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Dynamics and Determinants of Eurozone Risk Premia

Liviu Voinea

Matei Kubinschi

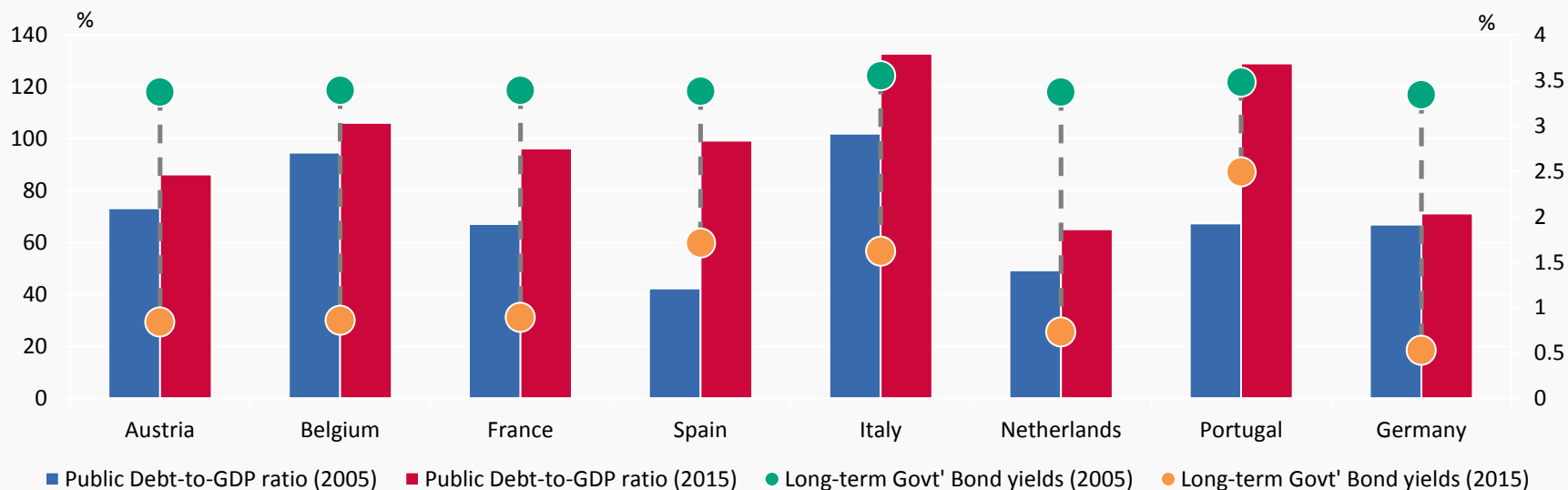
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Presentation outline

- Motivation and main objectives
- Empirical modelling of eurozone risk premia:
 - Extracting information from the term structure of sovereign yields
 - Decomposing yield spreads based on macroeconomic, fiscal and eurozone sentiment indicators
 - Measuring asymmetric effects of Eurozone sentiment transmission
- Results and conclusions

1. Motivation

- Ever since the introduction of the single currency, the remarkable compression of sovereign risk premium differentials → doubts about **financial markets' ability** to provide **fiscal discipline** across euro area members
- Fiscal imbalances, caused by the crisis, significantly contributed to the increase in financing costs for some euro area countries. Conversely, highly indebted countries currently register **record-low sovereign financing costs**



Source: Eurostat

Chart 1. Public Debt and bond yields dynamics (2005 vs. 2015)

1. Motivation (2)

Sovereign Debt Crisis → **widening** of sovereign risk premium differentials in the euro area

The perceived risk of default for euro area countries remained generally low, but financial markets appear to have been increasingly discriminating among government issuers while requiring overall **higher risk premia**

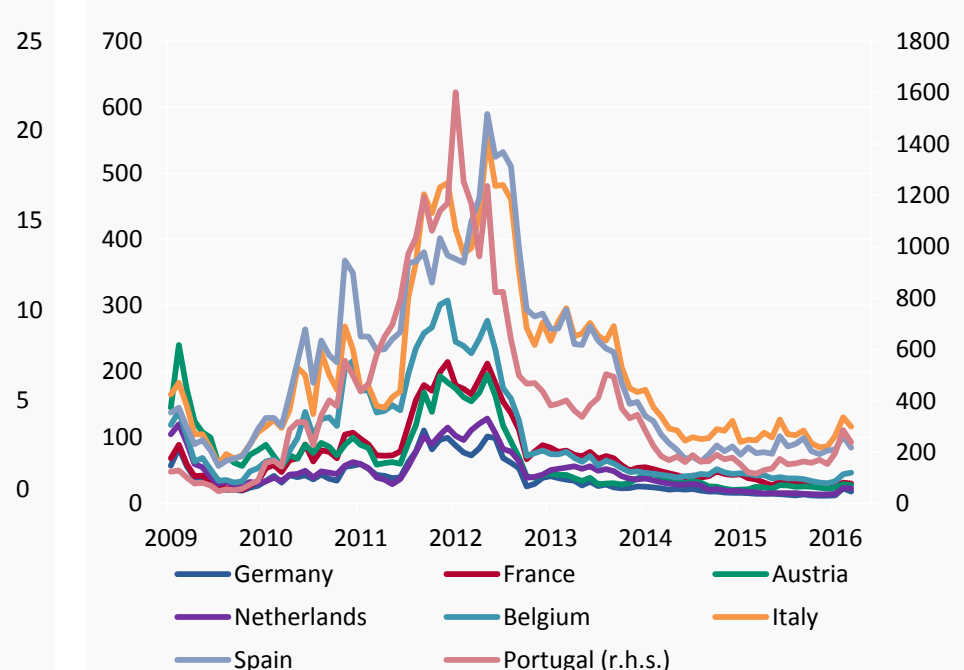
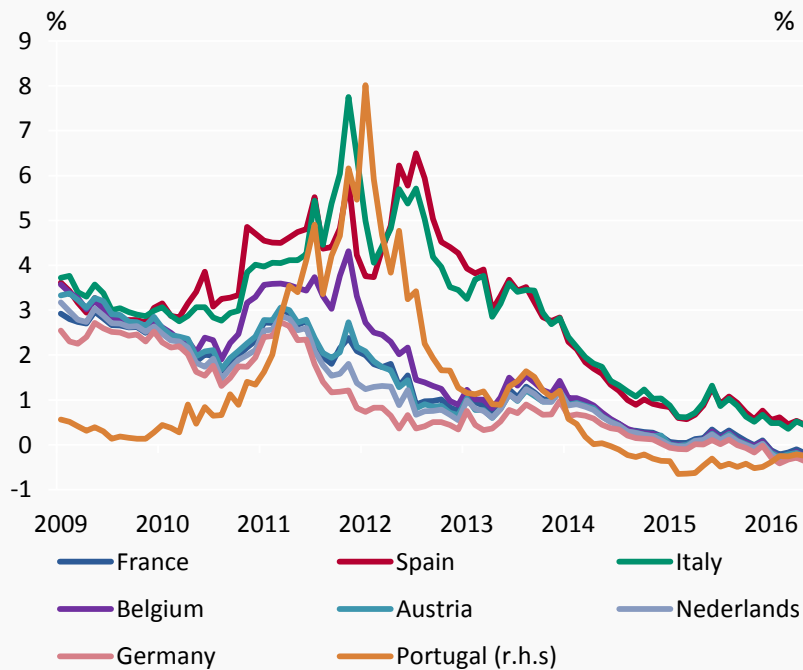


Chart 2. Sovereign yields (*left*) and CDS (*right*) dynamics for eurozone countries

1. Main objectives

In this complex macroeconomic context, the paper tries to shed light on the following subjects:

- What was the impact of **eurozone accession and other important events** on the term structure of sovereign yields?
- What are the **main drivers** behind the divergence in yields observed after 2010?
- Is the impact of **eurozone sentiment higher** in periods of systemic stress?
- Has the eurozone membership acted as a **safeguard** or a **risk source**, in the absence of autonomous monetary and exchange rate policies?

2.1. Extracting information from the term structure of sovereign yields

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sovereign yields

Main idea: apply a 3-factor term structure model (*Nelson-Siegel*, 1987) and extract latent factors (*Level*, *Slope* and *Curvature*) using a state-space approach:

$$y_t(\tau) = L_t + S_t \left(\frac{1 - e^{-\lambda\tau}}{\lambda\tau} \right) + C_t \left(\frac{1 - e^{-\lambda\tau}}{\lambda\tau} - e^{-\lambda\tau} \right) \quad (1)$$

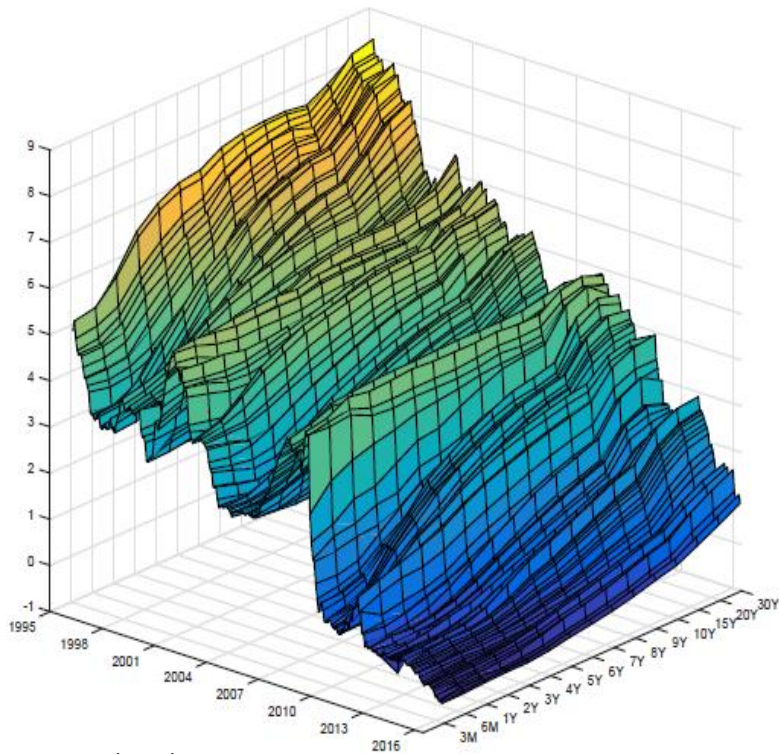
System estimated using ML (*Kalman filter*), using daily zero-coupon yields on 15 maturities for 8 Eurozone states between 1995 – 2016

Measure the impact of **events** on the term structure of interest rates: EMU accession (1995 – 1998), Financial crisis (Sep. 2008 – Dec. 2009), Sovereign debt crisis (Mar. 2010 – Mar. 2014), FED QE (Dec. 2008 – Oct. 2014) and ECB QE (Jan. 2015)

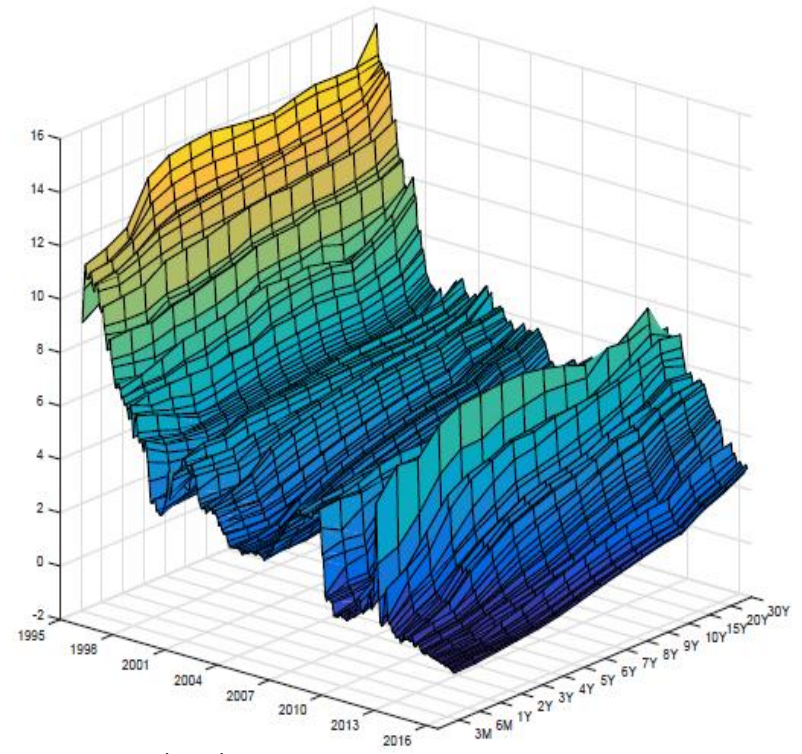
2.1. Extracting Information from the term structure of sovereign yields

sovereign yields

Significant changes in term structure dynamics over the analyzed period



Source: Bloomberg



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Chart 3. Term structure of zero-coupon yields with maturities between 6M and 30Y for **Germany** (left) and **Italy** (right), extracted from Bloomberg

2.1. Extracting information from the term structure of

sovereign yields

Results show significant changes in: **level component** for the EMU accession and ECB QE, **slope component** for EMU accession and the Financial Crisis and **curvature component** for ECB QE

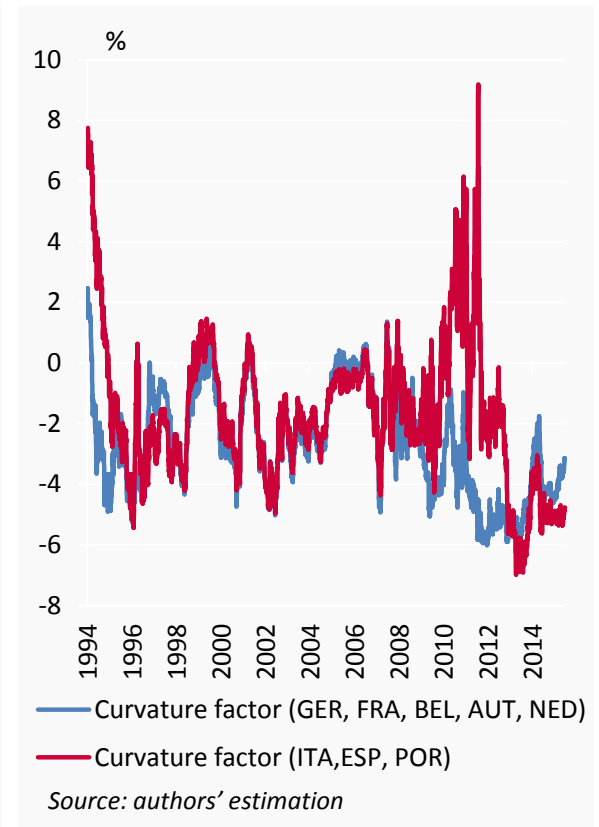
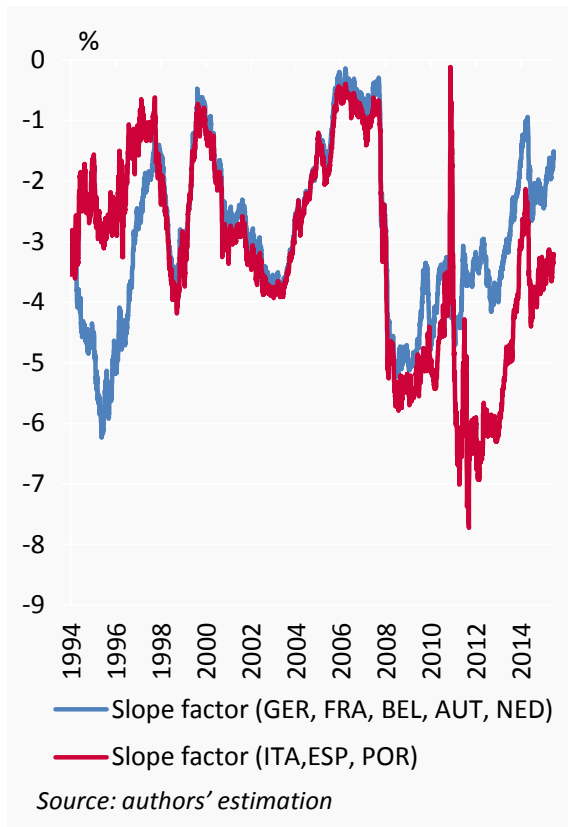
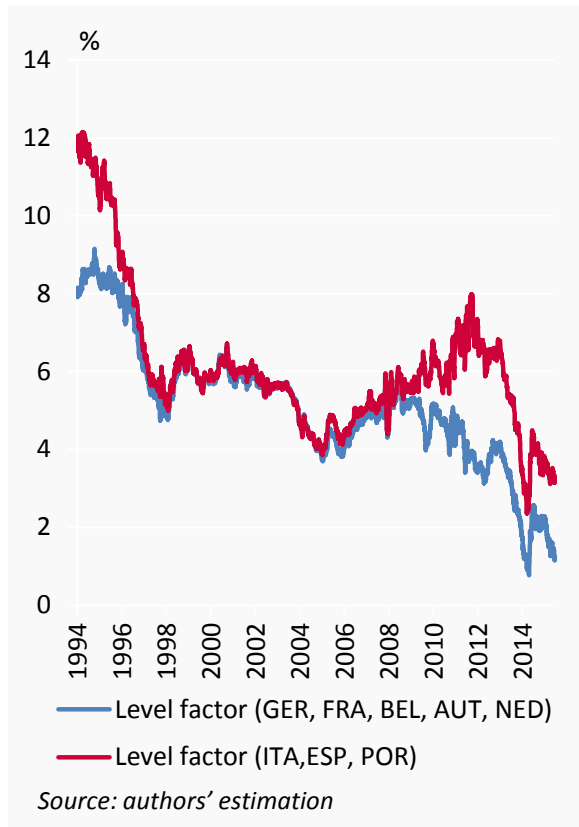


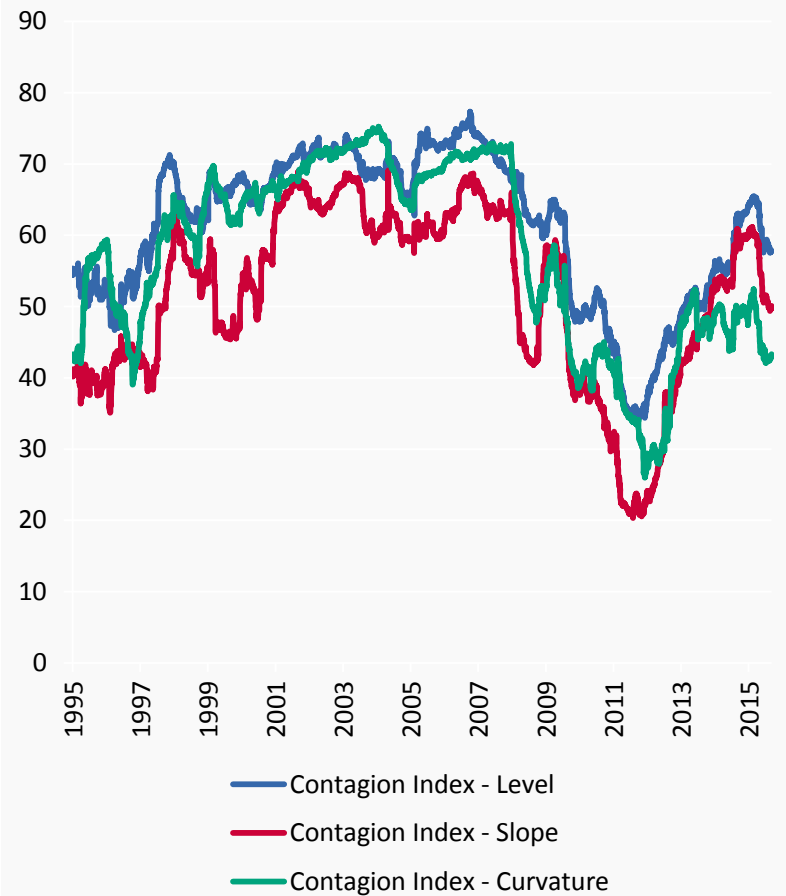
Chart 4. Level (*left*), Slope (*center*) and Curvature (*right*) results for the eurozone states

2.1. Extracting information from the term structure of

sovereign yields

Estimated contagion indices (*Diebold and Yilmaz, 2007*), reveal several distinctive episodes:

- **rapid growth** of contagion level in the EMU accession period, on all 3 factors
- **high degree of contagion** during the synchronized period (2000-2005)
- **declining contagion** level after 2010 → yield divergence can be attributed to **fundamental** factors (sovereign debt issues of EU countries)
- rebound in contagion since 2013 → **market sentiment** is (once again) a significant driver of sovereign yields across all countries analyzed



Source: authors' estimation

Chart 5. Estimated spillover indices for the Level, Slope and Curvature factors

2.2. Decomposing yield spreads based on macroeconomic, fiscal and Eurozone sentiment indicators

2.2. Decomposing yield spreads

Main idea: build a structural model (SVAR) to analyse historical contribution (HD) of macroeconomic, fiscal and Eurozone sentiment shocks to yield spreads.

Variables included in the model:

- **Macroeconomic** – real GDP growth rate and 3M Euribor rate
- **Fiscal** – public deficit-to-GDP ratio
- **Eurozone sentiment** – composite indicator (*PCA weighted*) using ESI, Economic Policy Uncertainty Index (*Baker et al.*) and Google trends "*Grexit*" search index
- **5-year sovereign yield spreads** between each country and Germany

Sample period → Quarterly data, 2000Q1 – 2015Q4

Identification via *short-run restrictions* (Cholesky ordering by exogeneity)

2.2. Decomposing yield spreads

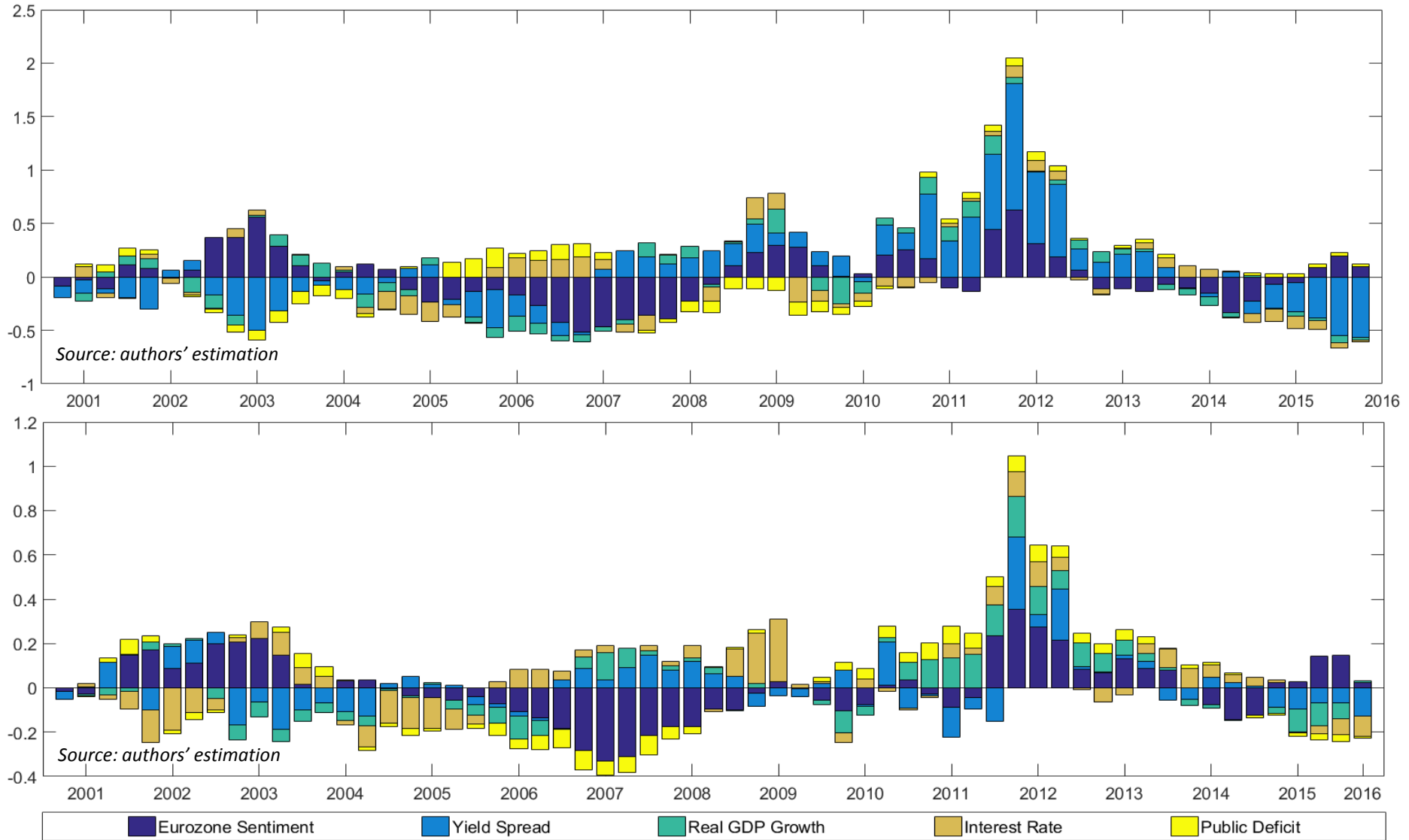


Chart 6. Historical Decomposition (HD) of yield spreads for Belgium (*top*) and France (*bottom*)

2.2. Decomposing yield spreads

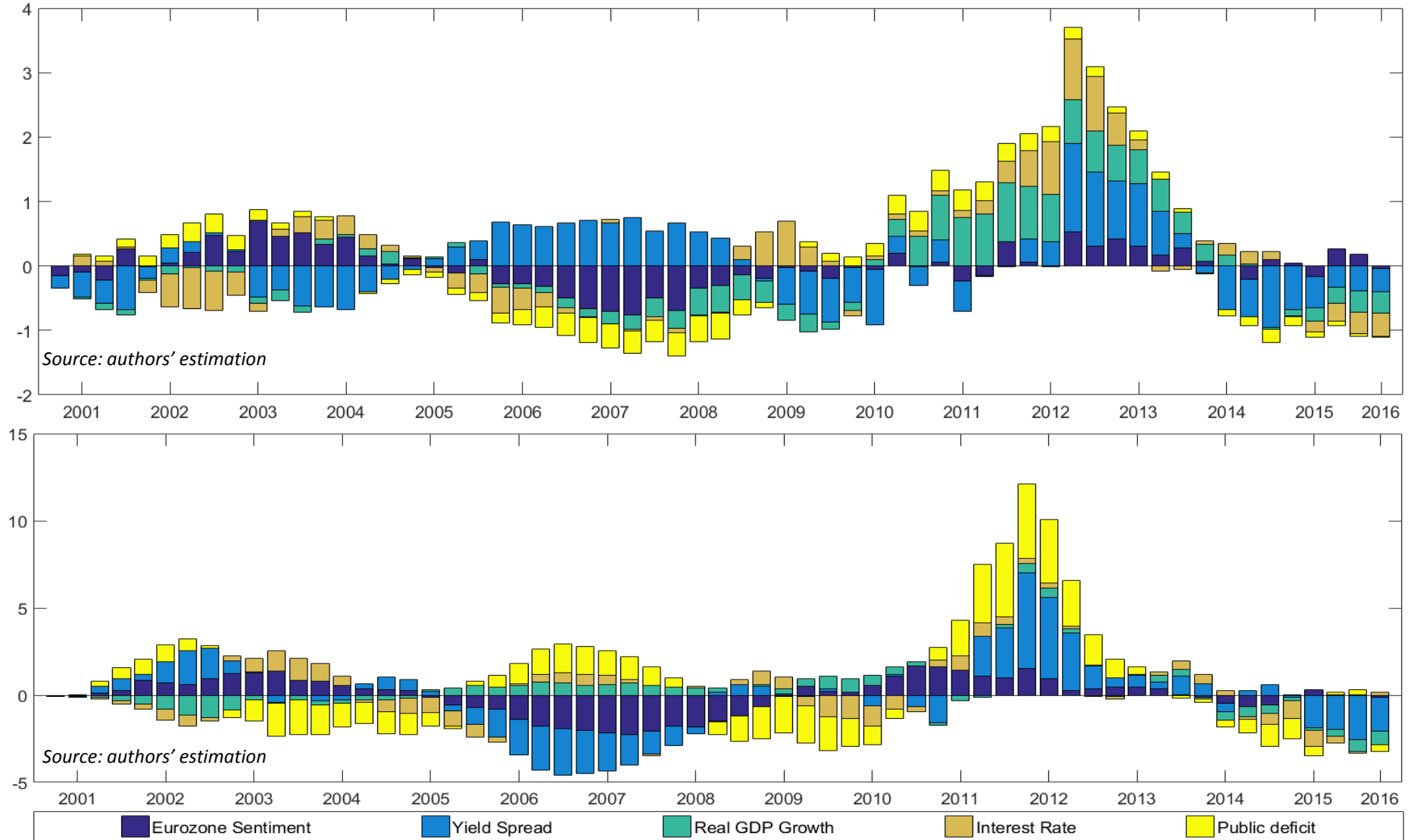


Chart 7. Historical Decomposition (HD) of yield spreads for Spain (*top*) and Portugal (*bottom*)

2.3 Measuring asymmetric effects of Eurozone sentiment

Main idea: extend the structural model (SVAR) to incorporate **Markov-Switching behaviour** (MS-SVAR) → capture **asymmetric responses** in times of stress

Bayesian estimation (*Sims, Waggoner and Zha, 2008*) allowing for switching in the variance → construct regime-dependent **impulse response functions** (IRFs)

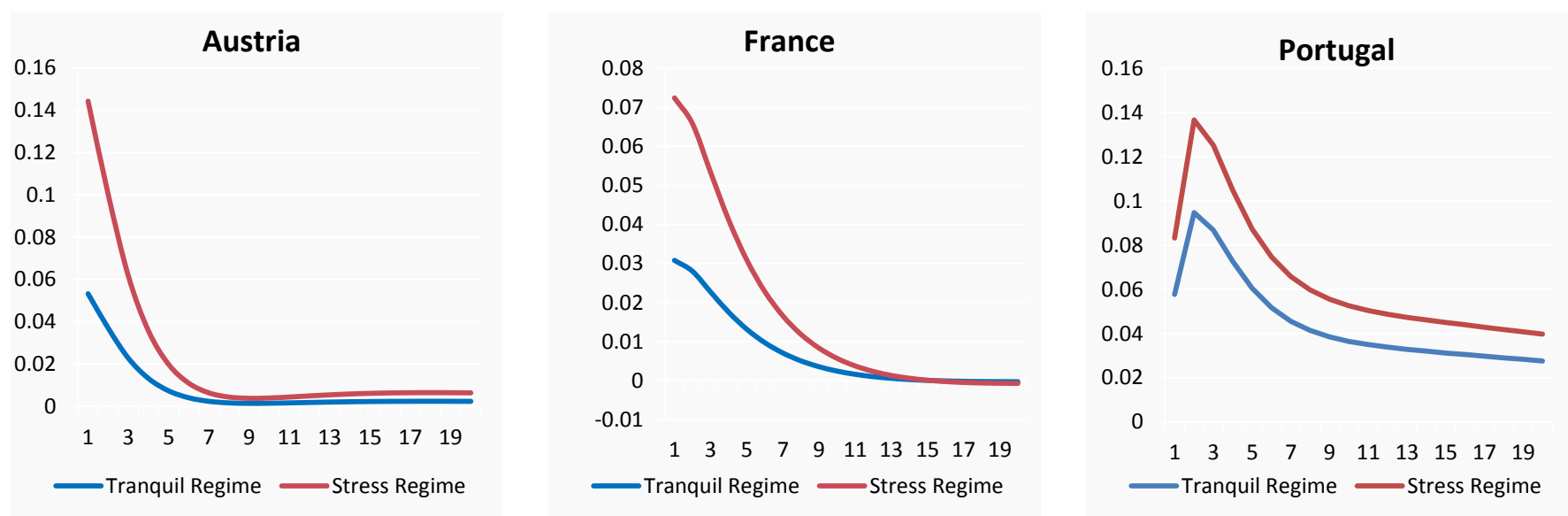


Chart 8. Regime-dependent Impulse-Response Functions (IRF) in Yield Spreads to a Eurozone Sentiment Shock

2.3 Measuring asymmetric effects of Eurozone sentiment

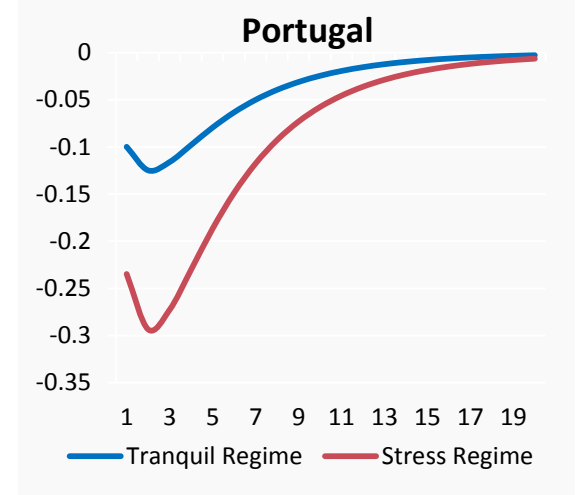
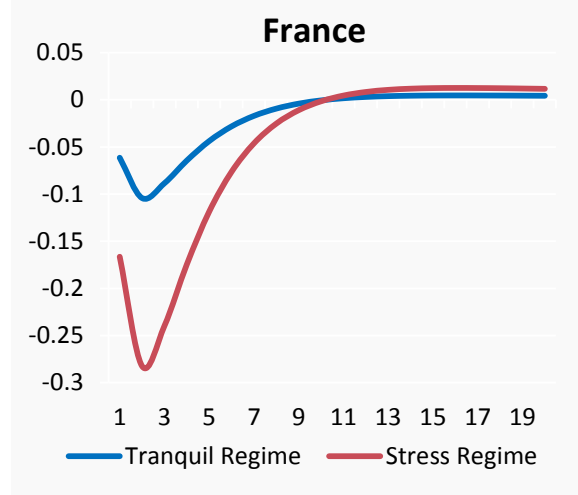
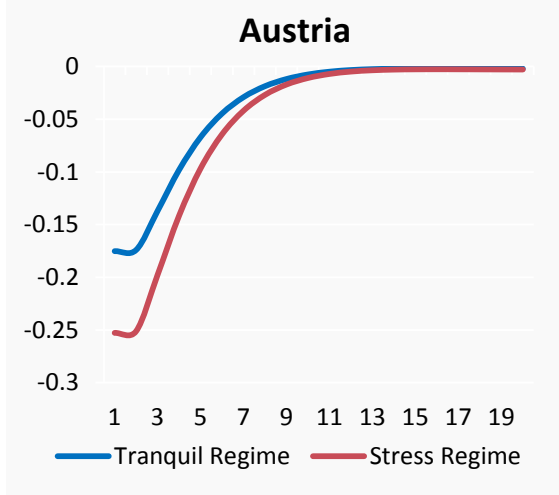


Chart 9. Regime-dependent Impulse-Response Functions (IRF) in GDP growth to a Eurozone Sentiment Shock

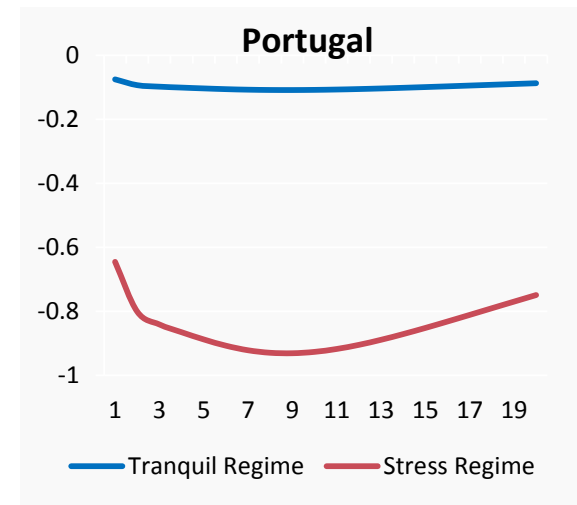
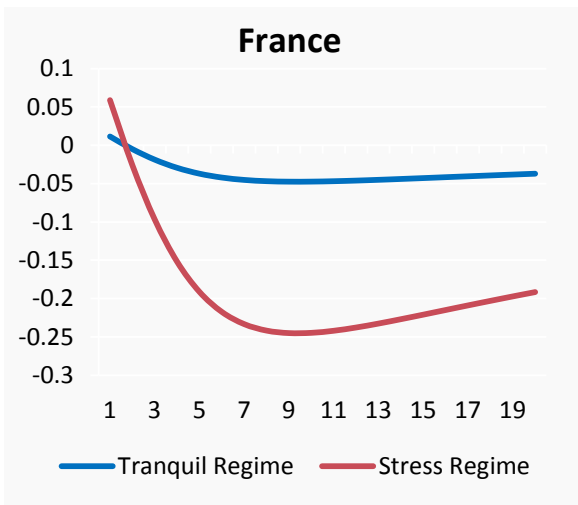
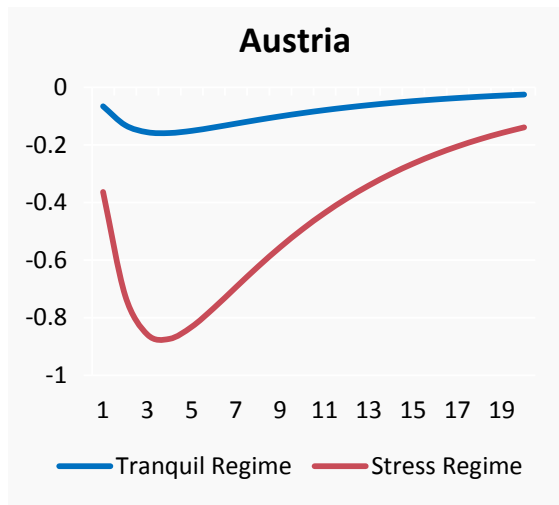


Chart 10. Regime-dependent Impulse-Response Functions (IRF) in Public deficit to a Sovereign spread Shock

Conclusions

- EMU accession → **significant impact** on the term structure of sovereign yields — **high degree of contagion** following EMU accession period with significant spillovers between the Western EU countries and PIIGS group
- Sovereign spreads → driven by macroeconomic, fiscal and sentiment indicators; Specific **country imbalances** have a significant impact on spread divergence (fiscal – Portugal, macro – Spain)
- Eurozone sentiment → **procyclical behaviour**, positive contribution during stressful episodes (sovereign debt crisis) while lowering yield spreads in tranquil times (2005 – 2008)
- Regime-switching model → **significantly higher** impact of *Eurozone risk premia* on economic growth and yield spreads, in volatile periods ↔ **fiscal** and **macroeconomic equilibria** are *sine qua non* conditions for the optimal functioning of the EMU



Thank you for your attention!