Lecture 16: Review

- Mundell-Fleming
- AD-AS
Mundell-Fleming

IS : \[ Y = C(Y-T) + I(Y,i) + G + NX(Y,Y^*, \frac{E^e}{1+i-i^*}) \]

\[ E = \frac{E^e}{1+i-i^*} \]

* Fiscal and Monetary policy
Fixed Exchange Rates (Credible)

- A little bit of it even in “flexible” exchange rates systems; “commitment” to E rather than M

\[ \Rightarrow \quad i = i^* \]

\[ \Rightarrow \quad \frac{M}{P} = YL(i^*) \]

- Central Bank gives up monetary policy
Interest parity

- Fiscal and Monetary policy
- Capital controls; imperfect capital flows
Note: There is a shift in the IS as well... but this is small, especially in the short run
Building the Aggregate Supply

• The labor market
• Simple markup pricing
• Long run (Natural rate: Aggregate demand factors don’t matter for Y)
• Short run
  – Impact: Same as before but P also change (partial)
  – Dynamics (go toward Natural rate)
Wage Determination

- Bargaining and efficiency wages

\[ W = P^e F(u, z) \]

Real wages  Bargaining power  Unemployment insurance
Nominal wage setting  Fear of unemployment  Hiring rate (reallocation)
Bargaining
Price Determination

• Production function (simple)

\[ Y = N \]

\[ \Rightarrow \]

\[ P = (1 + \mu) W \]
The Natural Rate of Unemployment

• “Long Run” \( P = P^e \)

• The wage and price setting relationships:

\[
\frac{W}{P} = F(u,z)
\]

\[
\frac{P}{W} = 1 + \mu
\]

\( \Rightarrow \)

The natural rate of unemployment

\[
F(u,z) = \frac{1}{1 + \mu}
\]
Price setting

Wage setting

Unemployment

\[ \frac{1}{1+\mu} \]

\[ u_n \]

z, markup
From $u_n$ to $Y_n$

$$u = \frac{U}{L} = \frac{L - N}{L} = 1 - \frac{N}{L} = 1 - \frac{Y}{L}$$

$$F(1 - \frac{Y_n}{L}, z) = \frac{1}{1 + \mu}$$
W/P

1

\[ \frac{1}{1 + \mu} \]

Y

Wage setting

Price setting

Y_n

Z, markup
Aggregate Supply

\[ W = P^e F(1-Y/L,z) \]

\[ P = (1+ \mu) W \]

\[ P = P^e (1+ \mu) F(1-Y/L,z) \]
\[ P = P^e (1 + \mu) F(1 - Y/L, z) \]
Aggregate Demand

IS: \[ Y = C(Y-T) + I(Y,i) + G \]

LM: \[ \frac{M}{P} = Y L(i) \]

LM': \[ P' > P \]
AD: \[ Y = Y(M/P, G, T) \]
AD-AS: Canonical Shocks

Monetary expansion; fiscal expansion; oil shock
From AS to the Phillips Curve

* The price level vs The inflation rate

\[ P(t) = P^e(t) (1 + \mu) F(u(t), z) \]

Note that:
\[ \frac{P(t)}{P(t-1)} = 1 + \frac{(P(t)-P(t-1))}{P(t-1)} \]
\[ \frac{P^e(t)}{P(t-1)} = 1 + \frac{(P^e(t)-P(t-1))}{P(t-1)} \]

Let
\[ \pi(t) = \frac{(P(t)-P(t-1))}{P(t-1)} \]
• Then

\[(1+\pi(t)) = (1+\pi^e(t)) (1+\mu) F(u(t), z)\]

but

\[\ln(1+x) \approx x \quad \text{if } x \text{ is “small”}\]

Let also assume that

\[\ln(F(u(t), z)) = z - \alpha u(t)\]
The Phillips Curve

* The price level \( P(t) \) vs The inflation rate \( \pi(t) \)

\[
P(t) = P^e(t) (1+\mu) F(u(t), z)
\]

\[\approx\]

\[
\pi(t) = \pi^e(t) + (\mu+z) - \alpha u(t)
\]
The Phillips Curve and The Natural Rate of Unemployment

\[ \pi^e(t) = \pi(t) \]
\[ \Rightarrow \]
\[ u_n = \frac{(\mu+z)}{\alpha} \]
\[ \pi(t) = \pi^e(t) - \alpha (u(t) - u_n) \]