Comments by Rafael Repullo on

The Secular Decline of Bank Balance Sheet Lending

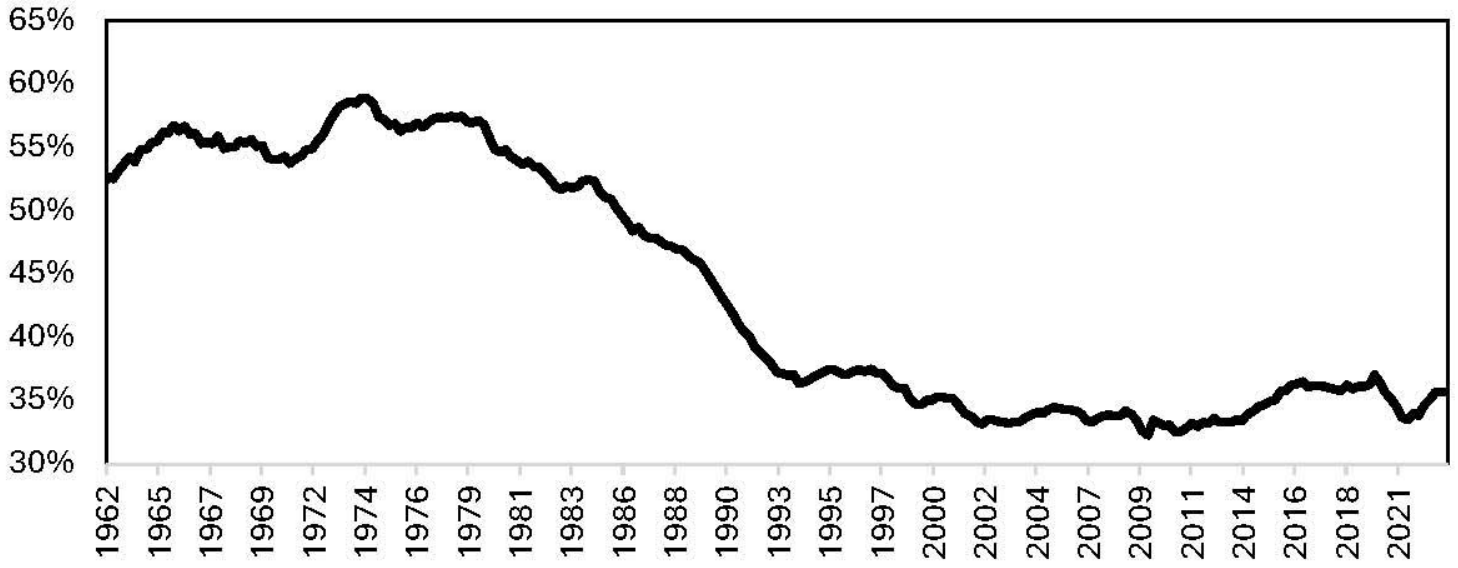
Greg Buchak, Gregor Matvos, Tomasz Piskorski, Amit Seru

Fourth Annual Conference on Financial Stability

London School of Economics, 7 June 2024

Introduction (i)

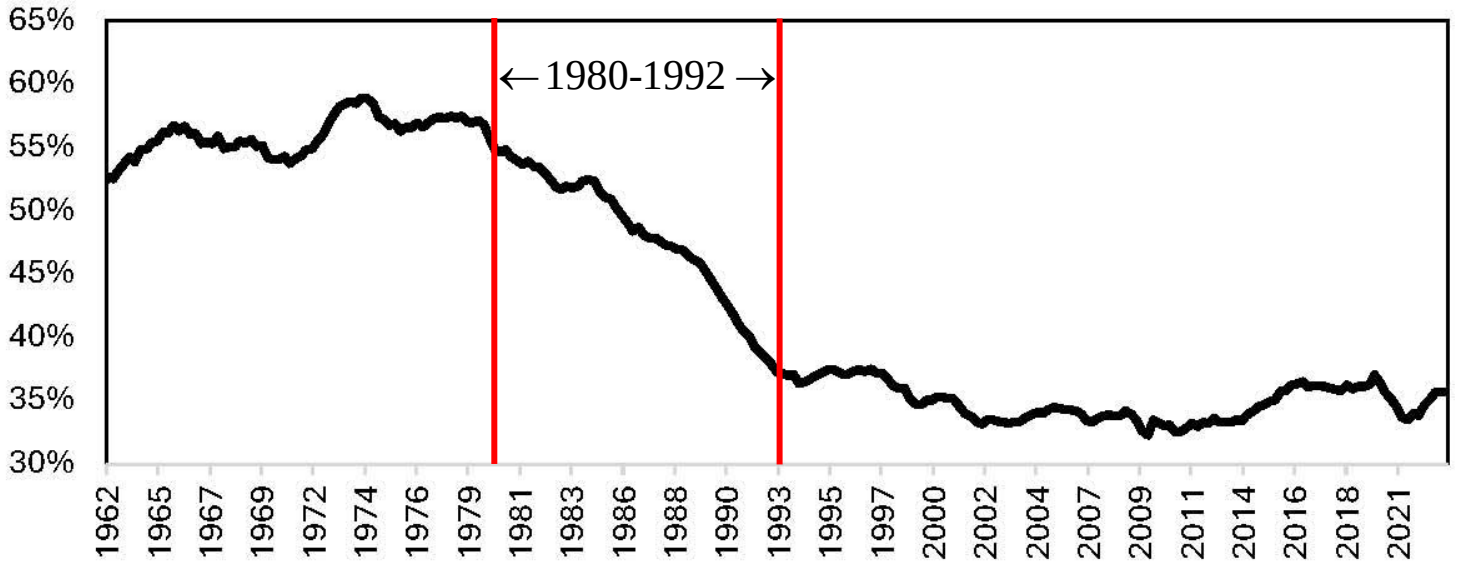
- Purpose of paper: Understand trends in US financial system
    1. Reduction in share of informationally sensitive (bank) lending in total lending



(a) Informationally sensitive lending share

Introduction (i)

- Purpose of paper: Understand trends in US financial system
    1. Reduction in share of informationally sensitive (bank) lending in total lending

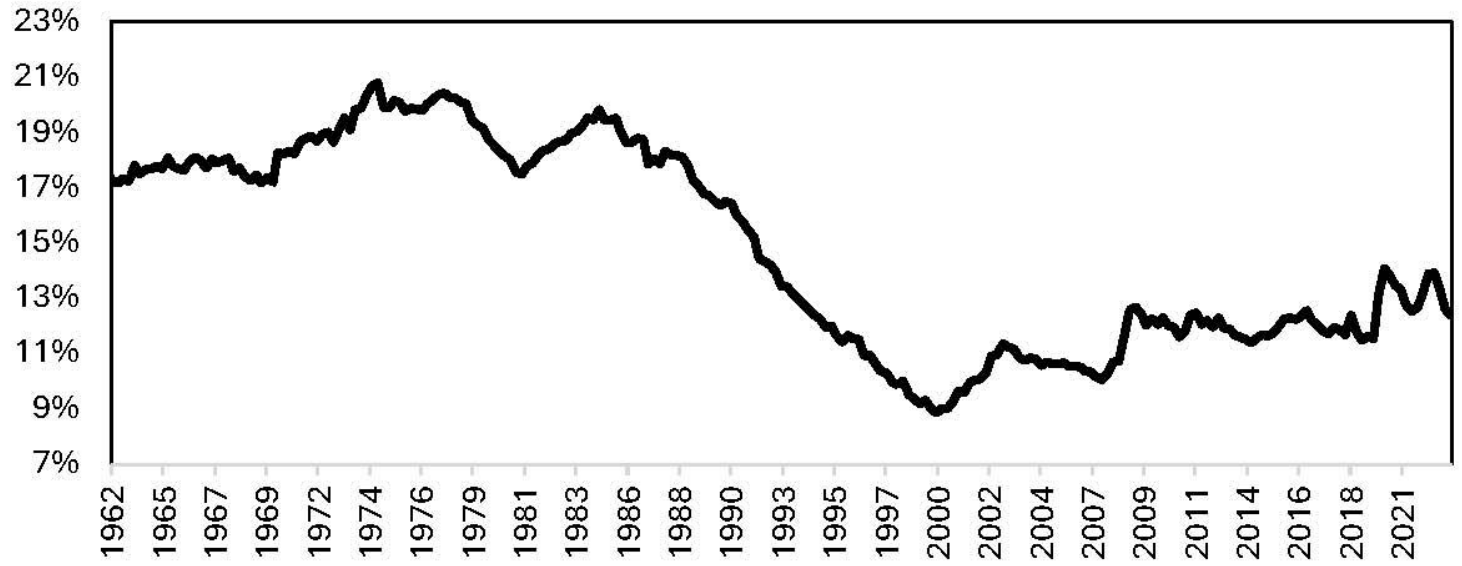


(a) Informationally sensitive lending share

Introduction (i)

- Purpose of paper: Understand trends in US financial system

2. Reduction in share of bank deposits in total savings

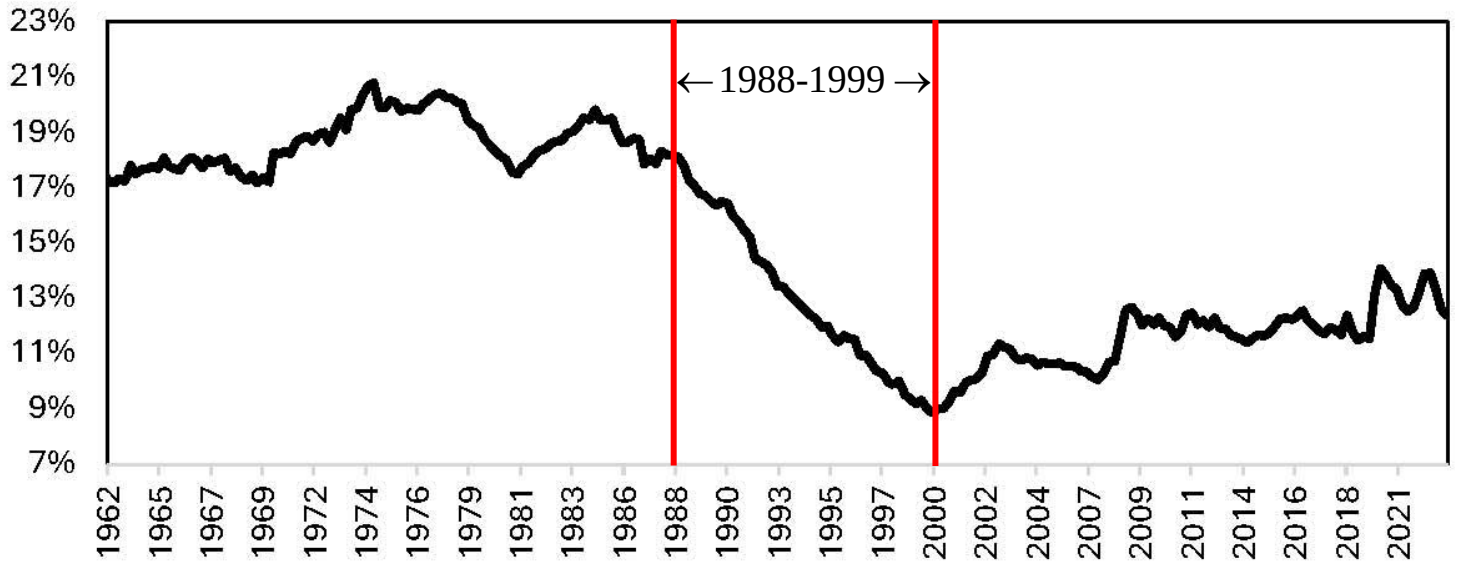


(b) Deposit share of domestic non-financial sector financial assets

Introduction (i)

- Purpose of paper: Understand trends in US financial system

  2. Reduction in share of bank deposits in total savings

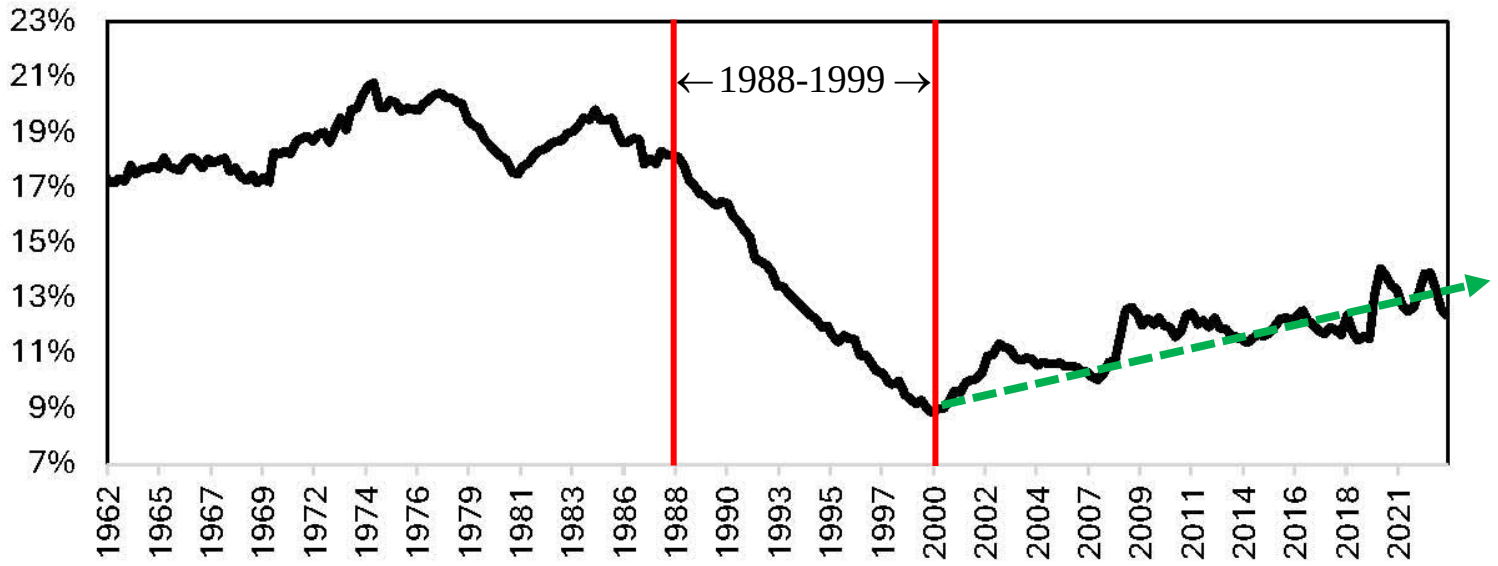


(b) Deposit share of domestic non-financial sector financial assets

Introduction (i)

- Purpose of paper: Understand trends in US financial system

  2. Reduction in share of bank deposits in total savings



(b) Deposit share of domestic non-financial sector financial assets

Introduction (ii)

- Focus on three main drivers of these trends

  → Technological improvements in issuance of debt securities

  → Changes in savers' preferences

  → Changes in regulation of banking sector

- Structural model to quantify the contribution of these drivers

Strategy for the analysis

- Estimate parameters of the model

  → In particular: technology, preferences, and regulation

- Construct counterfactual outcomes in 2023

  → Baseline scenario: keep drivers at 1963 level

  → Compute the separate effect of each of these drivers

Main results

- Decline in share of informationally sensitive (bank) lending

  → All three drivers contribute to the decline

  → Main driver: change in savers' preferences

  → Second driver: change in intermediation technology

- Decline in share of bank deposits in total savings

  → Main driver: change is savers' preferences

  → Partially compensated by changes in regulation (subsidies)

Initial comments

- Complicated structural model

  → Can we trust the model specification?

  → Macro developments (e.g. inflation) are missing

  → How robust are the results?

- Estimation considers the entire 1963-2023 period

  → Focus on 1980s for changes in lending?

  → Focus on 1990s for changes in savings?

This discussion

- Review original structural model

  → Point out two issues

- Sketch simple theoretical model

  → To better understand effect of the three drivers

Part 1

Structural model

Model setup

- Static (two date $t = 0, 1$) model with four types of agents
- Savers with given wealth at $t = 0$

  → Invest in savings vehicles that are imperfect substitutes
- Borrowers with given repayment at $t = 1$

  → Borrow using vehicles that are imperfect substitutes
- Banks raise deposits (and equity capital) and invest in loans
- Non-bank financial intermediaries (NBFI): pass-through entities

Savers (i)

- Initial wealth M to be invested at $t = 0$ in n savings vehicles
- Utility of savings vehicles

$$U(Q) = \left(\sum_j \alpha_j^{\frac{1}{\sigma}} Q_j^{\frac{\sigma-1}{\sigma}} \right)^{\frac{\sigma}{\sigma-1}}$$

  → where Q_j is payment of vehicle j at $t = 1$

- Interest rate of vehicle j given by r_j
- Note: Omitting subscript s (savers) to simplify notation

Savers (ii)

- Savers' decision problem

$$\max_Q U(Q) = \left(\sum_j \alpha_j^{\frac{1}{\sigma}} Q_j^{\frac{\sigma-1}{\sigma}} \right)^{\frac{\sigma}{\sigma-1}}$$

→ subject to

$$\sum_j \frac{1}{1+r_j} Q_j = M$$

→ recall that Q_j is payment of vehicle j at $t = 1$

- Closed form solution $Q_d(r)$ (now with the subscript)

Borrowers (i)

- Debt repayment M due at $t = 1$
- Utility of borrowing vehicles

$$U(Q) = \left(\sum_j \beta_j^{\frac{1}{\sigma}} Q_j^{\frac{\sigma-1}{\sigma}} \right)^{\frac{\sigma}{\sigma-1}}$$

  → where Q_j is borrowing in vehicle j at $t = 0$

- Interest rate of vehicle j given by r_j
- Note: Omitting subscript b (borrowers) to simplify notation

Borrowers (ii)

- Borrower's decision problem

$$\max_Q U(Q) = \left(\sum_j \beta_j^{\frac{1}{\sigma}} Q_j^{\frac{\sigma-1}{\sigma}} \right)^{\frac{\sigma}{\sigma-1}}$$

→ subject to

$$\sum_j (1+r_j) Q_j = M$$

→ recall that Q_j is borrowing in vehicle j at $t = 0$

- Closed form solution $Q_l(r)$ (now with the subscript)

Banks (i)

- Balance sheet (omitting equity) at $t = 0$

$$Q_l + \frac{1}{1+r_s} Q_s = \frac{1}{1+r_d} Q_d$$

→ where Q_s is investment in securities at the rate r_s

Banks (ii)

- Objective function (as written in the paper)

$$\Pi(Q) = (1 + r_l + \Delta_l)Q_l + Q_s - \frac{1 + r_d + \Delta_d}{1 + r_d} Q_d$$

→ where Δ_l and Δ_d are intermediation wedges

Banks (ii)

- Objective function (as written in the paper)

$$\Pi(Q) = \underbrace{(1 + r_l + \Delta_l)Q_l}_{t=1} + \underbrace{Q_s}_{t=1} - \underbrace{\frac{1 + r_d + \Delta_d}{1 + r_d} Q_d}_{t=0}$$

- Two issues

  → There is an inconsistency in the timing of terms of $\Pi(Q)$

  → Where is $\Delta_l > 0$ coming from (if not from the borrowers)?

Comment (i)

- Unclear whether the timing is a substantive problem

  → Justification (footnote 11)

  > "Broadly 'savings' technologies cost $p = (1 + r_s)^{-1}$ today and return 1 tomorrow. 'Borrowing' technologies cost 1 today and return $p = 1 + r_l$ tomorrow. This helps keep demand functions symmetric across the sectors."

  → Is this really needed?

Comment (ii)

- Lending wedge Δ_l should be negative

  → Loan provisioning costs

  → Justification (p. 21): connection with bank capitalization

  > "A better capitalized bank receives effectively more repayment per loan."

  → You could introduce this with a (less) negative wedge

Part 2

Simple theoretical model

Model setup

- Static (two date $t = 0, 1$) model with four types of agents

  → Savers, borrowers, banks, and NBFIs

- Notation:

  → Deposits of banks and NBFIs denoted by D_b and D_n

  → Deposit rates of banks and NBFIs denoted by r_b and r_n

  → Loans of banks and NBFIs denoted by L_b and L_n

  → Loan rates of banks and NBFIs denoted by i_b and i_n

Savers

- Initial wealth M to be invested at $t = 0$ in banks and NBFIs
- Bank deposits yield utility (transaction services): $\alpha \ln(D_b)$
- Savers' decision problem

$$\max\left[(1+r_b)D_b + (1+r_n)D_n + \alpha \ln(D_b)\right]$$

subject to $D_b + D_n = M$

- Solution

$$D_b = \frac{\alpha}{r_n - r_b} \quad \text{and} \quad D_n = M - D_b$$

Borrowers

- Production function $A(L_b + L_n)^{\gamma}$
- Bank loans yield utility (monitoring services): $\beta \ln(L_b)$
- Borrowers' decision problem

$$\max\left[A(L_b + L_n)^{\gamma} - (1+i_b)L_b - (1+i_n)L_n + \beta \ln(L_b) \right]$$

- Solution

$$L_b = \frac{\beta}{i_b - i_n} \quad \text{and} \quad L_b + L_n = \left(\frac{\gamma A}{1+i_n} \right)^{\frac{1}{1-\gamma}}$$

Banks (i)

- Balance sheet

$$L_b + I_n = D_b$$

where I_n is investment in securities

- Banks' profits

$$\Pi_b = (1 + i_b - c_l)L_b + (1 + r_n)I_n - (1 + r_b + c_d)D_b$$

where c_l and c_d are the costs of lending and deposit taking

Banks (ii)

- Substituting I_n from balance sheet into profits yields

$$\Pi_b = (i_b - c_l - r_n)L_b + (r_n - r_b - c_d)D_b$$

- Assuming a competitive banking system

  → zero profit conditions

$$i_b = r_n + c_l \quad \text{and} \quad r_b = r_n - c_d$$

NBFIs

- Balance sheet

$$L_n = D_n + I_n$$

- NBFIs' profits

$$\Pi_n = (1 + i_n - c_n)L_n - (1 + r_n)(D_n + I_n) = (i_n - c_n - r_n)L_n$$

where c_n are the costs of securitization

- Assuming a competitive NBFI system

→ zero profit condition

$$i_n = r_n + c_n$$

Balance sheets

Banks

L_b	D_b
I_n	

Borrowers

K	L_b
	L_n

Savers

D_b	M
D_n	

NBFIs

L_n	D_n
	I_n

$$K = L_b + L_n = D_b + D_n = M$$

Equilibrium rates

- Equilibrium condition

$$L_b + L_n = \left(\frac{\gamma A}{1+i_n} \right)^{\frac{1}{1-\gamma}} = D_b + D_n = M$$

→ Equilibrium NBFI loan rate

$$1+i_n^* = \frac{\gamma A}{M^{1-\gamma}}$$

→ Other equilibrium rates

NBFI deposit rate: $r_n^* = i_n^* - c_n$

Bank loan rate: $i_b^* = r_n^* + c_l = i_n^* - c_n + c_l$

Bank deposit rate: $r_b^* = r_n^* - c_d$

Equilibrium quantities

- Bank deposits

$$D_b^* = \frac{\alpha}{r_n^* - r_b^*} = \frac{\alpha}{c_d}$$

- Bank loans

$$L_b^* = \frac{\beta}{i_b^* - i_n^*} = \frac{\beta}{c_l - c_n}$$

- NBFI deposits $D_n^* = M - D_b^*$

- NBFI loans $L_n^* = M - L_b^*$

Comparative statics (i)

- Main drivers of financial sector trends

  → Improvements in issuance of debt securities: $c_n \downarrow$

  → Changes in savers' preferences: $\alpha \downarrow$

  → Changes in regulation of banking sector: $c_l \uparrow$

Comparative statics (ii)

- Since

$$D_b^* = \frac{\alpha}{r_n^* - r_b^*} = \frac{\alpha}{c_d}$$

→ reduction in α leads to fall in bank deposits

→ this could be compensated by reduction in costs c_d

- Since

$$L_b^* = \frac{\beta}{i_b^* - i_n^*} = \frac{\beta}{c_l - c_n}$$

→ reduction in c_n leads to fall in bank loans

→ this would be reinforced by increase in c_l

Comparative statics (iii)

- Decline in share of bank deposits in total savings

  → Depends on the ratio α/c_d

  → How can we separate the effects of α and c_d?

- Decline in share of informationally sensitive (bank) lending

  → Depends on the ratio $\beta/(c_l - c_n)$

  → How could we separate the effects of c_l and c_n?

Concluding remarks

Concluding remarks (i)

- Paper addresses key issue from a novel perspective

  → Understanding trends in US financial system by building a structural model

  → Importantly, model incorporates a NBFI sector

  → Approach is relevant for other jurisdictions (except for the peculiar US government sponsored sector)

Concluding remarks (ii)

- Model allows for counterfactual analysis

  → Including the effects through NBFIs

  → Interesting policy implications

  → Small effects of bank regulation on aggregate lending

  → Because of reallocation to NBFIs

Concluding remarks (iii)

- There is scope for more research in this area
- Two possible directions
  - → Simplify model to better understand the mechanisms
  - → Complicate model to introduce dynamic considerations
- Both directions should be pursued