Lecture 15: The Phillips Curve
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

\[ \pi^e(t) = \pi(t) \]

\[ \Rightarrow \]

\[ u_n = \frac{(\mu + z)}{\alpha} \]

\[ \pi(t) = \pi^e(t) - \alpha (u(t) - u_n) \]