

# Shadow banking and mortgage rules: a Canadian perspective

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Note: Views expressed here are those of the authors and do not represent the views of the Bank of Canada.

# Research question & key features of the model

- Research question
  - How shadow banking affects the effectiveness of regulatory policies (LTV, PTI, insured or not) due to potential leakage across sub-sectors of the mortgage market?
  - How shadow banking affects monetary policy transmission through sub-sectors of the mortgage market?
- Key features of the model
  - DSGE model with two types of agent: patient savers and impatient borrowers that maximize life-time utility
  - Two types of financial intermediaries: Shadow (SB) and traditional banks (TB)

# Key features of the model

- Shadow bank borrowers:
  - Face loan to value (LTV) constraint
  - Not insured
  - Larger default rate for shadow bank borrowers
- Traditional bank borrowers:
  - Two Constraints: LTV and payment to income (PTI) constraints
  - Can be insured (I) or uninsured (U)
  - Insured allows for a smaller down payment but tighter income qualification
- Mortgage contracts:
  - 5-year fixed rate amortized over 25/30 years
  - The only source of financing
  - Prepayment is allowed

# Credit limits

- **Loan-to-value** constraint:

$$m_{i,t}^{*k} \leq \theta_j^{LTV_k} p_t^h h_{i,t}^*, \quad j \in (I, U), \quad k \in (SB, TB)$$

- Looser in insured market:  $\theta_U^{LTV_{TB}} < \theta_I^{LTV_{TB}}$
- Credit limit:  $\bar{m}_{i,t}^{LTV_k} = \theta_j^{LTV_k} p_t^h h_{i,t}^*$

- **Payment-to-income** constraint:

$$\frac{m_{i,t}^{*TB} (r_t^* + \nu_j + \alpha)}{w_t n_t e_{it}} \leq (\theta_j^{PTI_{TB}} - \omega)$$

- Tighter in insured market:  $\theta_U^{PTI_{TB}} > \theta_I^{PTI_{TB}}$
- Credit limit:  $\bar{m}_{i,t}^{PTI_{TB}} = \frac{(\theta_j^{PTI_{TB}} - \omega) w_t n_t e_{it}}{r_t^* + \nu_j + \alpha}$

- Overall credit limits in TB:

- Within sector  $j$ :  $\bar{m}_{i,t}^j = \min(\bar{m}_{i,t}^{PTI_{TB}}, \bar{m}_{i,t}^{LTV_{TB}})$
- Across sectors:  $\bar{m}_{i,t} = \max(\bar{m}_{i,t}^I, \bar{m}_{i,t}^U)$

# Constraint structure by submarket

- Intra-period income shock vary among borrowers

$$\text{Income} = w_t n_t e_{it}, \quad e_{it} \sim \Gamma_e$$

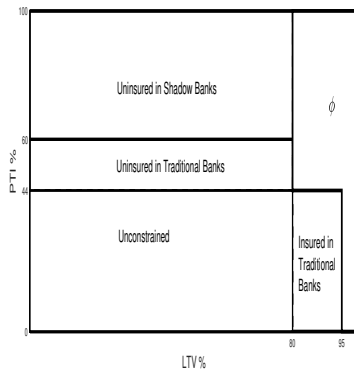
The threshold values of the shock is

$$\bar{e}_{I,t} = \frac{\bar{m}_{I,i,t}^{LTV_{TB}}}{\bar{m}_{I,i,t}^{PTI_{TB}}}, \quad \bar{e}_{U,t} = \frac{\bar{m}_{U,i,t}^{LTV_{TB}}}{\bar{m}_{U,i,t}^{PTI_{TB}}}$$

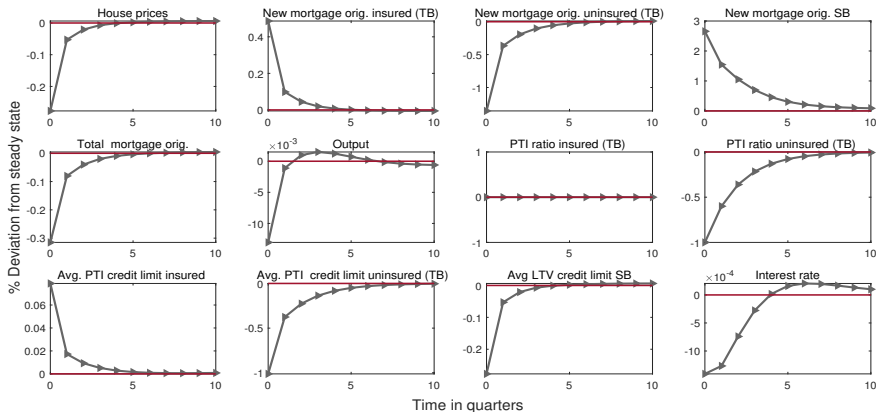
$$\bar{e}_{U,t}^{SB} = \frac{\bar{m}_{U,i,t}^{LTV_{SB}} - \Psi_2}{\bar{m}_{U,i,t}^{PTI_{TB}}}$$

- Segmented mortgage market
  - Following shocks, borrowers can migrate across segments
  - Threshold value of the shock is

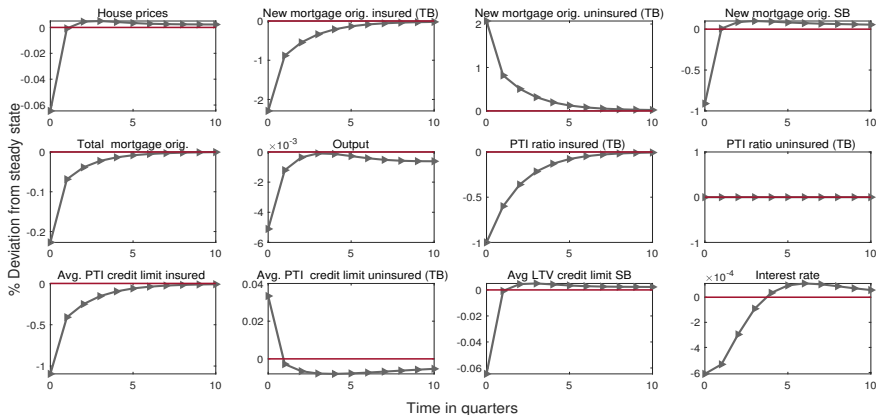
$$\bar{e}_t = \frac{\mu_{U,t} \bar{m}_{U,i,t}^{LTV_{TB}}}{\mu_{I,t} \bar{m}_{I,i,t}^{PTI_{TB}}}$$



# Macroprudential policy: tighter PTI limit of the uninsured Borrowers move to traditional insured sector or to shadow banking

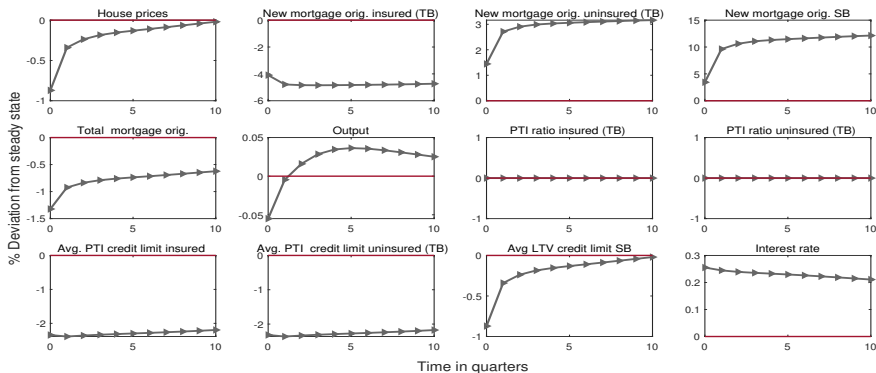


# Macroprudential policy: tighter PTI limit of insured Borrowers move to uninsured sector which partly offsets the regulation



# Monetary policy: contractionary

Reduces the average credit limit due to PTI constraint and reduces mortgage originations in the insured sector



- Still working on model calibration