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Pacific-Basin Finance Journal

journal homepage: www.elsevier.com/locate/pacfin



U.S. and Japanese macroeconomic news and stock market volatility in Asia-Pacific[☆]

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ARTICLE INFO

Article history:

Received 7 May 2008

Accepted 21 March 2009

Available online 1 April 2009

JEL classification:

E44

F30

G14

G15

Keywords:

Macroeconomic news

Volatility

International equity markets

Information

ABSTRACT

I use a new comprehensive dataset to analyze the impact of ten U.S. and six Japanese macroeconomic announcements on stock market volatility in Japan, Hong Kong, South-Korea and Australia. A GARCH model that allows for multiplicative announcement effects and asymmetries is employed. Overnight conditional variances are significantly higher on announcement days and significantly lower on days before and after announcements, especially for U.S. news. The impact of announcements on implied volatilities, in contrast, is much weaker. Out-of-sample trading strategies that systematically buy delta-neutral straddles on announcement days generate statistically significant profits, but these disappear after transaction costs are taken into account.

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1. Introduction

Stock market volatility plays a key role in portfolio construction, risk management and the pricing of derivative securities. Furthermore, changes in market risk affect expected returns of all individual securities in asset pricing models. Understanding the determinants of stock market volatility is therefore important to both academics and practitioners. Since the contributions of [Engle \(1982\)](#) and [Bollerslev \(1986\)](#), substantial progress has been made in the empirical modeling of time-varying volatilities in financial markets. However, most volatility models only include past (squared) returns and lagged volatilities and remain silent on the fundamental determinants of volatility.

[☆] I am grateful to IMC Asia-Pacific for support and hospitality during my visit for the project in Hong Kong in March and April 2008. Questions and suggestions during various presentations at IMC Asia-Pacific substantially improved the quality of this paper. I especially thank Bart Brooks for his comments. I would also like to thank Wenneke Vrugt-Repko for her extensive support in preparing the data and an anonymous reviewer for constructive comments and suggestions.

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The studies that do link macroeconomic fundamentals to asset return volatility focus primarily on U.S. financial markets and conditional volatility. In contrast, this paper analyzes stock markets in Asia-Pacific and studies the impact of macroeconomic news on both conditional and implied volatility. The first contribution of this paper is to show that macroeconomic announcements from the U.S. and Japan have a different impact on implied and conditional stock market volatility. International macroeconomic news strongly affects conditional stock market volatility. The impact on implied volatility, on the other hand, is very weak. This discrepancy suggests an interesting difference in how primary and derivatives markets incorporate economic fundamentals in Asia-Pacific. If underlying stock markets significantly move in response to macroeconomic announcements, but this is not reflected in ex-ante options prices, profitable trading strategies can possibly be formed. This would constitute important information for the (in) efficiency of international options markets. Testing whether this difference can be exploited economically forms the second contribution of this paper.

The studies of [Connolly and Wang \(2003\)](#) and [Kim \(2003\)](#) are most closely related to the current paper. [Connolly and Wang \(2003\)](#) study the causes of contemporaneous return comovement in U.S., U.K., and Japanese equity markets. The authors analyze the impact of news announcements made in these three countries during the period 1985–1996. Using various GARCH-specifications, macroeconomic announcements cannot explain comovements between international markets. By focusing on volatility rather than return dynamics, I take a different perspective than [Connolly and Wang \(2003\)](#). [Kim \(2003\)](#) investigates the nature of macroeconomic announcement spillovers from the U.S. and Japan to conditional stock market volatility in Australia, Hong Kong and Singapore. The analysis includes six macroeconomic surprises from the U.S. and Japan from Money Market Services International (MMS) over the period 1991 to mid-1999. Using an exponential GARCH (or EGARCH) model, [Kim \(2003\)](#) shows that announcements in the U.S. and Japan have a significant impact on both returns and conditional volatilities in Asia-Pacific. Furthermore, markets respond differently to good and bad news, with bad news announcements in general leading to increases in volatilities in the other markets. Apart from using a different data source with many macroeconomic announcements and a long and recent sample period, I extend the work of [Kim \(2003\)](#) in two dimensions. First, in addition to analyzing conditional volatility with GARCH models, I study the impact of macroeconomic announcements on implied volatilities. This has, to the best of my knowledge, not been done before. Interestingly, I document a lack of importance of news about fundamentals for implied volatilities. Second, I test whether the difference in how primary and derivatives markets incorporate information can be exploited economically by systematic option trading strategies.

Most prior studies take a U.S. perspective. [Pearce and Roley \(1985\)](#), for example, show that monetary policy surprises significantly affect stock prices in the U.S. The evidence for inflation surprises, however, is weaker and there is no noticeable impact of real activity surprises. [McQueen and Roley \(1993\)](#) show that the response of U.S. stock prices to news is much stronger after allowing for different stages of the business cycle. When economic conditions are good, the stock market reacts negatively to news about higher real economic activity. [Flannery and Protopapadakis \(2002\)](#) estimate a GARCH model and document that macroeconomic variables affect both conditional returns and volatilities in the U.S. Whereas most studies typically examine only a single market, [Kim et al. \(2004\)](#) consider the impact of economic news on U.S. stock, bond and foreign exchange markets. With a GARCH model, the authors show that markets respond primarily to macroeconomic surprises, rather than the act of releasing information about fundamentals itself. Balance of trade news is the most important release for the foreign exchange market. For the bond market, news about the internal economy is most important and for the stock market consumer and producer price information. Finally, volatility increases for news announcements of some variables, but falls with releases for others. [Andersen et al. \(2007\)](#) study the response of international financial markets to U.S. news releases using high-frequency data. Macroeconomic announcements cause conditional mean returns to jump. Once the stage of the business cycle is taken into account, the response of the foreign exchange and equity markets is as strong as the response of bond markets.

Another strand of the literature shows that there are significant inter-market linkages and volatility spillovers between international financial markets.¹ [Koutmos and Booth \(1995\)](#) document strong volatility

¹ See [Gagnon and Karolyi \(2006\)](#) for a recent overview of the literature.

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