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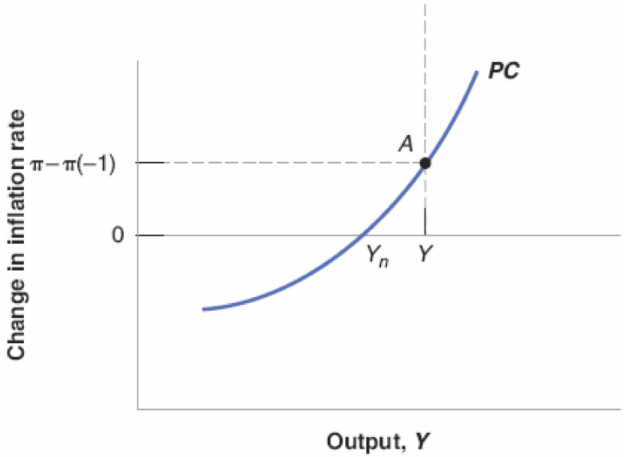

A (very) simplified new-synthesis model

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A (very) simplified New-Keynesian model

- Captures New-Keynesian perspective on fluctuations;
- Underpins mainstream policy discussions;
- Integrates old-Keynesian and monetarist insights;
- Not microfounded.
- *Romer (2000), Carlin & Soskice (2005), Blanchard (2017).*

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A 3-equations economy

- IS Curve:

$$y_t = A - ar_{t-1} \tag{1}$$

- Accelerationist PC:

$$\pi_t = \pi_{t-1} + \alpha(y_t - y^\star) \tag{2}$$

- Central Bank reaction function:

$$r_t = r^\star + \psi(\pi_t - \pi^T) \tag{3}$$

$y =$ output; π = inflation rate; $y^\star$=potential output; r=interest rate; $r^\star$=equilibrium interest rate; π^T=target interest rate;

Old-Keynesian IS Curve

- Output:

$$y_t = C_t + I_t + \bar{G}$$

- Consumption:

$$C_t = c_0 + c_1(1-\bar{t})y_t$$

- Housing investment:

$$I_t = a_0 - a_1 r_{t-1}$$

- Short-run equilibrium output:

$$y_t = A - a r_{t-1}$$

$$\text{where } A = \frac{c_0 + a_0 + \bar{G}}{1 - c_1(1-\bar{t})} \text{ and } a = \frac{a_1}{1 - c_1(1-\bar{t})}$$

'Monetarist' Phillips Curve (1/2)

- Wage setting

$$\frac{W_t}{P_t^e} = 1 - \beta u_t \quad \Rightarrow \quad W_t = P^e(1 - \beta u_t) \tag{4}$$

- Price setting

$$y_t = N_t \quad \Rightarrow \quad P_t = (1 + m)W_t \tag{5}$$

- Inflation rate

$$P_t = P_t^e(1 + m)(1 - \beta u_t) \quad \Rightarrow \quad \pi_t = \pi_t^e + m - \beta u_t \tag{6}$$

- Medium-run equilibrium unemployment rate

$$\pi = \pi^e \quad \Rightarrow u^\star = \frac{m}{\beta} \quad \Rightarrow \quad \pi - \pi^e = -\beta(u_t - u^\star) \tag{7}$$

'Monetarist' Phillips Curve (1/2)

- Phillips curve

$$\pi - \pi^e = -\beta(u_t - u^\star)$$

- Assuming adaptive expectations

$$\pi^e = \pi_{t-1} \quad \Rightarrow \pi_t = \pi_{t-1} - \beta(u_t - u^\star)$$

- Rewrite in terms of output

$$\pi_t = \pi_{t-1} + \alpha(y_t - y^\star)$$

- Define equilibrium ('natural') interest rate:

$$y^\star = A - ar^\star \quad \Rightarrow \quad y_t - y^\star = -a(r_{t-1} - r^\star)$$

Central Bank reaction function

- CB minimizes a loss function

$$\min_r \ell = (y_t - y^\star)^2 + \gamma(\pi - \pi^T)^2$$

- CB's desired output gap

$$y_t - y^\star = -\alpha\gamma(\pi_t - \pi^T)$$

- CB choice of interest rate (*Monetary policy rule*)

$$r_t = r^\star + \psi(\pi_t - \pi^T)$$

$$\text{with } \psi = \frac{1}{a(\alpha + \frac{1}{\alpha\gamma})}$$

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A 3-equations economy

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- Equilibrium:

$$y = y^\star; \quad u = u^\star; \quad r = r^\star; \quad \pi = \pi^T$$

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Out of equilibrium dynamics

- suppose $y = y^\star$, $r = r^\star$ and $\pi = \pi^T$ initally
- a positive demand shock occurs, eg $c_0 \uparrow$

1 Economic boom:

$$y > y^\star, \quad u < u^\star; \quad r^\star \uparrow;$$

2 Accelerating inflation:

$$\pi > \pi^T \text{ and rising}$$

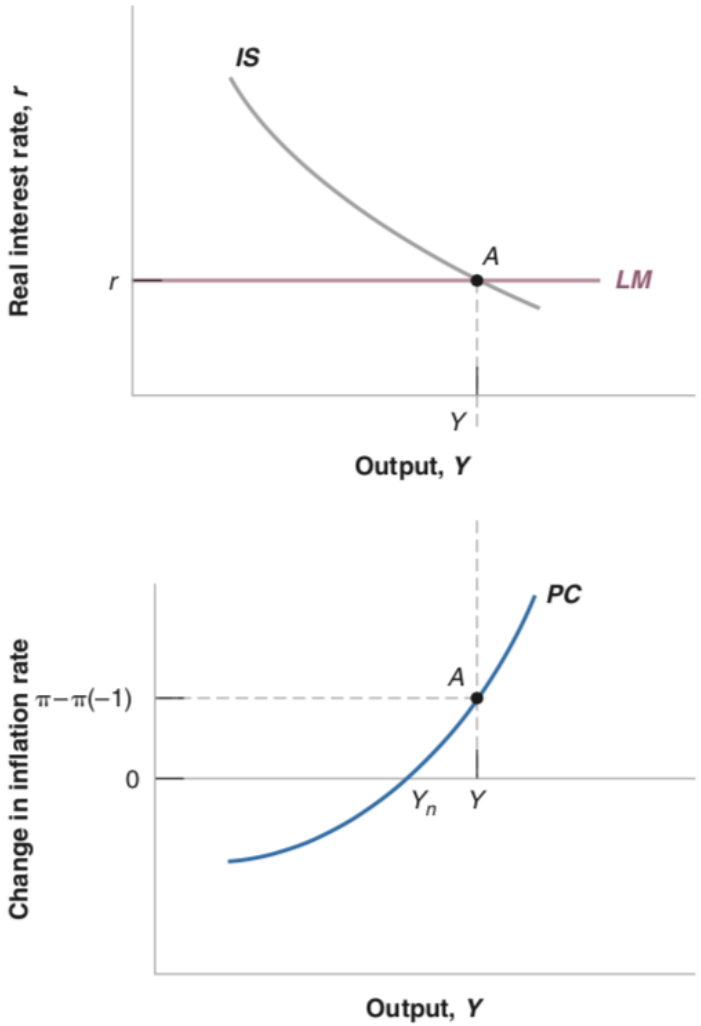
3 CB reaction and downturn:

$$r \uparrow; r > r^\star \quad \Rightarrow \quad Y \downarrow; Y < Y^\star.$$

5 Stabilization:

$$\pi = \pi^T; \quad r = r^\star; \quad Y = Y^\star$$

A short-run equilibrium with output above potential



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Challenges for the new-synthesis consensus

Five critical assumptions:

1. Monetary policy always effective in increasing output;
2. Policy-makers have a good estimate of a well-defined $u^\star$ and other key parameters;
3. Low unemployment always translates in higher wages & prices;
4. The level of potential output is unaffected by changes in demand;
5. Low interest rates have no negative side-effects