Banking Dynamics, Market Discipline and Capital Regulations

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Motivation

- Counter-Cyclical Capital Buffer (**CCyB**): a time-varying capital requirement in Basel III
  - ▷ Address the pro-cyclicality of constant capital requirement and smooth bank credit supply over time

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  - ▷ Address the pro-cyclicality of constant capital requirement and smooth bank credit supply over time
  - ▷ In Canada, Pillar-2 implementation of time-varying capital regulation, introduced in 2018 at **1.5 pp**
- *Market discipline* viewed important force that reinforces capital regulations in Basel III
  - ▷ promoted through disclosure requirements under Pillar 3
  - ▷ facilitate the pricing of *individual* bank risk to limit "over-borrowing" from the wholesale market.

Questions and findings

1. What is the impact of CCyB through a Great Financial Crisis-like episode:
   - Average impact on bank credit supply and the prob of default?
   - Differential policy impacts across banks with different capital ratios?
2. How does market discipline change the way banks react to CCyB? Heterogeneity?

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2. How does market discipline change the way banks react to CCyB? Heterogeneity?
   - ▷ *Raises capital ratios in normal times (precautionary motive), softening the impact of crisis*
   - ▷ *Raises the roll-over risk; even large and well-capitalized banks could be vulnerable to crisis*

Contribution of our paper

Analyzes interaction between a counter-cyclical capital regulation and market discipline

- dynamic model of banking industry with heterogeneous banks
- implications for
  - ▷ precautionary motives and dynamic risks associated with wholesale funding
  - ▷ buffer size

Many other papers related to CCyB in the literature:

Theory: Kashyap and Stein (2004), Repullo (2013), Repullo and Suarez (2013), Martinez-Miera and Suarez (2014), Benes and Kumhof (2015), Davydiuk (2019), Gertler, Kiyotaki and Prestipino (2020), Schroth (2021), Van der Ghote (2021), Corbae and D'Erasmo (2021)

Empirical: Jiménez, Ongena, Peydró and Saurina (2017), Auer and Ongena (2019), Chen, Sivec and Volk (2019), Avezum, Oliveira and Serra (2021), Behncke (2022), Van Oordt (2022)

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A heterogeneous-bank model with Timing of events

- stochastic aggregate state – normal and crisis

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- ▷ bank-specific loan failure rate shocks – higher average failure rates in crisis
- ▷ endogenous bank default generates risk premium on bank's wholesale funding (WSF):

$$\text{Discount price of WSF} = \frac{1 - Prob(default_{t+1})}{1 + r_f} \quad \Rightarrow \quad \textit{market discipline}$$ Pricing

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- ▷ the balance sheet:

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- banks must satisfy capital requirements, including CCyB

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   - CCyB not released
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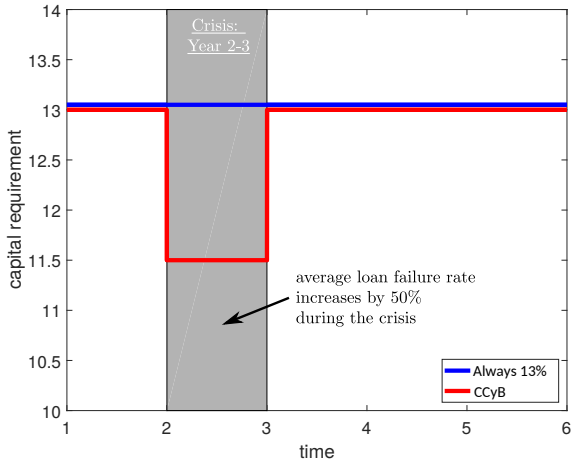

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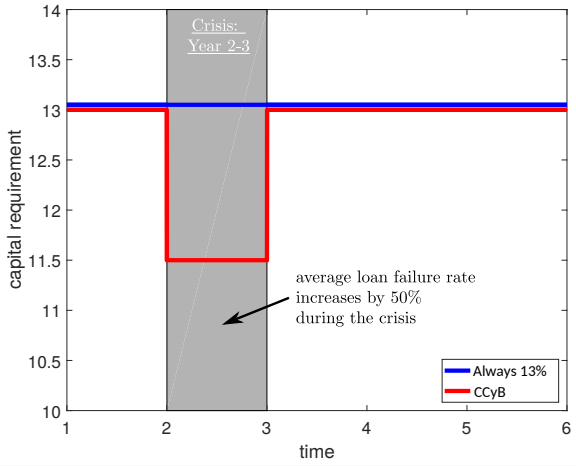
   - Three bank groups in capital ratio
     - ▷ Top decile
     - ▷ All banks
     - ▷ Bottom decile

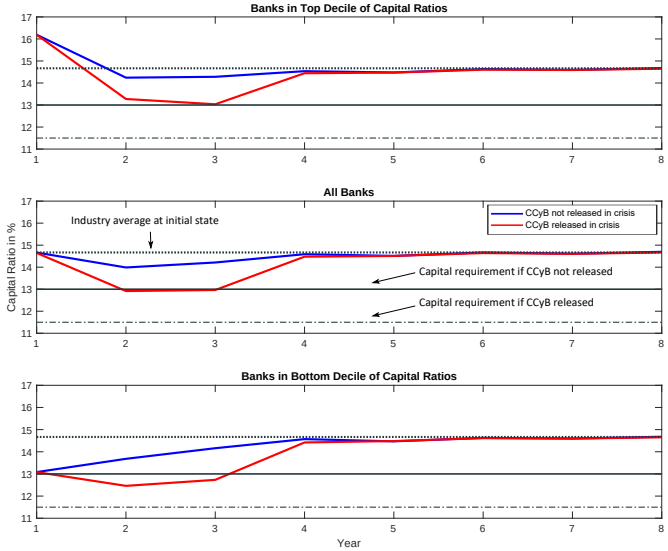


Stationary economy prior to the crisis

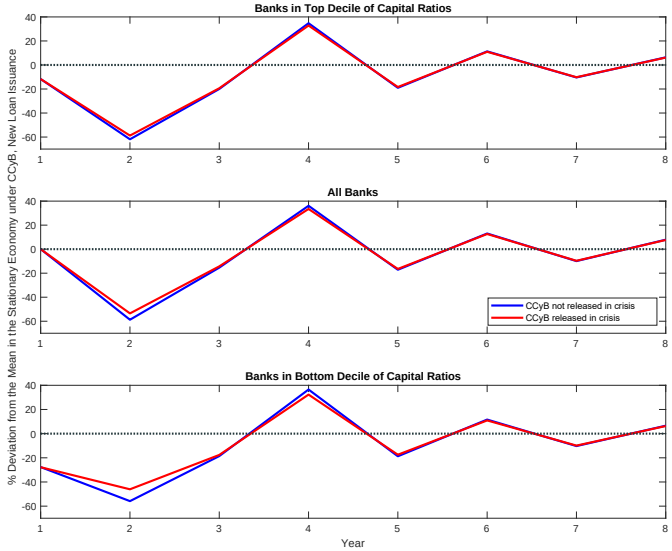
	1.5pp CCyB (Baseline)	1.5pp CCyB (No Market Discipline)
Capital Requirement	13%	13%
Average Capital Ratio	14.64%	13.85%
Bank Insolvency Rate	0.12%	0.19%
New Loans/Deposit	1.02	1.06

- Size of private capital buffer depends on precautionary motive and market discipline
- Market discipline makes banks more prudent and hold more capital in normal times
  - ▷ reinforcing CCyB in normal times
  - ▷ but market discipline is not counter-cyclical and can have an opposing effect if a crisis happens

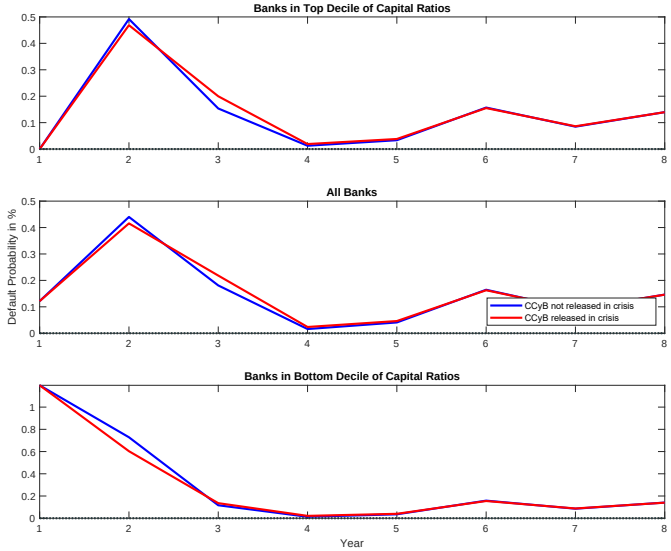
IRF of Capital Ratio with 1.5-pp CCyB (13% → 11.5%)



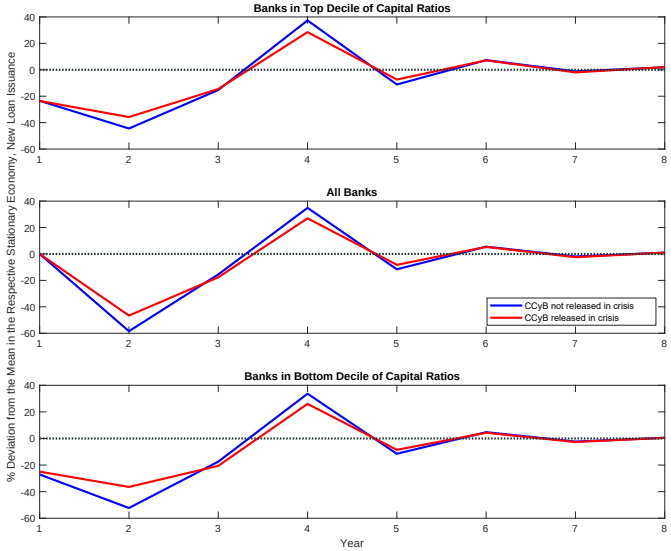
IRF of New Loan Issuance with 1.5-pp CCyB (13% → 11.5%)



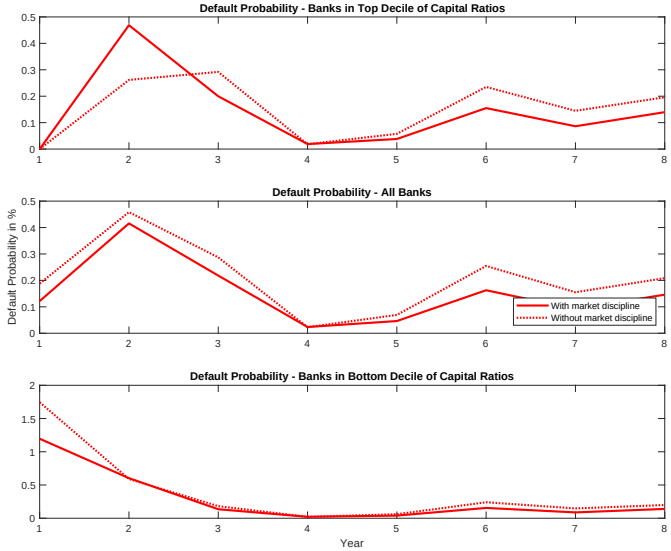
IRF of % of Bank Default with 1.5-pp CCyB (13% → 11.5%)



IRF of New Loan Issuance with 5-pp CCyB (16.5% → 11.5%)



IRF of Bank Default with and w/o Market Discipline, 1.5-pp CCyB

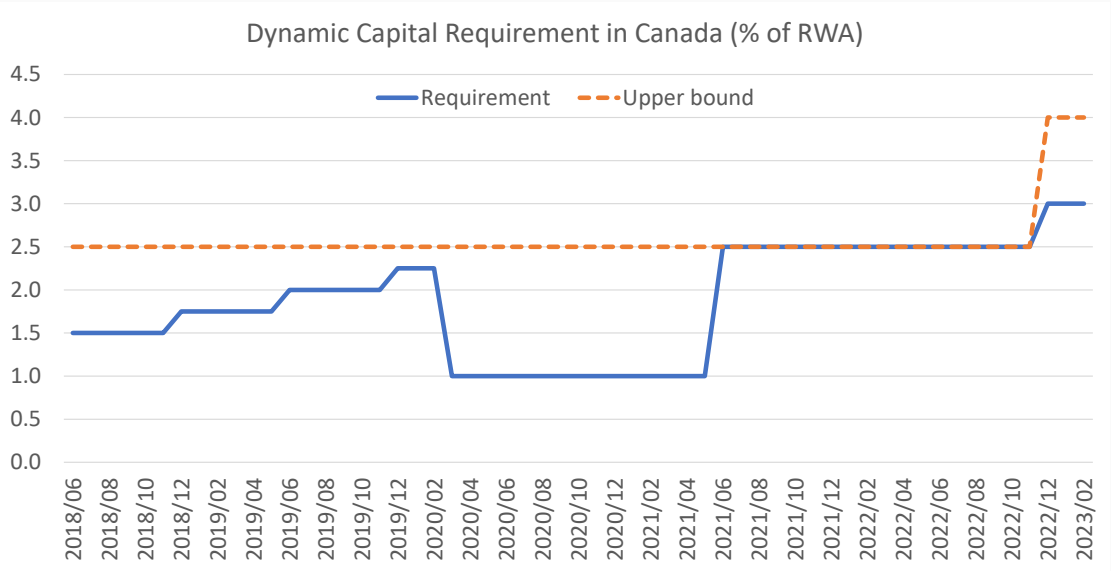


Conclusion

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 limited for a small buffer, but a larger impact as buffer size increases
   - ▷ 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 roll-over risk during a crisis, *working against CCyB*
     - potentially increases default risk for even well-capitalized banks with large exposure on wholesale funding

History of Dynamics Capital Requirement in Canada



Model: Timing of shocks and decisions

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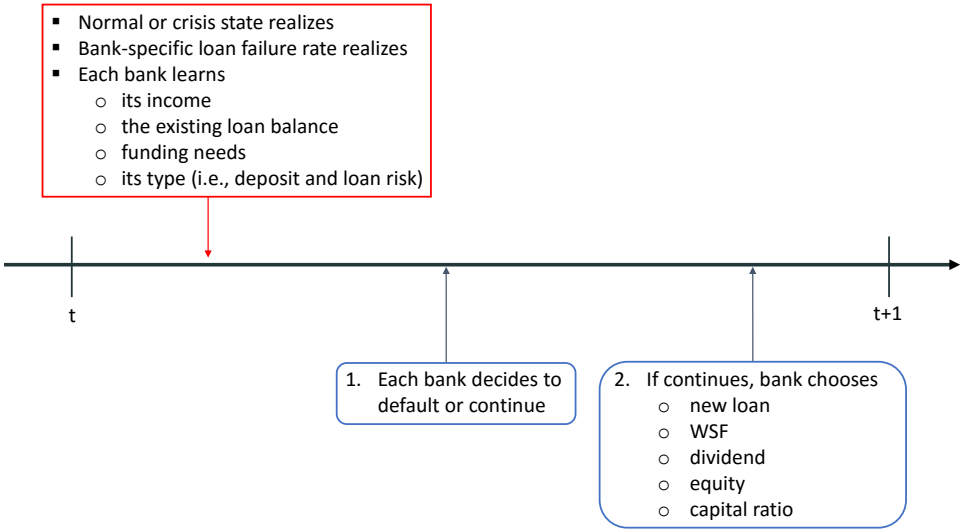

Discount price of WSF for large banks in normal times

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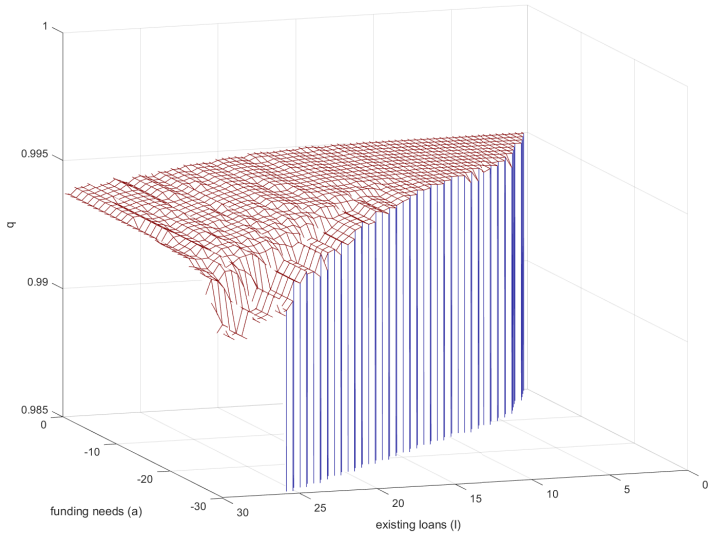

Bank Distributions Before and After the Crisis Shock

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