Macroeconomic Policy Model

- Combines Taylor Rule, IS curve to obtain Macroeconomic Policy curve
- Reintroduce Phillips Curve
- Find equilibrium in output gap/inflation space
- Show effects of policy changes defined as changes in rules
Taylor Rule

\[ r_t = \pi_t + \beta \hat{Y}_t + \delta(\pi_t - \pi^*_t) + R^*_t \]

\[ r_t = (1 + \delta)\pi_t + \beta \hat{Y}_t + R^*_t - \delta \pi^*_t \]
FIGURE 16.1 Graph of the Taylor Rule

- Taylor rule
- 45° line showing real interest rate of 2 percent
- Target inflation rate ($\pi$)
Taylor Rule

Federal Funds Rate and Inflation Targets

Notes: $R^* = 2.5\%$, $\beta=0.5$, $\delta=0.5$
FIGURE 16.3 Shifts of the Taylor Rule
FIGURE 16.4 Effect of a Fiscal Policy Change
IS Curve Revisited

\begin{align*}
R_t &= s_0 - s_1 Y_t + s_2 G_t \\ 
R_t^* &= s_0 - s_1 Y^* + s_2 G_t \\ 
R_t - R_t^* &= -s_1 (Y_t - Y^*) \\ 
R_t - R_t^* &= -s_1 Y^* \left( \frac{Y_t - Y^*}{Y^*} \right) \\ 
R_t - R_t^* &= -\sigma \hat{Y}_t
\end{align*} 

(16.3),
(16.4);
(16.5);
(16.6)
(16.7)
\[ r_t = \pi_t + \beta \hat{Y}_t + \delta (\pi_t - \pi_t^*) + R^* \]  
(16.1)

\[ r_t - \pi_t - R_t^* = \beta \hat{Y}_t + \delta (\pi_t - \pi_t^*) \]  
(16.8);

\[ R_t - R_t^* = \beta \hat{Y}_t + \delta (\pi_t - \pi_t^*) \]  
(16.9);

\[ -\sigma \hat{Y}_t = \beta \hat{Y}_t + \delta (\pi_t - \pi_t^*) \]  
(16.10)

\[ \hat{Y}_t = \frac{-\delta}{(\beta + \sigma)} (\pi_t - \pi_t^*) \]  
(16.11)
FIGURE 16.5 The Macroeconomic Policy Curve
FIGURE 16.6 Shifts in the Macroeconomic Policy Curve
FIGURE 16.7 Price Adjustment Line Determining the Inflation Rate
Phillips Curve, Again

- Assume expectations augmented,
- Where expectations are adaptive
- Supply shocks allowed for

\[ \pi_t = \pi_{t-1} + \hat{f}\hat{Y}_{t-1} + Z_t \]  

(16.12)
FIGURE 16.8 Simultaneously Determining Inflation and Output

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FIGURE 16.9 A Boom

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FIGURE 16.10 Disinflation
FIGURE 16.11 A Boom-Bust Cycle

1. Expansionary policy leads to a boom.
2. But inflation then rises.
3. Leading to policy reversal and recession.
4. And a decline in inflation, so the economy returns to normal.
Price shock causes PA line to shift up, then gradually shift down during stagflation

FIGURE 16.12 An Oil Price Shock
FIGURE 16.14 Quarterly Growth Rate of Real GDP
FIGURE 16.15 Inflation

Q1 1968: Fed funds rate was 4.8%

Q2 1989: Fed funds rate was 9.7%