Securitization and Cross-border Spillovers from Macroprudential Policy

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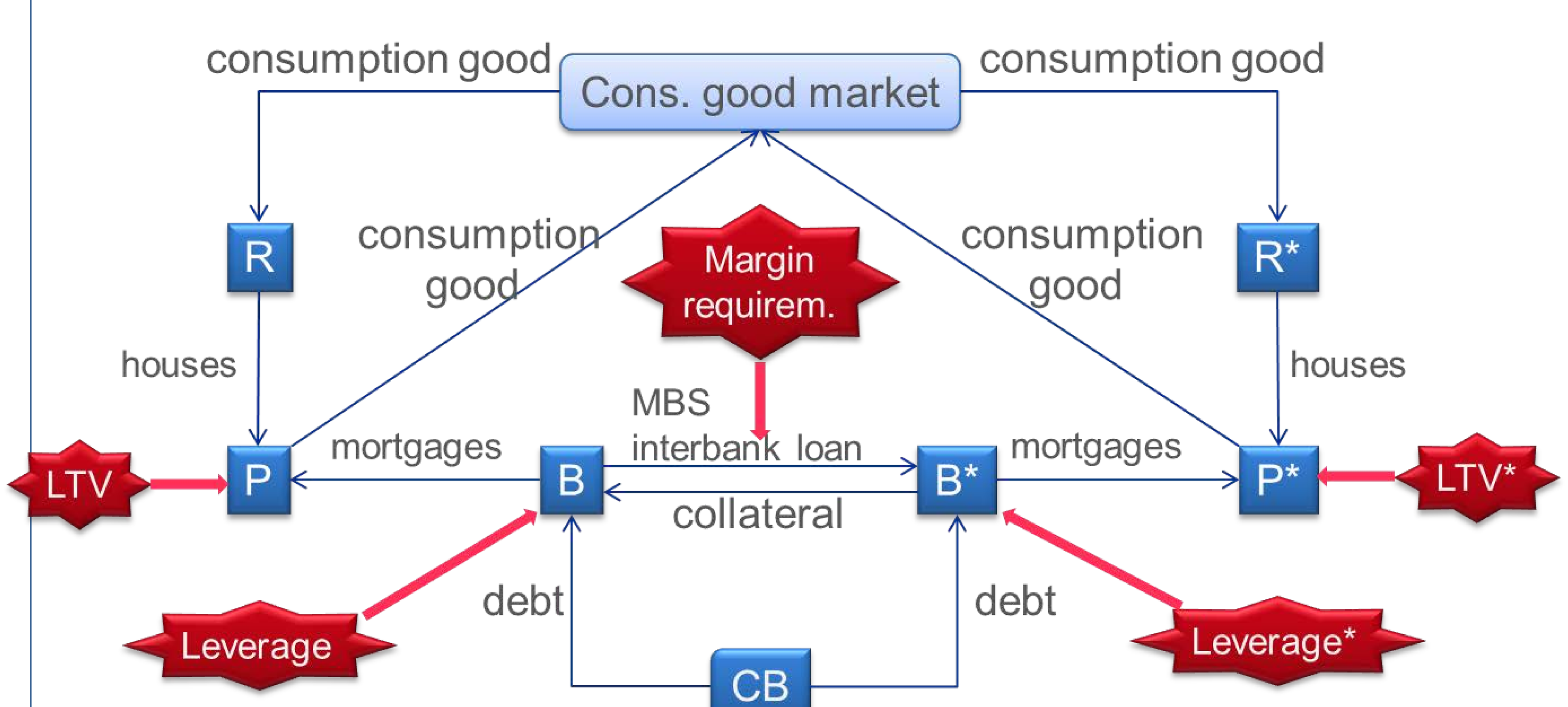
Abstract

This paper puts forward a **two-country two-period general equilibrium model with fragmented mortgage and capital markets and heterogeneous banks.** I extend Goodhart et al. (2013) model by allowing for securitization and by varying risk aversion across banks in two countries. In such a set-up I test the cross-border propagation from capital and loan-to-value (LTV) regulation. I find that the re-optimization of bank balance sheets in response to a macroprudential policy innovation is crucial in determining the magnitude of cross-border spillovers. I also find that **by means of securitization banks may shift risk across borders in response to rebalancing the macroprudential policy stance** between the two countries, thereby weakening the effectiveness of the policy (securitization channel). In particular, an uncoordinated LTV policy may lead to unintended results as **banks increase their originate-to-distribute activity in response**. In this way an asymmetric macro-prudential policy innovation is leaked across borders.

Model set-up



Agent P's and P*'s optimization problem

Food endowment

$$\overline{e}^P = (e^P_{1,f}, e^P_{g,f}, e^P_{b,f})$$

First period budget constraint

$$p_{1,h}c^P_{1,h} \leq E^P_1 + M^P_1 + p_{1,f}q^P_{1,f}$$

Second period budget constraints (bad state):

- Default condition: if underlying collateral is worth less than the mortgage

$$p_{s,h}c_{1,h}(1-\delta) \leq M^P_1(1+\rho^M) \qquad s \in \{g,b\}$$

- Budget constraint

$$p_{b,h}c^P_{b,h} \leq E^P_b + p_{b,f}q^P_{b,f}$$

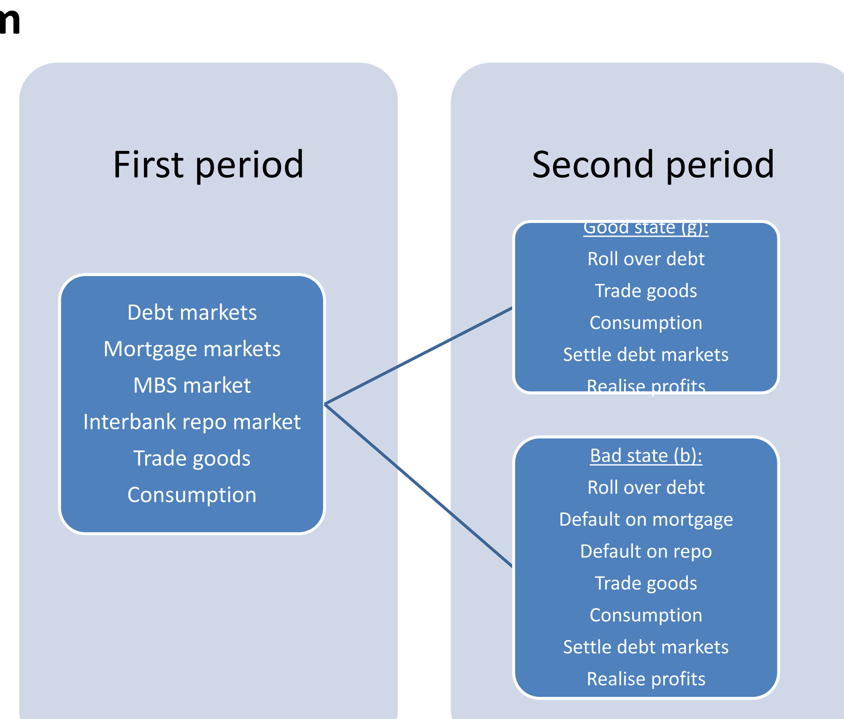
Second period budget constraint (good state)

- Mortgage repaid

$$M^P_1(1+\rho^M) + p_{g,h}c^P_{g,h} \leq E^P_g + p_{g,f}q^P_{g,f}$$

Optimization problem

- $\overline{U}^P = U^P(c^P_{1,f}, c^P_{1,h}) + \beta\omega_g[U^P(c^P_{g,f}, (1-\delta)c^P_{1,h} + c^P_{g,h})] + \beta(1-\omega_g)[U^P(c^P_{bs,f}, c^P_{bs,h})]$



Bank B optimisation problem / **Bank B* optimisation problem**

First period budget constraint: raise debt issue (B) and securitize (B*) mortgages

$$M^B_1 - P^M_1\sigma^B_1 M^B_1 + L^B_1 \leq D^B_1 + E^B_1$$

$$M^{B^*}_1 + \overline{M}^{B^*}_1 P^M_1 \leq D^{B^*}_1 + E^{B^*}_1 + L^{B^*}_1$$

Second period - debt rollover

$$D^B_1(1+r_1) \leq D^B_s \quad \text{for } s \in \{g,b\}$$

$$D^{B^*}_1(1+r_1) \leq D^{B^*}_s \quad \text{for } s \in \{g,b\}$$

Profit in good state – no default

$$\pi^B_g = M^B_1(1-\sigma^B_1)(1+\rho^M) + L^B_1(1+\rho^L) - D^B_g(1+r_g)$$

$$\pi^{B^*}_g = M^{B^*}_1(1+\rho^{M^*}) + \overline{M}^{B^*}_1(1+\rho^M) - L^{B^*}_1(1+\rho^L) - D^{B^*}_g(1+r_g)$$

Profit in bad state – default: P* defaults on the mortgage; B* defaults on repo

$$\pi^B_b = V_b M^B_1(1-\sigma^B_1)(1+\rho^M) + L^B_1 V^{Repo}_b - D^B_b(1+r_b)$$

$$\pi^{B^*}_b = V^*_b M^{B^*}_1(1+\rho^{M^*}) - D^{B^*}_b(1+r_b)$$

Maximize expected payoff, subject to budget constraints

$$\overline{P}^B = \beta\sum_s \omega_s P^B(\pi^B_s) \quad \text{for } s \in \{g,b\}$$

+ linear penalty for the default on repo

$$\overline{P}^{B^*} = \beta\omega_g P^{B^*}(\pi^{B^*}_g) + \beta\omega_b[P^{B^*}(\pi^{B^*}_b) - \tau[L^{B^*}_1(1+\rho_L) - V_b\overline{M}^{B^*}_1(1+\rho^M)]] \quad \text{for } s \in \{g,b\}$$

Results

What is the role of **banks' risk aversion and securitization** in macroprudential policy cross-border propagation in fragmented banking markets?

	On home mortgages (prudent bank)	On foreign mortgages (risk-loving bank)
Mortgages extended to P	↓	↑
Mortgages extended to P*	→	↓
Mortgages securitised	↓↓	↑↑
Interbank loans	↓↓	↑↑
Leverage ratio B	↓	→
Leverage ratio B*	↓↓	↑↑
LTV	-1.0%	↑
LTV*	→	-1.0%

How do capital regulation and LTV compare as alternative macroprudential policy instruments?

	Leverage ↓	LTV ↓
Mortgages extended to P	↑	↑
Mortgages extended to P*	↓	↓
Mortgages securitised	↓	↑↑
Interbank loans	↓	↑↑
Leverage ratio B	→	→
Leverage ratio B*	-1.0%	↑↑
LTV	↑	↑
LTV*	↓	-1.0%

Can the **macroprudential** policy complement the **monetary** policy?

	w/o leverage regulation	with leverage regulation
Mortgages extended to P	↓	↓
Mortgages extended to P*	↓	↑
Mortgages securitised	↑↑	→
Interbank loans	↑↑	→
Leverage ratio B	↓	↓↓
Leverage ratio B*	↑↑	↓

Can **capital regulation and LTV regulation** offset each other?

	LTV ↑ and leverage ↓ (prudent bank)	LTV* ↑ and leverage* ↓ (risk-loving bank)
Mortgages extended to P	→	→
Mortgages extended to P*	↓	→
Mortgages securitised	↑↑	↓
Repos	↑↑	↓
Leverage ratio B	-1.0%	→
Leverage ratio B*	↑↑	-1.0%
LTV	0.6%	→
LTV*	↑	0.1%

Conclusions

Adjustments of banks' balance sheets in response to a macroprudential policy innovation is crucial in **cross-border propagation**

- Risk averse banks are less willing to adjust their balance sheets

Securitization "leaks" across borders the impact of an asymmetric **macroprudential policy innovation**

LTV ratio caps relatively more efficient tool in addressing an asymmetric shock than capital regulation

- Yet the overall efficacy of this tool needs to be assessed in the context of cross-border spillovers that may vary depending on banks attitude towards risk
- LTV regulation can result in strong cross-border spillover

Policy discussion

Uncoordinated macroprudential policy may lead to sub-optimal results as banks may switch to originate-to-distribute business model

Macroprudential policy may **complement monetary policy** by addressing undesirable cross-border/cross-sector shifting of risk or excessive risk taking

A framework, in which those macroprudential policy instruments that are outside the realms of the ECB (LTV) could be coordinated (the role for the ESRB)

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