

Financial intermediation, risk taking and monetary policy

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* This presentation reflects the views of the authors and not necessarily those of the BIS or of central banks participating in the meeting.

Financial Intermediation, Risk Taking and Monetary Policy

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Risk Taking and Interest Rate Policy

- The recent financial crisis popularized the view that:

Low interest rates lead to
excessive risk taking by financial intermediaries

- Empirical evidence suggests a link
 - ▶ e.g. Ioannidou, Ongena and Peydró (2009); Jiménez, Ongena, Peydró and Saurina (2009); Altunbas, Gambacorta, and Marques-Ibane (2010); Delis and Kouretas (2010); López, Tenjo and Zárata (2011)

What We Do

In model where interest rate policy affects risk taking:

- find optimal interest rate policy
- evaluate consequences of deviating from the optimal policy

Risk taking is *excessive* if investments in high risk projects

- exceed the amount a social planner would choose

Two Risk Taking Channels of Policy

Dynamic model with aggregate and idiosyncratic risk:

- Financial intermediaries with limited liability
 - ▶ are initially identical
 - ▶ choose safe bonds and risky projects
 - ▶ find out type specific productivity risk: high or low
 - ▶ adjust portfolios via collateralized borrowing in repo market
- Interest rate policy affects risk taking through
 - ▶ returns to safe bonds → portfolio channel
 - ▶ amount of collateral → collateral channel

Empirical Importance of Collateral Channel

- Repo market: large and growing market in U.S.
- Evidence of link between policy and repo market
 - ▶ Fed funds rate is highly correlated with repo rate
 - ▶ Government bonds big part of collateral used in repo market
- Evidence of link between repo market and risk taking

Adrian and Shin (2010) show that changes in repo positions

 - ▶ key margin of balance sheet adjustment for intermediaries
 - ▶ forecast changes in financial market risk

What We Find

In model where interest rate policy affects risk taking through portfolio and collateral channel, we find:

- Optimal policy implies *excessive* risk taking
- Lower than optimal interest rates reduce risk taking

Why Lower Rates Reduce Risk Taking?

Lower than optimal interest rates have two effects:

1. **Portfolio channel:** buy less bonds in primary bond market
 - all intermediaries put more resources in risky assets
2. **Collateral channel:** have less bonds for repo transactions
 - in good times, high risk FI have high expected returns; want more risky assets; are constrained by amount of collateral
 - moral hazard problem is lessened

Collateral channel is quantitatively stronger

lower than optimal interest rates \Rightarrow less risk taking

Why Collateral Channel Dominates?

Main imperfection: limited liability

Optimal interest rates policy:

- aims to restrict risk taking by high risk FI
- makes collateral constraint for high risk FI binds

Collateral channel is quantitatively stronger because it allows to selectively control risk taking

Our Model with Mispriced Collateral

Add to the model the possibility of mispriced collateral:

- Financial intermediaries issue private bonds
- Rating agencies misreport riskiness of these private bonds
- There is foreign demand for *safe* domestic bonds

In this environment

- intermediaries have more collateral for repo market
- lower than optimal interest rates \Rightarrow MORE risk taking

Model Outline

Model Outline

Dynamic general equilibrium model with:

- Aggregate and idiosyncratic risk
- Financial intermediaries (FI) trade in repo market
- Deposit insurance
- Limited liability of FI

Main Choices and Events in Model

- Households consume, work, invest in equity and deposits
- Government sets bond prices in primary bond market
- Financial intermediaries (FI):
 - ▶ take equity and deposits, invest in capital and gov't bonds
 - ▶ learn riskiness of their project: High or Low risk
 - ▶ trade in repo market with bonds as collateral
- Aggregate productivity shock realizes
- FI: collect returns to risky projects and bonds; pay deposits and equity returns, *unless bankrupt*
- Government funds deposit insurance and repayment of bonds with lump-sum taxes

Optimal Policy and Repo Transactions

In good times, high risk financial intermediaries (FI)

- have high expected return,
- trade bonds on repo market to invest more in risky projects,
- due to limited liability, disregard potential losses in a bad aggregate state
- if bad shock occurs, high risk FI incur losses

Depositors disregard these losses due to deposit insurance

Optimal interest rate policy aims to mitigate moral hazard problem by making collateral constraint bind

Model Results

Experiments

Exp. 1 Optimal interest rate policy, $1/p^*$

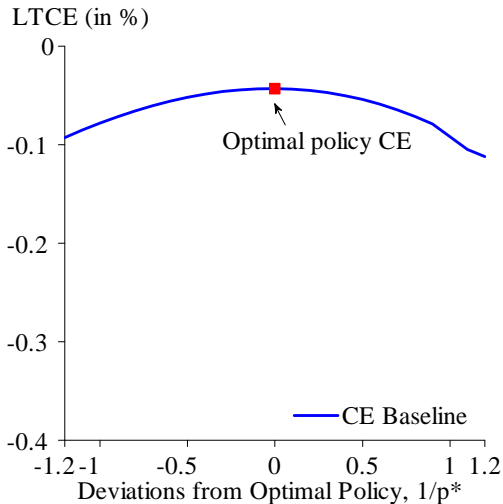
Exp. 2 Level shifts in optimal policy's returns on bonds:

$$1/p^* \pm \Delta \text{ percentage points}$$

Exp. 3 Private mispriced bonds and foreign demand

Examine welfare and risk taking relative to the social planner

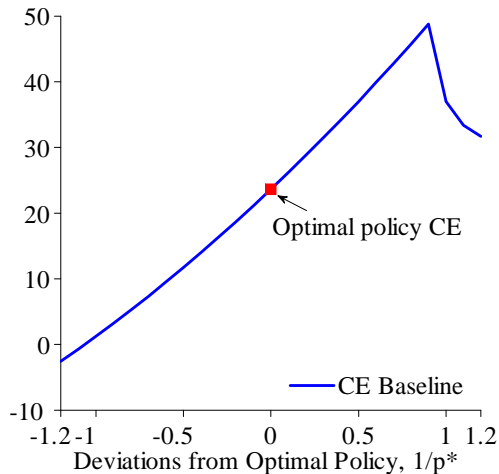
Welfare Implications of Policy



- Optimal policy CE: close, but below, the social planner
- Deviations from optimal policy: not too costly

Risk Implications of Policy

Risk taking (in %)



- Optimal Policy CE: more risk relative to social planner

Close to optimum

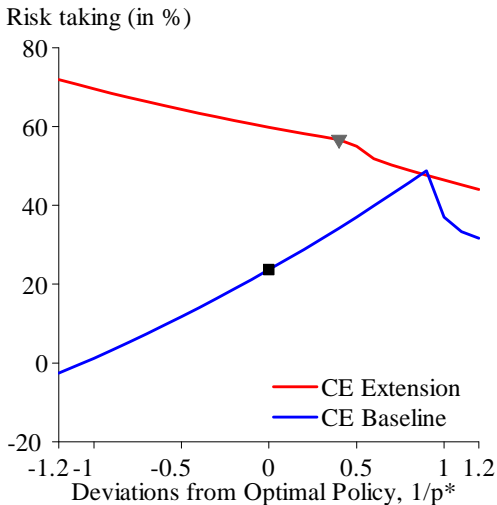
- Lowering rates: reduces risk taking

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Risk Taking with Mispriced Collateral



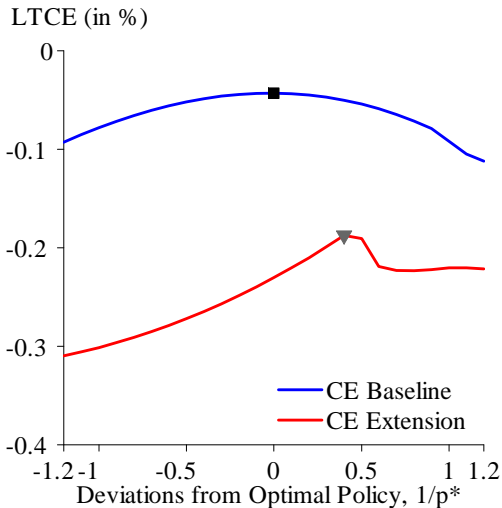
Model extension

- Much more risk
- Lowering rates: increases risk taking

Baseline Model

- Lowering rates: reduces risk taking

Welfare with Mispriced Collateral



Model extension

- Higher optimal policy rates
- "Too high" rates are better than "too low" rates

Conclusion

We examine link between interest rate policy and risk taking

1. Optimal interest rate policy
 - ▶ close to SP optimum in welfare
 - ▶ more risk taking than social planner
2. Deviations from the optimal policy
 - ▶ lower than optimal interest rates decrease risk taking
3. Extension: private mispriced collateral and foreign demand
 - ▶ lower than optimal interest rates increase risk taking