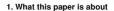
Systemic Sovereign Risk: Macroeconomic Implications in the Euro Area

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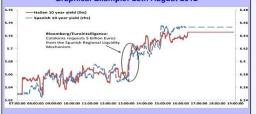


Issue: High sovereign borrowing costs motivated substantial policy response: Austerity, Bailouts, Monetary Interventions.

Question: How fluctuations in sovereign borrowing costs impact the economy?

Approach: Combination of high frequency and narrative identification.

Graphical Example: 28th August 2012



What I do:

- . Build a narrative of events in the crisis: impact of foreign events on local yields.
- $\bullet \ \ \text{Measurement error} \Rightarrow \text{proxy SVAR; adapted for panel setup}.$

2. What are we identifying?

Using high frequency reactions deal with some criticisms of the narrative approach

• events are endogenous; predictable; badly scaled.

But we can never be sure why the market reacts:

· simultaneous events; real/financial linkages; learning.

Some stories of the crisis: Multiplicity/Self-fulfilling beliefs; Cross-country insurance; Convertibility; Common Creditors

Stories are not mutually exclusive but my approach can encompass them.

Not going to: explain the size/sign of the transmission or investigate determinants.

3. Constructing the proxy

What Happened: Need a non-subjective methodology to filter crisis into a narrative series of events.

- News summaries (Beetsma et al (2013)): EuroIntelligence and Bloomberg.
 Event must be country-specific (IT,ES,PT,IE,GR,CY).
 - Must be timeable, looking for announcements.
 - Not: editorial, relate to private companies, unsourced/rumour, data.

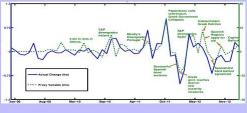
- Gauging the reaction: event time via a news-wire.

 Look at change in bond yields in 20 min window around event time.
 - Important: Remove overlapping events.
- Outside trading hours: only include if it is the "headline" story in the summary.

Another Example: The Italian Election



Annotated Proxy Series (Italy)



4. Methodology:Proxy SVAR identification

Reduced form model (monthly frequency):

 $Y_t = C(L)Y_{t-1} + u_t, \ u_t \sim N(0, \Sigma_u)$

An A-type structural form can be expressed as:

 $Au_{t}=e_{t};\,E(e_{t}e_{t}^{'})=I_{N}$

Partitioned identification: $e_t = (\varepsilon_{1t}', \varepsilon_{2t}')'$. Assume we have a proxy m_t . Key identifying assumptions:

Relevance: $Cov(m_t, \epsilon_{1t}) = \emptyset$ Exogeneity: $Cov(m_t, \epsilon_{2t}) = \mathbf{0}_{N-1}$

SVAR assumption: there exists a row vector $a_1u_t = \varepsilon_{1t} \Rightarrow$

 $m_{t} = \phi \varepsilon_{1t} + \omega_{t} = \phi a_{1}u_{t} + \omega_{t} = \Upsilon' u_{t} + \omega_{t}$

Strip out ϕ using a unit variance assumption.

4.1 Adding a Panel Setting

 $Y_{c,t} = B_c(L)Y_{c,t-1} + u_{c,t}, \ u_{c,t} \sim N(0, \Sigma_{c,u}), \ m_{c,t} = \Upsilon_c u_t + \omega_t$

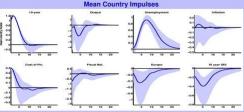
nd the priors in the panel VAR: countries are similar but different. Formalised with excl

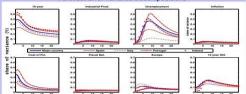
 $\beta_{\rm c} \sim \textit{N}(\tilde{\beta}, \Lambda_{\rm lc}), \; \Sigma_{\rm u,c} \sim \textit{IW}(\tilde{S}, \kappa), \; \Upsilon_{\rm c} \sim \textit{N}(\tilde{\Upsilon}, \Lambda_{\rm 2c})$

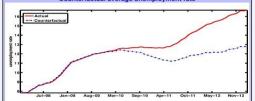
 $vec(B_c)$, and $\bar{\beta}$, \bar{S} , \bar{Y} , Λ_{1c} and Λ_{1c} are estimated hyperparameters. Decompose the variance $\Lambda_{1c} = \lambda_1 L_{1c}, \Lambda_{2c} = \lambda_2 L_{2c}$

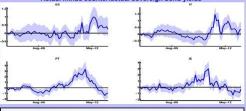
The λ 's determine the degree of shrinkage with $\lambda_1, \lambda_2 \sim IG(-1, 0)$

5. Results









5.1 Sensitivity analyis - alternative proxy definitions

