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Transmission of the financial and sovereign debt crises to the EMU: Stock prices, CDS spreads and exchange rates

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ABSTRACT

This paper tests for the transmission of the 2007–2010 financial and sovereign debt crises to fifteen EMU countries. We use daily data from 2003 to 2010 on country financial and non-financial stock market indexes to analyze the stock market returns for three country groups within EMU: North, South and Small. The following results hold for both the North and South European countries, while the smallest countries seem to be relatively isolated from international events. First, we find strong evidence of crisis transmission to European non-financials from US non-financials, but not for financials. Second, in order to test how the sovereign debt crisis affects stock market developments we split the crisis in pre- and post-Lehman sub periods. Results show that financials become significantly more dependent on changes in the difference between the Greek and German CDS spreads after Lehman's collapse, compared to the pre-Lehman sub period. However, this increase is much smaller for non-financials. Third, before the crisis euro appreciations coincide with European stock market decreases, whereas this relationship reverses during the crisis. Finally, this reversal seems to be triggered by Lehman's collapse.

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1. Introduction

The global financial and economic crisis of 2007–2010, which originated in the United States (US) subprime mortgage market, triggered a chain reaction in the US and global financial systems. These problems reached their zenith with the collapse of Lehman Brothers, when it became clear that there would be a deep global recession. European financial markets were not isolated from developments in the US. To stem the evolving crisis European national governments massively injected capital in financial institutions (e.g. Hypo Real Estate, Fortis, Anglo-Irish, etc.) and undertook fiscal stimulus measures. The single currency, however, proved vulnerable to the crisis because it was created without a single supranational government above it to control tax, spending and transfers between the euro area's richer and poorer economies. Consequently, financial markets distrust some of the European governments resulting in a sovereign debt crisis. The country worst hit to date by this sovereign debt crisis is Greece. It is in a deep economic recession and cannot borrow anymore on international capital markets. Since early 2010 it receives financial support from a joint EMU-IMF rescue package.[1]

This paper investigates the sensitivity of financials and non-financials in 15 EMU countries to crisis developments in the US, to sovereign debt problems in EMU and to exchange rate movements before and during the financial crisis. By comparing a tranquil pre-crisis period (1-1-2003 until 26-2-2007) with a crisis period (27-2-2007 until 31-8-2010) we test explicitly for the transmission of the financial crisis. In addition, we distinguish between two sub periods within the financial crisis, where the bankruptcy of Lehman Brothers on 15 September 2008 is the break point.

To keep the discussion tractable we split the 15 EMU countries in three groups based on the financial market's assessment of default risk: Low default risk, high default risk and small countries. Low default risk countries are Austria, Belgium, Finland, France, Germany and the Netherlands, whereas high default risk countries are Greece, Ireland, Italy, Portugal and Spain. We coin the first group "North" and the second "South". The smallest EMU countries (Cyprus, Luxembourg, Malta and Slovenia) have very illiquid stock markets and the crisis transmission process may work differently.

We estimate individual GARCH models for each group's financials and non-financials index. The GARCH model is well known for its ability to deal with time varying stock market volatility, a necessity when analyzing the turbulent markets during the financial crisis. We include both the contemporaneous and lagged US return in the empirical model to capture the dependence on developments in the US and deal with non-synchronous trading hours. In addition, by including euro-dollar exchange rate changes we control explicitly for exchange rate movements. Finally, when considering only the crisis period, Greek CDS spreads are included to investigate the effects of the European sovereign debt crisis on stock returns. In order to test for the crisis transmission we include an indicator variable to allow the coefficients to change during the pre-crisis vs. crisis periods and pre-Lehman vs. post-Lehman sub periods. A significant coefficient for the indicator variable(s) signals transmission of the crisis.

The results show four key findings. First there is evidence of crisis transmission to all European non-financials from US non-financials, but not for financials in the North and South groups. Second, financials become significantly more sensitive to changes in the difference between the Greek and German Credit Default Swap (CDS) spread after the collapse of Lehman Brothers across all country groups. Non-financials exhibit a similar pattern, albeit with smaller magnitude. Third, before the financial crisis euro appreciations coincide with stock market decreases for both European financials and non-financials. However, during the crisis this association changes: stock prices increase when the euro appreciates for both financials and non-financials. This holds for both the North and South European country groups. However, stock prices in the smallest EMU countries are far less influenced by exchange rate movements. Finally, the reversal in the relationship between euro appreciations and stock prices seems to be triggered by Lehman's collapse and the concomitant radical change in default expectations among market participants.

The paper is organized as follows. Section 2 discusses the key dates of the crisis and the country groups. Section 3 covers the data and empirical methodology. Section 4 presents the empirical findings and Section 5 concludes.

[1] Recently, Ireland and Portugal also received support from the other EMU countries and the IMF.

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