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U.S. stock market uncertainty and cross-market European stock returns

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ABSTRACT

We investigate the cross-market differential relations of U.S. stock market uncertainty (VIX) with U.S. and European stock market returns before and during the European equity market crisis. Also, we examine whether VIX has predictive ability with respect to short-run European stock market returns. We find a strong negative contemporaneous relation between VIX changes and European stock returns that was twice as large during the equity market crisis period than before it. Changes in VIX have significant predictive ability for daily returns in the major European equity markets during the European equity market crisis period but not before it. The VIX fears persist longer in European markets than in the U.S. market, suggesting market frictions and limitations in information-processing capabilities of investors.

1. Introduction

A large body of empirical literature provides evidence of short-term interdependence of prices and returns across the stock markets of U.S. and industrialized countries of Europe and Asia (Hamao et al., 1990; Shiller et al., 1991; King and Wadhwani, 1990; Peiro et al., 1998; Baur and Jung, 2006). In a recent study, Rapach et al. (2013) show that lagged U.S. stock returns are a powerful predictor of monthly stock returns in numerous non-U.S. industrialized countries. They find that the prediction power of

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lagged U.S. stock returns is substantially better than that of the countries' own economic variables, and that this prediction power is more pronounced during business cycle recessions. However, lagged non-U.S. stock returns displayed limited predictive ability for the U.S. stock returns.

Connolly et al. (2005) report that U.S. stock returns tend to be low when U.S. stock market uncertainty rises, and that stock market uncertainty has important cross-market pricing influences within the U.S. markets. Giot (2005) finds that future U.S. stock returns are always positive (negative) after very high (low) levels of U.S. stock market volatility, suggesting that high levels of uncertainty indicate oversold markets. Dash and Moran (2005) show that hedge fund returns are negatively correlated to U.S. stock market uncertainty and this correlation profile is asymmetric. All of these studies use the Chicago Board Option Exchange's Volatility Index (VIX) as a measure of U.S. stock market uncertainty. Blair et al. (2001) demonstrate that VIX contains nearly all relevant information about the future realized volatility of stock market returns. Copeland and Copeland (1999) and Dash and Moran (2005) advocate the use of VIX as a stock market timing or options trading timing tool. Durand et al. (2011) find that the market risk premium and the value premium in the Fama and French three-factor model are sensitive to changes in VIX. Fleming et al. (1995) find a large negative contemporaneous relation between VIX changes and S&P 100 index returns, suggesting an inverse relation between VIX and stock market prices.

While the negative contemporaneous relation between U.S. stock market returns and VIX is well established, the cross-market influences of VIX on stock market returns in non-U.S. industrialized countries have received little or no research attention in the empirical literature. Since Rapach et al. (2013) show that lagged U.S. stock returns are a powerful predictor of stock returns in several industrialized countries, it is quite possible that U.S. stock market uncertainty (VIX) has important cross-market influences on stock returns in non-U.S. industrialized countries. In this paper, we examine the cross-market influences of U.S. stock market uncertainty (VIX) on stock returns in industrialized countries of Europe. Because U.S. stock returns are found to be a strong predictor of non-U.S. returns during recessions (Rapach et al., 2013), we specifically examine the cross-market influences of VIX for European stock returns during the recent global financial crisis and concomitant global equity market crisis. Hong and Stein (1999) and Daniel et al. (1998) find that stock market returns may behave differently depending on the state of the market.

Our analysis of cross-market influences of VIX in European stock markets focuses on two important empirical dimensions. First, we investigate the contemporaneous cross-market relations of VIX with European stock market returns. Since the empirical studies find a strong negative instantaneous relation between VIX and U.S. stock market returns, we would also expect a negative relation between VIX and European stock market returns. This negative relation between VIX and U.S. equity returns is often used to dub VIX as an investor fear gauge. Thus, our VIX-returns analysis will uncover if the return fears of investors as reflected in VIX spread instantaneously from U.S. stock markets to European stock markets. This dimension of the analysis is especially meaningful in light of the recent global economic recession, and it will have important implications for the effectiveness of cross-market hedging in an international setting during periods of high stock market uncertainty. Our analysis also explores the differential influences of VIX across the U.S. and European equity markets to further investigate the empirical relevance of cross-market diversification and the notion of flight-to-quality within equity markets under heightened stock market uncertainty. Boscalgon and Clarke (2013) report that large increases in VIX trigger flight-to-safety among investors who tactically shift their portfolios toward substantial asset allocations in gold or gold industry related stocks. Our study subperiod 2007-13 adds an interesting dimension to cross-market hedging possibilities because both VIX futures and options were available and actively traded on CBOE for the first time during this subperiod.

Second, we examine if changes in the level of VIX are informative in predicting the short-run returns in European stock markets. In this short-run forward-looking focus, we study the lead-lag relations between changes in VIX and returns of European stock markets and investigate the strength and duration of European return reactions to risk shocks emanating from the U.S. stock market uncertainty (VIX). Rapach et al. (2013) suggest the existence of information frictions in explaining the predictive power of lagged U.S. stock returns for stock returns of non-U.S. industrialized countries. A similar leading role of VIX in predicting the European stock market returns may have important implications