



Macroeconomic and Fiscal Consequences of Quantitative Easing

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MCM

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50 years of
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Motivation for rethinking QE strategies

- The rapid surge in inflation after the pandemic => more upside inflation risks
 - Quantitative Easing (QE) may have contributed to overheating and inhibited a more timely liftoff of policy rates (Orphanides, 2023; Eggertsson and Kohn, 2023)
- QE exposed CBs to greater maturity risk => large CB balance sheet losses
 - Need to rebuild capital through profit retention or recapitalization by the government => fiscal consequences, pressure on central banks
- Important to **reconsider the conditions when QE likely to be warranted** as well as implementation and communication
 - Only use QE in deep recession?
 - More escape clauses to take account of need for early exit?
 - Do CB capital policies need to be modified to account for greater balance sheet risks?

Framework for assessing QE

- Methodological approach: weigh the **macroeconomic benefits** against the **consolidated fiscal costs**
 - “Consolidated” includes how QE benefits the government fiscal position by raising tax revenue and lowering interest payments in addition to CB losses
- Develop NK model building on Erceg et al. (2024)
 - Bond market segmentation => QE affects real activity
 - Behavioral discounting => FG cannot provide sufficient stimulus if liquidity trap is long
 - Proportional taxes => Fiscal revenue endogenously responds to stimulus
 - Nonlinearity in Phillips Curve => Inflation can rise steeply when output is close to potential
- Explore QE under different conditions: depth of liquidity trap, initial term premium, size of QE
- Focus on **QE for macro stimulus** when ELB binds (as in QE2/QE3, not QE1)

Modeling framework – bond market

- Incorporate bond market segmentation to allow QE to have real effects (Andres et al., 2004; Chen et al., 2012):
 - “Financially Restricted” HHs: trade only in long-term bonds (perpetuities with geometrically decaying coupons as in Woodford, 2001)
 - “Financially Unrestricted” HHs : trade in long-term bonds subject to **portfolio adjustment costs**, and also trade in short-term bonds

- Arbitrage on the bond market by “Unrestricted” agents:

$$\hat{E}_t R_{L,t+1}^1 = R_t + \zeta(B_{L,t}^u, \dots)$$

- Transmission of QE:
 - Supply of long-term bonds ↓ => Expected rate of return on long-term bonds ↓
 - Spending by “Restricted” agents ↑, Spending by “Unrestricted” agents ↔
(because of ELB and behavioral discounting)

Model parameterization

- Bond market segmentation calibrated so that effects of QE slightly below median estimates by academics in Fabo et al. (2021)
- Fiscal block:
 - Steady state tax rates, term premiums, debt-to-GDP, and debt duration reflecting average values for US
 - Long-term debt stabilized by (very slow) adjustment of labor income tax
- Nonlinearities in price setting (Kimball quasi-kinked demand) calibrated in line with Harding et al. (2022)
- Small (0.95) degree of behavioral discounting (myopia) a la Gabaix (2020)
- Nominal and real rigidities to match reactions to short-term interest rate and government spending shocks as estimated in VAR and DSGE models for US

Evaluating fiscal consequences of policies

- CB profits:

$$\Phi_t^c = (R_{L,t}^1 - R_{t-1})QE_{t-1} = \left(\frac{P_{L,t}}{P_{L,t-1}} R_{L,t} - R_{t-1} \right) QE_{t-1}$$

- Real face value of consolidated government debt

$$GD_t^f \equiv \underbrace{b_t^f}_{\text{short-term}} + \underbrace{b_{L,t}^f / (1 - \kappa)}_{\text{long-term}}$$

- Real consolidated government budget constraint

$$b_t^f - \frac{b_{t-1}^f}{\pi_t} + \left(b_{L,t}^f - \kappa \frac{b_{L,t-1}^f}{\pi_t} \right) P_{L,t} =$$

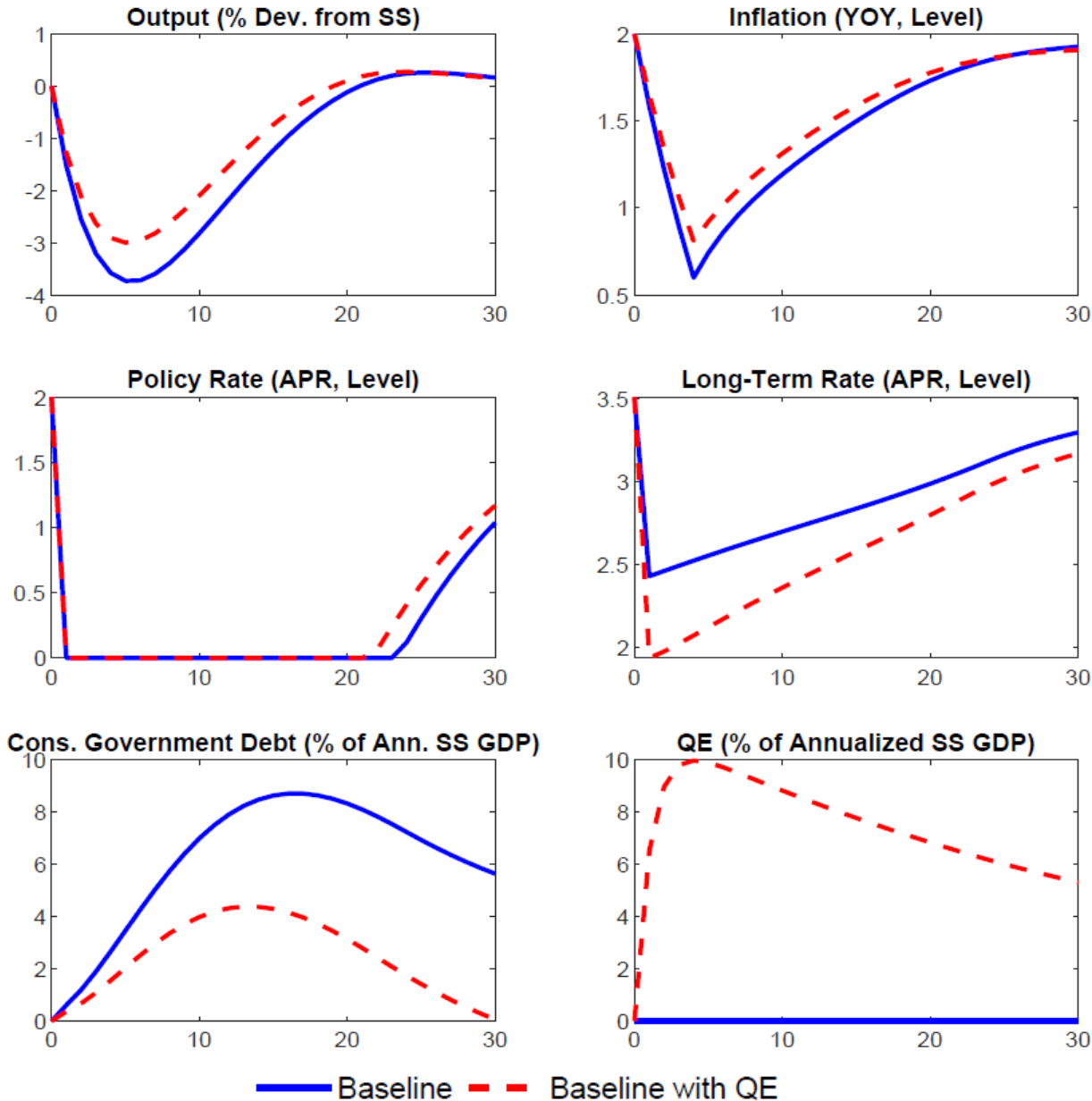
debt deflation
price of newly issued long-term bonds

$$\underbrace{\frac{R_{t-1}^{-1}}{\pi_t} b_{t-1}^f + \frac{1}{\pi_t} b_{L,t-1}^f}_{\text{debt servicing cost}} + \underbrace{g_t}_{\text{public consumption}} - \underbrace{(\tau_t^c c_t + \tau_t^n w_t n_t + t_t)}_{\text{tax revenue}} - \underbrace{\phi_t}_{\text{CB profit}}$$

Net debt issuance

Consolidated gov. deficit

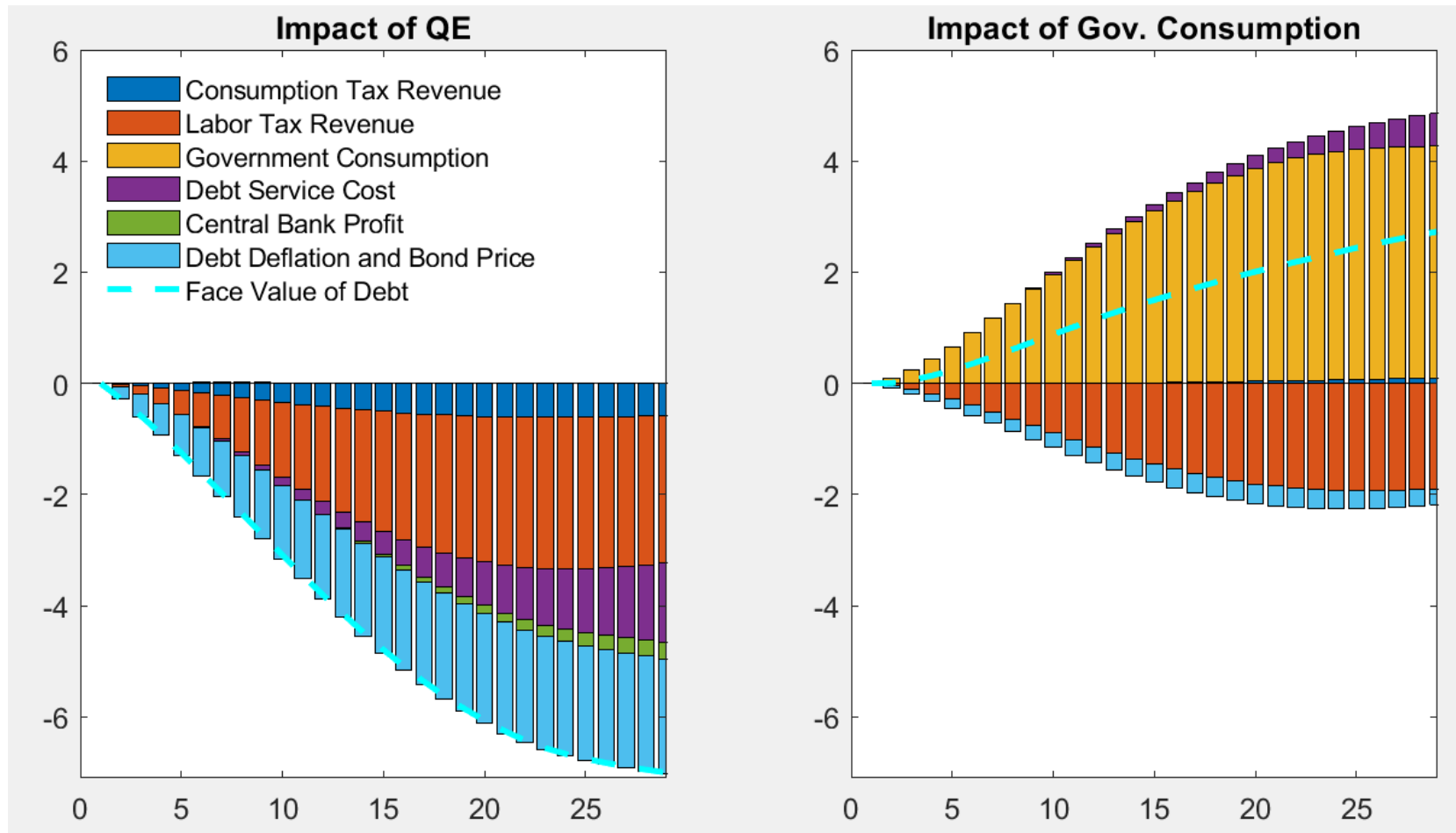
QE in deep liquidity trap



- Negative and persistent discount factor shock
=> liquidity trap
- Under modal outlook, QE has clear **macroeconomic benefits**
- And also has **favorable fiscal effects**: reduces government debt

How does QE “pay for itself”?

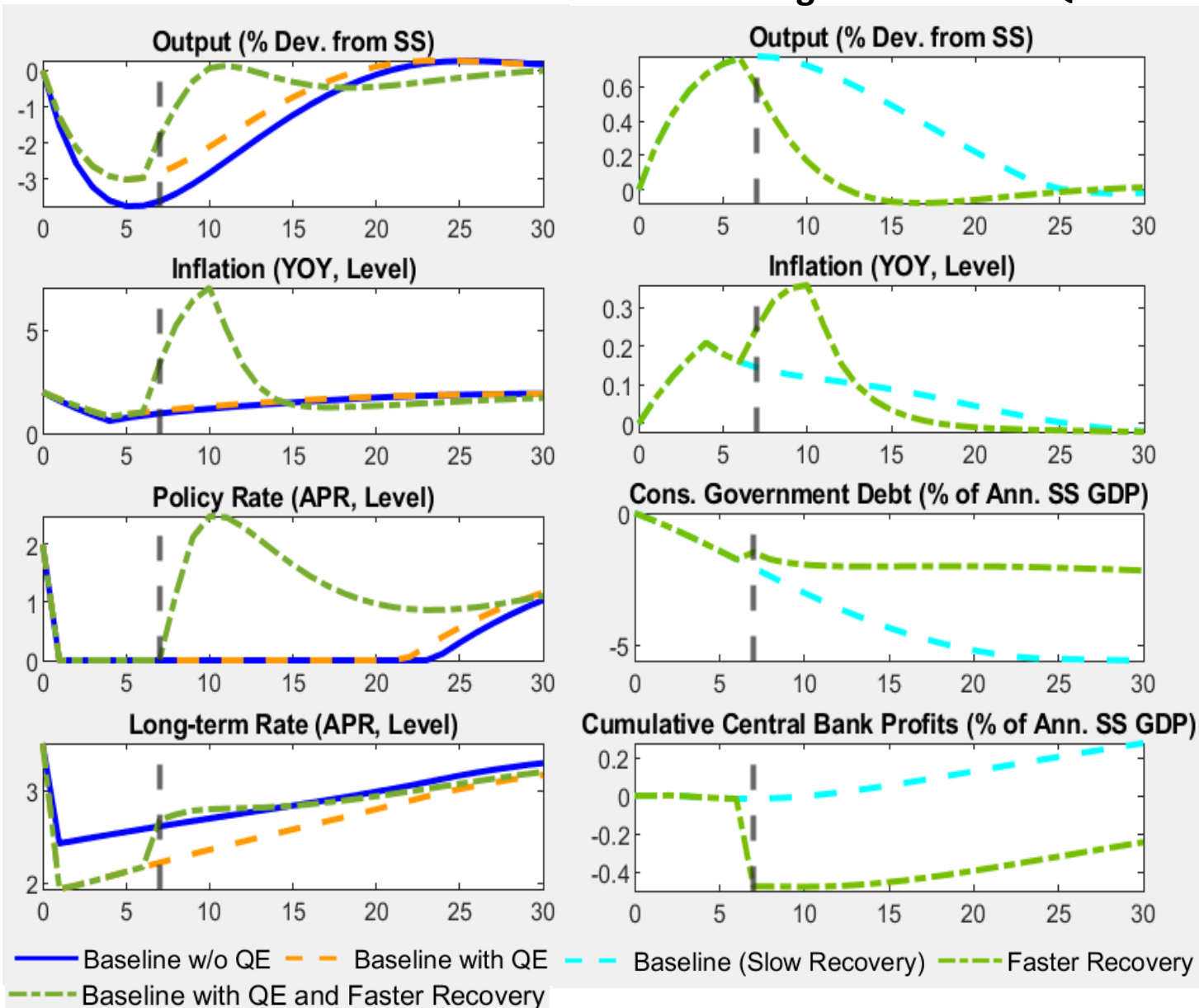
- Compare the **effect on government debt** of QE and government consumption (both having the same effect on output as QE in deep liquidity trap)



QE in deep liquidity trap with earlier recovery

A. Scenario Paths

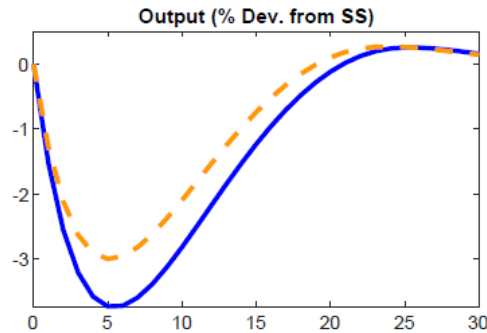
B. Marginal Effects of QE



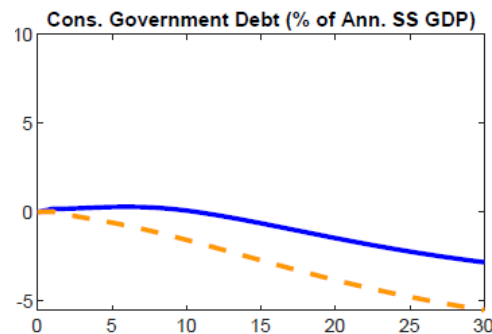
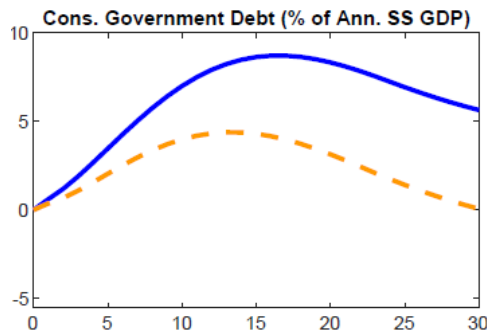
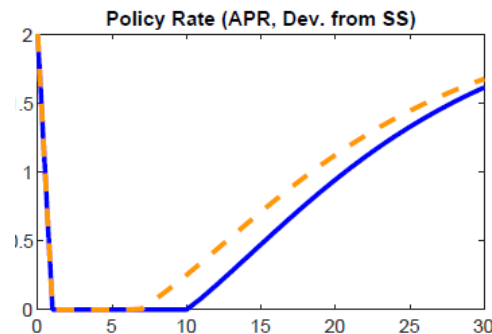
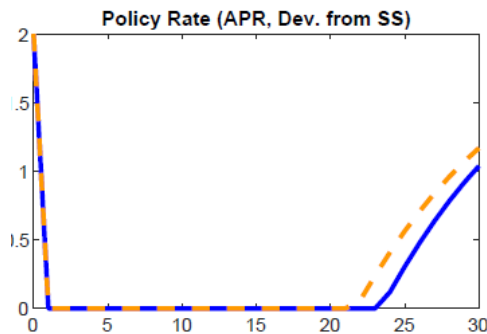
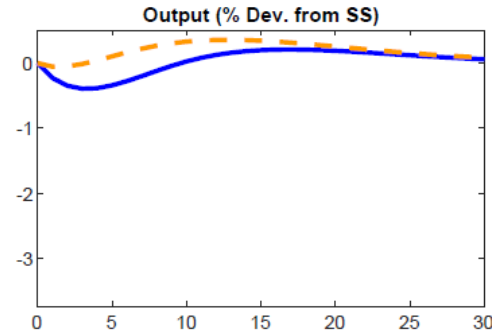
- Earlier recovery: demand and markup shocks hit 1.5 years after the shock driving the baseline => earlier liftoff
- Ex post **macroeconomic benefits** of QE reduced
- Earlier liftoff implies less stimulus to output
- Undesired uptilt in sensitivity of inflation to QE
- **Fiscal benefits** reduced, but still positive despite CB losses

QE in shallow liquidity trap

A. Deep Trap



B. Shallow Trap

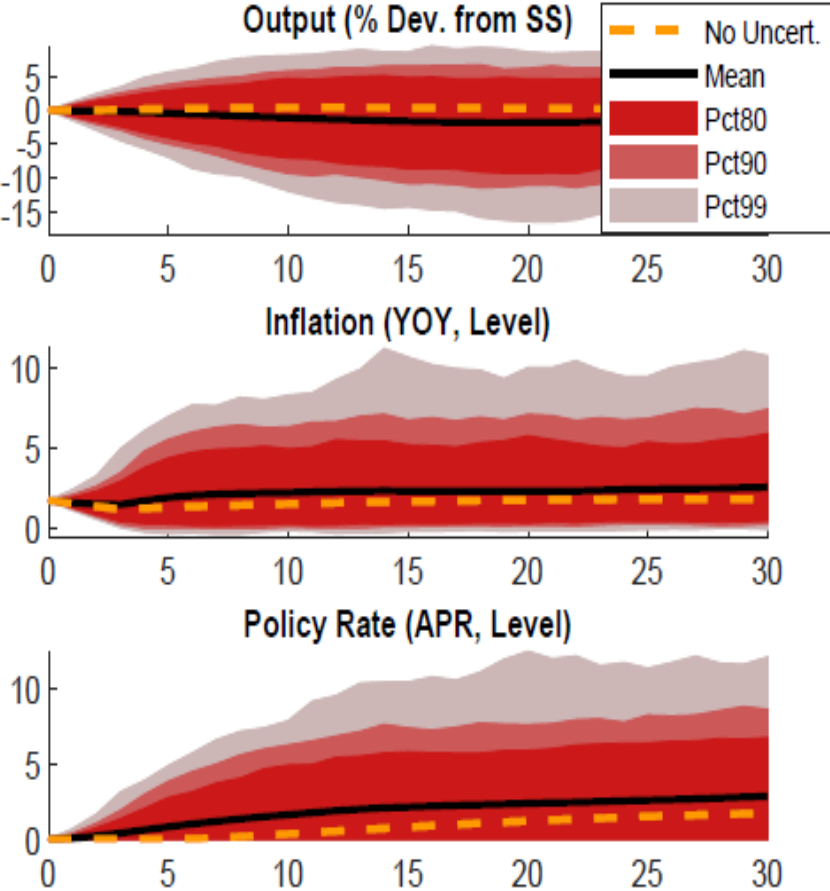


— Baseline — Baseline with QE

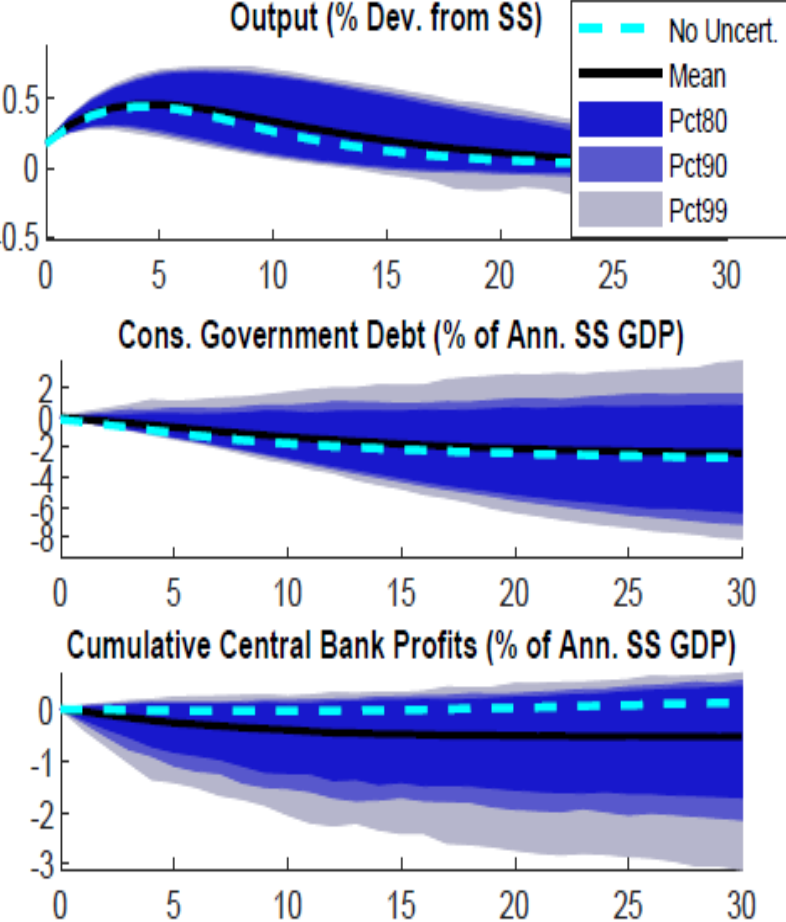
- Lower macroeconomic and fiscal benefits in a shallow liquidity trap
- An even earlier liftoff more likely in a shallow liquidity trap

QE in shallow liquidity trap: risk evaluation

A. QE in a Shallow Liquidity Trap



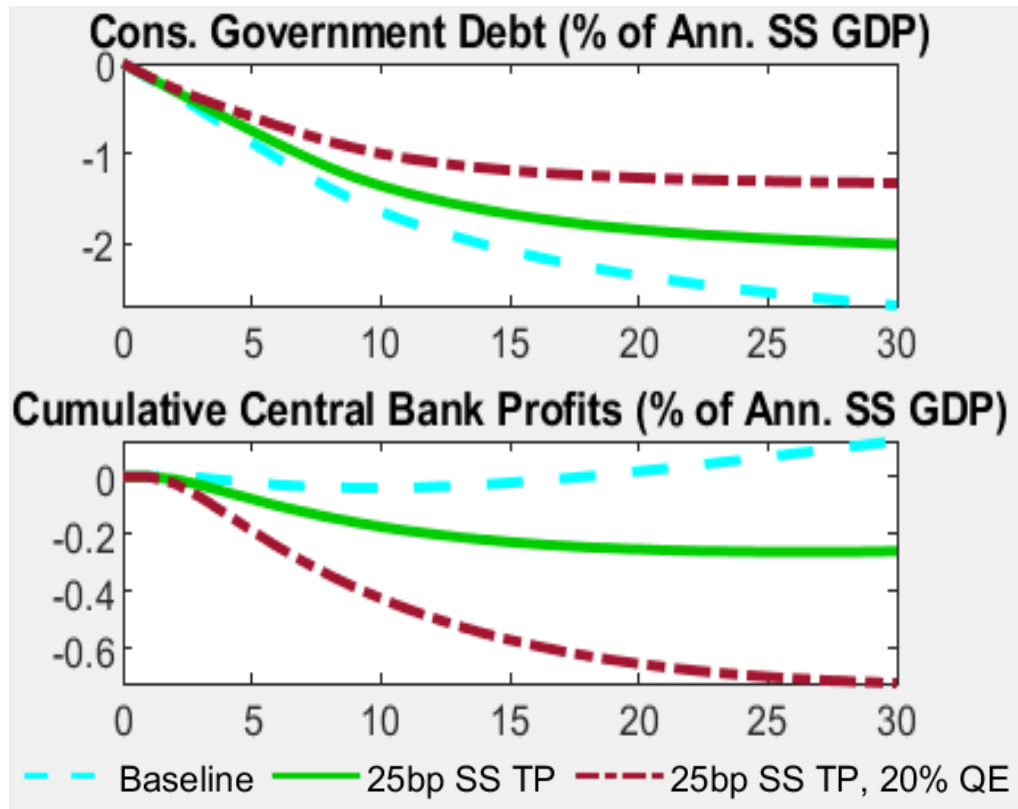
B. Marginal Effect of QE



- Shocks to match macroeconomic volatility for period 1960-2024
- Upside inflation risk makes earlier and sharp liftoff likely
- Large downside risk for CB profits
- QE still likely to be beneficial for the fiscal position

When can it go wrong for the fiscal?

Average effect (per 10% QE)



- Our simulations have assumed **steady state term premium of 100bp** and **QE worth 10%** of annual GDP at peak
- QE will be more costly if term premiums are already compressed, and asset purchases are bigger
- Bigger downside risk to CB profits

Summary

- **Macro benefits** of QE are bigger if:
 - QE is expected to remain in effect for significant period
 - Policy rate won't rise until well after QE ends, and then only gradually
- **Fiscal effects** of QE depend on the provided macro stimulus, but also on initial conditions: shallow vs deep trap, low vs high term premium, and its size
- **Strong rationale for using QE in deep trap** where risk of rapid liftoff is typically quite small
- **More reason for caution for sizeable QE in a shallow trap** and when term premiums are already compressed