Liquidity Traps and Monetary Policy: Managing a Credit Crunch

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Overview

- Study monetary/fiscal policies after credit crunch at ZLB
  - no sticky prices
  - heterogeneous entrepreneurs collateral constrained
  - tighter constraint affects productive, reduces TFP, Y

- Study 2 policies:
  1. No monetary intervention: deflation, then inflation
     - costly if nominal debt – redistributes away from productive
  2. Constant, low inflation target
     - Less misallocation – lower TFP decline, less severe recession
     - Prevent real rate from declining, prolong recession
Intuition from real model, Moll 2012

- Entrepreneurs heterogeneous in productivity, $z$:

$$\max_{c_t, a_{t+1}} \sum_{t=0}^{\infty} \beta^t \log(c_t)$$

- Technology: $y_t = z k_t$. Friction: $k_t \leq \lambda a_t$, $\lambda \geq 1$

- Budget constraint:

$$c_t + a_{t+1} = \max_k (z - r_t) k_t + (1 + r_t) a_t$$

- Solution: $k_t = \lambda a_t$ for $z > r_t$, 0 otherwise

- Return on $a$:

$$R_t(z) = \lambda \max(z - r_t, 0) + 1 + r_t$$
Intuition from real model, Moll 2012

$$\max_{c_t, a_{t+1}} \sum_{t=0}^{\infty} \beta^t \log(c_t)$$

s.t.

$$c_t + a_{t+1} = R_t(z) a_t$$

- Solution: $a_{t+1} = \beta R_t(z) a_t$
Intuition from real model, Moll 2012

- Equilibrium $r_t$ given $g_t(z, a)$

$$
\int_z \int_a k_t(z, a) g_t(z, a) \, da \, dz + B_t = \int_z \int_a a g_t(z, a) \, da \, dz = A_t
$$

$$
\lambda \int_{z \geq r_t} \int_a a g_t(z, a) \, da \, dz = A_t - B_t
$$

- Higher $B$ – higher $r$
Intuition from real model, Moll 2012

• Equilibrium \( r_t \) given \( g_t(z, a) \)

\[
\int z \int_a k_t(z, a) g_t(z, a) \, da \, dz + B_t = \int z \int_a a g_t(z, a) \, da \, dz = A_t
\]

\[
\lambda \int_{z \geq r_t} \int_a a g_t(z, a) \, da \, dz = A_t - B_t
\]

• Higher \( B \) – higher \( r \)
Intuition from real model, Moll 2012

- Higher $B$ – higher $r$

- Two effects on $Y$:
  - higher TFP – unproductive drop out
  - lower $K$ – high $r$ reduces $R_t(z) = \lambda(z - r_t) + 1 + r_t$
  - overall reduces $Y$
Monetary model

- Flex. prices: \((\Delta M, i)\) alone small effect on allocations
  - But fiscal policy \((\Delta B)\) changes \(r\)

- Suppose \(r^* < 0\) – e.g. constrained economy

- Suppose \(\pi = 0\) – bad monetary policy
  - ZLB \((i \geq 0)\) implies \(r \geq -\pi = 0 > r^*\)
  - Need to increase \(B\) to implement \(i = 0\) and \(\pi = 0\):
  - Higher \(r\) implies drop in \(Y\) relative to \(r = r^*\)
Key lessons:

• Strict low $\pi$ targeting bad idea
  • With ZLB, does not allow $r$ to adjust
  • Amplifies effect of credit crunch

• Tradeoff btw current and future $Y$ declines

• Nature of government transfers important
Comparison to NK models: inflation

- NK models: \( \pi_t = \kappa y_t + \beta \pi_{t+1} \)

- Low inflation due to price stickiness + lack of commitment
  - not poor choice of M.P.

- Question in NK: what is optimal policy given constraints?

- BN: ZLB not an actual constraint on policy
  - E.g., choose high \( i \) and low \( \pi \) – same \( r \)
  - Friedman rule optimal
  - Unlike NK, no distortions from non-zero \( \pi \)
  - Such distortions motivate \( \pi \) targeting in NK models

- But very similar lesson: want higher inflation at ZLB
Comparison to NK model: ↑ Fed balance sheet

- NK models: banks constrained, don’t lend entrepreneurs
  - E.g. Gertler-Karadi: \( k_t \leq \lambda a_t \), \( k_t \) bank loans
  - Implies \( R_{k,t} - r_t \) higher when lower \( \lambda a_t \)
  - Direct Fed loans reduce spreads: \( K = k^{bank} + k^{Fed} \)
  - Rationale for MBS etc. purchases

- BN would work similarly:
  - Lump-sum transfers vs. transfers targeted to entrepreneurs
  - Even lower \( Y \) declines if target to high \( z \)

- High debt, \( r \) not necessarily bad – inefficient transfers are
Questions, comments

- What is role of transaction frictions?
  - Are $Y$, $K$, $TFP$ responses affected?
  - Cashless limit?

- What is optimal policy?
  - Uninteresting in current version: lots instrum., commit.
  - No cost inflation
  - Restrict instruments and study optimal responses
  - Model source of $k \leq \lambda a_t$, cost of $\pi$
Questions, comments

- Study optimal monetary policy \((M, i)\) given fiscal \((B)\)

- Are CRS, no uncertainty important for results?
  - high \(z\) never grows out of credit constraint
  - high \(r\) unambiguously increases spreads
  - with DRS high \(r\) allows to quicker grow out of CC?
  - Bewley-Ayagari-McGrattan intuition on optimal \(B\) and \(r\)?
Questions, comments

- Take a stand: positive or normative?
  - Study policy in an alternative non-NK environment?
  - Or argue model describes recent U.S. experience?
    - low $\pi$, high debt?
    - and therefore Fed made bad mistakes
    - contrary to what NK model suggests
    - quantitative evidence BN vs. NK?
BN recession
U.S. recession

Output

Labor

Capital

TFP adj
Conclusions

• Overall: excellent, important paper

  • Closed-form solutions show mechanism very transparently
  • Explicitly model source of ZLB, decline \( r^* \)
  • Important interactions btw \( \pi \) and \( r^* \)
  • Raises lots of interesting questions

• One of few to explicitly introduce heterogeneity in monet. model

  • Striking feature recession: differential responses to CC
  • Model can inform on how M.P. can deal with heterogeneity