

Sufficient-Statistic Formula for Optimal Monetary Policy

Pascal Michailat
<https://pascalmichailat.org/c2/>

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^*
→ give 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* ↑ *Wicksell*

(upto 2nd order term)

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

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

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

i current nominal interest rate (FFR)

i^* optimal _____ (target)

$u - u^*$ unemployment gap

du/di monetary multiplier

($\bullet u - \sqrt{u^*}$
 \bullet more sophisticated formula)

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

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