

# **Do Credit Shocks Matter? A Global Perspective**

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## **Discussion**

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## Summary of the paper

- **Issue:** The recent financial crisis renewed the interest into the relationship between credit markets and the rest of the economy.

What is the role of credit markets in the business cycle? Did it "generate-amplify" the crisis? Was it different this time? The angle of this paper: are (both global and transmitted US) credit shocks an important driver of GLOBAL business cycles?

- **Method and Results 1:** Global shocks (shocks affecting aggregates of G7 variables)

- Stationary VAR (long-run relationships?) with five G7 aggregates (First PC) and US credit spreads. Identification of four shocks (sign restrictions): credit, policy, productivity and demand: IRF, Variance decomposition, Histories

- Credit shocks explain non-negligible portion of variance of global variables and are relevant to explain GDP dynamics in the last recession (20% of the cumulative growth rates).

- **Method and Results 2:** Transmission of US shocks

- Stationary VAR (long-run relationships?) with six US variables plus global GDP (PC)

- Results on importance of credit shocks confirmed (actually, magnified).

## Outline of the discussion

- 1) The debate on the relevance of credit markets
- 2) Do variable specific PCs fully capture global fluctuations?
- 3) How many "global" shocks?
- 4) Which credit aggregate/disaggregate to use?

# 1) The debate on the relevance of credit markets

Debate on the recent crisis: credit market as one of the culprits of the crisis. Renewed interest of exogenous drivers of the business cycle related to credit markets. However, credit markets relevant for business cycles for two potential reasons:

- 1) Source of business cycle per se (Exogenous Credit Shocks);
- 2) Affect the propagation of other shocks (Financial Accelerator)

Intuition from a toy NK model plus financial accelerator on households: Kannan, Rabanal and Scott (2009)

$$r_t^L = f\left(\frac{B_t}{A_t \times P_t^H}\right) + r_t + u_t^F$$

-  $P_t^H \uparrow \Rightarrow f(\cdot, P_t^H) \downarrow \Rightarrow r_t^L \downarrow \Rightarrow P_t^H \uparrow \dots$

-  $u_t^F$ : financial shock (exogenous tightening in credit supply, credit crunch)

Here: **importance of "credit" shocks**. Novel feature: global perspective. Literature: relatively mixed results (this paper seems the upper boundary so far).

Role for credit in economic fluctuations (propagation of shocks)  
EVEN if no role for credit shock. Other (more structural) tools needed to study role of credit in propagation.

**A SIMILAR DEBATE:** monetary policy matters for the business cycle?

## An exercise on the euro area

8 variables VAR (GDP, consumption, residential investment, credit, house prices, lending rate (house purchases), euribor 3 months, CPI). 5 lags

Bayesian shrinkage in order to control for estimation error (Doan, Litterman and Sims, 1984; De Mol, Giannone and Reichlin, 2008; Banbura, Giannone and Reichlin, 2009). Degree of shrinkage set as suggested in Giannone, Lenza and Primiceri, 2010.

### *Strategy:*

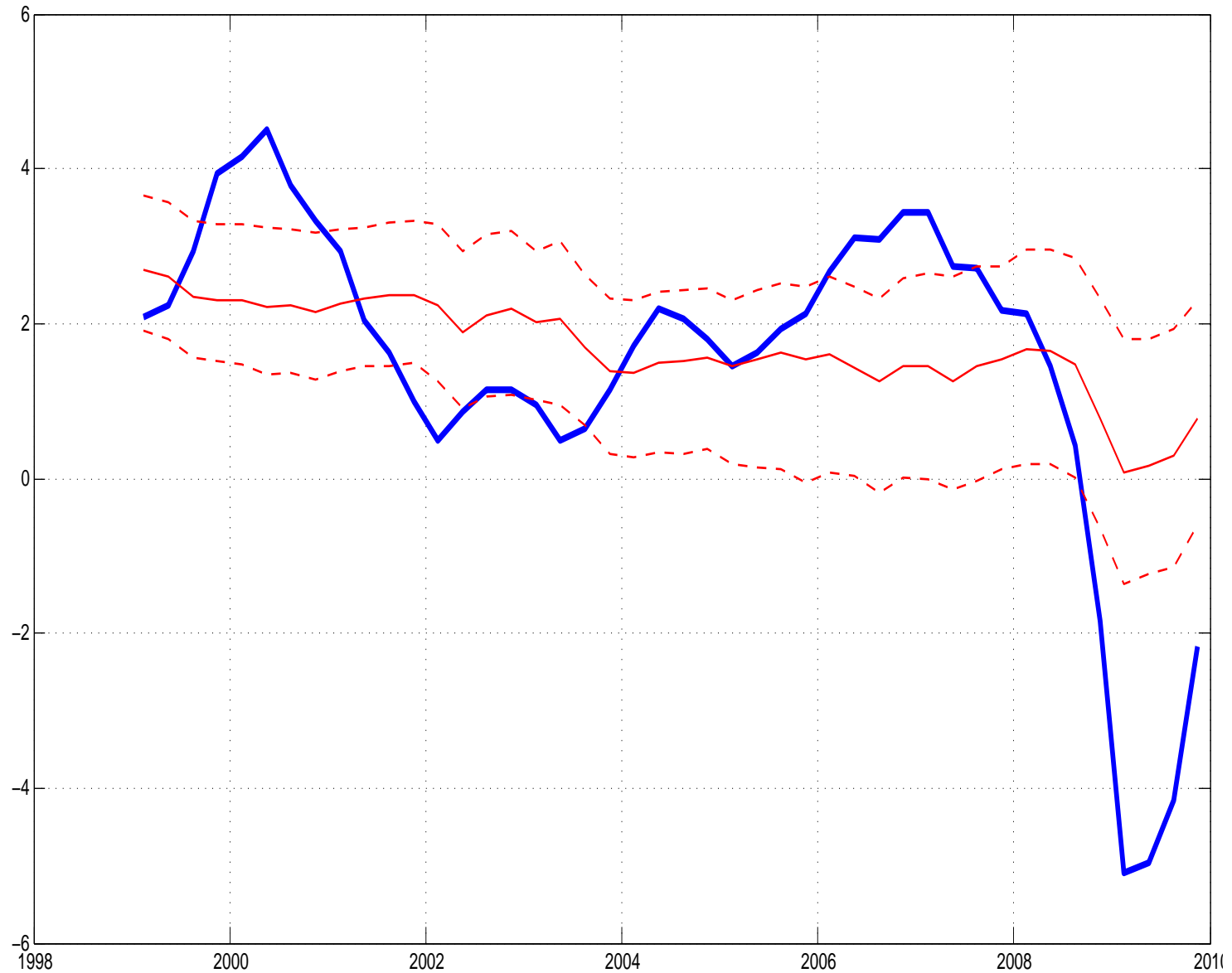
- Identify "credit shock" by means of sign restrictions in DSGE model mentioned above

### Impact of financial shocks

Variable	Impact
Lending rate	Negative
Consumer prices	Positive
Real activity	Positive
Policy rate	Positive

- Measure of relevance of financial shock: "histories" of VAR variables conditional on financial shock. **Zero out the effects of all shocks except the financial shocks.**

GDP



Conclusion 1: Though credit shocks might not be (too) relevant to explain BC fluctuations, credit markets may still play a key role to shape BC fluctuations by "amplifying" fluctuations due to other shocks!



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## 2) Do variable specific PCs fully capture global fluctuations?

Global VAR among variable-specific global factors (5+1); Global GDP included in US VAR

Global Factors: First principal component (PC) of GDP, Productivity, Inflation, Interest rates and Private Credit in G7 countries

Example: global credit  $C_t$

$$C_t = \alpha \times ([f_{1,t} \dots f_{p,t}]) + \beta \times ([g_{1,t} \dots g_{m,t}])$$

$f_{i,t}$ : common factor across variables and countries

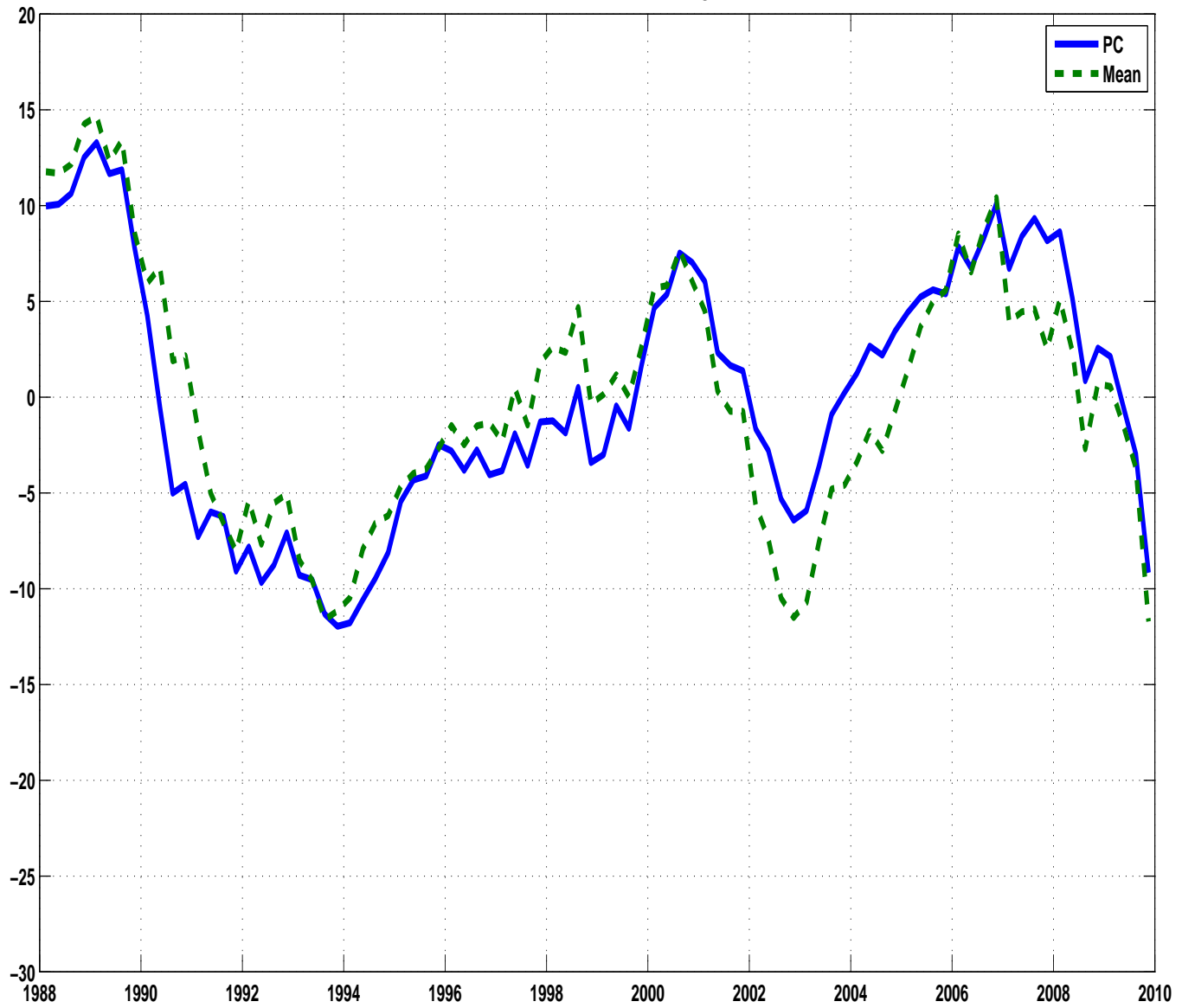
$g_{j,t}$ : common factor of credit across countries (possibly correlated with other variable specific factors)

**Question:** does  $C_t$  fully capture "global" credit (i.e. all the dynamics of credit owing to global shocks)?

Issue here is NOT if the full set of the six global variables captures all the global shocks (more on this later)!

$C_t$  is basically a cross-country average: correlation Mean/PC 0.85 (figure 1)

Credit: PC and Average

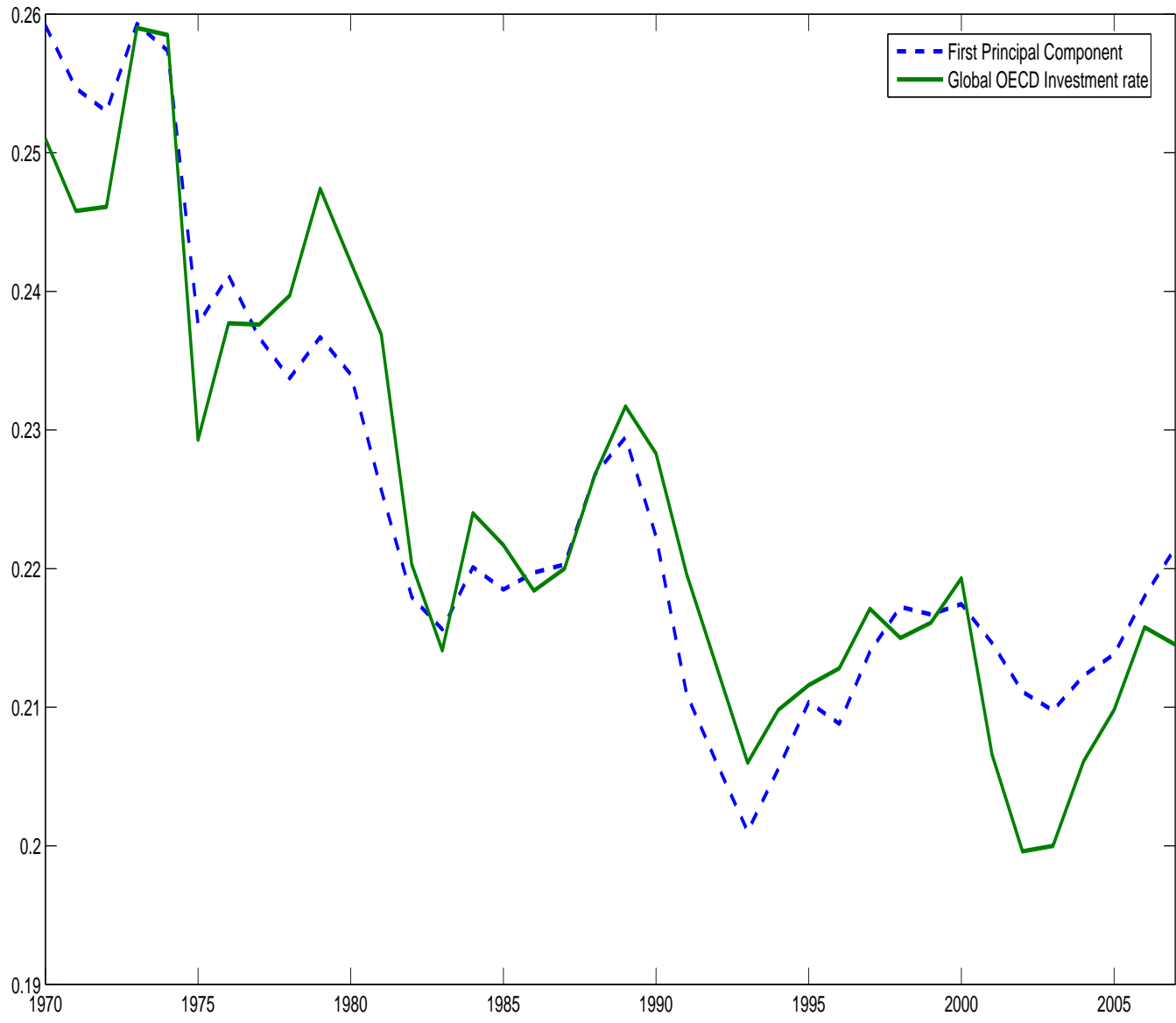


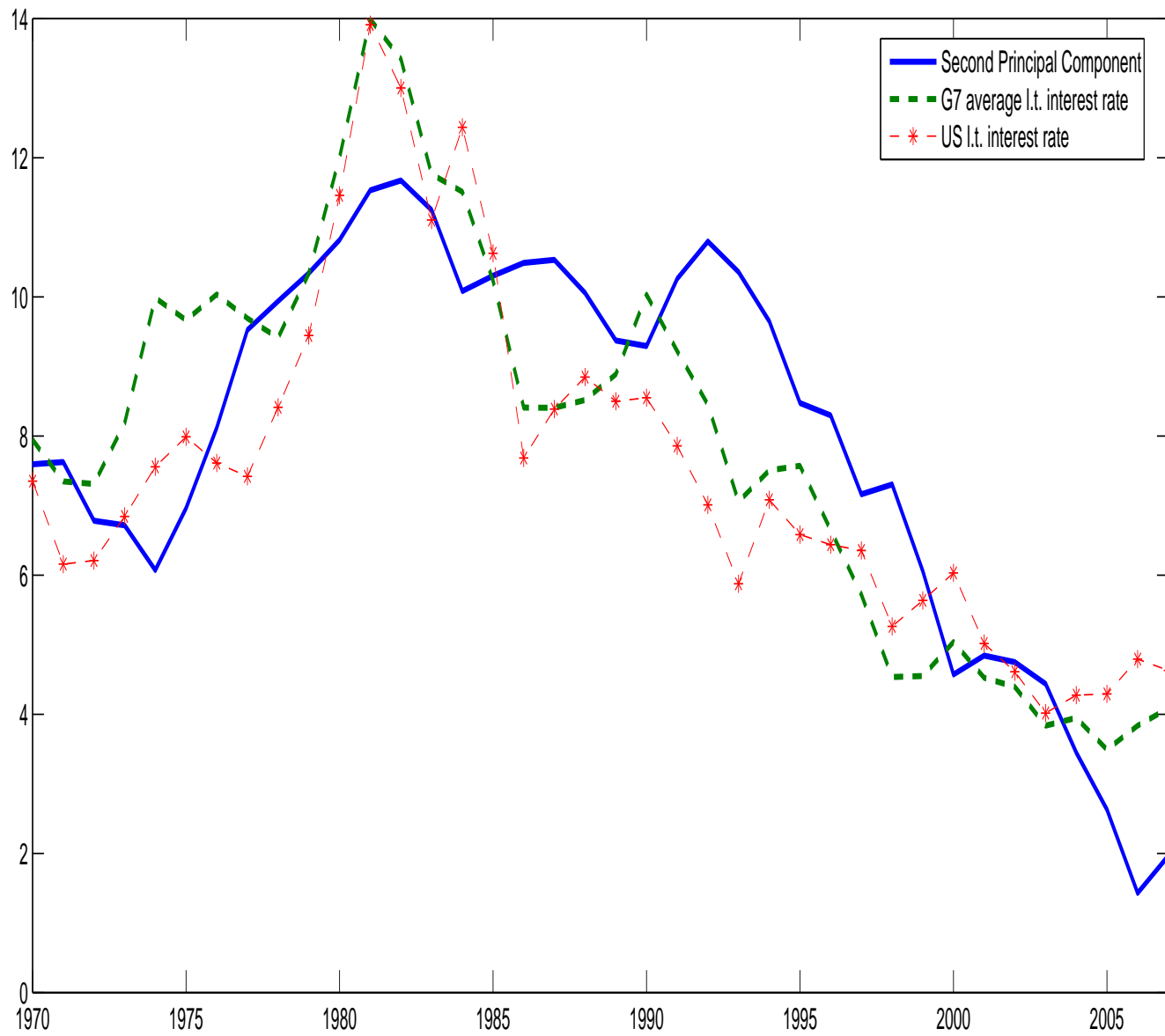
## **An example: Saving and Investment in OECD countries**

Giannone and Lenza (ISOM 2009): Panel of Saving and Investment to GDP ratios in OECD countries (1970 - 2007)

One aggregate (mean, PC) not able to capture the global dynamics in, say, Investment ratios

Off-average fluctuations can be driven by global shocks! Figures 2 and 3 (OECD Investment and Interest rates)





## Back to credit

Crude (due to small cross-section) test of importance of global shocks for off-average movements  $\Rightarrow$  Variance explained by PC's of Credit in G7 countries

### Percentage of variance captured by PC's of credit

1 Pc	2 Pc	3 Pc	4 Pc
35%	24%	19%	7%

Off-average fluctuations relevant. The study here explains the cross-country average of credit but it potentially neglects an important part of the "global" fluctuations in credit (and other variables).



## **A suggestion in light of Point 2...**

Why not to estimate a "traditional" structural factor model on all the variables?

$$x_{i,t} = \alpha * f_t + \beta * \xi_t$$

$f_t = A(L)f_{t-1} + u_t$ : common factor across variables and countries

Also the cross-section to identify shocks with signs.

Other alternative: Large Bayesian VAR. Bayesian shrinkage same as to estimate dynamic factor model if data comove (De Mol, Giannone and Reichlin, 2008).

Conclusion 2: Limiting the analysis to cross-country averages might lead to an understatement of the global component of different country/variables.

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### 3) How many "global" shocks?

Variance explained by STATIC principal components in the whole panel (36 variables)

#### Percentage of variance captured by PC's of credit

1 Pc	2 Pc	3 Pc	4 Pc
40%	21%	11%	6%

2-3 PCs can explain a relevant portion of the panel variance. PCs are an estimator of (a linear combination) of the common factors.

Number of "important" PCs is upper boundary of number of global shocks (equals the number of global shocks only in unlikely case of lack of "global" dynamic effects in the panel).

## Example

$$y_{i,t} = \alpha_{1,i} * u_t + \alpha_{2,i} * u_{t-1} + \beta_{1,i} * e_t$$

Define  $f_{1,t} = u_t$ ,  $f_{2,t} = u_{t-1}$  and  $f_{3,t} = e_t \Rightarrow y_{i,t} = \alpha_{1,i} * f_{1,t} + \alpha_{2,i} * f_{2,t} + \beta_{1,i} * f_{3,t}$

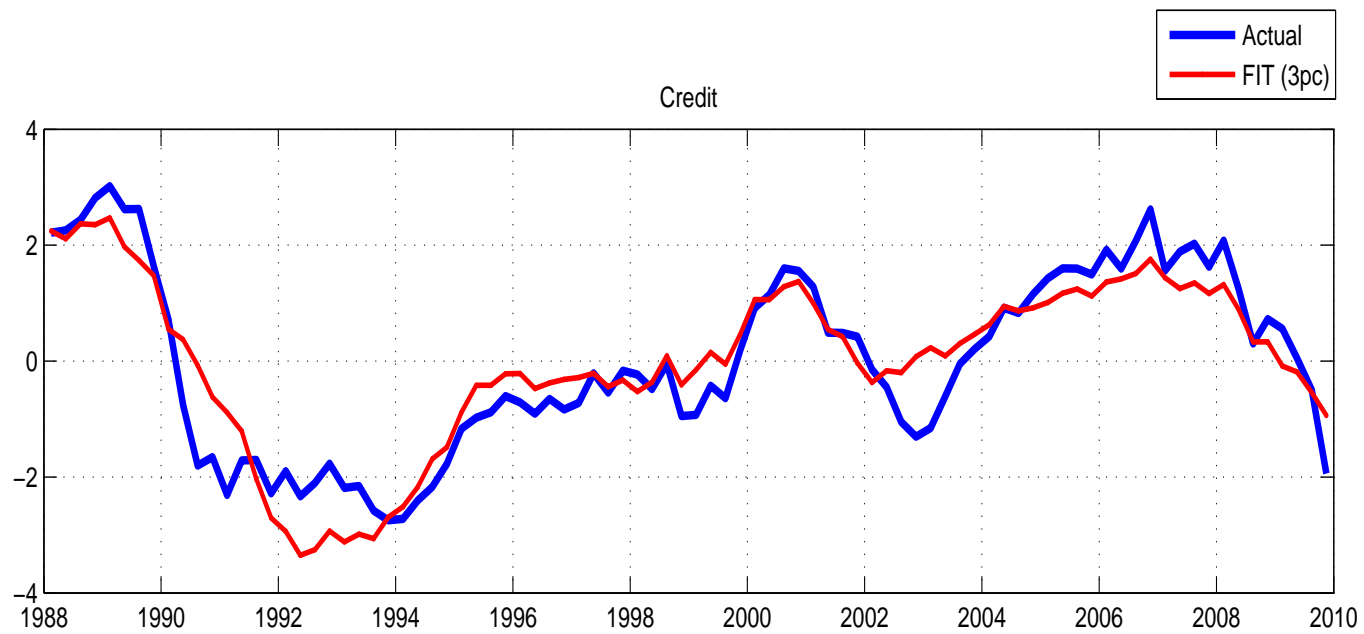
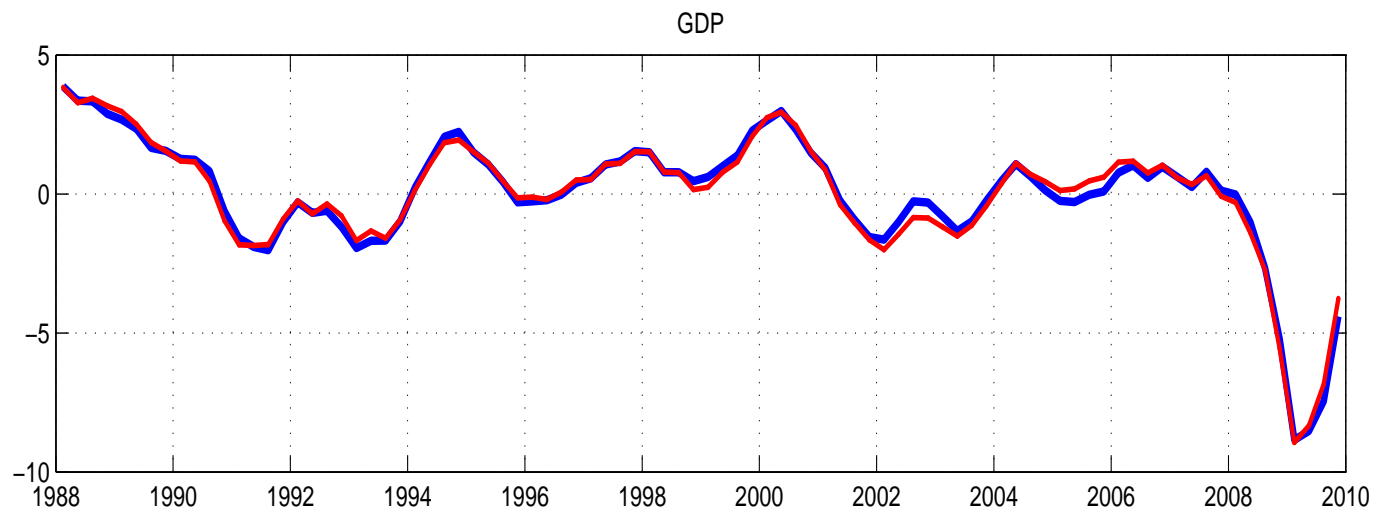
In the paper, some of the four identified shocks are not pervasive! Consistent with the evidence here. Indeed, the global aggregates still allow for the presence of "variable-specific" dynamics.

**The relationship of the aggregates in the paper with the factors computed on the whole panel (i.e, with the global shocks)**

Compare the aggregates with their fit in a regression on the factors estimated in the whole panel.

$$\tilde{C}_t = a_0 + a * \tilde{f}_t$$

I report only GDP (top panel, figure 4) and Credit (lower panel, figure 4). Two lines: aggregate in the paper (blue solid line) and fit of the aggregate with three PCs (red dashed line)



Conclusion 3: Global fluctuation driven by less than the four identified shocks. This could explain the lack of "pervasive" effects of some of them.

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#### 4) Which credit aggregate/disaggregate to use?

- Banks - non Banks

- Euro area more bank-based than US.

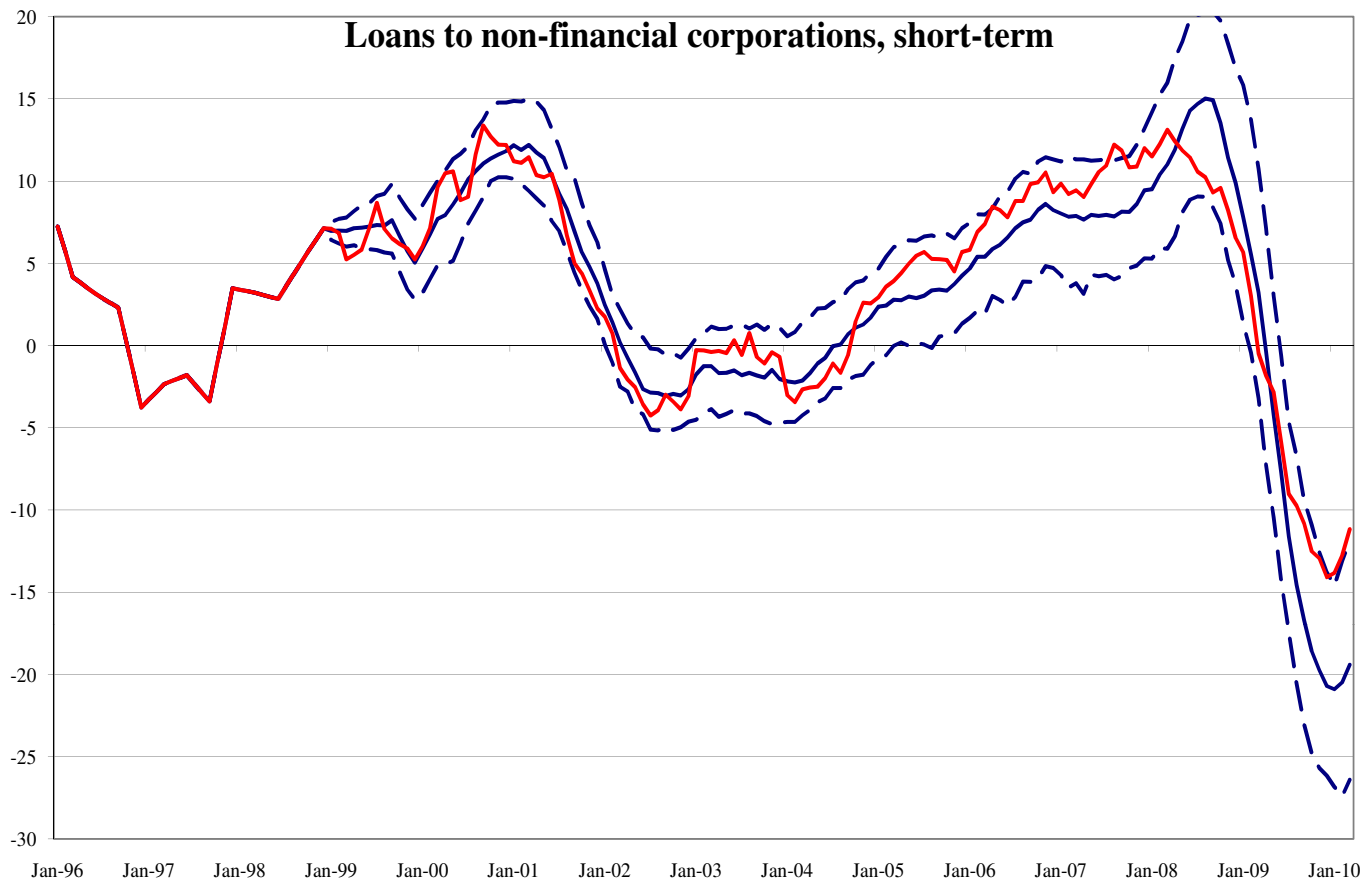
- Securitization

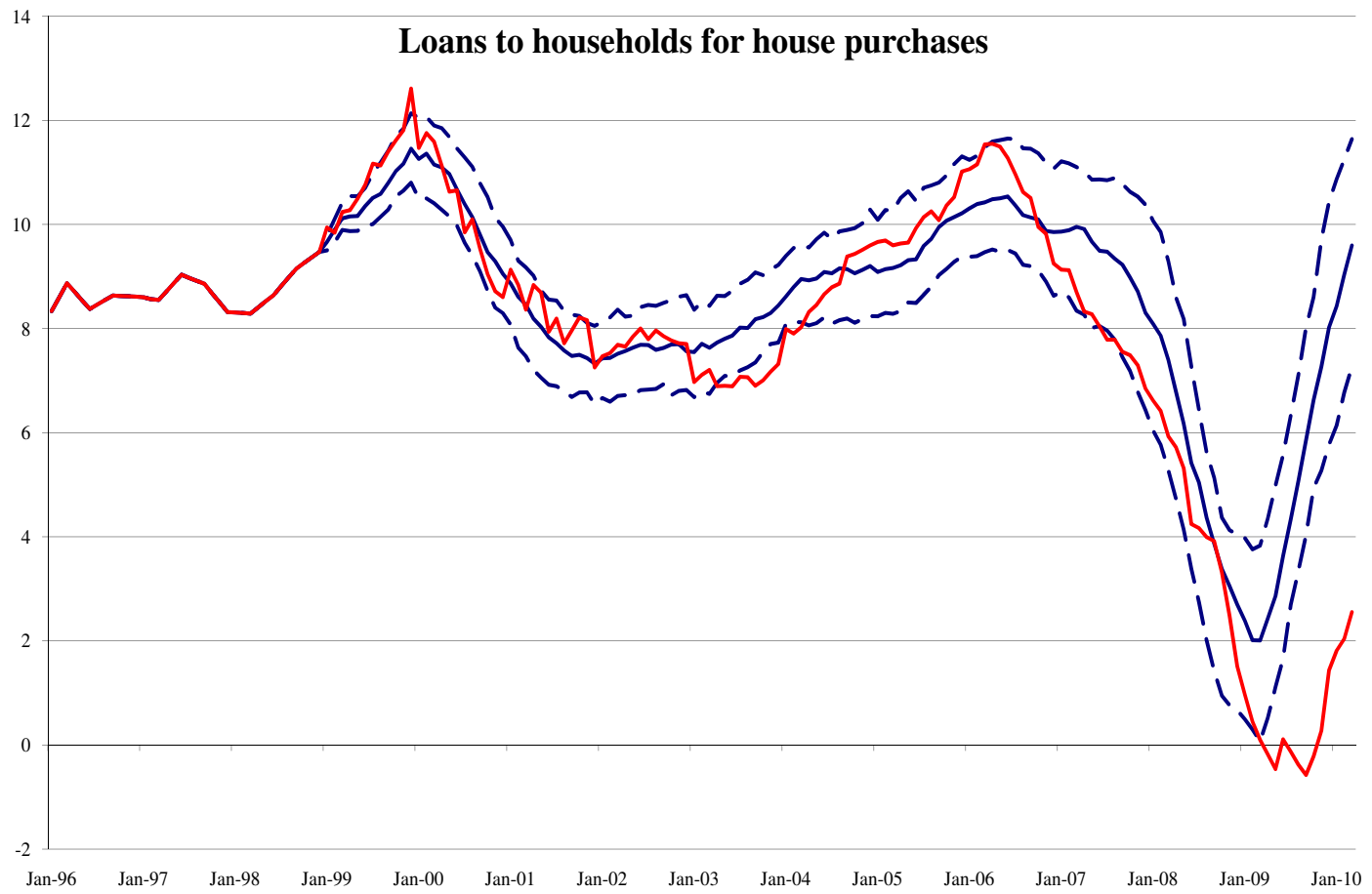
- Heterogeneity of behavior across holding sectors (households, firms)

- What is a credit shocks? Are there more possible credit shocks? (Bernanke-Gertler and/or Iacoviello)

- Giannone, Lenza and Reichlin (2010): large VAR (39 variables) of the euro area with disaggregated credit and money variables (and return on loans and money)

Different reaction to the same shocks: Monetary Policy/Business cycle.  
Different behavior of credit to households and firms during the crisis!  
(Figures 5 and 6)





Conclusion 4: Credit is hard to define. Relevant heterogeneity across sectors both in normal times and in crisis dynamics: in the euro area it is credit to households for which "this time is different"

## The messages of my discussion

- 1) Though credit shocks might not be (too) relevant to explain BC fluctuations, credit markets may still play a key role to shape BC fluctuations by "amplifying" fluctuations from other shocks!
- 2) Limiting the analysis to cross-country averages might lead to an understatement of the global component of different country/variables.
- 3) Global fluctuation driven by less than the four identified shocks. This could explain the lack of "pervasive" effects of some of them.
- 4) Credit is hard to define. Relevant heterogeneity across sectors both in normal times and in crisis dynamics: in the euro area it is credit to households for which "this time is different"