EUROPEAN CENTRAL BANK

EUROSYSTEM

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Discussion of "The I Theory of Money" by Markus Brunnermeier and Yulij Sannikov

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"The Role of Monetary Policy Revisited"

Summary and contribution

- **Monetary theory with a crucial role for financial intermediaries that can create inside money establishing a link between monetary and financial stability**
- **Financial intermediaries can transfer funds from households with high wealth but low productivity to households with low wealth and high productivity (better than direct lending)**
- **But it makes the system vulnerable to the balance-sheet strength of the intermediaries, which contract inside money (credit and deposits) when hit by bad shocks (collapse of money multiplier)**
- **This increases the value of outside money ("deflation") and amplifies the adverse effect on intermediaries' risk bearing capacity, inter alia, through an increased real value of deposits**
- **Monetary policy can counter these effects, because interest rate reductions increase the value of government bonds ("stealth recapitalisation") that the intermediaries may hold as a hedge against adverse shocks**

What the paper/model has and doesn't have

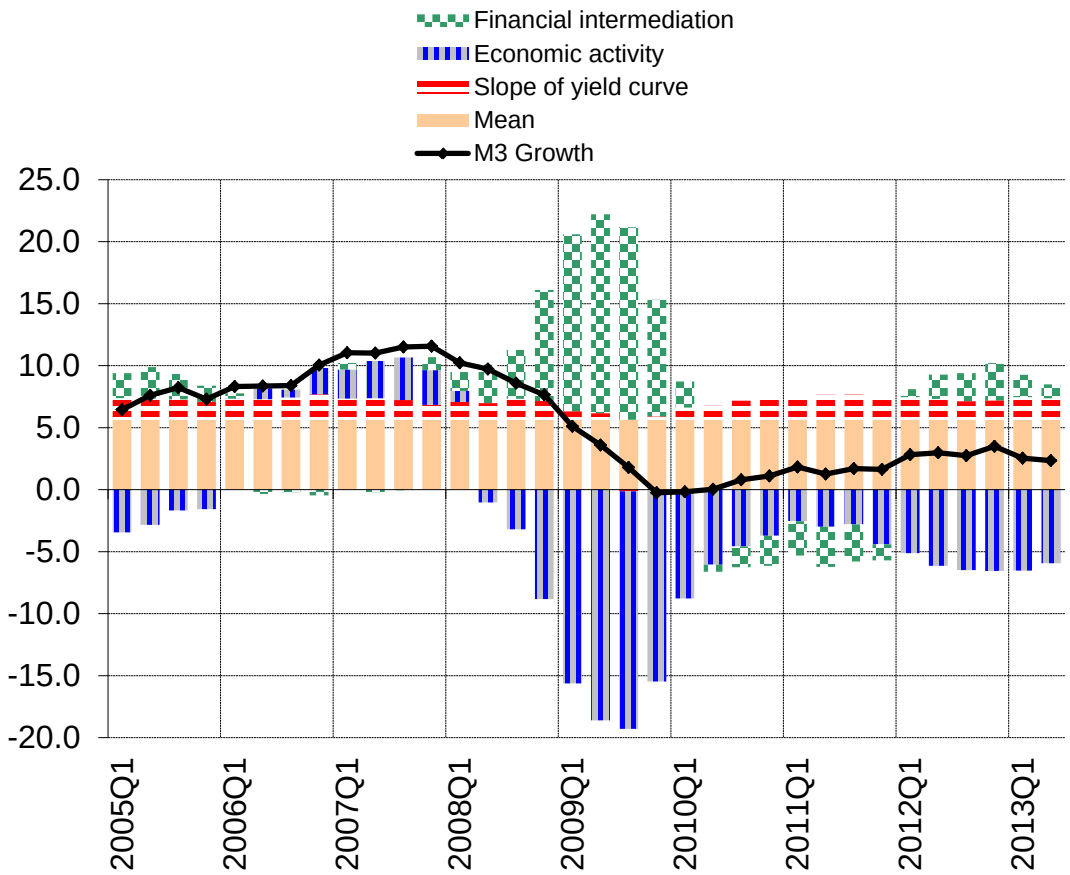
- **Displayed agents**
  - Optimising households that consume, allocate their portfolios between money and physical capital and are heterogeneous in wealth and productivity
  - Optimising representative intermediary that takes deposits from saving households and allocates its portfolios between money and lending capital to borrowing households
- **Not displayed**
  - Central bank that sets some type of optimal monetary policy (only example of specific interest rate reduction and bond purchases)
  - (Macro-)Prudential authority that sets some type of optimal regulatory policy
  - Resolution authority and/or equity market for restructuring intermediaries
  - Fiscal authority that sets some type of optimal tax/government debt policy (tax backing money)
- **Core of the model is the credit exchange part with the levels of intermediation, values of money and capital, portfolio allocations etc. depending on crisis or not**

Major challenge in economics: How to incorporate (systemic) financial instability into macroeconomics

- **Authors one of the leading early contributors on the theory side (Brunnermeier and Sannikov forthcoming: non-linearities, off-equilibrium dynamics, endogenous risks, volatility paradox etc.)**
- **But we need to go beyond**
  - Heterogeneous banks (maybe even shadow banks): systemic
  - Bank (or even sovereign) defaults in equilibrium: meaningful regulation
  - Risks not only on the asset side but also on the funding side
  - Potential destabilising aspects of long-term government bonds (e.g. maturity mismatch, sovereign risk, interest rate risk (particularly at low rates), replacement of private financing (Aoki and Sudo 2012)
- **Finally, profession has made some progress but the journey is not over (Mini survey: Hartmann, Hubrich and Kremer 2013)**
- **Better have further advanced frameworks, which allow assessing (macro-)prudential regulatory policies, then re-introduce monetary aspects and compare the roles of monetary and prudential policies**

Structural model in ECB's monetary analysis

Decomposition of M3 growth (annual percentage changes; percentage point contributions)



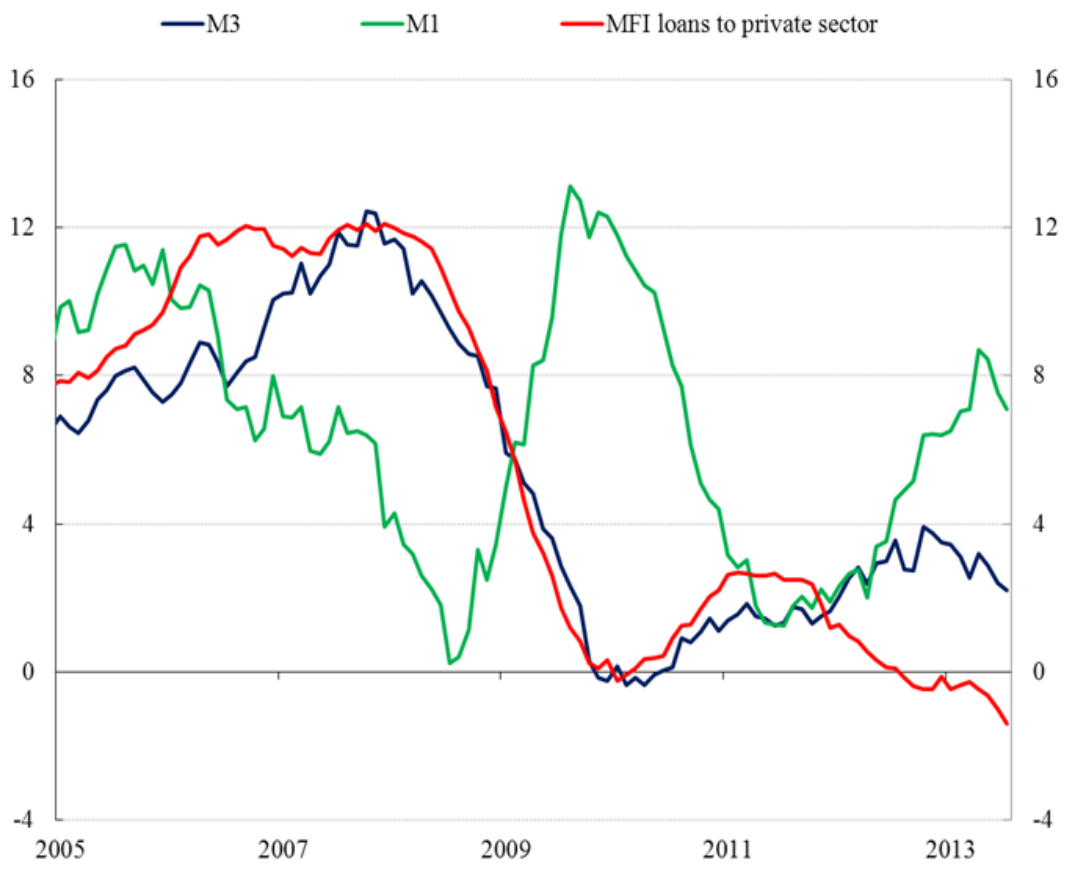
- **Allows observed M3 growth to be decomposed in the contributions from various structural shocks identified in the model**
- **Allows for cross-checking of ad hoc/judgmental/partial equilibrium approaches followed in real time**
- **Allows for counter-factual scenarios around the (Broad) Macroeconomic Projection Exercise baseline, which explore the impact of different assumptions for monetary and financial variables**

Source: ECB calculations, based on CMR-model (Christiano, Motto and Rostagno 2010)

Money and credit

- **Paper considers inside money as identical to credit to the private sector**
- **Recent uncoupling of money and credit growth in the euro area**
- **Low credit growth because of deleveraging and credit supply constraints**
- **M3 supported by capital inflows and money holdings by the government sector**

Monetary aggregates and MFI lending to the private sector
(annual percentage changes)



Source: ECB. Latest observation: August 2013.
M3 (annual growth): 2.2%; M1 (annual growth): 7.1%;
MFI loans to the private sector (annual growth): -1.4%.

Role of monetary policy

- **Should it really actively assume the role described in the paper?**

1) Endogenous/tail risks

- ECB has done some unconventional policies where related risks clogged the monetary transmission mechanism
- Fixed rate full allotment: Funding strains (not in the paper)
- Outright monetary transactions: Redenomination risk driving up sovereign yields (not in the paper)

2) Risk-bearing capacity of intermediaries

- 3-year LTROs: Funding strains (not in the paper)
- But the usual answer to solvency problems of banks are re-capitalisations (and not “stealth” ones through monetary policy/monetary financing?)
- Can’t compare costs and benefits in this model

3) Moral hazard

- “Leaning” versus “cleaning” (macro-pru versus monetary policy)
- Again, not comparable in the model

References

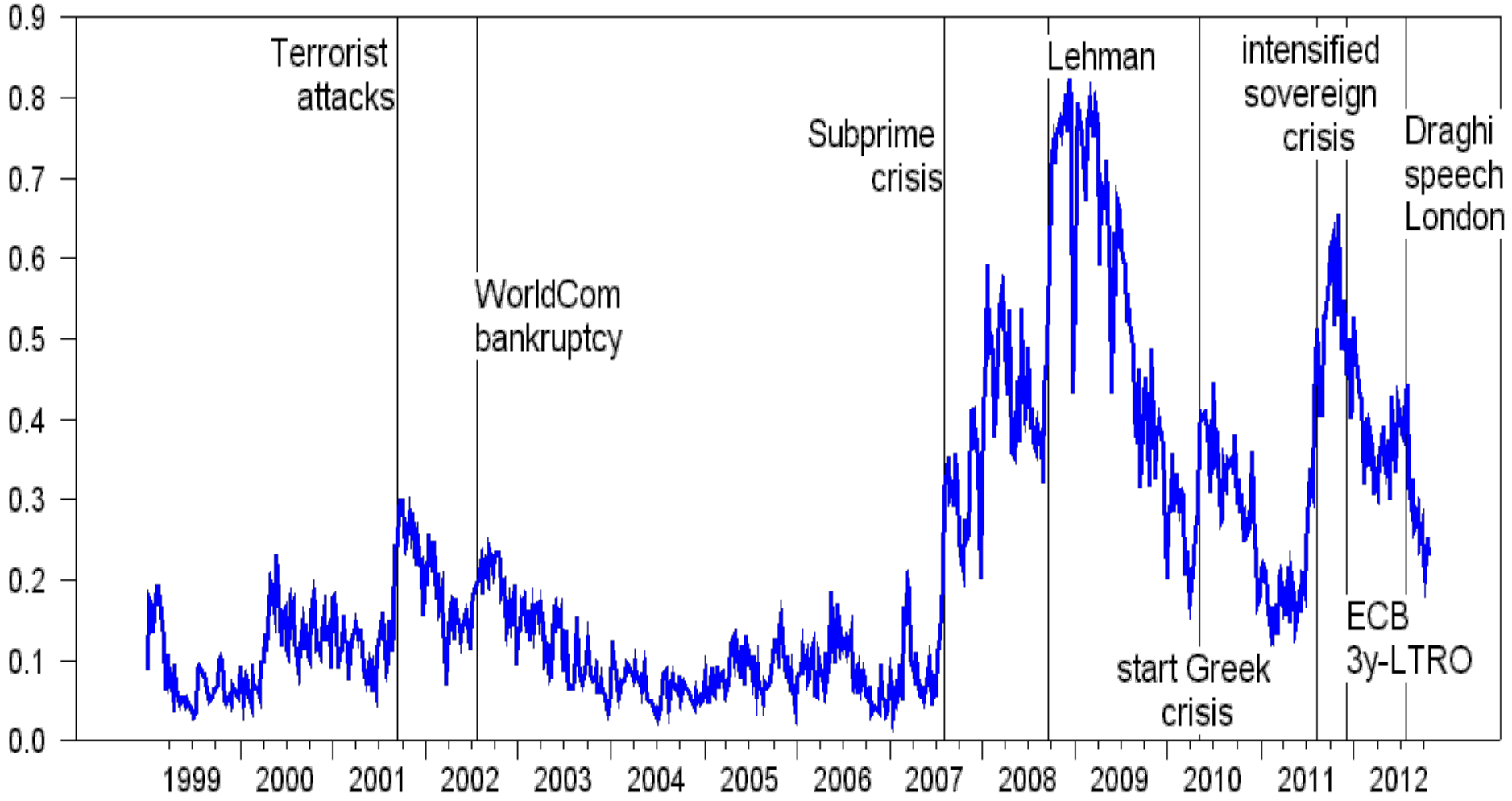
- **Aoki and Sudo (2012), Asset portfolio choice of banks and inflation dynamics, Bank of Japan Working Paper, no. 12-E-5, July**
- **Brunnermeier and Sannikov (forthcoming), A macroeconomic model with a financial sector, *American Economic Review***
- **Christiano, Motto and Rostagno (2010), Financial factors in economic fluctuations, ECB Working Paper, no. 1192, May**
- **Hartmann, Hubrich and Kremer (2013), Introducing systemic financial instability into macroeconomic: How to meet the challenge?, ECB Research Bulletin, no. 19, Autumn**
- **Hartmann, Hubrich, Kremer and Tetlow (2013), Melting down: Systemic financial instability and the macroeconomy, mimeo., ECB**

Annex

Example of a novel empirical macro model with systemic financial instability

- **Hartmann, Hubrich, Kremer and Tetlow (2013), Melting down: Systemic financial instability and the macroeconomy**
  - **Capture systemic financial instability with the ECB's Composite Indicator of Systemic Stress ("CISS"; Hollo, Kremer and Lo Duca 2012)**
  - **Embed the CISS in a richly specified Markov-Switching Bayesian Vectorautoregression (MS-VAR; Sims, Waggoner and Zha 2008) model otherwise featuring standard macro and financial variables**
    - **Regime switches/non-linearities (estimated parameters and error variances are allowed to switch independently)**
    - **Two-way interactions (feedbacks), in particular between instability in the financial sector and the real economy**
- **Variables: output growth (ΔIP), inflation, 3-month money market rate, loan volume and CISS (S)**
- **Data: euro area, monthly, 1987-2010**

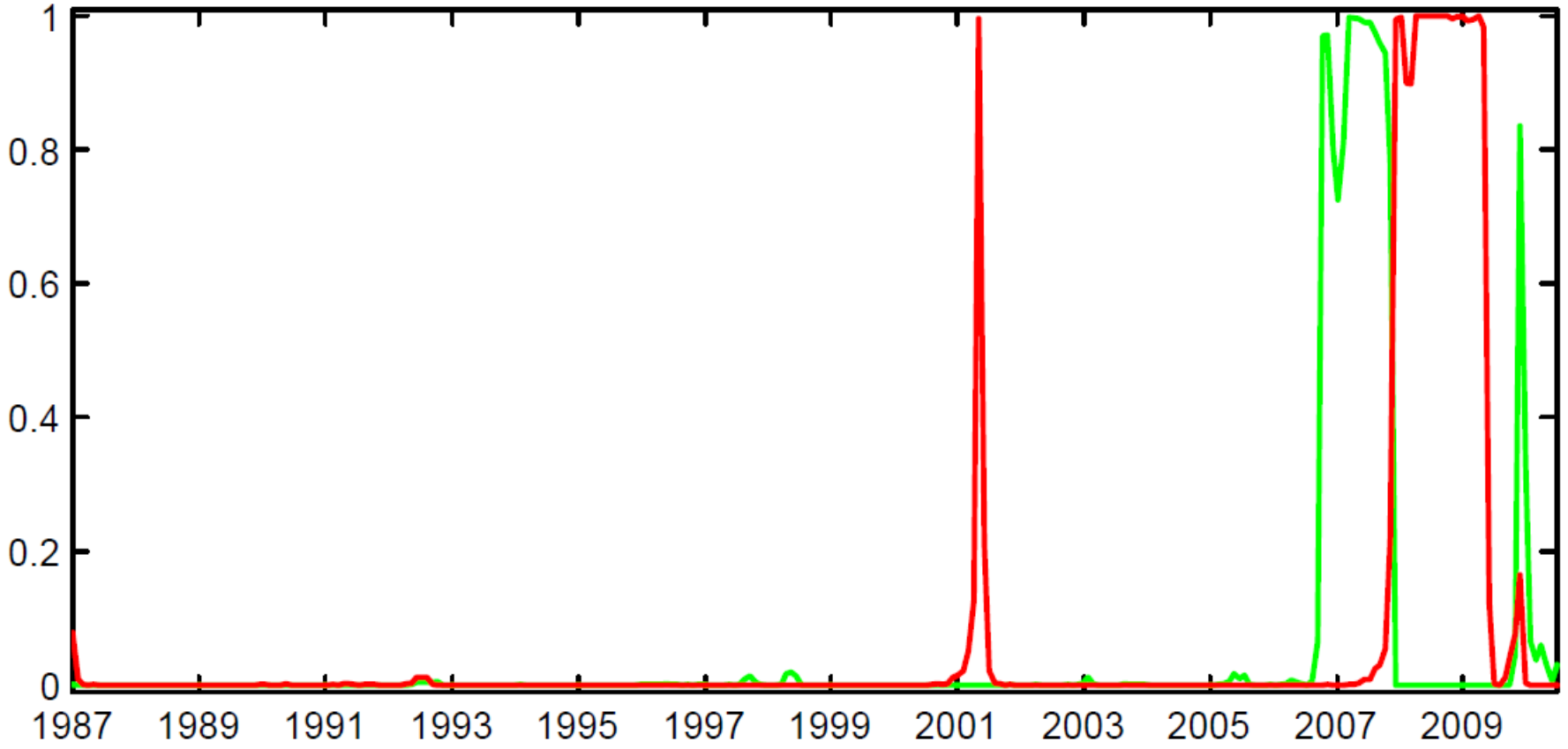
Composite indicator of systemic stress ("CISS")



- **Scope: Equity, bond, money and FX markets plus banking (various sub-items) - real time**
- **Basic sub-measures include volatilities, trends, spreads, recourse to marginal lending (weekly data)**
- **Normalisation between 0 and 1 and aggregation weighted with correlations ("systemic")**

Source: Hollo, Kremer and Lo Duca (2012)

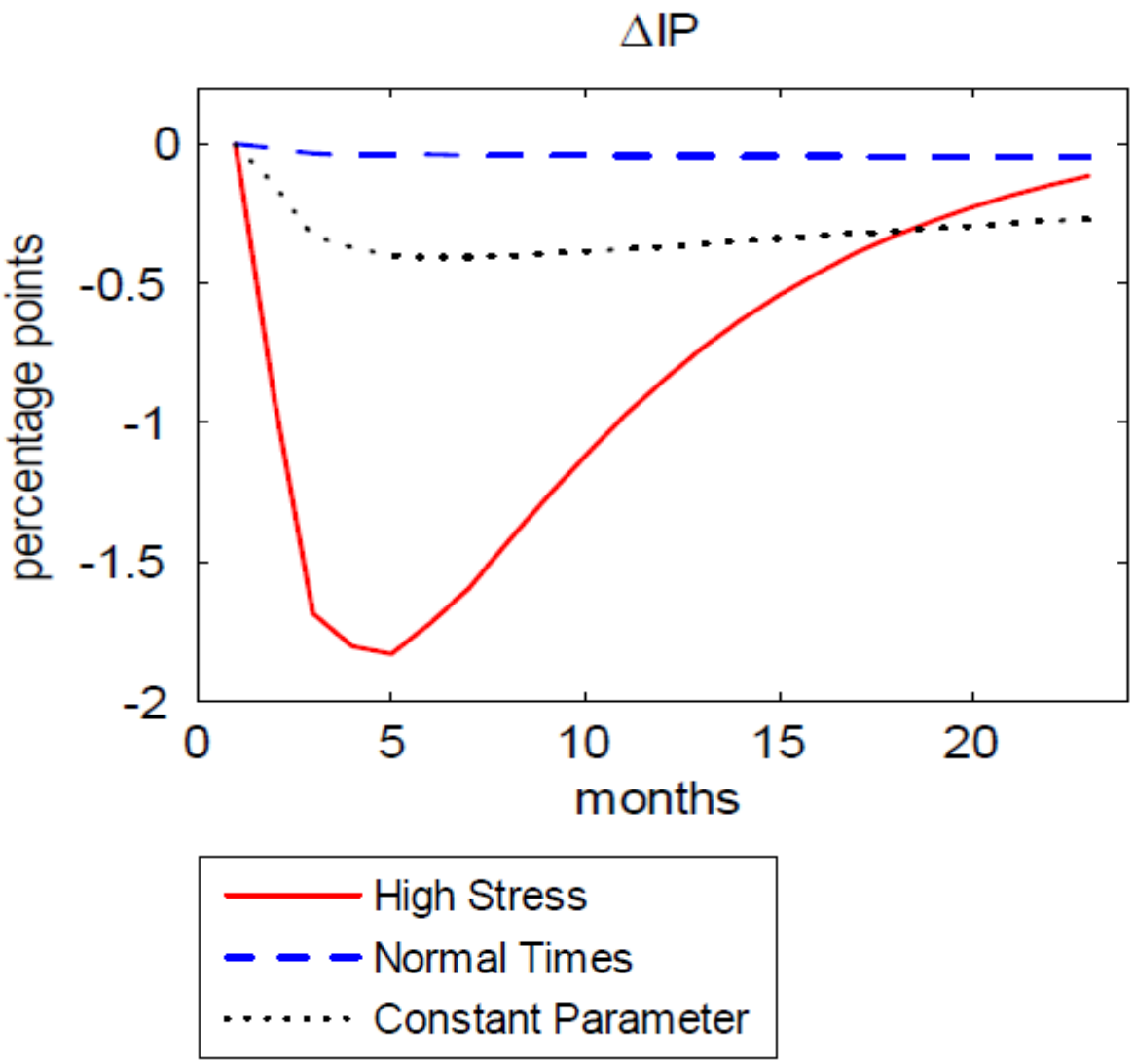
State/regime probabilities



- **Red (regime 6: HV,HC): May 2008 protracted; Sept 2001 short-lived**
- **Green (regime 5: HV,LC): July 2007 protracted ("market turmoil")**
- **Labelling is plausible: Fundamental change in macroeconomy at times of severe systemic events**

Source: Hartmann et al. (2013)

Impulse response functions for CISS shocks



- **Tremendous difference in the effect of 1 SD shock in *S* on Δ*IP* for "bad" regime 6 and tranquil times**
- **CISS increase by 0.1 in "bad" regime leads to an output contraction of 2 pp. over 5 months (in 08/07 and 09/08 systemic stress increases were 3 to 4 times larger)**
- **No effect in normal times**
- **Severe underestim-ation of output effects with traditional models**

Source: Hartmann et al. (2013)