Banking Dynamics, Market Discipline and Capital Regulations

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The views expressed are my own and do not necessarily represent those of the Bank of Canada’s Governing Council. The content is not related to the economic outlook or to monetary policy matters.
• **Counter-Cyclical Capital Buffer (CCyB)** is one of the Basel III capital requirements
  
  ▶ Address the pro-cyclicality of capital requirements and smooth bank credit supply over time
  
  ▶ In Canada, **Domestic Stability Buffer (DSB)** works similarly to CCyB, applied to DSIBs

  ○ 2018: With the range of 0-2.5%, set at **1.5%** with the total capital requirements of **13%** of RWAs (and **11.5%** if released)

  ○ 2019-2021: Changed in the range of 1-2.5%

  ○ 2022 December: Increased to **3%** with the range expanded to 0-4%
Motivation

- **Counter-Cyclical Capital Buffer (CCyB)** is one of the Basel III capital requirements
  - Address the pro-cyclicality of capital requirements and smooth bank credit supply over time
  - In Canada, **Domestic Stability Buffer (DSB)** works similarly to CCyB, applied to DSIBs
    - 2018: With the range of 0-2.5%, set at **1.5%** with the total capital requirements of **13%** of RWAs (and **11.5%** if released)
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- Basel III: **Market discipline** important and complement capital regulations
  - Facilitate the pricing of *individual* bank risk to limit “over-borrowing” from the wholesale market.
1. What is the impact of CCyB through a Great Financial Crisis-like episode:

- Average impact on bank credit supply and insolvency?

- Differential policy impacts across banks with different capital ratios?

2. How does market discipline change the way banks react to CCyB? Heterogeneity?
Questions and Findings

1. What is the impact of CCyB through a Great Financial Crisis-like episode:

- Average impact on bank credit supply and insolvency?
  - Smoothes credit supply and bank default
  - Quantitatively, small impacts when releasing only 1.5% of CCyB

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2. How does market discipline change the way banks react to CCyB? Heterogeneity?

   - Raises capital ratios in normal times (precautionary savings), softening the impact of crisis
   - Raises the liquidity risk; even large and well-capitalized banks could be vulnerable to crisis
A heterogeneous-bank model with

- stochastic aggregate state – normal and crisis

- bank-specific loan failure rate shocks – higher average failure rates in crisis

- endogenous bank default generates risk premium on bank's wholesale funding (WSF):

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\text{Discount price of WSF} = 1 - \text{Prob}(\text{default}_t+1)\frac{1}{1+r_f} \Rightarrow \text{market discipline}
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- Pricing inefficiency from moral hazard due to limited liability and deposit insurance

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- banks must satisfy capital requirements, including CCyB
Model features

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STATIONARY STATE AND IRF ANALYSIS

1. Calibrate to 2017 with 1.5-pp CCyB as a stationary economy in the normal time ⇒ starting point of simulation

Distributions
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   - Three bank groups in capital ratio
     - Top decile
     - All banks
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- Market discipline makes banks more prudent and hold more capital in normal times
  - complementing CCyB in normal times
  - However, in crisis times, market discipline can amplify crisis shocks via higher risk premiums whereas CCyB dampens them
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IRF of Capital Ratio with 1.5-pp CCyB (13% → 11.5%)
IRF of New Loan Issuance with 1.5-pp CCyB (13% → 11.5%)
IRF of % of Bank Default with 1.5-pp CCyB (13% → 11.5%)
IRF of New Loan Issuance with 5-pp CCyB (16.5% → 11.5%)
1. Confirms the intended benefits of CCyB over constant capital requirements:
   - Smoother credit supply and bank insolvency dynamics in a crisis-recovery episode
   - Average quantitative impact is limited at low levels of CCyB, but a larger impact on inadequately-capitalized banks

2. Market discipline has opposing effects on banks:
   - Lower bank risk-taking during normal times, *complementing CCyB*
     - softens the impact of the crisis on loan supply
     - reduces bank default on average
   - Larger liquidity risk during a crisis, *working against CCyB*
     - potentially increases default risk for even well-capitalized banks with large exposure on wholesale funding
Dynamic Capital Requirement in Canada (% of RWA)

- **Requirement**
- **Upper bound**

**History of Dynamics Capital Requirement in Canada**
- Normal or crisis state realizes
- Bank-specific loan failure rate realizes
- Each bank learns
  - its income
  - the existing loan balance
  - funding needs
  - its type (i.e., deposit and loan risk)

1. Each bank decides to default or continue
2. If continues, bank chooses
   - new loan
   - WSF
   - dividend
   - equity
   - capital ratio
Discount price of WSF for large banks in normal times
Bank Distributions Before and After the Crisis Shock