



A multilateral approach to examining the comovements among major world equity markets

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Abstract

This study investigates the comovement in stock indices among major developed markets, where Morgan Stanley Capital International (MSCI) indices are employed for the purposes of the study. We employ a model that accommodates multilateral international impacts on equity index movements. The empirical results reveal the existence of significant international transmission effects among these major world markets, both in terms of returns and volatility, and mostly in a positive direction. The U.S. market, as expected, is the leading market in the sense that it has the most pervasive and significant impact on all markets across continents. However, the U.S. market exhibits a different relationship with European markets from that with Asia-Pacific markets. The evidence also suggests that strong regional transmission effects exist. A further investigation using the extended model reveals that the linkages between U.S. and European markets are driven by positive global common forces and by negative international competitive effects. On the other hand, the U.S. and Asian markets are linked through positive global common forces and positive international contagion effects. The United States, Canada, and the U.K. are the three markets that still demonstrate contagion influence over countries outside its own region. The Asia-Pacific markets are more susceptible to contagion effects. Finally, it is interesting to find that Japanese market performance became more contagious toward other markets during the Asian financial crisis period.

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1. Introduction

The literature has documented a significant level of interdependence among international equity markets. Studies have also attempted to identify the existence of a leading

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market and the factors responsible for the equity market linkages (e.g., see [Arshanapalli & Doukas, 1993](#); [Becker, Finnerty, & Gupta, 1990](#); [Eun & Shim, 1989](#); [Hamao, Masulis, and Ng, 1990](#); [King, Sentana, & Wadhvani, 1994](#); [Koch & Koch, 1991](#); [Lau and McInish \(1993\)](#); [Lin, Engle, & Ito, 1994](#)). Meanwhile, researchers have had limited success in explaining international comovements as a common response to observable factors.¹ In a related study, [King and Wadhvani \(1990\)](#) have proposed a hypothesis that international participants ignore fundamental international economic information and simply focus on price movements in other countries, particularly the United States. This may explain why, on the one hand, it is difficult to explain the international correlation structure with macroeconomic variables while significant comovements among world equity markets are observed. Empirical support has indeed been found for the overreaction explanation using a contagion model in which pricing mistakes motivate the international correlation structure. Following [King and Wadhvani \(1990\)](#), [Lin et al. \(1994\)](#) postulate that information revealed during the trading hours of one market may have a global impact on the returns of the other markets. They propose an aggregate shock model that uses a GARCH process to test the international transmission effect, as well as a signal extraction model to separate global factors from local factors.

More recently, [Forbes and Rigobon \(2002\)](#) have shown that correlation coefficients are conditional upon market volatility. After adjustment for this bias, they find no increase in conditional correlation coefficients, that is, no contagions, where contagion is defined as a significant increase in market comovement after a shock to one country. This study confirms the importance of simultaneously giving consideration to return and volatility comovements when studying the intensity of return transmissions. Nonetheless, their conclusion of no contagion is derived from their correlation-based definition for contagions. In particular, the empirical literature generally finds that the spillover effects are not symmetric (e.g., see [Eun & Shim, 1989](#); [Hamao et al., 1990](#); [Karolyi, 1995](#); [Koch & Koch, 1991](#); [Lau & McInish, 1993](#); [Lin et al., 1994](#), among others). It follows that correlation coefficients are limited in terms of capturing the asymmetric transmission effect and, more importantly, the sources of the international transmission may arise from both fundamental common factors and pure contagion effects.

The purpose of this study is to investigate stock market comovements among G-7 and major Asia-Pacific developed markets, including the United States, Canada, the U.K., Germany, France, Italy, Japan, Australia, Hong Kong, and Singapore, a total of 10 markets. Morgan Stanley Capital International (MSCI) country indices are employed in this study. We apply the aggregate shock model proposed by [Lin et al. \(1994\)](#). The advantages of this model are that it uses return dynamics that better describe actual market returns, it accommodates the mechanism of volatility transmissions at the same time as the return transmissions, and, more importantly, it simultaneously considers the multilateral impacts of various major markets. This last consideration avoids the spurious observations

¹ [Schwert \(1989\)](#) analyzes the relationship between stock market and macroeconomic volatilities and other variables and finds little evidence of a relationship between macroeconomic innovations and the stock variations. [King et al. \(1994\)](#) find that only a small proportion of the covariance between national stock markets and their time variation can be accounted for by observable economic variables.

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