Discussion of
“Monetary policy options in a ‘low for long’ era”
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Overview

How effective are different types of monetary policy at stabilising inflation and output in an environment with a low $r^*$?

- Small-scale model
- Calvo rigidities in goods market, efficient steady state
- Persistence through
  - Consumption habits
  - Fraction of rule-of-thumb price setters
  - Price indexation
- QE in the form of long-term government bond purchases
  - Long end of the yield curve is a separate policy instrument due to portfolio costs that depend on bond positions
- Odyssean forward guidance
Model

• Assumption—No rule-of-thumb firms, no price indexation, no habits

• Simplified model

\[ \pi_t = \tilde{\beta}E_t \pi_{t+1} + \kappa x_t + u_t \]
\[ x_t = \alpha E_t x_{t+1} - \tilde{\sigma} (r^e_t - E_t \pi_{t+1} - r^*_t) \]
\[ r^e_t = r^s_t - \phi_1 q_t - \phi_2 (q_t - q_{t-1}) + \phi_3 E_t (q_{t+1} - q_t) \]

• Policy tools
  • Short-term interest rate \( r^s_t \)
  • Long-term bond purchases \( q_t \)
Policy

- Loss function

\[ L_t = E_t \sum_{s=t}^{\infty} \beta^{s-t} \left[ \pi_s^2 + \lambda_x x_s^2 + \lambda_q q_s^2 + \lambda \Delta q (\Delta q_s)^2 + \lambda \Delta r (\Delta r_s)^2 \right] \]

- Constraints under different policy approaches

<table>
<thead>
<tr>
<th></th>
<th>Strd. Policy</th>
<th>QE</th>
<th>Time consistent</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Pre-crisis consensus”</td>
<td>( r_t \geq zlb )</td>
<td>( q_t = 0 )</td>
<td>yes</td>
</tr>
<tr>
<td>“Post-crisis revealed pref.”</td>
<td>( r_t \geq zlb )</td>
<td>( 0 \leq q_t \leq \bar{q} )</td>
<td>yes</td>
</tr>
<tr>
<td>“Forward guidance”</td>
<td>( r_t \geq zlb )</td>
<td>( q_t = 0 )</td>
<td>no</td>
</tr>
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</table>
Results for the UK

For example, the results of Kiley and Roberts (2017) suggest that the US economy may be at the zero bound around a third of the time, even when $R^*$ is 1%. One reason for the low ZLB incidence is that we measure the fraction of simulation periods in which the policy rate is exactly zero. For $R^* = 0$ the fraction of simulation periods in which the policy rate is lower than 25 basis points is around 23% in both the US and UK models, a more comparable figure. Even under this definition, however, the incidence of low policy rates remains relatively low. This may reflect the fact that we consider optimal time-consistent monetary policy (rather than a simple rule) under the assumption that the policymaker has a preference for instrument smoothing. We explore the effects of this assumption further in Section 7.2.

6 Monetary policy responses to ‘low for long’

In this section, we examine the effects of alternative specifications for monetary policy on the distributions of macroeconomic variables in a low for long environment. Specifically, we focus on the case in which $R^* = 0$ and simulate the UK and US models under the alternative specifications of monetary policy shown in Table 1.

Figure 4: Simulated distributions under alternative policies, $R^* = 0$

Notes: Simulated distributions for the UK and US models when $R^* = 0$. Distributions are based on a simulation of 100,000 periods. The same shock sequence is used for both the UK and US results. All variables are plotted in levels, measured in percent. The vertical line in the inflation panel indicates the 2% inflation target. Alternative policy specifications are detailed in Table 1.

Figure: Effect of different policy approaches for $r^* = 0$
• Simplified model

\[ \pi_t = \bar{\beta}_t \pi_{t+1} + \kappa x_t + u_t \]
\[ x_t = \alpha \bar{E}_t x_{t+1} - \tilde{\sigma}(r^e_t - \bar{E}_t \pi_{t+1} - r^*_t) \]
\[ r^e_t = r^s_t - \alpha_1 q_t - \alpha_2(q_t - q_{t-1}) + \alpha_3 \bar{E}_t(q_{t+1} - q_t) \]

• Key challenges

1. Forward guidance puzzle ⇒ Role of expectations
2. Slope of the Phillips curve
Role of Expectations

\[ x_t = \alpha \frac{E_t x_{t+1} - \tilde{\sigma}(r_t^e - E_t \pi_{t+1} - r_t^*)}{1/(1+\epsilon \beta)} \]

- Commitment to interest rate path far in the future has implausibly large effects (Del Negro et al., 2015)
- Result of forward looking nature of dynamic IS curve (McKay et al., 2016)
- Issue mitigated by “discounted Euler equation” (McKay et al., 2017)
  \( \Rightarrow \) Can be seen as result of bigger incomplete markets model
  - How much discounting is plausible?
  - Based on micro-foundations in McKay et al. (2017), \( \alpha \in \{0.94; 0.97\} \Rightarrow \epsilon \beta \in \{0.03; 0.06\} \)
  - Here, based on Gabaix (2020), \( \epsilon \beta = 0.175 \)
A Single ELB Recession

- Thought experiment as in Eggertsson and Woodford (2003) and McKay, Nakamura and Steinsson (2017), among others
- Consider calibrated/estimated
  - Dynamic IS curve
  - Phillips curve
  from simplified model (for the US)
- Conventional policy tool set according to \( r_t^s = \max\{0, r_t^* + \phi \pi_t\} \)
- Shock
  - \( r_t^* \) drops to annualised value of -2%
  - Remains at low value with probability \( \lambda = 0.9 \) each quarter
  - Reverts to positive pre-crisis value with probability \( 1 - \lambda = 0.1 \)
    (absorbing state)
A Single ELB Recession

Output gap

Inflation

Percent

Quarter

Percent

Quarter
A Single ELB Recession

Output gap

Inflation

- Blue line: Baseline ($\epsilon_\beta = 0.175$)
- Red line: Less discounting ($\epsilon_\beta = 0.100$)
Slope of the Phillips curve

\[ \pi_t = \bar{\beta}E_t\pi_{t+1} + \kappa x_t + u_t \]

- Debated following “missing disinflation” in the wake of the Great Recession and “missing reinflation” in late 2010s
- Limited-information estimation of \( \kappa \)
  - Based on macro data, parameters of the NKPC weakly identified (Mavroeidis, Plagborg-Møller, Stock, 2014) \( \Rightarrow \) Wide range of estimates
  - Recently, identification based on state-level data from the US (e.g. Hazell et al., 2020) \( \Rightarrow \hat{\kappa} \approx 0.008 \)
  - Here, \( \kappa = 0.026 \)
A Single ELB Recession

Output gap

Inflation

- Blue: Baseline ($\epsilon_\beta = 0.175$, $\kappa = 0.026$)
- Red: Less discounting ($\epsilon_\beta = 0.100$)
- Green: Flatter PC ($\kappa = 0.008$)