Optimal Monetary Policy with the Risk Taking Channel

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This paper in one slide

- **Motivation**: Empirical evidence of risk taking (RT) channel of monetary policy
- **Question**: What does this channel imply for optimal monetary policy?
- **Approach**: Introduce the RT channel into the standard New Keynesian Model and analyze its effect on optimal monetary policy
- **Analytical Finding**: The RT channel introduces a motive for real rate stabilization, which has to be traded off against the conventional inflation stabilization motive
- **Numerical Finding**: Welfare costs of overlooking risk taking channel can be quantitatively significant
- **Punchline**: In face of the RT channel interest rate policy should be less activist!

Motivation

Stylized facts

1. **A fall in the interest rate causes a rise in loan risk**
   E.g. Jimenez et al. (ECMTA, 2014), Ioannidou et al. (Rev Finance, 2014), Buch et al. (JEDC, 2014), Heider et al (RFS, 2019), ...
2. **The loan rate does not rise sufficiently to offset the expected loan losses**. Hence, the expected return on loans goes down
   Ioannidou et al. (Rev Finance, 2014), Buch et al. (JEDC, 2014)

- How should **monetary policy** act in the presence of the risk-taking channel?
- Note: Regulation is important too, but not the focus of this paper.

Model Overview

- Integrate a financial sector (bank) into the textbook **3 equations NKM**
  - Input goods producers need to per-finance wages through banks
  - Input good production technology is risky: Convex relationship between probability of success q_t and expected return $f(q_t)$
  - Banks choose their capital structure and the idiosyncratic riskiness of their assets (input good projects)

- **3 key assumptions about banks** generate the RT channel
  1. Bank's equity providers protected by limited liability
  2. Bank's risk choice not observable / contractable
     $\Rightarrow$ Agency problem between bank managers/equity providers and depositors
  3. Bank equity more expensive than deposits
     $\Rightarrow$ Trade-off between deposits and equity

The bank's equilibrium risk choice

1. $q^{optimal} > q$ **Excessive risk taking**
2. $\frac{\partial q}{\partial R^{real}} > 0$ **Risk taking channel** (Stylized fact 1)
   Intuition: $R^{real} \uparrow \Rightarrow$ cost advantage of deposits becomes smaller in relative terms $\Rightarrow$equity rate$\uparrow$ $\Rightarrow$ more skin in the game $\Rightarrow$ $q \uparrow \Rightarrow$ risk$\downarrow$
3. $\frac{\partial f(q)}{\partial R^{real}} > 0$ Expected return of investment $f(q)$ is a **increasing** function of R^{real} (Stylized fact 2)
4. $\frac{\partial^2 f(q)}{\partial (R^{real})^2} < 0$ Expected return of investment $f(q)$ is a **concave** function of R^{real}

Model summary

- The model collapses to the standard 3 equations NKM, but with an endogenous TFP component $\boldsymbol{f}\left(\boldsymbol{q}\left(\boldsymbol{R_t^{real}}\right)\right)$

$$Y_t = \frac{\overbrace{A_t}^{\text{exog.}}\ \overbrace{\boldsymbol{f}\left(\boldsymbol{q}\left(\boldsymbol{R_t^{real}}\right)\right)}^{\text{endog.}}}{\Delta_t} N_t$$

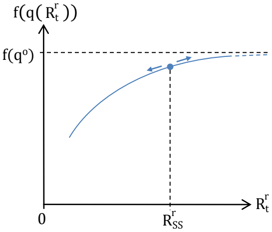
- We can linearize the model as in the textbook case and derive a quadratic approximation of welfare

Quadratic approximation of **welfare**

$$\mathbb{W} \approx -\frac{1}{2}\mathbb{E}_t \sum_{t=0}^{\infty} \beta^t \underbrace{\frac{\omega}{(1-\beta\omega)(1-\omega)}\theta\pi_t^2 + (\sigma+\varphi)\,x_t^2}_{\text{standard in NKM}} + \underbrace{\mathcal{R}_2\left(\hat{R}_t^{real}\right)^2}_{\text{new due to RT channel}}$$

$$\text{where } \mathcal{R}_2 = -\frac{\partial^2 f(q)}{\left(\partial R^{real}\right)^2}\frac{1}{f(q)} > 0$$

- **Result 1**: Real rate volatility has a negative effect on welfare
- Intuition: Jensen's inequality – MP can't affect the level of the *real* rate, but it can affect its volatility



Expected return on bank assets as a function of the real interest rate

Analytical characterization of **optimal policy**

- Monetary policy problem:
  - maximize (quadratic) welfare
  - subject to (linear) IS curve & Phillips curve & Fisher equation
  - under either discretion, OSR or full commitment

- **Result 2**: The RT channel increases (decreases) the optimal inflation (real rate) volatility
- **Result 3**: The RT channel lowers optimal Taylor rule coefficient on inflation
- **Result 4:** With commitment, the RT channel introduces a motive for interest rate inertia (absent in the standard NKM)

Quantitative importance of the real rate stabilization motive?

- Use a Smets and Wouters medium scale extension of the simple NKM with the RT channel, estimated on US data (see Abbate and Thaler 2019)
- Numerically find optimal simple rules (OSR) given a 2nd order approximation

- **Result 1**: Cost of conducting policy as if there were no RT channel: 0.7% of life time consumption equivalent
- **Result 2**: The RT channel increases (decreases) the optimal inflation (real rate) volatility by 50 to 70%
- **Result 3**: The RT channel lowers the optimal Taylor rule coefficient on inflation by 50%
- **Result 4:** A Taylor rule coefficient on the past policy rate close to 1 is optimal if and only if the RT channel is present