CLIMATE CHANGE AND THE MACROECONOMICS OF BANK CAPITAL REGULATION

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Model Summary

Quantitative assessment of capital regulation and carbon taxes

Environmental DSGE model with

- Banks (deposit insurance → capital requirements)
- Three intermediate goods producers (non-energy, clean, fossil)
- Competitive final goods producers
- Households derive utility from consumption and liquid deposits
- Public sector sets carbon taxes and capital requirements

Leverage choice (and default) at both firm and bank level

Two Main Results

1. Higher capital requirements for loans to fossil-fuel producers have a quantitatively negligible effect on emissions

2. Capital requirements can help address carbon tax shocks and resulting risk-taking incentives

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- Bank continues to make inframarginal loans
- Effect on emission depends on *marginal loan*
- Marginal loan may or may not be carbon intensive

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Setting capital requirement to 100%

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- In contrast, carbon tax directly reduces NPV

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- In principle, one could condition CRs on emission reduction. But practical?

R2: Carbon Tax Shock

The paper considers the following thought experiment:

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Endogenous leverage response in response to higher carbon tax:

- Clean firms temporarily increase leverage → increase clean CR
- Fossil firms reduce leverage → reduce fossil CR

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- Carbon tax is currently absent or inefficiently low
- Introduction of carbon tax negatively affects banks (stranded assets, transition risks)
- Higher fossil CRs may be required to make carbon tax credible

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Facilitator role of CRs in Oehmke and Opp (2022)

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Risk shock μ_t affects all bank assets **equally**

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Current model does not speak to different types of climate risks

- Perhaps something to consider in future versions?

Summary

Quantitative assessment of capital requirements and climate change is important

Effect of capital requirements on emissions small

I would look at different carbon tax shocks, focusing on transition to optimal carbon taxes

Can you explore richer risk structure that includes transition and/or physical risks?

Thank you!