Financial Stability with Sovereign Debt

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- **Government guarantees** *versus* **Financial regulation**
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  - A shock in banking sector hurts sovereign
  - The worse fiscal situation hurts the banking sector

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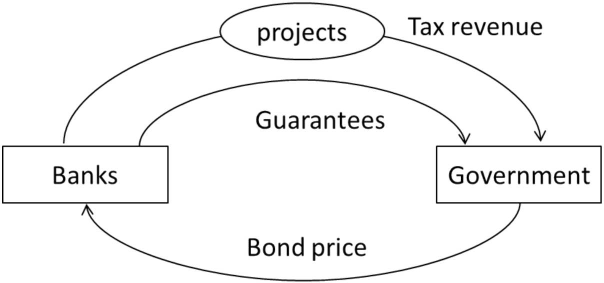
Question:
Which approach is the best to promote financial stability given this loop?

Motivation

The negative feedback loop



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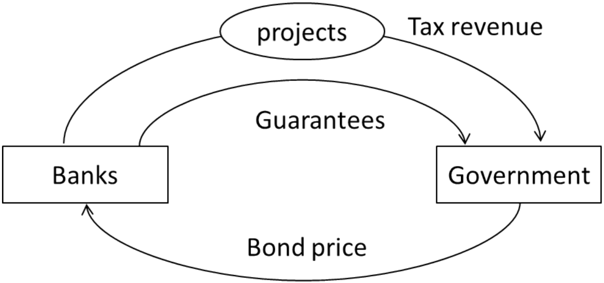

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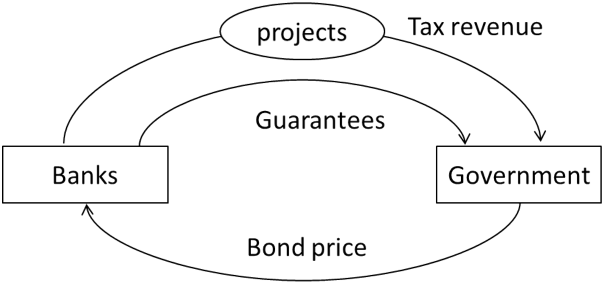

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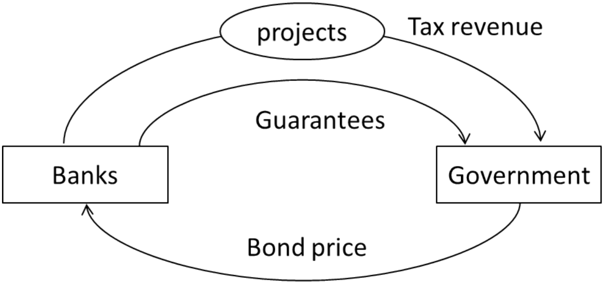

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- **Guarantee:** liquidity shortage $\Rightarrow$ transfers $\Rightarrow$ debt level $\uparrow$
- **Bond price:** worse fiscal situation $\downarrow$ $\Rightarrow$ bond price $\downarrow$ $\Rightarrow$ valuation loss

This paper

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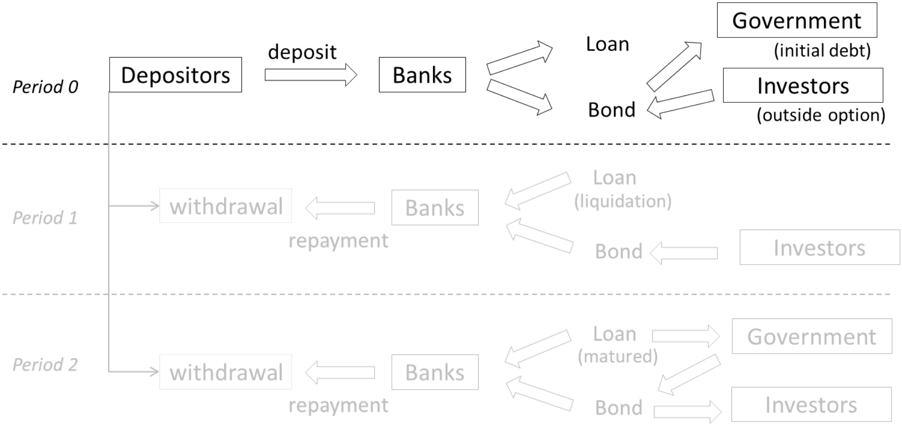
- **studies** sovereign default together with self-fulfilling bank runs
- **models** the negative feedback loop between banks and the government
- **compares** government guarantee, liquidity regulation, and a mix of them
- **derives** conditions under which each policy regime is effective

Baseline Model

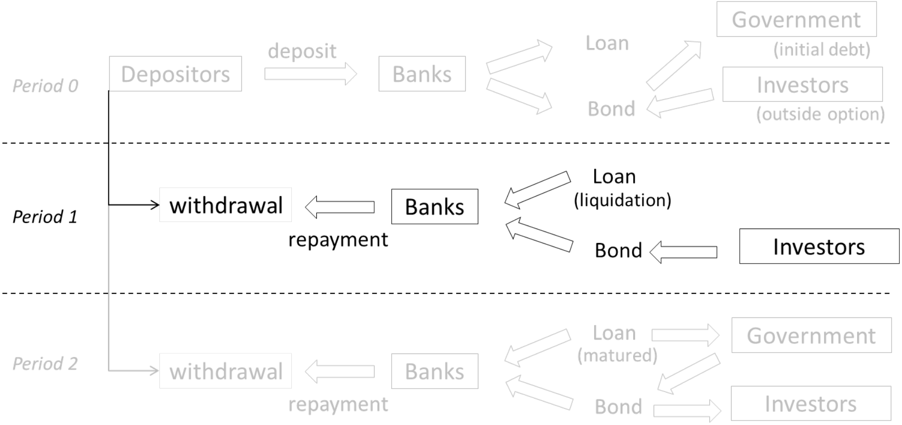
Mechanism

Diamond Dybvig model with a defaultable asset

- Agents: Depositors, Banks, (Outside) Investors and Government
- Time period: $t = 0, 1, 2$

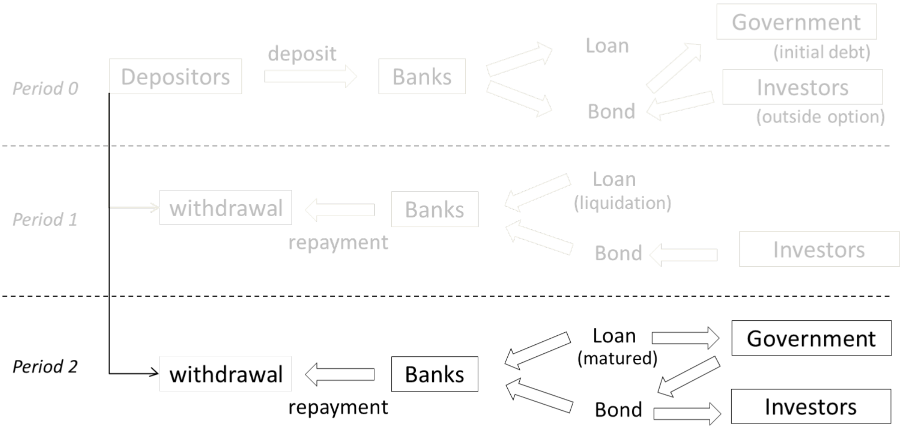


Mechanism



Period 0
Depositors
deposit
Banks
Loan
Bond
Government
(initial debt)
Investors
(outside option)
Period 1
withdrawal
repayment
Banks
Loan
(liquidation)
Bond
Investors
Period 2
withdrawal
repayment
Banks
Loan
(matured)
Bond
Government
Investors

Mechanism



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Model setup

- Fraction λ of depositors will be impatient and withdraw in period 1

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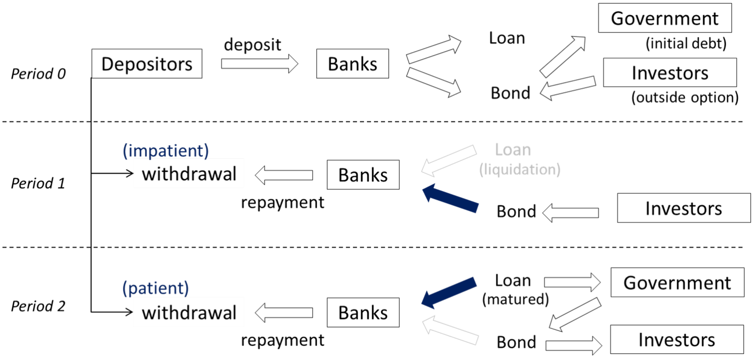
- Patient depositors withdraw either in period 1 or in period 2
- A bank run occurs if patient depositors withdraw in period 1
- Sovereign default occurs if the government cannot levy sufficient tax to repay bonds

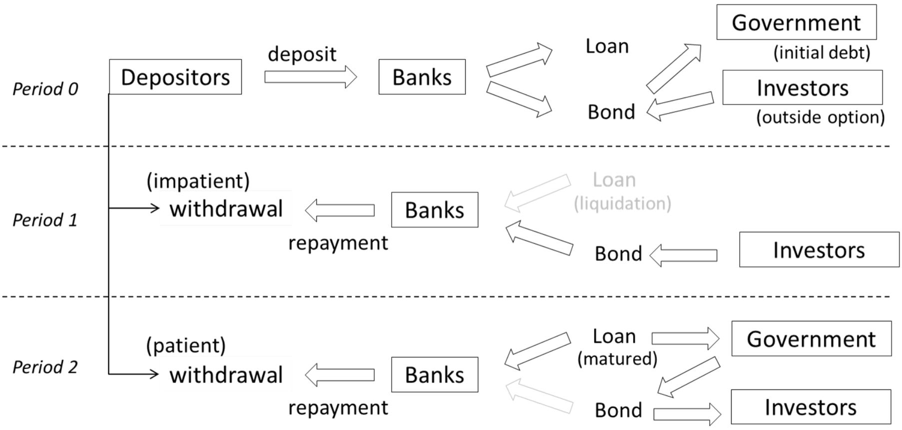
Efficient allocation

- Banks redeem a withdrawal by returns of $\begin{Bmatrix} \textit{bond} \\ \textit{loan} \end{Bmatrix}$ in period $\begin{Bmatrix} 1 \\ 2 \end{Bmatrix}$
- $\begin{Bmatrix} \textit{Impatient} \\ \textit{Patient} \end{Bmatrix}$ depositors withdraw in period $\begin{Bmatrix} 1 \\ 2 \end{Bmatrix}$
- Bond prices are determined through arbitrage with outside options



Bank run

A Bank Run



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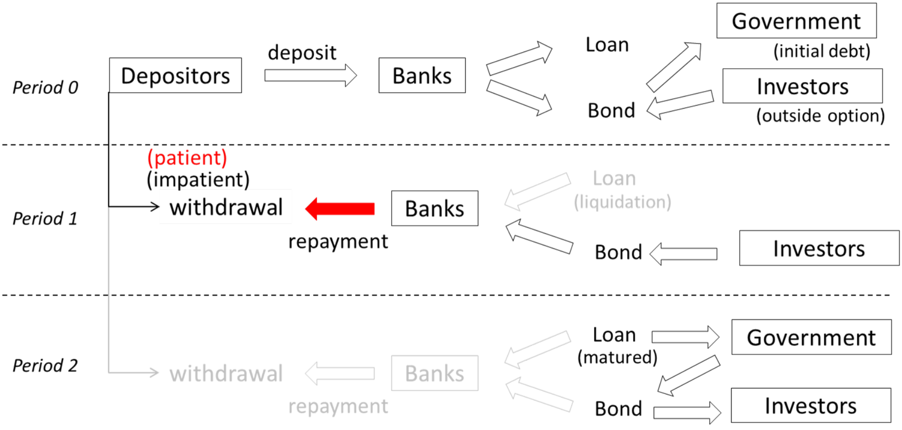
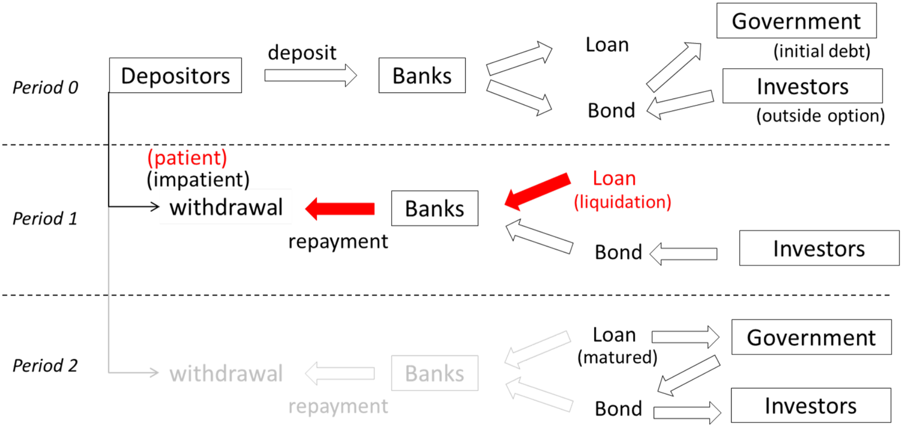


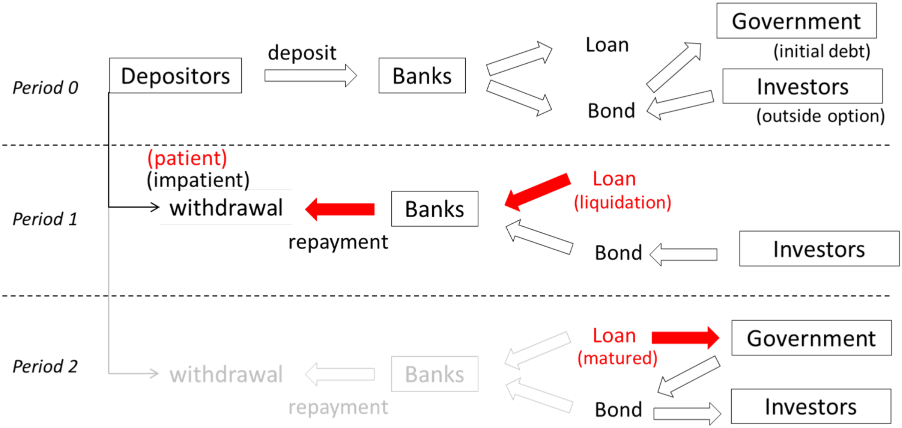
- Extra withdrawals

A Bank Run



- Liquidation

A Bank Run



- Liquidation $\Rightarrow$ Tax base $\downarrow$

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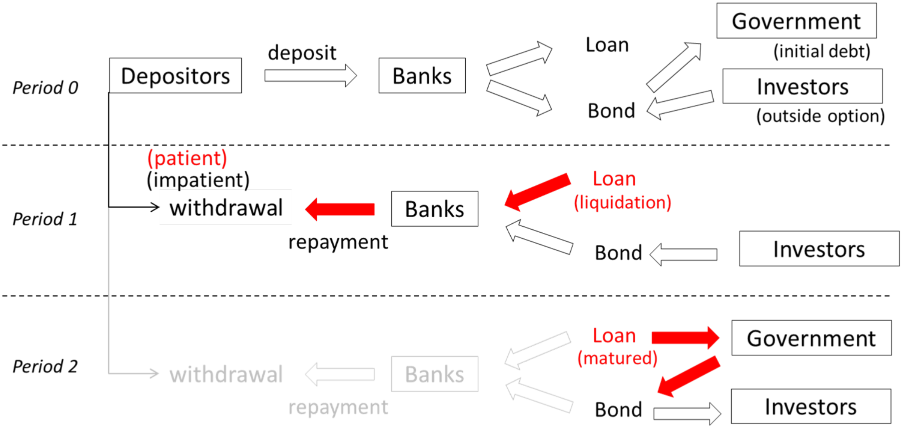

- Liquidation $\Rightarrow$ Tax base $\downarrow$ $\Rightarrow$ Default

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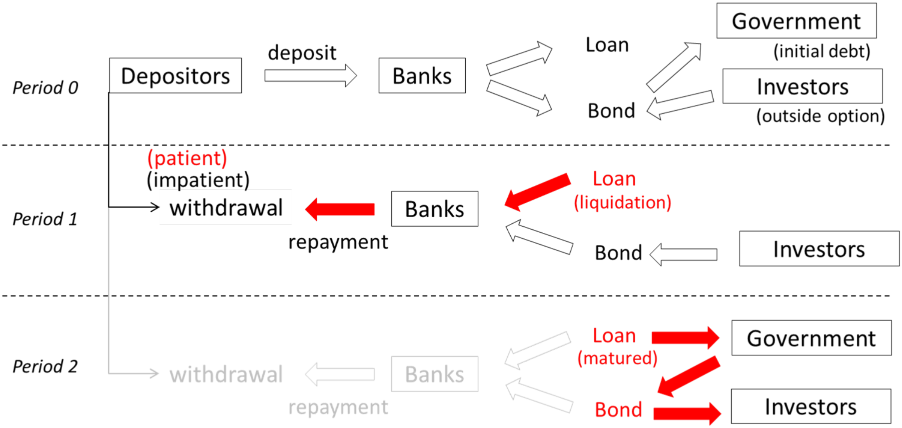

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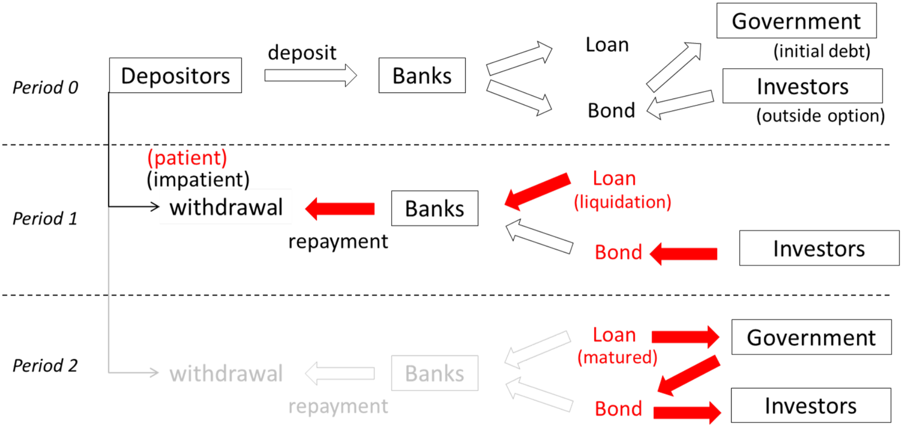

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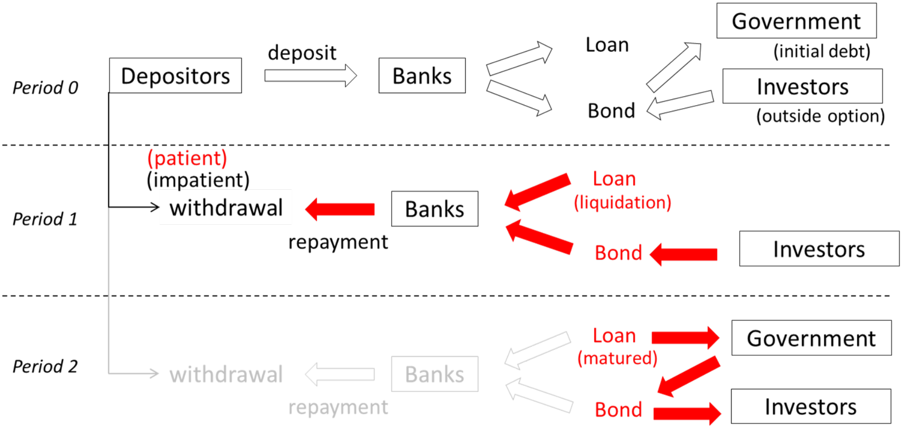

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Policies

- The bank run equilibrium always exists in the baseline model.

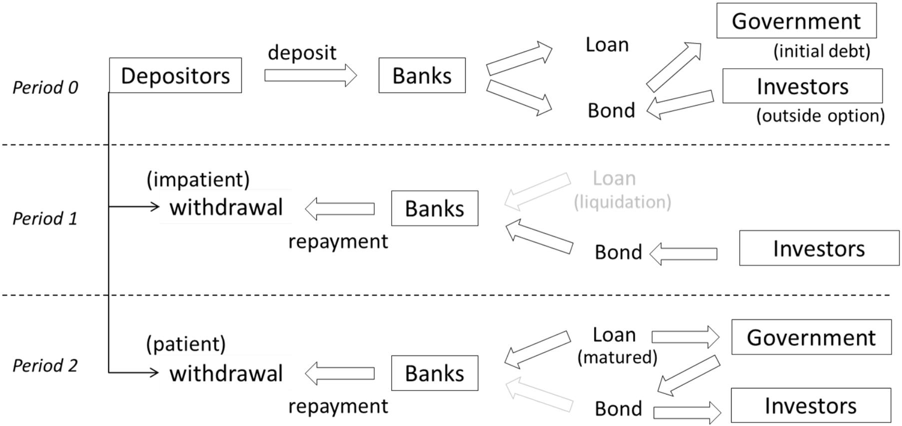
  Q. Do any of following policies eliminate the run equilibrium?

  1. Liquidity regulation
  2. Government guarantees
  3. A mix of these policies

Liquidity Regulation

- **Example:** Liquidity Coverage Ratio (LCR)

$$LCR = \frac{Stock\ \ of\ \ high\ \ quality\ \ liquid\ \ assets\ \ (HQLA)}{Total\ \ net\ \ cash\ \ outflows\ \ over\ \ the\ \ next\ \ 30\ \ calendar\ \ days\ \ (NCOF)}.$$



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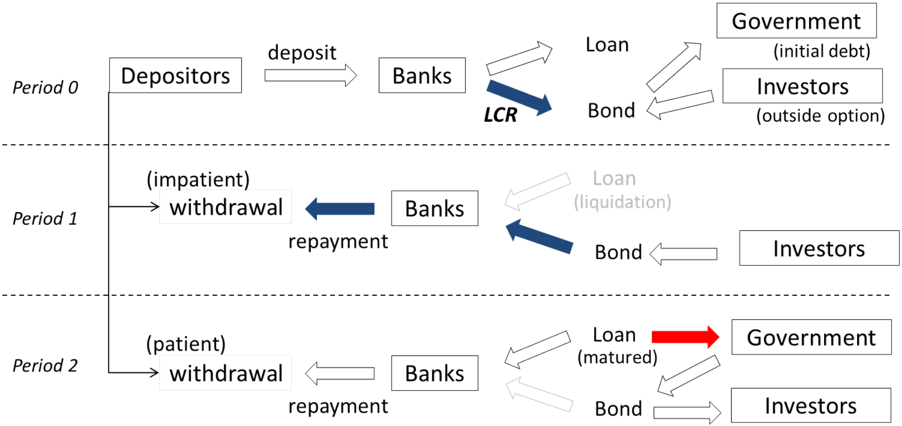
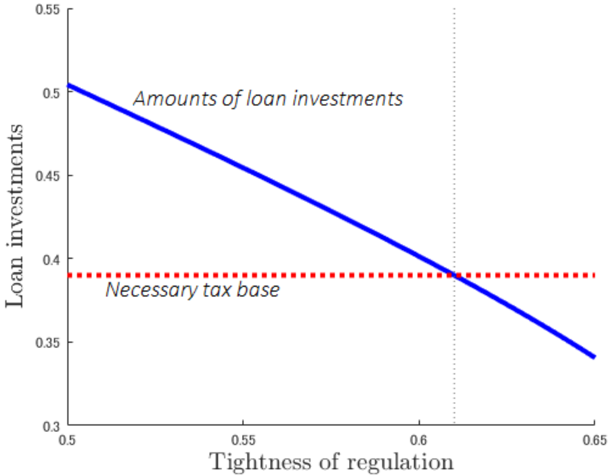


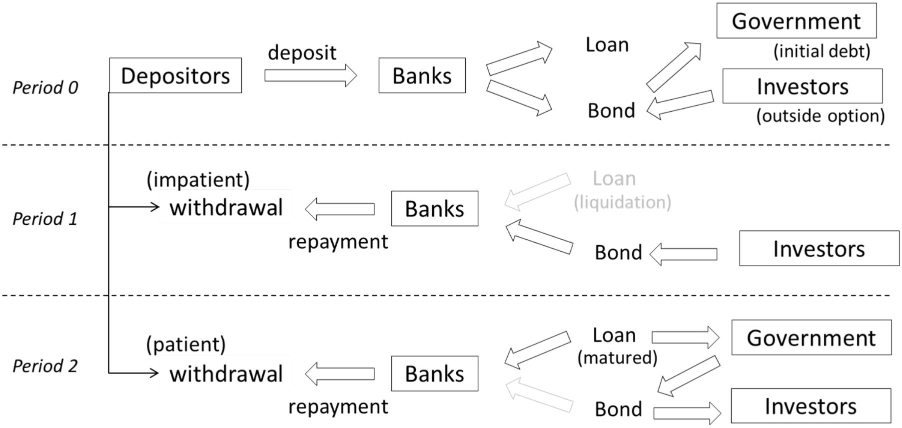
Liquidity Regulation

- may prevent a run.
- but, it distorts the allocation if it binds.
- and, it may cause sovereign default if it's too tight.



Government Guarantees

- No costly liquidation if the government can raise funds
- The government has higher accumulated debt to repay in period 2
- The credibility of guarantees depends on debt sustainability



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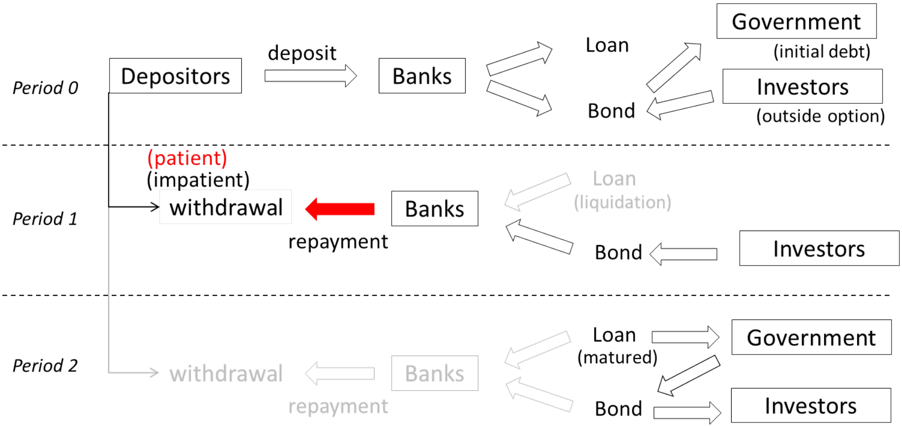

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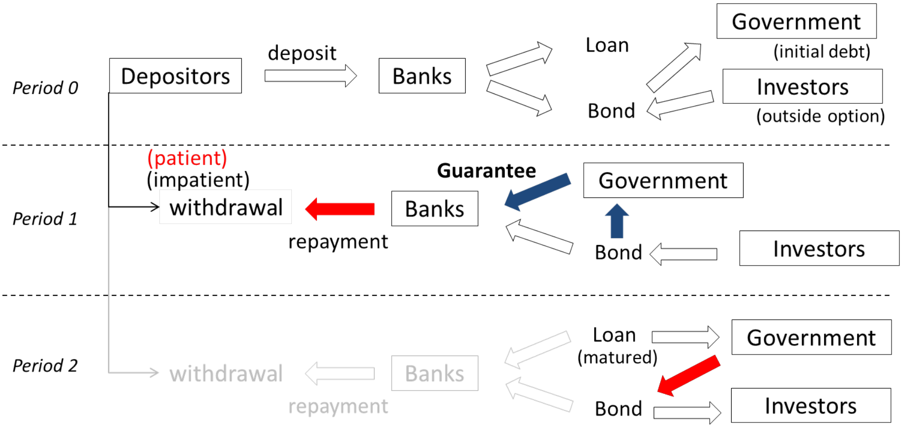
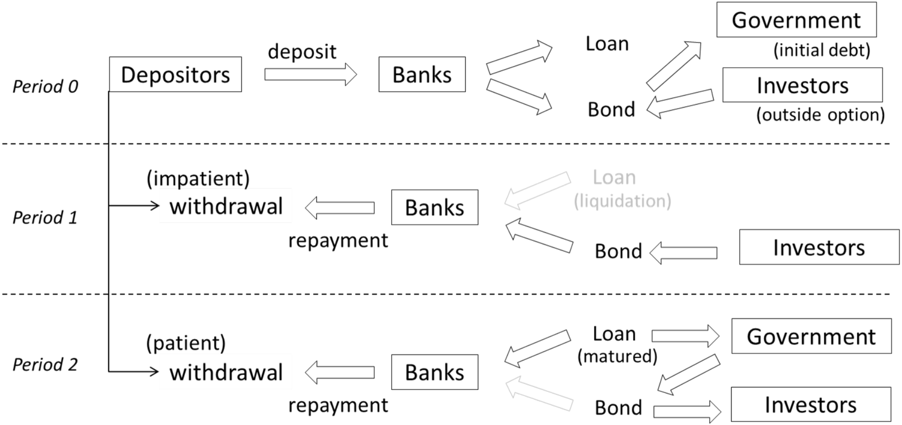


Policy Mix

- Liquidity regulation requires banks to have excess liquidity.
- The transfer mechanism is identical to Guarantee.



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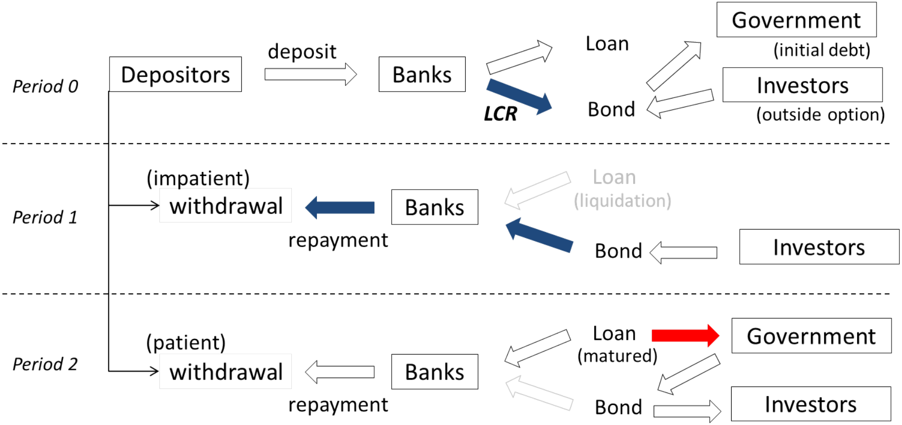

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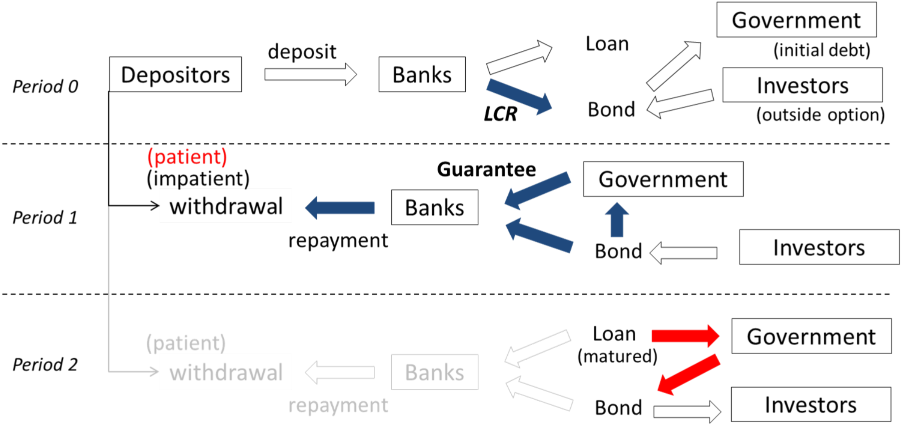

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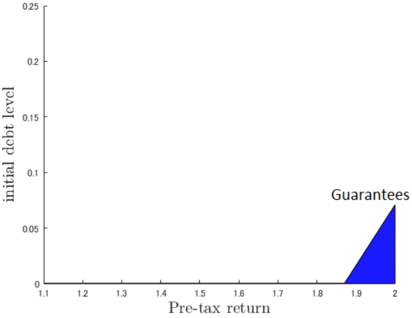

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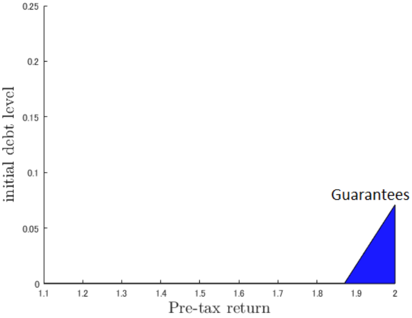

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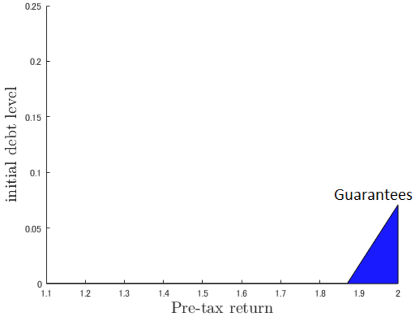

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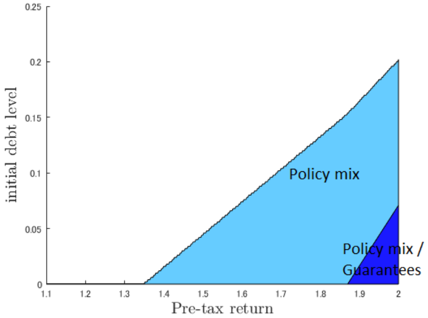

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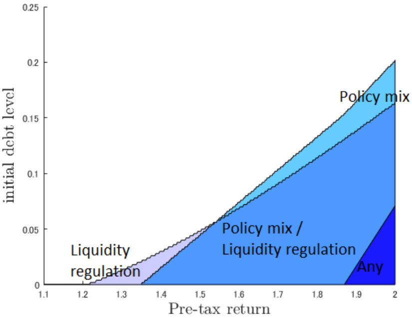

- Guarantee is effective in economies with high returns and low debts
- If the returns ↓ or debt ↑, Guarantee is ineffective
- But, Guarantee may work if combined it with liquidity regulation
- In some cases, only Liquidity regulation alone is effective

Conclusion

- **Findings:**
  - Guarantee
    - do not distort the allocation
    - effectiveness depends on debt sustainability
  - Liquidity regulation
    - distorts the allocation if it binds
    - causes a sovereign default if too strict
  - Policy mix
    - can complement government guarantees
    - but less effective than liquidity regulation alone in some cases