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Equity market contagion during global financial and Eurozone crises: Evidence from a dynamic correlation analysis

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ABSTRACT

The devastation resulting from the recent global financial and Eurozone crises is immense. Most researchers commonly believe that the global financial crisis originated in the United States, and spread immediately to global financial hubs where it eventually became the Eurozone crisis. Several studies have been conducted on financial market contagion during both global and Eurozone crises; however, the issue of whether equity market contagion spreads from the United States to the world equity markets during these crises has not been addressed yet. Through using US dollar-denominated MSCI daily indices from fifty-five equity markets for the period 2003–2013, we have found evidence of contagion in developed and emerging markets during the global and Eurozone crises. We show that contagion spread from the United States to the world markets during both crises. Our regression results identify that the bank risk transfer between the United States and other countries is the key transmission channel for cross-country correlations. This study has an important policy implication for portfolio diversification between the United States and other countries during these crises.

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1. Introduction

The world financial system has experienced two interrelated crises in recent years—the global financial crisis (hereafter GFC) and the Eurozone crisis (hereafter EZC). The source of the GFC was the subprime credit crisis in the United States. The bankruptcy of Lehman Brothers was the world's first indication of the imminent global financial crisis. The Lehman bankruptcy was followed by the takeover of Merrill Lynch by Bank of America, and the consequent rescue of AIG. The crisis inevitably spread throughout the world, especially to Europe. Although the PIIGS (Portugal, Italy, Ireland, Greece and Spain) countries were severely affected, the situation in Greece has been worse since the EZC hit the Euro area in 2010. Analysts agree that the world has experienced the deepest recession since World War II.

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Financial market contagion¹ is a widely discussed term within financial market research. The empirical studies investigate equity market contagion in the 1987 US stock market crash, the Asian, Russian, Mexican, Brazilian, global, and Eurozone crises. King and Wadhvani (1990) show that the correlations between the United States, the United Kingdom, and other developed markets increased significantly following the 1987 crash. Lee and Kim (1993), extending this analysis to a dozen countries that include emerging markets, confirmed increased correlations, and thus contagion, during the 1987 crash. Calvo and Reinhart (1996) investigate the 1994 Mexican crisis, and show that correlations increased in a group of emerging markets. Forbes and Rigobon (2002), studying the 1994 Mexican and the 1997 Asian crises, report no contagion but find interdependence in both episodes among 24 developed and emerging countries. However, Chiang et al. (2007) show contagion during the two phases of the Asian crisis, using a longer sample period. Baig and Goldfajn (1998) also find the presence of a contagion effect between equity and currency markets during the Asian currency crisis. Caporale et al. (2005) study the Asian crisis, and find a significant increase in co-movements among a group of South East Asian countries, and thereby conclude the co-movements are contagion. The study by Corsetti et al. (2005) is somewhat different from the existing studies on Asian crisis. Their study offers contagion for only five countries from a sample of seventeen countries (developed and emerging).

Goldfajn and Baig (2000) examine whether there was contagion during the Russian crisis with regard to Brazil, and conclude that contagion occurred, and that the mechanism of propagation was the debt securities market. Hon et al. (2004) test whether the terrorist attacks on the United States of September 11, 2001, resulted in contagion in the financial market. Their results indicate that international stock markets, particularly in Europe, responded closely to the US stock market shocks during the three to six months following the attacks. Cappiello et al. (2006) also conclude that, during periods of financial turmoil, equity market volatilities show important linkages, and conditional equity market correlations among similar regional groups increase dramatically.

Furthermore, by pursuing a contagion analysis on BRIC (Brazil, Russia, India and China), UK, and US data, Kenourgios et al. (2011) conclude that contagion spreads from the crisis country to other countries during the Brazilian, Asian, and Russian crises. Chudik and Fratzscher (2011) study 26 economies (defining the European Union area as a single economy) by using weekly data, and find that the tightening of financial conditions was the key transmission channel in advanced economies, whereas the real side of the economy was the main channel in emerging economies. Samitas and Tsakalos (2013) examine the correlation dynamics between Greek and European markets during the GFC and Greek crises, and report contagion during GFC, but not during the Greek crisis. Nevertheless, Kenourgios (2014) investigates volatility contagion across the United States and European stock markets during GFC and EZC, and finds the evidence of volatility contagion during both crises. In a nutshell, researchers have come to different conclusions depending on the econometric methods² they use to identify contagion, even though the general definition of contagion is the same.

The purpose of our paper is to investigate market contagion across countries due to the GFC and the EZC. Although a large number of studies have been conducted on the 1987 US stock market crash and the Asian, Russian, Mexican, Brazilian, global (GFC), and Eurozone (EZC) crises, the studies on equity market contagion due to the GFC and the EZC are still scarce, especially considering the United States as the source of contagion; however several recent studies examine sovereign bond and CDS contagion (for example Arghyrou and Kontonikas, 2012; Kalbaska and Gatkowski, 2012; Metiu, 2012; Mink and Haan, 2013; Claeys and Vasicek, 2014; Gunduz and Kaya, 2014). We adopt a definition of contagion, that is, the significant increase in the conditional correlations between the pre-crisis and crisis periods. By using daily MSCI US-dollar denominated price indices for 55 stock markets for the period from 2003 to 2013, we find that the evidence of contagion in developed and emerging markets during both the GFC and the EZC indicates the United States as a source of contagion. We find that Latin American emerging countries are affected during both crises, but Asian emerging countries are partially affected by the GFC. Conversely, African and Middle Eastern emerging countries are unaffected by the GFC, although they are partially affected by the EZC. We also report that crises (either GFC or EZC) are common phenomena for developed countries. We additionally show bank risk transfer between the United States and other countries as the primary transmission channel for the cross-country correlation, even though an exception is reported in African and Middle Eastern countries. We further show that

¹ Researchers define contagion as an excessive increase in the correlation among the countries causing the crisis and all other countries (see Masson, 1998, 1999; Masson and Mussa, 1995; Calvo and Reinhart, 1996; Forbes and Rigobon, 2002; Pesaran and Pick, 2003; Pericoli and Sbracia, 2003; Corsetti et al., 2005). Dornbusch et al. (2000) and Pritsker (2001) adopt the definition of contagion as the dissemination of market disturbances, primarily with negative consequences, from one market to another. Bekaert et al. (2005) also identify contagion in equity markets as the idea that markets move more closely together during periods of crisis. However, Sachs et al. (1996) illustrate financial market contagion as a significant increase in cross-country correlations of stock market returns and volatilities.

² Using a correlation analysis, Lee and Kim (1993) find evidence of contagion in the global stock markets after the 1987 US stock market crash. Chiang et al. (2007) use the dynamic conditional correlation (DCC) model of Engle (2002) to capture contagion in nine Asian stock markets (using daily stock-returns) during the 1997 crisis. Their study provides evidence of contagion in terms of increasing correlations. However, Boyer et al. (1999) and Forbes and Rigobon (2002) develop a measure of interdependence in order to test the change in correlation due to co-movements in the volatility of asset prices. A linear transmission mechanism is used where restrictions on the variance of the common factors relative to the variance of the country-specific shock are imposed. On the other hand, Corsetti et al. (2005) define contagion for asset prices as the observed pattern of co-movements that is too strong (or too weak) compared to the predicted co-movements that are conditional on a linear transmission mechanism across countries. Corsetti et al. (2005) argue that enhanced correlations across countries during a financial crunch does not provide evidence for contagion. Samarakoon (2011) uses a VAR framework on 63 emerging and frontier markets to produce counterintuitive results that contagion does not spread from the United States to emerging markets (except for Latin America), but from emerging markets to the US market.

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