BERLIN SCHOOL OF ECONOMICS

HUMBOLDT-UNIVERSITÄT ZU BERLIN

# Monetary Policy, Excess Reserves and Credit Supply: Old-Style vs. New-Style Central Banking

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## Research Question

**Could the monetary transmission mechanism have changed due to the switch in the Fed's operational framework in 2008?**

## Motivation

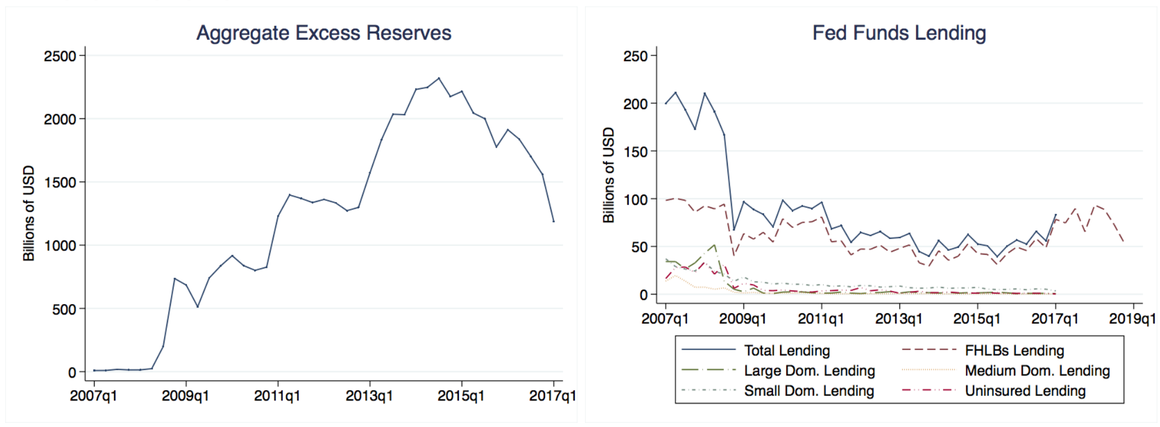



Figure 1: Own elaboration. Data from Armenter et al. (2019).

- **Bank-lending Channel** (Bernanke and Blinder, 1988)
  - Key assumption: $Res = \mu Dep$, with $\mu \in (0, 1)$.
  - Intuition (Contractionary MP via Open Market Operations):

    Bonds ↑ & Reserves ↓$\longrightarrow$Deposits ↓↓$\longrightarrow$ Loan supply ↓$\longrightarrow$ AD↓

- **Post-2008 facts:**
  - $ER/TR \in (0.92, 0.98) \longrightarrow Res > \mu Dep$
  - Operational setting changed from "Corridor" to a "Floor" system.
  - Dramatic change in size and participation in FF market.

## Model

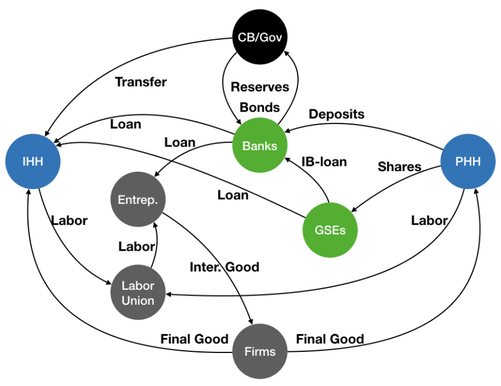



Figure 2: Model's Overview.

I extend the TANK model with *credit-supply* frictions by Gerali et al. (2010) by adding an IB-market, where non-bank financial institutions supply IB-funding, banks choose the level of reserves subject to adj. costs and an **occasionally binding RR constraint**.

- Wholesale Banking Branch ensures that B/S & RR Const. are hold. The FOCs are

$$R_t^b - R_t^d = \Phi_t^{\mu}(s_t) + \Lambda_t \mu, \tag{1}$$
$$r_t^{ib} - r_t^{res} = \Lambda_t, \tag{2}$$
$$r_t^{GB} = r_t^{ib}, \tag{3}$$
$$b_t^B + TR_t + B_t = D_t + IB_t, \tag{4}$$
$$\Lambda_t(\mu D_t - TR_t) = 0, \tag{5}$$

where $\Phi_t^{\mu}(s_t) \equiv -\phi_1(s_t)(TR_t) + \frac{\phi_2(s_t)}{2}(TR_t)^2$.

- **Monetary Policy via OMOs** as in Sterk and Tenreyro (2018)

$$b_t^{CB} - \frac{b_{t-1}^{CB}}{1+\pi_t} = TR_t - \frac{TR_{t-1}}{1+\pi_t}.$$

- CB sets the supply of (total) reserves according to

$$\frac{TR_t}{TR_{t-1}}(1+\pi_t) = 1 + z_t,$$

  where $z_t = \rho_{TR}(TR - TR_{t-1}) - \varepsilon_t^{TR}$.
- GSEs $\leftrightarrow$ patient HH via search and matching as in Mazelis (2018).
- The bond market clearing condition is $b^G = b_t^B + b_t^{CB}$.
- HH, Entrep., L. Union, Firms, as in Gerali et al (2010).

## Results

- Bank-lending channel is present in dynamic model (if RR-const. binds).
- The presence of ER replicates the "Great Divorce", i.e., monetary stance and CB's balance-sheet size are independent.
- The **Bank-lending channel breaks down** if the RR constraint is non-binding.
- **The transmission mechanism depends crucially on the operational framework:**
  - Corridor $\longrightarrow$ Reduction in reserves contracts real activity.
  - Floor $\longrightarrow$ **Reduction** in reserves **stimulates** real activity.

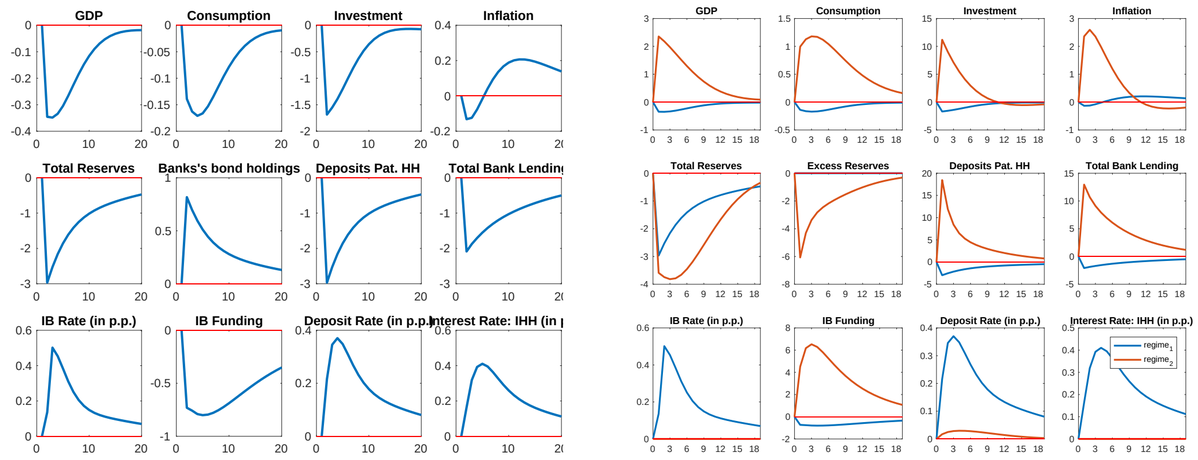



Figure 3 and 4: MP-shock equivalent to 50bps in target rate. All rates are shown as absolute deviations from steady state, given in percentage points. All other variables are percentage deviations from steady state. Regime 1 (in blue): $ER = 0$, and regime 2 (in orange): $ER \neq 0$.

**Mechanism:**

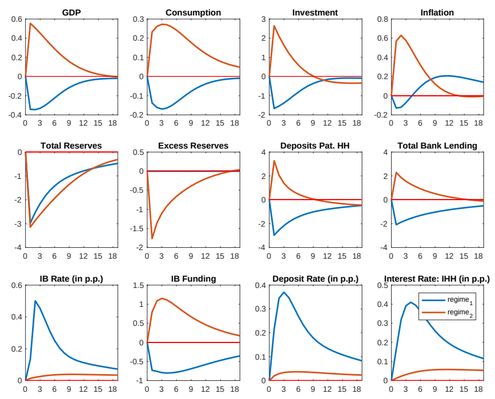
Bonds↑ & Reserves↓$\longrightarrow$ Reserve costs ↓$\longrightarrow$ Loan-Deposit spread↓ $\longrightarrow$ Deposit rates ↑$\longrightarrow$ Deposits ↑$\longrightarrow$ Lending ↑$\longrightarrow$ AD↑

- **FOMC's Normalization Strategy:**

  I add an interest rate rule to the interest rate on reserves

$$(1+r_t^{res}) = (1+\overline{r^{res}})^{(1-\phi_R)}(1+r_{t-1}^{res})^{\phi_R}\left[\left(\frac{1+\pi_t}{1+\bar{\pi}}\right)^{\phi_\pi}\left(\frac{y_t}{y_{t-1}}\right)^{\phi_y}\right]^{(1-\phi_R)}$$

Figure 5: MP-shock equivalent to 50bps in target rate. All rates are shown as absolute deviations from steady state, given in percentage points. All other variables are percentage deviations from steady state. Regime 1 (in blue): $ER = 0$, and regime 2 (in orange): $ER \neq 0$.




$\Rightarrow$ FOMC needs to find a **"Goldilocks zone"**, where expansionary effects of an ER reduction cancel out with the contractionary effects of increasing the IOR.

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