Spillovers of stock return volatility to Asian equity markets from Japan and the US

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Abstract

This paper examines the magnitude of return and volatility spillovers from Japan and the US to seven Asian equity markets. I construct a volatility spillover model that deals with the US shock as an exogenous variable in a bivariate EGARCH for Japan and Asian markets. First, only the influence of the US is important for Asian market returns; there is no influence from Japan. Second, the volatility of the Asian market is influenced more by the Japanese market than by the US. Third, there exists an adverse influence of volatility from the Asian market to the Japanese market.
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1. Introduction

Understanding the behavior of return volatility is crucial for pricing domestic securities, for executing global hedging strategies and asset allocation decisions, and for evaluating regulatory proposals to restrict international capital inflows. The purpose of my paper is to examine how and to what extent stock returns and volatility in an Asian market are influenced by the world market of the US and the regional market of Japan.

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Most existing studies on volatility spillovers, such as Base and Karolyi (1994), Karolyi (1995) and Karolyi and Stulz (1996), focus on how an American "world" market influences other markets but do not distinguish between influences from regional and world markets. However, Ng (2000) constructs a volatility spillover model by assuming that there are three shocks including local, regional and world, and that each shock is significant.

Ng (2000) uses more detailed research than previous papers and clarifies the role of a regional market. Her major contribution is her analyzes on return volatility in Asia. As expected, she finds that for Asian markets the world shock of the US is stronger than the regional one of Japan. Thus, Ng (2000) analyzes a regional and world shock as exogenous variables in the univariate volatility spillover model for the Asian markets. She uses weekly data from January 1975 to December 1996[1].

Recently, a large increase of portfolio and direct investment from Japan to the Asian countries in the latter half of 1990s is shown by the Bank of Japan (2001b) and Ministry of Finance (2000) official data, except during the period of Asian crisis in 1997. Also, Fornari and Levy (2000) point out that Japanese monetary expansion primarily translates into capital outflows (rather than domestic demand) toward Asian countries. Thus, Japanese international investors have held a large amount of Asian assets and hence the Asian market will affect the Japanese market through the portfolio management of assets of both countries. The analysis for the latter half of 1990s will have to consider the repercussion of the Asian markets, though Japan is a regional market. This strong tie between Japan and Asian markets is worthy of notice.

This paper considers a different volatility spillover model from Ng (2000), noting the strong relationship between Japan and Asian markets. For example a world shock of the US is only an exogenous variable in a bivariate volatility spillover model for Japan and an Asian country. In contrast to Ng (2000), this paper insists on the endogenity of the Japanese market shock though Japan may be a regional market against the Asian local markets. Omitting the period during the Asian crisis when stock data displayed the abnormal behavior, but obtaining the sufficient number of data, this paper uses recent daily data from January 1998 to April 2000.

This paper draws a major result that a regional factor is stronger than a world one for Asian market volatility, and also considers why the results are different from Ng (2000). In addition, the paper finds the endogenity of the Japanese variables and supports our setting different from Ng. Finally, the paper derives the different policy implication by asking the following question. Can Asian governments and international investors obtain some profits by using signals from a market that opens earlier?

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[1] Ng (2000) also shows that liberalization events (such as capital market reform and country fund launching), exchange-rate changes, the number of American Depositary Receipt listings, sizes of trade, and a country's fund premiums affect the relative importance of the world and regional market factors over time.