Differential Effects of Macroprudential Policy

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Motivation and Research Questions

- Macroprudential policy (MaPP) evaluation has mostly focused on its aggregate effects
- Little is known about its potential differential effects
- In particular:
    - Does MaPP affect some segments of the population more than others?
    - Do the effects on credit vary with household (HH) income?
    - What are the channels through which HHs may be affected differently?

This Paper

- We examine if new mortgage lending varies with HH income when MaPP tightens
- We focus on two lender-based MaPPs:
  - Levies/taxes on financial institutions, and
  - Minimum capital requirements
  - Important difference: The latter explicitly accounts for relative riskiness
- We discus the channels through which differential effects may operate:
  - Cost of lending/borrowing channel
  - Flight to quality channel

Preview of Results

- Different instruments may yield opposite differential effect on HH
- Tighter levies/taxes on fin. inst. $\Rightarrow$ smaller loans to high-income HH,
  - Channel: Rising cost of borrowing/lending
  - $\uparrow$ Levies/taxes in fin. inst. $\rightarrow \uparrow$ Cost of lending/borrowing $\rightarrow$
    High-income HH borrow less, supply higher down payment $\rightarrow$
    Stronger effects on high-income HH
- Tighter minimum capital req. $\Rightarrow$ smaller loans to low-income HH
  - Channel: Flight to quality
  - $\uparrow$ Minimum cap. req. $\rightarrow \downarrow$ Issuance of risky loans (high LTVs) $\rightarrow$
    Low-income HH experience more appl. rejections or get smaller loans $\rightarrow$
    Stronger effects on low-income HH

Existing literature

Two more closely related papers:

- Acharya et al. (2022) find that there is mortgage-loan reallocation from high- to low-income borrowers when LTV and LTI tighten (imposed in Feb 2015 in Ireland)
- Peydró and Rodriquez-Tous (2020) find low-income borrowers receive fewer high-LTI loans from constrained lenders

Other related papers:

- Carpentier et al. (2018), Frost and Stralen (2017), Georgescu et al. (2021), Biljanovska et al. (2021) among others

MaPP and Household-level Data

MaPP Data

- In EU, MaPP at the country level with much heterogeneity
- Source: ECB's Macroprudential Database (MaPPED)
- We focus on: levies/taxes on fin. inst. and minimum capital req.
- Net tightening = total tightening actions - total loosening actions

Household Data

- Household Finance and Consumption Survey (HFCS)
- Information on household financial and sociodemographic characteristics
- Information on individual mortgage loans (property type, loan purpose, interest rate, maturity, collateral)

Empirical Model

$$\mathrm{Y_{lict}} = \alpha \mathrm{H_{it}} + \beta \mathrm{MaPP_{ct}} \times \mathrm{IncomeDecile_{it}} + \gamma \mathrm{L_l} + \lambda_{\mathrm{ct}} + \epsilon_{\mathrm{lict}}, \tag{1}$$

l: Loan; i: Household; c: Country; t: Year (when the loan was taken)

Y: Amount of new mortgage loan (ln-levels)

H: Income, Net wealth (deciles), Age/Age2, Edu., Empl., Gender, HH members

MaPP: Net MaPP tightening action (levy/tax on fin. inst. or minimum cap. req.)

IncomeDecile: HH's income decile within a country

L: Loan characteristics: Maturity; Dummies for Adj. rate, High LTV, Refinancing

λ_{ct}: Country-Time FE

Main coefficient of interest: β on $\mathrm{MaPP_{ct}} \times \mathrm{IncomeDecile_{it}}$

Main Results: Effects of MaPP on Households Loan Size

	(1)	(2)
	New Loan (ln)	New Loan (ln)
Levy/Tax X IncomeDecile	-0.00181**	
	(0.000719)	
Min. Cap. X IncomeDecile		0.00112**
		(0.000488)
Country X Time FE	Yes	Yes
Obs	4582	4582

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Testing the Channels: Higher Lending/Borrowing Costs

Channel of operation:

$\uparrow$ Levies/taxes in fin. inst. $\rightarrow \uparrow$ Cost of lending/borrowing $\rightarrow$ High-income HH borrow less, supply higher down payment $\rightarrow$ Stronger effects on high-income HH

1. Test if borrowing costs increase when $\uparrow$ levies/taxes

$$\mathrm{Rate}_{\mathrm{lict}} = \alpha \mathrm{H}_{\mathrm{it}} + \beta \mathrm{MaPP}_{\mathrm{ct}} + \gamma \mathrm{L}_{\mathrm{l}} + \delta \mathrm{GDP}_{\mathrm{ct}} + \tau_{\mathrm{c}} + \sigma_{\mathrm{t}} + \epsilon_{\mathrm{lict}} \tag{2}$$

2. Test if down payment increases with HH income when $\uparrow$ levies/taxes

$$\mathrm{DownPayment}_{\mathrm{lict}} = \alpha \mathrm{H}_{\mathrm{it}} + \beta \mathrm{MaPP}_{\mathrm{ct}} \times \mathrm{IncomeDecile}_{\mathrm{it}} + \gamma \mathrm{L}_{\mathrm{l}} + \lambda_{\mathrm{ct}} + \epsilon_{\mathrm{lict}} \tag{3}$$

Testing the Channels: Higher Lending/Borrowing Costs—Results

Channel of operation:

$\uparrow$ Levies/taxes in fin. inst. $\rightarrow$ $\uparrow$ Cost of lending/borrowing $\rightarrow$ High-income HH borrow less, supply higher down payment $\rightarrow$ Stronger effects on high-income HH

	(1)	(2)
	Current rate	Downpayment*
Levy/Tax	0.140**	
	(0.0569)	
Levy/Tax X IncomeDecile		0.0541***
		(0.0204)
Country FE	Yes	No
Time FE	Yes	No
Country X Time FE	No	Yes
Obs	4402	4426

Standard errors in parentheses

* Downpayment is measured as a percentage of property value

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Testing the Channels: Evidence of Flight to Quality Channel

Channel of operation:

↑ Minimum cap. req. → ↑ Banks reduce exposure to risky/high LTV loans (typically held by low-income HH) → Stronger effects on low-income HH

- Due to lack of data, we cannot directly test this channel...
- ...but can provide some evidence in support of it
- Test: Run the baseline regression on a subsample of loans with different LTVs
- If the flight to quality channel operates → results will be driven by the sample with high-LTV loans

Testing the Channels: Evidence of Flight to Quality Channel—Results

Channel of operation:

↑ Minimum cap. req. → ↑ Banks reduce exposure to risky/high LTV loans (typically held by low-income HH) → Stronger effects on low-income HH

	(1)	(2)	(3)
	New Loan (ln)	New Loan (ln)	New Loan (ln)
Min. Cap. X HH Income	0.00112**	0.00137***	0.000670
	(0.000488)	(0.000475)	(0.000540)
Sample Split	LTV $\leq$ 100	LTV $\in$ [50,100]	LTV $<$ 50]
Country X Time FE	Yes	Yes	Yes
Obs	4582	3543	1028

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Alternative channels of operation: Risk-taking
Levies / Taxes on financial inst.

Channel of operation:

$\uparrow$ Levies/taxes in fin. inst. $\rightarrow \uparrow$ Banks exposure to risky/high LTV loans and reallocate credit $\rightarrow$ Stronger effects on high-income HH

- We perform two tests
  - Test if low-income households get larger loan amounts (intensive margin)
  - Test of low-income households with high LTV loans have a higher probability of getting a loan (extensive margin)
  - ...and find no evidence of the risk-taking channel

Alternative channels of operation: Cost of capital / Borrowing costs Minimum cap. req.

Channel of operation:

$\uparrow$ Minimum cap. req. $\rightarrow$ $\rightarrow$ $\uparrow$ capital by raising equity $\uparrow$ Cost of lending/borrowing $\rightarrow$ High-income HH borrow less, supply higher down payment $\rightarrow$ Stronger effects on high-income HH

- We test if borrowing costs increase when minimum cap. req. tighten, using specification (2)
- We find no evidence of this channel

Differential Effects on Properties Purchased?

$$\text{HousePrice}^{\text{j}}_{\text{ct}} = \beta^{\text{j}}\text{MaPP}_{\text{ct}} + \gamma\text{GDP}_{\text{ct}} + \sigma_{\text{c}} + \tau_{\text{t}} + \epsilon_{\text{ct}}, \quad \forall \text{j} \tag{4}$$

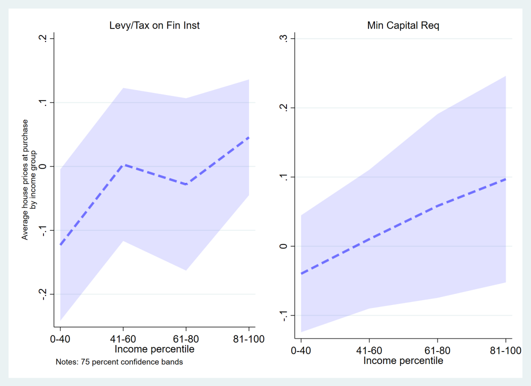

Figure: The left panel plots the coefficients β on levies/taxes in the regression above for each income group. The right hand-side panel plots the same coefficient for minimum capital requirements.

Robustness checks

- Concern: Other HH characteristics driving the differential effects
  - Control for interactions of MaPP with other HH-level characteristics
- Concern: Monetary policy may be driving the differential effects
  - Controlling for interaction of HH income and monetary policy shock
- Concern: Other MaPP may be driving the differential effects
  - Control for interactions of HH income with other MaPPs

All results continue to hold (with same signs and similar statistical significance).

Takeaways

- We find evidence of lender-based MaPP affecting HH differentially
- Higher-income households more affected when MaPP targeting total assets tightens
- Low-income households more affected when MaPP targeting risk-weighted assets tightens
- The differential effects operate via different channels
- These results suggest another consideration for policymakers when selecting and calibrating MaPPs