Heterogeneity, co-movements, and financial fragmentation within the Euro Area

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Motivation

- Common monetary policy/uncoordinated fiscal polices
- Financial cycles within and across countries
  - Higher synchronicity - more effective monetary and macroprudential policies
  - Lower synchronicity $\leftrightarrow$ financial fragmentation.
- Global financial crisis, sovereign debt crisis and financial fragmentation
  - The crises brought attention on the co-movements in the financial sector
  - Interest rate pass through (IRPT)

Research objectives

- We analyse financial fragmentation across the euro area member states by identifying common and country-specific factors that are driving the dynamics of bank lending rates, the cost of borrowing and credit volumes.
- Is the common European component the main driver of these fluctuations or can we capture a country-specific dynamics? Or are the fluctuations idiosyncratic?

Approach

- We implement a two-level multi country model to disentangle between the common European and the country-specific factors.
- Following Del Negro and Otrok (2008) we incorporate time-varying factor loadings and stochastic volatility.
- We make a distinction between "stressed" and "non-stressed" countries (Altavilla et al, forthcoming).

Related Literature

Financial Cycles

- Eickmeier et al (2009): "Macroeconomic Fluctuations and Bank Lending: Evidence for Germany and the Euro Area"
- Rey (2013, 2016): Global Financial Cycles
- ECB Ocassional Paper Series (2013, 2018): Investigate the effects of financial (cycles) shocks among the EU.
- Breitung and Eickmeier (2015): "Analyzing Business and Financial Cycles Using Multi-Level Factor Models".
- Aldasoro et al (2020): Global and domestic financial cycles.

Related Literature

Interest rate pass-through

- Cicarelli et al. (2013): Study the IRPT breakdown and financial fragmentation across the Euro Area.
- Blagov et al. (2015): Identify country-specific effects that led to the breakdown of IRPT.

Methodology

- Kose et al (2003): Multi-level dynamic factor model.
- Del Negro and Otrok (2008): DFM with time-varying factor loadings and stochastic volatility.
- Mumtaz and Surico (2012): Inflation dynamics.
- Musso and Mumtaz (2019): Global, region and country-specific uncertainty.

Methodology

Two-level dynamic factor model with time-variation in the factor loadings and stochastic volatility

$$y_{it} = B_{it}^{E} F_t^{E} + B_{it}^{C} F_t^{C} + e_{it} \tag{1}$$

$$F_t^{E} = \alpha_t^{E} + \sum_{p=0}^{P} \rho_{p,t}^{E} F_{t-p}^{E} + \sqrt{h_t^{E}} \epsilon_t^{E} \tag{2}$$

$$F_t^{C} = \alpha_t^{C} + \sum_{p=0}^{P} \rho_{p,t}^{C} F_{t-p}^{C} + \sqrt{h_t^{C}} \epsilon_t^{C} \tag{3}$$

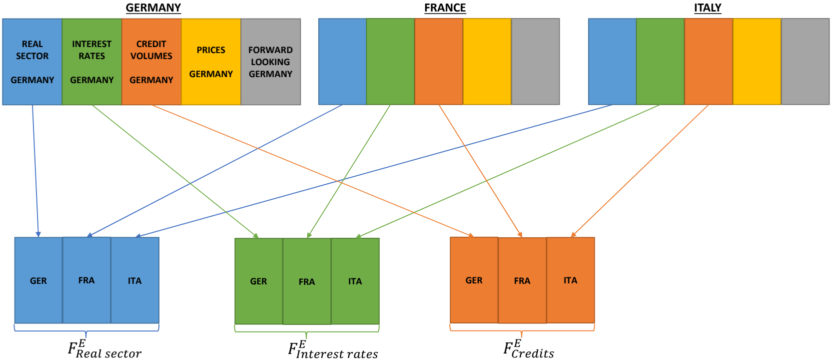
$$e_{it} = \sum_{m=1}^{M} \rho_{im} e_{it-m} + \sqrt{h_{it}} \varepsilon_{it} \tag{4}$$

^{E} denotes the common European component and ^{C} the country-specific component.

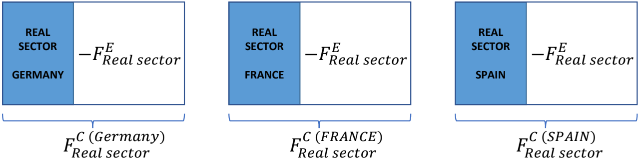
Model Visualisation: Data

REAL SECTOR GERMANY	INTEREST RATES GERMANY	CREDIT VOLUMES GERMANY	PRICES GERMANY	FORWARD LOOKING GERMANY
- Industrial production - Unemployment - Imports/Exports ...	- Short term rates - Long term rates - Deposit rates ...	- Credits up to 1 Million - Credits above 1 Million ...	- HICP - PPI - Real Exchange rate ...	- Outlook surveys - Inflation expectations ...

Model Visualisation: First level



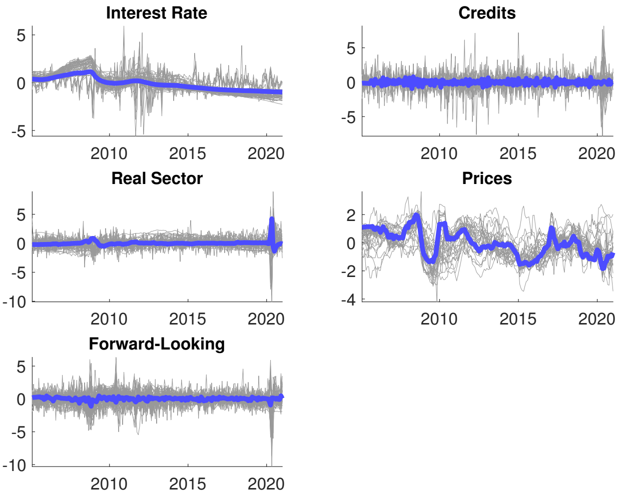
Model Visualisation: Second level



Data Set

- Monthly data starting in January 2003 until December 2020.
- Seven EU countries: Germany, France, Ireland, Italy, Netherlands, Portugal and Spain.
- Balanced panel of 30 macroeconomic and financial variables.
- Monetary and Financial Institutions (MFI) data set for lending rates and credit volumes.
- Harmonized Composite cost-of-borrowing indicators are based on MFI interest rate statistics (four categories).
- ECB, MFI Interest Rates, Non-Financial Corporations: short (below five years) and long (above)

Estimated factors



Methodology

- We focus on using these factors to explain co-movements in the data.
- $var(y_{it}) = (B_{it}^{C})^2 var(F_t^C) + (B_{it}^{E})^2 var(F_t^E) + var(e_{it})$
- Relative contribution coming from common-European component or country-specific component.
- Model is estimated using Bayesian methods.

Variance Decomposition

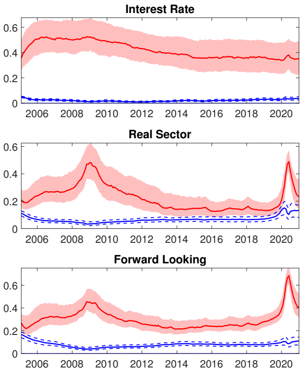
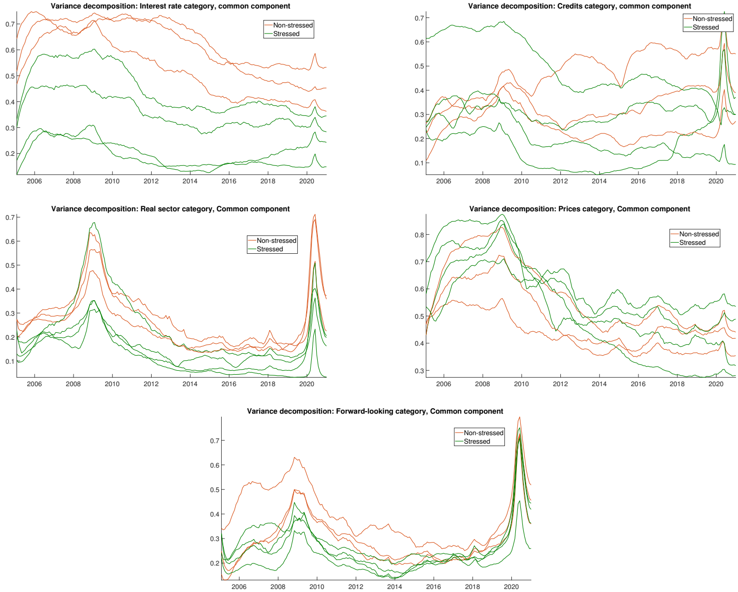
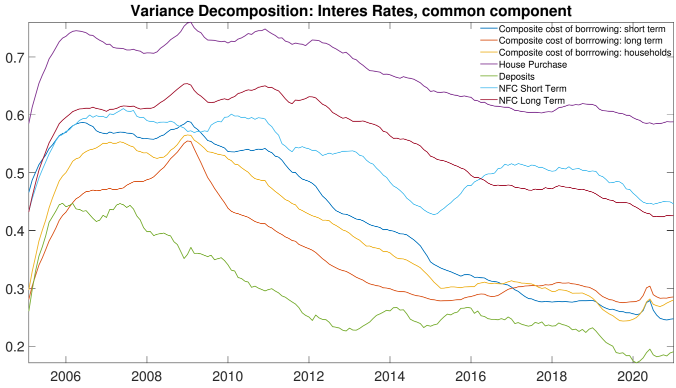


Figure 1: Red line: common European component. Blue line: country-specific component

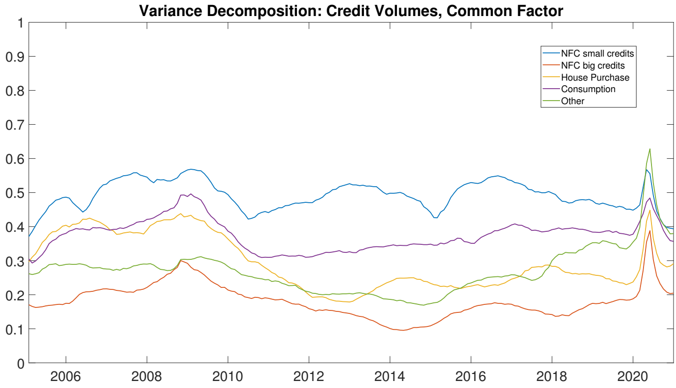


Variance decomposition: Interest rate category, common component
Non-stressed
Stressed
Variance decomposition: Credits category, common component
Non-stressed
Stressed
Variance decomposition: Real sector category, Common component
Non-stressed
Stressed
Variance decomposition: Prices category, Common component
Non-stressed
Stressed
Variance decomposition: Forward-looking category, Common component
Non-stressed
Stressed

Average contribution common component: interest rates



Average contribution common component: credits



Conclusions

- We find heterogeneity among the EU countries in the cost of borrowing varibles coming from the relative importance of the common factor (financial fragmentation).
- The relative importance of the common factor has decreased in recent years.
- There continues to be clear distinction in between the countries that were under stress during the sovereign debt crisis and the central European countries.

References I

Breitung, J. & Eickmeier, S.
Analysing international business and financial cycles using multi-level factor models.
Advances in Econometrics, Vol. 35.

Del Negro, M., & Otrok, C.
Dynamic factor models with time-varying parameters: measuring changes in international business cycles.
FRB of New York Staff Report 326. (2008).

Helene, R.
Dilemma not Trilemma: The global financial cycle and monetary policy independence.
NBER Working Paper No. 21162, May 2015

References II

Hubrich, K., D'Agostino, A., Cervená, M., Ciccarelli, M., Guarda, P., Haavio, M., Jeanfils, P., Mendicino, C., Ortega, E., Valderrama, M. and Endrész, M.
Financial shocks and the macroeconomy.
Occasional Papers, No 143, European Central Bank

Mumtaz, H. & Musso, A.
The Evolving Impact of Global, Region-Specific, and Country-Specific Uncertainty.
Journal of Business & Economic Statistics, 1-16. October 2019

Working Group on Econometric Modelling
Real and Financial Cycles in EU countries: Stylized facts and modelling implications.
ECB Ocassional Papers Series No. 205, January 2018