New Keynesian Model Review
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- Dynamic IS Curve (IS):
$$\hat{y_t} = E_t\{\hat{y}_{t+1}\} - \sigma[\hat{i}_t - E_t\{\hat{\pi}_{t+1}\}] \tag{1}$$
  - This comes from the household block. The optimality conditions generate an Investment-Saving (IS) curve that gives the relationship between output and real interest rate.
  - Aggregate demand depends negatively on the real interest rate and positively on future expected output.
  - Provides insight into how economic activity is influences by interest rates and expectations.
  - $-\sigma$: intertemporal rate of substitution.
- NK Phillips Curve:
$$\hat{\pi}_t = \beta E_t\{\hat{\pi}_{t+1}\} + \kappa(\hat{y}_t - \hat{y}_t^{flex}) \tag{2}$$
  - This comes from the Firm block. The NK Phillips curve is forward looking expectation augmented Phillips curve.
  - Relationship that describes how current inflation is determined by **expected future inflation** (firms set prices based on what they expect future inflation to be, making expectation crucial) and the level of economic activity, typically measured by **output gap** (when the economy is producing above it potential (positive gap) there is upward pressure on prices (inflation) and conversely, negative output gap exerts downward pressure on prices).
  - κ : parameter reflecting sensitivity of inflation to output gap. β: Discount Factor (time preference). $\hat{y}_t^{flex} = \frac{1+\phi}{\gamma+\phi}\hat{a}_t$ is exogenous driving process for the output gap
- Monetary Policy Rule (MPR):
$$\hat{i}_t = \phi_\pi \hat{\pi}_t + v_t \tag{3}$$
  - Central bank sets nominal interest rate according to interest rule (Taylor Rule).
  - Systematic way for central banks to set nominal interest rate based on economic conditions (particularly inflation an doutput gaps). Helps stabilize the economy by influencing aggregate demand through interest rate adjustments.
  - $\hat{v}_t$ is the monetary policy shock.
- NKPC describes how inflation evolves based on expectations and economic slack
- MPR describes how the central bank sets the interest rate in response to deviations of inflation from the target and output gap.
- NKPC + MPR + DIS together describes how the output gap is influence by real interest rates and expectation.