Credit conditions and the effects of economic shocks: amplification and asymmetries

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The views expressed in this presentation are those of the author and do not necessarily reflect the views of the European Central Bank and the Eurosystem.

Outline

Main questions

- Are macro-financial relationships characterized by **time-variation**?

- Which **type** of time-variation (smooth/abrupt)?

- What are the relevant **"state variables"** to describe the time-variation in macro-finance?

Model

Time-varying dynamic factor model

$$Y_t = A_{1,t}F_{t-1} + \cdots + A_{p,t}F_{t-p} + \epsilon_t$$
$$\epsilon_t = N(0, \Sigma_t)$$

Time-Variation

- $A_{u,t} = \alpha + \pi(\gamma, f_{t-1}^r, ...)\beta$ and $\Sigma_t = [1 - \pi(...)]\Sigma_1 + \pi(...)\Sigma_2$

  ▸ γ "smoothness" of the time variation (large implies abruptness)
  ▸ f_{t-1}^r state variable that "governs" the time variation

Factor Estimation

- $F_t = BY_t$, MAI model
- Y_t, 20 US variables capturing real activity (8), inflation (4), monetary policy (2) and credit conditions (6, spreads).

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Results

- Time-variation in US macro-financial relationships
- The relevant state variable to describe time-variation is the credit condition factor
  - Lesson for structural macro models?
  - Monetary and macro-prudential policy interaction?
- Time-variation well characterized by being abrupt (regime switching)
- In stress times, amplification and asymmetries in the effects of demand and supply shocks
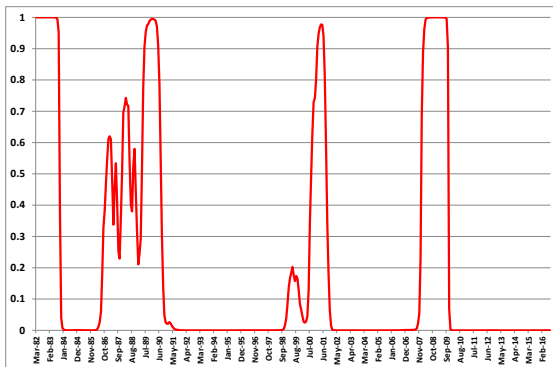
⇒ **Nice and relevant paper!**
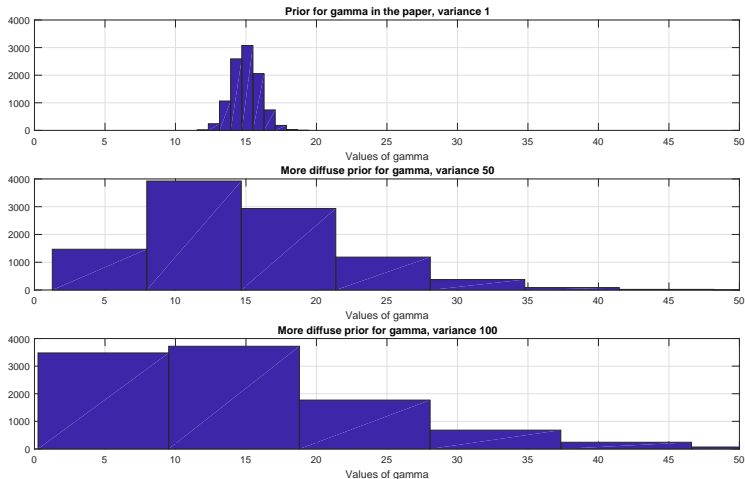
Outline

1 Summary of the paper

2 Comments
- The type of time-variation: exploring the prior for γ
- Dynamic heterogeneity
- Finance or Macro?

The type of time-variation: exploring the prior for γ

- Estimates of γ large $\Rightarrow$ Abrupt changes in regimes
- Is that really so strong in the data? Prior sensitivity analysis.

- The prior mass is mostly on high values
- How much ground for smooth or time-invariant behaviour?

- Gamma distribution is a great choice
  - ▶ Very popular now in the literature on time-variation for his ability to accommodate different types of behaviour
  - ▶ Explore more diffuse priors
- Another possible aspect to be considered: nature of persistence
  - ▶ In this paper, only coming from common sources (no lags of individual variables)
  - ▶ Jarocinski and Lenza (2018): ratio of MSE, inflation forecasts with and without idiosyncratic persistence

Horizon	One quarter	Two quarters	Four quarters
MSE ratio	0.93	0.92	0.85

  - ▶ It can be very important to account for idiosyncratic persistence

Dynamic heterogeneity

- The assumption of the linearity of the factor in the variables is extremely convenient
  - ▶ The factor are estimated by means of a linear regression
- It also makes a lot of sense!
  - ▶ Smart way to use the lessons from the empirical success of estimated dynamic factor models
  - ▶ Although, why is that relationship assumed to be time-invariant?
- However, the relationship is assumed to be only contemporaneous
  - ▶ We know that economic data are characterized by "dynamic" relationships
  - ▶ Comovement may be higher at leads and lags: it should be accounted for in the estimation
  - ▶ It could easily be done in this framework, where factor estimation boils down to a regression problem

An example of the relevance of dynamic heterogeneity, D'Agostino et al. (2014)
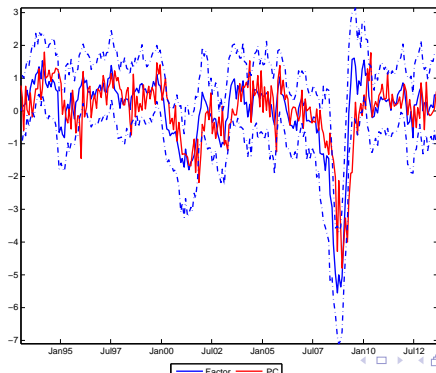
Finance or Macro?

- The factors are freely estimated (up to some normalization assumption) and then ex post labelled
- The strong dynamic comovement among variables complicates the identification of the sources of time-variation
- Table 2 shows that the factors are correlated
  - For example, finance and activity factors correlation is -0.49
- Are we really sure about the financial nature of the drivers of time-variation?
  - Is there an issue of identification?

Activity and finance factors
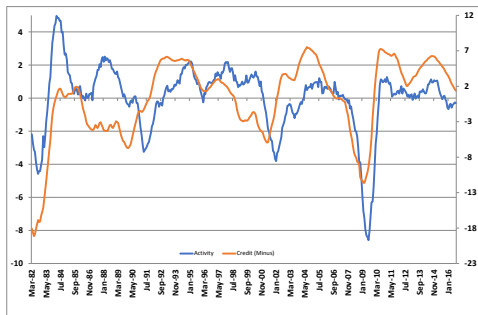
- Maybe the relevant drivers of the economy are financial shocks
- Alternative explanation: drivers are macro and financial variables just react earlier
  - An idea for the next paper? See also Leiva-Leon and Uzeda (2019)

- Very nice paper!

- Less dogmatic on time-variation?

- The authors could also continue to develop the technique in several directions

  - ▶ Taking more sophisticated dynamics into account
  - ▶ More ambitious identification of the drivers of time-variation