Discussion

MANAGING EXPECTATIONS WITHOUT RATIONAL EXPECTATIONS

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MY COMMENTS

• Bottom line: Outstanding paper on an important and policy-relevant question

• Usual mix of cheap shots, unfair comments and far-fetched suggestions but will not quote my own work :D
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- Bottom line: Outstanding paper on an important and policy-relevant question

- Usual mix of cheap shots, unfair comments and far-fetched suggestions and for sure quote only my own work :D
Overview

• Forward Guidance:
  • How it works.
  • The puzzle.
  • Potential Solutions

• Underlying view of the world
  • How does the counterfactual rational world look?
    Role of policy.
  • Power of communication/expectation management
Partial Equilibrium: Consumption Euler Equation

\[ c_t = E_t c_{t+1} - \sigma (i_t - E_t \pi_{t+1} - r^n_t) \]

General equilibrium \( c_t = y_t \): IS-equation.

\[ y_t = E_t y_{t+1} - \sigma (i_t - E_t \pi_{t+1} - r^n_t) \]
McKay, Nakamura & Steinsson
GE effects are small in normal times

Appendix: Partial Equilibrium versus General Equilibrium

Figure A1. Comparison of the General and Partial Equilibrium Responses to a 1 Percentage Point Reduction in Real Interest Rates in Period 20 with a Unit Intertemporal Elasticity of Substitution Under Complete Markets
THE PUZZLE
FORWARD GUIDANCE IN LIQUIDITY TRAPS

• Phillips curve

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

• Substituting and iterating

\[ \pi_t = \kappa \sum_{j=0}^{\infty} \beta^j E_t x_{t+j} \]

• Current inflation response depends on cumulative output response.

• The further is the interest rate change in the future the larger is the initial inflation response

• With full inflation/real interest rates/output feedback: large output effects.
guidance about interest rates five years in the future is roughly 18 times larger than the response of inflation to an equally sized change in the current real interest rate. To build intuition, we have assumed that there is no endogenous feedback from changes in output and inflation back onto real interest rates. Actual monetary policies are more complicated. In normal times, forward guidance about lower real interest rates in the future may be partly undone by higher real interest rates in the intervening period. On the other hand, when monetary policy is constrained by the zero lower bound on short-term nominal interest rates, the higher inflation associated with forward guidance about future interest rates will actually lower current real interest rates and this will in turn raise current output and inflation further. In this case, the outsized effects of forward guidance we describe above will be further reinforced by subsequent endogenous interest rate movements.

II. An Incomplete Markets Model with Nominal Rigidities

Section I shows that the huge power of far future forward guidance in standard monetary models depends crucially on the prediction of the model that the current response of output to an expected change in real interest rates in the far future (say five years in the future) is equally large as the response of output to a change in the current real interest rate. But is this realistic? With some probability, one will hit a borrowing constraint in the next five years. This effectively shortens one’s planning horizon. Also, households that face uninsurable idiosyncratic income risk and borrowing constraints will be wary of running down their wealth to take advantage

Figure 2. Response of Current Inflation to Forward Guidance about Interest Rates at Different Horizons Relative to Response to Equally Large Change in Current Real Interest Rate
**INCOMPLETE MARKETS AND FORWARD GUIDANCE**

- One approach taken to address puzzle: Heterogeneous-agent incomplete-markets models (Bewley-Imrohoroglu-Huggett-Aiyagari)
**Incomplete Markets and Forward Guidance**

- McKay, Nakamura & Steinsson 2015:
  - Strong Intertemporal Substitution (+ large real interest rate changes) explains large effects in complete markets (CM).
INCOMPLETE MARKETS AND FORWARD GUIDANCE

- McKay, Nakamura & Steinsson 2015:
  - Strong Intertemporal Substitution (+ large real interest rate changes) explains large effects in complete markets (CM).
  - Intertemporal Subst. weaker in incomplete markets (IM).
  - Forward guidance *less* effective in IM than in CM.

Intertemporal Substitution

Forward Guidance

Unconstrained

Output
Werning 2015:
- Taking GE effects into account can break this intuition.
- Benchmark: FG equally effective in IM and in CM.

General Equilibrium
Intertemporal Substitution

Forward Guidance

Unconstrained

Constrained

Output
**Farhi & Werning Level-k thinking**

<table>
<thead>
<tr>
<th></th>
<th>Complete Markets</th>
<th>Incomplete Markets</th>
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<tbody>
<tr>
<td><strong>Rational Expectations</strong></td>
<td>Benchmark</td>
<td>Zero or Modest Improvement</td>
</tr>
<tr>
<td><strong>Bounded Rationality</strong></td>
<td>Modest Improvement</td>
<td>Sizable Improvement</td>
</tr>
</tbody>
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- Based on attenuation of GE: agents respond less than in frictionless benchmark.
- Same here if strategic complements (instrument announcement).
- Opposite if strategic substitutes (target announcement): agents respond more than in frictionless benchmark.
- Question: Why not adjust the announcement accordingly?
- Question: Why not communicate both?
Lack of CK

- Applies to all (both) model equations
- Can thus eliminate the forward guidance puzzle
- But: Is lack of CK really the source of the puzzle?
- Yes for the PE/GE, \( c = y \).
- Sceptical about inflation/output part.
- Rather: Puzzle is a model deficiency
  (price/inflation indeterminacy in a liquidity trap).
View of the World

- Fully rational world / common knowledge: Forward guidance would be very powerful
- We do not observe large effects just because lack of rationality
- Large GE effects not taken into account by agents. Question: How can policy fix it?
- Maybe a model bug that the GE effects are so big. It is not lack of rationality that we do not observe them.
- Not the “real” model part, the “nominal” model part.
possible values of $\tau$, each of which selects the equilibrium in my parameterization. The figures give an idea of the full range of bounded equilibria that can emerge in this model, all for interest rate policy.

Before the liquidity trap ends, to the change in inflation, producing a gap when inflation is lower today than in the future. If expected to grow back to potential. The new-Keynesian Phillips curve (2) links the output gap to the general solution, (6), we verify that the economy is in the steady state as soon as the inflation and output gap approach from the bottom left, the region of decreasing, and therefore substantial, deflation.

If one wants a large output gap, the Phillips curve requires swiftly decreasing, and therefore substantial, deflation.

Figure 9 presents the local-to-frictionless equilibrium and the standard equilibrium in state space. The blue dashed line is the standard equilibrium choice, as in Werning (2012) Figure 1.

Figure 7 shows the no-inflation-jump equilibrium, the no-inflation-jump equilibrium, and the backward-stable equilibrium. Thinner lines show equilibrium in all equilibria. Equilibria are indexed by the expected value of $\tau$.

Now, let's look at a few equilibria in detail. Figure 3 presents this standard equilibrium choice, (8) and (9). Its output and inflation paths are also plotted as thicker lines in Figure 1 and Figure 2, for comparison with other equilibria.

2.4 The standard equilibrium choice is strong. This model does not produce a "slump," or "secular stagnation," a long period of a stagnation equilibrium, the no-inflation-jump equilibrium, and the local-to-frictionless equilibrium. Thinner lines show alternative equilibria are indexed by the value of $\tau$, each of which selects the equilibrium in my parameterization. The figures give an idea of the full range of bounded equilibria that can emerge in this model, all for interest rate policy.

Figure 7 and Figure 8 show a range of equilibria. The solid lines display the two-way bounded or local-to-frictionless equilibrium choice. The red line is the standard equilibrium choice, as in Werning (2012) Figure 1. The blue dashed line is the standard equilibrium choice, as in Werning (2012) Figure 1. The black dotted line is the no-inflation-jump equilibrium, and the local-to-frictionless equilibrium. Thinner lines show alternative equilibria are indexed by the value of $\tau$, each of which selects the equilibrium in my parameterization. The figures give an idea of the full range of bounded equilibria that can emerge in this model, all for interest rate policy.

Going forward in time, this solution starts at the right end of the blue line and works left, hitting the output gap peak at $\tau = \tau$ and then converging back to the steady state at the origin. The local-to-frictionless or two-way-bounded choice merges at a point to the northeast of the origin at $\tau = \tau$. The solid lines display the two-way bounded or local-to-frictionless equilibrium choice. The red line is the standard equilibrium choice, as in Werning (2012) Figure 1. The blue dashed line is the standard equilibrium choice, as in Werning (2012) Figure 1. The black dotted line is the no-inflation-jump equilibrium, and the local-to-frictionless equilibrium. Thinner lines show alternative equilibria are indexed by the value of $\tau$, each of which selects the equilibrium in my parameterization. The figures give an idea of the full range of bounded equilibria that can emerge in this model, all for interest rate policy.

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Specific interpretation assigned to

Monetary policy is 98 percent talk and only two percent action (Bernanke, 2015).

Not just (credible) communication of future policy.

Instead: expectation management almost life of its own.

But: CB has to be able to implements what it communicates (model, power of CB . . .)

Similar role of communication to achieve a higher inflation target.
**Power of Communication**

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- Friedman (1969):

  * . . . danger of assigning to monetary policy a larger role than it can perform, in danger of asking it to accomplish tasks that it cannot achieve, . . .*
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- Friedman (1969):
  
  *It [monetary authority] cannot use its control over nominal quantities to be a real quantity - the real rate of interest, the rate of unemployment, . . .*
Managing Expectations = Success ??
... OR MAYBE IT WORKS
TAKK