Sufficient-Statistic Formula for Optimal Monetary Policy

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Divine Beveridge-Wicksell framework

Optimal monetary policy: i^* = optimal nominal interest rate

$$u(i^*) = u^*$$

Sufficient-statistic formula: Given current u, i gives the optimal nominal interest rate i^*

→ gives optimal policy to Fed given current situation

Derivation of formula: First-order Taylor expansion around i^* & $u(i^*) = u^*$

$$u(i) = u(i^*) + \frac{du}{di} \times [i - i^*]$$

(Beveridge: u; Wicksell: i)

(up to 2nd order term)

$$u = u^* + \frac{du}{di}(i - i^*)$$

$$i - i^* = \frac{u - u^*}{du/di}$$

$$i^* = i - \frac{u - u^*}{du/di} \quad \oplus \quad \oplus$$

i current nominal interest rate (FFR)

i^* optimal ——— (target)

$u - u^*$: unemployment gap

- $u - \sqrt{uv}$
- more sophisticated formula

du/di monetary multiplier

Δ in unemployment (pp) when nominal interest rate increases by 1 pp.

$\Leftrightarrow du/di > 0$ bc higher i leads to higher u