



Volatility transmission in global financial markets[☆]



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ABSTRACT

This paper considers the transmission of volatility in global foreign exchange, equity and bond markets. Using a multivariate GARCH framework which includes measures of realised volatility as explanatory variables, significant volatility and news spillovers are found to occur on the same trading day between Japan, Europe, and the United States. All markets exhibit significant degrees of asymmetry in terms of the transmission of volatility associated with good and bad news. There are also strong links between diffusive volatilities in all three markets, whereas jump activity is only important within the equity markets. The results of this paper deepen our understanding of how news and volatility are propagated through global financial markets.

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1. Introduction

The practical importance of modelling the volatility of financial assets has given rise to a voluminous body of research. Much of the modern literature stems from the seminal work of Engle (1982) and Bollerslev (1986) who treat volatility as an unobserved quantity. More recent developments treat volatility as a realised (observed) variable, which is estimated from the squared returns of high-frequency financial asset returns (Andersen et al., 2003; Barndorff-Nielsen and Shephard, 2002). Hansen et al. (2012) provide one avenue for combining these two approaches. The vast majority of this work relates to modelling and forecasting the trajectory of the volatility of an asset in one particular market.

A relatively recent but growing area of interest addresses the important question of how volatility is propagated from one region of the world to another. The series of papers by Ito (1987), Ito and Roley (1987) and Engle et al. (1990) examine how volatility is transmitted through different regions of the world during the course of a global financial trading day. Their approach is to partition each 24 hour period (calendar day) into four trading zones, namely, Asia, Japan, Europe and the United States, and examine international linkages in volatility between these regions in the context of the foreign exchange market. Engle et al. (1990) describe two particular patterns, namely, the *heat wave* in which volatility in one region is primarily a function of the previous day's volatility in the same region, and the *meteor shower* in which volatility in one region is driven by volatility in the region immediately preceding it in

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