

# Monetary policy, leaning and concern for financial stability

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# Inflation targeting reconsidered

- Discussion after global financial crisis: Inflation targeting has failed as strategy ... increase likelihood of crisis! But should distinguish between:
  - ① Inflation targeting as such (serve to stabilize medium-term inflation expectations).
  - ② Specific doctrine that central bankers need not pay attention to asset prices/financial stability, when making monetary policy decisions.
- Crisis justifies reconsidering (2): Should central banks pay attention to financial developments (credit-financed real estate boom) except to extent these developments affect outlook for inflation (and output)?

- Woodford (2012) qualitative analysis: "Persuasive case for taking financial stability concern into account, as at least one factor, when making decisions about interest rates"
- Williams (2014) quantify specification: "Optimal monetary policy is affected during crisis and normal times (as policymakers guard against crisis), but effect is quite small"
- **Theory is persuasive suggest leaning is beneficial, but difficult to quantify any substantial effects for optimal monetary policy**

# What we do and how we contribute

- We suggest a mechanism that allows for endogeneity of the evolution of financial distortions using a NK open economy DSGE framework
- Use a Markov switching set up that captures the episodic character of periods of financial stress.
  - Policy analysis using DSGE: Local perturbation methods abstracts from the possibility of deviations from the normal range of variation in the state variables as a result of nonlinearities.
  - But extreme outcomes are exactly the ones that one must be concerned about in analysis of risk to financial stability
- Find that leaning will be beneficial if probability of crisis is different from zero.
- Will affect how monetary policy affect the economy in a crisis

NBW 2011: From 2010 Norges Bank has repeatedly stressed risk of future financial imbalances that may disturb economic activity and inflation somewhat further ahead when interest rates are low.

- *The rise in house prices and consumer spending has picked up recently. The consideration of guarding against the risk of future financial imbalances that may disturb activity and inflation somewhat further ahead suggests that the key policy rate should not be kept low for too long*

The Executive Board background note (December 2010)

## Our take on policymakers (NB) view

- Increasing house prices and debt accumulation increases the risk of abrupt disturbances to activity and inflation somewhat further ahead (nonlinearities)
- Justifies increasing interest rates today more than would otherwise have been warranted (leaning)
- Financial cycles (debt) are longer lasting and build up more gradually than the average business cycle (Reinhart and Rogoff 2009)

## Relevance of financial stability for policymakers

- The real issue is not identifying whether one type of asset or another is overvalued.
- Need to monitor the degree to which the positions taken by the leveraged institutions pose a risk to *financial stability*.
- Concern should not be on whether the mean of the distribution of future net worth of an institution is too low, but rather that the *lower tail* of the distribution is too large
- And even more important, concern for the probability of a bad *joint* outcome.

## Starting point - NK model with credit

- IS:

$$y_t = \gamma y_{t+1} + (1 - \gamma) y_{t-1} - \sigma (r_t - \pi_{t+1}) + \tau i_t^d + \varphi v_t + u_t$$

- Phillips-curve:

$$\pi_t = \bar{\zeta} \pi_{t+1} + (1 - \bar{\zeta}) \pi_{t-1} + \kappa y_t + \vartheta v_t$$

- UIP:

$$v_t = v_{t+1} - (r_t - \pi_{t+1} - r r_t^*)$$

- Debt accumulation:

$$d_t = \delta d_{t-1} + \underbrace{\vartheta y_t - \phi (r_t - \pi_{t+1})}_{i_t^d}$$

- Loss function:

$$L_t = E_t \sum_{i=1}^{\infty} \beta^i (\pi_{t+i}^2 + \lambda_y y_{t+i}^2)$$



# A conceptual model

- Related to Woodford (2012), Williams (2012)
- Simple NK model for small open economy
- Markov switching with two regimes:
  - "normal" and "financial stress"
- Constant transition probabilities
- Costs of entering periods of financial stress endogenously linked to some measure of financial imbalances

# NK model with credit and stress

- IS:

$$y_t = \gamma y_{t+1} + (1 - \gamma) y_{t-1} - \sigma (r_t - \pi_{t+1}) + \tau i_t^d + \varphi v_t - \omega z_t + u_t$$

- Stress impulse:

$$z_t = \rho z_{t-1} + \alpha d_t$$

- Phillips-curve:

$$\pi_t = \zeta \pi_{t+1} + (1 - \zeta) \pi_{t-1} + \kappa y_t + \vartheta v_t$$

- UIP:

$$v_t = v_{t+1} - (r_t - \pi_{t+1} - r r_t^*)$$

- Debt accumulation:

$$d_t = \delta d_{t-1} + \underbrace{\vartheta y_t - \phi (r_t - \pi_{t+1})}_{i_t^d}$$

- Loss function:

$$L_t = E_t \sum_{i=1}^{\infty} \beta^i \left( \pi_{t+i}^2 + \lambda_y y_{t+i}^2 \right)$$

# The Markov chain

- Two regimes:

$$R = \{normal, stress\}$$

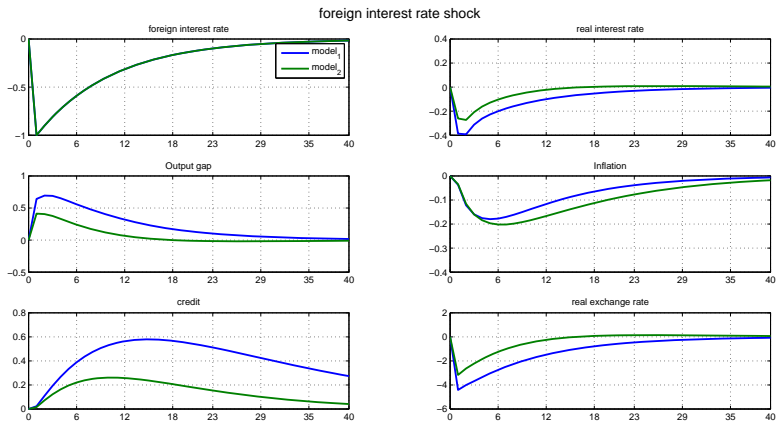
- Transition probabilities:

$$P = \begin{bmatrix} p_{nn} & p_{ns} \\ p_{sn} & p_{ss} \end{bmatrix}$$

- Switch parameter:

$$\alpha = \begin{cases} 0 & \text{if normal} \\ \bar{\alpha} > 0 & \text{if stress} \end{cases}$$

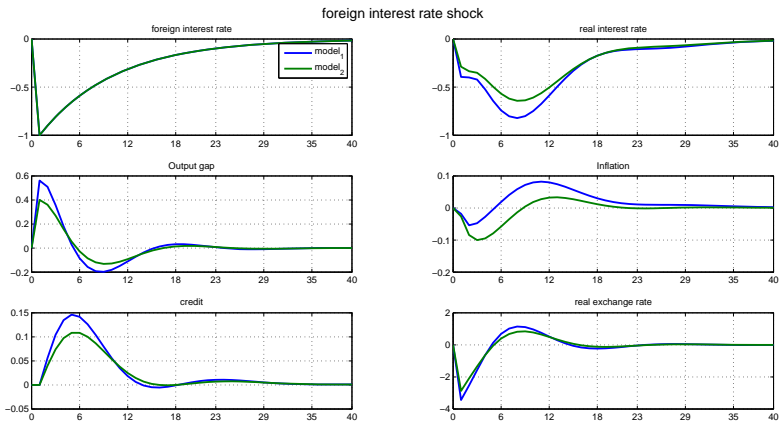
# A shock to foreign interest rates (normal times)



Note: Model 1:  $p(\text{stress})=\text{low}$ , Model 2:  $p(\text{stress})=\text{high}$

- Debt has NO feedback effects.

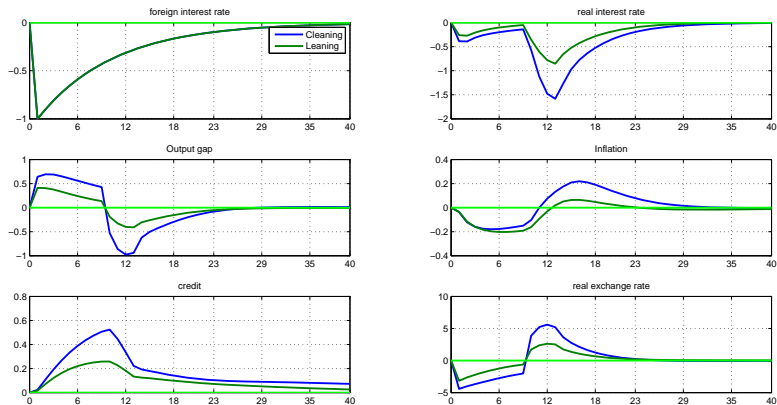
# A shock to foreign interest rates (financial stress)



Note: Model 1:  $p(\text{stress}) = \text{low}$ , Model 2:  $p(\text{stress}) = \text{high}$

- Debt has feedback effects

# Financial stress - a crisis scenario



- The economy switches into stress (period 10-13)
- Probability of a crisis is no longer zero, leaning is beneficial.

- Norway has not had many crises...
- ... Another relevant (closed economy) application is the US
- What are the cost of crisis? How does monetary policy affect house prices and debt in normal times and in crisis
- Probability of crisis function of endogenous macroeconomic conditions

# Conclusions

- We suggest a mechanism to incorporate financial stress so that it affects the Central Bank's loss function
- Leaning will be beneficial if probability of crisis is different from zero
- Will influence how monetary policy affects the economy in a crisis



Thank you!