Contagion in CDS, Banking and Equity Markets

Tabak, Medeiros Junior and de Castro Miranda

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Outline Discussion:
Contagion in CDS, Banking and Equity Markets

I. Motivation

II. Findings

III. What is not there

IV. Useful extensions

I. Motivation

1. Great contribution in resolving some of the current shortcoming in the literature of modeling empirical contagion
   - A priori assumption that we know exactly when crises begin and end.
   - Assessment of policies which may end contagious events.
   - Averts problems of running out of observations for tranquil periods during protracted crises (e.g. SCDS in Europe only began trading in 2008-09)
   - Frequency of data issues (LTCM a non event in quarterly data)

2. Current policy question: what is the role of contagion? Is contagion pushing up the cost of sovereign financing?
   - Important because of large sovereign debt and roll-over requirements in key countries
   - EU regulation to ban *uncovered* buying of protection of SCDS ("naked" short sales): potential unintended consequences

II. Their Findings

1. Look at three different markets individually
   - Domestic equity markets
   - Banking sector (Data Stream Bank Sector Index)
   - SCDS

2. Two different approaches
   - Forbes and Rigobon (2002) adjusted for correlated and persistent correlation in the volatilities (GARCH)
   - Fry, Martin and Tang (2008) based on two measures of co-skewness from the value of I to the volatility of j and from the volatility of I to the value of j

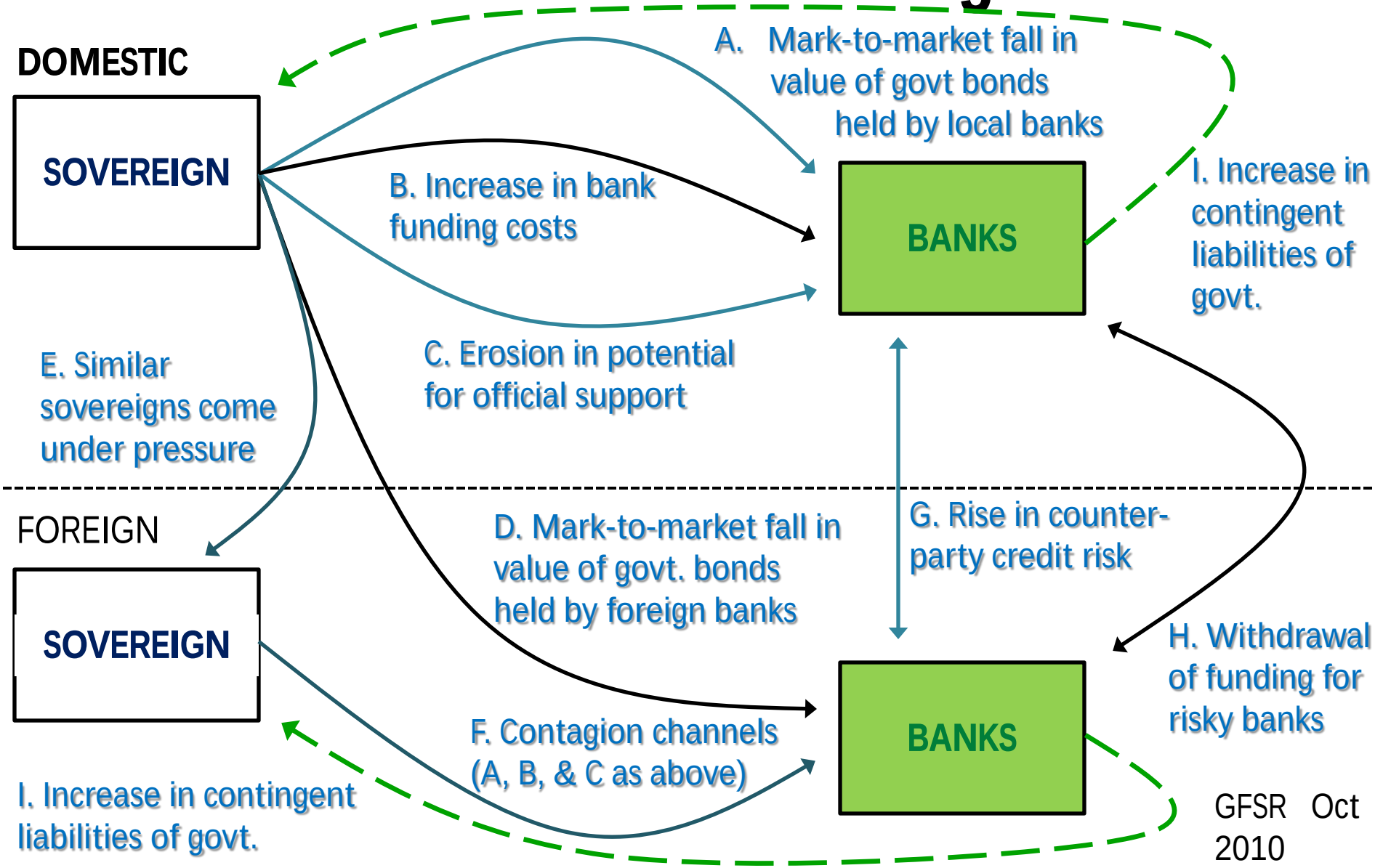
3. Endogenous estimation of the period of contagion, able to rank impact of markets and countries

III. What is not there

1. Different markets are connected, especially during crises periods. It would be nice to estimate these connections:
   - Domestic equity markets
   - Banking sector
   - SCDS

2. This is particularly a problem during periods of systemic risk as there is a transfer of risk among markets and sovereigns
   - Banks and implicit/explicit sovereign guarantees
   - Role of global/common factors that condition these relationships (global liquidity, MP+ policies, risk on/off)

Spillovers from the Sovereign to the Banks and Banks to Sovereigns



GFSR Oct 2010

➢ Risks embedded in SCDS cannot be readily isolated from the risk of the financial system and a holistic approach of both sectors is required…

- Evidence that implicit and explicit government support lowers FIs CDS spreads, below where they would be in the absence of government support
- Contingent Claims Analysis uses FIs equity market information plus balance sheet data to estimate credit risk indicators to calculate implied spreads without government support, thus disentangling its effect
- When SCDS spreads are low there is little correlation between SCDS and FIs CDS spreads, and vice versa

- By integrating network models using CCA risk indicators between sovereigns and financial institutions we can gauge how, when, and the strength by which sovereign risks is transmitted to FIs and vice versa

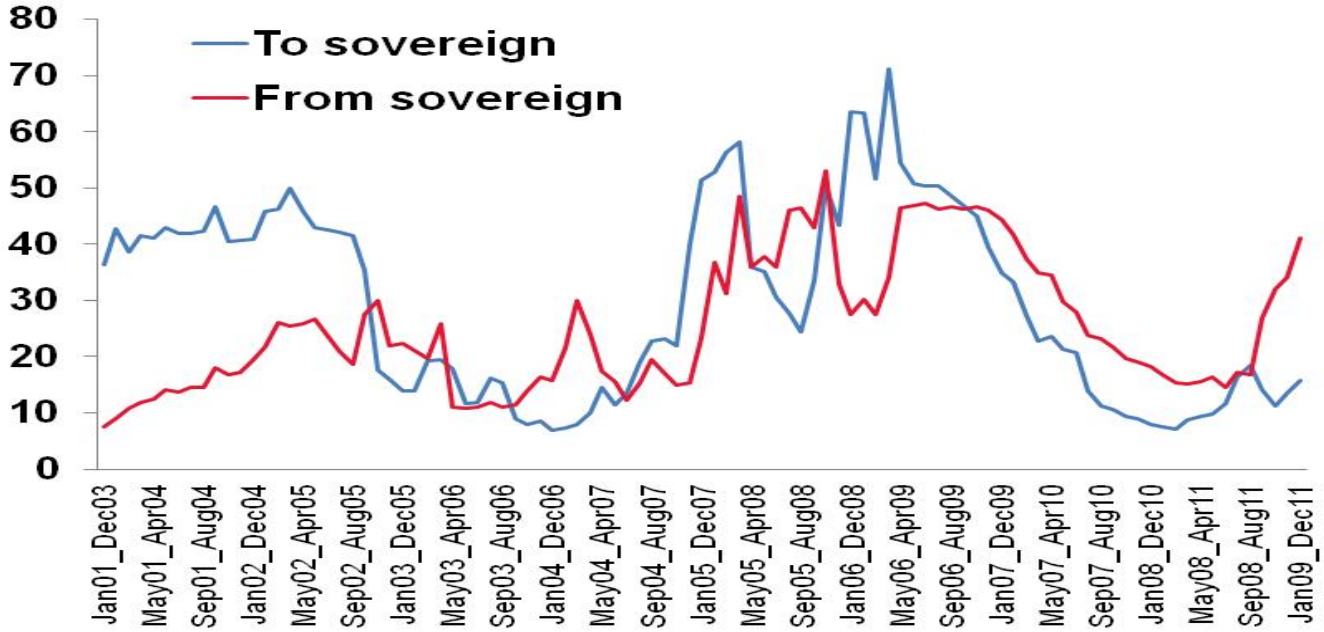
- Using CCA risk indicators for 63 banks, 39 insurance companies and 17 sovereigns in a network model shows the percent of significant connections out of total possible connections and the direction of causality

➢ Sovereign and FIs risk (transfer) difficult to separate

...From 2003–05 more significant connections to sovereigns from FIs (blue line). But since mid-2009 more connections from sovereigns to FIs (red line)

Network Measures: From Financials To and From Sovereigns

(In percent, monthly average over 3-year rolling window)



Note: Percent of significant connections to sovereigns from financial firms and from financial firms to sovereigns. Network measures based on 17 sovereigns, 63 banks, and 39 insurance companies.

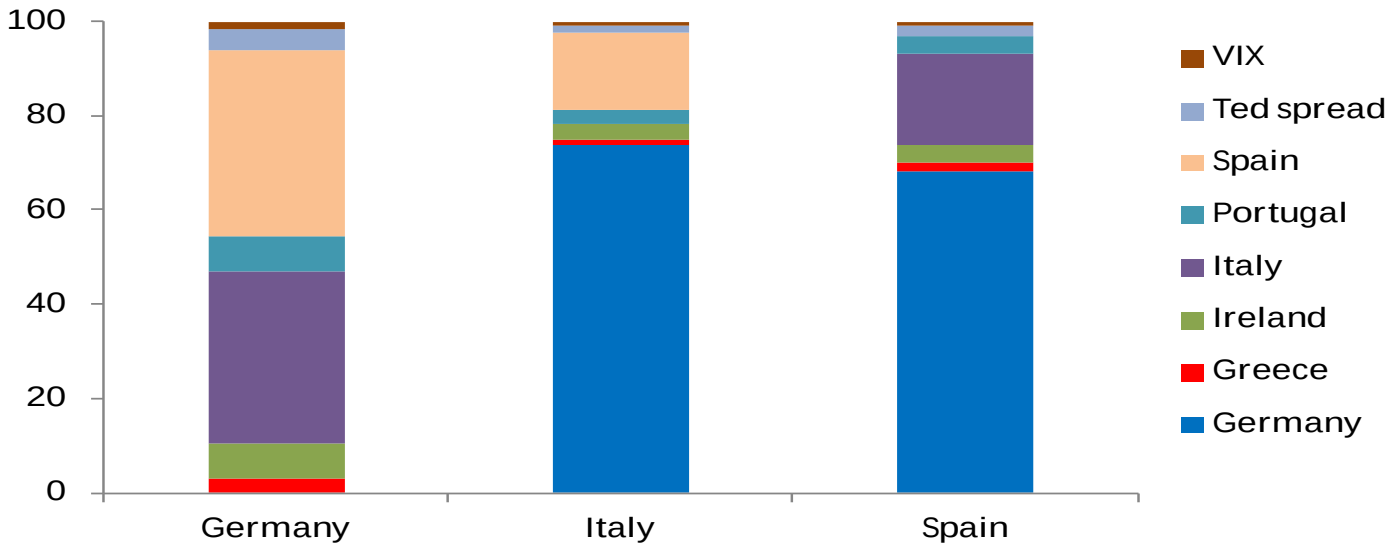
➢Stability Question: Are SCDS Markets more prone to be destabilizing than other markets? ...

Some evidence of significant cross-border SCDS spread volatility co-movement, especially during stress periods...

Volatility Factor Decomposition of Germany, Spain, and Italy SCDS

February 2009–October 2012

(In percent)

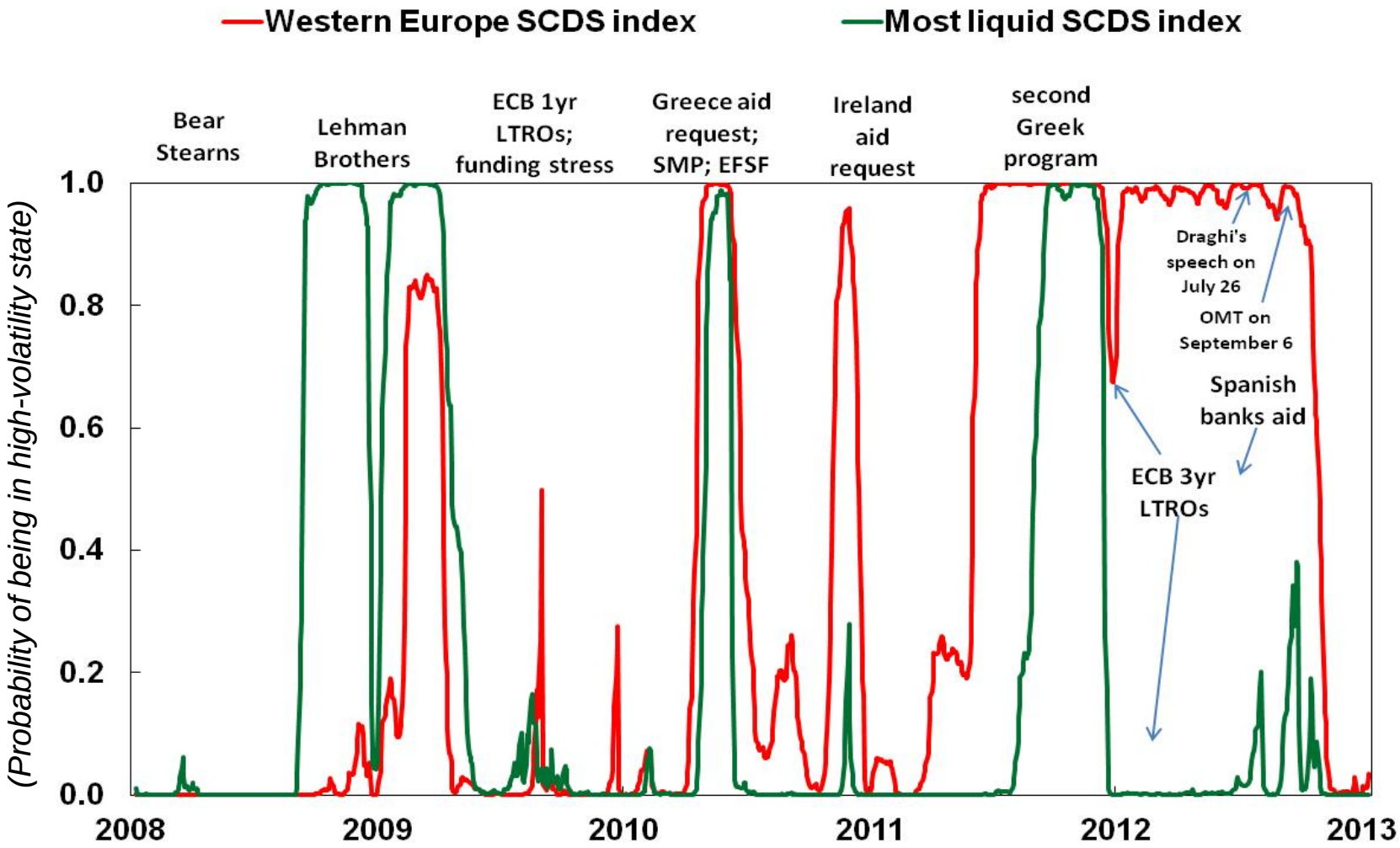


Source: IMF staff estimates.

Note: VIX = implied volatility on S&P 500 index options. This figure shows the decomposition of the volatility of SCDS that is not explained by own (or idiosyncratic) factors.

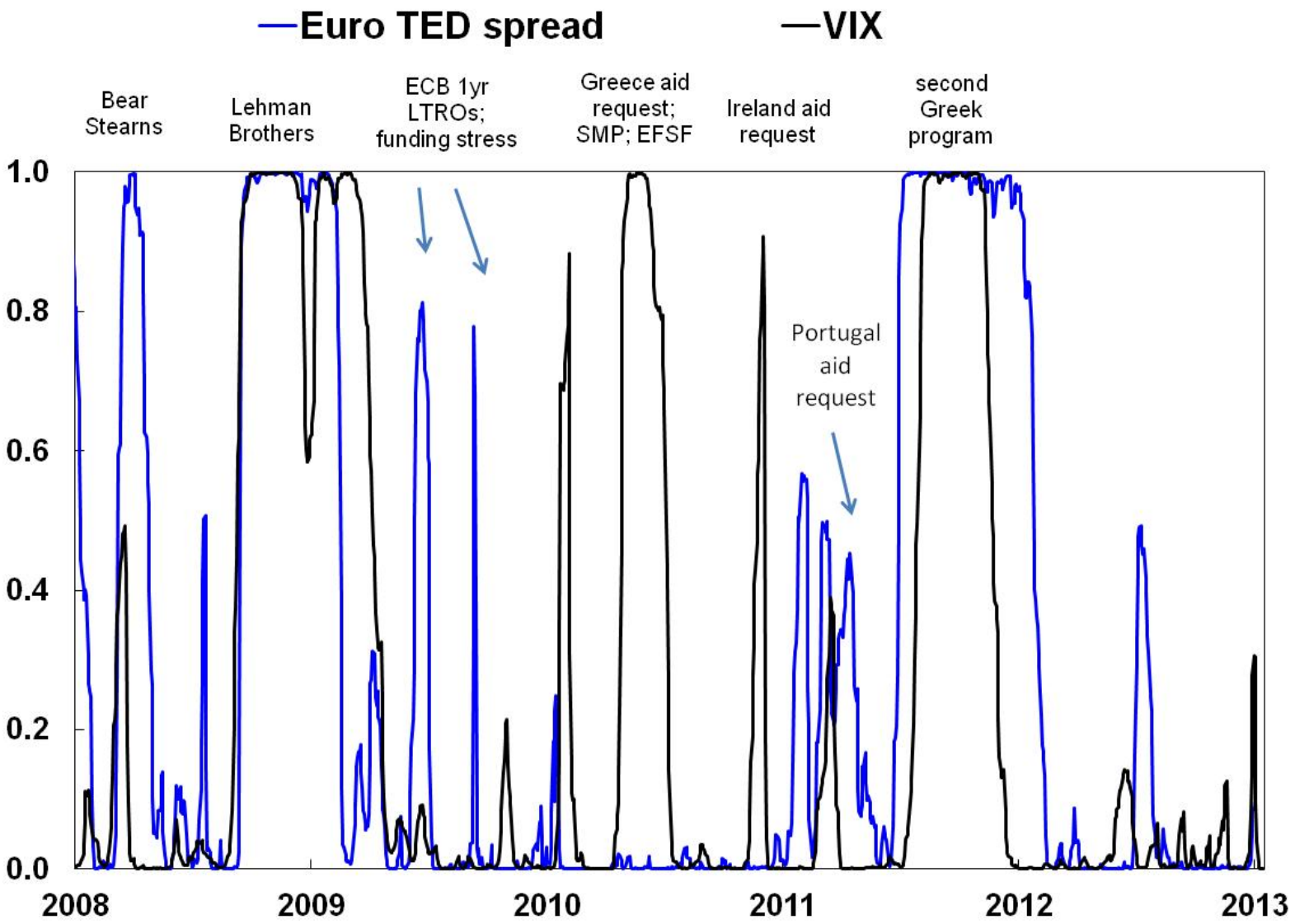
➢Stability Question: Are SCDS Markets more prone to be destabilizing than other markets?

…Markov-Switching ARCH Model shows that SCDS have been in high-volatility state during times of stress…



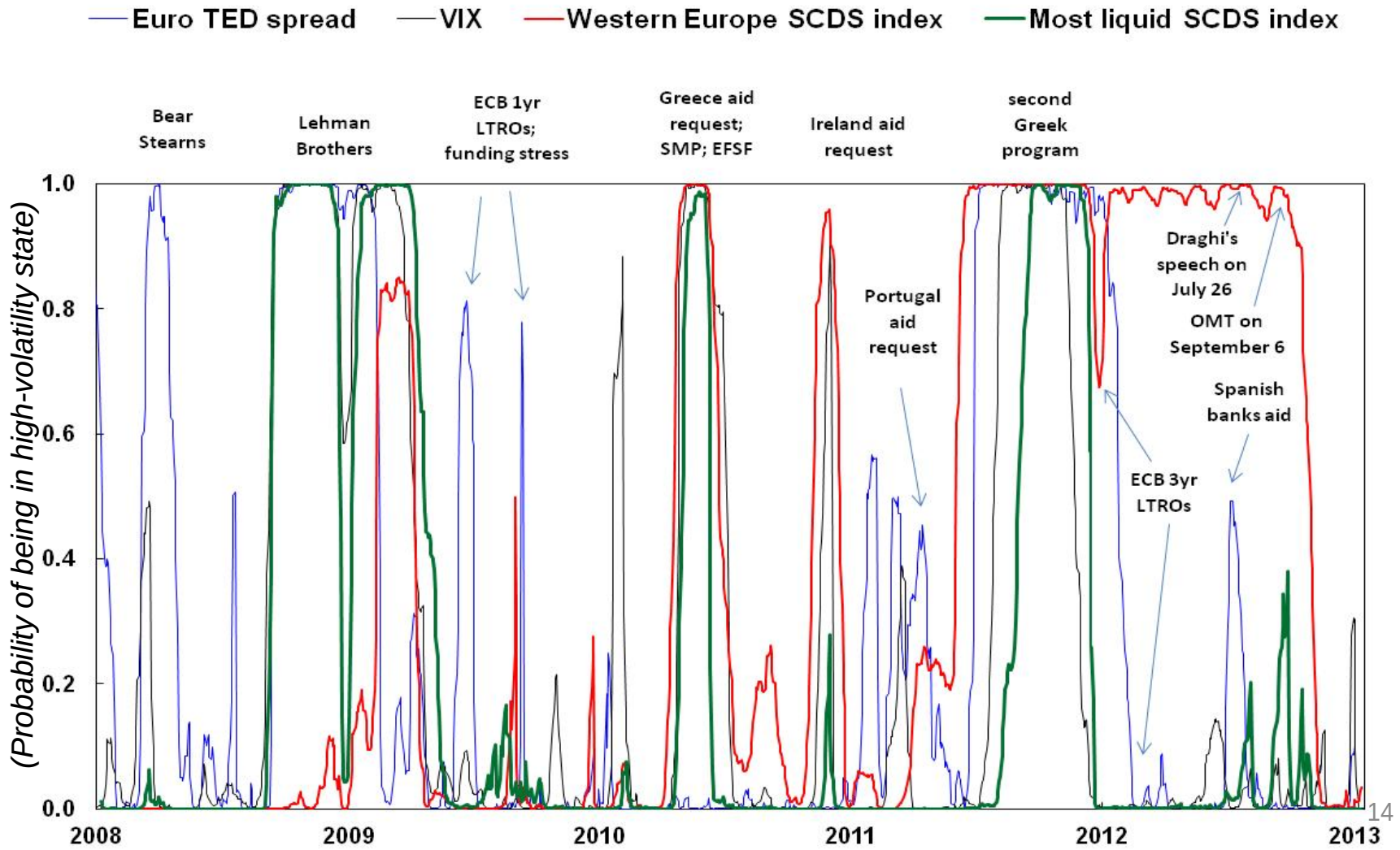
Markov-Switching ARCH Model

(Probability of being in high-volatility state)



➢Are SCDS Markets more prone to be destabilizing than other markets?

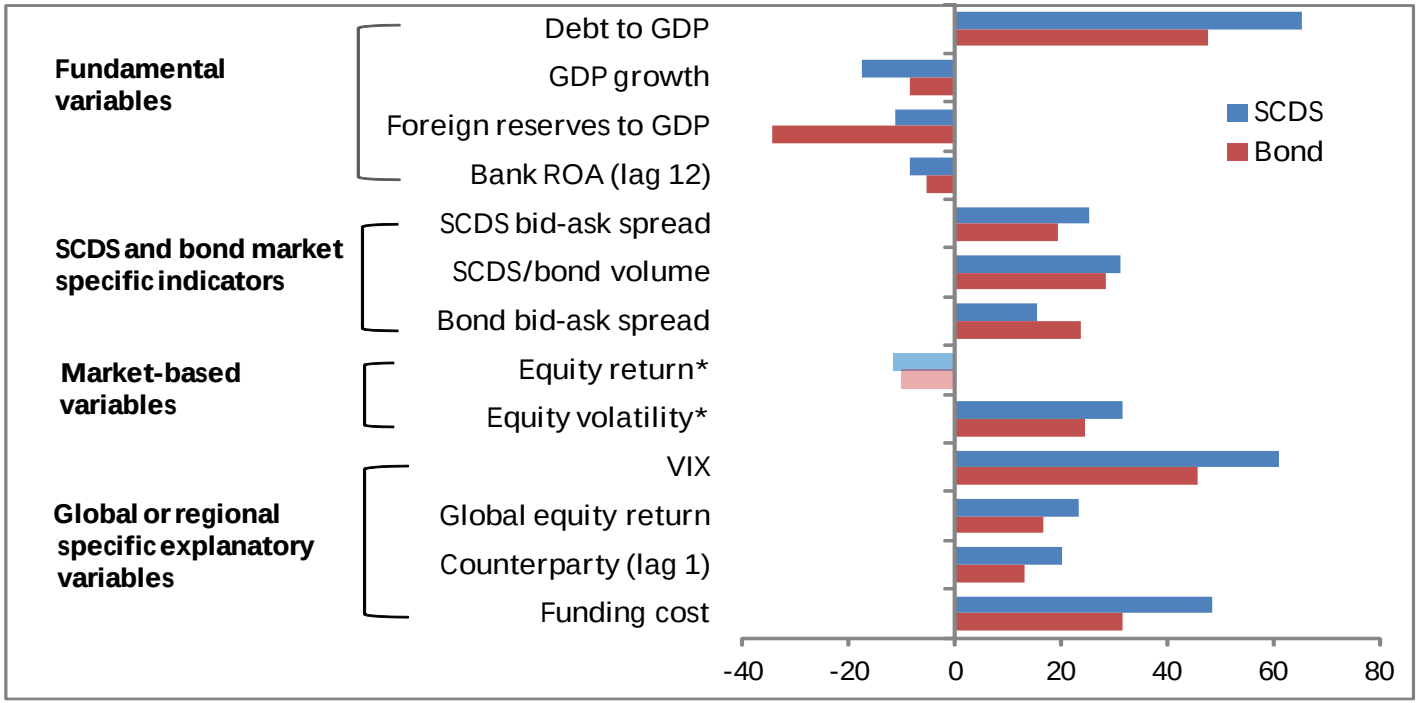
… but these models show that other financial markets have also been in high-volatility states during periods of stress



➢The fundamentals Question: Determinants of SCDS and bond spreads ... *Both economic fundamentals and market conditions matter*

Determinants of SCDS and Bond Spreads

(October 2008–September 2012, Relative sizes of factors)



Source: IMF staff estimates.

Note: ROA = return on assets; VIX = implied volatility on S&P 500 index options. For explanation of the variables, see Table 2.4. Relative sizes computed as coefficients from full country panel estimation multiplied by one standard deviation of each explanatory variable (averaged across countries). Results based on Table 2.5. Relative size is significant at the 90 percent confidence level or greater, except as noted.

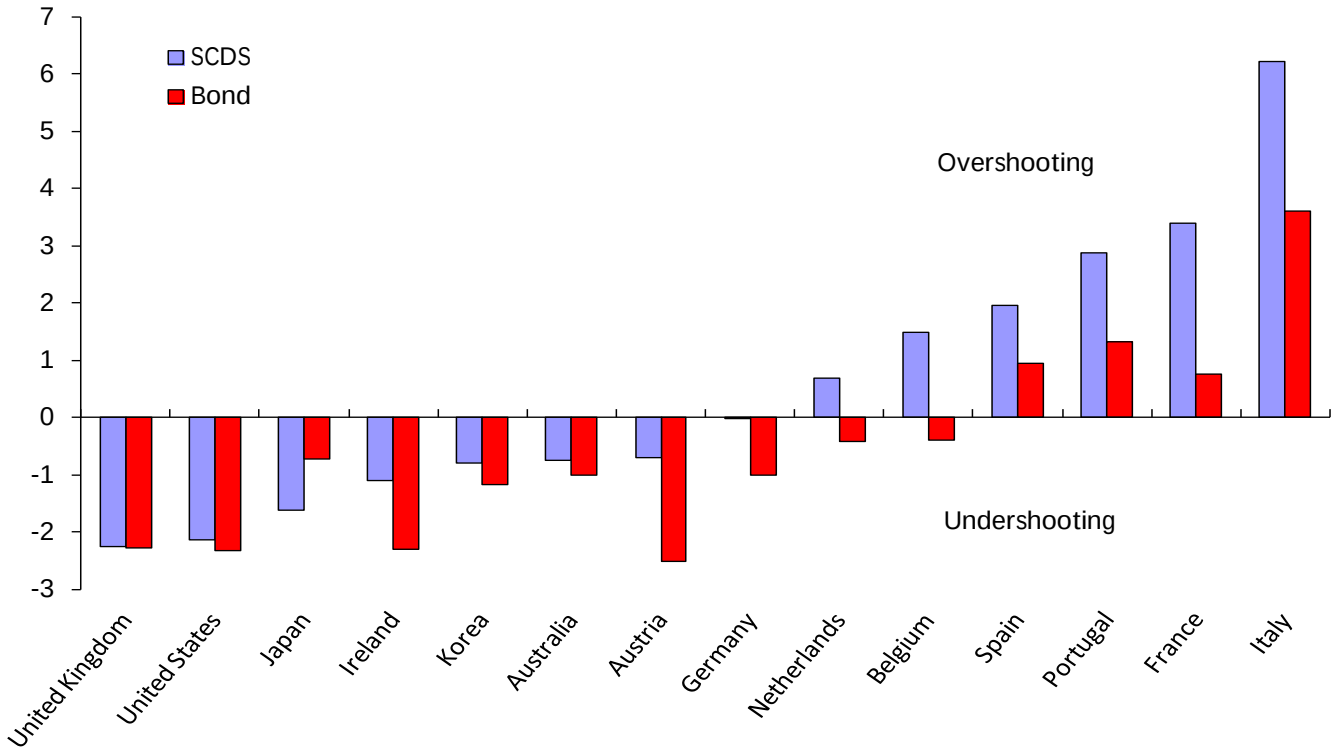
*Not statistically significant.

➢Stability Question: Some signs of overshooting in SCDS market

....Especially for peripheral European countries

Overshooting/Undershooting of SCDS and Sovereign Bond Markets

(Standardized average out-of-sample prediction errors, July 2012-September 2011)



Source: IMF staff estimate.

[1]Average of out-of-sample prediction errors for July 2011-September 2012 relative to the standard deviation of in-sample residuals. For in-sample estimation, the results of the base model (shown in Table 2.5) for 14 advanced economies during October 2008–June 2011 are used.

➢… but no systematic evidence that overshooting raises sovereign funding costs …

beyond what is explained by economic fundamentals and market conditions

Lead-Lag relationships between SCDS and Bond Residuals

(Using residuals from the base determinants model for SCDS and bond spreads for 14 advanced economies)

	SCDS Granger cause Bonds	SCDS do not Granger cause Bonds
Bonds Granger cause SCDS	Korea, Spain	Austria, France, Netherlands, Portugal
Bonds do not Granger cause SCDS	Italy, U.S.	Australia, Belgium, Germany, Ireland, Japan, U.K,

IV. Useful Extensions

1. Strip out risk transfer/guarantees between sovereigns and financial institutions
2. Not a one-by-one approach, but interactively. Surely SCDS are affected (and affect) FIs
3. Persistence: short vs. long duration across markets?
4. Extend the sample and assess policies more comprehensively
   - MP +
   - OMT
5. Look also at positive contagion (virtuous cycles)
   - E.g., Post-LTCM, great moderation, post OMT?
6. Synchronization vs. idiosyncratic from the country's perspective

➢ SCDS market liquidity has dropped off since July 2012 ...though also OMT impact?

Net Notional Outstanding, Selected EU Countries
(December 2011 = 100)