Macroprudential Reciprocity in the Eurozone in a High Inflation Environment

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Introduction

- Macroprudential policies have become a central cornerstone of global financial regulation
- However, institutional arrangements and coordination with other policies remains challenging
  - In the euro area, a range of borrower-based measures are set nationally, while capital requirements and CCyB are set by the Basel Committee
  - At the same time, monetary policy is conducted by the ECB

Reciprocity

- To alleviate inefficiencies in cross-border intermediation, Basel III measures are subject to mandatory reciprocity
- On the contrary, EU law does not impose reciprocity on other macroprudential tools, such as borrower-based instruments (e.g. LTV)
    - Absent international coordination, macropru can lead to cross-border spillovers and leakages, which reduce its efficiency

High inflation

- In a high inflation environment, ensuring that macropru is effective in preserving financial stability is particularly crucial
  - A rapid tightening of policy rates and financial conditions may come at the expense of increasing financial instability (firms and households are suddenly confronted with higher financing costs and a deteriorating demand outlook)
  - This strengthens the case for reciprocity, so that macropru is fully efficient

Research question

- In this paper, we study the macro-financial consequences of coordinating different macroprudential instruments and monetary policy in the presence of union-wide inflationary shocks.

Model overview

- Two-country euro area DSGE model (core vs. periphery) with financial frictions and domestic and foreign banks
- Banks in each jurisdiction intermediate funds both domestically and abroad via home and foreign branches
  - Importantly, we assume that foreign banks face larger information asymmetries when assessing the solvency of domestic borrowers, resulting in higher costs to recover assets
  - Therefore, domestic borrowers face different collateralized borrowing constraints on domestic and foreign debt

Macroprudential tools

- We introduce two countercyclical macroprudential tools to the model, responding to deviations of the credit-to-GDP ratio from its long-run value
- A countercyclical LTV – as an archetype of borrower-based measures
- A countercyclical capital-to-asset ratio applied to the banking sector resembling the Basel III countercyclical capital buffer (CCyB)

What we do

- We use our model to derive the welfare-maximizing degree of reciprocity in the LTV ratio rule in response to global cost-push shocks

- We assume full reciprocity in the CCyB, and account for the monetary policy response to the inflation surge by evaluating the optimal degree of reciprocity in macroprudential policies for different weights on inflation in the central bank's reaction function

Results

- We find that reciprocating a countercyclical rule on the LTV ratio is welfare-enhancing for the activating country when the domestic CCyB rule is not too responsive
- Regarding the interaction with monetary policy, we find that the optimal degree of reciprocity in the LTV ratio rule increases with the weight monetary policy puts on stabilizing inflation

Model Overview

- The model features two euro area countries: a core economy (country A, "domestic") and a periphery economy (country B, "foreign")

- Each country includes patient households (savers) and impatient ones (borrowers), domestic banks and branches of foreign banks, firms, and a national macroprudential authority

- Monetary policy is set union-wide by a common monetary policy authority

Savers

- Savers maximize their utility function by choosing consumption, housing and labor hours:

$$\max E_0 \sum_{t=0}^{\infty} \beta^t (\ln C_t' + j \ln h_t' - \frac{1}{\eta} l_t'^{\eta})$$

Subject to the budget constraint:

$$C_{A,t}' + \frac{P_{B,t}}{P_{A,t}} C_{B,t}' + d_t + z_t + q_t(h_t' - h_{t-1}') + \frac{\psi}{2} z_t^2 =$$

$$R_{A,t-1} \frac{d_{t-1}}{\pi_{A,t}} + R_{t-1} \frac{z_{t-1}}{\pi_{A,t}} + w_t' l_t' + \frac{\Pi_t}{P_{A,t}}$$

Borrowers

- Borrowers solve:

$$\max E_0 \sum_{t=0}^{\infty} \gamma^t (\ln C_t + j \ln h_t - \frac{1}{\eta} l_t^{\eta})$$

where $\gamma \in (0, 1)$ is impatient discount factor (lower than the one of the savers), subject to the budget constraint:

$$C_{A,t} + \frac{P_{B,t}}{P_{A,t}} C_{B,t} + q_t(h_t - h_{t-1}) + \tilde{R}_{t-1}^H \frac{b_{t-1}^H}{\pi_{A,t}} + \tilde{R}_{t-1}^F \frac{b_{t-1}^{F,D}}{\pi_{A,t}} =$$
$$b_t^H + b_t^{F,D} + w_t l_t$$

and the collateral constraints...

Collateral constraints

$$E_t[\tilde{R}_t^H \frac{b_t^H}{\pi_{A,t+1}}] \le E_t[m\alpha_t q_{t+1} h_t]$$

$$E_t[\tilde{R}_t^F \frac{b_t^{F,D}}{\pi_{A,t+1}}] \le E_t[q_{t+1}(1-\alpha_t)h_t(1-\frac{1-z_h}{qh}(q_{t+1}(1-\alpha_t)h_t))]$$

Banks

- The bank b's balance sheet is given by:

$$b_{t,b}^H + b_{t,b}^{F,S*} = n_{t,b} + d_{t,b}$$

where $n_{t,b}$ is bank net worth, and $b_{t,b}^H$, $b_{t,b}^{F,S*}$, and $d_{t,b}$ are loans provided to domestic and foreign impatient households and deposits obtained from domestic households, respectively

Banks

- We assume that banks face a maximum leverage ratio that they regard as an absolute maximum
    - They incur costs to avoid reaching this maximum that are larger as they get closer to the maximum leverage limit
- Each period, the bank chooses b_b^H, $b_b^{F,S*}$ and d_b to maximize its franchise value, subject to the incentive compatibility constraint, the balance-sheet constraint and the law of motion of its net worth

Monetary Policy

- The central bank of the monetary union follows a Taylor-type reaction function:

$$R_t = [\bar{R}(\frac{\pi_{A,t}^n \pi_{B,t}^{1-n}}{\bar{\pi}_A^n \bar{\pi}_B^{1-n}})^{\phi_\pi} (\frac{y_{A,t}^n y_{B,t}^{1-n}}{y_{A,t-1}^n y_{B,t-1}^{1-n}})^{\phi_y}]^{1-\rho_r} R_{t-1}^{\rho_r} \exp(e_{r,t})$$

Macroprudential Rules

- A countercyclical rule on the loan-to-value ratio applied to domestic borrowing from *domestic* banks
- A countercyclical rule on the loan-to-value ratio relative to domestic borrowing from *foreign* banks
- A countercyclical capital buffer (CCyB) rule for domestic banks
  - All rules respond to deviations of the credit-to-GDP ratio from its long-run value, i.e., to the credit-to-GDP gap defined by the Basel Committee

Calibration

- We calibrate the two-country model to account for core and periphery countries in the euro area
  - We assume the core to be approximated by the German economy (country A) and the periphery by the Spanish economy (country B)
- We assume that foreign LTV ratios are slightly lower than domestic LTV ratios in both countries to account for the fact that domestic lenders have better liquidation technologies than foreign ones
- Other parameters are calibrated in line with standard calibrations in the literature

Parameter Values

| Parameter	Description	Value
m_h	Domestic LTV in country A	0.76
m_f	Domestic LTV in country B	0.8
z_h & z_f	Foreign LTV	0.7
ϕ_b	Parameter of the leverage penalty cost function	0.0526
θ_b	Proportion of assets that can be diverted	0.1
ζ	Bank survival rate	0.975
ω	Capital of newly-formed banks as a fraction of bank assets	0.05
ϵ	Elasticity of demand for differentiated intermediate goods	6
ϕ_π	Coefficient on inflation in Taylor rule	0.5
ϕ_y	Coefficient on output in Taylor rule	0
ρ_r	Interest rate smoothing in Taylor rule	0.80
n	Size of country A	0.65

Impulse Responses (MP Shock)
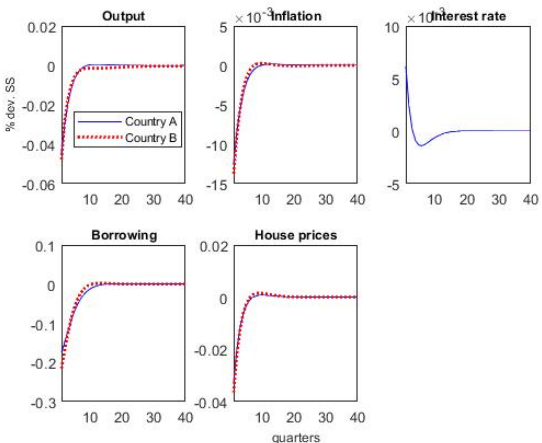
Impulse Responses (MP Shock)

- In response to the shock, inflation, the output gap and total borrowing – including domestic and foreign borrowing – in each country decline, as commonly found in the literature
- The effect of the monetary policy shock is amplified by falling house prices, triggering a tightening of borrowing constraints as the value of collateral declines

Impulse Responses (CP Shock)
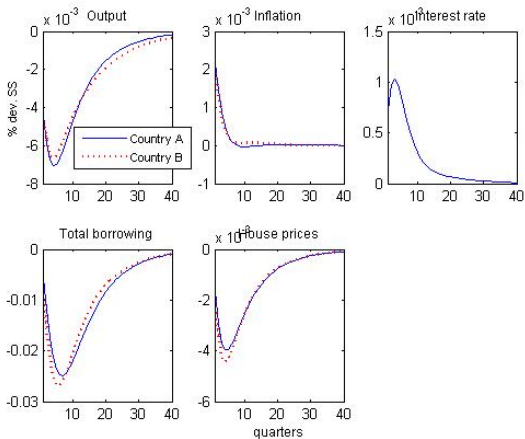
Impulse Responses (CP Shock)

- As commonly found, inflation rises while output declines in both countries in response to the cost-push shock

- In line with falling activity and higher nominal interest rates, borrowing falls in both countries – and more so in the foreign economy in which the domestic LTV is higher – as borrowing constraints tighten, in turn aggravating the economic downturn

- The collateral channel is amplifying the effects of the shock, as house prices fall in both countries

- The decline in aggregate demand exerts a negative effect on inflation, which partially offsets the positive impact of the cost-push shock

Experiment

- We evaluate the degree of reciprocity in the countercyclical LTV that maximizes welfare in country A, in the presence of global cost-push shocks
  - We optimize over the LTV rule parameter on foreign lending in country A, for given national LTV and CCyB policies (We consider that the domestic LTV policy is reciprocated when this parameter is greater than zero)

Main Results

- We find that reciprocation is optimal when the CCyB is deactivated or its responsiveness to credit is low
    - With high CCyB levels, reciprocity is not optimal, as CCyBs are already acting reciprocally =>the value added from aligning LTV policies is relatively low.

- Reciprocation is also optimal when the domestic LTV rule is relatively active, that is, when the initial gap in policies applied to domestic and foreign branches is large
    - By closing the gap in LTV policies applied to domestic and foreign branches, reciprocity agreements mitigate adverse effects from regulatory arbitrage

Interaction with monetary policy

- The aggressiveness in reciprocation also changes with the aggressiveness of the Taylor rule towards inflation
    - When monetary policy fights inflation in a sensible range, there is an increasing need for reciprocity in the LTV
    - Considering that there is a common monetary policy for the union, a more aggressive policy is aligning countries in such way that macroprudential policies also need to be aligned.

Macro-Financial Stability

- We find that reciprocity does not compromise macroeconomic stability, but mainly affects financial stability
  - Closing policy gaps reduces the volatility of credit, and this is why it is optimal to do so, especially when the CCyB rule is not very active $=>$ This translates to a welfare gain

Conclusions

- In this paper, we provide an analytical framework to study the macroeconomic and financial stability consequences of coordination in different macroprudential instruments in the euro area, in the context of a high inflation environment

- Relying on a two-country core-periphery DSGE model, we show that reciprocating borrower-based macroprudential countercyclical measures can be welfare-improving for low values of the CCyB rule parameter

- In addition, the optimal degree of reciprocity increases with the monetary policy response to inflation
  - Reciprocation in macroprudential policy in the euro area can thus improve the coordination between the common monetary policy and national macroprudential policies