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Foreign news and the structure of co-movement in European equity markets: An intraday analysis

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ABSTRACT

We investigate European equity market volatility responses to foreign macroeconomic surprises. We measure the length of the response and decompose the news effect into direct and indirect components. The latter is induced by volatility transmission between equity markets. We show that 50 percent of the total accumulated impact of US macroeconomic news on the DAX 30 and CAC 40 volatilities is attained after 90 min. We find that the news announcements have significant direct impacts on both European indices but the indirect effect on the French index is stronger than that on the German.

1. Introduction

It has been widely documented that macroeconomic news announcements have an immediate and direct effect on asset prices.[1] Moreover, multiple markets have been found to react simultaneously to the common sources of information. Thus, it is not surprising that financial markets show a higher degree of comovement amid relevant news. As exogenous shocks, such as macroeconomic news, impact different markets at the same time, and since the markets are linked, the news would show a total impact on a market coming from two different channels; a direct effect and an indirect effect.[2] The direct effect is interpreted as an immediate response of the stock prices to news announcements, and the indirect effect stems from other markets due to the comovement structure of related markets. The impact of the news on a market persists

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[1] For example, Andersson (2010) and Harju and Hussain (2011) show that the US macroeconomic news announcements have a significant and simultaneous effect on European stock markets' returns and volatilities. Similarly, the impact of information on the volatility of foreign exchange (FX) returns has also been documented in several papers (see for example, Andersen and Bollerslev, 1997; Andersen et al., 2003; Cai et al., 2001; and Melvin and Yin, 2000 among others). Moreover, Andersen et al. (2007) analyze the response of global stock, bond and foreign exchange markets to real-time US macroeconomic news.

[2] Ben Omrane and Hafner (2009) show the existence of the news' indirect effects in the foreign exchange markets.

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overtime and spreads to the other markets.[3] The purpose of this study is to investigate the direct and indirect effects of foreign macroeconomic surprises on stock indices volatilities in two major European markets, namely Germany and France, utilizing high frequency intraday 5-min data.[4]

There are only a few papers so far that have measured the direct and indirect impact of the macroeconomic surprises. Among those paper, Ben Omrane and Hafner (2009) propose the impulse response methodology to analyze the effects of US macroeconomic news announcements on the intraday volatilities of three pairs of currencies namely Euro/US Dollar, Pound/US Dollar and Japanese Yen/US Dollar. Their findings show that more than 50% of the total accumulated news effect on the Pound and the Yen are due to volatility transmission from the two major currencies and mainly from Euro, clearly implying an indirect news effect. Belgacem and Lahiani (2012) investigate the direct and indirect effect of the US scheduled macroeconomic news announcements on the French and German stock markets using daily data. The authors use the augmented GARCH framework to analyze the volatility transmissions across European markets and consider the estimated coefficient of the spillover variable as proxy for the indirect effect of the US macroeconomic news announcements. They found evidence of indirect effect across the French and German markets but they have not quantified the indirect effect with respect to the total effect or studied its dynamics over time.

Our study extends the literature on high-frequency news announcement effects in the following ways: Firstly, to the best of our knowledge, this is the first study to measure the direct and indirect effects of US macroeconomic surprises on the European equity markets and analyze their dynamics over time using high frequency 5-min data. Secondly, we implement an impulse response analysis to determine the persistence of news effect on volatility without any restrictions imposed on the direct and indirect effect to die out; rather we let our model decide how much time markets need to fully absorb the information.[5] Thirdly, this paper attempts to combine three important phenomena that have usually been studied separately; volatility transmissions, news effects, and stock markets linkages. Overall, this paper attempts to provide a complete picture of the "intraday news effect" and how the concurrently traded markets respond to the relevant macroeconomic surprises.

The main findings of this paper can be summarized as follows: The US macroeconomic surprises have significant effects on European markets volatilities. Our results regarding the decomposition of the effects clearly indicate a direct and indirect effect in both markets. However, a stronger indirect impact of US macroeconomic surprises on the CAC40 volatility compared to the DAX30 is observed. This is due to the volatility transmission asymmetry between the German and the French indices. Moreover, contrary to the findings of many previous studies, our results indicate that on average, it takes about an hour and a half for both markets to absorb the 50% of the total accumulated impulse response effect of the macroeconomic news with the complete adjustment taking place in longer time.[6] The news announcement effects are also found to be asymmetric in the sense that the bad news clearly increases the risk in both markets compared to the good news that has only a subdued effect on the volatility in both markets. Finally, the indirect effect is also found asymmetric implying that bad news relatively contributes more than good news towards the CAC 40 accumulated volatility.

The rest of the paper is organized as follows: Section 2 describes the data. Intraday volatility patterns in European equity markets are discussed in Section 3. The methodology is presented in Section 4. The empirical results are presented in Section 5, and the conclusion in Section 6.

2. Data

Our equity market data consist of 5-min price quotes on two major European aggregate price indices from January 2, 2005 to September 30, 2008. The two indices are: CAC 40; index of the 40 largest French companies traded on the Paris Bourse, and DAX 30; index of the 30 largest German companies traded on the Frankfurt Stock Exchange. These two stock markets share the same trading hours, i.e., 9:00–17:30 Central European Time (CET).[7] Summary statistics for 5-min intraday logarithmic returns are presented in Table 1. In line with the previous studies using 5-min interval data such as Andersson (2010) and Hussain (2011b), the sample mean of the aggregate equity returns are found to be small and dwarfed by their standard deviations. Given the large magnitudes of the Skewness and Kurtosis statistics, the intraday returns indicate non-normality for both markets.

[3] The indirect effects of news could occur due to information linkages and/or stock markets integration. There is a substantial amount of literature that has analyzed these issues in intraday settings. See, for example (Jeong, 1999) and Hussain (2011a) for evidence on volatility spillovers among related stock markets, and Andersson (2010) and Harju and Hussain (2011) for capital markets integration.

[4] There are some earlier studies suggesting that the U.S macroeconomic news announcements significantly affect volatility in European financial markets (Harju and Hussain, 2011; Hussain, 2011b; Andersson, 2010, etc.). Nikkinen and Sahlström (2004) show that while the U.S scheduled macroeconomic news announcements have a significant impact on the implied volatility in European stock markets, domestic news releases are found to be unimportant. Similar results are also reported by Délèze and Hussain (2014).

[5] Andersen et al. (2003) for example, uses polynomial structure of decay that imposes the response to gradually fade away. We prefer the model specification of Ben Omrane and Hafner (2009) because this does not impose any restrictions on the direct and indirect effect to die out.

[6] Andersen et al. (2003), for example, show that adjustments in exchange rate volatilities occur approximately within one hour after the macroeconomic news announcements.

[7] Hereafter all times are given in Central European Time (CET).