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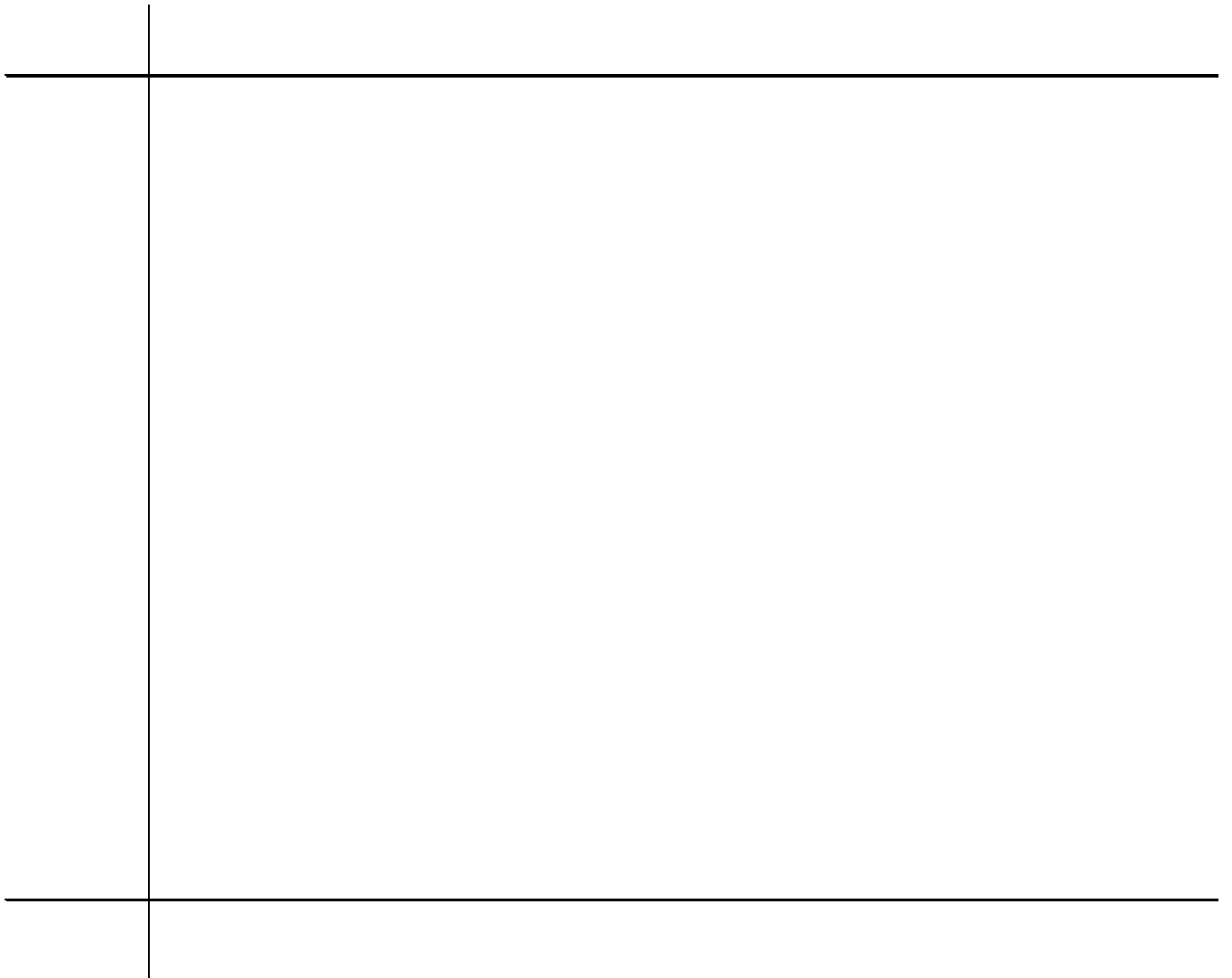and Nicola Spagnolo

Exchange Rates and Macro News in Emerging Markets

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Abstract

This paper uses a VAR-GARCH(1,1) model to analyse mean and volatility spillovers between macro news (in the form of newspaper headlines) and the exchange rates vis-a-vis both the US dollar and the euro of the currencies of a group of emerging countries including the Czech Republic, Hungary, Indonesia, Korea, Mexico, Poland, South Africa, Thailand and Turkey over the period 02/1/2003-23/9/2014. The results suggest limited dynamic linkages between the first moments compared to the second moments, causality-in-variance being found in a number of cases. The conditional correlations also provide evidence of co-movement. Finally, the recent global financial crisis appears to have had a significant impact.

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1   Introduction

The impact of macro news on exchange rates is a topic that has attracted considerable interest

forecasts to proxy it and find that its impact on the US dollar/euro exchange rate (as well as the US and German long-term interest rates) in the period from 1999 to 2014 is stronger when forecaster heterogeneity is lower, regardless of the frequency. Further, the response of exchange rates to macro news is time-varying, being muted in periods of unconventional monetary policy. There is also a literature connecting the impact of news in the FX market to order flows (see, e.g., the seminal study by Evans and Lyons, 2008). The key finding is that macro news mainly affect currency prices indirectly through the impact on the volatility of order flows.

Investor psychology could be crucial to explain the relationship between news and financial markets. For instance, in the model by De Long et al. (1990) noise traders react to negative belief shocks by selling shares to rational arbitrageurs (see also Campbell et al., 1993). Coval and Shumway (2001) and Antweiler and Frank (2004) instead relate investor sentiment to trading costs, with the perception of a more negative outlook resulting in lower trading volumes. Tetlock (2007) examines the links between media "pessimism" (generated by "bad news") and low investor sentiment in the US by estimating a VAR model. His empirical result suggest that models of noise and liquidity traders can account for the effects of low investor sentiment on financial markets (see also Tetlock et al., 2008). Fang and Peress (2009) use a wider dataset including more US daily newspapers and a cross-section of countries and find that media coverage affects asset prices by disseminating information broadly, even if it does not represent news.

Existing studies on the relationship between macro news and exchange rates mainly concern developed as opposed to emerging FX markets (evidence on emerging equity and bond markets is instead provided by Wongswan, 2006 and Andritzky et al., 2007, respectively). In particular, Cai et al. (2009) consider the effects of US and domestic news announcements on nine emerging markets (Czech Republic, Hungary, Indonesia, Korea, Mexico, Poland, South Africa, Thailand and Turkey). They follow Andersen et al. (2003) and model currency returns as a function of news including lagged effects and heteroscedastic errors, where the latter are the sum of the daily volatility forecast (based on a GARCH(1,.1) specification), the absolute value of news surprises including lags, and the Fourier flexible for the calendar effect. They find that US news matters more than domestic ones, and increasingly so. The role of market sentiment (proxied by the median value of the FX Consensus Forecasts) and uncertainty (measured by the dispersion of market forecasts) respectively are also investigated, only the former appearing to be statistically significant. Egert and Kocenda (2014) examine the impact of both macro news and central bank communication on FX markets in Central and Eastern European countries (CEECs). Whilst evidence is widely available in the case of the developed countries (see the studies surveyed by Blinder et al., 2008 and Cavusoglu,

in our case. Our study makes a twofold contribution. First, it focuses on the relationship between macro news and exchange rates in a group of emerging FX markets including the Czech Republic, Hungary, Poland, Argentina, Mexico, South Korea, Egypt, Nigeria, and Turkey, for which very limited evidence is available. Second, in contrast to most existing papers in this area of the literature, it models the dynamic interactions between both the first and the second moments of the variables of interest, as well as the impact of volatility on the mean. The layout is as follows. Section 2 outlines the econometric modelling approach. Section 3 describes the data and presents the empirical findings. Section 4 summarises the main findings and offers some concluding remarks.

2 The model

We represent the first and second moments of exchange rate returns (vis-a-vis the US dollar and the euro respectively) and macro news (as reported by newspapers in the form of headlines) in various emerging markets using a VAR-GARCH(1,1)[1] In its most general specification the model takes the following form:

$$\mathbf{x} = \check{\mathbf{Z}} + \check{\mathbf{z}}\,\mathbf{x}$$

The second moment takes the following form [4]:

$$= \Pi'_0 \, 0 + \Pi^0_{11} \begin{bmatrix} 2_1 & -1 \\ 1 & -1 & 2 & -1 \\ 1 & -1 & 3 & -1 \end{bmatrix} \begin{bmatrix} 2 & -1 & 1 & -1 \\ 2_2 & -1 \\ 2 & -1 & 3 & -1 \end{bmatrix} \begin{bmatrix} 3 & -1 & 1 & -1 \\ 3 & -1 & 2 & -1 \\ 2_3 & -1 \end{bmatrix} 11 + \Pi^0_{11} \, -1 \, 11 \quad (3)$$

where

$$\Pi_{11} = \Pi_{11} \quad 0 \quad 0$$

3 Empirical Analysis

We use daily data (from Bloomberg) on the exchange rates vis-a-vis the US dollar and the euro of the currencies of a group of emerging markets (the Czech Republic, Hungary, Poland, Argentina, Mexico, South Korea, Egypt, Nigeria, and Turkey) over the period 02 1 2003 - 23 9 2014, for a total of 3059 observations, daily returns being defined as the logarithmic differences of exchange rates.

We consider news coverage of four macroeconomic series, i.e. GDP, unemployment, retail sales and durable goods (as in Birz and Lott, 2013). The data for the News Index are collected from Bloomberg where news coverage is proxied by story headlines counts. News headlines were selected using an extensive search string, containing words indicating articles dealing with macro variables, and also allowing to distinguish between articles with a positive or negative connotation towards GDP, unemployment, retail sales and durable goods. News headlines about unemployment and GDP are the most frequent, whereas there is less coverage of retail sales and durable goods releases. The index we use does not distinguish between different types of macro news, since our focus is on the effects of domestic and USA (or eurozone) macro news, respectively, as reported by the media. The daily negative news percentage is defined as negative news/(negative news + positive news). [5]

Please Insert Table 1 and Figures 1-3 about here

We test for mean and volatility spillovers by placing restrictions on the relevant parameters; in particular, the following null hypotheses are tested: ( ) Domestic news affect the exchange rate before the 2008 crisis ($_{12} = 0$); ( ) Domestic news affect the exchange rate after the 2008 crisis ($_{12} = 0$); ( ) USA (Eurozone) news affect the exchange rate before the 2008 crisis ($_{13} = 0$); ( ) USA (Eurozone) news affect the exchange rate after the 2008 crisis ($_{13} = 0$); ( ) Domestic news volatility affects exchange rate volatility before the 2008 crisis ($_{21} = {}_{21} = 0$); ( ) j

dollar, and for that of Mexico ($_{31} + _{31} = 0\ 025$) vis-a-vis the euro.

Also, the exogenous variables considered are statistically significant only for a few countries, the estimated coefficients indicating a negative stock market effect and a positive interest rate differential effect. Trade could be a significant factor driving the exchange rates of emerging markets. However, this hypothesis cannot be tested directly using our framework, given the low frequency nature of the data on trade. Further investigation is needed considering that all nine countries are net exporters of natural resources (Argentina, Mexico, Egypt, Nigeria and Turkey), consumable goods (Czech Republic, Hungary, Poland) or technology (South Korea).

Finally, the conditional correlations obtained from the VAR-GARCH(1,1) model also provide evidence of co-movement between exchange rates and news. Summary (mean and variance) statistics for the conditional correlations, pre- and post- September 2008, are reported in Table 5. In particular, the conditional correlations between domestic news and

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Table 1: Descriprive Statistics

	Pre 2008		Post 2008	

News Index (%Negative News over Total News)

	Mean	S.D.	Mean	S.D.
Czech Rep.	0 49	0 07	0 51	0 12
Hungary	0 49	0 11	0 51	0 16
Poland	0 49	0 12	0 51	0 18
Argentina	0 48	0 12	0 51	0 19
Mexico	0 47	0 14	0 49	0 18
South Korea	0 48	0 12	0 48	0 21
Egypt	0 49	0 05	0 51	0 15
Nigeria	0 49	0 07	0 49	0 13
Turkey	0 48	0 12	0 49	0 17
Eurozone	0 43	0 18	0 49	0 21
USA	0 48	0 17	0 51	0 18

Exchange Rate Returns

	US Dollar		Euro		US Dollar		Euro	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Czech Rep.	0 11	0 56	−0 07	0 32	0 02	0 92	0 01	0 49
Hungary	0 02	0 81	0 03	0 55	0 03	1 17	0 02	0 76
Poland	0 03	0 71	0 01	0 56	0 03	1 14	0 02	0 73
Argentina	0 01	0 46	0 02	0 72	0 06	0 42	0 05	0 76
Mexico	0 01	0 47	0 02	0 69	0 02	0 89	0 01	0 85
South Korea	0 01	0 47	0 02	0 71	0 01	0 96	0 02	1 07
Egypt	0 01	0 22	0 01	0 65	0 02	0 16	0 01	0 68
Nigeria	0 01	0 53	0 02	0 88	0 02	0 54	0 01	0 88

02   0 54   0

TABLE 2: Exchange rate vis-a-vis the US dollar and the euro

	Czech Republic		Hungary		Poland	
	US Dollar	Euro	US Dollar	Euro	US Dollar	Euro
	Conditional Mean Equation					
1	0 071 (0 000)	−0 027 (0 000)	0 004 (0 958)	−0 036 (0 025)	0 034 (0 567)	−0 055 (0 028)
2	0 459 (0 000)	0 462 (0 000)	0 471 (0 000)	0 471 (0 000)	0 476 (0 000)	0 476 (0 000)
3	0 425 (0 000)	0 448 (0 000)	0 449 (0 000)	0 451 (0 000)	0 452	476

TABLE 3: Exchange rate vis-a-vis the US dollar and the euro

	Argentina		Mexico		South Korea	
	US Dollar	Euro	US Dollar	Euro	US Dollar	Euro
	Conditional Mean Equation					
1	0 075 (0 000)	−0 044 (0 173)	−0 001 (0 998)	−0 001 (0 098)	−0 001 (0 967)	−0 012 (0 759)
2	0 489 (0 000)	0 487 (0 000)	0 486 (0 000)	0 481 (0 000)	0 468 (0 000)	0 470 (0 000)
3	0 446 (0 000)	0 452 (0 000)	0 444 (0 000)	0 442 (0 000)	0 444 (0 000)	0 452 (0 000)
11	−0 122 (0 083)		−0 077 (0 001)			−0 189 (0 000)
12						
12						
13	−0 052 (0 050)					
13					−0 116 (0 049)	
12	−0 008 (0 003)					
13						
	Conditional Variance Equation					
11	0 830 (0 000)	−0 938 (0 000)	−0 953 (0 000)	0 959 (0 000)	−0 949 (0 000)	−0 962 (0 000)
21	0 012 (0 000)	0 003 (0 000)		−0 001 (0 024)		0 009 (0 091)
21	0 157 (0 057)					−0 130 (0 058)
22	0 999 (0 000)	−0 999 (0 000)	−0 990 (0 000)	0 988 (0 000)	0 996 (0 000)	0 996 (0 000)
31	0 023 (0 000)		−0 017 (0 057)	−0 002 (0 054)		
31			−0 026 (0 007)			
33	−0 987 (0 000)	−0 991 (0 000)	0 988 (0 000)	0 990 (0 000)	0 991 (0 000)	0 991 (0 000)
11	−0 751 (0 000)	0 339 (0 000)	0 284 (0 000)	0 299 (0 012)	0 294 (0 000)	0 262 (0 000)
21	−0 006 (0 003)			0 007 (0 043)		−0 002 (0 043)
21	−0 066 (0 000)	0 012 (0 000)				−0 007 (0 000)
22	−0 024 (0 003)	−0 012 (0 000)	0 128 (0 000)	−0 144 (0 000)	0 089 (0 000)	0 081 (0 000)
31	0 058 (0 000)		−0 013 (0 008)	0 010 (0 001)		
31	0 032 (0 070)	0 011 (0 074)	−0 019 (0 001)	0 015 (0 009)	0 005 (0 085)	0 005 (0 092)
33	0 148 (0 000)	−0 125 (0 000)	0 147 (0 000)	0 129 (0 000)	0 129 (0 000)	0 130 (0 000)
LogLik	2890 14	2228 44	1796 24	2157 37	2930 42	2968 61
	4 57	3 16	9 11	2 69	5 29	4 09
2	8 55	8 75	7 93	5 42	7 02	5 91

Table 5: Conditional Correlations

Ex. Rate	Pre 2008				Post 2008			
	Domestic News		USA News		Domestic News		USA News	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Czech Rep.	−0 011	0 069	0 032	0				

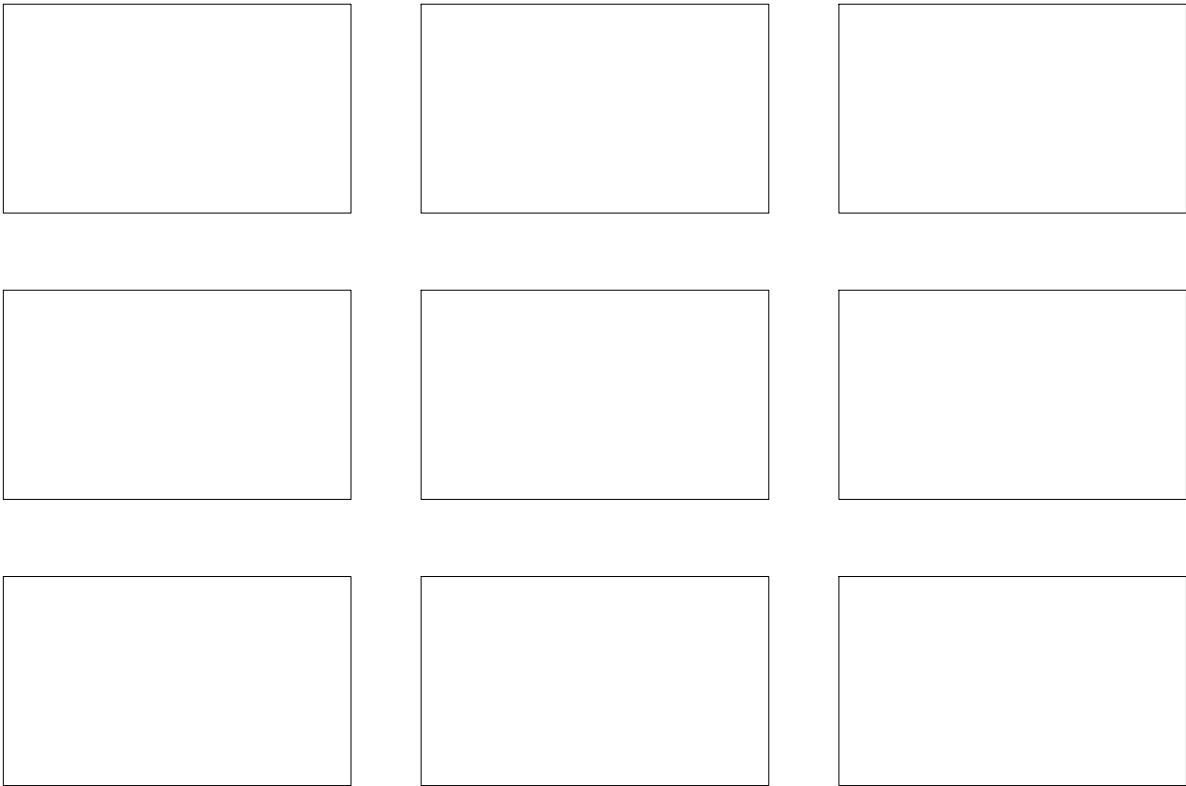Figure 2: Changes in exchange rates vis-a-vis the US dollar

Figure 3: News coverage of four macroeconomic series, i.e. GDP, unemployment, retail sales