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# Measuring Contagious Effects on Euro Area Debt Crisis Using Daily CDS Spreads Changes

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**Abstract**

This paper complements several recent studies on the contagion in the euro area after the historic tensions on the debt market. We consider the popular approach of dynamic conditional correlation (DCC) as introduced by Engle (2002) for sovereign CDS spreads associated with selected euro area countries. Additionally, we extend prior results by explaining to what extent the contagion is generated by market and macroeconomic indicators.



*Keywords*: euro area; debt crisis; contagion; CDS sovereign spreads; DCC models

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## 1. Introduction

Given the weight of the euro countries to the world economy, the ongoing debt crisis that began in late 2009 is of fundamental issue and has becoming a major area of interest and concern in finance nowadays. It has attracted attention of researchers, authorities, and media circles.

The growing seriousness of the current crisis can be shown with an obvious rising spreads on sovereign bonds and CDS. Moreover, the actions of downgrade would be the strongest signal of the euro zone's problems. Recently, S&P Bulletin (2013) reports that the sovereign ratings have been lowered for 12 of the 17 eurozone member states since the beginning of the crisis. Furthermore, we count more than 15 crisis summits in the last few years. Kilponen et al. (2012) identified more than fifty important policy initiatives have been directed to solving the Euro area crisis.

Broadly speaking, the causes of the sovereign debt crisis are essentially related to flaws in the architecture and the design of the currency union (Lane (2012)), lack of ability to manage shocks (Shambaugh (2012)), banking crisis, and low of competitiveness and productivity… Consequently, we can see rising government deficits, a dramatic rise of spreads on sovereign bonds, low liquidity, high volatility (Panetta (2011)). At the same time, it is known fact that these enormous economic and financial damages have spread progressively to several countries in the euro area and, hence, serious scenarios[*] of contagion became a major challenge for European authorities. At this regard, important measures and appropriate responses taken by European policy makers were of crucial urgency and aiming to contain and mitigate such phenomena (Constanciô (2012)).

There is a broader literature focusing on the phenomenon of contagion. In particular, important recent papers by Missio and Watzaka (2011), Constanciô (2012), Mink and de Haan (2012), Kalbaska and Gątkowski (2012), Audige (2013), Buchholz and Tonzer (2013), Gunduz and Kayay (2013) attempt to identify such phenomenon namely that escalate from Greece to the rest of the euro area countries. For instance, Missio and Watzaka (2011) find a positive correlation between Greek sovereign CDS spreads and the other countries' spreads. Kalbaska and Gątkowski (2012) reveal that there is significant contagion effects from CDS spreads of PIIGS (Portugal, Ireland, Italy, Greece and Spain)) debt's to those of France, Germany and the UK during the period of 2005-2010. In a more recent paper, Audige (2013) highlights contagion effects from Greece to Ireland and Portugal in 2010.

Moody's Investor Service (2011) reports that the downgrade of Portugal on July 5, 2011 can be explained by Greek conjuncture, among other factors. Another interesting example reported by Constanciô (2012) is that bad announcements about Italy imply to reducing the gap between CDS spreads associated with debts issued by Italy and Spain. Moreover, Mink and de Haan (2012) find that both announcements about development of Greece and its bailout affect the prices of sovereign debts of Spain, Ireland and Portugal. These results present some support for contagion argument.

The ongoing debt crisis of peripheral countries (Greece, Ireland, Italy, Portugal and Spain) creates an undesirable scenario for the global economy as well as for the core countries (include Austria, Belgium, Germany, Finland, France, Luxembourg, and the Netherlands) given that the strong economic and financial linkages between regions.

Note that the principal borrowers of PIIGS were French and German banks. For instance, the values of capital inflows climb from almost $357.2 billion in December 1999 to $1.6 trillion in December 2009 (Bank for International Settlements (2010)). Further, Chen et al. (2012) mention that the current account imbalances of most affected euro area countries were mostly financed by the lead core countries in particular France and Germany via government debts and loans from banks. Enrich and Stevens (2011) reports on Wall Street Journal "…Sixteen top European banks are holding a total of about €386 billion ($532 billion) of potentially suspect credit-market and real-estate assets, …That's more than the €339 billion of Greek, Irish, Italian, Portuguese and Spanish government debt that those same banks were holding at the end of last year, ….". These are examples of the strongest linkages between peripheral and core countries in the euro zone. Our study based on econometric analysis as well as the existing literature will give some useful explanations for this interesting observation.

This paper complements several recent studies on the contagion in the euro area after tensions on the sovereign debt markets. We start this paper by examining the approach of dynamic conditional correlation (DCC) as

[*] In early studies, works by Jorion and Zhang (2007), Longstaff (2010) highlight the possibility of such scenarios.