Comments on
Marvin Goodfriend and Robert G. King,
"The Great Inflation Drift"

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September 2008
Introduction

- Explaining the Great Inflation
- Fed objectives: Stabilize the output gap and maintain “continuity [predictability] of the interest rate”
- Inflation becomes stochastic trend
- Inflation increases with fall in potential output growth
- Switches between “Business as usual” and “Inflation fighting”
Model: Basics

Phillips curve

\[ \pi_t - \bar{\pi}_t = \beta E_t (\pi_{t+1} - \bar{\pi}_{t+1}) + h(y_t - y^*_t) \]  \hspace{1cm} (2)

Inflation trend, random walk (martingale)

\[ \bar{\pi}_t = E_t \bar{\pi}_{t+1} \]  \hspace{1cm} (11)

Aggregate demand, output gap, real interest-rate gap

\[ y_t - y^*_t = E_t (y_{t+1} - y^*_{t+1}) - \frac{1}{\sigma} (r_t - r^*_t) \]

(\(\sigma\) reciprocal of intertemporal elasticity of substitution)
Model: Basics

Potential output growth

\[ \Delta y_t^* = \rho \Delta y_{t-1}^* + \nu_t \]  \hspace{1cm} (4)

Natural interest rate

\[ r_t^* - r = \sigma E_t \Delta y_{t+1}^* = \sigma \rho \Delta y_t^* = \rho (r_{t-1}^* - r) + \sigma \rho \nu_t \]  \hspace{1cm} (7), (8)

Fisher equation, nominal interest rate

\[ R_t = r_t + E_t \pi_{t+1} \]  \hspace{1cm} (5)
Monetary policy

Assumptions

- Model known by Fed and private sector
- Monetary policy known by private sector and fully credible
- Rational-expections equilibria with fully credible policies
Monetary policy

- Output-gap stabilization and “continuity [predictability] of the short rate” ahead of low inflation
- Why not loss function and optimal policy?

\[ L_t = (\pi_t - \pi_t^*)^2 + \lambda (y_t - y_t^*)^2 + \mu (R_t - E_{t-1}R_t)^2 \]

- Might the Great Inflation then be explained by high \( \lambda, \mu \) and drifting \( \pi_t^* \)?
Why *predictability* \((R_t - E_t R_{t-1})\) of the short rate rather than traditional interest-rate *smoothing* \((R_t - R_{t-1})\)?

\[
L_t = (\pi_t - \pi_t^*)^2 + \lambda(y_t - y_t^*)^2 + \mu(R_t - R_{t-1})^2
\]

- Does it matter whether it is predictability or smoothing?
  - Yes, smoothing will have to be state-dependent to be equivalent to predictability
  - Evidence in transcripts of distinction between predictability and smoothing?
Monetary policy: Equilibria with zero output gaps

- Focus on equilibria with zero output gaps, $y_t - y_t^* = 0$
- Inflation equal to trend
  \[ \pi_t = \bar{\pi}_t = E_t \pi_{t+1} \]  
  (15)
- Real rate equal to natural
  \[ r_t = r_t^* \]
- Nominal rate
  \[ R_t = r_t^* + \bar{\pi}_t \]
Monetary policy: Equilibrium trend inflation?

- Innovations, use $E_{t-1} \bar{\pi}_t = \bar{\pi}_{t-1}$
  
  $$R_t - E_{t-1} R_t = r_t^* - E_{t-1} r_t^* + \bar{\pi}_t - \bar{\pi}_{t-1}$$

- Assume given degree of predictability of the short rate $\phi$, $0 \leq \phi \leq 1$
  
  $$R_t - E_t R_{t-1} = (1 - \phi)(r_t^* - E_{t-1} r_t^*)$$  \hspace{1cm} (17)

- Equilibrium innovation in trend inflation
  
  $$\bar{\pi}_t - E_{t-1} \bar{\pi}_t = - \phi (r_t^* - E_{t-1} r_t^*) = - \phi \sigma \rho \nu_t$$  \hspace{1cm} (18)

- Equilibrium trend inflation determined
  
  $$\bar{\pi}_t = \bar{\pi}_{t-1} - \phi \sigma \rho \nu_t$$  \hspace{1cm} (16), (19)
Monetary policy: Equilibrium trend inflation

- Equilibrium trend inflation

\[
\bar{\pi}_t = \bar{\pi}_{t-1} - \phi \sigma \rho \nu_t \quad (16), (19)
\]

- Innovation in potential-output growth (productivity) and natural interest rate

\[
r_t^* - E_{t-1} r_t^* = \sigma \rho (\Delta y_t^* - E_{t-1} \Delta y_t^*) = \sigma \rho \nu_t \quad (7), (8)
\]

- Trend inflation increases with negative productivity innovation, more when high predictability of short rate (\(\phi\))
- See directly from equilibrium nominal rate, \(R_t = r_t^* + \bar{\pi}_t\)
- Main result, basis for interpretation of Great Inflation
Monetary policy: Implementation?

1. Set and announce inflation target (becomes predetermined variable)

\[ \bar{\pi}_t = \bar{\pi}_{t-1} - \phi \sigma \rho v_t \]  \hspace{1cm} (16), (19)

Follow interest-rate rule

\[ R_t = \bar{\pi}_t + r^*_t + \Omega (\pi_t - \bar{\pi}_t), \quad \Omega > 0 \]  \hspace{1cm} (23)

- Above equilibrium unique
- But, how exactly to implement this?
- “Explicit instrument rule”: 
  \( R_t \) function of predetermined variables
- “Implicit instrument rule”: 
  \( R_t \) function of forward-looking variables
- Simultaneity. Iteration during day of decision? Not in real world
Monetary policy: Implementation?

1. Set and announce inflation target

\[ \bar{\pi}_t = \bar{\pi}_{t-1} - \phi \sigma \rho \nu_t \]  

(16), (19)

Follow interest-rate rule

\[ R_t = \bar{\pi}_t + r_t^* + \Omega(\pi_t - \bar{\pi}_t), \quad \Omega > 0 \]  

(23)

But, how exactly to implement this?

One way: Predict equilibrium \( \pi_t \), set \( R_t \) accordingly

\[ \pi_t = g_1 r_t^* + g_2 \bar{\pi}_t = \bar{\pi}_t \]

\[ R_t = \bar{\pi}_t + r_t^* + \Omega(g_1 r_t^* + g_2 \bar{\pi}_t - \bar{\pi}_t) = \bar{\pi}_t + r_t^* \]

But then different, explicit reaction function

Determinacy properties different! Here, indeterminacy!
Monetary policy: Implementation

Assume money demand

\[ \Delta m_t = \alpha \Delta y_t + \pi_t \]

Follow money-supply rule

\[ \Delta m_t = \alpha \Delta y_t^* - \phi \sigma \rho v_t + \alpha \rho \Delta y_{t-1}^* + \pi_{t-1} \]

- Implies

\[ \alpha \Delta (y_t - y_t^*) + \Delta \pi_t = - \phi \sigma \rho v_t \]

- Unique equilibrium?

- Is \( \bar{\pi}_t \) still determined by Fed and predetermined?
3. “5.3 How ‘Business as Usual’ Creates Inflation Drift”

- Implementation without central bank explicitly setting $\bar{\pi}_t$?
- $\bar{\pi}_t$ determined/inferred by private sector?
- $\bar{\pi}_t$ forward-looking variable?
- $\bar{\pi}_t = E_t \bar{\pi}_{t+1}$
- Unique equilibrium?
- Generally, for determinacy, “out-of-equilibrium” behavior by policymaker must be specified (Svensson-Woodford 2005, “Implementing Optimal Policy through Inflation-Forecast Targeting”)
Concluding comments

- If specified Fed objectives, why not loss function and optimal policy? (Under commitment or discretion)
- Strong assumptions for the Great Inflation: Known model, credible policies, rational expectations
- Explanation for the Great Inflation in other words: Small weight on inflation stabilization; drifting and opaque inflation target
Concluding comments

- Is trend inflation a predetermined inflation target determined by the Fed or a forward-looking variable determined by the private sector?
- Uniqueness not clear (to me) when trend inflation not predetermined variable
- Generally: Explicit out-of-equilibrium behavior needed. Examine eigenvalue configuration
- Unit root OK for predetermined variable, but non-uniqueness for forward-looking variable
- Exact implementation of equilibria here problematic