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 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
   ⇒ Agency problem between bank managers/equity providers and depositors
3. Bank equity more expensive than deposits
   ⇒ Trade-off between deposits and equity
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 $R_{real}$
The model collapses to the standard 3 equations NKM, but with an endogenous TFP component \( f \left(q \left(R^\text{real}_t\right)\right)\)

\[
Y_t = \frac{A_t \left(f \left(q \left(R^\text{real}_t\right)\right)\right)}{\Delta_t} N_t
\]

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

\[ W \approx -\frac{1}{2} \mathbb{E}_t \sum_{t=0}^{\infty} \beta^t \left( \frac{\omega}{(1 - \beta \omega)(1 - \omega)} \theta \pi_t^2 + (\sigma + \varphi) \chi_t^2 + \mathcal{R}_2 \left( \hat{R}_t^{\text{real}} \right)^2 \right) \]

standard in NKM

new due to RT channel

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

- **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 lifetime 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