Comment on Cochrane, ‘Michelson-Morley, Occam and Fisher: The Radical Implications of Stable Inflation at Near-Zero Interest Rates’

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John’s Headline Argument

- Federal Funds rate (nearly) constant since early 2009.
  - John’s inference: Fed was on (sort of) an interest rate peg.
- Standard NK model (active monetary/passive fiscal policy):
  - With peg, equilibrium *indeterminate* with possibility of sunspot volatility.
- But, no apparent sunspot volatility after 2009, since inflation smooth.
  - Standard NK model not useful.
- So, starting from the peg assumption, John concludes:
  - We need a new standard model.
  - It must have determinate equilibrium under peg.
  - Fiscal Theory of the Price Level (FTPL)!
- My response: but, Fed policy was NOT on an interest rate peg.
  - So, this case for FTPL not convincing.
People expected ‘peg’ to end soon (Swanson-Williams AER, 2014).

- In 2009-2011, Blue Chip forecasters expected lift off in a year.
- In August, 2011, Fed thinks lift-off won’t occur until mid-2013, and Blue Chip forecasters agree.

Consistent with expectations, lift-off has now begun.
Other Reasons John Doesn’t Like Standard NK Model

- Multiplicity of Equilibria.

- Standard NK model has ‘unappealing’ properties.

- John appears to suggest that the standard NK model provides an unsatisfactory account of comovement between inflation and the interest rate.
Uniqueness Problem in NK Model

- Equilibrium multiplicities in and out of the zero lower bound (ZLB) (Benhabib, et al., Mertens-Ravn; Braun, et. al.)
  - Interestingly, the multiplicities in ZLB not visible to analysts who focus on linear approximations of equilibrium conditions.

- Learning as an equilibrium selection device.
  - Christiano-Eichenbaum-Johannsen (2012, 2016) show that only one of multiple NK equilibria learnable.

- Robustness of Rational Expectations Equilibrium to learning seems particularly appealing now.
  - Recent events unfamiliar.
    - US has had little experience with ZLB.
    - Financial crises in advanced economies were thought to be a thing of the past.
Multiple Equilibria

- Zero Inflation steady state

- BSGU zero interest rate steady state

- Fisher Equation

- Taylor Rule
Unappealing Properties of Standard NK Model, According to John

- Dramatic, counterfactual, drop in inflation in zero lower bound.
  - Two forces prevented inflation collapse: fall in TFP and working capital problems (see Christiano, et al., and Gilchrist et al.).

- Perverse implications for effect of technology shock in ZLB.
  - Bad, temporary technology shock expansionary in ZLB.
  - But, with persistence a bad TFP shock has normal effect.

- Reducing price stickiness makes economy unstable without limit.
  - The economics of this result is classic, and can be traced back to DeLong and Summers (AER 1986).
  - The ‘without limit’ result is artifact linearization.

- Future policy actions have unrealistically large effects today.
  - True, but probably reflects taking rational expectations or details of price adjustment too seriously (Gabaix, Kiley).
Classical Beliefs and NK Model

- John’s desideratum: model should be useful to determine whether there is a set of coherent assumptions that rationalize a classic belief.

- A classic belief is that, to kill inflation (‘Volcker belief’):
  - Must initially raise the interest rate, suffering an output loss.
  - Eventually, interest rates and inflation are both reduced, leaving output at its original level.

- Standard NK model provides insight into the Volcker belief.
  - Transient cut in inflation target drives nominal interest rate up and output down (CEE 2005).
  - A permanent (credible) cut in the inflation target has an instantaneous Fisherian effect:
    - Immediate and equal drop in inflation and interest rate.

- Cannot rationalize Volcker belief in standard NK model.
  - With uncertainty over whether a change in inflation target is temporary or permanent, then do rationalize Volcker belief (Erceg and Levin)
What About the FTPL?

- John reports that NK model modified to include FTPL has nice properties.
  - Uniqueness under interest rate peg. Other nice properties too.

Problems:

- Uniqueness property of FTPL is fragile (Canzoneri, et al).
- In practice, FTPL does not provide a simple account of inflation/fiscal policy data.
  - Huge Reagan deficits led to inflation collapse in 1980s.
  - Huge Obama deficits led to drop in inflation recently.
- Other problems.
Simple Example of FTPL

- Deterministic, with \( t = 0, 1, 2, \ldots \)
- Real gov’t flow budget constraint:

\[
b_t = \beta^{-1} \left( b_{t-1} - \underbrace{s_t}_{\text{gov’t surplus}} \right), \quad b_{t-1} \equiv \frac{B_{t-1}}{P_t}
\]

- Household transversality condition:

\[
\lim_{T \to \infty} \beta^T b_{T-1} = 0.
\]

- Under FTPL:

\[
s_t \text{ not a function of } b_{t-1} = s > 0 \text{ for simplicity.}
\]

- Real flow budget constraint:

\[
b_t = \beta^{-1} (b_{t-1} - s)
\]
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\[ b_{t-1} = b^* \rightarrow P_0 = \frac{B_{-1}}{b^*} \]

\[ P_{t+1} = \beta R_t P_t \]
Fragility of FTPL

- Assumption of FTPL makes it a *simple* theory of the price level:

\[
b_{-1} = \frac{B_{-1}}{P_0} = \sum_{t=0}^{\infty} \beta^t s_t.
\]

One equation in one unknown!

- The assumption that fiscal policy, \( s_t \), is independent of \( b_{t-1} \), seems extreme.
  - But, most model assumptions aren’t literally true in reality.
  - However, we do hope that the results don’t completely collapse under reasonable perturbations.

- But, the FTPL’s ability to determine the price level does collapse under tiniest reasonable perturbation.
Fiscal Policy and Government Debt

- A common sense perturbation suggests that $s_t$ is increasing in $b_t$.
  - VAT tax gradually increasing from 3% in 1989 to 8% in 2014 in Japan, out of concern for large government debt.
  - Maastricht treaty requires that member countries adjust fiscal policy so that debt does not grow too much.
  - IMF pressures countries whose debt gets out of hand.

- Following is an $\varepsilon > 0$ deviation from FTPL that captures endogeneity of fiscal policy:

$$ s_t = \begin{cases} 
  s + \varepsilon (b_{t-1} - \bar{b}) & b_{t-1} \geq \bar{b} \\
  s & b_{t-1} \leq \bar{b} 
\end{cases}, $$

so that

$$ b_t = \beta^{-1} \left(1 - \varepsilon\right) b_{t-1} + \text{constant}. $$
\[ b_t = \beta^{-1}(b_{t-1} - s) \]

\[
\begin{align*}
  s_t &= \begin{cases} 
    s & b_{t-1} \leq \bar{b} \\
    s + \varepsilon (b_{t-1} - \bar{b}) & b_{t-1} \geq \bar{b}
  \end{cases}
\end{align*}
\]
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\[ s_t = \begin{cases} 
  s & b_{t-1} \leq \bar{b} \\
  s + \varepsilon (b_{t-1} - \bar{b}) & b_{t-1} > \bar{b} 
\end{cases} \]
\[
bt = \beta^{-1} (bt_{-1} - s)
\]

\[
b_t = \beta^{-1} (1 - \varepsilon) bt_{-1} + const
\]

\[
b_{-1} \geq b^* \rightarrow P_0 \geq \frac{B^{-1}}{b^*}
\]

\[
P_{t+1} = \beta R_t P_t
\]
Endogenous Fiscal Policy

• On the face of it, FTPL looks like a simple theory of the price level:

\[
\frac{B_{-1}}{P_0} = \sum_{t=0}^{\infty} \beta^t s_t
\]

• But, on closer examination it rests on an assumption that (in my opinion) defies common sense.
‘Simple’ Theory: How Presents Get Under the Tree On Christmas Morning
Conclusion

- NK model is a very useful framework for thinking about financial frictions, business cycles, etc.

- NK model has a lot of dimension for improvement.
  - Deviations from Rational Expectations.
  - More interesting financial frictions.
  - Improvements in labor market.
  - Economic foundations for reduced form assumptions about price stickiness.

- Introducing the FTPL would not improve the NK model, at least for the US.
  - Maybe good for Japan?
    - That country looks like it’s on an interest rate peg (20 years of ZLB).
  - But, they have been piling up government debt, with no sign of pickup in prices.