

# Monetary Policy Tightening and Macroprudential Policy

Luis Herrera  
Banco de España

Caterina  
Mendicino  
European  
Central Bank

Kalin Nikolov  
European  
Central Bank

Valerio  
Scalone  
European  
Central Bank

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# Motivation

- ▶ Since the GFC, macroprudential tools have been generally activated in a low interest rate environment to maintain financial stability:
  - ▶ Building up banks resilience and limiting their excessive risk-taking
  - ▶ Preventing overindebtedness of borrowers.
- ▶ Rising inflation has led to monetary policy tightening.
- ▶ Higher policy rates increase borrowing costs and decelerate the economy with potential side effects on financial stability.
- ▶ **Research Question:** What is the role of different macroprudential instruments in this new environment?

# Motivation

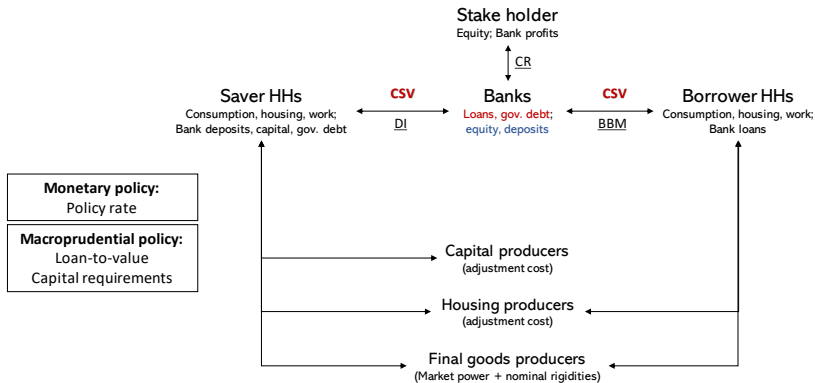
- ▶ This paper illustrates the side effects of monetary policy tightening on financial stability through the lens of a quantitative macro-banking model featuring:
  - ▶ Bank intermediation frictions
  - ▶ Bank and borrower default risk
  - ▶ New Keynesian features
- ▶ The role played by macroprudential policies in this context:
  - ▶ Borrower and capital based tools
  - ▶ Structural and Countercyclical tools (eg. CCyB, adjustments in BBMs to keep bindingness stable)

# Literature

- ▶ An extensive literature studies the interaction between macroprudential and monetary policies (e.g. Alpanda and Zubairy, 2017; Angelini, Neri, and Panetta, 2014; Carrillo et al., 2021; Chen et al., 2023; Collard et al., 2017; Ferrero, Harrison, and Nelson, 2024; Jensen, Ravn, and Santoro, 2018; Paoli and Paustian, 2017; Van der Ghote, 2021; Mendicino, Nikolov, et al., 2020)
- ▶ We focus in monetary policy tightening
- ▶ We analyse borrower and capital based measures in the same framework, accounting for their interaction
- ▶ We consider endogenous default risk (risk reduction channel of MAP)

## The model

Figure: Model diagram



# Savers

Max discounted future stream of utility

$$E_t \left[ \sum_{i=0}^{\infty} (\beta_{\varkappa})^{t+i} \left[ \log(c_{\varkappa,t+i}) + v_{\varkappa,t+i} \log(h_{\varkappa,t+i}) - \frac{\varphi_{\varkappa}}{1+\eta} (L_{\varkappa,t+i})^{1+\eta} \right] \right]$$

s. t.

$$\begin{aligned} c_{s,t} + q_{h,t} l_{h,s,t} + q_{k,t} l_{k,t} + d_t + B_t + N_{b,t}^{add} + c(N_{b,t}^{add}) \\ \leq w_t L_{s,t} + r_{k,t} k_{s,t-1} + \frac{\tilde{R}_t^d d_{t-1}}{\pi_t} + \frac{R_{t-1}^{rf} B_{t-1}}{\pi_t} + \Pi_{s,t} \end{aligned}$$

where

$\tilde{R}_t^d : R_t^d - (1 - \kappa)\Omega_t$	$h_t$ : Housing goods
$d_t$ : portfolio of deposits	$B_t$ : risk-free asset (in zero net supply)
$c_t$ : Consumption	$k_{s,t}$ : capital held by savers
$L_t$ : Labor	$N_t^{add}$ : add. equity issuance to bankers

# Impatient Households

- ▶ Impatient households are characterized by the same utility function
- ▶ They receive consumption insurance from their dynasty and can individually default on their mortgages
- ▶ Individual borrower optimally defaults if **terminal housing value** is insufficient to pay back its loan with bank

$$\omega_m q_{h,t+1} (1 - \delta) h_{m,t} < R_{m,t} B_{m,t}$$

- ▶ Household optimally decides the level of indebtedness taking into account the expected defaulted loans every given period and internalizing the borrowing cost increase driven by higher leverage

# Banking system (i)

## ▶ Bankers

- ▶ They belong to the saver
- ▶ They issue equity across banks using their limited net worth

## ▶ Banks

- ▶ Use **equity** and **deposits** to give loans to households  
 $b_t = eq_t + d_t$
- ▶ subject to **capital requirements**:  $eq_t \geq \phi_t b_t$
- ▶ **Banks optimally default** when their loan returns are not enough to repay for deposits

$$[\omega_b \tilde{R}_{b,t+1} b_{f,t} - R_{d,t} d_t] < 0$$

where  $\omega_b$  is an idiosyncratic shock to the returns on the diversified portfolio of the banks

## Banking system (ii)

Banks' willingness to invest in loans with returns  $\tilde{R}_{t+1}^b$  and subject to a capital requirement  $\phi_t$  requires having

$$E_t \Lambda_{b,t+1} [1 - \Gamma_{b,t+1}(\bar{\omega}_{b,t+1})] \tilde{R}_{t+1}^b \geq \phi_t v_{b,t}, \quad (1)$$

where the share of bank profits that accrue to depositors is:

$$\Gamma_b(\bar{\omega}_{b,t}) = \int_0^{\bar{\omega}_{b,t}} \omega_{b,t} f_b(\omega_{b,t}) d\omega_{b,t} + \bar{\omega}_{b,t} \int_{\bar{\omega}_{b,t}}^{\infty} f_b(\omega_{b,t}) d\omega_{b,t}$$

and the net of default return on loans is:

$$\tilde{R}_{t+1}^b = (\Gamma^f(\bar{\omega}_{f,t+1}) - \mu_f G_f(\bar{\omega}_{f,t+1})) R_{K,t+1}$$

# Monetary and Macro-prudential Authorities

**Monetary Policy Authority** : Taylor Rule

$$R_t = \rho_R R_{t-1} + (1 - \rho_R) \left[ \bar{R} \left( \frac{\pi_t}{\bar{\pi}} \right)^{\alpha_\pi} \left( \frac{GDP_t}{GDP_{t-1}} \right)^{\alpha_{GDP}} \right]$$

**Macro-prudential Authority** : sets capital requirements for banks  $\phi_t$  and Loan-to-value for borrowers,  $LTV_t$

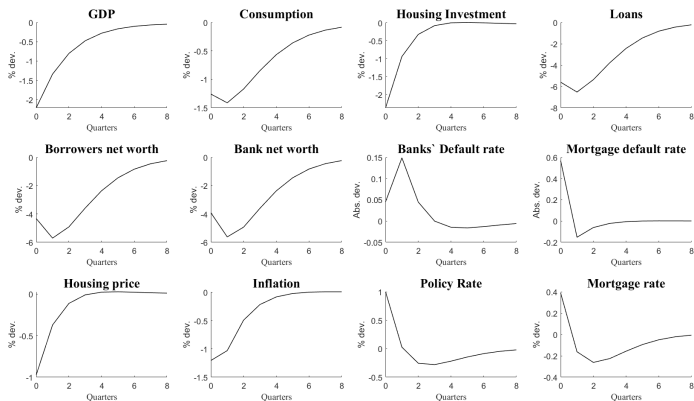
$$\phi_t = \bar{\phi} + \phi_{CCyB} \left( \frac{b_t}{\bar{b}} \right)$$

$$LTV_t = L\bar{T}V + \phi_{Ltv} \left( \frac{\mu_t^{Ltv}}{\bar{\mu}^{Ltv}} \right)$$

where  $\mu^{Ltv}$  is the lagrange multiplier of the LTV constraint and  $\phi_{CCyB}, \phi_{Ltv} > 0$  captures behaviour of the CCyB and bindingness adjustments of LTV.

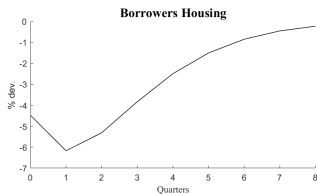
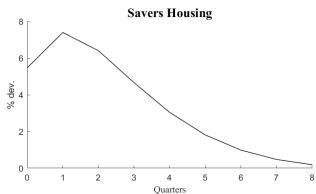
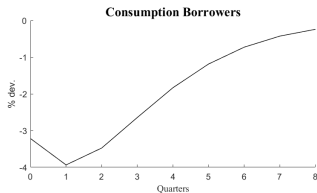
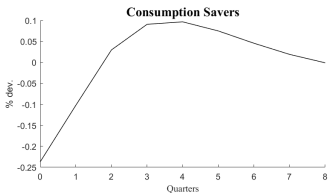
## Results

# Monetary policy shock



- ▶ Standard aggregate impact of monetary policy on demand and inflation
- ▶ Financial stability side effect: Bank and borrower default risk increases

## Monetary policy shock (ii)



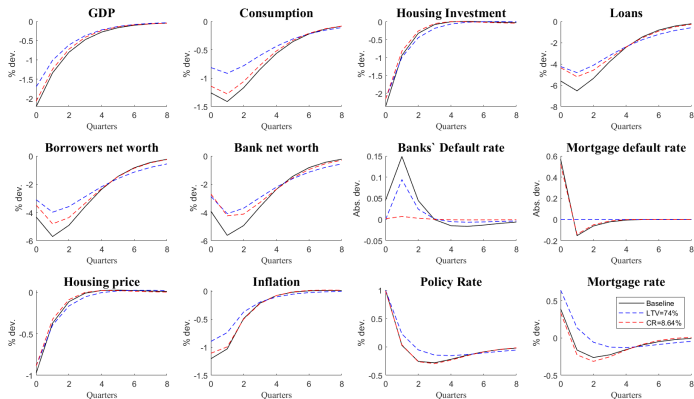
- ▶ Borrowers sharply cut consumption as they struggle with higher interest payments and lower collateral values
- ▶ Redistribution of demand within the housing market.

# What is the role for macroprudential policy?

- ▶ Increase financial resilience (**ex-ante policies**)
  - ▶ Bank capital regulation makes banks more resilient to losses: smaller effects of negative shocks on credit supply
  - ▶ LTV regulation makes borrowers more resilient: smaller effect of negative shocks on credit and housing demand
  
- ▶ Accommodate the countercyclical effect (**ex-post policies**)
  - ▶ CCyB releases capital buffers to accommodate the financial effects of negative shocks
  - ▶ LTV can be adjusted to maintain their bindingness constant

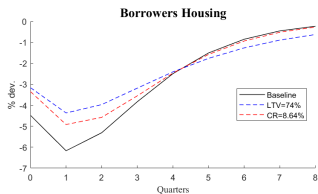
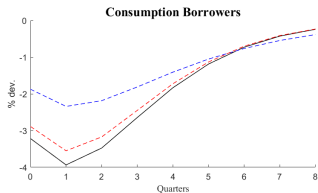
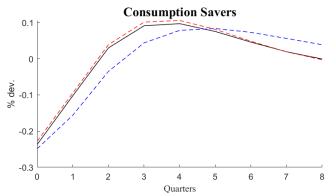
## Ex-ante policies

# The role of ex-ante measures



- ▶ Tighter CRs and LTVs both contain the side effects of monetary policy tightening
- ▶ LTV directly protects borrowers since they are less exposed to changes in lending rates and housing prices and indirectly help for banks too via more stable credit demand
- ▶ Banks solvency more directly affected by capital measures

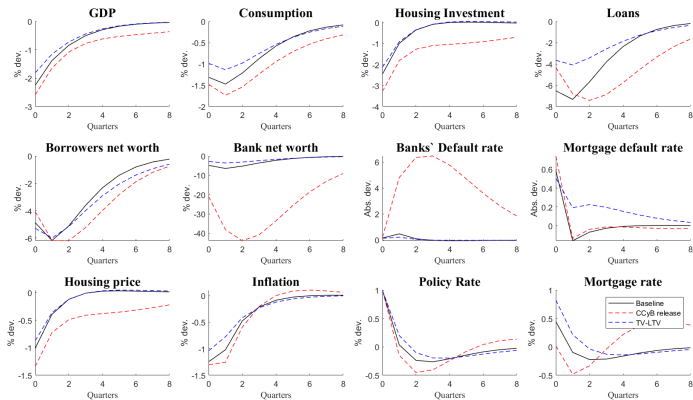
# The role of ex-ante measures



- ▶ **BBM:** The increase in interest payments and the drop in house prices do not push as many of them into financial distress
- ▶ **CR:** The effect on household spending is not as pronounced as with the LTV cap, but it is clearly stabilizing.

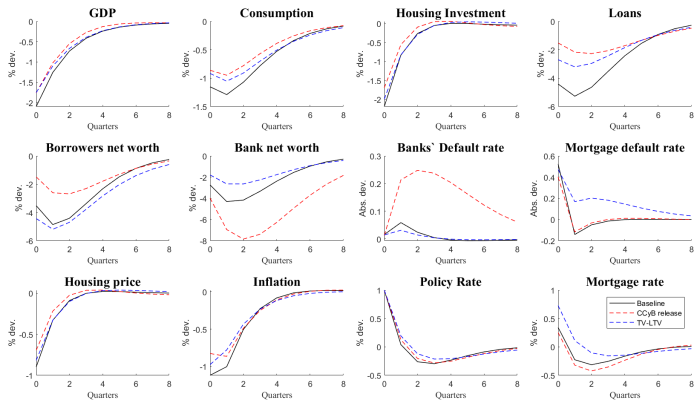
## Ex-post policies

# The role of ex-post measures (low initial bank capitalization)



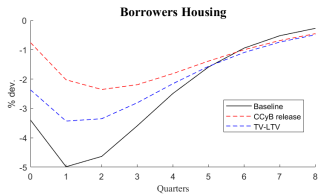
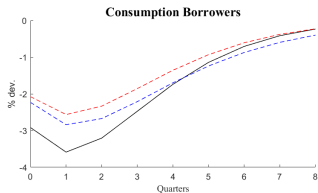
- ▶ Counter-cyclical capital measures are not effective when banks are fragile – risk channel dominates countercyclical channel
- ▶ The best countercyclical tool when banks are fragile is the LTV cap release

# The role of ex-post measures (high initial bank capitalization)



- ▶ CCyB release is beneficial when banks are well capitalized – countercyclical channel dominates risk channel

# The role of ex-post measures (high initial bank capitalization) (ii)



- ▶ CCyB release and LTV adjustments allows to accomodate the tightening

# Conclusion

- ▶ This paper investigates the role of macroprudential policies to mitigate monetary policy tightening side effects
- ▶ Tighter ex ante macroprudential measures make banks and borrowers more resilient to a monetary tightening
- ▶ Ex post capital release is beneficial only if banks are well capitalized. With fragile banks, adjusting LTV caps would be preferred
- ▶ Macroprudential tools must be activated, so that **monetary policy can focus on price stability.**

Thank you!