B}$ for NZD and SGD are significant at the 5% level.

expected to increase. In contrast, during economic recessionary states, unexpected inflation numbers may be good news for the economy, as discussed previously.

5.2 Impact of news announcements on realized volatilities and trade volumes

The final analysis involves analyzing the trading activities of the currencies around the time of announcement. We measure trading activities using the realized volatility and trading volume of the respective currencies. The realized volatility estimate is calculated by aggregating the time-series minute-by-minute interval of squared exchange rate changes for each macroeconomic announcement. To estimate trading volume, we take the average number of bid and ask quotes on a minute-by-minute basis, and then aggregate the time-series of the averaged minute-by-minute bid-ask quotes.

Figure 2 plots the realized volatility estimates in the period spanning –20 to +20 minutes surrounding the announcement time centered at t = 0. To save space, we only present the results for the following macroeconomic announcements: US-FED, US-NFP, CH-PMI, AUD-CPI and NZ-GDP.[28] The figure generally shows that the realized volatility estimate experiences a sharp upwards spike especially between t = –1 and 0. Take the example of the US-FED news announcement impact on AUD: the AUD realized volatility estimate is at a low level between t = –20 and –3, dramatically spiking between –3 and 0 minutes, before quickly subsiding back to the low level thereafter. In cases involving non-U.S. macroeconomic news, the upward surge in realized volatility is particularly apparent for currencies in which the countries release the news. Consider, for example, the AU-CPI (NZ-GDP) news impacts on the realized volatility of AUD (NZD), where the currency realized volatility dramatically increases around t = –2, and then quickly subsides by the time of the announcement (t=0).

[28] The results of realized volatilities and trading volumes for the remaining macroeconomic announcements are available upon request.

Figure 3 presents the equivalent plots for our measure of trading volumes. [29] Consider the UD-FED macroeconomic announcement: Apart from the impact on HKD, there is a discernible increase in trading volume leading to up to the UD-FED announcement, and the volume peaks around 5 minutes subsequent to the announcement before gradually subsiding thereafter. A similar pattern also emerges for the US-NFP news (apart from the inexplicable impact on YEN), where there is a sudden dip in volumes at the time of the announcement (t=0).

To summarize, the evidence presented in this sub-section is consistent with prior literature (e.g., Faust et al, 2007) that macroeconomic announcements are generally associated with a sudden increase in trading activities of foreign exchange markets.

6. SUMMARY

This study examines a comprehensive set of scheduled macroeconomic announcements emanating from the advanced economies of U.S., Japan, Hong Kong, Australia and New Zealand, and the emerging economy of China. We investigate the high-frequency speed and persistence of news reactions on five major Asia-Pacific currencies: AUD, HKD, NZD, SGD and YEN. We summarize our empirical findings as follows. First, we show, in general, that unanticipated macroeconomic news surprises are quickly impounded into the foreign exchange markets. There is some evidence of differences of asymmetric news effects pertaining to US-CPI, US-FED and US-ISM (in particular, the US-FED news impact on YEN, and US-ISM on AUD). We then document some evidence of price persistence in reaction to unanticipated US-FED, US-NFP and US-UMP news, and to CH-PMI news surprises. In terms of asymmetric news reactions, the AUD and NZD commodity currencies show a long-term persistence of price depreciation to the announcement of higher-than-

[29] The U.S. macroeconomic announcements may fall outside normal working hours for the domestic markets of currencies examined in this study. While all currencies are traded in global markets over a 24-hour period, it is not clear how differences in time zones between countries may have an impact on trading volumes.

expected US-NFP figures, and lower-than-expected CH-PMI numbers. The magnitude of price depreciation in NZD is significantly higher for positive NZ-UMP news surprises.

We also provide some evidence of differences in the speed and persistence of news reactions concerning macroeconomic announcements released domestically compared to cross-border macroeconomic announcements. The results demonstrate the pervasive impact of U.S. macroeconomic news on the speed and persistence of foreign exchange price reactions, whereas the effects of news emanating from other countries are somewhat more muted. The main exception is the CH-PMI news, which significantly affects the AUD and NZD commodity currencies. Interestingly, some Australian macroeconomic news surprises significantly affect both AUD and NZD, but not vice-versa.

We end the study with two analyses. The first concerns whether the states of the U.S. economy affect the speed of the news impacts on the currency markets considered. Interestingly, we find that during U.S. recessionary periods, unexpected US-FED news is associated with an appreciation of YEN relative to USD. Second, we examine the trading activities (as measured by realized volatilities and trading volumes of the currencies) around the time of the macroeconomic announcements. In many cases, the realized volatilities and trading volumes of the currencies experience a sharp temporal upward spike just prior to, and at the time of the news arrival, before gradually subsiding thereafter.

Overall our study contributes to understanding how Asia-Pacific exchange rates react to scheduled cross-border macroeconomic announcements. Our results will be of interest to foreign exchange traders, central banks and other market participants. Consistent with prior literature (e.g., Brusa et al., 2015), we find that U.S. scheduled macroeconomic announcements still play a predominant role in affecting foreign exchange rates in the Asia-Pacific market. However, macroeconomic announcements from other markets, particularly

China and Australia, can also impact the speed and persistency of the price reaction of currencies in other markets.

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Figure 1: Speed of news reactions conditioned on the states of the U.S. economy

The figure plots the slope coefficient estimates of $\beta_{i,k}^{e}$ (blue) and $\beta_{i,k}^{c}$ (purple) of Eq. (5). The coefficient estimates are marked with 'x' if their corresponding *t*-statistics are greater than the 95% two-sided robust critical values computed based on a Monte-Carlo simulation similar to the one used for Eq. (3); otherwise, they are marked with 'o'.

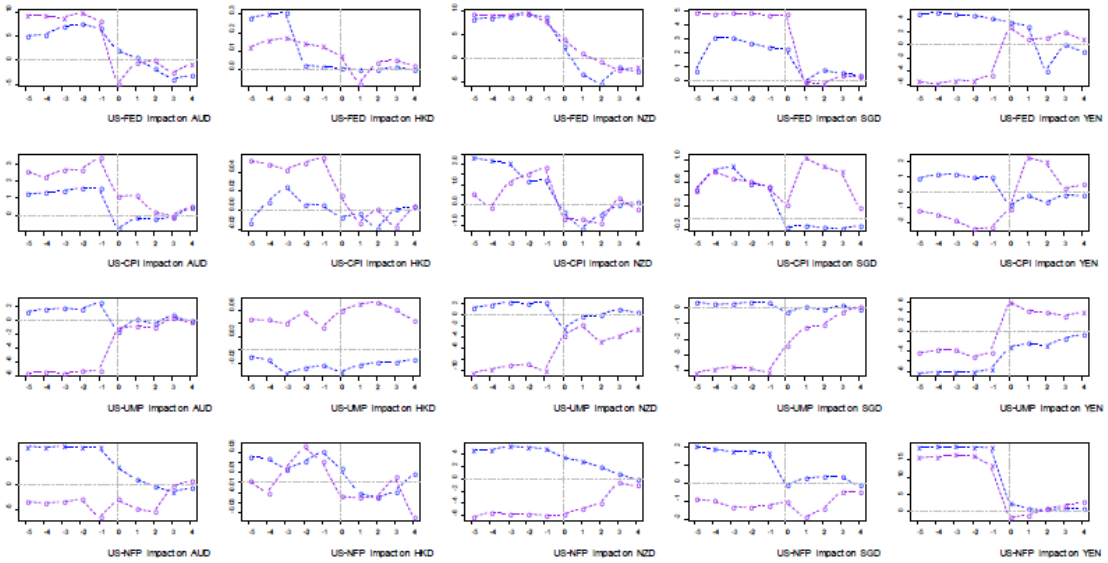

Figure 2: Volatilities of exchange rate changes

The figure plots the average exchange rate volatilities in the period spanning –20 to +20 minutes surrounding the announcement time at $t = 0$. Exchange rate volatility is calculated by squaring exchange rate changes (expressed in bps) in each minute.

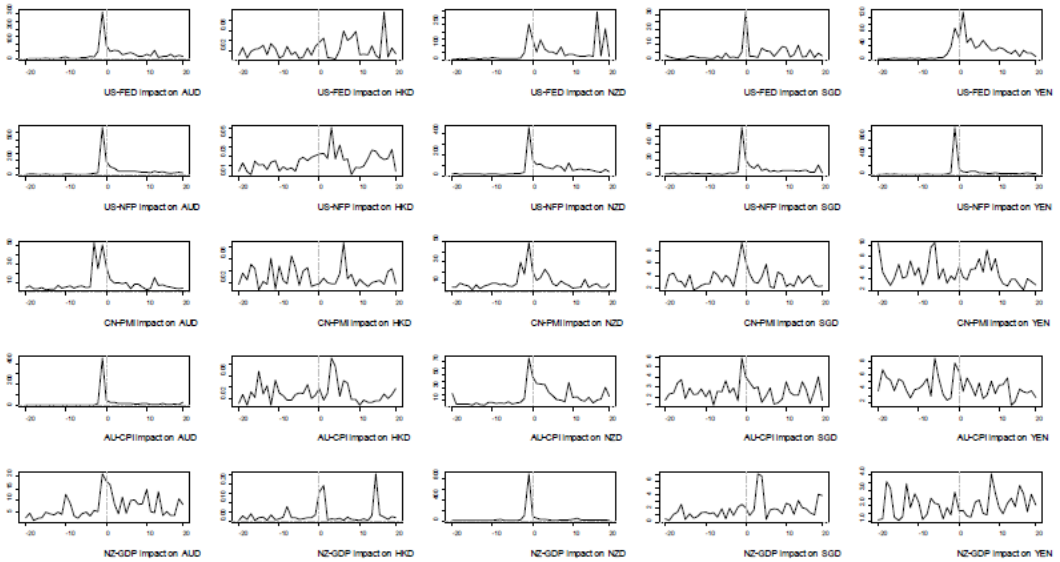

Figure 3: Trade volumes of exchange rates

The figure plots the average trade volumes of exchange rates in the period spanning –20 to +20 minutes surrounding the announcement time at $t = 0$. Trade volume is measured using the average number of bid and ask quotes in each minute.

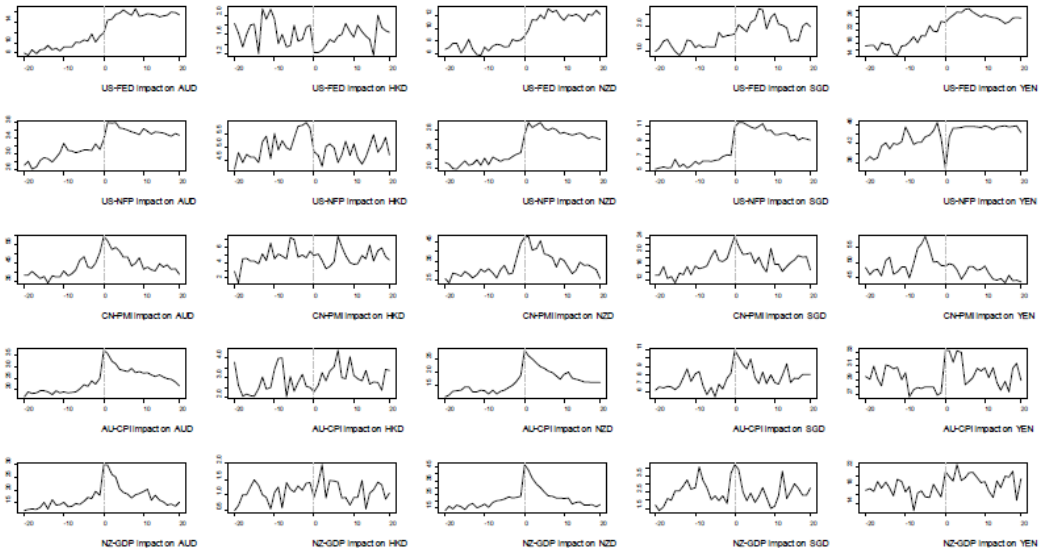

Table 1: Descriptive statistics for scheduled macroeconomic announcements

The table reports scheduled macroeconomic announcements emanating from the U.S., China, Hong Kong, Japan, Australia and New Zealand, the abbreviation of the news variables (arranged alphabetically for each country), their reported units, sample period (as dictated by the data availability of consensus forecasts obtained from Bloomberg), frequency of announcements, typical official announcement time (in GMT), number of observations (*N*) as well as mean and standard deviation (S.D.) of the news forecast errors ($A_{k,t} - F_{k,t}$). For example, the US-FED official news release is typically scheduled at 14:15 EST, which is equivalently to 18:15 GMT (with daylight saving) or 19:15 GMT (without daylight saving). For brevity, Tables 2 and 3 below only report the regression results associated with variables that are marked with asterisk (*) in the first column of this table.

	Abbrev.	Announcement	Units	Sample period	Freq.	Time (GMT)	*N*	Mean	S.D.
*	US-CPI	Consumer price index	% change	1/1998 - 12/2013	M	12:30 / 13:30	192	-0.007	0.130
*	US-FED	Federal Funds target rate	change in bps	2/1998 - 6/2008 [a]	8 per yr	18:15 / 19:15	89	-2.697	11.52
*	US-ISM	ISM manufacturing	index	1/1998 - 12/2013	M	14:00 / 15:00 [b]	192	0.133	1.978
*	US-NFP	Nonfarm payrolls	change in thousands	1/1998 - 12/2013	M	12:30 / 13:30	192	-18.18	86.03
*	US-PPI	Producer price index	% change	1/1998 - 12/2013	M	12:30 / 13:30	192	0.022	0.458
*	US-UMP	Unemployment rate	% rate	1/1998 - 12/2013	M	12:30 / 13:30	192	-0.027	0.149
	CN-CPI	Consumer price index	% change	8/2005-12/2013	M	Various [c]	101	0.004	0.328
*	CN-PMI	Purchasing manager index	index	10/2009-12/2013	M	1:00 [d]	51	-0.129	0.854
*	CN-PPI	Producer price index	% change	8/2005-12/2013	M	2:00	101	-0.075	0.519
	CN-TB	Trade balance	in billions (RMB)	8/2005-12/2013	M	Various [c]	99	0.693	7.497
*	HK-CPI	Consumer price index	% change	7/2000-12/2013	M	8:15 – 8:30 [e]	162	-0.068	0.512
	HK-EXP	Exports statistics	% change	6/2001-12/2013	M	8:15 – 8:30 [e]	151	0.255	5.930
	HK-IMP	Imports statistics	% change	7/2000-12/2013	M	8:15 – 8:30 [e]	161	0.557	5.991
	HK-RT	Retail trade	% change	7/2000-11/2013	M	8:15 – 8:30 [e]	161	-0.064	3.764
*	HK-UMP	Unemployment rate	% rate	7/2000-12/2013	M	8:15 – 8:30 [e]	162	-0.027	0.141
*	JP-CPI	Consumer price index	% change	1/2002 - 12/2013	M	23:30	144	0.016	0.108
	JP-IP	Industry production	% change	1/2002 - 12/2013	M	23.50	144	-0.414	1.087
	JP-MS	Money supply M2	bps	2/2000 - 12/2013	M	23:50 [f]	167	-1.078	23.23
	JP-RT	Retail Trade	% change	2/2000 - 12/2013	M	23.50	166	-0.338	1.367
	JP-TB	Trade balance	in billions (YEN)	1/2000 - 12/2013	M	23.50	165	-17.89	164.6
*	JP-UMP	Unemployment rate	% rate	2/2000 - 12/2013	M	23:30 [g]	168	-0.027	0.156
*	AU-CPI	Consumer price index	% change	1/1998 - 10/2013	Q	0:30 / 1:30	64	-0.023	0.254
*	AU-GDP	Gross domestic product	% rate	3/1998 - 12/2013	Q	0:30 / 1:30	63	0.103	0.432
	AU-TB	Trade balance	in millions (AUD)	1/1998 - 12/2013	M	0:30 / 1:30	192	-44.49	584.4
*	AU-UMP	Unemployment rate	% rate	1/1998 - 12/2013	M	0:30 / 1:30	192	-0.050	0.158
*	NZ-CPI	Consumer price index	% change	1/2001-10/2013	Q	21:45 / 22:45	52	-0.049	0.202
	NZ-EXP	Exports statistics	in billions (NZD)	9/2002-11/2013	M	21:45 / 22:45	135	0.019	0.207
*	NZ-GDP	Gross domestic product	% rate	6/2001-12/2013	Q	21:45 / 22:45	51	0.037	0.314
	NZ-IMP	Imports statistics	in billions (NZD)	6/2001-11/2013	M	21:45 / 22:45	150	0.055	0.220
*	NZ-UMP	Unemployment rate	% rate	2/2001-11/2013	Q	21:45 / 22:45	52	-0.056	0.336

[a] The Federal Funds rate after June 2008 has been constant at approximately 15 bps and the FOMC has subsequently no longer reported a point target rate until the end of the sample period.
[b] In August 2001, the US-ISM report was time-stamped at 13:26 GMT.
[c] The CN-CPI and CN-TB reports were released in various times.
[d] In December 2008 and April 2009, the CH-PMI report was time-stamped at 1:13 GMT and 12:00 GMT, respectively.
[e] All the relevant Hong Kong macroeconomic news reports were officially released at 8:15 GMT prior to September 2008, and at 8:30 GMT thereafter.
[f] Prior to November 2000, the JP-MS report was officially released at 22:50 GMT.
[g] Prior to October 2000, the JP-UMP report was officially released at 22:00 GMT. In February 2004, it was released twice in the same month.

Table 2: Parameter estimates of regression Eq. (3)

The table reports the estimated $\beta_{i,k}$ of Eq. (3) for notable macroeconomic announcements emanating from the U.S., China, Hong Kong, Japan, Australia and New Zealand. The estimates are reported in basis points (bps). The news variables are arranged alphabetically for each country, and all the currencies are expressed per unit of USD. The estimates are highlighted in bold if their corresponding *t*-statistics are greater than the two-sided Monte-Carlo simulated critical values at the 5% significance level. Panel I reports the results for the speed of news reactions, whereas Panel II reports the results for the persistence of news impacts.

		Panel I: Speed of news reactions										Panel II: Persistence of news impacts								
Variable	FX	–5	–4	–3	–2	–1	0	+1	+2	+3	+4	+5	+10	+15	+30	+45	+60	+90	+120	+180
US-CPI	AUD	**1.65**	1.59	**1.81**	**1.91**	**2.13**	0.25	0.22	0.14	0.09	0.44	0.25	0.02	0.23	0.12	-0.35	0.05	0.17	-0.06	-1.25
	HKD	0.01	0.02	0.03	0.02	0.02	0.00	0.01	0.01	0.00	0.00	0.00	0.01	**0.05**	-0.05	-0.08	-0.06	**-0.09**	-0.08	0.03
	NZD	**1.87**	**1.53**	**1.83**	1.28	**1.44**	0.45	1.02	0.57	0.11	0.07	0.45	0.26	0.22	-0.70	-0.07	0.00	2.56	0.74	0.30
	SGD	0.48	**0.81**	**0.83**	**0.59**	0.54	0.05	0.21	0.13	0.10	0.03	0.05	0.07	0.10	0.05	-0.47	-0.12	0.31	0.19	0.80
	YEN	0.33	0.42	0.35	0.02	0.09	0.95	0.52	0.08	0.05	0.02	0.95	**2.17**	**3.25**	**-2.72**	**-2.79**	-2.64	-1.40	-2.38	-1.58
US-FED	AUD	**7.90**	**7.95**	**8.23**	**9.10**	**7.68**	2.59	0.15	0.51	**2.89**	1.39	2.59	1.03	0.07	-2.95	-0.81	1.48	0.80	1.37	0.69
	HKD	**0.13**	**0.16**	**0.18**	**0.14**	**0.12**	**0.07**	0.07	0.04	0.05	0.02	**0.07**	0.19	**0.22**	**0.25**	-0.05	0.05	0.02	-0.12	-0.12
	NZD	**9.02**	**9.11**	**9.10**	**9.67**	**8.18**	3.72	0.36	2.15	2.33	**2.21**	3.72	**3.11**	**7.02**	1.56	3.38	4.85	4.66	8.42	10.43
	SGD	3.66	**4.30**	**4.33**	**4.24**	**4.06**	**4.04**	0.09	0.07	**0.41**	**0.33**	**4.04**	3.79	5.21	**4.42**	**3.82**	**4.60**	**6.76**	**8.26**	**9.91**
	YEN	-2.36	-2.55	-2.26	-2.32	-1.92	2.97	1.49	0.58	1.38	0.19	2.97	2.81	4.22	**9.23**	**12.84**	**11.67**	11.93	11.83	11.26
US-ISM	AUD	-1.04	-1.06	-1.03	-0.83	-0.89	0.51	0.86	0.28	0.01	0.10	0.51	0.16	1.46	1.39	1.93	**3.39**	3.63	**5.81**	**5.49**
	HKD	-0.01	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.01	0.01	-0.06	-0.05	-0.08	**-0.13**
	NZD	-0.61	-0.65	-0.37	-0.52	-0.27	0.13	0.94	0.21	0.20	0.04	0.13	1.79	2.02	2.62	2.91	**4.86**	**4.11**	**6.10**	**6.11**
	SGD	0.41	0.37	0.48	0.14	0.22	0.26	0.28	0.11	0.10	0.10	0.26	0.57	**0.76**	0.84	0.88	0.94	**1.84**	1.72	1.23
	YEN	**8.96**	**8.87**	**8.70**	**8.39**	**8.51**	**2.26**	0.97	0.20	0.25	**0.72**	**2.26**	**2.72**	**3.60**	**4.44**	**4.67**	**4.94**	**5.81**	3.99	3.88
US-NFP	AUD	**6.25**	**6.17**	**6.29**	**6.14**	**5.58**	2.78	0.42	0.93	**1.17**	0.35	2.78	**5.43**	**5.66**	**7.27**	**8.40**	**10.30**	**10.64**	**10.46**	**8.93**
	HKD	0.02	0.02	0.01	0.02	0.03	0.01	0.01	0.01	0.01	0.00	0.01	0.04	**0.05**	0.10	**0.11**	0.12	**0.13**	0.12	0.09
	NZD	3.08	3.25	**3.69**	3.60	3.38	2.10	1.80	1.10	0.60	0.22	2.10	**6.83**	**8.06**	**10.49**	**13.05**	**14.02**	**14.87**	**15.17**	**12.41**
	SGD	**1.60**	**1.48**	1.30	**1.30**	1.23	0.24	0.03	0.09	0.23	0.20	0.24	0.81	1.18	1.94	**2.73**	**2.92**	**3.34**	2.56	**3.06**
	YEN	**18.41**	**18.48**	**18.57**	**18.47**	**17.81**	1.76	0.59	0.58	0.84	1.04	1.76	**3.20**	**3.01**	**5.58**	**5.30**	**4.36**	1.98	-0.06	1.55
US-PPI	AUD	0.50	0.29	0.37	0.42	0.42	0.32	0.51	0.33	0.70	0.04	0.32	0.05	0.19	-1.12	-1.67	-1.28	-1.62	-2.62	-2.42
	HKD	**0.03**	0.02	0.01	0.01	-0.01	0.00	0.01	0.01	0.01	0.01	0.00	0.00	0.00	-0.05	-0.07	**-0.09**	-0.08	-0.07	0.01
	NZD	1.12	1.20	**1.51**	**1.44**	1.37	0.48	0.26	0.40	0.32	0.28	0.48	1.32	1.13	0.57	0.03	0.24	-1.12	-1.55	-2.70
	SGD	**0.78**	**0.90**	**0.72**	**0.70**	**0.67**	**0.47**	0.15	0.17	0.15	0.02	**0.47**	**0.72**	0.73	0.59	0.25	0.32	0.02	-0.15	-0.42
	YEN	**1.66**	**1.65**	**1.74**	**1.75**	**2.05**	0.57	0.18	0.11	0.51	0.16	0.57	0.79	1.19	0.16	-0.19	1.13	0.53	0.15	-1.96
US-UMP	AUD	-0.68	-0.39	-0.26	-0.38	0.53	1.48	0.00	0.59	0.72	0.09	1.48	**3.48**	**3.84**	-2.90	**-4.47**	-4.38	**-6.94**	-5.25	**-8.03**
	HKD	0.00	0.00	-0.02	-0.01	-0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.04	**0.06**	**-0.12**	-0.09	-0.10	-0.12	-0.11	-0.08
	NZD	-1.32	-0.75	-0.20	-0.38	-0.39	**2.71**	0.65	1.07	0.03	0.27	**2.71**	**3.45**	**4.65**	-2.86	**-5.45**	**-5.20**	**-7.86**	-5.81	**10.63**
	SGD	-0.63	-0.70	-0.62	-0.59	-0.67	0.75	0.22	0.33	0.07	0.05	0.75	**1.63**	**1.50**	-0.36	**-1.83**	**-1.90**	**-2.25**	-1.36	-2.03
	YEN	**-7.42**	**-7.14**	**-7.12**	**-7.44**	**-6.83**	1.07	0.97	1.28	0.37	0.38	1.07	1.67	0.52	0.57	-1.23	-2.36	-2.64	-2.92	-3.27
CH-PMI	AUD	**-9.34**	**-9.58**	**-8.82**	-6.33	**-6.18**	2.96	0.07	0.04	0.15	0.39	2.96	**5.40**	**7.52**	**-6.49**	**-7.75**	**10.07**	**10.54**	-7.18	**10.62**
	HKD	-0.16	-0.18	-0.15	-0.11	**-0.08**	0.05	0.04	0.03	0.03	0.01	0.05	0.04	0.09	-0.07	-0.11	-0.12	-0.04	-0.05	-0.05
	NZD	**-6.65**	**-7.59**	**-6.92**	**-5.78**	**-4.52**	2.27	0.19	0.03	0.27	0.92	2.27	**4.83**	5.06	-4.46	-2.92	-4.04	-4.09	-3.76	-4.14
	SGD	**-2.44**	**-2.81**	**-2.70**	-2.10	**-1.71**	0.28	0.14	0.31	0.65	0.35	0.28	0.78	1.20	-0.80	-1.49	**-2.25**	**-2.12**	**-2.42**	-3.77
	YEN	**1.42**	1.15	0.88	0.88	0.14	0.54	0.08	0.33	0.18	0.38	0.54	0.72	0.74	0.39	-0.13	-0.58	-0.63	-0.99	-2.10
CH-PPI	AUD	0.29	0.40	0.35	0.26	0.35	0.07	0.65	0.85	0.05	0.15	0.13	0.14	0.15	-0.20	-1.41	-0.54	-1.06	-1.41	0.73
	HKD	0.05	0.05	0.04	0.02	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.00	0.07	0.01	0.06	0.08	0.07	-0.06
	NZD	-0.30	-0.34	0.07	-0.09	-0.38	-	-	-	-	-	0.36	-	-	-0.68	-1.24	-1.05	-1.34	-1.19	2.08

							0.64	0.61	0.95	0.44	0.08		0.32	0.75						
	SGD	-0.05	0.08	-0.04	-0.24	-0.28	-0.33	-0.12	-0.06	-0.35	0.13	-0.10	-0.08	-0.13	-0.76	**-1.76**	-0.94	-0.68	-0.56	-1.88
	YEN	-0.81	-0.89	-0.67	-0.60	-0.65	-0.60	-0.43	-0.20	-0.17	0.02	-0.20	-0.38	-0.20	-0.08	-0.29	-0.49	-0.22	-1.06	0.98

		Panel I: Speed of news reactions										Panel II: Persistence of news impacts								
Variable	FX	–5	–4	–3	–2	–1	0	+1	+2	+3	+4	+5	+10	+15	+30	+45	+60	+90	+120	+180
HK-CPI	AUD	-0.30	-0.35	-0.54	0.03	-0.22	-0.08	0.03	0.27	0.28	-0.07	0.08	0.33	-0.02	0.14	0.02	0.46	0.68	-1.06	-1.02
	HKD	**-0.06**	**-0.07**	**-0.06**	**-0.05**	**-0.05**	**0.05**	**0.03**	**0.03**	**0.02**	-0.01	**0.05**	**0.06**	0.04	-0.06	-0.03	-0.02	-0.05	-0.08	-0.04
	NZD	-0.35	-0.20	-0.70	0.05	-0.16	-0.24	-0.07	-0.13	-0.18	-0.14	-0.24	-0.01	-0.63	-0.68	-1.95	-2.26	-2.61	-1.37	-3.35
	SGD	**-0.62**	-0.54	**-0.56**	**-0.48**	-0.38	-0.08	-0.15	-0.07	-0.09	-0.18	-0.08	**-0.61**	-0.40	-0.04	-0.02	-0.28	-0.19	-0.33	-0.82
	YEN	0.40	0.39	0.19	0.38	0.40	-0.55	-0.67	-0.29	-0.00	-0.10	-0.55	-0.55	-0.57	-0.70	-0.28	-0.38	-0.50	-0.09	-0.16
HK-UMP	AUD	**0.92**	**0.94**	0.39	0.24	0.40	-0.22	-0.20	-0.35	-0.16	-0.18	-0.22	**-1.06**	-0.52	**-1.34**	-1.43	-1.06	2.06	1.53	-1.24
	HKD	-0.02	-0.02	-0.01	-0.01	-0.01	0.02	0.01	0.01	0.02	0.00	0.02	0.00	0.02	0.02	0.00	0.01	-0.03	0.03	-0.04
	NZD	1.00	**1.29**	0.84	0.97	0.65	0.62	0.48	0.26	0.30	0.22	0.62	**-1.24**	**-1.24**	-1.04	-1.38	-1.55	0.69	-0.85	-2.50
	SGD	**0.70**	**0.55**	**0.51**	**0.38**	**0.39**	**0.42**	0.27	0.20	0.03	0.04	**0.42**	**0.48**	**0.61**	**0.83**	0.71	0.79	0.16	0.36	0.15
	YEN	0.85	0.69	0.72	0.81	**0.90**	0.64	0.56	0.27	0.34	**0.34**	0.64	0.07	0.10	0.90	0.21	0.19	-0.16	-0.39	-0.57
JP-CPI	AUD	0.28	0.00	0.25	0.01	0.01	-0.02	-0.04	-0.28	-0.30	-0.16	0.02	-0.68	-1.07	-1.03	-0.57	0.63	0.10	-1.08	-1.81
	HKD	0.01	0.02	0.02	0.01	0.01	0.00	0.01	0.01	0.00	-0.01	0.00	-0.03	-0.06	-0.04	-0.10	-0.06	-0.05	-0.13	0.01
	NZD	0.11	-0.12	0.12	-0.06	-0.15	-0.11	-0.21	-0.10	-0.44	**-0.50**	-0.11	-0.08	-0.40	-0.72	-0.53	1.13	1.41	-0.67	0.72
	SGD	0.24	**0.44**	0.22	0.23	0.24	**-0.33**	-0.09	-0.13	-0.12	**-0.16**	**-0.33**	-0.03	-0.19	-0.16	**-1.05**	-0.95	-0.98	-1.06	**-2.35**
	YEN	**-0.71**	-0.44	**-0.82**	**-0.85**	**-0.83**	-0.06	-0.01	-0.10	-0.02	-0.03	-0.06	-0.04	-0.15	-0.51	**-1.91**	**-2.80**	**-2.88**	-2.81	**-4.20**
JP-UMP	AUD	-0.19	0.10	0.15	0.31	0.33	-0.39	-0.14	-0.40	-0.38	-0.27	-0.39	-0.02	-0.64	-0.72	-0.35	-0.77	0.54	-1.45	0.54
	HKD	-0.02	-0.03	-0.04	-0.02	-0.01	-0.01	-0.01	-0.00	-0.00	-0.00	-0.01	-0.01	-0.00	-0.05	-0.06	-0.04	-0.19	**-0.21**	-0.02
	NZD	-0.08	0.08	0.38	0.70	0.60	-0.58	-0.09	-0.10	-0.09	-0.12	-0.58	-0.00	-0.11	-0.05	-0.43	-0.20	-0.24	-1.71	-0.15
	SGD	**-0.53**	-0.27	-0.21	-0.32	-0.16	-0.03	-0.01	-0.18	-0.19	-0.07	-0.03	-0.10	-0.27	-0.00	-0.23	-0.17	-0.17	-0.42	-0.32
	YEN	**0.69**	**0.82**	**0.73**	**0.76**	**0.92**	-0.40	-0.35	-0.22	**-0.32**	**-0.27**	-0.40	-0.64	**-1.32**	**-1.55**	-1.66	**-2.91**	-2.13	-2.64	-3.71
AU-CPI	AUD	**13.03**	**13.18**	**12.53**	**12.93**	**12.82**	-0.57	-0.20	-0.38	-0.25	-0.31	-0.57	-1.15	-0.28	-0.48	-2.28	-2.09	0.36	-0.39	-0.71
	HKD	-0.04	0.02	0.00	-0.01	0.00	-0.02	-0.00	-0.01	-0.00	-0.04	-0.02	-0.03	-0.02	-0.01	-0.17	**-0.09**	-0.10	-0.05	-0.06
	NZD	-1.60	-1.64	-1.33	-1.80	-1.30	**-3.49**	-1.13	-1.50	-0.77	-0.56	**-3.49**	**-4.14**	**-5.05**	**-5.68**	**-8.23**	**-7.03**	**-5.22**	**-5.94**	**-6.16**
	SGD	**-0.99**	**-1.21**	**-1.05**	**-1.05**	**-1.28**	-0.13	-0.05	-0.27	-0.18	-0.15	-0.13	-0.13	-0.34	-1.37	-1.07	-1.43	-0.50	-1.12	-0.86
	YEN	**-1.06**	**-1.03**	**-1.08**	**-1.25**	**-1.06**	-0.52	**-0.71**	**-0.84**	-0.25	-0.01	-0.52	-0.05	-0.16	-1.24	-1.45	-1.57	-2.22	-1.06	-0.47
AU-GDP	AUD	**21.54**	**22.07**	**21.91**	**21.73**	**21.83**	-2.53	-1.55	-0.89	-0.86	**-1.65**	-2.53	**-4.88**	**-6.47**	**-7.63**	**-8.30**	**-9.43**	**-10.18**	**-8.02**	**-6.66**
	HKD	0.02	0.07	0.08	0.04	0.02	-0.01	-0.01	-0.00	-0.00	-0.02	-0.01	-0.10	-0.09	-0.09	**-0.17**	**-0.22**	-0.17	-0.15	-0.18
	NZD	**-8.32**	**-8.21**	**-8.54**	**-8.55**	**-8.47**	-0.07	-0.50	-0.31	-1.16	-0.80	-0.07	-2.61	-2.37	-2.64	-2.70	-2.70	-4.26	-2.02	-1.17
	SGD	-0.72	-0.88	-0.81	-0.94	-0.98	-0.30	-0.33	-0.46	-0.14	-0.04	-0.30	-0.64	-1.10	**-2.64**	-1.84	-1.17	-0.57	-1.36	-1.63
	YEN	1.07	0.61	0.85	1.11	0.97	-1.00	-0.87	-0.34	**-0.79**	-0.20	-1.00	**-1.85**	-1.70	-0.10	-0.71	-0.06	-0.28	-1.55	-0.07
AU-UMP	AUD	**12.45**	**12.30**	**12.36**	**12.33**	**12.63**	**2.35**	-0.29	-0.08	-0.20	-0.19	**-2.35**	**-2.61**	**-2.68**	-2.05	-1.42	-0.68	-0.02	-0.90	-1.82
	HKD	0.02	0.01	0.02	0.02	0.00	0.00	0.00	-0.01	-0.01	-0.01	0.00	0.00	0.00	0.00	-0.04	-0.09	-0.11	-0.07	-0.02
	NZD	**4.84**	**4.59**	**4.84**	**4.69**	**4.70**	-0.05	-0.52	-0.09	-0.01	-0.32	-0.05	-0.69	-0.59	-1.44	-2.24	-2.45	**-3.67**	**-4.34**	**-5.17**
	SGD	**1.27**	**1.50**	**1.07**	**1.44**	**1.39**	-0.53	-0.59	-0.14	-0.21	**-0.26**	-0.53	**-0.62**	**-0.74**	-0.21	-0.27	-0.48	-0.33	-0.41	-0.20
	YEN	-0.04	-0.03	-0.05	-0.16	-0.28	-0.10	-0.08	-0.02	-0.24	-0.11	-0.10	-0.00	-0.05	**-1.31**	**-2.59**	**-2.41**	**-2.48**	-2.03	-1.31
NZ-CPI	AUD	-0.57	-0.67	**-1.05**	**-0.86**	**-0.99**	-0.07	-0.41	-0.33	-0.02	-0.17	-0.07	-0.29	-0.62	-1.00	-1.03	-0.84	-0.07	-0.39	-3.66
	HKD	**0.06**	**0.05**	**0.06**	0.05	0.03	-0.02	-0.03	-0.02	-0.02	-0.02	-0.02	-0.01	-0.01	-0.00	-0.08	-0.02	-0.01	-0.12	-0.03
	NZD	**-18.77**	**-19.03**	**-19.31**	**-19.07**	**-18.55**	**-3.22**	**-3.14**	**-2.56**	-0.88	-0.01	**-3.22**	**-3.16**	-2.71	**-4.52**	**-4.06**	**-4.58**	-3.39	-2.71	**-5.20**
	SGD	-0.53	-0.61	-0.41	-0.05	-0.13	-0.12	-0.06	-0.18	-0.27	**-0.33**	-0.12	-0.12	-0.46	-0.59	-0.44	-0.73	-0.26	-0.13	-2.81
	YEN	-0.39	-0.59	-0.67	-0.66	-0.36	-0.30	-0.31	-0.44	**-0.39**	-0.10	-0.30	-0.70	-0.79	-0.34	-0.23	-0.77	-1.08	-0.11	-1.40
NZ-GDP	AUD	**-3.56**	**-3.24**	**-2.84**	**-2.60**	**-2.22**	-0.05	-0.47	-0.68	-1.31	-0.98	-0.05	-0.01	-0.59	-0.30	-0.90	-0.83	-1.15	-1.45	-0.85
	HKD	-0.07	-0.08	-0.08	-0.08	-0.05	-0.06	-0.06	-0.02	-0.01	-0.01	-0.06	-0.04	-0.01	-0.01	-0.02	-0.14	-0.09	-0.05	-0.02
	NZD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-8.11

		27.44	**27.10**	**26.75**	**26.81**	**23.57**	**-5.68**	**-3.54**	-0.82	-0.59	-0.01	**-5.68**	**-5.33**	**-7.70**	**-10.51**	**-12.66**	**-12.24**	**-10.47**	**-8.96**	
	SGD	-0.50	-0.58	**-0.63**	**-0.72**	**-0.68**	0.28	0.02	-0.22	0.01	-0.11	0.28	0.37	0.45	**-1.84**	**-2.20**	**-2.36**	0.26	-0.23	-2.96
	YEN	0.36	0.21	0.39	0.37	0.29	0.03	0.19	0.15	-0.07	-0.05	0.03	0.61	0.23	-0.49	-1.15	0.35	0.77	-1.12	-1.03
NZ-UMP	AUD	1.28	1.40	1.39	**1.51**	**1.56**	-0.51	-0.87	**-0.82**	**-0.80**	-0.47	-0.51	-0.02	-0.17	-0.10	-0.23	-0.05	0.28	-0.42	-0.20
	HKD	0.04	0.05	0.08	0.04	-0.02	-0.05	-0.09	-0.08	-0.07	-0.08	**-0.05**	0.07	**-0.09**	-0.09	**-0.15**	**-0.14**	-0.16	-0.05	0.02
	NZD	**23.70**	**23.60**	**24.22**	**23.51**	**20.43**	**-2.90**	-0.87	-1.01	-0.44	-0.21	**-2.90**	**-6.02**	**-5.59**	**-7.29**	**-9.02**	**-7.60**	**-8.84**	-6.45	**-11.26**
	SGD	**0.79**	**0.73**	**0.86**	**0.83**	**1.16**	**-0.90**	-0.15	-0.04	-0.07	-0.12	**-0.90**	-0.53	-0.40	-0.23	-0.55	-0.96	-2.34	-2.96	**-4.54**
	YEN	-0.41	0.10	0.15	0.16	0.16	-0.26	-0.29	-0.19	-0.35	-0.01	-0.26	-0.80	-1.56	-0.05	-0.16	-0.28	-2.51	-2.55	-3.02

Table 3: Parameter estimates of regression Eq. (4)

The table reports the estimated $\beta^{+}_{i,k}$ (in light cells) and $\beta^{-}_{i,k}$ (in shaded cells) of Eq. (4) for notable macroeconomic announcements emanating from the U.S., China, Hong Kong, Japan, Australia and New Zealand. The estimates are reported in basis points (bps). The news variables are arranged alphabetically for each country, and all the currencies are expressed per unit of the USD. The estimates are highlighted in bold if their corresponding *t*-statistics are greater than the two-sided Monte-Carlo simulated critical values at the 5% significance level. Panel I reports the results for the speed of news reactions, whereas Panel II reports the results for the persistence of news impacts.

Variable	FX	Panel I: Speed of news reactions																				Panel II: Persistence of news impacts																	
		–5		–4		–3		–2		–1		0		+1		+2		+3		+4		+5		+10		+15		+30		+45		+60		+90		+120		+180	
US-CPI	AUD	-0.69	**-3.92**	-1.07	**-4.16**	-0.85	**-4.38**	-0.31	**-4.06**	-0.46	**-4.64**	**-1.95**	-1.40	-0.49	-0.91	-1.22	-0.91	-0.99	-0.78	0.08	-0.80	**-1.95**	-1.40	**-3.00**	**-2.95**	**-4.65**	**-4.06**	**-4.18**	**-4.29**	-4.21	-3.41	-3.24	-3.25	0.67	0.31	2.19	2.25	1.18	1.45
	HKD	0.04	0.02	0.05	0.01	0.02	-0.04	0.01	-0.03	0.03	-0.02	-0.02	-0.02	-0.03	-0.01	**-0.05**	-0.03	-0.05	**-0.04**	-0.02	-0.03	-0.02	-0.02	-0.02	-0.01	-0.08	0.03	-0.09	0.00	-0.11	0.05	-0.16	-0.02	-0.17	0.03	-0.16	0.00	0.01	-0.08
	NZD	0.97	**-2.74**	0.30	**-2.73**	-0.07	**-3.67**	-1.29	**-3.78**	-0.81	**-3.62**	**-2.30**	-1.34	-1.67	0.40	-1.04	0.11	-0.44	-0.65	0.33	0.18	**-2.30**	-1.34	-1.93	-1.37	**-4.03**	**-3.48**	**-6.17**	**-4.61**	-5.63	**-5.33**	-5.37	**-5.20**	-0.36	-5.39	1.91	0.41	3.87	1.75
	SGD	-0.36	**-1.30**	-0.18	**-1.77**	-0.11	**-1.74**	-0.12	**-1.28**	-0.31	**-1.37**	**-1.05**	**-0.93**	-0.50	**-0.90**	-0.20	-0.46	0.00	-0.20	-0.07	-0.01	**-1.05**	**-0.93**	**-1.27**	**-1.08**	**-2.19**	**-1.92**	**-2.38**	**-2.42**	**-2.46**	-1.46	-2.17	-1.88	-0.91	-1.49	-1.79	-2.11	-0.96	-2.05
	YEN	-0.92	-1.54	-0.67	-1.47	-0.50	-1.18	-0.84	-0.86	-0.84	-0.99	-1.70	0.22	0.45	-0.60	0.46	0.29	0.25	0.35	0.48	0.50	-1.70	0.22	**-3.20**	1.16	**-5.72**	0.85	-4.72	0.77	-3.02	2.56	-3.99	1.33	-1.51	1.30	-2.99	1.79	-2.74	-0.18
US-FED	AUD	**12.98**	-7.31	**13.18**	**-7.34**	**12.66**	**-7.72**	**17.83**	**-8.09**	5.62	**-7.92**	4.21	3.38	1.83	0.38	-3.95	0.11	-0.43	**3.17**	-2.60	1.25	4.21	3.38	5.46	1.78	5.08	0.51	2.23	3.55	3.30	1.29	11.01	-0.37	-2.28	-1.16	2.61	-1.22	6.35	-2.90
	HKD	**0.32**	**-0.11**	**0.31**	**-0.15**	**0.38**	**-0.16**	**0.29**	-0.12	**0.23**	-0.11	0.25	-0.06	**0.28**	0.10	-0.06	-0.04	0.01	-0.05	0.00	-0.02	0.25	-0.06	0.52	-0.16	0.55	-0.19	0.61	-0.22	**0.33**	0.08	**0.80**	0.01	**1.53**	0.10	**1.79**	**0.28**	2.04	**0.25**
	NZD	**10.68**	**-8.83**	**14.37**	**-8.50**	**14.08**	**-8.52**	**13.30**	**-9.25**	-0.16	**-9.15**	3.24	-3.77	-1.61	0.21	1.95	2.62	0.89	**2.70**	-4.33	**1.96**	3.24	-3.77	3.86	-3.03	**9.61**	**-6.72**	9.59	-0.63	6.66	-3.00	6.97	-4.61	1.62	-5.01	5.36	-8.78	9.16	-11.9
	SGD	3.95	-3.63	4.32	**-4.29**	3.98	**-4.36**	4.49	-4.22	3.96	-4.07	**3.41**	-4.10	0.23	0.12	0.30	-0.05	0.89	-0.37	0.76	**-0.30**	3.41	-4.10	3.57	-3.81	4.73	-5.25	9.51	**-3.99**	9.11	**-3.37**	12.81	**-3.90**	4.48	**-6.96**	5.06	**-8.53**	7.33	**-9.53**
	YEN	8.48	3.61	7.96	3.77	9.45	3.62	9.71	3.71	**14.28**	3.80	**23.46**	-0.59	26.74	1.44	12.88	2.14	9.34	-0.46	-2.88	-0.55	**23.46**	-0.59	11.00	-1.86	**11.58**	-3.37	**16.11**	**-8.43**	**37.69**	**-9.96**	40.28	**-8.35**	51.38	-7.35	55.92	-6.71	53.66	-6.98
US-ISM	AUD	2.44	**5.34**	2.58	**5.56**	**3.01**	**6.01**	3.02	**5.58**	2.38	**4.94**	**2.67**	**4.44**	1.78	**4.11**	1.32	2.27	0.76	0.93	0.39	0.25	**2.67**	**4.44**	**3.14**	3.52	**4.19**	1.92	1.38	-1.41	**4.10**	0.76	3.39	-3.40	2.89	-4.55	4.65	-7.24	4.29	-5.32
	HKD	0.02	0.05	0.04	0.05	0.04	0.03	0.03	0.03	0.00	0.00	0.01	0.01	0.04	**0.05**	0.03	0.03	0.03	0.04	0.02	0.03	0.01	0.01	-0.01	-0.04	-0.04	-0.11	0.02	-0.01	-0.02	-0.05	0.01	0.15	0.00	0.12	-0.07	0.10	-0.02	0.17
	NZD	1.69	3.45	1.50	3.31	1.96	3.25	1.89	3.51	2.38	3.54	1.53	2.19	0.44	2.64	0.50	1.10	-0.31	0.06	0.09	0.21	1.53	2.19	2.51	-0.89	2.65	-1.23	2.33	-2.98	**5.44**	0.21	4.35	-5.48	1.22	**-7.69**	4.51	8.06	5.68	-5.08
	SGD	**1.30**	0.70	**1.58**	1.14	**1.69**	1.04	**1.24**	1.23	**1.21**	1.02	**1.24**	0.97	**0.94**	0.55	**0.76**	0.70	**0.69**	0.63	0.15	-0.04	**1.24**	0.97	**0.96**	-0.08	**1.35**	-0.01	0.99	-0.66	0.96	-0.78	0.98	-0.89	1.28	-2.53	1.68	-1.77	1.92	-0.67
	YEN	**7.29**	**-11.0**	**7.50**	**-10.6**	**7.28**	**-10.4**	**7.18**	**-9.88**	**7.08**	**-10.3**	1.66	**-2.99**	1.36	-0.50	0.70	0.41	0.41	-0.04	**0.90**	-0.49	1.66	**-2.99**	1.37	**-4.39**	2.08	**-5.47**	2.44	**-6.91**	1.85	**-8.15**	2.25	**-8.27**	5.02	-6.79	**5.53**	-2.09	5.37	-2.56
US-NFP	AUD	4.81	**-7.11**	5.85	**-6.35**	6.28	**-6.30**	5.72	**-6.39**	5.43	**-5.67**	2.93	-2.69	-0.08	-0.72	-2.34	0.09	**-2.36**	0.46	-0.93	0.01	2.93	-2.69	6.48	**-4.80**	**8.50**	-3.96	**13.78**	-3.39	**16.15**	-3.78	**19.83**	-4.61	**19.86**	-5.15	**21.56**	-3.84	**17.84**	-4.55
	HKD	0.03	-0.02	0.02	-0.02	0.01	-0.01	0.01	-0.03	0.04	-0.02	0.00	-0.02	**-0.07**	-0.02	**-0.07**	-0.02	-0.04	-0.02	-0.01	-0.01	0.00	-0.02	0.11	0.00	**0.16**	0.01	0.27	0.00	**0.30**	0.00	0.30	-0.01	**0.41**	0.04	0.40	0.05	0.38	0.05
	NZD	4.18	-2.43	5.41	-1.97	6.81	-1.83	6.19	-2.05	6.29	-1.65	3.56	-1.24	0.94	-2.32	2.48	-0.29	3.54	1.16	0.11	0.42	3.56	-1.24	6.16	**-7.24**	8.14	**-8.01**	**15.07**	-7.76	**19.04**	**-9.47**	**22.11**	**-9.19**	**24.84**	**-8.93**	**27.08**	-8.08	**23.77**	-7.49
	SGD	1.70	-1.54	1.63	-1.39	1.33	-1.29	1.24	-1.34	1.10	-1.32	0.14	0.47	-0.52	-0.27	-0.82	-0.63	-0.55	-0.69	-0.18	0.21	0.14	0.47	2.13	-0.02	**2.98**	-0.11	**5.38**	0.11	**6.55**	-0.45	**8.13**	0.19	**8.38**	-0.34	**6.92**	0.05	5.99	-0.96
	YEN	**20.45**	**-17.2**	**21.55**	**-16.6**	**20.94**	**-17.2**	**20.16**	**-17.5**	**21.25**	**-15.8**	1.90	-1.67	-2.35	-2.34	-0.09	-0.98	-0.24	-1.48	-0.15	**-1.75**	1.90	-1.67	4.32	-2.54	2.41	-3.36	**8.42**	-3.89	**8.83**	-3.19	6.40	-3.15	2.37	-1.74	0.33	-0.29	1.37	-0.98
US-PPI	AUD	0.89	-0.02	0.85	0.42	0.87	0.27	1.33	0.75	1.23	0.62	0.21	1.00	0.24	1.45	0.34	1.18	0.09	**1.69**	0.49	0.73	0.21	1.00	**2.29**	2.78	1.60	1.60	2.28	**5.43**	**3.53**	**8.28**	3.57	**7.42**	3.65	**8.31**	1.29	**7.58**	-0.72	4.58
	HKD	**0.05**	0.01	0.04	0.00	0.01	-0.02	0.01	-0.02	-0.01	0.00	-0.01	-0.02	0.00	-0.02	**-0.03**	-0.02	-0.02	0.00	**-0.03**	-0.02	-0.01	-0.02	-0.02	-0.04	-0.02	-0.02	-0.09	-0.01	-0.15	-0.04	**-0.19**	-0.05	-0.11	0.04	-0.13	-0.01	0.07	0.11
	NZD	1.83	-0.23	**2.48**	0.44	**2.35**	-0.45	**2.94**	0.48	2.42	-0.04	1.32	0.60	**1.84**	1.75	**1.72**	1.27	1.05	**2.05**	-0.47	0.04	1.32	0.60	**2.66**	0.38	1.67	-0.43	2.65	2.07	3.65	4.57	4.09	**4.65**	2.24	5.39	2.86	**7.15**	1.03	5.03
	SGD	0.81	-0.76	0.87	-0.95	0.80	-0.61	**0.96**	-0.38	0.84	-0.46	0.69	-0.19	0.36	0.10	0.47	0.20	-0.16	-0.53	0.21	0.32	0.69	-0.19	**1.05**	-0.31	0.96	-0.43	1.43	0.48	1.62	1.49	**2.54**	2.50	**2.34**	**2.94**	**2.27**	**3.23**	1.77	3.11
	YEN	0.95	-2.56	0.80	-2.73	0.80	-2.94	0.94	-2.77	1.46	**-2.81**	0.05	1.36	0.54	1.09	0.84	1.31	0.79	**2.16**	**0.73**	**1.29**	0.05	1.36	1.04	3.11	1.08	**4.06**	1.52	1.57	2.42	3.51	3.00	1.24	1.50	0.71	2.28	2.55	-0.23	4.46
US-UMP	AUD	1.50	2.25	1.41	1.68	1.88	1.81	1.75	1.92	2.19	0.67	-0.55	2.16	1.09	0.78	0.76	1.57	1.42	-0.21	0.92	0.81	-0.55	2.16	-3.63	3.38	**-7.94**	0.88	-5.67	0.90	-8.35	1.68	-6.27	3.02	-8.81	5.59	-3.85	6.26	-2.19	**7.78**
	HKD	0.02	0.01	0.06	0.04	0.03	**0.05**	0.01	0.02	0.03	0.04	0.00	0.02	0.01	0.01	0.03	0.02	0.06	**0.04**	0.02	0.01	0.00	0.02	-0.02	0.05	-0.03	0.08	-0.03	**0.19**	-0.03	0.13	-0.01	**0.17**	0.01	**0.21**	0.04	**0.23**	-0.04	0.15
	NZD	-2.23	0.66	-1.94	-0.11	-1.14	-0.48	-0.53	0.28	-0.88	0.03	-3.60	2.07	-0.56	0.72	-1.08	1.07	0.34	0.20	0.26	0.64	-3.60	2.07	-3.00	3.77	-6.06	3.63	-4.41	1.75	**-11.6**	0.99	-9.36	2.20	-12.3	4.68	-7.34	4.71	-11.2	6.96
	SGD	-2.1	-0.	-2.0	-0.	-1.8	-0.	-1.8	-0.	-1.8	-0.	-0.9	0.61	-0.4	0.02	-0.4	0.22	-0.	-0.	-0.	0.05	-0.9	0.61	-2.3	1.09	**-3.3**	0.16	-0.8	-0.	-3.0	0.95	-3.8	0.52	-3.6	1.21	-1.4	1.29	-1.9	1.90

		1	45	0	24	0	22	6	33	9	20	6		9		8		03	14	04		6		9		**7**		9	03	4		2		9		7		0	
	YEN	**-9.50**	**5.91**	-8.80	**5.94**	**-8.91**	5.83	**-9.21**	**6.16**	**-8.86**	5.38	0.03	1.87	0.81	2.26	1.66	**3.39**	2.08	**2.14**	1.42	0.36	0.03	1.87	-0.44	2.56	0.22	1.04	3.35	1.43	0.47	2.46	-1.11	3.25	-1.25	3.64	-5.88	0.78	-6.68	2.43
CH-PMI	AUD	**-13.1**	8.00	**-13.4**	**8.22**	**-14.1**	6.94	**-12.0**	4.29	-8.01	5.52	2.63	**4.97**	0.92	0.43	3.03	**1.15**	1.82	0.46	0.69	-0.28	2.63	**4.97**	5.07	**9.16**	0.98	**10.57**	2.75	**9.80**	-2.16	**9.76**	-4.69	**12.00**	-1.96	**13.62**	1.90	**10.44**	-1.23	**13.99**
	HKD	**-0.61**	0.00	-0.63	0.01	-0.53	0.01	-0.30	0.04	-0.15	0.05	-0.12	0.02	-0.05	0.03	-0.10	0.01	-0.04	0.03	-0.03	0.01	-0.12	0.02	0.08	0.09	-0.13	0.08	-0.02	0.09	0.32	0.26	0.13	0.21	0.37	0.19	0.48	0.24	0.46	0.27
	NZD	-2.60	**8.10**	-3.97	**8.88**	-3.28	**8.23**	-3.54	**6.58**	-3.21	4.99	4.90	**4.84**	2.80	1.26	3.90	1.43	2.05	1.10	-1.52	-1.80	4.90	**4.84**	5.82	**8.65**	4.35	**8.44**	**9.61**	**9.51**	4.26	**5.49**	5.56	**7.49**	6.63	7.94	9.52	8.52	5.85	**8.68**
	SGD	-0.12	3.28	0.39	3.97	0.56	3.87	0.73	3.12	-0.38	2.18	**3.53**	1.66	**3.69**	1.52	1.93	1.12	0.96	1.23	-0.79	0.19	**3.53**	1.66	**4.50**	2.68	3.06	2.73	**3.96**	**2.51**	1.10	2.42	-2.91	2.02	-1.58	2.31	-2.25	2.48	-2.98	3.66
	YEN	1.49	-1.40	0.87	**-1.25**	0.45	-1.03	1.04	-0.82	1.02	0.17	0.66	-0.50	1.04	0.26	0.07	-0.42	-0.53	0.05	-1.44	0.00	0.66	-0.50	1.82	-0.32	-1.18	0.58	0.88	-0.21	1.69	0.78	-0.23	0.71	0.02	0.87	-2.56	0.43	-5.81	0.10
CH-PPI	AUD	-3.03	-2.17	-1.64	-1.56	-1.47	-1.39	-0.79	-0.85	-1.52	-1.40	-1.60	-0.80	-2.06	-0.15	-2.24	-0.06	-1.10	-0.71	-0.56	-0.56	-1.60	-0.80	-0.93	-0.41	-1.94	-2.12	-1.84	-2.29	-3.59	-1.09	-1.41	-0.80	0.54	2.34	-3.31	-1.60	-2.41	-4.68
	HKD	**0.23**	0.05	**0.22**	0.04	**0.21**	0.05	**0.16**	0.06	**0.14**	0.07	0.08	0.03	0.05	**0.04**	**0.07**	**0.05**	**0.08**	**0.06**	0.04	**0.03**	0.08	0.03	0.07	0.00	-0.02	-0.04	-0.11	**-0.13**	-0.14	**-0.16**	-0.12	-0.15	-0.26	**-0.20**	-0.36	-0.16	-0.34	-0.12
	NZD	-3.34	-1.42	-2.78	-1.03	-2.98	-1.80	-2.06	-1.03	-2.36	-0.74	-3.25	-0.84	-3.14	-0.82	**-3.79**	-0.65	**-2.48**	-0.72	**-2.02**	-1.02	-3.25	-0.84	-2.80	-2.43	-4.92	-3.63	-3.25	**-5.86**	-8.30	**-6.64**	-4.17	**-5.72**	-0.81	-1.61	-5.65	-4.89	-5.77	-8.41
	SGD	-0.30	-0.10	0.36	0.08	-0.21	-0.05	-0.44	0.13	-0.09	0.39	-0.55	0.21	-0.66	-0.18	-0.21	-0.03	-0.25	0.40	0.43	0.04	-0.55	0.21	-0.36	0.08	-0.85	-0.15	-0.59	0.08	-0.05	1.10	1.57	1.96	2.76	3.17	2.21	3.03	1.28	3.29
	YEN	0.05	1.30	0.38	1.61	0.43	1.29	-0.37	0.74	-0.29	0.86	-1.34	0.18	**-1.35**	-0.10	**-1.12**	-0.32	**-1.35**	-0.50	**-0.68**	-0.42	**-1.34**	0.18	-1.67	-0.58	**-2.31**	-0.63	-3.25	-1.80	-2.17	-1.98	-2.79	-2.81	**-3.88**	**-3.51**	0.48	-2.60	1.07	-1.98
HK-CPI	AUD	-0.91	-0.05	-0.76	0.11	-1.24	0.12	-0.18	-0.16	-0.87	-0.16	-0.38	-0.10	-0.33	-0.24	0.29	-0.25	0.57	-0.11	0.15	0.20	-0.38	-0.10	-1.52	-1.42	0.01	-0.03	1.37	0.58	0.99	0.55	0.02	-0.72	2.73	0.52	2.93	3.39	7.39	4.76
	HKD	-0.02	0.08	-0.05	**0.08**	-0.05	0.07	**-0.05**	0.05	-0.03	0.05	**-0.05**	**0.06**	-0.02	**0.03**	**-0.04**	0.02	-0.02	0.03	0.00	0.02	**-0.05**	**0.06**	**-0.06**	0.06	-0.03	0.05	0.02	**0.10**	0.02	0.06	0.01	0.04	-0.01	0.08	0.05	0.16	0.00	0.06
	NZD	-0.87	0.04	-0.69	-0.08	-1.79	0.06	-0.77	-0.54	-0.66	-0.14	-0.19	-0.49	-0.75	-0.55	-0.43	-0.45	-0.60	-0.63	**-0.77**	-0.24	-0.19	-0.49	-0.70	-0.42	1.89	0.10	4.13	1.34	**6.16**	0.51	5.55	-0.33	7.76	0.40	**8.89**	3.02	**12.32**	3.79
	SGD	-0.20	**0.87**	-0.37	0.64	-0.78	0.43	-0.46	0.50	-0.30	0.42	-0.37	-0.09	-0.33	0.04	0.06	0.15	0.02	0.15	-0.45	0.03	-0.37	-0.09	-0.18	**0.86**	0.21	0.76	1.21	0.77	0.44	0.22	0.26	0.60	0.22	0.42	0.99	1.10	1.73	1.66
	YEN	1.33	0.15	1.11	0.03	0.90	0.23	1.07	0.02	0.90	-0.10	1.09	-0.23	1.08	-0.43	0.36	-0.26	0.49	0.29	0.01	0.17	1.09	-0.23	1.49	1.75	2.39	0.50	0.54	1.43	**3.43**	1.56	4.21	1.86	4.71	1.96	4.43	**2.74**	5.89	2.88

		Panel I: Speed of news impact																				Panel II: Persistence of news impact																	
Variable	FX	–5		–4		–3		–2		–1		0		+1		+2		+3		+4		+5		+10		+15		+30		+45		+60		+90		+120		+180	
HK-UMP	AUD	1.07	-0.83	1.90	-0.39	1.13	0.04	1.71	0.60	1.34	0.14	1.17	0.32	1.26	0.41	1.28	0.19	**1.02**	0.34	**1.05**	0.32	1.17	0.32	1.58	-0.77	0.51	-0.53	1.87	-1.03	2.69	-0.70	0.90	-1.15	-9.15	-2.02	-7.45	-1.88	-8.85	**-5.15**
	HKD	0.00	0.02	0.00	0.03	-0.02	0.01	-0.01	0.01	0.00	0.01	0.00	0.02	0.00	0.02	-0.02	0.00	-0.02	0.02	0.02	0.01	0.00	0.02	0.01	0.00	0.01	0.04	0.09	0.02	-0.01	-0.01	-0.02	-0.03	-0.07	0.01	-0.03	0.03	-0.10	-0.07
	NZD	0.43	-1.32	0.83	-1.55	1.19	-0.63	1.77	-0.51	0.50	-0.74	1.28	-0.24	1.16	-0.09	0.13	-0.34	0.56	-0.15	0.25	-0.20	1.28	-0.24	2.27	-0.64	2.12	-0.74	1.80	-0.60	1.63	-1.24	2.20	-1.18	-7.14	-3.02	-6.09	**-4.85**	-4.85	**-5.94**
	SGD	**1.54**	-0.21	**1.18**	-0.18	**1.23**	-0.10	0.70	-0.19	**0.88**	-0.12	0.61	-0.31	0.50	-0.14	0.42	-0.08	0.28	0.11	0.14	0.02	0.61	-0.31	-0.23	**-0.90**	0.27	-0.81	0.72	-0.88	0.66	-0.74	1.58	-0.33	1.10	0.37	0.59	0.90	-0.58	-0.40
	YEN	-1.33	**-2.11**	-1.21	**-1.78**	-1.06	**-1.74**	-0.62	**-1.63**	-0.21	**-1.54**	-0.92	**-1.54**	**-1.18**	**-1.57**	-0.75	-0.86	-0.13	**-0.61**	-0.04	**-0.57**	-0.92	**-1.54**	**-2.54**	**-1.58**	**-2.08**	**-1.36**	-0.36	-1.62	-3.89	**-2.56**	-2.77	-1.89	-3.59	-1.81	-2.68	-0.93	-6.57	-3.38
JP-CPI	AUD	0.59	0.17	0.53	0.76	0.72	0.43	0.50	0.71	0.43	0.61	0.35	0.56	0.36	0.63	-0.09	0.54	-0.17	0.50	0.06	0.48	0.35	0.56	-0.50	0.93	-0.08	**2.53**	-0.97	1.11	-0.80	0.23	0.48	-0.84	-0.53	-1.02	-2.54	-1.04	-2.09	-0.81
	HKD	-0.02	-0.06	-0.03	-0.10	-0.03	-0.09	0.00	-0.04	0.00	-0.02	-0.02	-0.04	-0.03	-0.08	**-0.04**	-0.08	**-0.06**	-0.09	**-0.03**	-0.07	-0.02	-0.04	0.03	-0.03	0.10	-0.01	0.10	0.06	0.15	-0.02	0.07	-0.05	-0.07	-0.24	-0.05	**-0.40**	-0.11	-0.31
	NZD	1.06	1.26	1.03	**1.80**	1.02	1.20	1.01	**1.61**	0.65	1.31	0.73	1.34	0.54	**1.29**	0.40	0.84	0.23	**1.41**	-0.08	1.12	0.73	1.34	0.47	0.48	0.70	1.99	-0.30	1.34	0.37	1.85	2.11	0.30	0.23	-3.13	-1.42	-3.72	0.05	-2.75
	SGD	0.18	-0.34	0.18	-0.82	0.13	-0.36	0.33	-0.10	0.34	-0.09	0.14	-0.61	0.00	-0.21	0.17	-0.06	0.11	-0.13	0.19	-0.11	0.14	-0.61	-0.36	-0.60	-0.29	0.04	0.00	0.38	-0.99	1.13	-0.77	1.21	-0.73	1.33	-1.91	-0.16	-1.84	0.37
	YEN	**-1.69**	-0.69	**-1.07**	-0.46	**-1.59**	-0.26	**-1.51**	-0.07	**-1.71**	-0.44	**-1.01**	-1.29	-0.73	-1.06	-0.26	-0.62	**-0.48**	-0.62	-0.11	-0.23	**-1.01**	-1.29	-0.70	-1.11	-0.64	-0.54	-0.92	-0.06	-1.02	**3.17**	-0.87	**5.55**	-0.13	**6.79**	-0.08	**6.69**	2.98	6.20
JP-UMP	AUD	0.68	0.72	0.06	-0.12	-0.31	-0.42	-0.29	-0.68	-0.44	-0.80	-0.16	-0.72	-0.48	-0.51	-0.16	-0.74	-0.07	-0.66	-0.22	-0.57	-0.16	-0.72	1.20	0.77	1.14	1.72	-0.45	0.88	0.31	0.75	2.73	2.90	4.68	1.97	8.13	2.60	**11.49**	**4.38**
	HKD	-0.04	0.01	0.02	0.06	0.03	0.08	0.05	0.06	0.04	0.04	0.02	0.03	0.05	0.05	0.06	0.03	0.05	0.03	0.03	0.02	0.02	0.03	0.01	0.02	0.09	0.05	0.05	0.12	0.06	0.13	0.12	0.14	-0.09	0.26	-0.10	0.27	0.08	0.19
	NZD	**2.45**	1.62	**1.81**	0.97	0.72	-0.18	0.66	-0.72	1.38	-0.13	1.27	-0.16	0.74	0.30	-0.16	0.06	0.04	-0.13	**0.62**	0.19	1.27	-0.16	**1.69**	1.03	1.87	0.97	0.18	0.19	2.38	2.13	5.60	**3.72**	7.39	**4.87**	9.87	3.25	**11.99**	**6.40**
	SGD	-0.39	0.61	-0.18	0.32	-0.20	0.22	-0.38	0.28	-0.01	0.25	0.10	0.10	0.36	0.24	-0.23	0.14	-0.18	0.20	0.20	0.01	0.10	0.10	0.34	0.37	0.24	0.59	-0.54	-0.35	0.42	0.64	1.78	1.41	0.76	0.75	0.46	-0.39	1.12	-0.61
	YEN	**1.67**	-0.1	**1.97**	-0.1	**1.79**	-0.0	**1.71**	-0.1	**1.64**	-0.4	0.87	-0.	0.83	-0.	0.32	-0.	0.41	-0.	**0.55**	-0.	0.87	-0.	1.46	-0.	0.67	-1.	2.21	-1.1	2.98	-0.8	3.85	-2.3	4.42	-0.7	2.35	-2.8	2.62	-1.5

			0		3		9		9		9		11		06		15		27		09		11		15		71		6		7		5		6		1		8
AU-CPI	AUD	-8.49	**16.84**	**-8.88**	**16.79**	-8.55	**15.87**	-8.42	**16.71**	-7.27	**17.49**	0.68	-0.49	2.84	2.02	2.98	1.81	2.18	**2.28**	1.51	0.70	0.68	-0.49	-2.42	0.08	-3.62	-2.53	-3.65	-3.96	-2.56	-6.34	-1.93	-5.46	-3.42	-2.22	-3.08	-3.31	-2.59	-0.47
	HKD	-0.08	0.00	-0.03	-0.07	-0.06	-0.07	-0.05	-0.03	-0.03	-0.03	-0.04	0.01	-0.05	-0.04	-0.02	0.00	-0.03	-0.03	**0.11**	0.03	-0.04	0.01	-0.10	-0.03	-0.08	-0.03	0.03	0.01	0.12	-0.21	**0.20**	0.02	0.13	-0.07	0.16	0.06	0.10	0.05
	NZD	-0.93	2.17	0.06	**3.07**	1.14	3.41	0.81	**4.00**	-0.09	2.31	**4.00**	-3.06	1.35	-0.95	1.98	-1.11	2.33	0.54	0.96	-0.23	**4.00**	-3.06	**5.79**	-2.76	4.19	-5.76	**6.51**	-4.99	7.12	-9.17	**7.86**	-6.33	5.34	-5.11	6.86	-5.16	4.93	-4.39
	SGD	-0.80	1.17	-1.45	0.99	**-1.77**	0.38	**-1.34**	0.78	**-1.91**	0.69	0.07	-0.17	-0.15	-0.25	0.86	0.29	**1.15**	**0.74**	0.09	-0.22	0.07	-0.17	-0.44	-0.17	0.37	-0.31	0.32	**-2.35**	-0.87	**-2.89**	0.20	-2.59	0.10	-0.88	1.86	-0.43	0.92	0.03
	YEN	-1.48	0.71	-0.66	1.34	-1.13	1.05	-1.63	0.92	-1.38	0.78	-0.62	0.44	-0.97	0.49	-0.97	0.73	-0.28	0.23	-0.23	-0.21	-0.62	0.44	-0.21	-0.08	1.61	1.06	2.46	-0.21	4.04	0.73	2.98	-0.38	2.74	-1.78	3.53	1.01	1.09	0.35
AU-GDP	AUD	**-18.3**	**26.49**	**-18.9**	**26.95**	**-18.2**	**27.61**	**-18.2**	**27.14**	**-18.1**	**27.52**	-1.75	3.73	-0.48	3.18	-0.96	0.77	0.65	-1.20	0.79	-2.97	-1.75	3.73	-5.24	4.34	-4.96	8.77	-4.59	**12.26**	-6.59	**10.92**	-6.22	**14.33**	-9.28	**11.54**	-7.65	**8.60**	-8.46	3.83
	HKD	0.04	0.00	0.07	-0.05	0.07	-0.10	0.03	-0.04	0.07	0.06	0.07	0.09	0.04	0.09	0.02	0.04	-0.02	-0.03	-0.03	-0.01	0.07	0.09	**0.21**	0.06	**0.21**	0.09	0.10	-0.08	0.18	-0.15	**0.40**	0.05	0.28	0.01	0.25	0.00	0.30	0.01
	NZD	**-6.34**	**11.35**	**-6.71**	**10.51**	**-6.89**	**11.05**	**-6.67**	**11.41**	**-6.32**	**11.75**	0.04	0.24	1.87	1.58	1.93	2.17	**2.12**	0.30	**1.69**	0.55	0.04	0.24	-3.39	1.41	-1.70	3.37	-2.87	2.28	-3.97	0.78	-6.41	-2.96	-6.81	0.36	-7.45	-6.24	-6.02	-8.13
	SGD	0.04	1.88	-0.27	1.81	0.01	2.06	0.35	**2.91**	0.35	**3.01**	**1.29**	**2.72**	1.02	**2.39**	0.17	**1.43**	0.26	0.73	0.35	0.63	**1.29**	**2.72**	**1.66**	**4.15**	**2.09**	**5.96**	0.97	**8.14**	1.56	**7.00**	1.99	**5.98**	**2.98**	3.09	1.84	-0.64	2.46	-0.68
	YEN	0.93	-1.28	0.24	-1.18	0.88	-0.81	1.15	-1.05	1.17	-0.68	0.92	-1.13	1.33	-0.16	-0.16	-1.11	-0.01	**-2.01**	-0.26	-0.92	0.92	-1.13	1.38	**-2.57**	1.40	-2.15	0.89	1.60	2.09	1.39	-1.50	-2.45	-1.57	-3.10	-2.03	0.82	-2.94	-0.63
AU-UMP	AUD	**14.02**	**-11.5**	**14.10**	**-11.3**	**14.04**	**-11.4**	**14.32**	**-11.2**	**14.22**	**-11.7**	3.80	-1.50	-1.40	-1.27	-0.62	-0.49	-0.40	0.09	0.08	0.35	3.80	-1.50	3.76	-1.94	3.15	-2.40	-2.30	**-4.58**	-3.20	**-4.11**	-2.26	-2.39	-0.94	-0.58	-1.31	0.67	-3.07	1.09
	HKD	0.04	-0.02	0.02	-0.01	0.03	-0.01	0.01	-0.03	0.00	0.00	0.01	0.01	-0.01	0.00	0.01	-0.02	0.01	-0.01	0.00	-0.01	0.01	0.01	0.15	0.08	0.14	0.08	0.16	0.09	0.03	0.08	-0.10	0.08	-0.31	0.00	-0.28	-0.05	-0.31	-0.13
	NZD	2.86	**-6.00**	2.09	**-6.04**	2.14	**-6.40**	1.83	**-6.35**	1.80	**-6.38**	-2.11	-1.30	**-3.81**	-1.39	**-2.85**	**-1.51**	**-2.39**	**-1.40**	-0.70	-0.90	-2.11	-1.30	**-4.52**	-1.54	**-4.14**	-1.47	**-8.98**	-2.94	**-10.3**	-2.47	**-9.20**	-1.47	**-8.66**	0.77	-7.80	2.33	**-9.46**	3.52
	SGD	0.87	**-1.50**	2.00	-1.20	0.92	-1.16	0.98	**-1.70**	1.05	**-1.59**	-0.27	-0.99	**-1.01**	**-1.52**	-0.73	-0.19	**-0.65**	-0.05	-0.30	0.24	-0.27	-0.99	-0.53	**-1.29**	-0.31	**-1.35**	-0.39	-0.56	0.01	0.44	-1.01	0.17	0.99	0.05	0.90	-0.12	0.07	-0.51
	YEN	1.06	0.55	**1.42**	0.78	1.06	0.53	0.32	0.44	0.65	0.82	0.51	0.14	0.24	0.02	0.56	0.36	**1.00**	0.20	0.15	-0.08	0.51	0.14	1.21	0.70	2.10	**1.30**	2.32	**3.42**	3.12	**5.91**	2.94	**5.51**	3.05	**5.69**	2.27	**4.53**	2.56	**4.10**
NZ-CPI	AUD	-0.03	0.95	0.66	**1.61**	0.56	**2.18**	0.33	1.69	-0.03	1.67	1.12	0.91	0.29	0.90	0.95	**1.23**	0.76	0.57	0.45	0.02	1.12	0.91	1.28	1.39	2.34	0.60	2.18	**3.24**	5.32	**5.50**	5.61	**5.38**	6.76	**4.87**	7.66	**6.06**	0.77	5.14
	HKD	-0.10	-0.18	-0.08	-0.15	0.00	-0.10	0.00	-0.10	-0.02	-0.07	0.02	**-0.05**	0.02	-0.05	0.02	-0.02	0.03	-0.01	0.05	0.01	-0.02	-0.05	0.05	0.05	0.07	0.04	0.24	0.18	0.24	0.33	0.27	0.24	0.13	0.09	0.31	0.02	0.25	-0.01
	NZD	**-23.2**	**15.63**	**-23.5**	**15.89**	**-21.6**	**17.69**	**-23.0**	**16.33**	**-22.9**	**15.47**	-3.73	2.86	-1.44	**4.33**	-0.25	**4.18**	0.26	1.68	0.40	0.26	-3.73	2.86	-0.09	5.31	-0.74	4.10	3.83	**10.38**	8.31	**12.76**	9.27	**14.31**	8.54	11.77	8.17	10.36	5.03	10.76
	SGD	-0.67	0.42	-0.69	0.56	-0.54	0.31	0.20	0.24	0.19	0.39	0.15	-0.10	0.04	-0.08	0.27	-0.11	0.10	-0.40	-0.14	-0.68	0.15	-0.10	0.38	0.50	0.18	0.96	-0.47	0.68	0.20	0.93	-0.19	1.14	0.12	-0.37	-0.29	-0.45	0.00	0.43
	YEN	-1.35	-0.28	-0.97	-0.31	0.99	-0.45	-0.81	0.55	1.42	-0.38	-0.89	-0.12	-0.84	-0.07	-0.72	0.24	-0.66	0.20	0.05	0.21	-0.89	-0.12	-0.82	0.63	-0.97	0.65	-1.66	-0.60	-1.72	-0.81	-0.22	-1.46	-0.18	1.71	-3.10	-2.36	0.24	-2.06
NZ-GDP	AUD	-1.01	**7.43**	-0.43	**7.50**	-0.32	**6.67**	-0.50	**5.79**	-0.21	**5.28**	1.04	1.70	0.44	-0.51	0.08	-1.58	1.23	-1.43	0.53	-1.66	1.04	1.70	-0.04	-0.02	-1.62	-0.97	-1.61	-1.69	-0.53	1.46	1.13	3.80	0.07	-2.79	-0.02	-3.67	0.02	-5.50
	HKD	-0.06	0.10	-0.04	0.16	-0.03	0.17	-0.04	0.17	-0.08	-0.01	-0.05	0.09	-0.07	0.04	-0.01	0.03	-0.01	0.00	-0.01	0.00	-0.05	0.09	-0.01	0.10	0.10	0.23	**0.20**	**0.42**	0.14	0.33	-0.11	0.18	0.09	0.43	**0.43**	**0.97**	0.39	0.94
	NZD	**-20.7**	**37.74**	**-20.2**	**37.55**	**-20.6**	**36.11**	**-20.7**	**36.09**	**-17.2**	**33.21**	-4.04	**8.18**	-0.37	**8.34**	0.59	2.95	0.45	2.16	-0.08	-0.10	-4.04	**8.18**	**-7.65**	1.82	**-9.45**	5.06	-9.32	12.31	**-11.4**	14.55	-8.25	**18.30**	-5.80	17.55	-5.82	13.74	-6.59	8.87
	SGD	-0.61	0.28	-0.71	0.34	-0.82	0.27	-0.85	0.46	1.08	-0.09	0.16	**1.10**	**0.73**	**1.44**	0.24	**1.09**	0.36	**0.66**	0.22	0.75	0.16	**1.10**	-0.43	0.25	-0.83	-0.29	-2.15	1.26	-0.16	6.07	-0.98	4.97	0.88	0.90	1.43	3.38	-1.84	1.75
	YEN	0.82	0.33	0.62	0.43	1.04	0.59	1.04	0.64	0.53	0.07	-0.16	-0.32	-0.04	-0.53	0.08	-0.25	-0.17	-0.09	0.06	-0.04	-0.16	-0.32	0.72	-0.44	0.54	0.24	0.25	1.60	0.10	**3.04**	1.40	1.26	1.73	0.68	-1.68	0.26	-3.16	-0.79
NZ-UMP	AUD	3.16	-0.08	**3.08**	-0.32	2.72	-0.54	3.04	-0.53	2.46	-0.99	-1.22	0.05	-1.74	0.31	-1.49	0.39	-1.11	0.61	**-1.24**	-0.02	-1.22	0.05	-1.73	-1.08	-3.63	-2.05	-5.32	-3.23	-5.59	-3.20	-6.69	-4.19	**-9.30**	-6.41	**-11.0**	**-6.35**	-6.58	**-8.49**
	HKD	-0.14	-0.16	-0.09	-0.14	-0.06	-0.17	-0.09	-0.13	-0.11	-0.04	0.02	**0.09**	0.05	0.19	0.07	0.18	0.06	0.17	0.05	0.17	0.02	**0.09**	-0.02	0.11	-0.06	0.11	0.12	0.23	-0.07	**0.20**	-0.06	**0.19**	0.01	0.28	0.11	0.16	0.19	-0.01
	NZD	**45.29**	**-9.89**	**45.35**	**-9.69**	**45.95**	**-10.3**	**44.37**	**-10.2**	**36.60**	**-10.1**	**5.29**	-1.37	4.33	1.34	4.32	1.11	1.89	0.49	1.08	**1.03**	**5.29**	-1.37	5.36	**-6.44**	2.44	**-7.61**	1.03	**-11.3**	7.73	-9.84	7.66	-7.56	8.88	**-8.82**	4.25	-7.86	6.29	-10.7
	SGD	0.65	**-0.88**	0.78	**-0.69**	1.10	**-0.71**	0.75	**-0.88**	**1.57**	**-0.90**	**1.09**	**-0.78**	1.09	0.45	0.33	0.15	-0.01	0.10	0.00	0.20	**1.09**	**-0.78**	0.41	-0.61	1.46	0.28	1.72	0.73	-0.21	-1.03	-0.05	-1.61	-1.96	**-5.11**	-4.07	**-7.49**	-3.52	**-10.3**
	YEN	**-2.35**	-0.83	**-2.30**	**-1.63**	**-2.15**	**-1.63**	**-2.01**	-1.55	-1.82	-1.43	-1.56	**-1.42**	-1.14	-1.20	**-1.24**	-0.48	**-1.41**	-0.32	0.19	0.14	**-1.56**	**-1.42**	-1.19	-2.08	1.79	-1.41	3.69	2.44	**5.28**	3.64	4.21	2.24	4.89	-1.00	1.53	-3.20	-0.86	-6.50

Highlights

- Examine the speed of impact and persistency of news on Asia-Pacific currencies.
- The impact of news released domestically and from the U.S. is rapid.
- Evidence of persistence effect from U.S. news and China's purchasing manager index.
- Evidence of heterogeneity in the currency reactions to asymmetric news surprises.
- Increase in volatility and currency trading volumes around time of announcement.